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K1A 0S5

## Revision to a Request for a Standing Offer

## Révision à une demande d'offre à commandes

Regional Individual Standing Offer (RISO)

Offre à commandes individuelle régionale (OCIR)

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Offer remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'offre demeurent les mêmes.

## Comments - Commentaires

## Vendor/Firm Name and Address

Raison sociale et adresse du  
fournisseur/de l'entrepreneur

## Issuing Office - Bureau de distribution

Defence Science Projects Division/Division des  
projets des sciences de la défense  
Les Terrasses de la Chaudière  
10, rue Wellington, 4e étage  
Gatineau  
Quebec  
K1A 0S5

<b>Title - Sujet</b> Expertise related to housing, build Expertise related to housing, building	
<b>Solicitation No. - N° de l'invitation</b> 23240-220001/A	<b>Date</b> 2021-08-20
<b>Client Reference No. - N° de référence du client</b> 23240-220001	<b>Amendment No. - N° modif.</b> 001
<b>File No. - N° de dossier</b> 002sl.23240-220001	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$\$SL-002-39838	
<b>Date of Original Request for Standing Offer</b> <b>Date de la demande de l'offre à commandes originale</b> 2021-08-09	
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> Eastern Daylight Saving Time EDT <b>on - le 2021-10-07</b> Heure Avancée de l'Est HAE	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Castonguay, Karianne	<b>Buyer Id - Id de l'acheteur</b> 002sl
<b>Telephone No. - N° de téléphone</b> (373) 572-0584 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Delivery Required - Livraison exigée</b>	
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	
<b>Security - Sécurité</b> This revision does not change the security requirements of the Offer. Cette révision ne change pas les besoins en matière de sécurité de la présente offre.	

Instructions: See Herein

Instructions: Voir aux présentes

<b>Acknowledgement copy required</b> <b>Accusé de réception requis</b>	<b>Yes - Oui</b> <input type="checkbox"/>	<b>No - Non</b> <input type="checkbox"/>
<b>The Offeror hereby acknowledges this revision to its Offer.</b> <b>Le proposant constate, par la présente, cette révision à son offre.</b>		
<b>Signature</b>	<b>Date</b>	
Name and title of person authorized to sign on behalf of offeror. (type or print) Nom et titre de la personne autorisée à signer au nom du proposant. (taper ou écrire en caractères d'imprimerie)		
<b>For the Minister - Pour le Ministre</b>		

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## **PART 1 - GENERAL INFORMATION**

### **1.1 Introduction**

The Request for Standing Offers (RFSO) is divided into seven parts plus attachments and annexes, as follows:

- |        |                                                                                                                                                                                                                                                                                                                               |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part 1 | General Information: provides a general description of the requirement;                                                                                                                                                                                                                                                       |
| Part 2 | Offeror Instructions: provides the instructions applicable to the clauses and conditions of the RFSO;                                                                                                                                                                                                                         |
| Part 3 | Offer Preparation Instructions: provides offerors with instructions on how to prepare their offer to address the evaluation criteria specified;                                                                                                                                                                               |
| Part 4 | Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria which must be addressed in the offer, 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 Insurance Requirements: includes specific requirements that must be addressed by offerors; and                                                                                                                                                                                                        |
| Part 7 | 7A, Standing Offer, and 7B, Resulting Contract Clauses:<br><br>7A, includes the Standing Offer containing the offer from the Offeror and the applicable clauses and conditions;<br><br>7B, includes the clauses and conditions which will apply to any contract resulting from a call-up made pursuant to the Standing Offer. |

The Annexes include the Statement of Requirement, the Basis of Payment, the Electronic Payment Instruments, the Federal Contractors Program for Employment Equity - Certification and any other annexes

### **1.2 Summary**

The Buildings and Renewables Group (BRG) at Natural Resources Canada's (NRCan) CanmetENERGY-Ottawa (CE-O) carries out a wide range of research and development (R&D) to improve the energy performance of the built environment and further the application of renewable energy. BRG's R&D activities include activities such as developing feasibility studies, carrying out data analysis, creating technical reports, and developing technical presentations and guides to share the R&D findings. Standing Offers provide BRG with greater capacity to address a wide range of R&D and complete it in a timely manner. Thirty-two (32) areas of expertise (AE) have been established with the objective of having up to three offerors for each one.

#### **1.2.1 Estimated Utilization**

The responsive offers with the three (3) lowest firm all-inclusive hourly rates under each of the areas will share the estimated usage for the initial three (3) year period in accordance with the following:

- (a) the lowest price offer will share 50% of the estimated total cost per area of expertise
- (b) the 2nd lowest price offer will share 30% of the estimated total cost per area of expertise
- (c) the 3rd lowest price offer will share 20% of the estimated total cost per area of expertise

In the event that only two offerors are deemed responsive:

The two (2) lowest firm all-inclusive hourly rates under the area of expertise will share the estimated usage of the initial three (3) year period in accordance with the following:

- (a) the lowest rate will share 60% of the estimated total cost per area of expertise
- (b) the 2<sup>nd</sup> lowest rate will share 40% of the estimated total cost per area of **expertise**

In the event that only one offeror is deemed response under the area of expertise it will be allocated 100% of the estimated total cost per area of expertise for the three year period of the SO).

The same usage as mentioned above will apply to any extension period exercised.

The level of service specified herein is only an approximation of requirements given in good faith.

Services are required for a period of three (3) years commencing from the date of authorization to use the Standing Offer. Canada may authorize the use of the Standing Offer beyond its initial period, for two (2) additional two (2) years periods. Should Canada authorize the use of the Standing Offer beyond its initial period, Canada will calculate an automatic increase of 3% of the most recent all-inclusive rates.

The Work will be allocated in accordance with article 7.8, "Allocation of Work", under Part 7 of the Standing Offer Resulting Contract Clauses.

Pursuant to section 01 of Standard Instructions 2006, Offerors must submit a complete list of names of all individuals who are currently directors of the Offeror. Furthermore, as determined by the Special Investigations Directorate, Departmental Oversight Branch, each individual named on the list may be requested to complete a Consent to a Criminal Record Verification form and related documentation.

For services requirements, Offerors in receipt of a pension or a lump sum payment must provide the required information as detailed in article 3 of Part 2 of the Request for Standing Offers (RFSO)

This requirement is limited to Canadian goods and/or services.

#### **1.2.2 Canadian Content Certification**

The requirement is subject to a preference for Canadian services.

##### **1.2.3 This procurement is conditionally limited to Canadian services.**

Subject to the evaluation procedures contained in the bid solicitation, bidders acknowledge that only bids with a certification that the service offered is a Canadian service, as defined in clause A3050T, may be considered.

Failure to provide this certification completed with the bid will result in the service offered being treated as a non-Canadian service.

The Bidder certifies that:

- ( ) the service offered is a Canadian service as defined in paragraph 2 of clause A3050T.

*SACC Manual* clause A3050T (2020-07-01) Canadian Content Definition

*SACC Manual* clause A3051T (2018-12-06) Canadian Content Certification

##### **1.2.4 This RFSO allows offerors to use the epost Connect service provided by Canada Post Corporation to transmit their offers electronically. Offerors must refer to Part 2 of the RFSO entitled Offeror Instructions and Part 3 of the RFSO entitled Offer Preparation Instructions, for further information on using this method.**

### 1.3 Security Requirements

There are no security requirements associated with the requirement of the Standing Offer.

### 1.4 Debriefings

Offerors may request a debriefing on the results of the request for standing offers process. Offerors should make the request to the Standing Offer Authority within 15 working days of receipt of the results of the request for standing offers process. The debriefing may be in writing, by telephone or in person.

### 1.5 Anticipated migration to an e-Procurement Solution (EPS)

Canada is currently developing an online EPS for faster and more convenient ordering of goods and services. In support of the anticipated transition to this system and how it may impact any resulting Standing Offer that is issued under this solicitation, refer to 7.15 Transition to an e-Procurement Solution (EPS).

The Government of Canada's [press release](#) provides additional information.

## PART 2 - OFFEROR INSTRUCTIONS

### 2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the Request for Standing Offers (RFSO) 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>) issued by Public Works and Government Services Canada.

Offerors who submit an offer agree to be bound by the instructions, clauses and conditions of the RFSO and accept the clauses and conditions of the Standing Offer and resulting contract(s).

The [2006 \(2020-05-08\)](#) Standard Instructions - Request for Standing Offers - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the RFSO.

### 2.2 Submission of Offers

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated in the bid solicitation.

Note: Bidders will need to submit using epost Connect for bids closing at the Bid Receiving Unit in the National Capital Region (NCR) the email address is:

[tpsgc.dgareceptiondessoumissions-abbidreceiving.pwgsc@tpsgc-pwgsc.gc.ca](mailto:tpsgc.dgareceptiondessoumissions-abbidreceiving.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.

Vendors must ensure they submit their requests before the closing time and date – ideally 6 business days prior. Once completed, one of the BRU employees will respond to their request and attach a bid submission guide which directs them as to how they can access the epost Connect services.

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

### 2.3 Former Public Servant

Contracts awarded to former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, offerors must provide the information required below before the issuance of a standing offer.

#### Definitions

For the purposes of this clause,

"former public servant" is any former member of a department as defined in the *Financial Administration Act* R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

an individual;

an individual who has incorporated;

a partnership made of former public servants; or

a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"[lump sum payment period](#)" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"[pension](#)" means a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c. C-17, the *Defence Services Pension Continuation Act*, 1970, c. D-3, the *Royal Canadian Mounted Police Pension Continuation Act*, 1970, c. R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c. R-11, the *Members of Parliament Retiring Allowances Act*, R.S. 1985, c. M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c. C-8.

#### Former Public Servant in Receipt of a Pension

As per the above definitions, is the Offeror a FPS in receipt of a pension? YES ( ) NO ( )

If so, the Offeror must provide the following information, for all FPS in receipt of a pension, as applicable: name of former public servant; date of termination of employment or retirement from the Public Service.

By providing this information, Offerors agree that the successful Offeror's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

#### Work Force Adjustment Directive

Is the Offeror a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment

Directive? YES ( ) NO ( )

If so, the Offeror must provide the following information:

name of former public servant;

conditions of the lump sum payment incentive;

date of termination of employment;

amount of lump sum payment;

rate of pay on which lump sum payment is based;

period of lump sum payment including start date, end date and number of weeks;

number and amount (professional fees) of other contracts subject to the restrictions of a work force adjustment program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including Applicable Taxes.



## 2.4 Enquiries - Request for Standing Offers

All enquiries must be submitted in writing to the Standing Offer Authority no later than 10 calendar days before the Request for Standing Offers (RFSO) closing date. Enquiries received after that time may not be answered.

Offerors should reference as accurately as possible the numbered item of the RFSO to which the enquiry relates. Care should be taken by offerors 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 offerors do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all offerors. Enquiries not submitted in a form that can be distributed to all offerors may not be answered by Canada.

## 2.5 Applicable Laws

The Standing Offer and any contract resulting from the Standing Offer must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Offerors may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their offer, 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 offerors.

## 2.6 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential offerors to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages offerors to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[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) Offerors should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Offerors should therefore act quickly when they want to challenge any aspect of the procurement process.

## PART 3 - OFFER PREPARATION INSTRUCTIONS

### 3.1 Offer Preparation Instructions

- Canada requests that the Offeror submits its offer 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 offer must be gathered per section and separated as follows:

Section I: Technical Offer  
Section II: Financial Offer  
Section III: Certifications  
Section IV: Additional Information

#### Section I: Technical Offer

In their technical offer, offerors should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.



---

## **Section II: Financial Offer**

**ALL INFORMATION RELATED IN ANY WAY TO PRICE IS TO APPEAR ONLY IN THE FINANCIAL OFFER.**

### **Pricing Basis**

Offerors must submit their financial offer in accordance with the following:

A firm all-inclusive hourly rate for each area of expertise for the initial three (3) year period of the standing offer. The rates for the subsequent four (4) one (1) year possible extension periods would be adjusted with an automatic 3% increase

The total amount of Applicable Taxes must be shown separately.

No travel and living expenses will be paid for services provided within the National Capital Region (NCR). Further, Canada will not accept any travel and living expenses for travel between the contractor's place of business and the NCR. All of these costs are to be included in the firm all inclusive labour rates requested above.

The information should be provided in accordance with the "Financial Offer Presentation Sheet" in Attachment 1 to Part 4.

#### **3.1.1 Electronic Payment of Invoices - Offer**

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

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

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

## **Section III: Certifications**

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

## **PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**

### **4.1 Evaluation Procedures**

- (a) Offers will be assessed in accordance with the entire requirement of the Request for Standing Offers including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the offers.

#### **4.1.1 Technical Evaluation**

##### **4.1.1.1 Mandatory Technical Criteria**

The Offeror must comply with the following Mandatory Technical Requirements and provide the necessary documentation to support compliance.

Any offer which fails to meet any of the following Mandatory Technical Requirements will be declared non-responsive. Each requirement should be addressed separately.

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

1. 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
2. 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 criterion; or
3. the Bidder's subcontractors (maximum of 2), 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.

In the event that the Bidder fails to submit any of the information pursuant to **M1, M2 and M3** below, the Contracting Authority may request it thereafter in writing, including after the closing date of the bid solicitation. It is mandatory that the Bidder provide the missing information within three (3) business days of the written request or within such longer period as specified by the Contracting Authority in the notice to the Bidder.

- M1** The Offeror must clearly identify in its offer the area (s) of expertise for which it is submitting an offer (refer to Annex A).
- M2** The Offeror must not propose the same individual for more than four (4) areas of expertise (refer to Appendix 1 to Annex A).
- M3** The Offeror must demonstrate, for each of the proposed resources(s), that they have a minimum of three (3) years of experience within the last ten (10) years, (measured back from date of RFSO closing) related to each Area of Expertise (AE) for which they are submitting an offer.

#### **4.1.1.2 Point Rated Technical Criteria**

For those Technical Offers that meet all the Mandatory Requirements, each individual submitted under a particular area of expertise will be evaluated and scored separately in accordance with the following evaluation criteria.

Marks are assigned to each individual and marks of more than one individual cannot be combined.

For a complete "Overview" and "Description of Tasks" for each of the 32 categories of expertise, reference is made to Part 7, "STANDING OFFER AND RESULTING CONTRACT CLAUSES", at "ANNEX "A", STATEMENT OF REQUIREMENT".

A quantitative evaluation of experience will be carried out as described in the chart below. The applicant will demonstrate that they meet the requirements by providing relevant examples from their experience.

- Each example can score points where all of the information requested is adequately provided.
- No partial points will be awarded for examples where any of the requested information is missing.
- List only the number of projects requested. If more are provided, only first listed will be evaluated.

#### **PRTC-1 – Proposed Individual(s) Experience**

The Offeror will identify the individual's highest number of years of experience (measured back from the date of closing).

**A score of one (1) point to a maximum of ten (10) points for every year of experience as indicated in Annex A, Statement of Requirement.**



played a significant role in project.  
**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**  
**Minimum points required to pass: 20**

**Grant Total Maximum – 100 points**  
**Passing Mark – 70 points**

**1. Residential - Field assessment and monitoring of housing energy performance (whole house and specific equipment and systems)**

Area	Experience	Maximum Points
1.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years carrying out field monitoring of equipment, systems and whole house monitoring studies where monitoring equipment was installed and data was analyzed.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Contribution within this area of expertise (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> <li>• Number of homes in study:</li> </ul> <p>The first two example projects provided must relate to studies that included at least 5 homes.</p> <p>List up to <b>three (3)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	30
1.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>whole house monitoring studies where you were the primary author or the resulting study.</b></p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> <li>• Alignment between planned and implemented methodology (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
<b>Total</b>		<b>50</b>

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

## 2. Residential - Windows, Exterior Doors and Fenestrations

Area	Experience	Maximum Points
2.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in conducting research into the performance of window, door and fenestration systems. Relevant projects may relate to the development of assembly specifications; thermal, energy and moisture modelling; costing analysis, or the assessment of solar shading or solar control devices.</p> <p>For each example, provide the following:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>three (3)</b> relevant projects. <b>Five (5)</b> points will be awarded for each project.</p>	15
2.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, with Canadian, North American, or international standards, or with product marketing programs such as ENERGY STAR.</p> <p>For each example, provide the following:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• The relevant standard(s) or marketing program(s)</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> relevant projects. <b>Five (5)</b> points will be awarded for each project.</p>	10

2.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in conducting field testing and monitoring of fenestration systems using recognized test standards or protocols, or analyzing the results of such testing.</p> <p>Requirements for each example:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• The relevant test standard(s) or protocol(s):</li> <li>• The fenestration products tested:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	10
2.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing best-practice guides and training modules, and/or providing technical assistance to builders and manufacturers on the design, specification, and/or installation of fenestration products</p> <p>Requirements for each example:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• The relevant fenestration product:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	15
<b>Total</b>		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

### 3. Residential - Building Envelope Research and Assessments

Area	Experience	Maximum Points
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3.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and illustrating wall assemblies and details. Provide:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Software used: Project Result(s) (2 lines max.): The illustrated detail:</p> <p>List <b>one (1)</b> project. <b>Ten (10)</b> points will be awarded.</p>	10
3.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, of evaluating thermal performance and modeling coupled heat and moisture transport in envelope components using analytic tools such as WUFI, Delphin, hygIRC. For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Software used and analysis conducted (2 lines max.): Project Result(s) (2 lines max.):</p> <p>List two <b>(2)</b> projects. <b>Ten (10)</b> points will be awarded.</p>	20
3.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, of lab characterization, field-testing and monitoring of materials and envelope components. For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Project Result(s) (2 lines max.):</p> <p>List <b>one (1)</b> project. <b>Ten (10)</b> points will be awarded.</p>	10
3.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing field-guides, best-practice guides or training modules for building envelopes.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed:</p>	10



	<p>Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Project Result(s) (2 lines max.):</p> <p>List <b>one (1)</b> project. <b>Ten (10)</b> points will be awarded.</p>	
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects, preferably comprehensive with many aspects, provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

<b>4 Residential – High Performance Housing</b>		
<b>Area</b>	<b>Experience</b>	<b>Maximum Points</b>
4.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in applying the <b>“House as a System” philosophy</b> to the design and/or analysis of high-performance, low-energy housing. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Describe the project performance objectives (2 lines max.):</li> <li>• Identify the goals and analysis methods used (2 lines max.):</li> <li>• Describe insights gained from application of the <b>“House as a system” philosophy</b> (4 lines max)</li> </ul> <p>List up to <b>six (6)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	30
4.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in examining program requirements for low-energy housing (e.g. R-2000, net-zero, passive house)</p>	10

	<ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Labelling standard evaluated (2 lines max.):</li> <li>• Findings:</li> </ul> <p>List up to two (2) projects. Five (5) points will be awarded for each project.</p>	
4.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in interviewing industry representatives to gather input on challenges of and solutions for high-performance housing:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Sectors interviewed (2 lines max.):</li> <li>• Outcomes from interviews (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	10
Total		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

#### 5. Residential - Energy Advisory Expertise

Area	Experience	Maximum Points
5.1	Using example projects relevant to the Area of Expertise of subdivision scale developments that include a minimum of 50 homes, the proposed resource is requested to demonstrate experience, in the last 10 years, advising builders on how to reach high performance housing program goals. Services must include a minimum of the following tasks: advising builders during the planning phase, plans evaluation and HOT2000 energy analysis, and on-site performance audits.	20

	<p>For each example, provide the following information: Development name and location: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (3 lines max.)</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity. No partial points will be awarded for examples that do not meet all requirements.</p> <p>One (1) project is to be for single detached housing. One (1) project is to be for multi-unit housing such as townhomes, stack-towns, back-to-backs, or apartments.</p>	
5.2	<p>Using example home energy retrofit projects, the proposed resources is requested to demonstrate experience, in the last 10 years, carrying out a minimum of the following tasks: plan or site evaluation, energy analysis and proposing energy performance measures, and a post retrofit assessment or audit.</p> <p>For each example, provide the following information: Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (3 lines max.)</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	20
5.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and delivering presentations on low energy housing practices at industry events.</p> <p>For each example, provide the following information: Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p>		

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

**6. Residential - Photovoltaic System Design Expertise**

Area	Experience	Maximum Points
6.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in designing PV systems for NZE homes. Services must include a minimum of the following tasks: defining builder preferences for PV integration; defining utility requirements and constraints; defining annual PV energy production target; defining modules, inverters, layout and providing a full design; and defining the energy monitoring approach.</p> <p>For each example, provide the following information:  Development name and location:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (3 lines max.)</p> <p>.List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p> <p>One (1) project is to be for single detached housing. One (1) project is to be for multi-unit housing such as townhomes, stack-towns, back-to-backs, or apartments.</p>	20
6.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in designing PV systems for retrofit housing. Services must include a minimum of the following tasks: defining builder preferences for PV integration; defining utility requirements and constraints; defining annual PV energy production target; defining modules, inverters, layout and providing a full design; and defining the energy monitoring approach.</p> <p>For each example, provide the following information:  Development name and location:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (3 lines max.)</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p> <p>One (1) project is to be for single detached home. One (1) project is to be for multi-unit housing such as townhomes, stack-towns, back-to-backs, or apartments</p>	20

6.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and delivering presentations on residential PV systems best practices at home building industry events.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
Total		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b>  <b>Minimum points required to pass: 20</b></p>		
<b>7. Buildings - Field assessment and monitoring of building energy performance (whole building and specific equipment and systems) for Low-Rise Multi Residential Buildings</b>		
Area	Experience	Maximum Points
7.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in MURB specific research related to whole-building energy performance monitoring, (including building systems, equipment and components), energy analysis, development of energy models and the development of monitoring methodologies protocols. Provide specific examples for both new buildings as well as the retrofit of existing MURBs..</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Any related technical publication(s) :</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Six (6)</b> points will be awarded for each applicable project or activity. <b>Each example must have a distinct methodology, not simply repeat a project on a different building</b></p>	30

7.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>whole building monitoring studies where you were the primary author of the resulting study</b>. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> <li>• :My Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> <li>• Alignment between planned and implemented methodology (2 lines max.):</li> </ul> <p>List up to four (4) projects. Five (5) points will be awarded for each project. Each example must have a distinct methodology, not simply repeat a project on a different building.</p>	20
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of this AE task requirement</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

<b>8. Buildings - Integrated Design Process</b>		
<b>Area</b>	<b>Experience</b>	<b>Maximum Points</b>
8.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in using Integrated Design Process in the development of whole building project performance criteria.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
8.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to</p>	10

	<p>demonstrate experience, in the last 10 years, in assessing the impact of various energy efficiency measures against whole building energy performance trends.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	
8.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in facilitating integrated design processes, formal training in facilitation, or experience facilitating other collaborative processes.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
8.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in directing multi-disciplinary integrated design teams.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
Total		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p>		



**Maximum points available: 30**  
**Minimum points required to pass: 20**

<b>9. Buildings - Monitoring of Advanced and Renewable Energy Technologies</b>		
<b>Area</b>	<b>Experience</b>	<b>Maximum Points</b>
9.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in conducting residential, or commercial, advanced / renewable energy technology monitoring and verification assessments. Requirements for each example:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Year Completed</li> <li>• Overall Project Description (2 lines max.)</li> <li>• Description of Relevant Project Contribution (2 lines max.)</li> <li>• Project Results (2 lines max.)</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	20
9.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in conducting a techno economic analysis for residential, or commercial, advanced / renewable energy systems, from field monitoring results.</p> <p>Applicants can provide examples in each of the following areas: Photo Voltaic (PV), solar domestic hot water (DHW), solar thermal space heating (including solar-combination systems), passive solar design, PV/thermal hybrid systems, heat pumps (gas or electric), earth tubes, tri-generation or micro-Combined Heat and Power (CHP) systems.</p> <p>Requirements for each example:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Year Completed</li> <li>• Overall Project Description (2 lines max.)</li> <li>• Description of Relevant Project Contribution (2 lines max.)</li> <li>• Project Results (2 lines max.)</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	15
9.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in designing, developing, specifying or supervising the installation of innovative advanced / renewable energy system designs or installations (such as PV, solar DHW, solar thermal space heating, passive solar design, PV/Thermal hybrid systems, Heat Pumps (gas or electric), Earth Tubes, Trigen or m-CHP systems)</p> <p>Requirements for each example</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Year Completed</li> <li>• Overall Project Description (2 lines max.)</li> </ul>	10

	<ul style="list-style-type: none"> <li>• Description of Relevant Project Contribution (2 lines max.)</li> <li>• Project Results (2 lines max.)</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	10
9.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing advanced or renewable energy system performance predictions or comparisons.</p> <p>Requirements for this example</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Year Completed</li> <li>• Overall Project Description (2 lines max.)</li> <li>• Description of Relevant Project Contribution (2 lines max.)</li> <li>• Project Results (2 lines max.)</li> </ul> <p>List <b>one (1)</b> project. <b>Five (5)</b> points will be awarded.</p>	5
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

10. Communities – Data Collection & Analysis		
Area	Experience	Maximum Points
10.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing models characterizing and enabling simulation of energy end-use, GHG emissions and costs associated with housing, buildings and energy technologies.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Technologies modelled: Simulation platform(s) used to develop the datasets</p>	15

	<p>The degree to which energy, emissions and costs were described in the datasets (2 lines max.):</p> <p>List up to three (3) projects. Five (5) points will be awarded for each applicable project or activity.</p>	
10.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in using existing conventional and novel datasets for modelling and simulation of community energy and emissions.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Conventional and/or novel data sources used (2 lines max.): Method(s) used to integrate these datasets with other datasets typically used to characterize community energy and emissions (4 lines max.):</p> <p>List up to three (3) projects. Five (5) points will be awarded for each applicable project or activity.</p>	15
10.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, with the integration of data from housing and building and/or renewable energy technology and/or district energy technology simulation tools and/or measured utility data or other novel datasets into Geographical Information Systems (GIS).</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): The technologies studied and the simulation platforms used (if any) to develop variables relating to them (2 lines max.): the GIS platform used: Examples of approaches used to integrate the datasets (4 lines max.):</p> <p>List up to two (2) projects. Five (5) points will be awarded for each project.</p>	10
10.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in Business analysis experience with a focus on information systems and data holdings; examples including but not limited to stakeholder and enterprise analysis, as-is and to-be business process and information systems modelling, use case and requirements gathering, change management.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.):</p>	10

	List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.	
Total		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

11. Communities – Regulatory and Policy Analysis		
Area	Experience	Maximum Points
11.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in development and/or analysis of provincial planning legislation and/or building codes governing municipalities, with a focus on energy and emissions in housing and buildings</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
11.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in development and/or analysis of provincial regulations governing utilities with a focus on conservation potential reviews and/or demand side management program planning and/or estimation, measurement and verification (EM&amp;V)</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):</p>	15

11.2	My Relevant Project Contribution (2 lines max.): List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. A minimum of three (3) projects must be listed.	15
11.3	Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the development and/or analysis of community energy and emissions policies and/or plans and/or programs with a focus on energy and emissions in housing and/or buildings  For each example, provide the following information: Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.	15
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

## 12. Communities: Low Carbon District and/or Community Energy Systems

### Quantitative Scoring

Area	Experience	Maximum Points
12.1	Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the design and integration of low carbon district and/or community energy systems, their operation, development of control strategies and performance monitoring. For each example, provide the following information: <ul style="list-style-type: none"> <li>Name of facility and/or community</li> <li>Project (or Activity) Title</li> <li>Client Organization</li> <li>Project Year Completion</li> <li>Overall Project Description (2 lines)</li> </ul>	10

	<ul style="list-style-type: none"> <li>• Description of Your Relevant Project Contribution (2 lines)</li> <li>• Project Results (2 lines) including any performance monitoring reporting, if applicable</li> <li>• Type and Rated Capacity of the District Energy System if applicable</li> </ul> <p>List up to two (2) project examples. Five (5) points will be awarded for each relevant project or activity.</p>	
12.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the technical and economic evaluation of low carbon district and/or community energy systems that included the integration of renewable energy resources and technologies.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Name of municipality and/or community</li> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Project Year Completion</li> <li>• Overall Project Description (2 lines)</li> <li>• Description of Your Relevant Project Contribution (2 lines)</li> <li>• Project Results (2 lines)</li> <li>• Description of the Type of Alternative or Renewable Technology Involved</li> </ul> <p>List up to three (3) project examples. Five (5) points will be awarded for each relevant project or activity.</p>	15
12.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, with modelling and simulation of district and/or community energy systems to determine technology integration options, operational performance, input energy requirements, peak demands and greenhouse gas emissions of different system configurations</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Name of municipality and/or community</li> <li>• Project (or Activity) Title</li> <li>• Client Organization</li> <li>• Project Year Completion</li> <li>• Overall Project Description (2 lines)</li> <li>• Description of Your Relevant Project Contribution (2 lines)</li> <li>• Modelling software used</li> <li>• Project Results (2 lines)</li> </ul> <p>List up to three (3) projects. Five (5) points will be awarded for each relevant project or activity</p>	15

12.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the assessment of building energy system components and operational conditions to determine necessary equipment modifications and costs associated with connecting existing buildings to a district energy supply.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Name of municipality and/or community</li> <li>Project (or Activity) Title</li> <li>Client Organization</li> <li>Project Year Completion</li> <li>Overall Project Description (2 lines)</li> <li>Description of Your Relevant Project Contribution (2 lines)</li> <li>Project Results (2 lines)</li> </ul> <p>List up to two (2) projects. Five (5) points will be awarded for each relevant project or activity.</p>	10
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

### 13. Active Solar – Next generation building thermal energy storage

The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered

Area	Experience	Maximum Points
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13.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>the completion of field-testing and demonstration at Technology Readiness Level 7 (TRL-7)* or higher of new concepts design, construction, and or performance monitoring of innovative zeolite, zeolite composites, and or salt hydrate based RTES integrated HVAC systems.</b></p> <p><i>*TRL definition may be found at the following web site.</i> <a href="http://www.ic.gc.ca/eic/site/101.nsf/eng/00077.html">http://www.ic.gc.ca/eic/site/101.nsf/eng/00077.html</a></p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.)</li> </ul> <p>List up to <b>two (2)</b> projects (or activities). <b>Twenty (20)</b> points will be awarded for each applicable project or activity.</p>	40
13.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>the field-testing and demonstration at Technology Readiness Level 6 (TRL-6)* of new concepts design, construction, and or performance monitoring of innovative zeolite, zeolite composites, and or salt hydrate based RTES integrated HVAC systems.</b></p> <p><i>*TRL definition may be found at the following web site.</i> <a href="http://www.ic.gc.ca/eic/site/101.nsf/eng/00077.html">http://www.ic.gc.ca/eic/site/101.nsf/eng/00077.html</a></p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• Your Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects (or activities). <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

#### 14. Active Solar - Solar Thermal and Heat Pump Heating and Cooling R&D

The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered.

Area	Experience	Maximum Points
14.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in Solar Thermal Water Heating, Space Heating or Cooling R&amp;D.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
14.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in Solar Thermal Assisted Heat Pump Water Heating and/or Space Heating R&amp;D</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
14.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in Photovoltaic-Thermal (PVT) solar collectors R&amp;D.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to two <b>(2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10

14.4	<p>Using example projects relevant to the Area of Expertise, the proposed resource is requested to demonstrate experience, in the last 10 years, in Thermoelectric Heat Pumps.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): Your Relevant Project Contribution (2 lines max.): Project Result(s) (2 lines max.):</p> <p>List one (1) project (or activity). <b>Five (5)</b> points will be awarded for the applicable project or activity.</p>	5
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		
<p><b>15. Active Solar - Renewable Heating Systems Simulation and Analysis</b></p> <p>The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered.</p>		
Area	Experience	Maximum Points
15.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in analyzing the performance of solar domestic hot water systems (SDHW) under CSA F379 and SRCC OG-300 standard conditions using TRNSYS simulation software</p>	15

	<p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>three (3)</b> projects (or activities).. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	
15.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing new TRNSYS components/types, including coding of such models, for large scale (&gt; 1 MWh) ATES or PTES seasonal thermal storage systems for TRNSYS simulations.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>three (3)</b> projects (or activities).. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
15.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in demonstrate experience in community energy analysis through TRNSYS simulations.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>two (2)</b> projects (or activities).. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
15.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and deploying TRNSYS TRNSED models of SDHW, solar thermal assisted heat pumps, or community energy systems.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p>	10

	List up to <b>two (2)</b> projects (or activities).. <b>Five (5)</b> points will be awarded for each applicable project or activity.	
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		
<p><b>16. Active Solar – Industry Survey</b></p> <p>The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered.</p>		
Area	Experience	Maximum Points
16.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>conducting solar thermal industry surveys in support of research and development activities.</b></p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.).</p> <p>List up to <b>two (2)</b> projects (or activities) relevant to solar thermal industry survey. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	20
16.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>conducting thermal storage and or other renewable energy industry surveys in support of research and development activities.</b></p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):</p>	20

	<p>Project Result(s) (2 lines max.). List up to <b>two (2)</b> projects (or activities)..</p> <p>List up to <b>two (2)</b> projects (or activities).. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	
16.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience in <b>completing either technology briefs and or renewable energy techno economic studies.</b></p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.).</p> <p>List up to <b>two (2)</b> projects (or activities). <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b>  <b>Minimum points required to pass: 20</b></p>		

#### 17. Active Solar - Large-Scale Seasonal Thermal Energy Storage

The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered.

Area	Experience	Maximum Points
17.1	Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in large-scale (> 2500 GJ heating or cooling load serviced) PTES monitoring and/or design, engineering and implementation	30

	<p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>three (3)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	
17.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in large-scale ATES or BTES (&gt; 2500 GJ heating or cooling load serviced) monitoring and/or design, engineering and implementation.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  Your Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity</p>	10
17.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in large-scale outdoor TTES (&gt;4000 m³) monitoring and/or design, engineering and implementation.</p> <p>For the example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):  Project Result(s) (2 lines max.):</p> <p>List <b>one (1)</b> project. <b>Ten (10)</b> points will be awarded for the applicable project or activity.</p>	10
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p>		



<b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b>	<b>30</b>
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#### 18. Active Solar – Solar Resource and Potential Assessment

The Bidder MUST provide detailed references (indicating the date) and copy of a verifiable report dated 2005 or more recent (peer reviewed published paper(s), conference publication(s) presented at international/national solar energy conference(s) or other relevant conference(s), technical report(s)). Other credible report(s) can be submitted. Failure to this submission, the submitted experience will not be considered.

**The Bidder MUST submit copy of a third-party publication/report that confirms the expert already owns a validated satellite based solar resource model**

Area	Experience	Maximum Points
18.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in <b>Developing high-resolution satellite derived GHI and DNI time series dataset (10 km gridded or less) for northern hemispheres countries such as Canada using expert own satellite-derived solar resource model.</b></p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Fifteen (15)</b> points will be awarded for each applicable project or activity.</p>	30
18.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in completing renewables technology deployment potential studies (solar in combination with other renewables such as wind, river hydrokinetics and or tidal) in various geographical locations, electricity jurisdictions and markets using gridded renewables resource datasets.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	20
Total		50

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

### 19. Simulation – Residential Energy Modelling

Area	Experience	Maximum Points
19.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, using HOT2000 to develop new models for residential buildings, and to examine their energy performance. For each example, provide the following:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Description of the house modelled and its energy performance (e.g. EnergyStar, Net-Zero-Ready, % better than code) — 2 lines max:</p> <p>List up to five (5) projects. Two (2) points will be awarded for each project.</p>	10
19.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, using HTAP and/or CTAP to analyze energy use in residential buildings. For each example, provide the following:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Description the project objective, (2 lines max.)</li> <li>• Description describing the archetypes used in this work, including number, size location and vintage (2 lines max.)</li> <li>• Description describing the technology measures included in the model and the metrics examined (2 lines max.)</li> </ul> <p>List up to two (2) projects for HTAP and two projects for CTAP. Five (5) points will be awarded for each project.</p>	20

19.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, performing housing stock analysis to support program or code design. For each example, provide the following:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): Geographic regions and housing stock segments examined (2 lines max.): Description of the archetypes deployed (2 lines max) Description of metrics evaluated (2 lines max): Description of project results and outcomes (2 lines max):</p> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	10
19.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, consulting with industry for the purposes of collecting data (e.g. costing, housing characteristics) and/or providing recommendations (e.g. optimal designs). For each example, provide the following:</p> <p>Project (or Activity) Title: Number of companies consulted Year Completed: Brief description of the consultation, including the nature of data collected or information exchanged (4 lines max.):</p> <p>List up to <b>five (2)</b> projects. <b>Five (5)</b> points will be awarded for each project.</p>	10
Total		50
	<p>Describe in detail <b>one</b> relevant example project of your choice from either <b>Area B, Area C or Area D</b>. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>	30

20. Simulation - Commercial Simulations Developer, Modeler and Analyst		
Area	Experience	Maximum Points
20.1	Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to	15

	<p>demonstrate experience, in the last 10 years, working on the development of building simulation models based on the performance path of NECB or other energy codes. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Building energy simulation tool used:</li> <li>• Energy code name and vintage:</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	
20.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the application of building energy simulation to support the design of cost effective high performance buildings with lower GHG emissions. At least one of the projects provided has to be for the support of an IDP. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Phases of the design process supported:</li> <li>• Building energy simulation tool used:</li> </ul> <p>List up to <b>three (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
20.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, using Object Oriented computer programming languages (e.g. C++, Fortran90, Python, Ruby, etc ...) in the analysis of building energy systems. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Programming language used:</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
20.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, developing reports for specific use cases using data analytics to disseminate the results of building energy simulation projects. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> </ul>	10

	<ul style="list-style-type: none"> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Reporting tool used:</li> </ul> <p>List up to <b>three (2)</b> projects. Five <b>(5)</b> points will be awarded for each applicable project or activity.</p>	
	Total	50
	<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>	30

21. Simulation - Cost Engineering Consultant for Commercial Buildings		
Area	Experience	Maximum Points
21.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in obtaining material and labour costs for: (a) new construction and (b) retrofit technologies beyond established construction database (RSMeans).</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects for new construction and up to <b>four (4)</b> projects for retrofit construction. <b>Two and one-half (2.5)</b> points will be awarded for each applicable project or activity.</p>	10
21.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing construction steps and sequences for new construction and applying retrofits, and preparing drawings/materials.</p>	30

	<p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. The <b>four (4)</b> projects can be any combination of new construction and retrofits.</p>	
21.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing general costing rules to be applied at Class D and C costing estimates</p> <p>For each example, provide the following information:</p>	10
	<ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	
21.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in preparing construction/retrofit costing specifications</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

22. Simulation - Machine Learning Architect		
Area	Experience	Maximum Points
22.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in data management &amp; cleaning large and complex datasets for analysis.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Data toolsets Used</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
22.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in development and deployment of ML models from multiple data sources using languages such as R, Python, or Julia.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• AI / ML tools used:</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
22.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in providing training and knowledge transfer of developed AI/ML models to subject matter experts:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to two <b>(2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
22.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in deployment of AI/ML models to be consumed by dashboards and data-visualization in a desktop or web-based environments.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> </ul>	10



	<ul style="list-style-type: none"> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Dashboard and data-visualization tools used.</li> </ul> <p><i>List up to two (2) projects. Five (5) points will be awarded for each applicable project or activity.</i></p>	
	Total	50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

### 23. HVAC - Heat Pump Hybrid and Integrated Systems Research and Development (R&D), Assessment and Monitoring

Area	Experience	Maximum Points
23.1	<p>Project Planning and/or System Design - Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, within this context for heat pumps (electric or natural gas or thermally driven) or hybrid systems.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Heat pump or hybrid systems tested:</li> <li>Monitoring and Validation method used (e.g. analytical validation, empirical validation, or comparative testing method)</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. No partial points will be awarded for examples that do not meet all requirements.</p>	10
23.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in the development of testing protocols for monitoring and verification (M&amp;V) for system energy balance determination</p> <p>Project (or Activity) Title:</p> <ul style="list-style-type: none"> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> </ul>	

	<ul style="list-style-type: none"> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Heat Pump or hybrid systems within this context:</li> <li>• Standards and/ or protocols referenced:</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. No partial points will be awarded for examples that do not meet all requirements.</p>	
23.3	<p>Lab or Field Testing or Supervision of Field Testing - Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, as it relates to heat pump or hybrid systems.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Heat Pump or hybrid systems or subcomponent tested:</li> <li>• Standards and/ or protocols referenced:</li> </ul> <p>List up to three <b>(3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity</p>	15
23.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in analysing, presenting, and/or publishing results from monitored data.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Type of heat pump or hybrid systems assessed:</li> <li>• Description of the testing conditions (4 lines max.):</li> <li>• Parameters tested:</li> <li>• Cite publication, articles, reports or other relevant documents produced</li> </ul> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
Total		50

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

#### 24. HVAC - System Design

Area	Experience	Maximum Points
24.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, with designing HVAC systems for new housing.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects, with one project for each of the following: combination system, furnace, air source heat pump, ground source heat pump. <b>Seven and a half (7.5)</b> points will be awarded for each applicable project or activity.</p>	30
24.2	<p>Using relevant example projects, demonstrate experience, in the last 10 years, with designing HVAC systems for retrofit housing. For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects, with one project for each of the following: combination system, furnace, air source heat pump, ground source heat pump. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
<b>Total</b>		50

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

#### 25. HVAC - Monitoring and Analysis of HVAC Equipment

Area	Experience	Maximum Points
25.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience in planning and carrying out at least one residential and/or at least one commercial building HVAC system monitoring study where you planned and installed monitoring equipment. Provide examples for residential and commercial building contexts if possible.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> <li>• Residential: Number of homes in study</li> <li>• Commercial: Building Type assessed in study</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Four (4)</b> points will be awarded for each applicable project or activity.</p>	20
25.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in analyzing data and reporting on comfort, energy and/or GHG emissions reduction results for residential and/or commercial building HVAC monitoring studies where you analyzed data gathered and were the primary author of the resulting study. Provide examples for residential and commercial building contexts if possible.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> </ul>	30

	<ul style="list-style-type: none"> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> <li>Project Result(s) (2 lines max.):</li> <li>Alignment between planned and implemented methodology (2 lines max.):</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Six (6)</b> points will be awarded for each applicable project or activity. The same projects listed as a response to question 25.1. may also be used in response to question 25.2.</p>	
<b>Total</b>		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

#### 26. HVAC - Laboratory Analysis and Standards -HVAC Equipment (including Water Heating Technologies)

Area	Experience	Maximum Points
26.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing or evaluating HVAC energy performance testing protocols or standards, based on Laboratory testing, evaluation of other laboratory test work or a review and evaluation of relevant literature available:</p> <p>Requirements for each example:</p> <ul style="list-style-type: none"> <li>Type of Project (Own Lab, Other Lab, Paper Study)</li> <li>Protocol, Test Method or standard title:</li> <li>Date of project:</li> <li>Standards body or other organization:</li> <li>Description of your role in the project:</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
26.2	<p>Using the relevant example projects listed in 26.1 demonstrate experience, in the last 10 years, in using, verifying, or advising on HVAC product energy performance tests or standards. Applicants can provide examples in any of the following areas: Space Heating, Water Heating, Ventilating, or Air Conditioning. Projects may include Laboratory testing or paper studies.</p> <p>Requirements for each example:</p>	20

	<ul style="list-style-type: none"> <li>• Type of Project (Own Lab/ Other Lab / Paper)</li> <li>• Equipment function / tested</li> <li>• Type of equipment</li> <li>• Name of governing test standard or a brief description of the test protocol used, and any modifications to the test protocol proposed.</li> <li>• Date</li> <li>• Brief description of your role in testing and reporting.</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	
26.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in providing advice to manufacturers, or others, on product improvements based upon a Lab evaluation or review of provided lab test results.</p> <p>Requirements for each example:</p> <ul style="list-style-type: none"> <li>• Type of Evaluation: (LabTest / Review of results)</li> <li>• Equipment: generic description of the product and what it does (2 lines max):</li> <li>• Testing reference: description of energy performance tests the product underwent – can use a reference to a standard where applicable:</li> <li>• Date: date when recommendations were made</li> <li>• Recommendations: brief description of the type of recommendations made to enhance performance as a result of reviewing the product and/or the related test results (3 lines max)</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Two and a Half (2.5)</b> points will be awarded for each applicable project or activity.</p>	10
<b>Total</b>		50
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements for this Area of Expertise. Show how and where you have participated in standards activities (e.g. American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE), Canadian Standards Association (CSA), Underwriters Laboratory of Canada (ULC)),</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

## 27. General - Residential - Industry and Innovation Strategy

Area	Experience	Maximum Points
27.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, with innovative products or processes related to high-performance buildings</p> <ul style="list-style-type: none"> <li>i) successfully commercialized while you were managing a manufacturing company <u>or</u></li> <li>ii) successfully integrated into homes while you were managing a construction company</li> </ul> <p>These projects must relate to:</p> <ul style="list-style-type: none"> <li>• the first introduction of a new class of products or the first introduction of a significant innovation within a class of products, or</li> <li>• early and innovative application of such products, or</li> <li>• the development and/or adoption of innovative construction processes or technologies or business models.</li> </ul> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Project Result(s) (2 lines max.):</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	50
<b>Total</b>		50

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**

**Minimum points required to pass: 20**

## 28. General - Residential Technical Writing

Area	Experience	Maximum Points
28.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing detailed and comprehensive research reports, technical papers, guideline documents and best practice guides, for housing-related R&amp;D technical communications.</p>	25



28.1	<p>For each example project , provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Project Results (2 lines max.):</li> <li>• The medium (web, print, etc):</li> <li>• The audience (1 line):</li> <li>• Language:</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. <b>Each example must demonstrate the breadth of technical competencies, knowledge and understanding and the development/creation of distinct communication products, not simply repeating one type of communication product or one type of technology.</b></p>	25
28.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in creating research summaries and highlights, infographics and technical bulletins derived from existing housing-related R&amp;D technical publications or surveys.</p> <p>For each example project, provide the following information:</p> <ul style="list-style-type: none"> <li>• Project (or Activity) Title:</li> <li>• Client Organization:</li> <li>• Year Completed:</li> <li>• Overall Project Description (2 lines max.):</li> <li>• My Relevant Project Contribution (2 lines max.):</li> <li>• Project Results (2 lines max.):</li> <li>• The medium (web, print, etc):</li> <li>• The audience (1 line):</li> <li>• Language:</li> </ul> <p>List up to <b>five (5)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity. <b>Each example must demonstrate the breadth of technical competencies, knowledge and understanding and the development/creation of distinct communication products, not simply repeating one type of communication product or one technology.</b></p>	25
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

29. General - Graphic Communication & Design Services		
Area	Experience	Maximum Points
29.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in preparing combined text and graphic materials for print and/or digital <b>publication</b> using a multi-page format. Include final publication dates and details. Include at least one draft project, along with final project, to illustrate client review process.</p> <p><b>NOTE: This experience area is mandatory and must include a minimum of 1 project submission.</b></p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>four (4)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	20
29.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in creating <b>interactive graphic materials or signage</b> for use in exhibitions, way-finding, instruction &amp; training. This may include large format graphics, print or digital banners, flyers, instructions, tests, manuals, didactic or interpretive signage.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> </ul> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
29.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in creating a <b>Graphic Identity Package</b> for a business, organization or individual. This may include graphic logos, typeface, letterhead, banners, business cards, websites or other materials.</p> <p>For each example, provide the following information:</p> <ul style="list-style-type: none"> <li>Project (or Activity) Title:</li> <li>Client Organization:</li> <li>Year Completed:</li> <li>Overall Project Description (2 lines max.):</li> <li>My Relevant Project Contribution (2 lines max.):</li> </ul>	10

	List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.	
29.4	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in creating a <b>graphic illustration</b>, either digitally or hand-rendered, that explains or elaborates on a written description, article or text. This may include digitally produced or rendered images, photography, photo-editing, photo-manipulation or collage. Include description of media, software and file format, as applicable.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>five (5)</b> projects. <b>Two (2)</b> points will be awarded for each applicable project or activity.</p>	10
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.  <b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.  <b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.  <b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b>  <b>Minimum points required to pass: 20</b></p>		

<b>30. General - Web Application Development</b>		
<b>Area</b>	<b>Experience</b>	<b>Maximum Points</b>
30.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and testing new web applications for desktop and mobile devices using the following programming languages: JavaScript, HTML, CSS, Python, Ruby, or Java.</p> <p>For each example, provide the following information:  Project (or Activity) Title:  Client Organization:  Year Completed:  Overall Project Description (2 lines max.):  My Relevant Project Contribution (2 lines max.):  Programming language used</p>	15

	List up to <b>three (3)</b> projects with one project for each of the following programming languages used: JavaScript, HTML, CSS, Python, Ruby, or Java. <b>Five (5)</b> points will be awarded for each applicable project or activity.	
30.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in troubleshooting and maintaining web applications deployed on desktop and mobile devices.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): What was the issue: How did you resolve it:</p> <p>List up to <b>three (3)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	15
30.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in user experience research (client specifications) and design for web applications deployed on desktops and mobile devices</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.): Example of the interface or screens with explanation of user experience</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity</p>	20
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p> <p><b>Maximum points available: 30</b> <b>Minimum points required to pass: 20</b></p>		

31. General - Excel Tool Development		
Area	Experience	Maximum Points

31.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing new Excel tools using VBA</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title:</p> <p>Client Organization:</p> <p>Year Completed:</p> <p>Overall Project Description (2 lines max.):</p> <p>My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects using VBA. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
31.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in troubleshooting excel tools</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title:</p> <p>Client Organization:</p> <p>Year Completed:</p> <p>Overall Project Description (2 lines max.):</p> <p>My Relevant Project Contribution (2 lines max.):</p> <p>What was the issue:</p> <p>How did you resolve it:</p> <p>List up to <b>two (2)</b> projects. <b>Five (5)</b> points will be awarded for each applicable project or activity.</p>	10
31.3	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in user experience research and design for Excel tools</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title:</p> <p>Client Organization:</p> <p>Year Completed:</p> <p>Overall Project Description (2 lines max.):</p> <p>My Relevant Project Contribution (2 lines max.):</p> <p>Example of the interface or screens with explanation of user experience.</p> <p>List up to <b>three (3)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	30
<b>Total</b>		<b>50</b>
<p>Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.</p> <p><b>30 points:</b> Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.</p> <p><b>25 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.</p> <p><b>20 points:</b> Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.</p> <p><b>0 points:</b> Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.</p>		

**Maximum points available: 30**  
**Minimum points required to pass: 20**

### 32. General - Embodied Carbon Advisory Expertise

Area	Experience	Maximum Points
32.1	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in new and/or retrofit housing projects that include embodied carbon analysis, specification and implementation, demonstrate experience carrying out a minimum of the following tasks: establish embodied carbon goals, undertake carbon analysis, propose embodied carbon reduction measures, and support alternate detailing and implementation of measures.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (3 lines max.)</p> <p>List up to <b>two (3)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	30
32.2	<p>Using example projects relevant to the Area of Expertise and similar to the one identified in the Statement of Requirement, the proposed resource is requested to demonstrate experience, in the last 10 years, in developing and delivering presentations on embodied carbon in Canadian market and low energy housing at industry events.</p> <p>For each example, provide the following information:</p> <p>Project (or Activity) Title: Client Organization: Year Completed: Overall Project Description (2 lines max.): My Relevant Project Contribution (2 lines max.):</p> <p>List up to <b>two (2)</b> projects. <b>Ten (10)</b> points will be awarded for each applicable project or activity.</p>	20
	Total	50

Select one of the sample projects provided in the responses above. In 250 words or less, provide a detailed description of the project's significance, methodology, and outcomes, as well as the applicants' role in the initiatives, identifying how the project meets relevant components of the task requirements of this AE.

**30 points:** Project is relevant to the AE. It makes a significant contribution to industry's advancement in this area. Methodology is logical and the outcomes are described. Individual led or played a significant leading role in the project. Description inspires confidence that future efforts will be successful.

**25 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project. Description inspires confidence that future efforts will be successful.

**20 points:** Project is relevant to the AE. Methodology is logical and outcomes are described. Individual led or played a significant role in project.

**0 points:** Project is not relevant to AE. Methodology and outcomes are not described. The role of the individual is unclear or insignificant in project.

**Maximum points available: 30**  
**Minimum points required to pass: 20**

## 4.1.2 Financial Evaluation

### 4.1.2.1

SACC Manual Clause M0220T (2016-01-28), Evaluation of Price - Offer

## 4.2 Basis of Selection

To be considered responsive in any area of expertise, an offer must:

- (a) meet all of the Mandatory Requirements of the bid solicitation;
- (b) achieve at least the minimum pass mark under the point-rated criterion at article 3.1(d) Point Rated Criteria – Qualitative Assessment; and
- (c) achieve at least the minimum overall pass mark under the point-rated criteria for each individual. Marks of one individual cannot be combined with those of another.

Offers not meeting (a) or (b) or (c) above will be given no further consideration. Subject to the Offeror's compliance with the *Conditions Precedent to the Authorization to Use a Standing Offer* contained in Annex "C", for each area of expertise, it will be recommended to authorize the use of three lowest total estimated priced responsive offers shared in accordance with the "**ESTIMATED UTILIZATION**", clause of this RFSO. In the event of a tie, the Offeror with the highest technical score will be recommended. In the event of a second tie, the proposed resource with the most years of experience identified under M3 will be recommended.



**Attachment 1 to Annex A**  
**FINANCIAL OFFER PRESENTATION SHEET**

The Offeror must submit one firm all-inclusive hourly rate for each area of expertise being offered (each individual may only be named for a maximum of four (4) areas of expertise), for the initial three (3) years and following Option years of the Standing Offer period, GST/HST extra. Should Canada authorize the use of the Standing Offer beyond its initial period, Canada will calculate an automatic increase of 3% of the most recent all-inclusive rates

Residential (AE)		Est. level of effort (hours)	The Level of Effort will be multiplied by the Firm, All-Inclusive Hourly Rate to determine the cost					
			Firm All-Inclusive Hourly Rate for Initial Term			Firm All-Inclusive Hourly Rate for Option Year (O/Y)		
			Years 1	Years 2	Years 3	SUM	O/Y 1 + 3%	O/Y 2 + 3%
1	Residential - Field assessment and monitoring of housing energy performance (whole house and specific equipment and systems)	330						
2	Residential - Windows, Exterior Doors and Fenestrations	330						
3	Residential - Building Envelope Research and Assessments	330						
4	Residential – High Performance Housing	330						
5	Residential - Energy Advisory Expertise	330						
6	Residential - Photovoltaic System Design Expertise	330						
Building Categories		Est. level of effort (hours)	The Level of Effort will be multiplied by the Firm, All-Inclusive Hourly Rate to determine the cost					
			Firm All-Inclusive Hourly Rate for Initial Term			Firm All-Inclusive Hourly Rate for Option Year (O/Y)		
			Years 1	Years 2	Years 3	SUM	O / Y 1 + 3%	O / Y 2 + 3%
7	Buildings - Field assessment and monitoring of building energy performance (whole building and specific equipment and systems) for Low-Rise Multi Residential Buildings	330						
8	Buildings - Integrated Design Process	330						



Simulation Categories		Est. level of effort (hours)	The Level of Effort will be multiplied by the Firm, All-Inclusive Hourly Rate to determine the cost								
			Firm All-Inclusive Hourly Rate for Initial Term				Firm All-Inclusive Hourly Rate for Option Year (O/Y)				
			Years 1	Years 2	Years 3	SUM	O / Y 1 + 3%	O / Y 2 + 3%	O / Y 3 + 3%	O / Y 4 + 3%	
19	Simulation – Residential Energy Modelling	330									
20	Simulation - Commercial Simulations Developer, Modeler and Analyst	330									
21	Simulation - Cost Engineering Consultant for Commercial Buildings	330									
22	Simulation - Machine Learning Architect	330									
Heating, Ventilation and Air-Conditioning (HVAC) Categories		Est. level of effort (hours)	The Level of Effort will be multiplied by the Firm, All-Inclusive Hourly Rate to determine the cost								
			Firm All-Inclusive Hourly Rate for Initial Term				Firm All-Inclusive Hourly Rate for Option Year (O/Y)				
			Years 1	Years 2	Years 3	SUM	O / Y 1 + 3%	O / Y 2 + 3%	O / Y 3 + 3%	O / Y 4 + 3%	
23	HVAC - Heat Pump Hybrid and Integrated Systems Research and Development (R&D), Assessment and Monitoring	330									
24	HVAC - System Design	330									
25	HVAC - Monitoring and Analysis of HVAC Equipment	330									
26	HVAC - Laboratory Analysis and Standards - HVAC Equipment (including Water Heating Technologies)	330									

General Categories		Est. level of effort (hours)	The Level of Effort will be multiplied by the Firm, All-Inclusive Hourly Rate to determine the cost										
			Firm All-Inclusive Hourly Rate for Initial Term				Firm All-Inclusive Hourly Rate for Option Year (O/Y)						
			Years 1	Years 2	Years 3	SUM	O / Y 1 + 3%	O / Y 2 + 3%	O / Y 3 + 3%	O / Y 4 + 3%			
27	General - Residential - Industry and Innovation Strategy Marketing and Promotion	330											
28	General - Residential Technical Writing	330											
29	General - Graphic Communication & Design Services	330											
30	General - Web Application Development	330											
31	General - Excel Tool Development	330											
32	General - Embodied Carbon Advisory Expertise	330											
			Total Cost for Year 1, 2, 3										

ESTIMATED TOTAL COST OF INITIAL TERM ONLY TO A LIMITATION OF EXPENDITURE: \$ \_\_\_\_\_  
(Applicable Taxes extra)

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## PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Offerors must provide the required certifications and additional information to be issued a standing offer.

The certifications provided by offerors to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare an offer non-responsive, will have the right to set-aside a standing offer, or will declare a contractor in default if any certification made by the Offeror is found to be untrue whether made knowingly or unknowingly during the offer evaluation period, during the Standing Offer period, or during the contract period.

The Standing Offer Authority will have the right to ask for additional information to verify the Offeror's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Standing Offer Authority will render the offer non-responsive, result in the setting aside of the Standing Offer or constitute a default under the Contract.

### Mandatory Certifications Required Precedent to Issuance of a Standing Offer

#### Code of Conduct and Certifications - Related documentation

By submitting an offer, the Offeror certifies that the Offeror and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Offer of Standard Instructions 2006. The related documentation therein required will assist Canada in confirming that the certifications are true.

#### 5.1 Certifications Required with the Offer

Offerors must submit the following duly completed certifications as part of their offer.

##### 5.1.1 Integrity Provisions - Declaration of Convicted Offences

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

##### 5.1.2 Additional Certifications Required with the Offer

###### 5.1.2.1 Canadian Content Certification

###### 5.1.2.1.1 SACC Manual clause [A3050T](#) (2020-07-01) Canadian Content Definition

1. **Canadian good:** A good wholly manufactured or originating in Canada is considered a Canadian good. A product containing imported components may also be considered Canadian for the purpose of this policy when it has undergone sufficient change in Canada, in a manner that satisfies the definition specified under the [North American Free Trade Agreement](#) (NAFTA) Rules of Origin. For the purposes of this determination, the reference in the NAFTA Rules of Origin to "territory", is to be replaced with "Canada". (Consult Annex 3.6(9) of the [Supply Manual](#).)

For photocopiers, computers and office equipment within Federal Supply Classification (FSC) groups 36, 70 and 74, see paragraph 6.(a)).

2. **Canadian service:** A service provided by an individual based in Canada is considered a Canadian service. Where a requirement consists of only one service, which is being provided by more than one individual, the service will be considered Canadian if a minimum of 80 percent of the total bid price for the service is provided by individuals based in Canada.

3. **Variety of goods:** When requirements consist of more than one good, one of the two methods below is applied:
  - a. aggregate evaluation: no less than 80 percent of the total bid price must consist of Canadian goods; or,
  - b. item by item evaluation: in some cases, the bid evaluation may be conducted on an item-by-item basis and contracts may be awarded to more than one supplier. In these cases, suppliers will be asked to identify separately each item that meets the definition of Canadian goods.
4. **Variety of services:** For requirements consisting of more than one service, a minimum of 80 percent of the total bid price must be provided by individuals based in Canada.
5. **Mix of goods and services:** When requirements consist of a mix of goods and services, no less than 80 percent of the total bid price must consist of Canadian goods and services (as defined above).

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the [Supply Manual](#).

6. **Other Canadian goods and services:**
  - a. For photocopiers, computers and office equipment within FSC groups 36, 70 and 74, only the products of the following firms are considered Canadian goods:
    - i. MERIT Partner under the [MERIT Partnership Program](#) (administered by Industry Canada [IC] and Public Works and Government Services Canada [PWGSC]);
    - ii. Companies which, on March 31, 1992, were allocated to Priority Group 1 under the Priority Groups Policy in effect at that time; or
    - iii. [CIRCLE Canada](#) companies as agreed on by IC and PWGSC.
  - b. Textiles: Textiles are considered to be Canadian goods according to a modified rule of origin, copies of which are available from the Clothing and Textiles Division, Commercial and Consumer Products Directorate.

## 5.2 Certifications Precedent to the Issuance of a Standing Offer and Additional Information

The certifications and additional information listed below should be submitted with the offer, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Standing Offer Authority will inform the Offeror 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 provided will render the offer non-responsive.

### 5.2.1 Federal Contractors Program for Employment Equity - Standing Offer Certification

By submitting an offer, the Offeror certifies that the Offeror, and any of the Offeror's members if the Offeror 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-Labour's](#) website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4>).

Canada will have the right to declare an offer non-responsive, or to set-aside a Standing Offer, if the Offeror, or any member of the Offeror if the Offeror is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of issuing of a Standing Offer or during the period of the Standing Offer.

Canada will also have the right to terminate the Call-up 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](#)" list during the period of the Contract.

The Offeror must provide the Standing Offer Authority with a completed annex titled Federal Contractors Program for Employment Equity - Certification, before the issuance of a Standing Offer. If the Offeror is a

Joint Venture, the Offeror must provide the Standing Offer Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

## 5.2.2 Additional Certifications Precedent to Issuance of a Standing Offer

The certifications listed below should be completed and submitted with the offer, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Standing Offer Authority will so inform the Offeror and provide the Offeror with a time frame within which to meet the requirement. Failure to comply with the request of the Standing Offer Authority and meet the requirement within that time period will render the offer non-responsive.

### 5.2.2.1 Canadian Content Certification

#### 5.2.2.2. SACC Manual clause [A3050T](#) (2020-07-01) Canadian Content Definition

#### 5.2.2.3 Status and Availability of Resources

The Offeror certifies that, should it be issued a standing offer as a result of the Request for Standing Offer, every individual proposed in its offer will be available to perform the Work resulting from a call-up against the Standing Offer as required by Canada's representatives and at the time specified in a call-up or agreed to with Canada's representatives. If for reasons beyond its control, the Offeror is unable to provide the services of an individual named in its offer, the Offeror may propose a substitute with similar qualifications and experience. The Offeror must advise the Standing Offer Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Offeror: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, 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 résumé 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.

## PART 6 - SECURITY, FINANCIAL AND INSURANCE REQUIREMENTS

### 6.1 Security Requirements

There are no security requirements associated with the requirement of the Standing Offer.

### 6.2 Financial Capability

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

### 6.3 Insurance Requirements

The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

## QUESTIONS AND ANSWERS

The following questions and answers have been provided to help potential new vendors quickly consider if and how they may want to submit a proposal for this Request For Standing Offers (RFSO).

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 call up against the Standing Offer, including any annexes;
- b) the articles of the Standing Offer;



- |    |                                                                                                           |
|----|-----------------------------------------------------------------------------------------------------------|
| c) | the general conditions <u>2005</u> (2017-06-21), General Conditions - Standing Offers - Goods or Services |
| d) | the general conditions 2040 (2020-05-28), General Conditions - Research and Development                   |
| f) | Annex A, Statement of Requirement;                                                                        |
| g) | Annex B, Basis of Payment;                                                                                |
| j) | the Offeror's offer dated _____.                                                                          |

- Answers are brief to enable quick review.
- These questions and answer do not reduce vendors' need to review the entire RFSO package.
- The questions list is in no way exhaustive.
- Vendors must make sure that all of the requested information is included in their bids.
- Should you have additional questions, they need to be asked through the contracting authority.

**1. What is a standing offer?**

A standing offer is an offer from a potential supplier to provide goods and/or services at pre-arranged prices, under set terms and conditions, when and if required. It is not a contract until the government issues a "call-up" against the standing offer. (See Buy and Sell web site.)

**2. How long will this standing offer last?**

- 3 years with options to renew it for up to 4 additional one year period (See section 7.4 for details)

**3. What are the standing offer categories?**

- The categories are listed at the start of ANNEX "A" Statement of Requirement and elsewhere in the document

**4. How many vendors will be placed on the resulting standing offer?**

- A maximum of 3 per category (see section 1.2.1).
- To review the selection process, see section 4.2.

**5. How can I decide which categories I want to apply for?**

- It is probably easiest to start by going to ANNEX "A" Statement of Requirement
- It lists all 32 categories so you can quickly see which ones may fit best
- For each category, ANNEX "A" also provides an 'overview' and a 'description task list'. These will help you confirm or pass on the categories you shortlisted.
- Next, go to PART 5 to find out how your categories of interest are evaluated.
- Submit applications for categories where your self assessment against the evaluation criteria looks promising.

**6. What if only one category applies?**

- This will be fairly typical for many bidders.  
Complete bids for the categories that fit with your experience, whether that it is 1, 2, 3 or 4 categories.

**7. How should the technical part of the application be formatted for each category?**

- It is anticipated that most will lay out the technical elements of their applications using a chronological approach. This would follow the headings in PART 4, namely using:
  - the headings that included the three Mandatories (M1, M2 and M3) and their related titles, and then,
  - the headings for the five Point Rated Technical Criteria (PRTC-1 through to PRTC-5) and their related titles.

- For the quantitative elements, one way would be to cut and paste the relevant sections from the RFSO into a word processor and fill the resulting 'forms' in repeatedly with each applicable experience. The quantitative elements are likely to be the longest section of the application. Completing it this way may make it easier for you to check that all the required information is present.

**8. Is there anything in particular that I need to watch for from the perspective of a consulting firm with multiple employees that are applying to the standing offer?**

- Remember that while applications come from the company, each staff member must individually meet all the requirements of each specific category that they are applying for.
- More than one employee from the same firm can apply for the same category.
- Firms can bid on as many categories as they would like, provided individual staff member bid on no more than four categories.

## **PART 7 - STANDING OFFER AND RESULTING CONTRACT CLAUSES**

### **STANDING OFFER**

#### **7.1 Offer**

##### **Standing Offers Reporting**

The Offeror must compile and maintain records on its provision of goods, services or both to the federal government under contracts resulting from the Standing Offer. The data must be submitted on a semi-annual basis to the Public Works and Government Services Canada (PWGSC) Standing Offer Authority.

##### **Periodic Utilization Reports**

The following information is to be provided on a semi-annual basis for each call-up made pursuant to this Standing Offer.

<b>Date of Call-up</b>	<b>Call-up Number</b>	<b>Name of Identified User</b>	<b>Call-up Total Value (GST/HST extra)</b>
			\$
			\$
			\$
<b>Total</b>			\$

All data fields of the report must be completed as requested. If some data is not available, the reason must be indicated in the report. If no goods or services are provided during a given period, the Offeror must still provide a "NIL" report. Failure to provide fully completed reports in accordance with the above instructions may result in the setting aside of the Standing Offer and the application of a vendor performance corrective measure.

- 7.1.1** The Offeror offers to fulfill the requirement in accordance with the Statement of Requirement at Annex "A".

#### **7.2 Security Requirements**

- 7.2.1** There is no security requirement applicable to the Standing Offer.

#### **7.3 Standard Clauses and Conditions**

All clauses and conditions identified in the Standing Offer and resulting contract(s) 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>)  
issued by Public Works and Government Services Canada.

### 7.3.1 General Conditions

**2005 (2017-06-21)** General Conditions - Standing Offers - Goods or Services, apply to and form part of the Standing Offer.

### 7.4 Term of Standing Offer

The period for making call-ups against the Standing Offer is for a three (3) year period from the date of issuance of the Standing Offer.

#### 7.4.1 Extension of Standing Offer

If the Standing Offer is authorized for use beyond the initial period, the Offeror offers to extend its offer for an additional four (4) one (1) year period(s), under the same conditions and at the rates or prices calculated in accordance with the formula specified in the Standing Offer.

The Offeror will be advised of the decision to authorize the use of the Standing Offer for an extended period by the Standing Offer Authority at any time prior to the expiry of the initial period (or of any extension thereof, if applicable), by giving written notice to the Offeror.

Any authorization of an extension will be confirmed by the Standing Offer Authority through the issuance of a "Revision to a Standing Offer" document.

### 7.5 Authorities

#### 7.5.1 Standing Offer Authority

The Standing Offer Authority is:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Public Works and Government Services Canada

Acquisitions Branch

Directorate: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_ - \_\_\_\_ - \_\_\_\_

Facsimile: \_\_\_\_ - \_\_\_\_ - \_\_\_\_

E-mail address: \_\_\_\_\_

The Standing Offer Authority is responsible for the establishment of the Standing Offer, its administration and its revision, if applicable. Upon the making of a call-up, as Contracting Authority, he is responsible for any contractual issues relating to individual call-ups made against the Standing Offer by any Identified User.

#### 7.5.2 Project Authority

The Project Authority for the Standing Offer is:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_ - \_\_\_\_ - \_\_\_\_

Facsimile: \_\_\_\_ - \_\_\_\_ - \_\_\_\_

E-mail address: \_\_\_\_\_

The Project Authority is the representative of the department or agency for whom the Work will be carried out pursuant to a call-up under the Standing Offer and is responsible for all the technical content of the Work under the resulting Contract.

## 7.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a Public Service Superannuation Act (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2019-01 of the Treasury Board Secretariat of Canada.

## 7.7 Identified Users

The identified User authorized to make call-ups against the Standing Offer is the Standing Offer Authority.

## 7.8 Allocation of Work

Call-ups will be issued on a proportional basis such that:

The areas of expertise that are authorized three (3) standing offers: the offeror with the lowest hourly rate receives 50 percent of the predetermined amount of the work, the second lowest hourly rate receives 30 percent of the predetermined amount of the work and the 3rd lowest hourly rate receives 20 percent of the predetermined amount of the work;

The areas of expertise that are authorized two (2) standing offers: the offeror with the lowest hourly rate receives 60 percent of the predetermined amount of the work and the second lowest hourly rate receives 40 percent of the predetermined amount of the work;

The areas of expertise that are authorized one (1) standing offer: the offeror will receive 100 percent of the predetermined amount of the work.

Call-up activities will be monitored to ensure that call-ups are allocated in accordance with the predetermined work distribution specified herein.

The same usage as mentioned above will apply to any extension period exercised.

## 7.9 Call-up Procedures

A call-up made against this Standing Offer shall form a contract only for those goods or services, or both, which have been called-up, provided always that such call-up is made in accordance with the provisions of this Standing Offer.

Call-ups made against this Standing Offer will be authorized as follows:

1. The Technical Authority will provide the Offeror with a description of the Work to be performed.
2. The Offeror will submit to the Technical Authority a price proposal (i.e.. a firm price, a ceiling price or a limitation of expenditure), and a delivery schedule for each task, with supporting details. The price of the Work to be performed will be established in accordance with the Basis of Payment attached hereto as **Annex "B"**. A ceiling price or a limitation of expenditure will be used instead of a firm price only in cases where the Work to be performed is not in sufficient detail to accurately establish a firm price.
3. The Offeror will be authorized by the Technical Authority to proceed with the Work by the issuance of a duly completed and **signed** Call-up form PWGSC-TPSGC 942. A description of the Work to be performed will be appended to the form PWGSC-TPSGC 942. The Offeror shall not commence any work until it has received a Call-up form PWGSC-TPSGC 942 **signed by** the Authorized Individual. The Offeror acknowledges that any and all work performed in the absence

of a **signed** call-up will be done at its own risk, and Canada shall not be liable for payment therefor.

## 7.10 Call-up Instrument

The Work will be authorized or confirmed by the Identified User(s) using the duly completed forms or their equivalents as identified in paragraphs 2 and 3 below, or by using Canada acquisition cards (Visa or MasterCard) for low dollar value requirements.

1. Call-ups must be made by Identified Users' authorized representatives under the Standing Offer and must be for goods or services or combination of goods and services included in the Standing Offer at the prices and in accordance with the terms and conditions specified in the Standing Offer.
2. Any of the following forms could be used which are available through [PWGSC Forms Catalogue](#) website:
  - PWGSC-TPSGC 942 Call-up Against a Standing Offer
  - PWGSC-TPGSC 942-2 Call-up Against a Standing Offer - Multiple Delivery
  - PWGSC-TPSGC 944 Call-up Against Multiple Standing Offers (English version)
  - PWGSC-TPSGC 945 Commande subséquente à plusieurs offres à commandes (French version)

## 7.11 Limitation of Call-ups

Individual call-ups against the Standing Offer must not exceed \$100,000.00 (Amendment and Applicable taxes included). For all call-ups Public Works Standing Offer Authority approval will be required prior to issuing the call-up.

## 7.12 Financial Limitation M9033T (2011-05-16)

The total cost to Canada resulting from call-ups against the Standing Offer must not exceed the sum of \$ (Applicable taxes excluded) unless otherwise authorized in writing by the Standing Offer Authority. The Offeror must not perform any work or services or supply any articles in response to call-ups which would cause the total cost to Canada to exceed the said sum, unless an increase is so authorized.

The Offeror must notify the Standing Offer Authority as to the adequacy of this sum when 75 percent of this amount has been committed, or four (4) months before the expiry date of the Standing Offer, whichever comes first. However, if at any time, the Offeror considers that the said sum may be exceeded, the Offeror must promptly notify the Standing Offer Authority.

## 7.13 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 call up against the Standing Offer, including any annexes;
- b) the articles of the Standing Offer;
- c) the general conditions [2005](#) (2017-06-21), General Conditions - Standing Offers - Goods or Services
- d) the general conditions 2040 (2020-05-28), General Conditions - Research and Development
- e) Annex A, Statement of Requirement;
- f) Annex B, Basis of Payment;
- g) the Offeror's offer dated \_\_\_\_\_.

## 7.14 Certifications and Additional Information

### 7.14.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Offeror with its offer or precedent to issuance of the Standing Offer (SO), and the ongoing cooperation in providing additional information are conditions of issuance of the SO and failure to comply will constitute the Offeror in default. Certifications are subject to verification by Canada during the entire period of the SO and of any resulting contract that would continue beyond the period of the SO.

#### **7.15 Applicable Laws**

The Standing Offer and any contract resulting from the Standing Offer must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

#### **7.16 Transition to an e-Procurement Solution (EPS)**

During the period of the Standing Offer, Canada may transition to an EPS for more efficient processing and management of individual call-ups for any or all of the SO's applicable goods and services. Canada reserves the right, at its sole discretion, to make the use of the new e-procurement solution mandatory.

Canada agrees to provide the Offeror with at least a three-month notice to allow for any measures necessary for the integration of the Offer into the EPS. The notice will include a detailed information package indicating the requirements, as well as any applicable guidance and support.

If the Offeror chooses not to offer their goods or services through the e-procurement solution, the Standing Offer may be set aside by Canada.

## B. RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from a call-up against the Standing Offer.

### 7.1 Statement of Requirement

The Contractor must perform the Work described in the call-up against the Standing Offer.

### 7.2 Standard Clauses and Conditions

#### 7.2.1 General Conditions

[2005 \(2017-06-21\)](#) General Conditions - Standing Offers - Goods or Services, apply to and form part of the Standing Offer.

### 7.3. Term of Contract

#### 7.3.1 Period of the Contract

The Work must be completed in accordance with the call-up against the Standing Offer.

### 7.4 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a Public Service Superannuation Act (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2019-01 of the Treasury Board Secretariat of Canada.

### 7.5 Payment

#### 7.5.1 Procedures for issuing call-ups

A call-up made against this Standing Offer shall form a contract only for those goods or services, or both, which have been called-up, provided always that such call-up is made in accordance with the provisions of this Standing Offer.

Call-ups made against this Standing Offer will be authorized as follows:

1. The Technical Authority will provide the Offeror with a description of the Work to be performed.
2. The Offeror will submit to the Technical Authority a price proposal (i.e.. a firm price, a ceiling price or a limitation of expenditure), and a delivery schedule for each task, with supporting details. The price of the Work to be performed will be established in accordance with the Basis of Payment attached hereto as **Annex "B"**. A ceiling price or a limitation of expenditure will be used instead of a firm price only in cases where the Work to be performed is not in sufficient detail to accurately establish a firm price.
3. The Offeror will be authorized by the Technical Authority to proceed with the Work by the issuance of a duly completed and **signed** Call-up form PWGSC-TPSGC 942. A description of the Work to be performed will be appended to the form PWGSC-TPSGC 942. The Offeror shall not commence any work until it has received a Call-up form PWGSC-TPSGC 942 **signed by** the Authorized Individual. The Offeror acknowledges that any and all work performed in the absence of a **signed** call-up will be done at its own risk, and Canada shall not be liable for payment therefor.



## 7.6 Invoicing Instructions

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) An electronic copy to the Technical Authority identified in the resultant Standing Offer for certification and payment; and
- (b) An electronic copy to be forwarded to the Standing Offer Authority identified under the section entitled "Authorities" of the Standing Offer.

## 7.7 Insurance Requirements

The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

The Contractor must forward to the Contracting Authority within ten (10) days after the date of award of the Contract, a Certificate of Insurance evidencing the insurance coverage and confirming that the insurance policy complying with the requirements is in force. For Canadian-based Contractors, coverage must be placed with an Insurer licensed to carry out business in Canada, however, for Foreign-based Contractors, coverage must be placed with an Insurer with an A.M. Best Rating no less than "A-". The Contractor must, if requested by the Contracting Authority, forward to Canada a certified true copy of all applicable insurance policies.

## 7.8 Federal Contractors Program for Employment Equity - Standing Offer Certification

By submitting an offer, the Offeror certifies that the Offeror, and any of the Offeror's members if the Offeror 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-Labour's](https://www.canada.ca/en/employment-social-development/canada-labour's) website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#s4>).

Canada will have the right to declare an offer non-responsive, or to set-aside a Standing Offer, if the Offeror, or any member of the Offeror if the Offeror is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of issuing of a Standing Offer or during the period of the Standing Offer.

Canada will also have the right to terminate the Call-up 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](#)" list during the period of the Contract.

The Offeror must provide the Standing Offer Authority with a completed annex titled Federal Contractors Program for Employment Equity - Certification, before the issuance of a Standing Offer. If the Offeror is a Joint Venture, the Offeror must provide the Standing Offer Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

## 7.9 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](#)".

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**Annex "A"**  
**Statement of Requirement and Listing of Areas of Expertise (AE)**

**1 REQUIREMENT**

The NRCan requires various services on an "as and when requested basis in support of the following functional areas and as further detailed below:

Residential (AE)

1. Residential - Field assessment and monitoring of housing energy performance (whole house and specific equipment and systems)
2. Residential - Windows, Exterior Doors and Fenestrations
3. Residential - Building Envelope Research and Assessments
4. Residential – High Performance Housing
5. Residential - Energy Advisory Expertise
6. Residential - Photovoltaic System Design Expertise

Building Categories

7. Buildings - Field assessment and monitoring of building energy performance (whole building and specific equipment and systems) for Low-Rise Multi Residential Buildings
8. Buildings - Integrated Design Process
9. Buildings - Monitoring of Advanced and Renewable Energy Technologies

Communities Categories

10. Communities – Data Collection & Analysis
11. Communities – Regulatory and Policy Analysis
12. Communities: Low Carbon District and/or Community Energy Systems

Active Solar Categories

13. Active Solar – Next generation building thermal energy storage
14. Active Solar - Solar Thermal and Heat Pump Heating and Cooling R&D
15. Active Solar - Renewable Heating Systems Simulation and Analysis
16. Active Solar – Industry Survey
17. Active Solar - Large-Scale Seasonal Thermal Energy Storage
18. Active Solar – Solar Resource and Potential Assessment

Simulation Categories

19. Simulation – Residential Energy Modelling
20. Simulation - Commercial Simulations Developer, Modeler and Analyst
21. Simulation - Cost Engineering Consultant for Commercial Buildings
22. Simulation - Machine Learning Architect

Heating, Ventilation and Air-Conditioning (HVAC) Categories

23. HVAC - Heat Pump Hybrid and Integrated Systems Research and Development (R&D), Assessment and Monitoring
24. HVAC - System Design
25. HVAC - Monitoring and Analysis of HVAC Equipment
26. HVAC - Laboratory Analysis and Standards - HVAC Equipment (including Water Heating Technologies)

General Categories

27. General - Residential - Industry and Innovation Strategy
28. General - Residential Technical Writing
29. General - Graphic Communication & Design Services
30. General - Web Application Development
31. General - Excel Tool Development

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## 32. General - Embodied Carbon Advisory Expertise

### 2. **BACKGROUND**

CanmetENERGY Ottawa's Buildings and Renewables Group has multiple teams needing support as they carrying out research and development, demonstration and dissemination activities. These teams are focussed on activities such as the following:

- improving building energy systems: developing novel envelope, mechanical, and energy storage technologies capable of reducing building GHG emissions by at least 80%, while simultaneously improving affordability, resiliency, and comfort for occupants and industry confidence in these solutions
- developing pathways to carbon-neutral housing and buildings: developing and de-risking low-cost and low-GHG pathways for deep energy retrofit, net-zero energy (NZE), and net-zero energy ready (NZER) new construction, as well as for next-generation, carbon-neutral housing and buildings
- advancing low-carbon communities: developing advanced energy technologies, design and analysis tools, and methods to support resilient community energy systems that significantly reduce GHG emissions
- delivering Local Energy Efficiency Partnership (LEEP) initiatives: accelerating energy efficient construction by enabling builders and renovators to reduce their time and risk in finding and trying innovations that can help them build higher performance homes better, faster and more affordably
- **grid integration**: increasing the understanding and acceptance of various renewables as sources of ancillary services on the grid, in partnership with utilities, industry, and technology developers
- **resource assessment**: developing improved renewable energy (solar, wind, river hydrokinetic) resource datasets for the Canadian north and south

The execution of such a wide array of activities in a timely and cost-effective manner requires in part the availability of expertise for specific projects. In this regard, thirty-two (32) Areas of Expertise (AE) have been established with the objective of having up to three offerors for each of the AE's.

### 3 **PROJECT SCOPE**

The Contractor must provide resources capable of performing various services that will be required to support including, but not limited to research and development (R&D), modelling, presentation of R&D results and development of tools for the research, academia and various housing and building sectors.

### 4 **DELIVERABLES**

Deliverables will be detailed in each Request for Standing Offer and must be provided to the Technical Authority or the person designated by the Technical Authority in accordance with the provisions of the call-up and in accordance with the schedule therein. Unless otherwise specified, the Contractor may provide all required deliverables in an electronic format established by the Technical Authority.

### 5 **RESOURCE CATEGORY TASKS AND MINIMUM QUALIFICATIONS**

A description of the roles, responsibilities and tasks by resource category and the minimum resource qualification requirements for each resource category is attached at TBD.

### 6. **LANGUAGE**

Languages as specified within the Call Ups, all meetings, trials, demonstrations and deliverables must be conducted or provided in English or French as applicable.

### 7. **LOCATION OF WORK**

The Work must be conducted at the Contractor's and in participating partner sites.

## 8. TRAVEL

There is no travel associated to this contract.

## 9. SECURITY

There are no security requirements associated with this Contract.

Residential (AE)
<p><b>1. Residential - Field assessment and monitoring of housing energy performance (whole house and specific equipment and systems)</b></p> <p><b>1.1: Overview</b></p> <p>The 'House as a system' approach is a key principle to achieve greater energy efficiency levels in homes. The interactive effects between one piece of equipment or system and other components plays an important role in determining the overall energy performance and long-term durability of homes. As part of developing sustainable and efficient technologies and systems, Natural Resources Canada (NRCan) monitors the field performance of homes, carries out detailed analyses to evaluate the performance of equipment, systems and, overall home energy performance.</p> <p>Field surveys include in-house monitoring, energy analysis modelling, utility (bill) data analysis, occupant comfort and, in some cases, indoor air-quality of homes. Scope of this category is to provide field assessment and monitoring of equipment, system or/and full building.</p> <p><b>1.2: Description task list</b></p> <p>Tasks include but are not limited to:</p> <ul style="list-style-type: none"><li>• Develop methodology and protocols to assess the operating performance of whole house including specific components and impact upon overall energy use</li><li>• Develop monitoring equipment specifications and data analyses methods</li><li>• Install, calibrate and commission monitoring equipment and collecting data</li><li>• Conduct energy evaluation field surveys of homes and validate field measured data with the energy estimated determined using energy analysis programs</li><li>• Develop reports documenting overall energy performance, explain issues found, provide recommendations for improvements, and extrapolate the results to provide meaning in the larger market context.</li></ul>
<p><b>2. Residential - Windows, Exterior Doors and Fenestrations</b></p> <p><b>2.1: Overview</b></p> <p>Natural Resources Canada (NRCan) undertakes research and development of high thermal and energy performance windows, skylight and door fenestration. Using this work, NRCan will develop and refine strategies for fenestration selection on conventional and advanced energy homes, as well as improve window thermal and optical performance.</p> <p>This category will specifically focus on residential windows, glass doors, skylights and commercial fenestration systems. Specifically focusing on innovative frame and door materials; fenestration systems for small commercial and multi-residential buildings; field-testing and monitoring; and development of technical documents suitable for practitioners.</p> <p><b>2.2: Description task list</b></p> <p>Tasks include but are not limited to:</p> <ul style="list-style-type: none"><li>• Research on innovative products and methods for windows meeting the aspirational targets</li><li>• Researching, analyzing and developing innovative dynamic glazing, solar control and shading devices</li><li>• Developing specifications for window and door systems and near- and net-zero housing in both new construction and retrofit scenarios. Enumerate experience in using the glazing and</li><li>• window analysis methods such as Lawrence Berkeley National Laboratory's (LBNL's)</li></ul>

- Windows, THERM and other tools.
- Developing and reviewing energy and moisture performance standards for windows, doors and fenestration components
- Analyzing fenestration product specifications and performance data to support the development of next-generation labeling and rating criteria (such as ENERGY STAR)
- Conducting and/or analyzing results from field-testing and monitoring of window products
- Developing of best practice guides and instruction modules for window design, selection and installation
- Developing communications materials that increasing public awareness of advances in windows, door and other fenestration products for publication on the internet

### **3. Residential - Building Envelope Research and Assessments**

#### **3.1: Overview**

This category will specifically focus on building envelopes (not including fenestration). Potential project activities include development of specifications of above- and below-grade wall assemblies suitable for near- and net-zero energy new and existing housing and buildings; innovative insulation materials; design and construction of prototype wall assemblies; thermal and moisture modelling and durability assessment; lab and field-testing and monitoring of envelope components; and life-cycle analysis of insulation products and building envelope assemblies.

Building envelope research and technical assessments category scope is for the following segments:

- New and existing residential buildings National Building Code (NBC) Part 3 and Part 9);
- Site-built and prefabricated building enclosure components
- Factory-built, modular building units

#### **3.2: AE Description of task list**

Tasks include but are not limited to:

- Developing and illustrating climate specific, durable, cost effective, energy efficient and constructible wall assemblies and details (such as air sealing, wall/window joints, water management, joint details, and other aspects)
- Modeling thermal and moisture performance of envelope components using analytic tools such as Flexio, THERM and Heat-3
- Modeling coupled heat and moisture transfer in envelope components using analytic tools such as WUFI, Delphin, WUFI-Passive and other suitable analytic tools
- Investigating new materials, assemblies or technologies applicable to new or retrofit above and below-grade walls and roofs for energy efficiency and durability
- Lab characterization, field-testing and monitoring of materials and envelope components
- Design and evaluation of pre-fabrication process flow
- Assessing life-cycle costs, thermal performance and greenhouse gas (GHG) impacts of insulation products and building envelope assemblies
- Developing best practice guides, instruction materials and varied delivery modules.
- Providing technical advice to Natural Resources Canada on the implications of proposed changes to standards, and the technical potential of enhancing energy performance of envelope components

### **4 Residential – High Performance Housing**

#### **4.1: Overview**

Natural Resources Canada (NRCan) supports development and delivery of advanced housing programs and next-generation building codes that dramatically improve energy performance. These activities depend on knowledge of the factors affecting home energy use, and how different components and systems with the building interact in day-to-day operation. To develop this knowledge base, NRCan continually undertakes novel research and analysis of emerging energy technologies, whole house design strategies, and operational performance of occupied homes.

#### 4.2: Description task list:

- Tasks include but are not limited to: Conducting technology scans to identify emerging technologies and design standards in the residential sector
- Assessing the efficacy and maturity of candidate technologies in Canadian climates
- Applying the “**House as a system**” philosophy to develop integration strategies for these technologies, and to identify potential consequences of their deployment
- Comparing and contrasting whole-home performance metrics and labelling programs (such as Net-Zero-Energy, Passive House, and Zero-Carbon)
- Estimating potential impacts on whole house performance, including peak and seasonal energy use, occupant comfort, climate resilience and affordability
- Interviewing with builders, renovators, manufacturers and utilities to collect feedback on potential solutions
- Developing design guides and other information products to support delivery

### 5. Residential - Energy Advisory Expertise

#### 5.1: Overview

Energy Advisors play a key role in the delivery of low energy housing. They use their technical skills to: evaluate plans, use house-as-a-system thinking to propose enhancements, carry out energy analysis using software packages, and carry out site audits to help builders and renovators ensure they meet their targets. They also use their interpersonal and business skills to: help decision makers consider the business case for low energy housing, and develop networks of specialists that can support builders and renovators cost effectively deliver high performance housing. In short, they are on the front lines of high performance housing in Canada and often become aware of and support energy saving trends in advance of the construction industry in general. Researchers need to consult experienced energy advisors to ensure research is well aligned with the market, to test new concepts with the energy advisors' multidisciplinary networks before expending significant time in developing them, document best practices, and find training approaches that the construction industry is most likely to adopt.

#### 5.2: Description task list:

- Tasks include but are not limited to: Providing residential energy analysis using HOT2000, the cost benefit analysis tool (CBAT), and or the housing technology assessment platform (HTAP).
- Developing and delivering technical presentations on high performance housing to builder and renovator audiences
- Developing best practice guides that support the local stakeholders (such as builders, renovators, building officials, suppliers and trades) in working together more effectively in delivering low energy housing.
- Reporting on typical energy advisor practices including quality assurance in support of high performance builds and retrofits.
- Reporting on current builder and renovator trends and trade practices
- Developing brief best practice case study reports based upon successful low energy housing projects

### 6. Residential - Photovoltaic System Design Expertise

#### 6.1: Overview

The net zero energy (NZE) housing market is small but growing quickly. There is a need for experienced photovoltaic (PV) system designers to carry out research, provide advice and develop best practices for housing of various forms including subdivision scale projects, singles, townhomes, and multi unit residential buildings (MURBs). These needs are both for the new housing and the retrofit market.



## 6.2: Description task list:

- Tasks include but are not limited to: Providing best practice case studies and advice on the design of PV systems for both the new and retrofit housing markets.
- Developing and delivering technical presentations on the application of PV in high performance housing to builder and renovator audiences
- Developing best practice guides that support the local stakeholders (such as builders, renovators, building officials, suppliers and trades) in working together more effectively in integrating PV into their low energy housing projects.
- Reporting on typical PV system designer practices including quality assurance in support of high performance builds and retrofits.
- Coordinating costing analysis for different types of PV installations.

## Area - Buildings

### 7. Buildings - Field assessment and monitoring of building energy performance (whole building and specific equipment and systems) for Low-Rise Multi Residential Buildings

#### 7.1: Overview

This category will specifically focus on research, technology assessment and field monitoring of low-rise multi-unit residential buildings (MURBs); including both new construction or the retrofit of existing buildings. This category comprises of buildings compliant with Part 9 of the National Building Code (NBC) of Canada; that is, three stories or less in height and having a building foot-print area of less than 600 square meters. Additionally, there are a maximum of 20 units, at least 50% of the floor space, including below grade spaces, is used for residential purposes, and there is no specialized commercial equipment.

In determining the overall energy performance and long-term durability of low rise residential buildings, the 'House as a system' approach is used to assess the interactive effects amongst the various pieces of equipment, building systems (including the building enclosure) and components. In developing sustainable and efficient technologies and systems, Natural Resources Canada (NRCan) monitors the field performance of buildings, carries out detailed analyses to evaluate the performance of equipment, systems and, overall building energy performance.

Field surveys include building monitoring, energy analysis modelling, utility (bill) data analysis, occupant comfort and, in some cases, indoor air-quality of units. Scope is to provide field assessment and monitoring of equipment, system and/or full building.

#### 7.2: Description task list

The main tasks related to this area of expertise (AE) are as follows:

The main tasks in this area of expertise (AE) include:

- Develop methodology and protocols to assess the operating performance of whole buildings.
  - This may include focusing on specific building systems, equipment or components and assessing their impact upon overall energy use.
  - This may include assessing the energy performance of new and innovative materials and technologies applicable to new and existing low rise MURBs.
- Develop monitoring equipment specifications, data collection protocols and data analyses methods
- Install, calibrate and commission monitoring equipment and collect data
- Conduct energy evaluation-related field surveys of buildings to develop energy models (using appropriate energy analysis programs such as HOT2000, EnergyPlus, EE4, etc.) and validate field measured data with the estimated energy performance as determined by the energy models
- Develop reports documenting overall energy performance, explain issues found, provide recommendations for improvements, and extrapolate the results to provide meaning in the

larger market context.

## 8. Buildings - Integrated Design Process

### 8.1: Overview

Through the work of Buildings and Renewables Group (BRG), Natural Resources Canada (NRCAN) conducts research on integrated design process (IDP) undertaken in the effort to achieve net-zero energy performance for commercial, institutional, and multi-unit residential buildings (larger than National Building Code of Canada, Part 9). A key part of this research is the application of IDP principles in real-world building design projects, and evaluation of IDP outcomes on improved building performance. What are the benefits of IDP over a more traditional design approach? What is the incremental cost associated with an IDP approach? To answer this question it is essential to develop some performance metrics that will allow us to measure (quantify) the cost/benefit of IDP approach.

To complete this work, research skills or a good understanding are required in design facilitation, interdisciplinary design coordination, project management, whole building energy modelling, design visualization, building physics and envelope design, and integration of renewable energy systems with the building envelope and mechanical or electrical systems.

### 8.2: Description task list

The tasks in this area of expertise (AE) contribute to a better understanding of design strategies to achieve net zero energy, net-zero emissions and better indoor and outdoor environment.

These tasks pertain to four primary activity areas:

1. What is the current state of use of IDP in the built environment in Canada and what advantages and disadvantages architects, engineers and other building design professionals have found following an IDP approach?
2. Building energy simulation tasks related to demonstrations of building science principles with multiple variables and systems
3. Development of performance metric of an Integrated design process
4. Development tasks for standardized approaches to integrated design

Subtasks related to activity area 1 include:

- What building types are commonly designed with an IDP approach and why?
- What flexibility IDP is offering during the charrettes with respect to design milestones?
- IDP is typically associated with new construction. Can it be applied to deep retrofit projects and if the answer is yes, what adjustment should we consider in the process to take into account the design constraints of an existing building?
- Integrated design process is typically used for commercial and institutional buildings. A pilot project for residential building could be interesting to consider to evaluate the relevance and effectiveness of such an approach for this building category.

Subtasks related to activity area 2 include:

Assessing how building heating and cooling loads change with changes in building form and fenestration-and-door to wall ratios

- Assessing how lighting power consumption changes with changes in building form and fenestration-and-door to wall ratios
- Assessing the impacts of space conditioning system selection (radiant versus air exchange) on the performance of the building envelope in terms of annual energy consumption, peak heating and cooling loads, and thermal comfort
- Assessing the ability of various renewable energy sources to match the demands produced by individual building designs

Subtasks related to activity area 3, integrated design process research include:

- Identify the 'tools' used by the facilitator to engage the participants in an efficient and

scalable process

- Explain the decision process that was adopted to develop the design concept
- Survey the participants at the end of an IDP to get their appreciation of the process
- Examining and documenting outcomes from IDP on building design, and recommending improvements

Subtasks related to activity area 4 include:

- Reviewing and commenting on the suitability of standard industry contract templates for use in IDP
- Adjusting standard industry contract templates for design to adapt them to differing work flows arising from the use of IDPs
- Liaising with professional associations and professional licensing bodies to investigate and develop the use of IDP in standard form contracts

## 9. Buildings - Monitoring of Advanced and Renewable Energy Technologies

### 9.1: Overview

Natural Resources Canada's (NRCan) research and development (R&D) initiatives and housing and building programs assist and encourage builders to build more efficient structures by providing technical resources, performance and cost analysis of innovative building products. NRCan's research and technology transfer efforts require in-depth investigation into the performance, durability and application of new technologies and building practices.

This area of expertise (AE) deals with monitoring and assessment of advanced and renewable energy systems. This work generally consists of instrumentation of housing and buildings, evaluating data collected, and describing the issues associated with integrating a given technology into a home or building (identifying initial and operating costs, applications, maintenance, code acceptance, etc).

A thorough understanding of typical Canadian residential housing or commercial building design & energy performance, and of advanced or renewable energy technologies and their application is critical for this work.

### 9.2: Description task list

The main tasks related to this area of expertise (AE) are as follows:

- Assessing advanced & renewable energy technologies, through comparative monitoring.
- Benchmarking, undertaking energy and performance analysis, and developing cost estimates of various systems using field monitoring results and/or building simulation tools.
- Developing best practise approaches for various (new and retrofit) advanced / renewable technology installations.
- Soliciting suppliers, manufacturers, distributors and installers of products to obtain list prices or quotes on components, installation time and requirements and performing costing analysis
- Monitoring and evaluating the results of advanced / renewable technology field testing.

## Area – Communities

### 10. Communities – Data Collection & Analysis

#### 10.1: Overview

Over 400 municipalities have developed energy and emissions plans and some are embarking on planning and deploying housing energy retrofit strategies. Municipalities undertake inventory development, and to a lesser extent, archotyping and mapping. Municipalities and their service providers spend time and money collecting data, including utility data, to populate models, inform plans and track progress towards their greenhouse gas (GHG) target through the creation of inventories.

On a regulated basis, utilities undertake conservation potential review studies and integrated resources planning to inform their demand side management programs and load planning. As more renewables

come on line, utilities will seek to improve impact in their demand side management programs to offset expensive infrastructure upgrades associated with higher electrical loads. New modelling and customer engagement approaches may be sought out.

To support planning of research & development (R&D) initiatives related to buildings and energy data and modelling in support of municipalities and utilities, contractors will develop, implement and validate new approaches and improve existing methods within the Geographical Information Systems (GIS) environment, and apply them to the analysis of neighborhood and community scale retrofit, renewable and district energy technology integration opportunities.

#### **10.2: Description task list:**

The main tasks related to this area of expertise (AE) are as follows:

- Developing datasets characterizing urban design and energy end-use, GHG emissions and costs associated with houses and buildings, renewable and district energy systems and equipment
- Developing new approaches to the integration of data from housing, building, renewable and district energy technology simulation tools, measured utility data or novel datasets into (GIS)
- Validating the predictions of models and system designs through comparison to analytical solutions, measured data, or predictions from other models and community simulation software to ensure the reliability of results and recommendations
- Describing and graphically illustrating model theory, implementation, validation and application in presentations, research reports and peer-reviewed papers
- Applying business analysis approaches to assess information systems and data holdings; examples including but not limited to stakeholder and enterprise analysis, as-is and to-be business process and information systems modelling, use case and requirements gathering, change management

### **11. Communities – Regulatory and Policy Analysis**

#### **11.1: Overview**

Over 400 municipalities have developed energy and emissions plans and some are embarking on planning and deploying housing energy retrofit strategies. Municipalities undertake inventory development, and to a lesser extent, archotyping and mapping. Municipalities and their service providers spend time and money collecting data, including utility data, to populate models, inform plans and track progress towards their greenhouse gas (GHG) target through the creation of inventories.

On a regulated basis, utilities undertake conservation potential review studies and integrated resources planning to inform their demand side management programs and load planning. As more renewables come on line, utilities will seek to improve impact in their demand side management programs to offset expensive infrastructure upgrades associated with higher electrical loads. New modelling and customer engagement approaches may be sought out.

To support planning of research & development (R&D) initiatives related to buildings and energy data and modelling in support of municipalities and utilities, a more comprehensive understanding is required of provincial regulatory and reporting contexts. *What are the current legislative, regulatory and policy barriers and opportunities for improved data interoperability between utilities and municipalities?*

#### **11.2: Description task list:**

The main tasks involved in this area of expertise (AE) are:

Development and/or analysis of provincial legislation and/or building codes governing municipalities, with a focus on energy and emissions in new and/or existing housing and buildings

Development and/or analysis of provincial regulations governing utilities with a focus on conservation potential reviews and/or demand side management program planning and/or

estimation, measurement and verification (EM&V)  
Development and/or analysis of community energy and emissions policies and/or plans and/or programs with a focus on energy and emissions in new and/or existing housing or buildings

## **12. Communities: Low Carbon District and/or Community Energy Systems**

### **12.1: Overview**

Over 400 municipalities, many institutions and government facilities have developed energy and emissions plans and some are embarking on planning and deploying low carbon energy technology strategies. These stakeholders and their service providers spend time and money analyzing technology options, impacts and opportunities towards meeting their greenhouse gas (GHG) target through the development and implementation of plans. However the advancements in the adoption of low carbon technologies on a community scale has been relatively slow due to several barriers, including regulatory, policy and technology applications.

Natural Resources Canada's CanmetENERGY-Ottawa (NRCan CE-O) undertakes research into the relationship between the built environment (in particular communities) and its energy consumption patterns on a community or campus basis to enable assessment of low-carbon energy system integration. A key aspect of this work is the design, development and analysis of district and/or community energy systems and their components including their interconnection with the buildings themselves, as well as the integration of various renewable energy resources, technologies and the existing energy service infrastructure

### **12.2: Description task list:**

The main tasks involved in this area of expertise (AE) include:

- Evaluating the design and integration of components of low carbon district and/or community energy systems, including their construction and operation, and associated costs
- Developing and evaluating approaches for integrating renewable and low carbon energy technologies into district and/or community energy systems
- Conducting modelling and simulation of low carbon district and/or community energy systems to evaluate operational performance, energy requirements, peak demands, operating and maintenance costs and greenhouse gas emissions of different system configurations
- Evaluating building system components and operational conditions to determine necessary equipment modifications and costs associated with connecting existing buildings to a district energy supply

## **Area – Active Solar**

### **13. Active Solar – Next generation building thermal energy storage**

#### **13.1: Overview:**

CanmetENERGY-Ottawa, of Natural Resources Canada (NRCan CE-O) is collaborating with national and international partners to accelerate the development, field-testing and demonstration in the Canadian market and at the Technology Readiness Level (TRL) 7 and higher of next generation high-storage density thermochemical storage materials (TCM) based RTES technologies and solutions. As part of these R&D activities, NRCan CE-O ~~is and~~ will develop third-party reliable data, information, HVAC integration design and analysis tools in order to assess the potential of large-scale electric grid integration of residential thermal energy storages (RTES) technologies in various Canadian electricity jurisdictions. This will help characterize power-to-heat potential and limits of innovative next generation RTES technologies and solutions in decarbonizing the Canadian electrical grid by the electrification of the residential heating loads.

#### **13.2: Description task list:**

The main tasks involved in this area of expertise (AE) are:

- Designing new concepts of innovative high-storage density zeolite and zeolite-based composites TCM-based residential RTES integrated HVAC systems.
- Constructing laboratory-scale and or full-scale TCM-based RTES prototypes for residential heating and cooling applications, more specifically for Canadian home retrofit and or new built home applications
- Developing optimum integration strategies, configurations and controls for solar assisted TCM-RTES systems
- Constructing RTES prototypes ancillary components for home HVAC systems integration
- Designing, developing and implementing laboratory RTES test benches, field performance characterisation plans and test procedures
- Developing input data for assessing technical and economic market potential for next generation TCM-based heating and cooling applications in Canada and abroad.
- Participating on various Canadian and international code/standards committees (e.g., Canadian Standards Association (CSA), American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), International Standards Organization (ISO) related to TCM storage systems and components
- Developing linkages with manufacturers, utilities, energy service providers, industry associations and or Provinces on collaborative initiatives to accelerate TCM development for solar seasonal storage applications

#### **14. Active Solar - Solar Thermal and Heat Pump Heating and Cooling R&D**

##### **14.1: Overview**

The Solar Thermal R&D Program within Natural Resources Canada (NRCan) is the lead program within the Federal Government for the development of solar thermal technologies in Canada. The primary objective of the program is to accelerate the development and commercialization of solar thermal energy technologies which have significant potential to be more cost-effective, efficient, and less polluting than conventional technologies. This category covers the need for support in the development of equipment and systems related to solar thermal and solar for heating technologies, as stand-alone systems or integrated with heat pumps.

##### **14.2: Description task list:**

Potential tasks in this area of expertise (AE) include:

- Assessing the technical and economic market potential for solar and heat pump solar water heating, space heating and cooling and industrial process heating systems in Canada and abroad (for residential, commercial and industrial applications);
- Design and support for construction of systems testing apparatus and equipment;
- Developing optimum integration strategies, configurations and controls;
- Reviewing and identifying solar and heat pump heating and cooling system topologies that exhibit cost-effective, energy savings & greenhouse gas (GHG) reduction potential in support of net zero energy buildings and communities;
- Developing linkages with manufacturers, utilities, energy service providers, industry associations and Provinces on collaborative initiatives to accelerate solar and heat pump solar technology development;
- Participating on various Canadian and international code/standards committees (e.g., Canadian Standards Association (CSA), American Society for Heating Refrigerating and Air-conditioning Engineers (ASHRAE), International Standards Organization (ISO) related to solar and heat pump HVAC water heating systems and components;
- Participation on International Energy Agency (IEA) Tasks related to solar and heat pump water heating, space heating and cooling and industrial process heating.

#### **15. Active Solar - Renewable Heating Systems Simulation and Analysis**



### 15.1: Overview

The Solar Thermal R&D Program within Natural Resources Canada (NRCan) is the lead program within the Federal Government for the development of solar thermal technologies in Canada including the use of solar thermal technology in community energy systems, such as the Drake Landing Solar Community. This category covers the need for support in the simulation and analysis of small and large thermal systems using the TRNSYS simulation tool, including simulations to support equipment rating and certification. The main technology areas include solar thermal and solar for heating technologies, short-term and long-term (seasonal) thermal storage, and heat pumps.

### 15.2: Description task list:

Potential tasks in this area of expertise (AE) include:

- Analyzing the performance of solar domestic hot water systems (SDHW) under Canadian Standards Association (CSA) F379 and Solar Rating and Certification Corporation (SRCC) OG-300 standard conditions using TRNSYS simulation software;
- Validating SDHW simulation results with measured results from CSA F379 testing at the National Solar Test Facility;
- Developing and calibrating TRNSYS models SDHW system components (heat exchangers, collectors, tanks, pumps) using published performance data;
- Consulting with manufacturers to confirm system design and operation;
- Estimating SDHW performance ratings using simulations and measured data;
- Developing TRNSED (utility user-interface to TRNSYS) models of SDHW and community energy systems for use by NRCan, private industry and the public;
- Developing models and analyzing solar thermal driven low-carbon communities;
- Developing TRNSYS models and analyzing energy performance of solar thermal assisted heat pump systems for single residential, multi-residential and commercial building applications;
- Developing new TRNSYS components/types for solar thermal driven low-carbon communities, including seasonal thermal storage systems;
- Developing models and analyzing seasonal thermal storage systems, including aquifer thermal energy storage (ATES), pit thermal energy storage (PTES) and borehole thermal energy storage (BTES).

## 16. Active Solar – Industry Survey

### 16.1: Overview

NRCan CanmetENERGY-Ottawa (CE-O) has been completing solar thermal industry surveys and other renewable energy surveys for several decades since the 1980s. Results of these surveys inform NRCan CE-Os solar thermal related research and development (R&D) activities, standards development. Survey results are also used to inform NRCan's programming and policy development. Survey results are also reported at the international and are included in the annual world reports issued annually by the International Energy Agency's (IEA) Solar Heating and Cooling Technology Collaboration Program.

### 16.2: Description task list:

The main tasks involved in this area of expertise (AE) are:

- Developing survey documents and questionnaires to determine industry needs and future research priorities
- Developing contact list of solar thermal, thermal energy storage and other renewable energy companies active in Canada and distributing the survey and collecting responses
- Summarizing and analyzing the data aggregated to protect confidentiality
- Obtaining third party alternative statistics data for validation of the survey results
- Preparing reports describing collected data and analysis thereof, as well as presenting the results to NRCan staff and industry as required
- Completing solar thermal and other renewable technologies briefs



- Completing solar thermal and other renewable technologies techno economic studies

## 17. Active Solar - Large-Scale Seasonal Thermal Energy Storage

### 17.1: Overview

The Solar Thermal Research and Development (R&D) Program within Natural Resources Canada (NRCan) is the lead program within the Federal Government for the development of solar thermal technologies in Canada including the use of large scale solar thermal technology with seasonal thermal energy storage, such as the Drake Landing Solar Community. This category covers the need for support in the analysis of technical and economic feasibility, engineering, construction, implementation and monitoring of large scale thermal energy storage. The technology areas include borehole thermal energy storage (BTES), pit thermal energy storage (PTES) and aquifer thermal energy storage (ATES) and tank thermal energy storage (TTES).

### 17.2: Description task list:

Potential tasks in this area of expertise (AE) include:

- Support technical and economic feasibility of large scale underground thermal energy storage;
- Design and engineering of large-scale borehole thermal energy storage (BTES);
- Design and engineering of large-scale pit thermal energy storage (PTES);
- Designing and engineering of large-scale aquifer thermal energy storage (ATES);
- Designing and engineering of large-scale tank thermal energy storage (TTES);
- Technical support for construction activities of large-scale seasonal thermal energy storage;
- Monitoring support, including monitoring system design, of large-scale seasonal thermal energy storage;
- Support models development and analysis of seasonal thermal storage systems, including aquifer thermal energy storage (ATES), pit thermal energy storage (PTES), borehole thermal energy storage (BTES) and tank thermal energy storage (TTES).

## 18. Active Solar – Solar Resource and Potential Assessment

### 18.1: Overview

NRCan CanmetEnergy-Ottawa (CE-O) in collaboration with its partners is developing a high-resolution gridded hourly global horizontal irradiance (GHI) and direct normal irradiance (DNI) (10 km gridded or less) solar irradiance dataset for Canada. This dataset is used to update the weather design engineering files, such the Canadian Weather Energy and Engineering Datasets (CWEEDS) and their derived Canadian Weather Year For Energy Calculation (CWEC). CWECs are used by the scientific and engineering community for solar systems design and analysis buildings energy calculations.

### 18.2: Description task list:

The main tasks involved in this area of expertise (AE) are:

- Developing high-resolution dataset (10 km gridded or less) for Canadian south of 58 degrees latitude based on geostationary satellites imagery input datasets.
- Developing high-resolution dataset (10 km gridded or less) for Canadian north of 58 degrees latitude based on polar-orbiting satellites imagery input datasets.
- Contributing to validation of the updated solar resource datasets by comparison with ground measured solar datasets in different Canadian locations.
- Completing solar technology deployment potential studies in various Canadian geographical locations and electricity jurisdictions and markets. These studies will be completed using either NRCan's existing solar resource datasets or the solar resource dataset that will need to be updated.
- Completing renewables (solar in combination of other renewables: wind, river hydrokinetics, tidal) technology deployment potential studies in various Canadian geographical locations and electricity jurisdictions and markets. These studies will be completed using either NRCan's existing solar resource datasets or the solar resource dataset that will need to be updated.
- Developing the ancillary inputs required by NRCan partners, such as NASA, NREL and others,

- for the development of the underlying inputs, such as the cloud and albedo gridded datasets, required for the update of the Canadian solar resource datasets.
- Contributing to a joint publications and reports with NRCan and its partners to document the approach used for the new solar resource data updates.

## Area – Simulation

### 19. Simulation – Residential Energy Modelling

#### 19.1: Overview

The Buildings and Renewable Group (BRG) conducts cost benefit and impact analysis associated with residential energy technologies. The scope of this work includes application to single home designs, as well as provincial and federal programs and building codes. Recently, NRCan and BRG developed innovative tools to enable new analysis methods – these include a command-line version of HOT2000, HTAP, and CBAT.

#### 19.2: Description task list:

Activities in this category focus on configuration and utilization of residential energy analysis tools, and the analysis of the data they produce. NRCan anticipates tasks will often include use of the HTAP and/or CBAT simulation tools, but other software platforms may also be used. Specific tasks include:

- Compiling construction cost data for residential energy technologies
- Identifying archetype models from datasets provided by NRCan and/or developing new HOT2000 archetype models using plans or other requirements set forward by NRCan
- Deploying analysis tools (including HTAP and CBAT) to optimize designs in single buildings and/or in large stocks of homes.
- Performing economic and environmental impact analysis using current and future forecasted utility rates, emission factors and carbon tariffs.
- Recommending technology choices, and requirements to achieve builder, program and code objectives.

### 20. Simulation - Commercial Simulations Developer, Modeler and Analyst

#### 20.1: Overview

The Buildings & Renewable Group (BRG) of CanmetENERGY- Ottawa (CE-O) is actively working on the development of the building technology assessment platform (BTAP) to support the design of high performance commercial and institutional buildings in Canada. BTAP can be used to study the energy, economic, and greenhouse gas (GHG) performance of commercial buildings through the use of archetype buildings that meet the requirements of the performance path of National Energy Code for Buildings (NECB). BTAP also has a growing library of the most common energy conservation measures (ECMs) to explore cost effective solution sets that exceed the requirements of the NECB to achieve net-zero and net-zero ready performance targets. The commercial simulations developer, modeler and analyst will work on tasks to further advance the development of BTAP and/or its application in the design of energy efficient buildings.

The BTAP energy module is an open source tool automating the creation of the reference case of the compliance path of NECB 2011, 2015, and 2017 with plans to add future vintages of NECB. The energy module source code is housed under the same Github repository as the 'openstudio-standards' project (<https://github.com/NREL/openstudio-standards>), led by the US National Renewable Energy Laboratory, which uses the OpenStudio suite of tools (<https://www.openstudio.net/>). BTAP also includes a costing module which is currently not in the open source domain. CE-O will provide specific training and documentation to the successful applicants on the application and further development of the various modules of BTAP.

#### 20.2: Description task list:

Almost all the tasks involved for this category will involve working extensively with a Git repository for

BTAP source code, documentation, and project management utilities. Tasks involving implementation of source code in BTAP will be mostly done in the Ruby programming language. The main tasks involved in this area of expertise (AE) are:

1. Implementation in BTAP of performance path compliance rules for NECB and other energy codes.
  - Interpret energy code rules for implementation in BTAP
  - Implement compliance rules in BTAP
  - Develop and implement in BTAP test cases for compliance rules
  - Implement costing specifications in BTAP
2. Development of BTAP scripts for ECMs for building envelope, HVAC (heating, ventilation and air-conditioning) systems, and costing.
  - Develop modelling strategies for new ECMs in BTAP
  - Implement in BTAP OpenStudio or EnergyPlus measures for ECMs
  - Implement in BTAP costing specifications for ECMs
  - Develop and implement in BTAP of test cases for ECMs
3. Application of BTAP to support the Integrated-Design Process of high performance commercial and institutional buildings.
  - Attend meetings for IDP for different building types
  - Use BTAP to prepare data and visualizations to support the various stages of IDP
  - Present results of BTAP data analysis at IDP sessions
  - Develop OpenStudio measures to automate IDP workflows
  - Perform optimization runs to develop optimum solutions based on energy, cost, and/or greenhouse gas (GHG).
4. Data analysis and reporting of simulation results to clients and stakeholders.
  - Review of BTAP simulation output to develop user friendly reports for specific use cases (e.g. IDP, peak reduction, energy code development support, etc ...)
  - Develop appropriate visualizations to present the simulation data for specific use cases

## **21. Simulation - Cost Engineering Consultant for Commercial Buildings**

### **21.1: Overview**

CanmetEnergy-Ottawa (CE-O) researches construction techniques, mechanical and electrical systems, renewable energy integration and district energy/electrical networks intended to efficiently utilize energy, while reducing greenhouse gas emissions. This applies to new construction and existing commercial buildings, which would incorporate renovation and retrofit measures. To that end, economic considerations are paramount to the decision-making and possible adoption of these research outcomes. These economic considerations not only include the cost of energy, but also the capital and maintenance cost of new construction techniques, different mechanical and electrical systems and other technologies applied to new and existing commercial buildings. Different levels of construction and retrofit costing is necessary to assess the cost effectiveness of simulation results for policy, building code, and incentive implications for general archetypical commercial buildings. Also, construction costing is used with simulation to assess design options in integrated design and retrofit process sessions. Most of the costing will fall under class C or D estimates, as the simulations are mainly based upon archetypical commercial buildings rather than an actual building being built. These archetypical buildings are general in architectural layout and follow envelope U-values, ventilation requirements, lighting levels and power densities, mechanical systems, setpoints and operating schedules according to mandatory and prescriptive requirements in codes and standards.

### **21.2: Description task list:**

The main tasks involved in this area of expertise (AE) are:

1. Collection of New Construction and Retrofit Costing Technologies
  - Collect costs of new construction and retrofit construction materials and labour including

newer technologies to be added to a costing database used for simulation purposes.

## 2. Design/Construction Sequences

- Develop construction/retrofit steps to apply new and retrofit technologies to different commercial buildings. An example would involve adding exhaust air heat recovery to a supply only dedicated outdoor air system (DOAS). This would involve the collection of the exhaust air via interior ducting and connecting that ducting back to a heat recovery unit located near the DOAS. The ducting diameter/length and fan power would have to be sized for the geometry/height of the building plus the exhaust requirements. The heat recovery unit may not likely be included within the DOAS, therefore a ducting arrangement to connect the heat recovery device to the DOAS would have to be included. Controls, dampers, fire dampers would also have to be considered. All of these devices have cost implications which would have to be determined and costed based upon the building and ventilation requirements.
- Develop a listing of materials (main end use device, distribution devices, control equipment, energy services) required for different levels of construction costing (class C estimate will have specific equipment sizes, whereas a class D estimate will have ranges of equipment sizes)
- Develop conceptual drawings of architectural details and mechanical/electrical layouts for different construction and mechanical/electrical systems according to codes and design practices. These will be used to determine ducting, piping, conduit and flue lengths for sizing and costing. These would be general layouts for cost estimating purposes (class C) and not detailed drawings/layouts for a specific building.

## 3. Construction and Retrofit Costing Rules for Simulation Purposes

- Develop generalized costing rules and assumptions to be applied to general (archetypical) commercial building simulation models related to mechanical/electrical equipment configurations and sizing. The simulation models are based upon archetype constructions and layouts of spaces. General rules as to how to apply equipment to spaces are required. Examples could include spacing if lighting fixtures based upon lighting power densities or numbers and locations of ceiling diffusers based upon space types, airflow and ventilation requirements. These are general rules to apply the costed equipment to simulation models. The simulation models are energy end use models and do not provide equipment layouts for a space; only energy loads (heating, cooling, lighting, ventilation)
- Compare costing rules and assumptions to established engineering practices, costing for class B type projects

## 4. Construction Costing Specifications and Evaluation of Software Output

- Assist in the development of specifications (word document and hand calculations) that the simulation software team will implement into the software coding.
- Review and assess the resultant costing output from the simulation and compare with expected results (industry type norms)

## 22. Simulation - Machine Learning Architect

### 22.1: Overview

CanmetENERGY-Ottawa (CE-O) leverages simulation and optimization tools to explore the broad range of design options in housing and buildings. These simulation tools, when used to create broad swaths of data, require extensive computing power, are slow to return results, and require the purchase of cloud computing resources. This results in a high-cost product due to inefficiencies in how results are obtained. Development and deployment of machine learning surrogate models would speed up the analysis and make it more cost effective to generate high value results.

CE-O has many data sources in various formats such as text files, databases and web-resources. Proponents would also support the sorting of this data, modelling the data, and undertake analysis to understand trends and support building design and stock assumptions

## **22.2: Description task list:**

The main tasks involved in this area of expertise (AE) are:

- Data gathering / cleaning
  - Organizing unstructured data from various sources, formats, types, and units.
  - Data-normalization
  - Removing incomplete data and duplicates, outliers.
  - Transforming data for use with ML algorithms.
  - Work with subject matter experts to refine data as required
  - Data integration/Reduction and cross-referencing different datasets
- Data analysis, modelling, and deployment of AI/ML models
  - Application of existing AI/ML methods to develop models to replace expensive compute and bench Development of AI/ML experiments.
  - Testing and deployment of AI/ML models in languages such as Python and R, and on cloud providers
  - Application of model to support engineering and research activities
  - Proponent would performing modeling in an environment compatible with Natural Resources Canada's IT structure. Ideally using proponent's Microsoft Azure or Amazon Web Service (AWS) cloud offerings.
  - Perform validation and supply confidence metrics for models developed.
- Client training / knowledge transfer
  - Document the approach taken for the model/optimization development.(workflow diagrams, build documents, etc)
  - Develop sample code or application programmer's interfaces (APIs) that enables researchers to leverage the new models and data as required.
  - Source code management/ (git)
- Data visualization and reporting
  - Develop desktop/web dashboards and data visualization based on the models created as required.
  - Dashboards developed should be compatible with Natural Resources Canada (NRCan) Azure or AWS cloud offerings.

## **Area – Heating, Ventilation and Air-conditioning (HVAC)**

### **23. HVAC - Heat Pump Hybrid and Integrated Systems Research and Development (R&D), Assessment and Monitoring**

#### **23.1: Overview**

Natural Resources Canada (NRCan) undertakes research on advanced heat pump hybrid<sup>1</sup> and integrated systems aiming to achieve 80% greater efficiency over conventional residential and commercial space and water heating systems.

<sup>1</sup> A hybrid system is defined as a system that combines 2 or more systems that are powered by different fuel sources with one central controller that may operate together or independently. An example of such a system is an electrically powered air source heat pump combined with a natural gas-fired furnace.

To achieve this objective, novel new heat pump (electrical and gas or thermally-driven), and hybrid systems (two systems that can work together but may operate independently) will need to be designed, developed, tested and validated. These may include systems with smart switching controls, artificial intelligence and connectivity through the Internet of Things (IoT).

Such systems by necessity will need to rely on increased electrification and integration with renewable sources of energy. Integration with micro cogeneration systems or other space and water heating balance of plant components (buffer tanks, auxiliary heating sources, etc.) and connection to thermal or electrical storage may be some of the hybrid combinations to be entertained. In the case of gas-driven heat pumps, such systems will need to be fuel flexible, allowing for the incorporation of biofuel, hydrogen or other renewable feedstocks. This research is both for the residential and commercial building stock.

### 23.2: Description task list:

The main tasks involved in this area of expertise (AE) are:

- Project planning and/or system design
  - Background information and energy data collection, organization, investigation, assessment and integration.
  - Development of schematics for heat pump hybrid systems and/or integrated systems and balance of plant components (conception and design)
- Development of testing protocols for monitoring and verification (M&V) for system energy balance determination
  - Data acquisition, extraction, and analysis of monitored data
  - Specifying, purchasing, installing, calibrating and commissioning of monitoring equipment
  - Recommendations for procurement of monitoring equipment (sensors, actuators, controls, piping, etc.)
- Lab testing, field testing or supervision of field testing of heat pump and hybrid systems performance or their subcomponents (example: a mCHP (Combined Heat & Power) thermally or electrically driven heat pump or a heat pump with auxiliary boiler)
- Analysing, presenting, and publishing results from monitored data

Proponents applying to this may wish to explicitly reference any of the following skillsets they have applied with supporting details, and if applicable, in their write-up.

- Defining monitoring boundaries
- Selecting metrics and relevant data required
- Establishing relationships between the selected performance metrics in order to reduce the number of measurements points
- Identifying suitable sensors and data acquisition systems
- Recognizing possible metering gaps and how to resolve them
- Defining data quality check procedures
- Verifying monitoring equipment capabilities to project requirements
- Preparing specifications for monitoring equipment and installations
- Knowledge of Suppliers and procuring of monitoring equipment
- Calibrating monitoring equipment
- Installing and commissioning monitoring and data acquisition systems
- Defining and implementing data post-processing (elaboration of performance indicators, etc)
- Establishing correlations and relationships with monitored data
- Troubleshooting and rectification of monitoring protocols
- Evaluating mismatches between energy production and consumption
- Evaluating peak load reduction
- Evaluating, under specific operational conditions, system capacity, efficiency, specific cost,



- cycle life, safety, environmental impact and scarcity.
- Installing equipment for real-time transmission of monitored data to remote locations
- Collecting data from monitoring equipment
- Managing transmission and storage of monitored data
- Verifying data quality
- Developing, maintaining and arranging hosting for websites presenting monitored data
- Examining data and identifying relationships between measured parameters
- Examining data and identifying relationships between measured parameters

## 24. HVAC - System Design

### 24.1: Overview

Natural Resources Canada (NRCAN) carries out research on how best to install residential HVAC systems. This area of expertise (AE) pertains to those who have expertise designing HVAC systems to meet these demands. It pertains to sizing and selecting equipment, designing the overall systems, specifying controls and the distribution systems. The work relates to HVAC systems for mainstream production builders as well as smaller custom home builders.

### 24.2: Description task list:

The main tasks related to this area of expertise (AE) are as follows:

- Defining home HVAC design loads
- Performing Canadian Standards Association (CSA) F280-12 load calculations, size ducts and draft HVAC drawings
- Developing approaches to efficient field installations that can utilize renewables and/or optimize controls, taking into consideration peak and off peak rates where applicable
- Designing example systems using specified technologies
- Working with home HVAC system designers to support improvements to their practices

## 25. HVAC - Monitoring and Analysis of HVAC Equipment

### 1: Overview

Natural Resources Canada (NRCAN) monitors and analyzes the performance of innovative new and existing HVAC systems in occupied homes and buildings to:

- Determine if they are functioning as intended,
- Identify opportunities for improvement,
- Assess their energy, greenhouse gas (GHG) emissions and comfort performance, and
- Assess the broader market context of the system.

Occupant surveys may also be conducted at the same time to assess occupant understanding of the system performance and overall user experience.

### 2: Description task list

The main tasks in this area of expertise include:

- Developing an understanding of a particular HVAC system operation and commissioning procedure
- Developing a field monitoring methodology to assess the operating performance of the system and its impact upon overall home energy use, comfort and GHG emissions
- Reviewing system installations and operation according to manufacturer's operation and commissioning procedures
- Specifying, purchasing and installing monitoring equipment, troubleshooting it, and collecting data
- Developing reports that evaluate overall energy and GHG emissions performance, comfort and customer satisfaction, including:



explaining issues found,  
providing recommendations for improvements, and  
extrapolating the results to provide meaning in the larger market context.  
Conducting occupant surveys if required.

## **26. HVAC - Laboratory Analysis and Standards -HVAC Equipment (including Water Heating Technologies)**

### **26.1: Overview**

Natural Resources Canada (NRCan) facilitates the development of innovative new products that are more energy efficient than typical current options. A key element of this work is the development of new test and evaluation protocols that may be used in-house or become the basis for wider adoption, as an efficiency program tool or a product performance standard. This test development work will enable manufacturers and others to identify the market advantages of their product, determine energy efficiency ratings (or other performance metrics) for their new products, and determine where they may need to make product improvements. The results of testing to these new protocols help to develop independent third-party databases that the market can use to make a science-based and informed decision, with respect to product selection.

### **26.2: Description task list**

The main tasks related to this area of expertise are as follows:

- Developing and recommending technical elements of test protocols and test standards for new types of HVAC equipment. This task may be achieved through Lab testing or by literature review and selection.
- Overseeing third party lab testing, reviewing analyses, and providing advice upon how to improve test procedures, calculations and where appropriate prototype and product performance.
- Conducting laboratory testing and evaluating a new test method or draft standard, for ease of use, accuracy, repeatability and/or determining how closely the test method represents real-world use.
- Providing technical advice to NRCan on the implications of proposed changes to standards, and the technical potential of various ways of enhancing HVAC equipment energy performance.

## **Area – General**

### **27. General - Residential - Industry and Innovation Strategy**

#### **27.1: Overview**

Research to facilitate the development of new technologies requires that Natural Resources Canada (NRCan) not only be focused upon the particular technologies but also how they relate to the business capabilities and opportunities of potential partners. NRCan needs the advice of consultants who have previously run heating ventilating and air conditioning (HVAC) manufacturing companies and home building or construction companies, and have had to balance various business needs in considering which research to undertake. NRCan research can be better targeted where advice has been obtained from those who have a track record for leading their companies through the innovation cycle, making decisions on which technologies to research, develop or implement, and where to market or apply them. This category may also include innovative business models, project delivery models or innovative program design to overcome barriers to high performance construction, retrofit and delivery of northern housing.

The scope includes new and existing Part 3 and Part 9 of the National Building Code (NBC) residential buildings.

## **27.2: Description task list**

The main tasks related to this area of expertise (AE) are as follows:

- assessing various technology opportunities
- defining the related barriers, opportunities for overcoming them, and priorities in order to support the technology entering the market
- assessing most likely entry market niches
- assessing potential types of partnering opportunities and forging such partnerships
- developing materials on targeted opportunities for manufacturing and home building decision-makers most likely to take on these opportunities

## **28. General - Residential Technical Writing**

### **28.1: Overview**

Facilitating the development of new technologies requires that Natural Resources Canada (NRCan) not only be focused upon the particular technologies but also how they communicate the research results to the intended target audiences. NRCan needs the advice and services of technical writing practitioners to introduce new and innovative technologies into Canada's housing sector. Effective and compelling written communication is essential. Research results are most often communicated through papers and reports that use text with supporting tables and graphs. The practitioners will have experience creating a variety of communication products for various mediums (including web postings) to increase awareness of research studies that inform housing stakeholders. Communication products may take on a range of forms. At one end of the spectrum, products may include detailed and comprehensive research reports, technical papers, guideline documents and best practice guides. At the other end of the spectrum, communication products may be of a broader technical nature comprising of research summaries and highlights, infographics and technical bulletins. The services required may also include preparation of materials for presentations, exhibits, forums and workshops and dissemination to stakeholders via web postings. The service provider must have produced materials in both English and French in MS Word format, as well as for the web that meet both the Common Look and Feel (CLF) 2.0 standards and accessibility guidelines (WCAG) for the Government of Canada (GoC). NRCan needs advice and services from those who have a track record in providing technical writing services in support of the innovation cycle to business channels. Such services will assist in making decisions on which technologies to develop or implement. Additionally, communication products help increase awareness of current and upcoming research and development (R&D) efforts, and how, when and where the research and development (R&D) will assist the market. Full knowledge of the branding guidelines for Government of Canada logos is required.

### **28.2: Description task list**

The main tasks related to this area of expertise (AE) are as follows:

- Creating detailed research reports, technical papers, guideline documents technical illustrations and/or best practice guides based on information derived from research studies and/or technical investigations undertaken at NRCan. .
- Create derivative products (research highlights, summaries, infographics, technical bulletins, or other information pieces) that are derived from existing NRCan original research studies, reports or technical investigations.
- Create supporting graphics, illustrations, images and other visual aids, derived from the original research studies, reports or technical investigations.

## **29. General - Graphic Communication & Design Services**

### **29.1: Overview**

Natural Resources Canada's (NRCans) CanmetENERGY-Ottawa (CE-O) needs the advice and services of graphic design professionals. Our work provides support to Canadians through research, innovation and the development of new technology. CE-O must communicate with a wide variety of target audiences, therefore effective and compelling graphic communication is essential. While

research results are most often communicated through papers and reports that use text with supporting tables and graphs, Technological Innovation often requires illustration, explanation and graphic reference materials. The services required may include preparation of materials for presentations, exhibits, forums and workshops. This work may also include advice on media format, digital communication options and strategy. NRCan is seeking creative professionals who have demonstrated experience in providing graphic communication services in support of the innovation cycle between research and business. Successful applicants will be required to comply with the branding guidelines and communication protocol of the Government of Canada and the *Common Look and Feel Standards* (CLF) 2.0 and Accessibility Guidelines (WCAG) for the Government of Canada. This may include extensive coordination and review. The provider must be able to produce final materials in both English and French, as all publications must be in both official languages.

### **29.2: Description task list:**

The main tasks involved in this area of expertise (AE) are:

- Digital Typography
- Illustration - digital or analogue
- Photography & image editing
- Graphic Layout for Print and/or Digital Publication, including compliance with CLF and WCAG guidelines
- Copyright & IP experience including GOC approvals
- User Experience & Target Audience expertise
- Branding Identity & Event Marketing
- Exhibits & Interactive Graphic Materials
- Software and File Exchange expertise

## **30. General - Web Application Development**

### **30.1: Overview**

Natural Resources Canada (NRCan) develops tools to support building industry in making informed decisions on individual energy efficient technology assessments as well as energy efficient technology combinations (pathways) to higher levels of overall energy and greenhouse gas (GHG) performance. These models create large swaths of new data and leverage extensive external cost and building stock data. There is a need to make these tools available in the form of web applications to disseminate research results to industry and to the public. Web applications would also support NRCan's ability to collect critical data support ongoing research objectives. There is a need for services not only in the development of these applications, but also in the ongoing maintenance of active applications. NRCan will require full stack web developers with extensive expertise in web application development. This includes user experience research and design coupled with front and back end development and testing of the applications. The work would pertain to developing new multiplatform (desktop & mobile) web applications, upgrading active applications, and providing maintenance to active applications such as performing regular updates and bug fixes.

### **30.2: Description task list:**

The main tasks involved in this area of expertise (AE) include:

- Developing new web applications for desktop and mobile devices ensuring that they meet government of Canada standards and security requirements
- Leading the user experience research (including client specifications) and design.
- Programming applications using JavaScript, HTML, CSS, Python, Ruby, or Java.
- Developing test plans and reporting results against them
- Upgrading web applications with new features for desktop and mobile devices
- Maintaining web applications for desktop and mobile devices

- Investigating and fixing bugs in web applications for desktop and mobile devices.

## 31. General - Excel Tool Development

### 31.1: Overview

Natural Resources Canada's CanmetENERGY-Ottawa (NRCan's CE-O) develops many spreadsheet tools. Some tools support the building industry in making informed decisions on individual energy efficient technology assessment as well as energy efficient technology combinations (pathways) to higher levels of overall energy and greenhouse gas (GHG) performance. These models create large data sets, and leverage extensive external cost and building stock data. Other tools focus on specific technologies and their related energy performance in a wide range of applications across the built environment. They too can involve large data sets. There is a need to make these Excel tools available to disseminate research results to industry and to the public. NRCan will require an Excel tool developer to conduct user experience research and design, and the programming of tools. The work would pertain to developing new Excel tools, upgrading existing Excel tools, and providing ongoing maintenance to active tools such as performing regular updates and bug fixes.

### 31.2: Description task list:

The main tasks involved in this area of expertise (AE) are:

- Develop new excel tools ensuring that they meet government of Canada standards.
- Lead the user experience research and design.
- Program tools using Excel's built-in functions or VBA.
- Develop test cases, sample inputs and expected outputs
- Upgrade excel tools with new features for desktop.
- Investigate and fix bugs in Excel tool.
- Develop documentation to support user experience and further development

## 32. General - Embodied Carbon Advisory Expertise

### 32.1: Overview

Architectural, engineering, and building science consultants play a key role in the delivery of low carbon housing. They use their technical skills to: evaluate plans, use house-as-a-system thinking to propose enhancements, carry out energy analysis using software packages, and carry out site audits to help their stakeholder meet their energy and carbon targets. They also use their interpersonal and business skills to: help decision makers consider the business case for low carbon housing, and develop networks of specialists that can support builders and renovators cost effectively deliver high performance low carbon housing. In short, they are on the front lines of high performance housing in Canada and often become aware of and support low carbon construction in general. Researchers need to consult experienced architectural, engineering, and building science consultants to ensure research is well aligned with the market, to test new concepts with multidisciplinary networks before expending significant time in developing them, document best practices, and find training approaches that the construction industry is most likely to adopt.

### 32.2: Description task list:

The main tasks involved in this area of expertise (AE) are:

- Providing analysis of embodied carbon of construction materials and elements using industry standard industry documentation including 3<sup>rd</sup> party Environmental Product Declarations (EPDs) and relevant academic research in the field.
- Developing and delivering technical presentations on embodied carbon to builder and renovator audiences
- Developing best practice guides that support the local stakeholders (such as builders, renovators, building officials, suppliers and trades) in working together more effectively in

delivering low embodied carbon housing.

- Reporting on current builder and renovator trends and trade practices with regards to the embodied carbon of materials
- Developing brief best practice case study reports based upon successful low carbon housing projects
- Developing training material for industry and academia for the calculation of embodied carbon and approaches reducing embodied carbon in Canadian residential housing.

## ANNEX "B"

### BASIS OF PAYMENT

The Offeror must submit one and only one firm all-inclusive hourly rate for each area of expertise being offered (each individual may only be named for a maximum of seven (7) areas of expertise), for the initial three (3) years of the Standing Offer period, GST/HST extra.

The rates for the subsequent four (4) one (1) year possible extension periods will be calculate at an automatic increase of 3% of the most recent all-inclusive rates

Residential (AE)		Years 1	Years 2	Years 3	O/Y 1 + 3%	O/Y 2 + 3%	O/Y 3 + 3%	O/Y 4 + 3%
1	Residential - Field assessment and monitoring of housing energy performance (whole house and specific equipment and systems)							
2	Residential - Windows, Exterior Doors and Fenestrations							
3	Residential - Building Envelope Research and Assessments							
4	Residential – High Performance Housing							
5	Residential - Energy Advisory Expertise							
6	Residential - Photovoltaic System Design Expertise							
Building Categories		Years 1	Years 2	Years 3	O/Y 1 + 3%	O/Y 2 + 3%	O/Y 3 + 3%	O/Y 4 + 3%
7	Buildings - Field assessment and monitoring of building energy performance (whole building and specific equipment and systems) for Low-Rise Multi Residential Buildings							
	Buildings - Integrated Design Process							
9	Buildings - Monitoring of Advanced and Renewable Energy Technologies							
Communities Categories		Years 1	Years 2	Years 3	O/Y 1 + 3%	O/Y 2 + 3%	O/Y 3 + 3%	O/Y 4 + 3%
10	Communities – Data Collection & Analysis							
11	Communities – Regulatory and Policy Analysis							
12	Communities: Low Carbon District and/or Community Energy Systems							
Active Solar Categories		Years 1	Years 2	Years 3	O/Y 1 + 3%	O/Y 2 + 3%	O/Y 3 + 3%	O/Y 4 + 3%
13	Active Solar – Next generation building thermal energy storage							

14	Active Solar - Solar Thermal and Heat Pump Heating and Cooling R&D							
15	Active Solar - Renewable Heating Systems Simulation and Analysis							
16	Active Solar – Industry Survey							
17	Active Solar - Large-Scale Seasonal Thermal Energy Storage							
18	Active Solar – Solar Resource and Potential Assessment							
<b>Simulation Categories</b>		<b>Years 1</b>	<b>Years 2</b>	<b>Years 3</b>	<b>O/Y 1 + 3%</b>	<b>O/Y 2 + 3%</b>	<b>O/Y 3 + 3%</b>	<b>O/Y 4 + 3%</b>
19	Simulation – Residential Energy Modelling							
20	Simulation - Commercial Simulations Developer, Modeler and Analyst							
21	Simulation - Cost Engineering Consultant for Commercial Buildings							
22	Simulation - Machine Learning Architect							
<b>Heating, Ventilation and Air-Conditioning (HVAC) Categories</b>		<b>Years 1</b>	<b>Years 2</b>	<b>Years 3</b>	<b>O/Y 1 + 3%</b>	<b>O/Y 2 + 3%</b>	<b>O/Y 3 + 3%</b>	<b>O/Y 4 + 3%</b>
23	HVAC - Heat Pump Hybrid and Integrated Systems Research and Development (R&D), Assessment and Monitoring							
24	HVAC - System Design							
25	HVAC - Monitoring and Analysis of HVAC Equipment							
26	HVAC - Laboratory Analysis and Standards - HVAC Equipment (including Water Heating Technologies)							
<b>General Categories</b>		<b>Years 1</b>	<b>Years 2</b>	<b>Years 3</b>	<b>O/Y 1 + 3%</b>	<b>O/Y 2 + 3%</b>	<b>O/Y 3 + 3%</b>	<b>O/Y 4 + 3%</b>
27	General - Residential - Industry and Innovation Strategy Marketing and Promotion							
28	General - Residential Technical Writing							
29	General - Graphic Communication & Design Services							
30	General - Web Application Development							



Solicitation No. - N° de l'invitation  
23240-220001  
Client Ref. No. - N° de réf. du client  
23240-220001

Amd. No. - N° de la modif.  
File No. - N° du dossier  
23240-220001

Buyer ID - Id de l'acheteur  
002sl  
CCC No./N° CCC - FMS No./N° VME

31	General - Excel Tool Development							
32	General - Embodied Carbon Advisory Expertise							

## **ANNEX "C" to PART 3 OF THE REQUEST FOR STANDING OFFERS**

### **ELECTRONIC PAYMENT INSTRUMENTS**

*As indicated in Part 3, clause 3.1.2, the Offeror must complete the information requested below, to identify which electronic payment instruments are accepted for the payment of invoices.*

The Offeror 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);
- ☐ ( ) Large Value Transfer System (LVTS) (Over \$25M)

## ANNEX "D" "to PART 5 OF THE REQUEST FOR STANDING OFFERS

### FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

I, the Offeror, by submitting the present information to the Standing Offer 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 an offer non-responsive, or may set-aside a Standing Offer, or will declare a contractor in default, if a certification is found to be untrue, whether during the offer evaluation period, during the Standing Offer period, or during the contract period. Canada will have the right to ask for additional information to verify the Offeror's certifications. Failure to comply with any request or requirement imposed by Canada may render the Offer non-responsive, may result in the Standing Offer set-aside 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 RFSO closing date.)

Complete both A and B.

A. Check only one of the following:

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

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

- ☐ A5.1 The Offeror certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with ESDC-Labour.
- OR
- ☐ A5.2. The Offeror certifies having submitted the [Agreement to Implement Employment Equity](#) (LAB1168) to ESDC-Labour. As this is a condition to issuance of a standing offer, 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 Offeror is not a Joint Venture.

OR

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