



**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

Réception des soumissions - TPSGC / Bid Receiving
- PWGSC
Voir dans le document/
See herein
NA
Québec
NA

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet North Warning System Hybrid Power S North Warning System Hybrid Power System	
Solicitation No. - N° de l'invitation 23332-220150/A	Date 2021-12-24
Client Reference No. - N° de référence du client 23332-22-0150	
GETS Reference No. - N° de référence de SEAG PW-\$QCL-056-18266	
File No. - N° de dossier MTA-1-44079 (056)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Standard Time EST on - le 2022-02-11 Heure Normale du l'Est HNE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Mohammed-Azizi, Samia	Buyer Id - Id de l'acheteur qcl056
Telephone No. - N° de téléphone (418) 576-9803 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: MINISTERE DES RESSOURCES NATURELLES CAMNET, centre de la technologie de l'énergie 1615 BOUL.LIONEL BOULET CP4800 VARENNES Québec J3X1S6 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

TPSGC/PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date



Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination	Plant/Usine	Del. Offered Liv. offerte
1 T	GoodNorth Hybrid Power Syst. CANME	2332	2332	1	CH	\$	XXXXXXXXXXXX	

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**ANNEX "E" TO PART 5 OF THE BID SOLICITATION - FEDERAL CONTRACTORS PROGRAM FOR
EMPLOYMENT EQUITY – CERTIFICATION 68**

**ANNEX "F" TO PART 5 OF THE BID SOLICITATION - COVID-19 VACCINATION REQUIREMENT
CERTIFICATION 69**

PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides Bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications and Additional Information: includes the certifications and additional information to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by Bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include:

- Annex "A" Statement of work;
- Annex "B" Basis of payment;
- Annex "C" Security Requirement Check List;
- Annex "D" Electronic Payment Instruments.
- Annex "E" Federal Contractors Program for Employment Equity – Certification
- Annex "F" COVID-19 Vaccination Requirement Certification

1.2 Summary

1.2.1 Title

North Warning System Hybrid Power System

1.2.2 Description of the Requirement

CanmetENERGY Research Centre in Varennes, QC is seeking to procure a ruggedized and air cargo transportable 90 kW continuous average load (180 kW peak) battery system capable of being integrated with a diesel generator and solar photovoltaics (hybrid microgrid system).

1.2.3 Period of the contract

The period of the Contract is from date of Contract to March 31, 2024 inclusive.

1.2.4 Security Requirements

There are security requirements associated with this requirement. For additional information, consult Part 6 - Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses. For more information on personnel and organization security screening or security clauses, Bidders should refer to the [Contract Security Program](#) of Public Works and Government Services Canada website.

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1.2.5 Federal Contractors Program for employment equity

The Federal Contractors Program (FCP) for employment equity applies to this procurement; refer to Part 5 – Certifications and Additional Information, Part 7 - Resulting Contract Clauses and the annex titled Federal Contractors Program for Employment Equity – Certification.

1.2.6 epost Connect Service

This bid solicitation allows bidders to use the epost Connect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.

1.2.7 COVID-19 Vaccination Requirement

This requirement is subject to the COVID-19 Vaccination Policy for Supplier Personnel. Failure to complete and provide the COVID-19 Vaccination Requirement Certification as part of the bid will render the bid non-responsive.

1.3 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2020-05-28) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of [2003](#), Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days
Insert: 180 days

2.1.1 SACC Manual Clauses

[A7035T](#) (2007-05-25), List of Proposed Subcontractors

2.2 Submission of Bids

Bids must be submitted only to the Public Works and Government Services Canada (PWGSC) Quebec Region Bid Receiving Unit specified below by the date and time indicated on page 1 of the bid solicitation.

2.2.1 Epost Connect

Bidders choosing to submit using epost Connect must send an email requesting to open an epost Connect conversation to the following address:

TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca

Note: **Bids will not be accepted if emailed directly to this email address.** This email address is to be used to open an epost Connect conversation, as detailed in Standard Instructions [2003](#), or to send bids through an epost Connect message if the bidder is using its own licensing agreement for epost Connect.

It is the Bidder's responsibility to ensure the request for opening an epost Connect conversation is sent to the email address above at least six days before the solicitation closing date.

[Steps to follow for the Bid Submission to Bid Receiving Unit \(BRU\) using epost Connect](https://buyandsell.gc.ca/steps-to-follow-for-the-bid-submission-to-bid-receiving-unit-bru-using-epost-connect) (<https://buyandsell.gc.ca/steps-to-follow-for-the-bid-submission-to-bid-receiving-unit-bru-using-epost-connect>)

2.2.2 Facsimile

Facsimile number: 418-566-6168.

2.2.3 Bids transmitted by hardcopy to PWGSC will not be accepted.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than 7 business days calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Quebec.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

2.5 Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least 7 business days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

2.6 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](https://buyandsell.gc.ca/for-businesses/selling-to-the-government-of-canada/bid-follow-up/bid-challenge-and-recourse-mechanisms) website, under the heading "[Bid Challenge and Recourse Mechanisms](https://buyandsell.gc.ca/for-businesses/selling-to-the-government-of-canada/bid-follow-up/bid-challenge-and-recourse-mechanisms)" (<https://buyandsell.gc.ca/for-businesses/selling-to-the-government-of-canada/bid-follow-up/bid-challenge-and-recourse-mechanisms>) contains information on potential complaint bodies such as:
 - Office of the Procurement Ombudsman (OPO)
 - Canadian International Trade Tribunal (CITT)
- (c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. The epost Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

The bid must be gathered per section and separated as follows:

Section I: Technical Bid
Section II: Financial Bid
Section III: Certifications

Bids transmitted by hardcopy will not be accepted.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

3.1.1 Policy on Green Procurement

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). To assist Canada in reaching its objectives, bidders should:

- 1) Include all environmental certification(s) relevant to your organization (e.g. ISO 14001, Leadership in Energy and Environmental Design (LEED), Carbon Disclosure Project, etc.)
- 2) Include all environmental certification(s) or Environmental Product Declaration(s) (EPD) specific to your product/service (e.g. Forest Stewardship Council (FSC), ENERGYSTAR, etc.)
- 3) Unless otherwise noted, bidders are encouraged to submit bids electronically.

Section I: Technical Bid

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Annex "B", Basis of payment.

3.1.2 Electronic Payment of Invoices – Bid

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Annex "D" Electronic Payment Instruments, to identify which ones are accepted.

If Annex "D" Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

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Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

3.1.3 Exchange Rate Fluctuation

C3011T (2013-11-06), Exchange Rate Fluctuation

3.1.4 SACC Manual Clauses

Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.

Section IV: Additional Information

3.1.5 Bidder's Proposed Sites or Premises Requiring Safeguarding Measures

- 3.1.5.1** As indicated in Part 6 under Security Requirements, the Bidder must provide the full addresses of the Bidder's and proposed individuals' sites or premises for which safeguarding measures are required for Work Performance:

Street Number / Street Name, Unit / Suite / Apartment Number
City, Province, Territory / State
Postal Code / Zip Code
Country

- 3.1.5.2** The Company Security Officer must ensure through the Contract Security Program (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html>) that the Bidder and proposed individuals hold a valid security clearance at the required level, as indicated in Part 6 – Security, Financial and Other Requirements.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Technical Evaluation

Bids will be reviewed to determine whether it meets the mandatory requirements of the Request for Proposal (RFP). All the elements of the RFP specifically identified as “must”, “shall” or “mandatory” are mandatory requirements.

Bids that fail to meet all of the mandatory requirements, without exception, will be declared non-responsive and rejected.

Bidders must provide a proposal that demonstrates their corporate experience and corporate expertise in designing, delivering, installing and commissioning power system solutions for autonomous networks and microgrids.

PWGSC reserves the right to contact the named client as a reference to verify the accuracy and veracity of the information provided by the Bidder.

4.1.1.1 Bidder Experience

Except where expressly provided otherwise, the experience described in the bid must be the experience of one or more of the following:

- a) The Bidder itself (which includes the experience of any companies that formed the Bidder by way of a merger but does not include any experience acquired through a purchase of assets or an assignment of contract); or
- b) The Bidder's affiliates (i.e. parent, subsidiary or sister corporations, maximum of 2), provided the Bidder identifies and demonstrates the transfer of know-how, the use of toolsets and the use of key personnel from the affiliate for the applicable criteria; or
- c) The Bidder's subcontractors, provided the Bidder includes a copy of the teaming agreements and identifies the roles and responsibilities of all parties under the agreement and how their work will be integrated.

The experience of the Bidder's suppliers will not be considered.

4.1.1.2 Joint Venture Experience

- a) Where the Bidder is a joint venture with existing experience as that joint venture, it may submit the experience that it has obtained as that joint venture.

Example: A bidder is a joint venture consisting of members L and O. A bid solicitation requires that the bidder demonstrate experience providing maintenance and help desk services for a period of 24 months to a customer with at least 10,000 users. As a joint venture (consisting of members L and O), the bidder has previously done the work. This bidder can use this experience to meet the requirement. If member

L obtained this experience while in a joint venture with a third party N, however, that experience cannot be used because the third party N is not part of the joint venture that is bidding.

- b) A joint venture bidder may rely on the experience of one of its members to meet any given technical criterion of this bid solicitation.

Example: A bidder is a joint venture consisting of members X, Y and Z. If a solicitation requires: (a) that the bidder have 3 years of experience providing maintenance service, and (b) that the bidder have 2 years of experience integrating hardware with complex networks, then each of these two requirements can be met by a different member of the joint venture. However, for a single criterion, such as the requirement for 3 years of experience providing maintenance services, the bidder cannot indicate that each of members X, Y and Z has one year of experience, totaling 3 years. Such a response would be declared non-responsive.

- c) Joint venture members cannot pool their abilities with other joint venture members to satisfy a single technical criterion of this bid solicitation. However, a joint venture member can pool its individual experience with the experience of the joint venture itself. Wherever substantiation of a criterion is required, the Bidder is requested to indicate which joint venture member satisfies the requirement. If the Bidder has not identified which joint venture member satisfies the requirement, the Contracting Authority will provide an opportunity to the Bidder to submit this information during the evaluation period. If the Bidder does not submitted this information within the period set by the Contracting Authority, its bid will be declared non-responsive.

Example: A bidder is a joint venture consisting of members A and B. If a bid solicitation requires that the bidder demonstrate experience providing resources for a minimum number of 100 billable days, the bidder may demonstrate that experience by submitting either:

- o Contracts all signed by A;
- o Contracts all signed by B; or
- o Contracts all signed by A and B in joint venture, or
- o Contracts signed by A and contracts signed by A and B in joint venture, or
- o Contracts signed by B and contracts signed by A and B in joint venture.

that show in total 100 billable days.

- d) Any Bidder with questions regarding the way in which a joint venture bid will be evaluated should raise such questions through the Enquiries process as early as possible during the bid solicitation period.

4.1.1.3 Proposed Resources

- a) By submitting a bid, the bidder certifies that, if it is awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed with Canada's representatives.
- b) By submitting a bid, the Bidder certifies that all the information provided in the resumes and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.
- c) If the Bidder is unable to provide the services of an individual named in its bid due to the death, sickness, extended leave (including parental leave or disability leave), retirement, resignation or dismissal for cause of that individual, within five business days of Canada's knowledge of the unavailability of the individual the Bidder may propose a substitute to the Contracting Authority, providing:
- i. the reason for the substitution with substantiating documentation acceptable to the Contracting Authority;
 - ii. the name, qualifications and experience of a proposed replacement immediately available for work; and

- iii. proof that the proposed replacement has the required security clearance granted by Canada, if applicable.
- d) No more than one substitute will be considered for any given individual proposed in the bid. In response to the Bidder's proposed substitution, the Contracting Authority may elect in its sole discretion either to:
 - i. set aside the bid and give it no further consideration; or
 - ii. evaluate the replacement in accordance with the requirements of the bid solicitation in the place of the original resource as if that replacement had originally been proposed in the bid, with any necessary adjustments being made to the evaluation results, including the rank of the bid vis-à-vis other bids.
- e) If no substitute is proposed the Contracting Authority will set aside the bid and give it no further consideration.
- f) If the Bidder has proposed any individual who is not an employee of the Bidder, by submitting a bid, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her resume to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

4.1.1.4 Mandatory Technical Criteria

The technical evaluation will be based on the mandatory technical criteria detailed in the table below.

Bidders must demonstrate that the goods and/or services offered are compliant with each of these mandatory technical criteria with documents and/or technical drawings, which must be submitted with their proposal.

Bidders should complete the table below in order to indicate where the technical criteria are demonstrated within their submitted documents and/or technical drawings and include it with their proposal.

Table 1 – Mandatory Technical Criteria

Mandatory Technical Criteria :	Bidder's Substantion (indicate page # in proposal)
<p>MC1</p> <p>Bidders must have successfully completed, at least one 1 project of similar scope and in the same field as required herein, and this, delivered within the past 5 years from the date of the closing of bids.</p> <p><u>"Similar in scope"</u> means: an experience entailing the design, assembly, commissioning and installation of a power system in a microgrid application.</p> <p><u>"Same field"</u> means: Power solution project for an autonomous network or microgrid equivalent to what is described in the statement of work of Annex A.</p> <p>In order to demonstrate that their enterprise has the required qualifications, bidders should submit at least the following information:</p> <ul style="list-style-type: none"> • The title of the contract; 	

	<ul style="list-style-type: none">• A description of the power system solution for the autonomous network or microgrid equivalent to that mentioned in the statement of work at Annex A;• The name of the organization/client, including the name and phone number of a contact person.• The exact dates of the contract (month and year of the start and end/delivery).• When the system was delivered to the client and fully operational.• Current status of the system installed. <p><i>Information should be provided in a format similar to Table A in the attachment 1 of part 4, Technical Criteria</i></p>	
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4.1.2 Point Rated Evaluation Criteria

- a) Any proposal that meets all of the mandatory technical requirements specified above in Table 1 - Mandatory Technical Criteria, will be evaluated and scored according to the evaluation criteria listed in Table 2, 3, and 4.
- b) The rated evaluation is divided in 3 sections:
 - a. Corporate Experience
 - b. Corporate Expertise
 - c. Work Plan
- c) No points will be awarded if compliance with the point rated technical criterion is not sufficiently demonstrated.
- d) Bids which fail to obtain the required minimum number of points specified will be declared non-responsive.
- e) Each point rated technical criterion should be addressed separately.
- f) The number of months and years of experience required is calculated according to the project dates (format: Month Year) on which the tenderer has worked. For example, a bidder who worked on a project from July 2019 to October 2019 could count four months of experience for this project, and thus add the number of months for each project he worked on.
- g) The months and years of experience can be concomitant.

4.1.2.1 Corporate Experience

- a) In order to demonstrate its corporate experience, the bidder should provide a description of up to 5 reference projects following the instruction provided in Attachment 1 of Part 4.
- b) Each criterion will be evaluated in accordance with the score scale provided in Table 2.

Table 2 - Corporate Experience

ID	POINT RATED EVALUATION CRITERIA	MAXIMUM SCORE	Bidder's Substantion Indicate Page # in proposal
C1	<p>YEARS OF EXPERIENCE:</p> <p>The bidder should demonstrate their number of years of experience in the design, assembly, installation and commissioning of power system solutions for autonomous networks and microgrids.</p> <p>20 points: More than 120 months</p> <p>15 points: From 73 months to 120 months</p> <p>10 points: From 37 months to 72 months</p> <p>5 points: From 24 months to 36 months</p> <p>0 points: Less than 24 months</p>	20	
C2	<p>EXPERIENCE COMBINING DIFFERENT DISTRIBUTED ENERGY RESOURCES:</p> <p>The bidder should demonstrate their experience in combining different distributed energy resources such as diesel generators, battery energy storage and inverter technologies to meet power demands in autonomous networks and microgrids in an islanded power system configuration delivered within the last 15 years. For each project referenced a letter of recommendation from the client should be provided to confirm the information provided.</p> <p>30 points: Integrating and controlling at least 4 distributed energy resources in a microgrid.</p> <p>20 points: Integrating and controlling 3 distributed energy resources in a microgrid.</p> <p>10 points: Integrating and controlling 2 distributed energy resources in a microgrid.</p> <p>5 points: Integrating and controlling 1 distributed energy resources in a microgrid.</p> <p>0 points: Integrating and controlling no distributed energy resources in a microgrid.</p> <p>Bonus points:</p> <p>5 points: For proposals that include a system description where the integration and control of diesel generator with battery energy storage and solar photovoltaics was performed</p>	40	

	<p>5 points: If one of the described projects is still functioning with all listed distributed energy resources still operation.</p>		
C3	<p>EXPERIENCE IN ARCTIC/ANTARCTIC AND REMOTE/OFF GRID AUTONOMOUS POWER SOLUTIONS FOR MICROGRIDS:</p> <p>The bidder should demonstrate their experience designing and commissioning autonomous islanded power systems in Arctic or Antarctic and/or remote off grid regions.</p> <p>The bidder has experience in designing and commissioning an alternative energy solution project:</p> <p>10 points: in an Arctic or Antarctic regions</p> <p>5 points: in an off-grid non-Arctic/Antarctic region</p> <p>0 point: In no off-grid locations</p>	10	
C4	<p>EXPERIENCE IN INTEGRATING AUTONOMOUS POWER SOLUTIONS WITH FUTURE SITE POWER GENERATION AND REMOTE MONITORING SYSTEM</p> <p>The bidder should demonstrate their experience designing and interfacing an autonomous islanded power systems with Deutz Generators, Deep Sea Electronics Engine controllers and the Rockwell Automation Controllogix Platform.</p> <p>10 points: The bidder has experience in working with three of the listed components (Deutz diesel generator, Deep Sea Electronics Engine Controller, Rockwell Automation Controllogix Platform)</p> <p>7 points: The bidder has experience in working with two of the three listed components (Deutz diesel generator, Deep Sea Electronics Engine Controller, Rockwell Automation Controllogix Platform)</p> <p>4 points: The bidder has experience in working with one of the three listed components (Deutz diesel generator, Deep Sea Electronics Engine Controller, Rockwell Automation Controllogix Platform)</p> <p>0 points: The bidder has no experience in working with at least one of the three listed components (Deutz diesel generator, Deep Sea Electronics Engine Controller, Rockwell Automation Controllogix Platform)</p>	10	
	CORPORATE EXPERIENCE TOTAL (C1 to C4)	80	
	MINIMUM SCORE REQUIRED	40	

4.1.2.2 Corporate Expertise

- a) In order to demonstrate its corporate expertise, the bidder should provide a minimum of 2 résumés for each category of resources and a description of up to 5 reference projects following the instruction provided in Section 2 of the Attachment 1 of Part 4.

Table 3 - Corporate Expertise

ID	POINT RATED EVALUATION CRITERIA	MAXIMUM SCORE	Bidder's Substantion Indicate Page # in proposal
C5	<p>PROJECT MANAGER</p> <p>The bidder should demonstrate the expertise and technical qualification of the resource proposed as the “project manager” showing work experience in managing projects to deliver alternative power solutions in autonomous networks and microgrids.</p> <p>15 points: The bidder has demonstrated the proposed resource has acquired expertise of managing at least 3 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>10 points: The bidder has demonstrated the proposed resource has acquired expertise of managing 2 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>5 points: The bidder has demonstrated the proposed resource has acquired expertise of managing 1 project successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>0 point: The bidder has not demonstrated that the proposed resource has acquired expertise of managing a project successfully delivering an alternative power solutions in an autonomous network and microgrid or no resume of the proposed resource was provided.</p> <p>Bonus points: 5 points: for a successfully managed project combining diesel power generation, battery energy storage and solar photovoltaics capable of delivering more than 50 kW.</p>	20	

C6	<p>ELECTRICAL DESIGN AND ENGINEERING PERSONNEL</p> <p>The bidder should describe the expertise and technical qualification of the “electrical design and engineering” resource showing work experience in the electrical design and engineering to deliver alternative power solutions in autonomous networks and microgrids.</p> <p>15 points: The bidder has demonstrated the proposed resource has acquired expertise in the electrical design and engineering through at least 3 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>10 points: The bidder has demonstrated the proposed resource has acquired expertise in the electrical design and engineering through 2 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>5 points: The bidder has demonstrated the proposed resource has acquired expertise in the electrical design and engineering through 1 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>0 point: The bidder has not demonstrated that the proposed resource has acquired expertise in the electrical design and engineering to successfully deliver an alternative power solutions in an autonomous network and microgrid or no resume of the proposed resource was provided.</p> <p>Bonus points:</p> <p>5 points: if one of the projects includes the use of diesel generator, battery energy storage and solar photovoltaics.</p> <p>5 points: Expertise is in-house or through the joint venture.</p>	25	
C7	<p>MICROGRID & BATTERY MANAGEMENT SYSTEM CONTROLS PERSONNEL</p> <p>The bidder should describe the expertise and technical qualification of the “microgrid & battery management system controls” resource showing work experience in microgrid controls to deliver alternative power solutions in autonomous networks and microgrids.</p> <p>15 points: The bidder has demonstrated the proposed resource has acquired expertise in the microgrid controls and battery system management through at least 3 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p>	35	

	<p>10 points: The bidder has demonstrated the proposed resource has acquired expertise in the microgrid controls and battery system management through 2 projects successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>5 points: The bidder has demonstrated the proposed resource has acquired expertise in the microgrid controls and battery system management through 1 project successfully delivering an alternative power solutions in an autonomous network and microgrid.</p> <p>0 points: The bidder has not demonstrated that the proposed resource has acquired expertise in the microgrid controls and battery system management to successfully deliver an alternative power solutions in an autonomous network and microgrid or no resume of the proposed resource was provided.</p> <p>Bonus points:</p> <p>5 points: if one of the projects includes the use of diesel generator, battery energy storage and solar photovoltaics.</p> <p>5 points: if the resource has experience interfacing the microgrid controls with the Deep Sea Electronics Generator control platform.</p> <p>5 points: if the resource has experience interfacing the microgrid controls with the Rockwell Automation ControlLogix Platform.</p> <p>5 points: Expertise is in-house or through the joint venture.</p>		
	CORPORATE EXPERTISE TOTAL (C5 to C7)	80	
	MINIMUM SCORE REQUIRED	40	

4.1.2.3 Work Plan

- a) The proposal must give an overview of the system being proposed, key project deliverables, timelines, risks and risk mitigation and to demonstrate the bidders understanding of the project. A more detailed work plan is to be provided upon contract award. The following criteria will be evaluated with the weighted score indicated.
- b) The bidder should provide the information required following the instruction provided in Section 3 of the Attachment 1 of Part 4.
- c) The evaluation grid (Table 5) below will be used to evaluate the bidders' proposals based on each rated criterion.

- d) The proposal will be evaluated on how well the bidder describes the hybrid microgrid system concept and approach that will be taken to meet the project objectives/requirements. The bidder should address clearly and in sufficient depth the points listed in Table 4 below. Simply repeating the statement contained in the bid solicitation is not sufficient.

Table 4 – Work plan

ID	POINT RATED EVALUATION CRITERIA	MAXIMUM SCORE	Bidder's Substantion Indicate Page # in proposal
C8	<p>PROJECT MANAGEMENT:</p> <p>The bidder must include a proposal describing the following to deliver the hybrid microgrid system described in the Statement of Work in Annex A. The proposal must clearly demonstrate how the proposed solution will meet the project objectives and will be evaluated based on the following criteria:</p> <p>GOAL OF THE PROJECT (10 Points) The bidder understands the objective of the project (4 points), required system size (3 points) and operational requirements (3 points)</p> <p>SYSTEM CONCEPT, DESIGN AND DEVELOPMENT (40 Points) The bidder describes the system being proposed (10 points) The bidder provides a schematic layout of the proposed system (5 points) The bidder provides a single line electrical diagram of proposed system (5 points) The bidder describes the battery energy storage module and how it is able to meet the operational loads with the distributed energy resources (10 points) The bidder clearly describes how the proposed system will be able to interface with the existing equipment and control platforms at the eventual deployment site (10 points)</p> <p>KEY SYSTEM COMPONENTS (20 Points) The bidder lists and provides specification sheets of the following components to be used in the hybrid microgrid system design: - Generator (5 points) - Batteries (5 points) - Inverter (5 points) - Microgrid Control Platform (5 points)</p>	110	

	<p>PRINCIPLE OF OPERATION (20 Points) The bidder provides a description of how the system will operate to meet the electrical loads of the site during the desired microgrid control options. This includes a description of when the system will operate under the following modes:</p> <ul style="list-style-type: none"> - Generator off mode (5 points) - Generator standby mode (5 points) - Generator mode (5 points) - Hybrid mode (5 points) <p>DEVELOPMENT AND BUILD SCHEDULE (10 Points) The bidder provides a description of the scope and timeline for the following phases of the project:</p> <ul style="list-style-type: none"> - Design (2 points) - Procurement of components (2 points) - Assembly of hybrid power system (2 points) - Development and testing of hybrid power system (2 points) - CSA/UL Certification (2 Points) <p>RISK AND RISK MITIGATION (10 Points) The bidder has identified at least one risk for each phase of the project and how to mitigate the risk.</p> <ul style="list-style-type: none"> - Design (2 points) - Procurement of components (2 points) - Assembly of hybrid power system (2 points) - Development and testing of hybrid power system (2 points) - CSA/UL Certification (2 Points) 		
	WORK PLAN TOTAL (C8)	110	
	MINIMUM SCORE REQUIRED	55	
TOTAL (C1 to C8)	270		
MINIMUM TOTAL SCORE REQUIRED	135		

Table 5 – Evaluation Grid for the Work Plan

EVALUATION GRID	
Excellent (100%)	The rated criteria are addressed in detail and the information provided shows that the bidder fully and thoroughly understands all elements of the rated criteria.
Very good (80%)	The information provided clearly shows the bidder fully understands all elements of the rated criteria.
Good (60%)	The information provided clearly shows the bidder fully understands certain but not all elements of the rated criteria.
Unsatisfactory (40%)	The information provided shows a limited understanding of the specified criteria, without showing that the bidder fully understands all elements of the rated criteria. The bidder shows basic communication skills. The project results presented are poor and non-significant.
Poor (20%)	The information provided shows that the bidder has a basic understanding of the specified criteria.
Unacceptable (0%)	The information provided does not meet the criteria.

4.1.3 Financial Evaluation

4.1.3.1 Evaluation of Price – Canadian / Foreign Bidders

1. Bidders must submit firm prices, custom duties and excise taxes included, and Applicable Taxes excluded.
2. Unless the bid solicitation specifically requires bids to be submitted in Canadian currency, bids submitted in foreign currency will be converted to Canadian currency for evaluation purposes. The rate given by the Bank of Canada in effect on the bid solicitation closing date, or on another date specified in the bid solicitation, will be applied as a conversion factor to the bids submitted in foreign currency.
3. Canada requests that bidders provide prices Delivery Duty Paid (DDP) destination Incoterms 2010. Bids will be assessed on an DDP destination basis.
4. For the purpose of the bid solicitation, bidders with an address in Canada are considered Canadian-based bidders and bidders with an address outside of Canada are considered foreign-based bidders.

4.2 Basis of Selection

4.2.1 Basis of Selection – Highest Combined Rating of Technical Merit and Price

1. To be declared responsive, a bid must:
 - a. comply with all the requirements of the bid solicitation; and
 - b. meet all mandatory criteria; and
 - c. obtain the required minimum points specified for each criteria group for the technical evaluation, and

- d. obtain the required minimum score of 135 overall for the technical evaluation criteria which are subject to point rating.
2. Bids not meeting (a) or (b) or (c) and (d) will be declared non-responsive.
 3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 70 % for the technical merit and 30 % for the price.
 4. To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 70 %.
 5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 30 %.
 6. For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
 7. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 70/30 ratio of technical merit and price, respectively.

Table 3 – Example - Highest Combined Rating of Technical Merit (70%) and Price (30%)

		Bidder 1	Bidder 2	Bidder 3
Overall Technical Score		135 / 270	180 / 270	220 / 270
Bid Evaluated Price		\$700 000,00	\$1 000 000,00	\$900 000,00
Calculations	Technical Merit Score	$(135 / 270) \times 70 =$ 35.00	$(180 / 270) \times 70 =$ 46.67	$(220 / 270) \times 70 =$ 57.04
	Score for the price	$\$700\,000,00 /$ $\$700\,000,00 \times 30 =$ 30.00	$\$700\,000,00 /$ $\$1\,000\,000,00 \times 30 =$ 23.33	$\$700\,000,00 /$ $\$900\,000,00 \times 30 =$ 21.00
	Combined Rating	65.00	70.00	78.04
	Overall Rating	3rd	2nd	1st

ATTACHMENT 1 TO PART 4 – TECHNICAL CRITERIA

In addition to part 4, this section provides a template detailing the information that should be provided for each reference project.

1. CORPORATE EXPERIENCE

- a) The bidder should provide the following information (see Table A) for each reference project to demonstrate its compliance to the mandatory criterion (MC1 and MC2) and the point rated technical criteria related to corporate experience (C1 to C4).
- b) Each project description must have a maximum of 3 pages per project excluding the cover page and letter of recommendation. If the number of pages is exceeded, the evaluation will be based on the first 3 pages for each project.

TABLE A: TECHNICAL EVALUATION CRITERIA – CORPORATE EXPERIENCE

Project Title	<i>Title</i>		
Location	<i>City, Province or State, Country</i>		
Client	<i>Organization, Name, Email, Phone</i>		
Project Start Date	<i>Month Year</i>	Project End Date	<i>Month Year</i>
Date the system was delivered and commissioned	<i>Month Year</i>	Current System Status	<i>In storage, fully operational, decommissioned, etc.</i>
Description of the Project			
<p>Description of Project (description of power solution delivered)</p> <ul style="list-style-type: none"> • Company contribution (design, assembly, installation and commissioning) • Distributed Energy Resources used • Description of Microgrid Control System and Objective Function • Battery Energy Storage System • Sizing (power and energy storage capacity) • Sizing (power and energy) of the distributed energy resources • Site and operational characteristics considered • Integration with Deutz Generator, Deep Sea Electronics Engine Controller, and/or Rockwell Automation Controllogix Platform <p>3 pages maximum per project</p>			

2. CORPORATE EXPERTISE

- a) The bidder should provide the resumes of proposed resources.
- b) If the bidder cannot propose resources for each category, subcontractors should be identified. The same information should be provided for the subcontractors' resources, and the same evaluation method will apply.

- c) In order to demonstrate its corporate expertise, the bidder should provide a minimum of 2 résumés for each category of resources and a description of up to 5 reference projects.
- d) The résumé should clearly indicate the following:
- i. Resource name;
 - ii. Education and diplomas earned;
 - iii. Occupational certification
 - iv. Months of experience in the relevant field;
 - v. Resources' months of experience with the firm;
 - vi. Capacity to offer services in English;
 - vii. List of projects managed by the resource, indicating title, value, and start month and end month
 - viii. Accomplishment, achievements and or awards.
- e) The bidder should provide the following information (see Table B) for each reference project to demonstrate the resource compliance to the point rated technical criteria related to corporate expertise (C5 to C7) to demonstrate the expertise and technical qualification of the proposed resource.
- f) Relevant projects are considered to be the deployment of a hybrid microgrid system, which includes a diesel generator with another distributed energy resource such as solar photovoltaics, battery storage, etc.
- g) Each project description must have a maximum of 3 pages per project excluding the cover page and résumés. If the number of pages is exceeded, the evaluation will be based on the first 3 pages for each project.

TABLE B: TECHNICAL EVALUATION CRITERIA – CORPORATE EXPERTISE

Project Title	<i>Title</i>		
Location	<i>City, Province or State, Country</i>		
Client	<i>Organization, Name, Email, Phone</i>		
Industry Sector			
Project Start Date	<i>Month Year</i>	Project End Date	<i>Month Year</i>
Date the system was delivered and commissioned	<i>Month Year</i>	Current System Status	<i>In storage, fully operational, decommissioned, etc.</i>
Description of the Project			
<p>Description of Project (description of power solution delivered)</p> <ul style="list-style-type: none"> • Description of autonomous power solution • Management of different areas of expertise for successful project deployment (civil, mechanical, electrical, controls, assembly and commissioning) • Electrical design and engineering for successful project deployment with multiple distributed energy resources. • Microgrid controls and battery system management for successful project deployment with multiple distributed energy resources. 			

- Microgrid control software platform used
- Battery Management System software control platform used
- Interfacing with or using Deep Sea Electronics Generator controls and Rockwell Automation ControlLogix Platform
- Contribution of resource to successful deployment of system

3 pages maximum per project

3. WORK PLAN

- a) The bidder should provide the following information (see Table C) for each reference project to demonstrate its compliance to the point rated technical criteria related to the work plan (C8).
- b) Each section of the proposed work plan must have a maximum of number of pages per section as indicated in Table C, which includes figures, tables and diagrams but excludes specifications of equipment and cover page. If the number of pages is exceeded for the respective section, the evaluation will be based on the first number of respective pages for each section.

TABLE C: TECHNICAL EVALUATION CRITERIA - WORK PLAN

PROJECT OBJECTIVE/GOAL (1 page maximum)
Description of project objective and what the system will be designed to deliver
SYSTEM CONCEPT, DESIGN AND DEVELOPMENT(10 pages maximum)
Description of system concept and conception schematic of proposed system <ul style="list-style-type: none"> • Description and conceptual layout of system being proposed • Single line electrical line diagram of system concept • Description of battery storage module • Description of how system with interface with existing equipment and final deployment site
SCOPE OF SUPPLY (2 pages maximum)
Key components to be used in the system <ul style="list-style-type: none"> • Generator • Batteries • Inverter • Microgrid Control Platform
PRINCIPLE OF OPERATION (2 pages maximum)
Description of how the system will operate to meet the electrical loads of the site during the desired microgrid control options. <ul style="list-style-type: none"> • Generator Off Mode • Generator Standby Mode • Generator Mode

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File No. - N° du dossier
MTA-1-44079

Buyer ID - Id de l'acheteur
QCL056
CCC No./N° CCC - FMS No./N° VME

- Hybrid Mode

DEVELOPMENT AND BUILD SCHEDULE (2 pages maximum)

Development and build schedule for the following phases of the project including timelines

- Design
- Procurement
- Assembly of the hybrid power system
- Development and Testing
- CSA/UL Certification

RISK AND RISK MITIGATION (2 pages maximum)

Identification of Risks and risk mitigation for the following project phases

- Design
- Procurement
- Assembly of the hybrid power system
- Development and Testing
- CSA/UL Certification

PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>) website, to be given further consideration in the procurement process.

5.1.2 Additional Certifications Required with the Bid

5.1.2.1 COVID-19 Vaccination Requirement Certification

In accordance with the COVID-19 Vaccination Policy for Supplier Personnel, all Bidders must provide with their bid, the COVID-19 Vaccination Requirement Certification attached to this bid solicitation, to be given further consideration in this procurement process. This Certification incorporated into the bid solicitation on its closing date is incorporated into, and forms a binding part of any resulting Contract.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame specified will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>) the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4) (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4>) website.

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File No. - N° du dossier
MTA-1-44079

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QCL056
CCC No./N° CCC - FMS No./N° VME

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4)" (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4>) list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex titled Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

5.2.3 Additional Certifications Precedent to Contract Award

5.2.3.1 Status and Availability of Resources

[A3005T](#) (2010-08-16), Status and Availability of Resources

5.2.3.2 Education and Experience

[A3010T](#) (2010-08-16), Education and Experience

5.2.3.3 Language Capability

The Bidder certifies that it has the language capability required to perform the Work, as stipulated in the Annex A, Statement of Work.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Security Requirements

1. Before award of a contract, the following conditions must be met:

- (a) the Bidder must hold a valid organization security clearance as indicated in Part 7 - Resulting Contract Clauses;
- (b) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work sites must meet the security requirements as indicated in Part 7 - Resulting Contract Clauses;
- (c) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites;
- (d) the Bidder's proposed location of work performance and document safeguarding must meet the security requirements as indicated in Part 7 - Resulting Contract Clauses;
- (e) the Bidder must provide the addresses of proposed sites or premises of work performance and document safeguarding as indicated in Part 3 - Section IV Additional Information.

2. Bidders are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful Bidder to obtain the required clearance will be at the entire discretion of the Contracting Authority.

3. For additional information on security requirements, Bidders should refer to the [Contract Security Program](http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html>) of Public Works and Government Services Canada website.

6.2 Financial Capability

SACC Manual clause [A9033T](#) (2012-07-16) Financial Capability

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

Note: the numbering of the clauses will be reviewed at contract award.

7.1 Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex "A" and the Contractor's technical bid entitled _____, dated _____ (*will be completed by PWGSC at contract award*).

7.1.1 Optional Goods and/or Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annex A, Statement of Work, of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before the expiry of the Contract by sending a written notice to the Contractor.

7.1.2 Work Authorization

Despite any other condition of the Contract, the Contractor is only authorized to perform the Work required to complete deliverables 5.1., Engineering and Transient Protection Study, 5.2., Project Plan, and 5.3., System Design and Engineering of the Statement of Work.

Upon completion of these deliverables, the Work will be reviewed before the Contractor is authorized to commence any Work for subsequent deliverables. Depending on the results of the review and evaluation of the Work, Canada will decide at its discretion whether to continue with the Work.

If Canada decides to continue with subsequent deliverables, the Contracting Authority will advise the Contractor in writing to commence work on subsequent deliverables. The Contractor must immediately comply with the notice.

If Canada decides not to proceed with subsequent deliverables, the Contracting Authority will advise the Contractor in writing of the decision and the Contract will be considered completed at no further costs to Canada. In no event will the Contractor be paid for any cost incurred for unauthorized work.

7.2 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

7.2.1 General Conditions

[2030](#) (2021-12-02), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

Subsection 46 of 2030: General conditions - Higher Complexity - Goods is incorporated as follows:

2030 46 (2021-11-04) Anti-forced labour requirements

1. The Contractor represents and warrants that the Work is not mined, manufactured or produced wholly or in part by forced labour. Regardless of who acts as an importer, the Contractor must not during the

- performance of the Contract, directly or indirectly, deliver Work to Canada or import Work into Canada the importation of which is prohibited pursuant to ss. 136(1) of the *Customs Tariff Act* and tariff item No. 9897.00.00 of the *Customs Tariff – Schedule* (as amended from time to time), because it is mined, manufactured or produced wholly or in part by forced labour.
2. If a tariff classification determination is made under the *Customs Act* and that the importation of the Work, or any part of the Work, is prohibited, the Contractor must immediately inform the Contracting Authority in writing. Canada may terminate the Contract for default in accordance with section 2030 31- Default by the Contractor if the Work or any part of the Work is classified under tariff item no. 9897.00.00 of the *Customs Tariff – Schedule* as mined, manufactured or produced wholly or in part by forced labour. If the Contractor is aware that the Work, or any part of the Work, is being or has been investigated regarding whether it is prohibited from entry pursuant to tariff item No. 9897.00.00, the Contractor must immediately inform the Contracting Authority in writing of that investigation.
 3. Canada may terminate the Contract for default in accordance with section 2030 31- Default by the Contractor if it has reasonable grounds to believe the Work was mined, manufactured or produced in whole or in part by forced labour or linked to human trafficking. Reasonable grounds for making such a determination may include:
 - a. Findings or Withhold Release Orders issued by the United States Customs *Trade and Border Protection*, under the US *Trade Facilitation and Trade Enforcement Act* (TFTEA) of 2015; or
 - b. Credible evidence from a reliable source, including but not limited to non-governmental organizations.
 4. Canada may terminate the Contract for default in accordance with section 2030 31- Default by the Contractor if the Contractor has, in the past three years, been convicted of any of the following offences under the *Criminal Code* or the *Immigration and Refugee Protection Act*.

Criminal Code

 - i. section 279.01 (Trafficking in persons);
 - ii. section 279.011 (Trafficking of a person under the age of eighteen years);
 - iii. subsection 279.02(1) (Material benefit - trafficking);
 - iv. subsection 279.02(2) (Material benefit - trafficking of person under 18 years);
 - v. subsection 279.03(1) (Withholding or destroying documents - trafficking);
 - vi. subsection 279.03(2) (Withholding or destroying documents - trafficking of person under 18 years); or

Immigration and Refugee Protection Act

 - vii. section 118 (Trafficking in persons).
 5. Canada may terminate the Contract for default in accordance with section 2030 31- Default by the Contractor if the Contractor has, in the past three years, been convicted of an offence in a jurisdiction other than Canada that, in Canada's opinion, is similar to any of the offences identified in paragraphs 4(i) to (vii).
 6. For purposes of determining whether a foreign offence is similar to a listed offence, PWGSC will take into account the following factors:
 - i. in the case of a conviction, whether the court acted within its jurisdiction;
 - ii. whether the supplier was afforded the right to appear during the court's proceedings or to submit to the court's jurisdiction;
 - iii. whether the court's decision was obtained by fraud; or
 - iv. whether the supplier was entitled to present to the court every defence that the supplier would have been entitled to present had the proceeding been tried in Canada.
 7. Where Canada intends to terminate the Contract under this section, Canada will inform the Contractor and provide the Contractor an opportunity to make written representations before making a final decision. Written representations must be submitted within 30 days from receiving a notice unless Canada establishes a different deadline.

7.2.2 Supplemental General Conditions

[4006](#) (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information

7.3 Security Requirements

7.3.1 The following security requirements (SRCL and related clauses provided by the Contract Security Program) apply and form part of the Contract.

SECURITY REQUIREMENT FOR CANADIAN SUPPLIERS: PWGSC FILE No. 165775

1. The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, hold a valid Facility Security Clearance at the level of **SECRET**, with approved Document Safeguarding and Production Capabilities at the level of **PROTECTED B**, issued by the Contract Security Program (CSP), Public Works and Government Services Canada (PWGSC).
2. The Contractor/Offeror personnel requiring access to PROTECTED information, assets or sensitive site(s) must EACH hold a valid personnel security screening at the level of **SECRET**, granted or approved by the CSP, PWGSC.
3. The Contractor MUST NOT utilize its Information Technology systems to electronically process, produce or store any sensitive PROTECTED information until the CSP, PWGSC has issued written approval. After approval has been granted, these tasks may be performed at the level of **PROTECTED B** and an IT Link at the level of **PROTECTED B**.
4. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of the CSP, PWGSC.
5. The Contractor/Offeror must comply with the provisions of the:
 - (a) Security Requirements Check List and security guide (if applicable), attached at Annex C;
 - (b) *Contract Security Manual* (Latest Edition).

SECURITY REQUIREMENT FOR FOREIGN SUPPLIERS: PWGSC FILE #165775

1. All CANADA PROTECTED / CLASSIFIED information/assets, furnished to the Foreign recipient { Contractor or produced by the Foreign recipient Contractor, shall be safeguarded as follows:
2. Document Safeguarding Capability Clearance at the level of SECRET and an authorization to produce (manufacture, and/or repair, and/or modify or otherwise work on) material or equipment at the Foreign recipient Contractor sites, at the level of SECRET, issued by the National Security Authority (NSA) or Designated Security Authority (DSA) for industrial security of their country in accordance with the National legislation, regulations and policies of their country.
3. All CANADA PROTECTED / CLASSIFIED information/assets provided or generated under this Contract will continue to be safeguarded in the event of withdrawal by the recipient party or upon termination of the Contract, in accordance with the National legislation, regulations and policies of their country.
4. The Foreign recipient Contractor shall provide the CANADA PROTECTED / CLASSIFIED information/assets a degree of safeguarding no less stringent than that provided by the

- Government of Canada in accordance with the National legislation, regulations and policies of, National Security legislation and regulations and as prescribed by the National Security Authority (NSA) or Designated Security Authority (DSA) of their country.
5. All CANADA PROTECTED / CLASSIFIED information/assets provided to the Foreign recipient Contractor pursuant to this Contract by the Government of Canada, shall be marked by the Foreign recipient Contractor with the equivalent security classification utilized by their country and in accordance with the National legislation, regulations and policies of their country .
 6. The Foreign recipient Contractor shall, at all times during the performance of this Contract, ensure the transfer of CANADA PROTECTED / CLASSIFIED information/assets be facilitated in accordance with the National legislation, regulations and policies of their country, and in compliance with the provisions of the Bilateral Industrial Security Instrument between their country and Canada.
 7. Upon completion of the work, the Foreign recipient Contractor shall return to the Government of Canada, via government-to-government channels, all CANADA PROTECTED / CLASSIFIED information/assets furnished or produced pursuant to this Contract, including all CANADA PROTECTED / CLASSIFIED information/assets released to and/or produced by its subcontractors, unless otherwise authorised in writing by the Canadian DSA.
 8. The Foreign recipient Contractor must identify an authorized Contract Security Officer (CSO) to be responsible for the overseeing of the security requirements, as defined in this contract. This individual will be appointed by the proponent Foreign recipient Contractor's Chief Executive Officer or Designated Key Senior Official, defined as an Owner, Officer, Director, Executive, and/or partner who occupies a position which would enable them to adversely affect the organization's policies or practices in the performance of the contract.
 9. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of their respective National Security Authority (NSA) or Designated Security Authority (DSA), in accordance with the National legislation, regulations and policies of their country / the Canadian DSA}.
 10. The Foreign recipient Contractor MUST NOT utilize its Information Technology systems to electronically process, produce, or store on a computer system and transfer via an IT link any CANADA PROTECTED / CLASSIFIED information/assets until the National Security Authority (NSA) or Designated Security Authority (DSA) of their country has granted approval to do so. After approval has been granted in writing to the Foreign recipient Contractor, these tasks may be performed up to the level of SECRET.
 11. The Foreign recipient Contractor shall not use the CANADA PROTECTED / CLASSIFIED information/assets for any purpose other than for the performance of the Contract without the prior written approval of the Government of Canada. This approval must be obtained from the Canadian DSA.
 12. The Foreign recipient Contractor visiting Canadian Government or industrial facilities, under this contract, will submit for approval a Request for Visit form to Canada's Designated Security Authority (DSA) through their respective National Security Authority (NSA) or Designated Security Authority (DSA).
 13. The Foreign recipient Contractor shall immediately report to the Canadian DSA all cases in which it is known or there is reason to suspect that CANADA PROTECTED / CLASSIFIED information/assets pursuant to this Contract has been compromised.
 14. The Foreign recipient Contractor shall immediately report to its respective National Security Authority (NSA) or Designated Security Authority (DSA) all cases in which it is known or there is reason to

suspect that CANADA PROTECTED / CLASSIFIED information/assets accessed by the Foreign recipient Contractor, pursuant this Contract, have been lost or disclosed to unauthorized persons.

15. The Foreign recipient Contractor shall not disclose CANADA PROTECTED / CLASSIFIED information/assets to a third party government, person, firm or representative thereof, without the prior written consent of the Government of Canada. Such consent shall be sought through the recipient's National Security Authority/ Designated Security Authority (NSA/DSA) / Canadian DSA.
16. The Foreign recipient Contractor must comply with the provisions of the Security Requirements Check List attached at Annex C.

7.3.2 Contractor's Sites or Premises Requiring Safeguarding Measures

- 7.3.2.1** Where safeguarding measures are required in the performance of the Work, the Contractor must diligently maintain up-to-date the information related to the Contractor's and proposed individuals' sites or premises for the following addresses:

Street Number / Street Name, Unit / Suite / Apartment Number
City, Province, Territory / State
Postal Code / Zip Code
Country

- 7.3.2.2** The Company Security Officer must ensure through the [Contract Security Program](http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html>) that the Contractor and individuals hold a valid security clearance at the required level.

7.4 Term of Contract

7.4.1 Period of the Contract

The period of the Contract is from date of Contract to March 31, 2024

7.4.2 Option to Extend the Contract

The Contractor grants to Canada the irrevocable option to extend the term of the Contract by up to 3 additional 1 year periods under the same conditions. The Contractor agrees that, during the extended period of the Contract, it will be paid in accordance with the applicable provisions as set out in the Basis of Payment.

Canada may exercise this option at any time by sending a written notice to the Contractor at least 30 calendar days before the expiry date of the Contract. The option may only be exercised by the Contracting Authority, and will be evidenced for administrative purposes only, through a contract amendment.

7.4.3 Delivery Points

Delivery of the requirement will be made to delivery point(s) specified at Annex "A", Statement of Work of the Contract.

Solicitation No. - N° de l'invitation
23332-220150/A
Client Ref. No. - N° de réf. du client
23332-22-0150

Amd. No. - N° de la modif.
File No. - N° du dossier
MTA-1-44079

Buyer ID - Id de l'acheteur
QCL056
CCC No./N° CCC - FMS No./N° VME

7.5 Authorities

7.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name : Samia Mohammed-Azizi
Title : Procurement Specialist
Public Works and Government Services Canada
Telephone : 418-576-9803
Email : samia.mohammed-azizi@tpsgc-pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

7.5.2 Project Authority *(to be completed by PWGSC at contract award)*

The Project Authority for the Contract is:

Name : _____
Title : _____
Organization : _____
Adress : _____

Telephone : _____
Facsimile : _____
Email : _____

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority; however, the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

7.5.3 Natural Resources Canada's Procurement Authority *(to be completed by PWGSC at contract award)*

The Procurement Authority for the Contract is:

Name : _____
Title : _____
Organization : _____
Adress : _____

Telephone : _____
Facsimile : _____
Email : _____

The Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The Procurement Authority is responsible for the implementation of tools and processes required for the administration of the Contract. The Contractor may discuss administrative matters identified in the Contract with the Procurement Authority however the Procurement Authority has

Solicitation No. - N° de l'invitation
23332-220150/A
Client Ref. No. - N° de réf. du client
23332-22-0150

Amd. No. - N° de la modif.
File No. - N° du dossier
MTA-1-44079

Buyer ID - Id de l'acheteur
QCL056
CCC No./N° CCC - FMS No./N° VME

no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

7.5.4 Contractor's Representative *(to be completed by the bidder)*

Name : _____
Title : _____
Organization : _____
Adress : _____

Telephone : _____
Facsimile : _____
Email : _____

7.6 Payment

7.6.1 Basis of Payment

7.6.1.1 Basis of Payment – Firm Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price as specified in Annex C, Basis of payment for a cost of \$_____ *(to be completed by PWGSC at contract award)*. Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

7.6.1.2 Limitation of Price

SACC Manual clause C6000C (2017-08-17) Limitation of price

7.6.2 Terms of Payment

7.6.2.1 Multiple Payments

Canada will pay the Contractor upon completion and delivery of deliverables in accordance with the payment provisions of the Contract if:

- a. an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada;
- c. the Work delivered has been accepted by Canada.

7.6.2 Electronic Payment of Invoices – Contract *(to be completed by PWGSC at contract award)*

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

- a. Visa Acquisition Card;
- b. MasterCard Acquisition Card;
- c. Direct Deposit (Domestic and International);
- d. Electronic Data Interchange (EDI);
- e. Wire Transfer (International Only).

7.6.3 Inspection and Acceptance

The Project Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

7.7 Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.
2. Invoices must be distributed as follows:
 - a. The original must be forwarded **by email** to the Project Contracting Authority identified under the section entitled "Authorities" of the Contract
 - b. One copy must be forwarded **by email** to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

7.8 Certifications and Additional Information

7.8.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

7.8.2 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "[FCP Limited Eligibility to Bid](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4)" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

7.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____ *(to be completed by PWGSC at contract award)*.

7.10 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the supplemental general conditions [4006](#) (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information;
- (c) the general conditions [2030](#) (2021-12-02), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract;
- (d) Annex A, Statement of Work;
- (e) Annex B, Basis of Payment;
- (f) Annex C, Security Requirements Check List;
- (g) Annex "D" Electronic Payment Instruments.
- (h) Annex "E" Federal Contractors Program for Employment Equity – Certification
- (i) Annex "F" COVID-19 Vaccination Requirement Certification
- (j) the Contractor's bid dated _____ *(to be completed by PWGSC at contract award)*.

7.11 Foreign Nationals

SACC Manual clause [A2000C](#) (2006-06-16) Foreign Nationals (Canadian Contractor)

OU

SACC Manual clause [A2001C](#) (2006-06-16) Foreign Nationals (Foreign Contractor)

7.12 Insurance

SACC Manual clause [G1005C](#) (2016-01-28) Insurance - No Specific Requirement

7.13 Dispute Resolution

- (a) The parties agree to maintain open and honest communication about the Work throughout and after the performance of the contract.
- (b) The parties agree to consult and co-operate with each other in the furtherance of the contract and promptly notify the other party or parties and attempt to resolve problems or differences that may arise.
- (c) If the parties cannot resolve a dispute through consultation and cooperation, the parties agree to consult a neutral third party offering alternative dispute resolution services to attempt to address the dispute.
- (d) Options of alternative dispute resolution services can be found on Canada's Buy and Sell website under the heading "[Dispute Resolution](#)" (<https://buyandsell.gc.ca/for-businesses/selling-to-the-government-of-canada/contract-management/dispute-resolution>).

ANNEX "A" - STATEMENT OF WORK

1. TITLE

NORTH WARNING SYSTEM HYBRID POWER SYSTEM

2. BACKGROUND

Defence Research and Development Canada (DRDC) Atlantic Research Centre seeks to develop energy initiatives and technologies with the specific goal of reducing the diesel dependency of the high Arctic North Warning System (NWS) Radar Sites. The "Advanced Microgrid towards Arctic Zero Emissions" (AMAZE) project aims to do this through the development of a pre-feasibility assessment tool, development of a microgrid test facility and demonstration of a prototype hybrid microgrid system at a North Warning Radar Site. AMAZE is a collaborative project with Natural Resources Canada, CanmetENERGY in Varennes and the National Research Council (NRC) Energy, Mining and Environment Research Centre – Vancouver.

As such, the Natural Resources Canada, CanmetENERGY Research lab in Varennes is seeking to procure a ruggedized and air cargo transportable 90 kW continuous average load (180 kW peak) battery system capable of being integrated with a diesel generator and solar photovoltaics (hybrid microgrid system). The hybrid microgrid system is to be comprised of the following requirements (all to be provided by the contractor):

- Ruggedized system for transport in a C130 Hercules aircraft and/or light utility helicopter.
- 2 synchronizable 30 kW diesel generators
- At least a 90 kWh battery energy storage
- Battery Energy Storage System (BESS) capable of meeting 180 kW peak power draw, including BESS Inverter, Battery Management System and safety system(s).
- Open architecture Microgrid Controller

A conceptual block diagram of the electrical system is shown in Figure 1. A Microgrid Design Power.

Note that the size of the hybrid microgrid system is sized for future potential expansions at a facility and is therefore larger than the electric load profile for the Short Range Radar Site. The vendor is to design the system such that it is modular and the battery storage capacity and power generation inputs (diesel generator, renewable, etc.) can be easily increased.

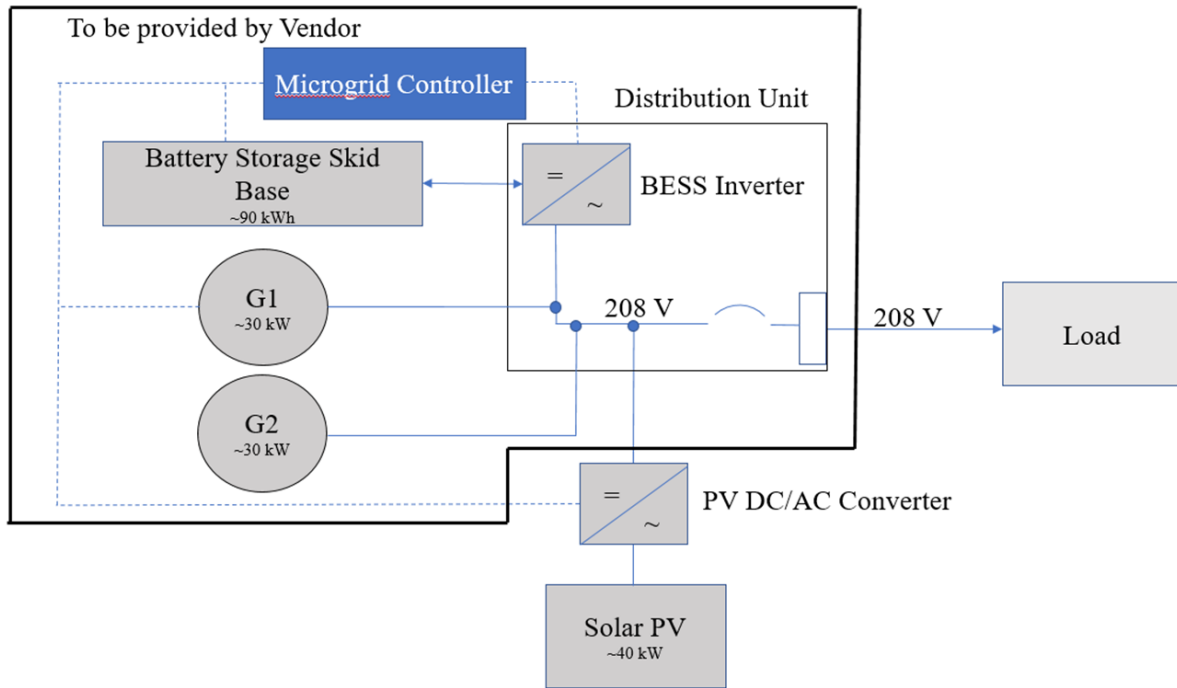


Figure 1: Electrical Block Diagram

The contractor will be required to assemble and commission the hybrid microgrid system (HMS) at the CanmetENERGY in Varennes laboratory in Quebec, Canada for in-house trials starting expectedly in the winter/spring of 2023 to validate system performance, operation and reliability for expected deployment at the Short Range Development (SRD) facility in North Bay, Ontario, Canada in the winter of 2024 for further proof of concept and operation validation. The contractor will also be required to install and commission the HMS at the North Bay SRD site.

To ensure the HMS can be integrated into the proposed North Bay SRD site, the contractor will be required to perform an engineering study in discussion with project partners including the onsite contractor of the North Bay SRD site to identify potential infrastructure upgrades to connect the low power distribution system of the HMS to the main building switchgear without modifications to the existing or proposed control and monitoring system. Infrastructure upgrades are the responsibility of CanmetENERGY; however the contractor will need to determine the requirements. The engineering plan is to be approved by CanmetENERGY. The contractor is to work with CanmetENERGY and project partners to ensure the HMS can be integrated into the North Bay SRD infrastructure.

The contractor will also be requested to perform a transient protection study to ensure the proposed HMS is capable of meeting the electrical loads when switching from one source to another. The contractor will be responsible for integrating a suitable strategy to mitigate transients that can affect the reliability of the system.

3. ACRONYMS

AC	Alternating Current
AMAZE	Advanced Microgrid towards Arctic Zero Emissions
BESS	Battery Energy Storage System
BMS	Battery Management System
DC	Direct Current

DER	Distributed Energy Resource
DRDC	Defence Research and Development Canada
EMS	Energy Management System
FAT	Factory Acceptance Test
HMS	Hybrid Microgrid System
HVAC	Heating, Ventilation and Air Conditioning
LRR	Long Range Radar
NWS	North Warning System
PF	Power Factor
PV	Photovoltaic
RPM	Rotation Per Minute
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SLD	Single Line Diagram
SOC	State of Charge
SOR	Statement of Requirement
SRD	Short Range Development
SRR	Short Range Radar
TA	Technical Authority
TCP	Transmission Control Protocol

4. GENERAL REQUIREMENTS

- a. The contractor must supply a firm price bid for a new, complete, and fully operational hybrid power system as outlined in section 4.1, including all necessary accessories, except as specifically noted as excluded in this specification.
- b. The HMS is to be delivered to CanmetENERGY in Varennes, Quebec, Canada and the contractor will be responsible for the delivery, assembly and commissioning of the system once connected to a programmable load bank, which will be provided by CanmetENERGY.
- c. It is expected that the HMS will be deployed at the North Bay SRD site no later than the winter of 2024. The contractor will be responsible for the integration, assembly and commissioning of the system delivered to CanmetENERGY in Varennes, Quebec, Canada at the North Bay SRD Site.
- d. The contractor will be required to perform an engineering study at the start of the project at the North Bay SRD site to identify any necessary infrastructure changes or upgrades to ensure the system can be integrated. Necessary changes relate to identifying how the low power distribution system of the HMS can be integrated into the main building switchgear. Due to the complexity of the IT and communication infrastructure at the NWS sites, the contractor is to ensure the HMS is able to communicate with Deep Sea Electronics DSE 7310 MKII generator controller and Rockwell Automation's Controllogix platform.
- e. The contractor will be required to perform a transient protection study to ensure the HMS can provide reliable power to the North Bay NWS Site. The transient protection study must give the contractor sufficient information to implement suitable transient mitigation strategies in the HMS.
- f. This specification covers the minimum requirements for a hybrid microgrid power system and controls (low-voltage system). The system hardware consists of the required battery storage system cells/pack assembly, diesel generator with heat recovery, a Battery Energy Storage System (BESS) four quadrant inverter (power conditioning system), necessary thermal management, an inverter controller (microgrid controller) platform (hardware and software including the application software), safety and protection system including monitoring and protection instrumentation and relays as well as a fire protection/suppression system, Battery Management System (BMS) hardware & software

including application software, operation monitoring station(s) (if required), I/O modules, cables, electrical/power distribution panels, networking equipment, personal computer based hardware (if required), and the necessary platform/configuration software(s).

- g. Omission of any component normally supplied and as specified, as part of a complete hybrid power system must be reviewed with CanmetENERGY for clarification and acceptance. Otherwise, items that have not been specifically excluded but are part of a fully functional hybrid power system must be considered a firm part of this specification.
- h. Compliance with this specification does not relieve the contractor of its responsibility to provide safe and reliable equipment when in operation or otherwise.
- i. The equipment must be complete as per scope of supply herein and ready for start-up after installation and commissioning.
- j. The contractor must ensure that all data transfers between their system components and external systems, if required, are robust, reliable and immune to ambient electrical noise and computer viruses. Failures of data transfers between system components must not cause equipment damage. Systems must also have the capability to be monitored remotely.
- k. The hybrid power system must be designed, assembled and tested according to ANSI/CAN/UL 9540 and CSA 22.1 standards.
- l. Regardless of the final deployment location, the HMS must be capable of being monitored and controlled remotely from the North Bay SRD Site. Possible solutions to be identified during the site visit and to be established by CanmetENERGY.

4.1 HYBRID POWER SYSTEM

The hybrid power system is to be comprised of several components which are to be integrated into a ruggedized solution suitable for transport, deployment and operation at SRR sites in the Arctic. As the system will eventually be deployed at an SRR site, the system must be designed to be as lightweight and small as possible, fitting into a C130 Hercules aircraft and eventually transported by a light utility helicopter (payload less than 1800 kg, 4000 lbs). Design options to be presented in the project plan. Heavy utility helicopter is also an eventual option for transport to the SRR site. System must demonstrate a 98% reliability (less than 175 hours of downtime a year) to be considered for deployment in the Arctic.

The following sections describe the requirements of the key hybrid power system components identified as:

1. Diesel Generator
2. Battery Energy Storage System (BESS)
3. BESS Inverter
4. Battery Management System (BMS) and Microgrid Controls
5. Low Voltage Power Supply and Distribution Unit (208 V)

System will ultimately be operated in a remote Arctic location in a conditioned space. System must be designed such that it is capable of operating at ambient temperatures as low as 0°C and up to 30°C. System must be capable of recovering from cold soaks temperatures of -40°C for 30 days or longer due to potential site outages.

The future generation plant controller is Rockwell Automation ControlLogix platform. The local future diesel generator controller is Deep Sea Electronics DSE 7310 MKII. The vendor must ensure that the system can be integrated with these controls with industry accepted control protocols (example MODBUS TCP/IP). Any control algorithms must be open for CanmetENERGY to view and modify.

4.2 DIESEL GENERATOR

For integration at the future SRR and SRD sites, the hybrid power system must be integrated with a Deutz 30 kW F6L914 engine and KATO engineering ABL-1-DP alternator. Generator must have a synchronization relay/synchronization mechanism. The vendor can provide an equivalent generator and alternator; however the final system deployment at the Short Range Development Site must integrate with the Deutz F6L914 engine and KATO Engineering ABL-1-DP alternator connected to the Deep Sea Electronics DSE 7310 MKII generator controller.

Two diesel generators with the following specifications must be included as part of the hybrid power system (Table 1). The diesel generator controller must be Deep Sea Electronics DSE 7310 MKII and be able to communicate and coordinate the control actions with the battery energy storage system (BESS) described in section 4.3, the Microgrid Controller in section 4.5 and the PV system that will be supplied by CanmetENERGY. The Diesel Generator will form the Microgrid under most circumstances and therefore it must be able to provide a mechanism for other Distributed Energy Resources (DERs) including the BESS and PV to synchronize to the Microgrid. Generator to be connected to the Low Voltage Bus which is 208 V.

The Diesel Generator engine/governor controls must also be capable of following the grid (grid support mode) in which case the BESS will form the grid and other DERs will synchronize to the BESS. However it is to be noted that this scenario will not be the predominant mode of operation.

Table 1: Required Diesel Generator Specifications (each generator)

Specifications	Value
United States Environmental Protection Agency (EPA) Rating Certification	Tier 2 or higher
Mounting/Enclosure	Engine, radiator, generator and control section must be mounted on a common steel skid base with the following dimensions: Maximum Length: ≤ 3.2 m Maximum Width: ≤ 1.9 m Maximum Height: ≤ 2.13 m The skid base must contain internally mounted vibration isolators, battery rack and openings to secure cables for lifting by crane or hoist. To be located in a conditioned environment between 0°C and 40°C.
Prime Power Rated Capacity (useful power to end user) @ 60 Hz	≥ 30 kWe ¹ (includes 10% overload capacity in accordance to ISO 3046)
Efficiency @ Full Load	≥ 3.50 kWh/L diesel
Operating Temperature	Minimum: ≤ 0°C Maximum: ≥ 40°C
Engine and generator	
Type	Air or Water ² Cooled, Multi-Fuel (JP8, Jet A-1, DF-1, DF-2, DS-A) Compatible.

¹ The battery energy storage system is to be able to work in parallel with the diesel generator to meet the short peak demand requirements of the NWS radar site. Stand-alone back-up generators are on-site to provide eventual emergency power if the BESS fails.

² Note that coolant must be able to withstand the temperatures down to -30°C and cold soaking for a long duration.

Fuel System	Direct Injection
Fuel Filter	Full flow spin on type oil filter, dip stick with running and stopped oil level indication.
Frequency	60 Hz, 1800 RPM ³
Starting System	12 or 24 volt starting system complete with heavy/duty battery(s) and battery charging alternator
Generator	
Type	Revolving field, brush-less type with permanent magnet excitation Class H insulation 125°C Standard Temperature Rise
Voltage	3 phase, 4 wire, 60 Hz, 208 V
Automatic Electronic Voltage Regulator	Installed on Generator Housing Provide no load to full load regulation $\leq \pm 0.5\%$ of its mean value Must function at 60 Hz, 3 phase
Control Panel	
Engine Controls	Deep Sea Electronics DSE 7310 MKII (for future integration requirements). Can be controlled remotely through the Microgrid controller/ Human Machine Interface (HMI).
Microgrid Controller/HMI	The engine/governor controls must be able to accept set points either from the Microgrid Controller or the HMI over Modbus RTU or Modbus TCP/IP or industry accepted equivalent.
Gauges/Indications	RPM DC volts Operating hours Oil Pressure (psi, kPa or bar) Coolant Temperature Voltage (Line to Line & Line to Neutral) Frequency (Hz) Amps (per phase & average) kW, kVA, kVAR, PF Fuel level Gauges/Indications must be capable of being monitored remotely through the Microgrid Controller or HMI.
Warning/shutdown with LED indication	Low oil pressure shutdown High coolant temperature shutdown Over speed shutdown Over crank warning Low Coolant temperature warning Low coolant level shutdown Panel mounted mushroom head emergency stop switch with visual indication Warnings and shutdowns must be capable of being monitored remotely through the Microgrid Controller or HMI
Communication Interface with other Controllers/Inverters and HMI	Open architecture Modbus RTU or Modbus TCP/IP or industry accepted equivalent.

³ Note that at the deployment site the diesel generators have been derated to 60 Hz and 1200 rpm.

Fuel Tank	
Certification	CAN/ULC S601
Mounting	Integral or Sub Base
Storage Capacity	≥ 120 L
Bulk tank connectivity	Must have the option to connect to a bulk tank to automatically refuel the sub-base fuel tank or run off the bulk tank

4.3 BATTERY ENERGY STORAGE SYSTEM (BESS)

A battery energy storage system with the following specifications (Table 2) must be included as part of the hybrid power system and work in conjunction with the diesel generator described in section 4.2 and inverters described in section 4.4. The Microgrid control requirements are described in section 4.5.

Table 2: Required Battery Energy Storage System Specifications

Specifications	Value
Battery Module	
Battery Cell Safety Standard	UL 1642
Battery Chemistry	LiFePO4, secondary rechargeable
Battery Operating Temperature	Minimum: ≤ 0°C Maximum: ≥ 40°C
Battery Storage Temperature	Minimum: ≤ -46°C Maximum: ≥ 35°C
80% of original capacity	≥ 3,000 cycles at 100% depth of discharge at 1C discharge/charge rates
Self-discharge	≤ 5% / month
Battery Energy Storage System (BESS)	
Module Safety	UL 60950
Energy Capacity	≥ 90 kWh
Continuous charge/discharge power	≥ 90 kW (1C) ⁴
Continuous discharge power	≥ 90 kW (1C)
Peak discharge power	≥ 180 kW (2C)
Modularity	Can be connected to a 2 nd or 3 rd BESS of the same characteristics and capacity to increase storage capacity
Cycle efficiency	≥ 90% (DC roundtrip discharge and charge @ 0.5C)
Electromagnetic Capability	Ensure devices can work together and meet IEC 62 040-2 CAT I and CAT III
Mounting/Enclosure	Batteries must be installed on a common steel skid base with the following dimensions: Maximum Length: ≤ 4.00 m Maximum Width: ≤ 0.65 m Maximum Height: ≤ 2.13 m The skid base must have openings to secure cables for lifting by crane or hoist.

⁴ Note that 1C charge/discharge rate is for future capabilities. Normal charge/discharge rates will be 30 kW at the deployment site.

	System can be comprised of multiple skid bases with the total dimensions meeting those listed above.
Enclosure Heating/Cooling	BESS will be installed in a conditioned building maintained between 0°C and 40°C.
Transportability	To ensure air transport regulations can be met, the battery modules must be capable of being separately packaged. Battery modules must be easily reintegrated into the BESS requiring common hand tools (no special equipment)
Separate battery package weight:	Maximum: ≤ 35 kg
Safety	
Battery Cell Level	Mechanical Venting
Battery Module Level	Voltage and temperature monitoring Cell balancing
Battery String Level	Battery Management System with: <ul style="list-style-type: none"> - Short-circuit protection - Over-current protection - Over-temperature protection - Over-voltage protection
BESS Level	Fire detection and suppression system Emergency Stop Button
Remote Emergency Stop	Contractor to provide dry contacts of the fire detection and suppression system, BESS E-stop and other safety systems to enable connection through a hardwired circuit to an existing safety panel. Existing emergency stop and hardwired circuit to be provided by CanmetENERGY. Emergency stop must be capable of being controlled remotely from another site (to be established by being able to interface with the Rockwell Automation Controllogix platform).

For the optional BESS for delivery to National Research Council in Vancouver, the BESS must have the following additions to ensure the system can be installed outdoors (Table 3).

Table 3: Additional Battery Energy Storage System Specifications for Optional Procurement

Specifications	Value
Mounting/Enclosure	<p>Batteries must be installed in a rugged, NEMA3 rated insulated enclosure mounted on a common steel skid base with the following dimensions</p> <p>Maximum Length: ≤ 6.10 m Maximum Width: ≤ 2.44 m Maximum Height: ≤ 2.13 m</p> <p>The skid base must have openings to secure cables for lifting by crane or hoist.</p> <p>Enclosure to be insulated to minimize system losses due to conditioning.</p> <p>Minimum Insulation Level: ≥ 4.0 m²C/W</p>

Enclosure Heating/Cooling	Able to maintain battery operating temperatures at the following ambient temperature conditions: Minimum: $\leq -10^{\circ}\text{C}$ Maximum: $\geq 30^{\circ}\text{C}$
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4.4 BESS INVERTER

The BESS must include one DC-AC (Direct Current – Alternating Current), Four Quadrant Inverter to meet the AC loads of the eventual facility. The preferred option is to have an AC coupled system. The BESS Inverter must be capable of operation in bi-direction in four quadrants as indicated in Figure 2 below. Thus, it will have the capability to absorb/produce real and reactive power, thereby stabilizing the microgrid.

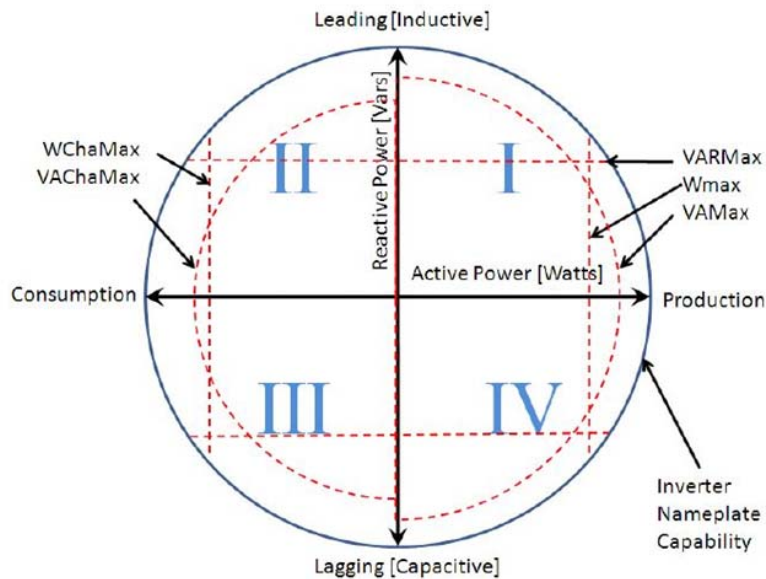


Figure 2: BESS Inverter Operation

BESS Inverter must have the capability to follow the grid (Microgrid) and also form the Microgrid, refer to the “Operational Modes” table below. Therefore the Inverter must be fully configurable by the users with the option to change the modes between Voltage Source Inverter (Microgrid former) and Current Source Inverter (Microgrid follower). Configuration to be capable of being done remotely from another site over the existing supervisory control and data acquisition (SCADA) network.

The inverter must have the following specifications (Table 4):

Table 4: Required BESS Four Quadrant Inverter Specifications

Specifications	Value
Four Quadrant Inverter	
Charge/Discharge Power	≥ 180 kW Peak @ 0.8 PF ≥ 90 kW normal @ 0.8 PF
Grid forming/following	Capable of both grid forming and grid following

AC side	Primary Voltage of Isolation Transformer, preferred 208 V AC		
Compliance	IEEE 1547-2018, UL 1741 and/or CSA C22.2 no. 107.1		
Efficiency	≥ 95% at rated maximum		
Total Harmonic Distortion	≤ 5% on AC side		
Inverter Controller Response to dynamic/transient events ⁵	≤ 60 milliseconds		
Operating Temperature:	Minimum: ≤ 0°C Maximum: ≥ 40°C		
Storage Temperature:	Minimum: ≤ -40°C Maximum: ≥ 55°C		
Inverter control functions			
<p>The four quadrant converter must be capable of operating in grid forming or grid following mode to meet the anticipated power requirements of the NWS.</p> <p>The four quadrant inverter control functions must be compliant with the latest edition of the “Common Functions for Smart Inverters” published by the Electric Power Research Institute (EPRI). The functions must be user selectable to perform control actions in coordination with the Microgrid Controller and Diesel Generator local controller. The following functions must be included as part of the Microgrid Controller/Inverter: Frequency-watt function, Volt-Var Function, Watt-Power Factor Function, low/high frequency ride-through and low/high voltage ride through.</p> <p>A list of some of the common Inverter/Microgrid Controller functions are given in the table below:</p>			
Frequency Control	Real Power Functions	Power Factor & Voltage Control Functions	Voltage Support
Frequency-watt Function	Limit Power Output	Volt-Var Function	Dynamic Volt-watt Function
Low/High Frequency Ride-Through	Dynamic Real-Power Support	Watt-Power Factor Function	Dynamic Reactive Current Support Function
	Peak Power Limiting Function		Volt-watt Function
	Load And Generation Following Function		Low/High Voltage Ride-Through Requirements
	Watt-Var Function		
	Direct Charge/Discharge Management Function		
	Coordinated Charge/Discharge Management Function		

⁵ The dynamic control will consist of the frequency control, the voltage control and the power factor control. The response time is defined as the time from the detection of the disturbance in the power system to the final feedback of the corrective action received by the inverter controller. The Vendor to conduct stand-alone tests of the dynamic controls and include test results in the factory acceptance test report.

4.5 BATTERY MANAGEMENT SYSTEM (BMS), MICROGRID CONTROLS

The following section describes and lists the requirements for the battery management system controller and Microgrid controls. The controllers must be completely modular and scalable in design with easy access to replace modules in the event there is a deficiency. Furthermore, as listed in the requirements below, the controllers must include all required hardware, software and software licenses and cabling for remote monitoring and on-line programming/editing of the system. The system must be open architecture and CanmetENERGY must have the ability to view and modify the control algorithms on the microgrid controller.

4.5.1. BATTERY MANAGEMENT SYSTEM (BMS) CONTROLLER

The battery management system (BMS) controller has the following requirements (Table 5):

Table 5: Required Battery Management System Controller Specifications

Specifications	Value
Monitoring and control	Voltage, Current and Temperature of Battery Cells
State of Charge (SOC) control and balancing	Battery Cells Battery Modules Battery Strings Regulation of the State of Charge
Real time calculation	Charge current limits Discharge current limits State of Charge using temperature, aging, voltage and current
Monitoring	State of charge of the system State of health based on calendar aging and cycling
Communication	MODBUS RTU or Modbus TCP/IP or industry accepted equivalent Open architecture
Safety control	Integrated for safety requirements listed in section 4.3
Faults/Alarms	Complete list of fault/alarms classified under critical fault, alarm and warning Description of interlocking actions for each fault/alarm Recorded with timestamp for system health assessment/analysis
Remote access	Controller must be accessible from a remote location through an existing SCADA network.

4.5.2 MICROGRID CONTROLLER

The Microgrid controller will ensure proper management of the power supplies and ensure the system is able to operate as the primary and sole source of power to the dedicated operational loads. In general, the Microgrid controller must ensure that the BESS is able to deliver the required power within the voltage and frequency tolerances needed by the operational loads.

The Microgrid controller must be capable of interfacing with the battery management system (BMS), diesel generator(s), Deep Sea Electronics DSE 7310 MK11 generator controller, Rockwell Automation Controllogix platform and eventual three or more inverter based renewable energy inputs (for example a solar photovoltaic (PV) DC-AC converter⁶).

⁶ Note that CanmetENERGY will connect a 40 kW solar photovoltaic array. CanmetENERGY will provide solar photovoltaic panels and the DC-AC converter to connect to the low-voltage power distribution system. Upon contract award, vendor is to coordinate with CanmetENERGY to ensure the DC-AC converter can communicate with the microgrid controller.

The following functions must be provided by the Microgrid controller:

1. Voltage and frequency control of the main Microgrid bus.
2. Manage the balance between generation and load keeping a spinning reserve. The spinning reserve must be such that a certain (configurable) BESS state of charge is maintained. State of charge to be determined based on eventual operational load profile.
3. Manage safety interlocks and actions to respond to any faults and alarms so as to ride through faults and prevent black outs.
4. Control functions must minimize the cycle life of the BESS.

The Microgrid controller must have at least the following modes of operation (Table 6) which is selected based on constantly monitoring the load and switching to the required operation mode accordingly:

Table 6: Required Microgrid Controller Operation Modes

Operation Mode	Function
Generator Off Mode	Battery (with PV) is providing the full load. Selected when: <ul style="list-style-type: none"> - Load is less than a user-defined low load parameter (i.e., 30 kW). - SOC of battery is adequate to support load.
Generator Standby Mode	Battery (with PV) is providing the full load. Generator is on standby so that it can be dispatched.
Generator Mode	If the load is above the user defined low-load parameter and less than 90 kW or if the battery SOC reaches the low-level setting, the generator will turn on to meet the load and operate at its prime efficiency to meet the load and charge the batteries.
Hybrid Mode	For periods of peak demand, the battery (with PV) provides load support to the generator.
Heat Recovery	Future option to control the system based on heat demand to optimize site fuel savings.
Fault	In the event of a diesel generator, battery energy storage system or solar photovoltaic fault, the controller must deactivate the faulted system to minimize risk of failure.
Objective function	Allow higher penetration of photovoltaic system such that the HMS displaces the fossil fuel (in this case diesel fuel) by approximately 20%. This objective function to be met keeping the operation constraints of all the DERs.

These modes will be configured through the HMI only when user has Administrative rights and permissions.

The application software must be made accessible for editing by the project authority (CanmetENERGY).

The microgrid controller must be a commercial off-the-shelf control platform that is industry accepted and has been deployed in real-world applications.

Additional features of the Microgrid controller include (Table 7):

Table 7: Required Microgrid Controller Features

Specifications	Value
Connectivity and interoperability	Communication using MODBUS RTU or Modbus TCP/IP or industry accepted equivalent.

	<p>Must be able to communicate with Deep Sea Electronics DSE 7310 MKII generator controller (for future capabilities).</p> <p>Must be able to communicate with Rockwell Automation Controllogix platform (for future capabilities).</p> <p>It is to be noted that the Microgrid Control System will be connected to an existing remote SCADA system. The bidder must therefore ensure the Microgrid Control System can interface with the Rockwell Automation Controllogix platform. Integration of Microgrid control system to be arranged by CanmetENERGY.</p>
Response time for transient/dynamic events (primary control)	Maximum time: ≤ 60 milliseconds
Key Operational Functions	<ul style="list-style-type: none"> - Regulate the system to the desired voltage and frequency - Enables parallel operation of the diesel generator with the PV and BESS. - Protect the generator from back feed by storing excess PV power in the BESS. - Communicate with PV inverters to curtail their output when necessary. - On-line editing feature to allow user to make control changes during system operation
Cyber Security	<p>Option to add cyber security features in the future:</p> <ul style="list-style-type: none"> - Encryption - Access control - Malware protection
Platform and Data storage	<p>Must be managed locally with the ability to connect with MissionLink 350 Satellite Terminal for a potential remote access (provided by CanmetENERGY).</p> <p>Cloud-based software platform is not possible due to the remote location and security requirements.</p>
Human Machine Interface (HMI)	<p>A dedicated HMI station must be supplied by the contractor that will be the dedicated operation control and monitoring station for all the controllers including the local Diesel Generator controller, the Microgrid controller, Battery Management System, the BESS Inverter and the PV Inverter. The HMI must be integrated with these controllers over Modbus RTU or Modbus TCP/IP or industry accepted equivalent.</p> <p>Displays the following information:</p> <ul style="list-style-type: none"> - Operating status - Notifications, faults, alarms and warnings - Power flows - System modes and equipment sub-modes <p>Ability to filter the notifications, faults, alarms and warnings and allow the user to acknowledge the faults and alarms.</p> <p>Time stamped sequence of event recording to enable event reconstruction and analysis. Time stamp ≤ 1 seconds.</p>

	<p>Provide means to configure modes, set points and engineering parameters for all the individual controllers/systems.</p> <p>Include a data historian and analysis tool that will be used store key parameters.</p>
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4.6 LOW VOLTAGE POWER SUPPLY (DISTRIBUTION UNIT)

The hybrid power system is to include a low-voltage power supply. Low voltage power supply includes the distribution transformer, electrical panels, inverters/power electronics, controller, network switches, operator controls (HMI), emergency stop and relays (if any). The electrical distribution unit can be part of the Battery System or in a separate electrical cabinet.

The low-voltage power supply is to have the following specifications (Table 8):

Table 8: Required Low Voltage Power Supply Specifications

Specifications	Value
Low Voltage Power System	
Microgrid bus	208 V
Mounting/Enclosure	<p>Components must be installed in an electrical enclosure with or without the BESS. Enclosure mounted on a common steel skid base with the maximum dimensions listed below.</p> <p>Maximum Length: ≤ 1.2 m Maximum Width: ≤ 0.65 m Maximum Height: ≤ 2.13 m</p> <p>The skid base must have openings to secure cables for lifting by crane or hoist.</p>
Diesel Generator Power Input/Source	<p>208 V, 3 phase, 5 wire, 60 Hz Power rating: ≥ 412.5 kVA Provision for 3 x 412.5 kVA circuit breakers for future expansion/capability Circuit breaker (amperage determined by contractor)</p>
Renewable Power Input/Source	<p>208 V, 3 phase, 5 wires, 60 Hz Power rating: ≥ 50 kVA Provision for 3 x 50 kVA circuit breaker for future expansion (amperage determined by contractor)</p>
BESS Power Input/Source	<p>208 V, 3 phase, 5 wires, 60 Hz Power rating: ≥ 225 kVA Peak (10 s) Provision for 3 x 225 kVA circuit breaker for future expansion/capability</p>
3 phase load connection	<p>3 phase, 5 wire, 208 V, 60 Hz Power rating: ≥ 225 kVA Peak Provision for 3 x 225 kVA circuit breaker (amperage determined by contractor) for future expansion</p>
All appliance wiring material (AWM)/ thermoplastic equipment wire (TEW) temperature rating:	<p>Minimum: ≤ -40°C Maximum: ≥ 105°C</p>
Power Cables	<p>Suitably rated for 208 V as required Basic Impulse Insulation Level ≥ 45 Metal Clad or equivalent</p>

Circuit Breakers	Circuit breakers should be of type that can be operated remotely from the HMI, e.g., motorized. Amperage ratings to be determined by vendor and must provide protection against all electrical faults.
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4.7 DETAILED ENGINEERING AND SRD SITE WORK

As part of the integration of the HMS at the SRD site, the HMS supplier shall work with CanmetENERGY and project partners to review and provide feedback on:

- The SRD power distribution, low-voltage electrical and control wiring/interconnection, equipment layouts, HVAC and safety system drawings & documents
- The design plan to incorporate the design aspects into the detailed engineering tasks performed by the HMS Supplier
- Site conditions including construction conditions, logistics and commissioning requirements
- Commissioning and performance acceptance plan/report

The scope of HMS includes detailed engineering tasks including:

- Perform an engineering study and work with project partners including the onsite contractor (refer to Section 5.1 in this document) to validate the power system integration of the HMS system to the existing power distribution system
- Create low-voltage electrical interconnection/wiring, control interconnection/wiring drawings and equipment layout drawings. These drawings/documents to be provided to CanmetENERGY and project partners for feedback before installation.
- Install the HMS equipment to the existing infrastructure as per the construction/installation drawings/documents.
- Commission the integrated HMS system in accordance with Commissioning and Acceptance plan/report.
- Provide technical support during operation of the equipment after commissioning and acceptance of the HMS equipment.

5. DELIVERABLES

DELIVERABLE 5A

The following deliverables (5.1 to 5.11) are requested for Deliverable 5A (Annex A): The complete hybrid power system.

DELIVERABLE 5B - OPTION

Note that an option to procure an additional Battery Energy Storage System, BESS 4 Quadrant Inverter and Microgrid Controller (sold separately) of the same capacity and capability is also requested. The Battery Energy Storage System is to also be installed in a NEMA 3 rated enclosure with suitable conditioning equipment.

In the event the **Option** to procure the Battery Energy Storage System, BESS 4 Quadrant Inverter and Microgrid Controller is executed, the deliverables 5.3 to 5.9 are also required for Deliverable 5B (Annex A): Battery Energy Storage System and Microgrid Controller (note this system does not include a diesel generator). Delivery and training is to be at NRC-Vancouver, British Columbia, Canada.

A proposed project timeline is summarized in section 6.

5.1 ENGINEERING AND TRANSIENT PROTECTION STUDY

Upon contract award, the contractor will be required to perform an engineering and transient protection study at the North Bay SRD site. Both studies will be required in order to support the development of the HMS and ensure the system is capable of reliably providing power to the site when it is deployed in 2023 or 2024.

The engineering study is to identify the best strategy to integrate the HMS at the North Bay SRD site and will be in discussion and in agreement with the project partners including the onsite contractor. Upon contract award the contractor will receive the electrical line diagram of the site as well as any other drawing packages required, if available. Through the engineering study, the contractor is to identify the most suitable strategy to connect the HMS with the onsite electrical power distribution system and any upgrades that would be required such as additional disconnect switches or circuit breakers, automatic transfer switches, etc. The CanmetENERGY is to make arrangements to make the necessary upgrades. The recommendations of the engineering study is to be included in the project plan. Integration of the microgrid controller to the existing communication systems is to be determined as well and agreed upon with the onsite contractor and other project partners.

The contractor will also be required to perform a transient protection study to identify features that must be incorporated into the HMS to ensure reliable power can be delivered safely to the site without affecting operations. The transient protection study is to be included in the project plan identifying the mitigation measures to be put in place to avoid electrical issues caused by transients in switching from one power source to another.

Arrangements for a visit to the North Bay SRD site can be arranged; however the vendor must receive the required security clearance from the Department of Defence.

5.2 PROJECT PLAN

Upon completion of the engineering and transient protection study, the contractor is to provide a project plan within 4 weeks outlining the details of the hybrid microgrid system, components to be used and how the system will meet the criteria outlined in sections 4.1 to 4.6. The project plan must also include the results of the engineering and transient protection study identifying infrastructure changes that must be completed to successfully integrate the system at the site expected to be no later than winter of 2024 and what mitigation measures are implemented in the HMS to prevent equipment damage or electrical interruption caused by transients. The following table (Table 9) summarizes what the project plan must include. Project plan is to be approved by the project authority prior to design/drawing phase.

Table 9: Project Plan

Project Plan	
1.	Overall System Design: Provide a description of the system, size of the system and considerations to ensure the system can operate to meet the anticipated North Warning Radar system power loads and capability to withstand storage temperatures down to -50°C in the event of system outage when deployed in the Arctic.

2.	<p>Engineering study and Site Work:</p> <p>What facility upgrades will be necessary to integrate the system at the North Bay SRD site.</p>
3.	<p>Transient Protection Study:</p> <p>What mitigation measures will be put in place to avoid damaging equipment or having power outages due to transients caused by the HMS.</p>
4.	<p>Diesel Generator:</p> <p>Describe the diesel generators selected with key performance metrics such as efficiency, generating capacity, fuel compatibility, air cooled/water cooled, etc.</p>
5.	<p>Battery Energy Storage System (BESS):</p> <p>Describe the containerized battery energy storage system and the battery management system. Description of the type of electrical energy storage, safety mechanisms in place and ability to individually package the battery modules for air transport.</p>
6.	<p>Four Quadrant Battery Energy Storage System (BESS) Inverter:</p> <p>Details and functional description of the four quadrant battery energy storage system inverter, how it is cooled to avoid overheating and its capability to respond to the anticipated loads and transient events. Also indicating the inverter's capability to operate in grid forming or grid following mode.</p>
7.	<p>System Controls (Microgrid Controller and Battery Management System):</p> <p>Describe the battery management system (BMS) and Microgrid controls and how they will be able to respond to the anticipated loads, while maintaining the desired voltage and frequency tolerances of the main Microgrid bus. Description of how the system will operate in grid forming or grid following mode must be provided. Description of the type of communication protocol and the flexibility of the CanmetENERGY to make changes to the control. Description on the level of development, functionality and robustness of the system.</p>
8.	<p>Microgrid Control Objective Function:</p> <p>Describe any advanced Microgrid system controls and ability for future improvements to increase energy savings. Examples can include:</p> <ol style="list-style-type: none"> 1. Allow higher penetration of Photovoltaic (PV) System by incorporating BESS to displace the fossil fuel (in this case diesel fuel) by approximately 20%. 2. Reduce the PV system curtailment by optimized dispatch of DGs, BESS and PVs through prediction based models on load and solar forecast.
9.	<p>Low Voltage Distribution System:</p> <p>Functional description and detailed drawings of the low-voltage distribution system with source and load circuit breaker/disconnect switch sizes and ratings.</p>
10.	<p>Scalable Design:</p> <p>Description of system modularity to increase the battery storage capacity and power generation inputs. Modularity is for future capabilities and potential deployment at other NWS sites.</p>

11.	Technical Feasibility: Describe how all the hybrid power system components will be able to work together and ensure the electrical demand of the anticipated loads can be met within the voltage and frequency power quality tolerances.
12.	Principle of Operation: Electrical Describe the principle of operation and the main modes of electrical operation aiming to maximize system efficiency without taking a risk of system failure or power outage.
13.	Provide a work plan and timeline on the design, procurement, build and factory testing. Work plan must include a work breakdown structure describing all the project elements that organize and define the scope of the project, including any subcontracted work and clear deliverables. A work breakdown structure must include work package descriptions of the key hybrid Microgrid system components. Risk identification, dependencies and risk mitigation must also be included.
14.	Certification: Description of what codes and standards the complete system and sub-components will meet upon delivery.
15.	Description of the tests to be conducted in the factory acceptance testing, witness tests and failure and recovery tests to ensure the hybrid power system will meet the identified power draws, load changes and overcome warnings and faults.

5.3 DESIGN AND ENGINEERING DRAWINGS

The contractor must design the system and provide the following engineering drawings in English. Drawings to be accepted by the project authority to proceed to next phase of the procurement and build of the hybrid power system components. The minimum set of drawings required is the following (Table 10):

Table 10: Required System Drawings

No	Type of Document/Drawing/Data
Architectural	
1	Enclosure/skid base (with dimensions)
2	Floor Plan (enclosure/skid base layout and subsystem configuration)
3	Structural
Mechanical	
1	Heating, Ventilation and Air Conditioning (HVAC) (if required)
2	Bill of Material
Electrical	
1	Lighting, receptacles diagram
2	Electrical Line diagram
3	Cable schedule
4	Bill of Materials (electrical/power system components)
5	Panel Schedules for all voltage levels
6	Grounding diagram
7	Interconnection and wiring diagrams
Control and Instrumentation	

No	Type of Document/Drawing/Data
1	Control schematic drawings
2	Control system interconnection and wiring drawings
3	Battery Management, Inverter, Microgrid Controller and Heat Recovery controls functional description
4	Metering and monitoring points with instrumentation list
5	Bill of Material (controls & instrumentation)
6	Data exchange matrix (Battery Management System and BESS Inverter)
7	Grounding diagram
Maintenance and Critical Parts List	
1	Maintenance document
2	Critical parts list
3	Pricing for critical parts

5.4 Procurement of System Components and System Build

The contractor is to provide proof of delivery of:

1. Diesel Generators
2. Battery Energy Storage System
3. BESS four (4) Quadrant Inverter
4. Microgrid Controller
5. Low Voltage Power Supply (Electrical Distribution Unit)
6. Programming and construction of the hybrid power system.

5.5 FACTORY ACCEPTANCE TESTING (FAT)

Upon completion of the hybrid power system build, the contractor is to provide an operation acceptance test which confirms at the minimum the following (Table 11):

Table 11: Required Operation and Acceptance Test

Test	Description
1	Verify and test that electrical, mechanical and control components of the system are ready for start-up. This includes: <ol style="list-style-type: none"> a. Point to point voltage interconnection verifications b. Grounding c. Current carrying wiring connection verifications d. Continuity tests of all power and control wiring e. Phase verifications
2	Verify the electrical protection and relays are coordinated and are operational
3	Verify and test that all safety systems are installed and operational
4	Verify and test that all communication systems are operating
5	Lock-out tags are functional and the lock-out process has been implemented
6	Upon system start-up operate all components and record: <ol style="list-style-type: none"> a. Voltage b. Currents c. Temperatures
7	Verify that all components and sub-systems operate as intended

8	Verify the controls operate as intended
9	Data collection functions with events recorded as required

The test results are to be saved by the HMI/data historian for future reference and analysis. Test results will be reviewed by the project authority for approval. If any of the operation acceptance tests fail, the contractor will be responsible (at their own cost) to make the necessary changes to ensure the tests pass. Failed tests will need to be redone and approved by the project authority.

A detailed FAT procedure report will be jointly created by CanmetENERGY and the contractor. This report will be a complete set of tests that will be performed during the FAT, including those above and any additional tests identified with the vendor to ensure system will meet the power requirements safely at the final deployment site.

5.6 WITNESS TEST

Upon completion of a successful approved Factory Acceptance Test, a witness test at the contractor's site will be required demonstrating the following steady load and dynamic load tests for proof of capability (Table 12). Witness test is to be approved by the project authority prior to delivery in case of changes required. In the event one of the witness tests fail, the contractor will be required to make the necessary changes (at their own expense) to pass the test. Failed tests will need to be redone and approved by the project authority.

Table 12: Required Witness Test

Test	Description
Steady Load Test	
1	System Power Draw: 30 kW
2	System Power Draw: 60 kW
3	System Power Draw: 90 kW
4	System Power Draw: 180 kW
Dynamic Load Test	
1	System Power Draw: 30 kW increases to 60 kW (maximum 10s) decreases back to 30 kW
2	System Power Draw: Load at 30 kW drops to 15 kW
3	System Power Draw: Load at 60 kW drops to 15 kW
4	System Power Draw: Load at 30 kW increases to 60 kW
5	System Power Draw: Load at 30 kW increases to 90 kW
6	System Power Draw: Load at 30 kW increases to 180 kW
7	System Power Draw: 2 second interval 15 kW to 25 kW (operate for 30 minutes)
Modes of Operation (reference 4.5.2)	
1	Generator off mode
2	Generator standby mode
3	Generator mode
4	Hybrid mode
Hybrid Power System Operation	
1	Grid forming mode
2	Grid following mode
Fault Detection and Safety	
1	Fire suppression system functionality
2	Mechanical venting/overheat protection (HVAC system)
3	Fault detection and deactivation of faulted system - Diesel generator fault

- Solar PV fault
- Battery Energy Storage System Fault

5.7 FAILURE AND RECOVERY TESTS

The following failure and recovery response tests (Table 13) must also be conducted and the response noted. The tests can be triggered through the software. The failure and recovery response tests is to be approved by the project authority prior to delivery in case of changes required. In the event one of the failure and recovery response tests fail, the contractor will be required to make the necessary changes (at their own expense) to pass the test. Failed tests will need to be redone and approved by the project authority.

Table 13: Failure and Recovery Response Test

Test	Description
1	BESS Inverter fatal failure
2	Microgrid Controller fatal hardware/software failure
3	Communication failure between Microgrid Controller and the BMS
4	Communication failure between Microgrid Controller and the BESS Inverter
5	Communication failure between Microgrid Controller and the local Diesel Generator
6	Fire Alarm Warning (not fault but pre-fault stage)
7	Fire Detected Fault in the BESS Container
8	High Temperature Warning in the BESS
9	High Temperature Fault in BESS
10	Low Temperature Warning in the BESS
11	Low Temperature Fault in the BESS
12	HVAC Warning in the BESS
13	HVAC Fault in the BESS
14	Diesel Generator back-feed fault
15	Diesel Generator fatal failure/shutdown
16	Diesel Generator Controller failure

5.8 DELIVERY, ASSEMBLY, COMMISSIONING AND TRAINING AT CANMETENERGY

Once delivered, the assembly and commissioning of the whole system will be performed at the CanmetENERGY site at Varennes. CanmetENERGY will provide a programmable 125 kW capacitive/inductive load bank during this phase as well as a fluid cooler. CanmetENERGY will provide the solar photovoltaics and inverter to integrate with the system provided by the contractor.

A detailed commissioning report will be jointly created by CanmetENERGY and the contractor, which will include the tests listed below and any additional tests identified with the contractor to ensure the HMS can safely meet the power requirements at the final deployment site.

The following tests must be completed by the contractor during the commissioning phase (Table 14) at CanmetENERGY in Varennes:

Table 14: Required Operation and Acceptance Test during Commissioning

Test	Description
1	Verify and test that electrical, mechanical and control components of the system are ready for start-up. This includes: <ul style="list-style-type: none"> a. Point to point voltage interconnection verifications

	<ul style="list-style-type: none"> b. Grounding c. Current carrying wiring connection verifications d. Continuity tests of all power and control wiring e. Phase verifications
2	Verify the electrical protection and relays are coordinated and are operational
3	Verify and test that all safety systems are installed and operational
4	Verify and test that all communication systems are operating
5	Lock-out tags are functional and the lock-out process has been implemented
6	Upon system start-up operate all components and record: <ul style="list-style-type: none"> a. Voltage b. Currents c. Temperatures
7	Verify that all components and sub-systems operate as intended
8	Verify the controls operate as intended
9	Data collection functions with events recorded as required
10	Steady state load test at 30 kW (30 minutes)
11	Steady state load test at 60 kW (30 minutes)
12	Steady state load test at 90 kW (30 minutes)
13	Dynamic load test pulsing between 15 kW to 25 kW every 2 seconds for 30 minutes
13	Mode of operation: Generator off mode
14	Mode of operation: Generator standby mode
15	Mode of operation: Generator mode
16	Mode of operation: Hybrid mode
17	Hybrid power system operation: grid forming
18	Hybrid power system operation: grid following

The project authority will approve the operation and acceptance tests during commissioning. If one of the tests fails during the commissioning phase, the contractor will be responsible to repair the error and redo the test for eventual approval by the project authority.

The project authority will also perform visual checks and verifications with respect to as built drawings for the whole system. The following verifications will be performed:

- Equipment inspections
- Mechanical integrity checks
- Coordinated Operational mode tests on all equipment (BESS and DGs)
- Continuity tests of all power and control wiring as per the site interconnection drawings
- Grounding and bonding verification as per site electrical drawings

The contractor will be responsible for addressing any failed visual checks and verifications. Visual checks and verifications will be done during the commissioning phase when the contractor is onsite.

Final design and assembly to be approved by the project authority.

The contractor must provide a 1-day training in English for up to five people with the delivery of the HMS. The training must include the following items, but not be limited to:

1. Operating the HMS
2. Selecting modes of operation
3. Use of the software and device options to change control parameters
4. Maintenance and inspections of key components of the HMS

5. Understanding and clearing fault codes and alarms

5.9 MANUALS AND SOFTWARE

The following manuals (hard copy and electronic) must be provided with the delivery of the HMS.

1. Operation Manual
2. Maintenance Manual
3. Parts Manual
4. Training Manual
5. Installation Manual
6. Safety procedures including lock out tag out procedures
7. Commissioning manual
8. Functional Description of the Microgrid Controller and the BESS Inverter
9. Functional Description of the Battery Management System

Relevant software for communication and configuration of system components must also be provided.

5.10 ASSEMBLY AND COMMISSIONING AT NORTH BAY SRD SITE

The project authority will make the necessary arrangements to transport the HMS from CanmetENERGY to the North Bay SRD site delivery point. CanmetENERGY will be responsible for dismantling the system and ensuring the equipment is transported properly to the North Bay SRD site. Any damage to the system during the transport will be the responsibility of CanmetENERGY to repair.

The contractor will be required to install and commission the system at the North Bay SRD site. The operation and acceptance tests outlined in Table 14 will need to be redone once the system is installed at the North Bay SRD site.

The contractor must provide a 1-day training in English for up to five people with the delivery of the HMS at the North Bay SRD site. The training must include the following items, but not be limited to:

1. Operating the HMS
2. Selecting modes of operation
3. Use of the software and device options to change control parameters
4. Maintenance and inspections of key components of the HMS
5. Understanding and clearing fault codes and alarms

5.11 TECHNICAL SUPPORT

The contractor must be available "on demand" to provide a technical support service after the commissioning to CanmetENERGY in Varennes until the end of the contract and for 3 additional 1-year periods.

The contractor must provide support services including but not limited to: system operation, system troubleshooting, fault diagnostics, and software maintenance.

- a) Estimate of 50 hours annually;
- b) Monday to Friday, 8:00 AM to 5:00 PM Eastern Standard Time;
- c) Response time: 48 hours maximum
- d) Communication by phone and email within 48 hours, and on-site if required with timing arrangements coordinated through CanmetENERGY.

- e) The contractor must be able to communicate information and advice to users in English.

6. DATES OF DELIVERY

The following table summarizes the delivery delays for the respective deliverables in Deliverable 5A: The complete hybrid power system and (Table 15).

Table 15: Delivery Dates for Deliverable 5A

No.	Deliverable	Timeline
5.1	Engineering and Transient Protection Study	6 Weeks
5.2	Project Plan	10 Weeks
5.3	Design and Engineering Drawings	20 Weeks
5.4	Procurement of System Components and System Build	36 Weeks
5.5	Factory Acceptance Testing (FAT)	40 Weeks
5.6	Witness Test	40 Weeks
5.7	Failure and Recovery Test	40 Weeks
5.8	Delivery, Assembly, Commissioning and Training at CanmetENERGY, Varennes, QC	44 Weeks
5.9	Manuals and Software	44 Weeks
5.10.	Assembly, Commissioning and Training at North Bay SRD site	TBD
5.11	Technical Support	TBD

The following table summarizes the delivery delays for the respective deliverables in Deliverable 5B: Battery Energy Storage System and Microgrid Controller in the event the option is exercised (Table 16).

Table 16: Delivery Dates for Optional Deliverable 5B

No.	Deliverable	Timeline
5.3	Design and Engineering Drawings	20 Weeks
5.4	Procurement of System Components and System Build	36 Weeks
5.5	Factory Acceptance Testing (FAT)	40 Weeks
5.6	Witness Test	40 weeks
5.7	Failure and Recovery Tests	40 weeks
5.8	Delivery, Assembly, Commissioning and Training at National Research Council (NRC), Vancouver, BC	44 Weeks
5.9	Manuals and Software	44 Weeks

7. LANGUAGE OF WORK

Deliverables must be written in English. Meetings and communications will also be in English.

8. TRAVEL

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, and private vehicle allowances specified in Appendices B, C and D of the [National Joint Council Travel Directive](#), and with the other provisions of the directive referring to

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"travellers", rather than those referring to "employees". Canada will not pay the Contractor any incidental expense allowance for authorized travel.

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

9. MEETINGS

The Project Authority will organize a kick-off meeting with the contractor and other representatives of Canada to discuss the details of the contract.

Other progress meetings may be organized by the contractor or Project Authority to discuss the status of the project. These meetings will be held virtually.

10. DELIVERY LOCATIONS

Natural Resources Canada
Government of Canada
1615 boul. Lionel-Boulet,
Varenes, QC, J3X 1P7
Canada

North Bay SRD Site
22 Wing CFB North Bay
Hornell Heights, ON P0H 1P0
Canada

National Research Council
Government of Canada
4250 Wesbrook Mall,
Vancouver, BC, V6T 1W5
Canada

ANNEX “B” - BASIS OF PAYMENT

TABLE 1 : DELIVERABLE 5A: HYBRID POWER SYSTEM

Item #	Description	Quantity	Unit	Total Firm Price
5.1	Engineering and Transient Protection Study for North Bay SRD site	1	EA	_____ \$
5.2	Project Plan - Overall system design - Identification and description of key hybrid microgrid system components Work breakdown structure	1	EA	_____ \$
5.3	System Design and Engineering Drawings - Architectural - Mechanical - Electrical - Controls & Instrumentation	1	EA	_____ \$
5.4.a	Procurement of Main Hybrid Power System Components - Diesel generator - Battery energy storage system (BESS) - 4 Quadrant BESS inverter - Microgrid controller - Low voltage power supply/distribution - Enclosures	1	EA	_____ \$
5.4.b	Hybrid Power System Programming and Build	1	EA	_____ \$
5.5	Factory Acceptance Test	1	EA	_____ \$
5.6	Witness Test	1	EA	_____ \$
5.7	Recovery Response Test	1	EA	_____ \$
5.8	Delivery, Installation , Assembly and Commissioning of HMS at CanmetENERGY in Varennes, QC including onsite training for system operation DDP (Varennes, QC, Canada) including customs duties, handling and the delivery	1	EA	_____ \$
5.9	Manuals, software, parts list and critical maintenance	1	EA	_____ \$
5.10	Assembly, Installation and Commissioning of HMS at North Bay, SRD site including onsite training for system operation	1	EA	_____ \$
TOTAL Bid Evaluation Price for Table 1 in CAD excluding Applicable Sales Taxes				_____ \$

TABLE 2: DELIVERABLE 5A - 5.11 TECHNICAL SUPPORT

Firm all-inclusive hourly rate (excluding applicable taxes and including profit and administration fees for each year of the contract period).

Estimated effort: 50 hours per year

Periods	Hourly Rates
Year 1 <i>Upon complete and certified delivery of deliverable 6.10 until March 31, 2023</i>	_____ \$
Year 2 <i>From April 1, 2023 to March, 31 2024</i>	_____ \$
Year 3 (option) <i>From April 1, 2024 to March, 31 2025</i>	_____ \$
Year 4 (option) <i>From April 1, 2025 to March, 31 2026</i>	_____ \$
Year 5 (option) <i>From April 1, 2026 until the end of the contract</i>	_____ \$
TOTAL Bid Evaluation Price for Table 2 in CAD excluding Applicable Sales Taxes:	_____ \$

TRAVEL AND LIVING EXPENSES – 5.11 TECHNICAL SUPPORT:

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, and private vehicle allowances specified in Appendices B, C and D of the [National Joint Council Travel Directive](#), and with the other provisions of the directive referring to "travellers", rather than those referring to "employees". Canada will not pay the Contractor any incidental expense allowance for authorized travel.

All travel must have the prior authorization of the Project Authority.

All payments are subject to government audit.

LIMITATION OF EXPENDITURES FOR DELIVERABLE 5.11 TECHNICAL SUPPORT (excluding applicable sales taxes) : _____ \$ *(to be completed by PWSGC at contract award)*

TABLE 3: DELIVERABLE 5B: OPTIONAL GOODS

Item #	Description	Quantity	Unit	Firm Unit Price	Total Firm Price
B.1	System Design and Engineering Drawings - Architectural - Mechanical - Electrical - Controls & Instrumentation	1	EA	_____ \$	_____ \$
B.2	Procurement of Battery Energy Storage System and Microgrid Controller - Battery Energy Storage System - 4 Quadrant Inverter - Microgrid Controller	1	EA	_____ \$	_____ \$
B.3	BESS Programming and Build	1	EA	_____ \$	_____ \$
B.4	Factory acceptance test	1	EA	_____ \$	_____ \$
B.5	Witness Test	1	EA	_____ \$	_____ \$
B.6	Failure and recovery response tests	1	EA	_____ \$	_____ \$
B.7	Delivery, Assembly and Commissioning System at National Research Council in Vancouver including onsite training for system operation DDP (Vancouver, BC, Canada), including customs duties, handling and the delivery	1	EA	_____ \$	_____ \$
B.8	Manuals, software, parts list and critical maintenance	1	EA	_____ \$	_____ \$
TOTAL Bid Evaluation Price for Table 3 in CAD excluding Applicable Sales Taxes:					_____ \$

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ANNEX "C" - SECURITY REQUIREMENTS CHECK LIST

See following pages

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ANNEX “D” to PART 3 OF THE BID SOLICITATION – ELECTRONIC PAYMENT INSTRUMENTS

As indicated in Part 3, clause 3.1.2, the Bidder must identify which electronic payment instruments they are willing to accept for payment of invoices.

The Bidder accepts to be paid by any of the following Electronic Payment Instrument(s):

- VISA Acquisition Card;
- MasterCard Acquisition Card;
- Direct Deposit (Domestic and International);
- Electronic Data Interchange (EDI);
- Wire Transfer (International Only).

ANNEX "E" to PART 5 OF THE BID SOLICITATION - FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit [Employment and Social Development Canada \(ESDC\) – Labour's](#) website.

Date: _____ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

- A1. The Bidder certifies having no work force in Canada.
- A2. The Bidder certifies being a public sector employer.
- A3. The Bidder certifies being a [federally regulated employer](#) being subject to the [Employment Equity Act](#).
- A4. The Bidder certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

- A5.1. The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity \(AIEE\)](#) in place with ESDC-Labour.
- OR**
- A5.2. The Bidder certifies having submitted the [Agreement to Implement Employment Equity \(LAB1168\)](#) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

- B1. The Bidder is not a Joint Venture.

OR

- B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

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ANNEX "F" to PART 5 OF THE BID SOLICITATION - COVID-19 VACCINATION REQUIREMENT CERTIFICATION

I, _____ (*first and last name*), as the representative of _____ (*name of business*) pursuant to **23332-220150/A**, warrant and certify that all personnel that _____ (*name of business*) will provide on the resulting Contract who access federal government workplaces where they may come into contact with public servants will be:

- (a) fully vaccinated against COVID-19;
- (b) for personnel that are unable to be vaccinated due to a certified medical contraindication, religion or other prohibited grounds of discrimination under the *Canadian Human Rights Act*, subject to accommodation and mitigation measures that have been presented to and approved by Canada; or
- (c) partially vaccinated against COVID-19 for a period of up to 10 weeks from the date of their first dose and subject to temporary measures that have been presented to and approved by Canada, immediately after which period the personnel will meet the conditions of (a) or (b) or will no longer access federal government workplaces where they may come into contact with public servants under this Contract;

until such time that Canada indicates that the vaccination requirements of the COVID-19 Vaccination Policy for Supplier Personnel are no longer in effect.

I certify that all personnel provided by _____ (*name of business*) have been notified of the vaccination requirements of the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel, and that the _____ (*name of business*) has certified to their compliance with this requirement.

I certify that the information provided is true as of the date indicated below and will continue to be true for the duration of the Contract. I understand that the certifications provided to Canada are subject to verification at all times. I also understand that Canada will declare a contractor in default, if a certification is found to be untrue, whether made knowingly or unknowingly, during the bid or contract period. Canada reserves the right to ask for additional information to verify the certifications. Failure to comply with any request or requirement imposed by Canada will constitute a default under the Contract.

Signature: _____

Date: _____

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Optional

For data purposes only, initial below if your business already has its own mandatory vaccination policy or requirements for employees in place. Initialing below **is not** a substitute for completing the mandatory certification above.

Initials: _____

Information you provide on this Certification Form and in accordance with the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel will be protected, used, stored and disclosed in accordance with the Privacy Act. Please note that you have a right to access and correct any information on your file, and you have a right to file a complaint with the Office of the Privacy Commissioner regarding the handling of your personal information. These rights also apply to all individuals who are deemed to be personnel for the purpose for the Contract and who require access to federal government workplaces where they may come into contact with public servants.