



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

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**

**11 Laurier St., / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2**

**Gatineau
Québec
K1A 0S5**

Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

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

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

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

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

Comments - Commentaires

Title - Sujet E3NA Solution	
Solicitation No. - N° de l'invitation K1A12-160736/A	Date 2017-02-03
Client Reference No. - N° de référence du client K1A12-160736	
GETS Reference No. - N° de référence de SEAG PW-\$SEL-615-31051	
File No. - N° de dossier 615el.K1A12-160736	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2017-03-14	
Time Zone Fuseau horaire Eastern Daylight Saving Time EDT	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Ghaddab, Nabil	Buyer Id - Id de l'acheteur 615el
Telephone No. - N° de téléphone (819) 956-5419 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Specified Herein Précisé dans les présentes	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Informatics Professional Services - EL Division/Services
professionnels en informatique - division EL
4C2, Place du Portage

Gatineau
Québec
K1A 0S5

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

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Buyer ID - Id de l'acheteur
615eI
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Reissue of Bid Solicitation:

Bid solicitation K1A12-160736/A cancels and supersedes previous bid solicitation number K1A12-149071/A dated November 20, 2015 with a closing date of January 08, 2016 at 02:00 PM.

BID SOLICITATION
UNIFIED ENERGY, EMISSIONS, AND ECONOMY MODELING
SOLUTION (E3NA)
FOR
ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC)

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List of Annexes to the Resulting Contract:

Annex A	Statement of Work
Annex B	Basis of Payment

List of Attachments to Part 3 (Bid Preparation Instructions):

- Attachment 3.1: Technical Compliance
- Attachment 3.2: Corporate Evaluation Criteria
- Attachment 3.3: Resources Evaluation Criteria
- Attachment 3.4: Financial Bid
- Attachment 3.5: Desirable Items

Forms:

- Form 1 - Bid Submission Form
- Form 2 - Software Publisher Certification Form
- Form 3 - Software Publisher Authorization Form

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- Form 4 - Declaration Form
- Form 5 - List of Names Form
- Form 6 - Federal Contractors Program for Employment Equity - Certification

PART 1 - GENERAL INFORMATION

1.1 Introduction

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

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

The annexes include the Statement of Work and the Basis of Payment.

1.2 Summary

- (a) Canada has an initial requirement for a commercially available Unified Energy, Emissions, and Economy Modeling Solution (the "**E3NA Solution**") for 10 Client Users. The required Software Solution must include the Licensed Software, a 24-month warranty, software maintenance and support, documentation and training. Additional training and professional services must also be provided, if requested. The bid solicitation is intended to result in the award of a contract for 2 years, plus 8 one-year irrevocable options allowing Canada to extend the term of the contract. Although Canada may make the Unified Energy, Emissions, and Economy Modeling Solution available to any or all of the Clients, this bid solicitation does not preclude Canada from using another method of supply for entities of the Government of Canada with the same or similar needs.
- (b) The initial Client is Environment and Climate Change Canada (EC). However, this bid solicitation will also allow Canada to make the Software Solution available to Natural Resources Canada (NRCan) and the National Energy Board (NEB).
- (c) The requirement is subject to the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), the Canada-Chile Free Trade Agreement (CCFTA), the Canada-Peru Free Trade Agreement (CPFTA), the Canada-Colombia Free Trade Agreement (CCoIFTA), the Canada-Panama Free Trade Agreement (CPanFTA) if it is in force, and the Agreement on Internal Trade (AIT).
- (d) The Federal Contractors Program (FCP) for employment equity applies to this procurement: see Part 5 - Certifications, Part 7 - Resulting Contract Clauses and the form titled "Federal Contractors Program for Employment Equity - Certification".

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1.3 Debriefings

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

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

- (a) All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.
- (b) Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.
- (c) The 2003 (2016-04-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation. If there is a conflict between the provisions of 2003 and this document, this document prevails.
- (d) "Subsection 3 of Section 01, Integrity Provisions - Bid of Standard Instructions 2003 incorporated by reference above is deleted in its entirety and replaced with the following:

3. List of Names

- a) Bidders who are incorporated or who are a sole proprietorship, including those bidding as a joint venture, have already provided a list of names of all individuals who are directors of the Bidder, or the name of the owner(s), at the time of submitting an arrangement under the Request for Supply Arrangement (RFSA).
- b) These Bidders must immediately inform Canada in writing of any changes affecting the list of directors during this procurement process.
- (e) Subsection 5(4) of 2003, Standard Instructions - Goods or Services - Competitive Requirements is amended as follows:
 - (i) Delete: 60 days
 - (ii) Insert: 180 days

2.2 Submission of Bids

- (a) Bids must be submitted only to Public Works and Government Services Canada PWGSC Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.
- (b) Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

2.3 Former Public Servant

- (a) Information Required

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 awarded to FPSs, bidders must provide the information required below before contract award.
- (b) 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.

(c) Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes () No ()**

If so, the Bidder 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, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental web sites 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](#).

(d) Work Force Adjustment Directive

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **Yes () No ()**

If so, the Bidder 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 - Bid Solicitation

- (a) All enquiries must be submitted in writing to the Contracting Authority no later than 10 calendar days before the bid closing date. Enquiries received after that time may not be answered.
- (b) Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.5 Applicable Laws

- (a) Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Note to Bidders: Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of its choice without affecting the validity of its bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of its choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidder. *Bidders are requested to indicate the Canadian province or territory they wish to apply to any resulting contract in their Bid Submission Form.*

2.6 Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reasons for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority in accordance with the article entitled "Enquiries - Bid Solicitation". Canada will have the right to accept or reject any or all suggestions.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

- (a) **Copies of Bid:** Canada requests that Bidders provide their bid in separately bound sections as follows:

- (i) Section I: Technical Bid (5 hard copies and 2 soft copies on a CD or DVD or USB key)
- (ii) Section II: Financial Bid (1 hard copy and 1 soft copy on as CD or DVD or USB key)
- (iii) Section III: Certifications (1 hard copy)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

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

- (b) **Format for Bid:** Canada requests that Bidders follow the format instructions described below in the preparation of their bid:

- (i) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (ii) use a numbering system that corresponds to the bid solicitation;
- (iii) include a title page at the front of each volume of the bid that includes the title, date, bid solicitation number, bidder's name and address and contact information of its representative; and
- (iv) include a table of contents.

- (c) **Canada's Policy on Green Procurement:** In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process. See the Policy on Green Procurement (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Bidders should:

- (i) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing a minimum of 30% recycled content; and
- (ii) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, and using staples or clips instead of cerlox, duotangs or binders.

- (d) **Submission of Only One Bid:**

- (i) A Bidder, including related entities, will be permitted to submit only one bid in response to this bid solicitation. If a Bidder or any related entities participate in more than one bid (participating means being part of the Bidder, not being a subcontractor), Canada will provide those Bidders with 2 working days to identify the single bid to be considered by Canada. Failure to meet this deadline will result in all the affected bids being disqualified.
- (ii) For the purposes of this Article, regardless of the jurisdiction where any of the entities concerned is incorporated or otherwise formed as a matter of law (whether that entity is a natural person, corporation, partnership, etc), an entity will be considered to be "**related**" to a Bidder if:

- (A) they are the same legal entity (i.e., the same natural person, corporation, partnership, limited liability partnership, etc.);
 - (B) they are "related persons" or "affiliated persons" according to the *Canada Income Tax Act*;
 - (C) the entities have now or in the two years before bid closing had a fiduciary relationship with one another (either as a result of an agency arrangement or any other form of fiduciary relationship); or
 - (D) the entities otherwise do not deal with one another at arm's length, or each of them does not deal at arm's length with the same third party.
- (iii) Individual members of a joint venture cannot participate in another bid, either by submitting a bid alone or by participating in another joint venture.
- (e) **Joint Venture Experience:**

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

Example: A bidder is a joint venture consisting of members L and O. A bid solicitation requires that the bidder demonstrate experience providing maintenance and help desk services for a period of 24 months to a customer with at least 10,000 users. As a joint venture (consisting of members L and O), the bidder has previously done the work. This bidder can use this experience to meet the requirement. If member L obtained this experience while in a joint venture with a third party N, however, that experience cannot be used because the third party N is not part of the joint venture that is bidding.

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

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

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

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

- Contracts all signed by A;

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

That show in total 100 billable days.

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

3.2 Section I: Technical Bid

- (a) The technical bid consists of the following:

- (i) **Bid Submission Form (Attached as Form 1):** Bidders are requested to include the Bid Submission Form - 1 with their bids. It provides a common form in which bidders can provide information required for evaluation and contract award, such as a contact name and the Bidder's Procurement Business Number, etc. Using the form to provide this information is not mandatory, but it is recommended. If Canada determines that the information required by the Bid Submission Form is incomplete or requires correction, Canada will provide the Bidder with an opportunity to do so.
- (ii) **Substantiation of Mandatory and Rated Technical, Corporate and Resources Compliance:** The technical bid must substantiate the compliance with the specific articles of Attachment 3.1 – Bid Evaluation Criteria - Technical Compliance, Attachment 3.2 – Corporate Evaluation Criteria and Attachment 3.3 – Resources Evaluation Criteria, which are the requested formats for providing the substantiation. The substantiation must not simply be a repetition of the requirements and carry out the required Work. Simply stating that the Bidder or its proposed solution or product complies is not sufficient. Where Canada determines that the substantiation is not complete, the Bidder will be declared non-responsive and disqualified. The substantiation may refer to additional documentation submitted with the bid - this information can be referenced in the "Bidder's Response" column of the Substantiation of Attachment 3.1 and Attachment 3.2 and Attachment 3.3, where bidders are requested to indicate where in the bid the reference material can be found, including the title of the document, and the page and paragraph numbers; where the reference is not sufficiently precise, Canada may request that the Bidder direct Canada to the appropriate location in the documentation.
- (iii) **Previous Similar Projects:** Where the bid must include a description of previous similar projects: (i) a project must have been completed by the Bidder itself (and cannot include the experience of any proposed subcontractor or any affiliate of the Bidder); (ii) a project must have been commenced by the bid closing date; (iii) each project description must include, at minimum, the name and either the telephone number or e-mail address of a customer reference; and (iv) if more similar projects are provided than requested, Canada will decide in its discretion which projects will be evaluated.
- (iv) **Proposed Resources:** The technical bid must include résumés for the resources identified in Attachment 3.3. The Technical Bid must demonstrate that each proposed individual meets the qualification requirements described (including any educational requirements, work experience requirements, and professional designation or membership requirements). With respect to résumés and resources:
- (A) Proposed resources may be employees of the Bidder or employees of a subcontractor, or these individuals may be independent contractors to whom the Bidder would subcontract a portion of the Work (refer to Part 5, Certifications).

- (B) For educational requirements for a particular degree, designation or certificate, PWGSC will only consider educational programs that were successfully completed by the resource by the time of bid closing. If the degree, designation or certification was issued by an educational institution outside of Canada, the Bidder must provide a copy of the results of the academic credential assessment and qualification recognition service issued by an agency or organization recognized by the Canadian Information Centre for International Credentials (CICIC).
- (C) For requirements relating to professional designation or membership, the resource must have the required designation or membership by the time of bid closing and must continue, where applicable, to be a member in good standing of the profession or membership throughout the evaluation period and Contract Period. Where the designation or membership must be demonstrated through a certification, diploma or degree, such document must be current, valid and issued by the entity specified in this solicitation. If the entity is not specified, the issuer must have been an accredited or otherwise recognized body, institution or entity at the time the document was issued. If the degree, diploma or certification was issued by an educational institution outside of Canada, the Bidder must provide a copy of the results of the academic credential assessment and qualification recognition service issued by an agency or organization recognized by the Canadian Information Centre for International Credentials (CICIC).
- (D) For work experience, PWGSC will not consider experience gained as part of an educational program, except for experience gained through a formal co-operative program at a post-secondary institution.
- (E) For any requirements that specify a particular time period (e.g., 2 years) of work experience, PWGSC will disregard any information about experience if the technical bid does not include the relevant dates (month and year) for the experience claimed (i.e., the start date and end date). PWGSC will evaluate only the duration that the resource actually worked on a project or projects (from his or her start date to end date), instead of the overall start and end date of a project or a combination of projects in which a resource has participated.
- (F) For work experience to be considered by PWGSC, the technical bid must not simply indicate the title of the individual's position, but must demonstrate that the resource has the required work experience by explaining the responsibilities and work performed by the individual while in that position. In situations in which a proposed resource worked at the same time on more than one project, the duration of any overlapping time period will be counted only once toward any requirements that relate to the individual's length of experience.
- (v) **Description of the Bidder's Maintenance and Support Services:** The Bidder should include a description of its maintenance and support services for the Unified Energy, Emissions, and Economy Modeling Solution, which must be consistent with all the requirements described in the Resulting Contract Clauses, including the Statement of Work. At a minimum, the Bidder should describe its:
 - (A) Problem reporting and response procedures;
 - (B) Escalation procedures;
 - (C) On-site support availability; and
 - (D) Any enhancements to the basic requirements that the Bidder is offering.

The Bidder may also describe any other information it considers relevant.

(vi) **Customer Reference Contact Information:**

(A) In conducting its evaluation of the bids, Canada may, but will have no obligation to request that a bidder provide customer references. If Canada sends such a written request, the bidder will have 2 working days to provide the necessary information to Canada. Failure to meet this deadline will result in the bid being declared non-responsive. These customer references must each confirm if requested by PWGSC, the facts identified in the Bidder's bid.

(B) The form of question to be used to request confirmation from customer references is as follows:

____ Yes, the Bidder has provided my organization with the services described above.

____ No, the Bidder has not provided my organization with the services described above.

____ I am unwilling or unable to provide any information about the services described above.

(C) For each customer reference, the Bidder must, at a minimum, provide the name and e-mail address for a contact person. If only the telephone number is provided, it will be used to call to request the e-mail address and the reference check will be done by e-mail.

Bidders are also requested to include the title of the contact person. It is the sole responsibility of the Bidder to ensure that it provides a contact who is knowledgeable about the services the Bidder has provided to its customer and who is willing to act as a customer reference. Crown references will be accepted.

(vii) **List of Proposed Software:** The Bidder must include a complete list identifying both the name and the version number of each component of the Licensed Software required for the proposed Software Solution.

3.3 Section II: Financial Bid

- (a) **Pricing:** Bidders must submit their financial bid in accordance with the Basis of Payment in Attachment 3.4 - Financial Bid. The total amount of Applicable Taxes must be shown separately. Unless otherwise indicated, bidders must include a single, firm, all-inclusive price quoted in Canadian dollars in each cell requiring an entry in the pricing tables.
- (b) **Variation in Resource Rates By Time Period:** For any given resource category, where the financial tables provided by Canada allow different firm rates to be charged for a resource category during different time periods:
- (i) the rate bid must not increase by more than 5% from one time period to the next, and
 - (ii) the rate bid for the same resource category during any subsequent time period must not be lower than the rate bid for the time period that includes the first month of the Initial Contract Period.
- (c) **All Costs to be Included:** The financial bid must include all costs for the requirement described in the bid solicitation for the entire Contract Period, including any option to extend the Contract Period. The identification of all necessary equipment, software, peripherals,

Solicitation No. - N° de l'invitation
K1A12-160736/A
Client Ref. No. - N° de réf. du client
K1A12-160736

Amd. No. - N° de la modif.
File No. - N° du dossier
615eIK1A12-160736

Buyer ID - Id de l'acheteur
615eI
CCC No./N° CCC - FMS No./N° VME

cabling and components required to meet the requirements of the bid solicitation and the associated costs of these items is the sole responsibility of the Bidder.

- (d) **Blank Prices:** Bidders are requested to insert "\$0.00" for any item for which it does not intend to charge or for items that are already included in other prices set out in the tables. If the Bidder leaves any price blank, Canada will treat the price as "\$0.00" for evaluation purposes and may request that the Bidder confirm that the price is, in fact, \$0.00. No bidder will be permitted to add or change a price as part of this confirmation. Any bidder who does not confirm that the price for a blank item is \$0.00 will be declared non-responsive.

3.4 Section III: Certifications

It is a requirement that bidders submit the certifications required under Part 5.

ATTACHMENT 3.1

BID EVALUATION CRITERIA – TECHNICAL COMPLIANCE

1.0 Mandatory Requirements

CANADIAN MODELING SOLUTION (E3MC)

E3MC must, in a dynamic and interactive manner, respond to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection related to any change in either energy-related or economic-related variables. These variables are fed in from the Canadian macroeconomic model and ENERGY2020-Canada.

E3MC is a Canadian energy, emissions and economic modeling solution that dynamically links **ENERGY2020-Canada** to a customized **Canadian macroeconomic model** and provides the users with:

1. **Functionality**, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness**, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met.
3. **Compliance**, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities.
4. **Innovation**, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities.
5. **Conformity** to Government of Canada's Operating Environment, such that it operates on
 - a) Microsoft Windows XP or higher, and
 - b) Windows Excel 2007, 2010 or 2013, and
 - c) Office 2010 and higher.
6. **Data sharing flexibility**, such that it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls,xlsx, cvs, txt, accdb and dbf.
7. **Timing of Deliverables**, such that the Contractor provides ECCC with
 - a) A licence to their current off-the-shelf Canadian macroeconomic model (Mandatory 3 and 4) at **contract signing**.
 - b) All future required functionalities listed (Mandatory 5 to Mandatory 29) **within 30 months of contract signing**.

Important instructions for Mandatory 1 to 29

1. It is essential that each Mandatory requirement be fully addressed within the "Bidder's Response" column of the Substantiation of Attachment 3.1.
2. Where a Mandatory requirement consists of a main item plus a listing of one or more sub criteria, each and every sub criteria must be explicitly addressed.
3. A Bidder may address each Mandatory requirement by way of:
 - a) Redirecting the evaluator to a specific section of the bid. This section of the bid must clearly illustrate how each Mandatory requirement (including each sub criteria) will be addressed by way of statement of understanding or a methodology.

Or,

 - b) Explicitly addressing within the grid how each Mandatory requirement (including each sub criteria) will be addressed by way of statement of understanding or a methodology.

CANADIAN MACROECONOMIC MODEL

Mandatories 3 to 18 represent the requirements for the Canadian macroeconomic model to be delivered **within 30 months of contract signing**.

		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 1	<p>The bidder must provide a global work plan that outlines in detail how the bidder proposes to carry out Mandatory 3 to 29 to achieve the project objectives. This global work plan must include visuals such as diagrams, tables, graphics or screenshots.</p> <p>The following items must be addressed, if applicable:</p> <ul style="list-style-type: none"> • Overview: <ol style="list-style-type: none"> a. Purpose, Background, Scope and Objectives; 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

	<ul style="list-style-type: none"> b. Assumptions, Constraints and Risks; c. Contract Deliverables; d. Organization Summary; and e. Schedule Summary. • Management Processes: <ul style="list-style-type: none"> f. Project Management Approach and Procedures; g. Schedule Control; h. Budget Control; i. Reporting; j. Problem Resolution; k. Project Work Tasks/Elements Closing; l. Support. 	
Mandat ory 2	The bidder must provide high-level estimate of the timeline, such as the number of weeks or months, required to deliver Mandatory 3 to 29.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
As per the Mandatory 1, the Global work plan must outlines in detail how the bidder proposes to carry out Mandatory 3 to 29.		
Mandat ory 3	At contract awarding, the Bidder must provide a licence to their current off-the-shelf CANADIAN MACROECONOMIC MODEL	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 4	At contract awarding, the Bidder must provide a user training and information session and model documentation (e.g., variable definitions and user manual) on their current off-the-shelf CANADIAN MACROECONOMIC MODEL	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 5	<p>Within 30 months of contract signing, the Contractor must provide ECCC with a customized MACROECONOMIC MODEL that will be:</p> <ol style="list-style-type: none"> 1. A 10-province and 3-territory dynamic macroeconomic model of the Canadian economy with foreign and regional linkages. 2. Based on Statistics Canada's latest* input-output tables at the national- and provincial-level including all interprovincial and international trade flows (http://www5.statcan.gc.ca/subject-sujet/result-resultat.action?pid=3764&id=2745&lang=eng&type=DAILYART&pageNum=1&more=0). 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<p>3. Fully aligned with Statistics Canada's Canadian National System of Accounts (CSNA2012).</p> <p>4. Reflects Statistics Canada's latest** North American Industrial Classification System (NAICS).</p> <p>*As of the creation of this Mandatory Criteria, the latest input-output tables were released in November/December 2016.</p> <p>***As of the creation of this Mandatory Criteria, the latest reference year for NAICS is 2007.</p>	
Mandatory 6	<p>Model I/O Dimension– The bid must clearly specify how the model links final demand with the supply-side activities at national, provincial and territorial levels.</p> <p>The bid must clearly demonstrate how they will integrate the input-output relationships into the model.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 7	<p>Model Purpose– The customized macroeconomic model must serve two purposes: forecasting and simulation analysis.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 8	<p>Model Operation– The customized macroeconomic model must run as a Stand-Alone Model and in combination with ENERGY2020 –Canada.</p> <p>The Standalone feature will include options to run a stand-alone provincial or regional economic model. The model must solve uniquely for each province and territory using their respective input-output tables. The Contractor must clearly demonstrate how they will integrate the input-output relationships into the model.</p> <p>Note: Final demand feeds into a demand-for-energy converter matrix plus a technology matrix. The output of this feeds into the input-output estimate of gross output; gross output feeds into a value-added share matrix to produce gross domestic product at basic prices. The provincial and territorial models are required to sum-up to Canada.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 9	<p>Major Blocks–The bid must explicitly outline how major blocks will be built into the model. Example of major blocks include:</p> <ol style="list-style-type: none"> 1. Aggregate Demand 2. Labour 3. Price/Wage 4. Income/Saving and Wealth 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<p>5. Government 6. Financial 7. Foreign</p>	
<p>Mandatory 10</p>	<p>Model Sectors and Concepts-The bid must provide details regarding how the customized model will capture the dynamics of the following broad sectors and concepts:</p> <ul style="list-style-type: none"> • Firms employ intermediate materials, capital, and labour to produce an output and supply financial instruments • Households consume domestic and foreign products, supply labour and demand financial assets • Governments collect taxes, purchase domestic and foreign products, produce output and supply financial instruments • Foreigners or agents out the province purchase products produced in the province, supply foreign products, and demand and supply financial instruments • Markets correspond to the domestic and foreign products, the labour market and financial market. Each of these markets is concerned with the determination of demand, supplies and prices. 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 11</p>	<p>Model Structure-The bid must provide details regarding how the customized model will respond to the figure below.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 12</p>	<p>Industrial Sector Dimension- The bid must provide a detailed of the industrial sector dimensions in the model and must demonstrate how the industrial and detailed energy sector dimensions in the macro model will be mapped to the ENERGY2020-CANADA sectors (Appendix 2).</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 13</p>	<p>The bidder must specify the function for the following concepts:</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE</p>

	<ol style="list-style-type: none"> 1. Consumer spending is driven by real income, wealth and interest rates. 2. Investment is driven by the return on investment and changes in capacity utilization. 3. Exports and imports reflecting domestic demand and competitiveness. 4. Wages move with inflation, productivity and unemployment relative to the natural rate. 5. Prices are a mark-up on unit costs, and profit margins are a function of the output gap. 6. Monetary policy is modelled to reflect central bank behaviour. 7. Exchange rates are determined by relative productivity and net external assets in the long run, and by movements in relative interest rates in the short run. 	<p><i>DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>
<p>Mandatory 14</p>	<p>Gross Domestic Product—The bid must explicitly illustrate how the model calculates national and provincial GDP in the following ways:</p> <ol style="list-style-type: none"> 1. Expenditure Based 2. Income Based 3. Factor Cost 4. Chained Weighted <p>Note: GDP at Factor Cost must be produced as listed in Appendix 1. Where the data is suppressed or confidential, the Bidder must clearly illustrate the methodology that will be used to produce reasonable estimates for those suppressed data series. In addition, the national, provincial and territorial models must have at least the sectors listed in Appendix 2 and these sectors must be fully aligned to Statistics Canada's new CSNA2012.</p>	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>
<p>Mandatory 15</p>	<p>Indicators—Key economic indicators must be provided by the macroeconomic model. These should be a direct reflection of the major blocks and concepts listed in Mandatory 11 and must include:</p> <ol style="list-style-type: none"> 1. Price Indexes, GDP expenditure-based, income-based, and at factor cost 2. Interest Rates, major short- and long-term 3. Consumer Price Indexes, by detailed final consumption category 4. Commodity Prices and Indices 5. Exchange Rates, by major trading partner 6. Population 7. Labour Supply, Employment and Unemployment 8. Migration, International and Interprovincial 	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>

<p>Mandat ory 16</p>	<p>Forecast Calibration and Tuning—The macroeconomic reference forecast must be:</p> <ol style="list-style-type: none"> Calibrated in the short-term: align the short-term projection with the projections outlined in Finance Canada’s most recently available Budget or Fiscal and Economic Update projections. Calibrated in the long-term: align the long-term Canadian forecast to Finance Canada’s long-term forecast. Tuned: detailed industry and demand variables must be fine-tuned for near-term expectations. <p>Note: This forecast will be used to send initial parameters to ENERGY2020 Canada. ENERGY2020 Canada contains detailed energy-related information. When the macroeconomic model is linked to ENERGY2020-Canada and the two models iterate, a new integrated equilibrium solution will be reached. The model must allow for the fine-tuning of the resulting macroeconomic projection to Finance Canada’s short-term and long-term economic indicators.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandat ory 17</p>	<p>Simulation Features— The bid must explicitly specify how the model will incorporate the policy initiatives and structural changes (e.g. new investment by business) made in a province or territory and how their impacts will be transformed across other provinces, territories and at national level.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandat ory 18</p>	<p>The customized model will include the following standard features:</p> <ol style="list-style-type: none"> Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. Allow the user to produce a number of standard tables from any database. Allows the user to implement a number of standard shocks to perform scenario analysis Allow the user to download data into spreadsheets and other data handling packages. Allow the user to compare data across alternative scenarios. <p>The Bidder must discuss how the customized model will respond to each element. Each element must be explicitly discussed.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>

CANADIAN INTERFACE MODULE

Mandatory 19 to 23 represent the requirements related to the **unifying interface module** that must be built to dynamically integrate the Canadian macroeconomic model with ENERGY2020-Canada. These must be delivered **within 30 months of contract signing**.

		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 19	Developing Automated Interface Module —The Bidder must develop an automated linking interface module between ENERGY2020-Canada and the macroeconomic model.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 20	Seamless Integration —The bid must illustrate how the interface module will ensure a dynamic and seamless integration.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 21	Interface Module —A key feature of the interface module is that ENERGY2020-Canada will be the 'command' program, controlling the execution of ENERGY2020-Canada and the macroeconomic model. This interface module must: <ol style="list-style-type: none"> 1. Override the macroeconomic model's energy block and allow ENERGY2020-Canada energy block to drive the macroeconomic model. 2. Iterate variables between the Canadian macroeconomic model and ENERGY2020-Canada until both models reach convergence. 3. Ensure that the Canadian macroeconomic model and ENERGY2020-Canada respond in a dynamic and interactive manner to changes introduced through energy and macroeconomic projection and reporting variables to produce a unique integrated energy, emissions and economic projection. These projection and reporting variables must be sensitive to the analysis of energy, 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<p>environment, and environment-related proposals and candidate initiatives of the Government of Canada.</p> <p>4. Linkages between ENERGY2020-Canada and the macroeconomic model must allow for simulation of the real-time impact of energy and environmental concerns on the economy and vice versa. ENERGY2020-Canada uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. Appendix 3 outlines the current sector structure of E3MC.</p> <p>5. An integrating program will need to be written to parse the output from the macroeconomic model output files and read the economic variables into a Promula database (see Note below). The code for the data transfers must be incorporated into the interface module between ENERGY2020-Canada and macroeconomic model.</p> <p>Note: ENERGY2020-Canada is the 'command program' and is written in Promula programming language while the existing interface module is written in Visual Basic. This interface module provides the ability to project ENERGY2020-Canada variables using executable code originating from the macroeconomic model.</p>	
<p>Mandatory 22</p>	<p>Interface Module Operation and Solution—To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020-Canada on a dynamic and integrated basis. As the modeling solution solves, each iteration must include:</p> <ol style="list-style-type: none"> 1. Extracting the data from the macroeconomic model. 2. Transferring the data to ENERGY2020-Canada. 3. Executing ENERGY2020-Canada. 4. Extracting data from ENERGY2020-Canada. 5. Transferring the data to the macroeconomic model. 6. Executing the macroeconomic model. <p>Note: The 'iteration' can be repeated as many times as needed.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 23</p>	<p>Data Transfer—Specific variables to be sent between ENERGY2020-Canada and the macroeconomic model will vary based on the policy being analyzed. The bid must identify:</p> <ol style="list-style-type: none"> a) Key macroeconomic variables to be passed from the macroeconomic model to ENERGY2020-Canada. 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

	<p>b) Key energy market related variables to be passed from ENERGY2020-Canada to the macroeconomic.</p> <p>c) How data will be Transferred—Variables in ENERGY2020-Canada will need to be aggregated into the macroeconomic model regions and mapped to the macroeconomic model economic categories before sending them as input. For example, ENERGY2020 reports barrels or BTUs of crude oil by type, while the macroeconomic model reports \$ value of crude oil.</p>	
<p align="center">E3MC TESTING, ANALYSIS, SCENARIO DEVELOPMENT AND OTHER</p> <p>Mandatory 24 to 29 must illustrate how E3MC will allow ECCC to test, analyze and develop scenarios. These must be delivered within 30 months of contract signing</p>		
		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 24	<p>Successful Integration Process—To ensure a successful integration process, the following must be accomplished:</p> <ol style="list-style-type: none"> 1. Inserting and Extracting Data—Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020-Canada. 2. Coding: <ol style="list-style-type: none"> a) Write code to insert data, extract data, and execute the macroeconomic model. Debug and test this code to ensure the results match the test case. b) Write code to extract data from the output of the model 'run(s)' such that it can be called directly into the transfer routine. c) Generate code for ENERGY2020-Canada to insert data into the macroeconomic model directly via the selected transfer routine and language. d) Combine the code which inserts data, extracts data, and executes the macroeconomic model with the code which inserts data, extracts data, and executes ENERGY2020-Canada to create an integrated solution 	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>

	<p>3. Convergence Criteria—Convergence rules may be required to limit the number of iterations needed to create a solution</p> <p>4. Endogenous Interaction—ENERGY2020-Canada and the macroeconomic model must interact endogenously through changes in energy variables such as production, prices, energy intensities, investment in energy industries, as well as macroeconomic variables. For each iteration period, energy supply and demand results from ENERGY2020-Canada will be automatically transferred to the macroeconomic model via the interface module.</p> <p>5. Testing—Create a test case of output data generated by modifying the macroeconomic input data.</p> <p>Note: A successful integrated solution is achieved when the macroeconomic model incorporates energy results from ENERGY2020-Canada into a new macroeconomic projection for that period. The new macroeconomic data is returned to ENERGY2020-Canada to create a new energy projection for the next iteration period. This process of using output from one iteration as input to the next is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy</p>	
<p>Mandat ory 25</p>	<p>E3MC Testing—Once the interconnections are established between the macroeconomic model and ENERGY2020-Canada, E3MC must undergo extensive testing to ensure that the new structure can assess the impact of multiple policy options. Testing must ensure that:</p> <ol style="list-style-type: none"> 1. Response Signals—Each model is responding to signals being sent from the other model. 2. Integration Failure—There will not be failure during the integration procedure between the two models. <p>Note: ECCC staff must be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the testing and review of output from both ENERGY2020-Canada and the macroeconomic model.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandat ory 26</p>	<p>Stress Testing—E3MC must be tested to ensure the successful interconnection of the customized macroeconomic model to ENERGY2020-Canada.</p> <p>Once the interconnections are established between the customized macroeconomic model and ENERGY2020-Canada, the integrated modeling solution (E3MC) must undergo extensive testing to ensure that the new structure</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>

	<p>correctly assesses the impact of multiple policy options. This must include:</p> <ol style="list-style-type: none"> 1. Stress-Testing of Modeling Solution: Testing must ensure that each model is responding reasonably to signals being sent from the other model. Stress-testing must ensure that there will not be failure during the interaction between the two models. 2. Consistency between macro model and ENERGY2020: The Bidder must ensure the thorough review of and adjustments to inputs and outputs, including: <ol style="list-style-type: none"> a) Financial input variables b) Financial output files c) Electricity and natural gas dispatch routines d) Commodity trading inflow/outflow including CO2 permit trading <p>Note: ECCC staff must be involved at all stages of testing to ensure that the model meets expectations. This includes design of the test and review of output from ENERGY2020-Canada and the customized macroeconomic model.</p>	
<p>Mandat ory 27</p>	<p>Integrated Reference Development—When the Canadian macroeconomic model is fully calibrated (aligned with Finance Canada’s forecast) and used as input to the ENERGY2020-Canada model, the new macroeconomic reference case forecast will be used for the following main functions:</p> <ol style="list-style-type: none"> 1. Policy Analysis: The model must have the capacity and flexibility to address ECCC regulatory or incentive policy at the required national- and provincial-level of sector detail. This includes regulatory analyses for oil, gas and emissions intensive trade exposed industries (EITE), and oil, gas and electricity. Note: Statistics Canada’s CANSIM Table 379-0030 provides the provincial-level of sector detail. 2. Policy Scenario-Building: Scenarios are built and tested by adjusting parameters such as device and process efficiency, capital costs, market shares, device lifetimes, non-price factors, emission coefficients, taxes, etc. Scenarios with multiple policies are run simultaneously and the model keeps track of interaction effects, rebound effects, etc. 3. Emission Trends Update: For the residential, commercial, manufacturing, oil and gas, transportation and electricity sectors as well as process emissions, prices and air pollutants. 	
<p>Mandat ory 28</p>	<p>Scenario Development and Analysis—E3MC must allow for the following types of scenario development and analysis:</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE</p>

	<ol style="list-style-type: none"> 1. Long-term Scenarios—Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation. 2. Regional Analysis—Analyze the regional, provincial and aggregate macroeconomic impacts (for example gross domestic product, industry gross output, employment, personal disposable income, tax interaction, government revenues/expenditures, and sector-specified competitiveness effects) of a range of energy and environment policy initiatives 3. Analyze Spillover Effects—Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US. 4. Analyze Joint Initiatives—Analyze joint Canada-US environment and energy policy initiatives. 5. Analyze Alternative Proposals—Analyze alternative provincial and industry proposals for achieving environmental goals. 	<p><i>THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>
<p>Mandatory 29</p>	<p>The integrated E3MC model will include the following standard features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios. <p>The Bidder must discuss how the customized model will respond to each element. Each element must be explicitly discussed.</p>	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>

US MODELING SOLUTION (E3US)

E3US is a US energy, emissions and economic modeling solution that links **ENERGY2020-US** to a customized **US macroeconomic model** and provides the users of E3US with:

1. **Functionality**, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness**, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met.
3. **Compliance**, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities.
4. **Innovation**, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities.
5. **Conformity to Government of Canada's Operating Environment**, such that it operates on
 - a) Microsoft Windows XP or higher, and
 - b) Windows Excel 2007, 2010 or 2013, and
 - c) Office 2010 and higher.
6. **Data sharing flexibility**, such that it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls,xlsx, cvs, txt, accdb and dbf.
7. **Timing of Deliverables**, such that the Contractor provides ECCC with
 - a) A licence to their current off-the-shelf American macroeconomic model (Mandatory 32 and 33) at **contract signing**.
 - b) All future required functionalities listed (Mandatory 32 to Mandatory 49) **within 30 months of contract signing**.

Important instructions for Mandatory 30 to 49

1. It is essential that each Mandatory requirement be fully addressed within the "Bidder's Response" column of the Substantiation of Attachment 3.1.
2. Where a Mandatory requirement consists of a main item plus a listing of one or more sub criteria, **each and every** sub criteria must be explicitly addressed.
3. A Bidder may address each Mandatory requirement by way of:
 - a) Redirecting the evaluator to a specific section of the bid. This section of the bid must clearly illustrate how each Mandatory requirement (including each sub criteria) will be addressed by way of **statement of understanding** or a **methodology**.

Or,

b) Explicitly addressing within the grid how each Mandatory requirement (including each sub criteria) will be addressed by way of **statement of understanding** or a **methodology**.

US MACROECONOMIC MODEL

Mandatory 32 to 39 represent the requirements for the US macroeconomic model. These must be delivered **within 30 months of contract signing**.

		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 30	<p>The bidder must provide a global work plan that outlines in detail how the contractor proposes to carry out Mandatory 32 to 49 to achieve the project objectives. This work plan must include visuals such as diagrams, tables, graphics or screenshots.</p> <p>The following items must be addressed, if applicable:</p> <ul style="list-style-type: none"> • Overview: <ul style="list-style-type: none"> a. Purpose, Background, Scope and Objectives; b. Assumptions, Constraints and Risks; c. Contract Deliverables; d. Organization Summary; and e. Schedule Summary. • Management Processes: <ul style="list-style-type: none"> f. Project Management Approach and Procedures; g. Schedule Control; h. Budget Control; i. Reporting; j. Problem Resolution; k. Project Work Tasks/Elements Closing; l. Support 	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>
Mandatory 31	<p>The bidder must provide high-level estimate of the timeline, such as the number of weeks or months, required to deliver Mandatory 32 to 49.</p>	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>

As per the Mandatory 30, the Global work plan must outlines in detail how the bidder proposes to carry out Mandatory 32 to 49.		
Mandat ory 32	At contract awarding, the Bidder must provide a licence to their current off-the-shelf US MACROECONOMIC MODEL	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 33	At contract awarding, the Bidder must provide a user training and information session and model documentation (e.g., variable definitions and user manual) on their current off-the-shelf US MACROECONOMIC MODEL	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 34	The US macroeconomic models must serve two purposes: forecasting and simulation analysis.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 35	Model Operation – The US macroeconomic model must run as a Stand-Alone Model and in combination with ENERGY2020 –US. The Standalone feature will include options to run a stand-alone state or regional economic model. The model must solve uniquely for each state or region using their respective input-output tables. The Contractor must clearly demonstrate how they will integrate the input-output relationships into the model.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandat ory 36	Model Sectors and Concepts -The bid must provide details regarding how the US macroeconomic model will capture the following broad sectors and concepts: <ul style="list-style-type: none"> • Firms employ intermediate materials, capital, and labour to produce an output and supply financial instruments • Households consume domestic and foreign products, supply labour and demand financial assets • Governments collect taxes, purchase domestic and foreign products, produce output and supply financial instruments • Foreigners or agents out the state purchase products produced in the province, supply foreign products, and demand and supply financial instruments 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<ul style="list-style-type: none"> • Markets correspond to the domestic and foreign products, the labour market and financial market. Each of these markets is concerned with the determination of demand, supplies and prices. 	
Mandatory 37	<p>Forecast Calibration and Tuning—The macroeconomic must have the flexibility to allow ECCC to calibrate and fine-tune the model’s macroeconomic to official US forecasts.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 38	<p>Simulation Features— The bid must explicitly specify how the model will incorporate the policy initiatives and structural changes (e.g. new investment by business) made in a state or region and how their impacts will be transformed across other states and at national level.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 39	<p>The US macroeconomic model will include the following features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios. <p>The Bidder must discuss how the customized model will respond to each element. Each element must be explicitly discussed.</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

US INTERFACE MODULE

Mandatory 40 to 44 represent the requirements related to the **unifying interface module** that will be used to integrate the US macroeconomic model with ENERGY 2020 (US). **These must be delivered within 30 months of contract signing.**

		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE (BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 40	Developing an Automated Interface Module —The Bidder must develop an automated linking interface module between ENERGY2020-US and the US macroeconomic model.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 41	Seamless Integration —The bid must illustrate how the interface module will ensure a dynamic and seamless integration.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 42	Interface Module —A key feature of the interface module is that ENERGY2020-US will be the 'command' program, controlling the execution of ENERGY2020-US and the macroeconomic model. This interface module must: 1. Override the macroeconomic model's energy block and allow ENERGY2020-US energy block to drive the macroeconomic model. 2. Iterate variables between the macroeconomic model and ENERGY2020-US until both models reach convergence.	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<p>3. Ensure that the macroeconomic model and ENERGY2020-US respond in a dynamic and interactive manner to changes introduced through energy and macroeconomic projection and reporting variables to produce a unique integrated energy, emissions and economic projection.</p> <p>4. Linkages between ENERGY2020-US and the macroeconomic model must allow for simulation of the real-time impact of energy and environmental concerns on the economy and vice versa. ENERGY2020-US uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. Appendix 3 outlines the current sector structure of E3MC.</p> <p>5. An integrating program will need to be written to parse the output from the macroeconomic model output files and read the economic variables into a Promula database (see Note below). The code for the data transfers must be incorporated into the interface module between ENERGY2020-US and macroeconomic model.</p> <p>Note: ENERGY2020-US is the 'command program' and is written in Promula programming language while the existing interface module is written in Visual Basic. This interface module provides the ability to project ENERGY2020-Canada variables using executable code originating from the macroeconomic model.</p>	
<p>Mandat ory 43</p>	<p>Interface Module Operation and Solution—To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020-US on a dynamic and integrated basis. As the modeling solution solves, each iteration must include:</p> <ol style="list-style-type: none"> 1. Extracting the data from the macroeconomic model. 2. Transferring the data to ENERGY2020-US. 3. Executing ENERGY2020-US. 4. Extracting data from ENERGY2020-US. 5. Transferring the data to the macroeconomic model. 6. Executing the macroeconomic model. <p>Note: The 'iteration' can be repeated as many times as needed.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandat ory 44</p>	<p>Data Transfer—Specific variables to be sent between ENERGY2020-US and the macroeconomic model will vary based on the policy being analyzed. The bid must identify:</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE</p>

	<p>a) Key macroeconomic variables to be passed from the macroeconomic model to ENERGY2020-US.</p> <p>b) Key energy market related variables to be passed from ENERGY2020-US to the macroeconomic.</p> <p>c) How data will be Transferred—Variables in ENERGY2020-Canada will need to be aggregated into the macroeconomic model regions and mapped to the macroeconomic model economic categories before sending them as input. For example, ENERGY2020 reports barrels or BTUs of crude oil by type, while the macroeconomic model reports \$ value of crude oil.</p>	<p>DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>E3US TESTING, ANALYSIS AND OTHER</p> <p>Mandatory 45 to 49 must illustrate how E3US will allow ECCC to test, analyze and develop scenarios.</p>		
		<p>BIDDER'S RESPONSE</p>
	<p>TECHNICAL REQUIREMENT</p>	<p>DEMONST RATED EXPERIEN CE</p>
<p>Manda tory 45</p>	<p>Successful Integration Process—To ensure a successful integration process, the following must be accomplished:</p> <ol style="list-style-type: none"> 1. Inserting and Extracting Data—Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020-US. 2. Coding: <ol style="list-style-type: none"> a) Write code to insert data, extract data, and execute the macroeconomic model. Debug and test this code to ensure the results match the test case. b) Write code to extract data from the output of the model 'run(s)' such that it can be called directly into the transfer routine. c) Generate code for ENERGY2020-US to insert data into the macroeconomic model directly via the selected transfer routine and language. d) Combine the code which inserts data, extracts data, and executes the macroeconomic model with the code 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>

	<p>which inserts data, extracts data, and executes ENERGY2020-US to create an integrated solution</p> <ol style="list-style-type: none"> 3. Convergence Criteria—Convergence rules may be required to limit the number of iterations needed to create a solution 4. Endogenous Interaction—ENERGY2020-US and the macroeconomic model must interact endogenously through changes in energy variables such as production, prices, energy intensities, investment in energy industries, as well as macroeconomic variables. For each iteration period, energy supply and demand results from ENERGY2020-US will be automatically transferred to the macroeconomic model via the interface module. 5. Testing—Create a test case of output data generated by modifying the macroeconomic input data. <p>Note: A successful integrated solution is achieved when the macroeconomic model incorporates energy results from ENERGY2020-US into a new macroeconomic projection for that period. The new macroeconomic data is returned to ENERGY2020-US to create a new energy projection for the next iteration period. This process of using output from one iteration as input to the next is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy</p>	
<p>Mandatory 46</p>	<p>E3US Testing—Once the interconnections are established between the macroeconomic model and ENERGY2020-US, E3US must undergo extensive testing to ensure that the new structure can assess the impact of multiple policy options. Testing must ensure that:</p> <ol style="list-style-type: none"> 1. Response Signals—Each model is responding to signals being sent from the other model. 2. Integration Failure—There will not be failure during the integration procedure between the two models. <p>Note: ECCC staff must be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the testing and review of output from both ENERGY2020-Canada and the macroeconomic model.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 47</p>	<p>Stress Testing—E3US must be tested to ensure the successful interconnection of the US macroeconomic model to ENERGY2020-US.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

	<p>Once the interconnections are established between the US macroeconomic model and ENERGY2020-US, the integrated modeling solution (E3US) must undergo extensive testing to ensure that the new structure correctly assesses the impact of multiple policy options. This must include:</p> <ol style="list-style-type: none"> 1. Stress-Testing of Modeling Solution: Testing must ensure that each model is responding reasonably to signals being sent from the other model. Stress-testing must ensure that there will not be failure during the interaction between the two models. 2. Consistency between macro model and ENERGY2020: The Bidder must ensure the thorough review of and adjustments to inputs and outputs, including: <ol style="list-style-type: none"> a) Financial input variables b) Financial output files c) Electricity and natural gas dispatch routines d) Commodity trading inflow/outflow including CO2 permit trading <p>Note: ECCC staff must be involved at all stages of testing to ensure that the model meets expectations. This includes design of the test and review of output from ENERGY2020-US and the US macroeconomic model.</p>	
<p>Mandatory 48</p>	<p>Scenario Development and Analysis—E3US must allow for the following types of scenario development and analysis:</p> <ol style="list-style-type: none"> 1. Long-term Scenarios—Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation. 2. Regional Analysis—Analyze the regional, provincial and aggregate macroeconomic impacts (for example gross domestic product, industry gross output, employment, personal disposable income, tax interaction, government revenues/expenditures, and sector-specified competitiveness effects) of a range of energy and environment policy initiatives 3. Analyze Spillover Effects—Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US. 4. Analyze Joint Initiatives—Analyze joint Canada-US environment and energy policy initiatives. 5. Analyze Alternative Proposals—Analyze alternative provincial and industry proposals for achieving environmental goals. 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 49</p>	<p>The integrated E3MC model will include the following standard features:</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE</p>

	<ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios. <p>The Bidder must discuss how the customized model will respond to each element. Each element must be explicitly discussed.</p>	<p><i>DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>
<p style="text-align: center;">NORTH AMERICAN MODELING SOLUTION (E3NA)</p> <p>E3NA must, in a dynamic and interactive manner, respond to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection related to any change in either energy-related or economic-related variables fed into E3MC and E3US.</p> <p>E3NA is a North American energy, emission and economic modeling solution that dynamically links E3MC and E3US to provide the users of E3NA with:</p> <ol style="list-style-type: none"> 1. Functionality, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document. 2. Completeness, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met. 3. Compliance, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities. 4. Innovation, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities. 5. Conformity to Government of Canada's Operating Environment, such that it operates on <ol style="list-style-type: none"> a) Microsoft Windows XP or higher, and b) Windows Excel 2007, 2010 or 2013, and c) Office 2010 and higher. 6. Data sharing flexibility, such that the it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls,xlsx, cvs, txt, accdb and dbf. 7. Timing of Deliverables, such that the Contractor provides ECCC with all future required functionalities listed (Mandatory 50 to Mandatory 60) within 30 months of contract signing. 		

Important instructions for Mandatory 50 to 60

1. It is essential that each Mandatory requirement be fully addressed within the "Bidder's Response" column of the Substantiation of Attachment 3.1.
2. Where a Mandatory requirement consists of a main item plus a listing of one or more sub criteria, **each and every** sub criteria must be explicitly addressed.
3. A Bidder may address each Mandatory requirement by way of:
 - a) Redirecting the evaluator to a specific section of the bid. This section of the bid must clearly illustrate how each Mandatory requirement (including each sub criteria) will be addressed by way of **statement of understanding** or a **methodology**.

Or,

 - b) Explicitly addressing within the grid how each Mandatory requirement (including each sub criteria) will be addressed by way of **statement of understanding** or a **methodology**.

NORTH AMERICAN INTERFACE MODULE

Mandatory 52 to 53 represent the requirements related to the interface module that will integrate the Canada and US macroeconomic models and E3MC and E3US in a dynamic and interactive manner.

		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 50	<p>The bidder must provide a global work plan that outlines in detail how the contractor proposes to carry out Mandatory 52 to 60 to achieve the project objectives. This work plan must include visuals such as diagrams, tables, graphics or screenshots.</p> <p>The following items must be addressed, if applicable:</p> <ul style="list-style-type: none"> • Overview: 	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

	<ul style="list-style-type: none"> a. Purpose, Background, Scope and Objectives; b. Assumptions, Constraints and Risks; c. Contract Deliverables; d. Organization Summary; and e. Schedule Summary. • Management Processes: <ul style="list-style-type: none"> f. Project Management Approach and Procedures; g. Schedule Control; h. Budget Control; i. Reporting; j. Problem Resolution; k. Project Work Tasks/Elements Closing; l. Support 	
<p>Mandatory 51</p>	<p>The bidder must provide high-level estimate of the timeline, such as the number of weeks or months, required to deliver Mandatory 52 to 60.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>As per the Mandatory 50, the Global work plan must outlines in detail how the bidder proposes to carry out Mandatory 52 to 60.</p>		
<p>Mandatory 52</p>	<p>Developing an Integrated Automated North American Interface Module—The bidder must develop an interface module that links the customized Canadian and US macro models and E3MC and E3US in a dynamic and interactive manner.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandatory 53</p>	<p>Integrated North American Model— The bid must demonstrate how their proposed solution represents a dynamic, interactive and integrated North American energy, emissions and economy model.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

E3NA TESTING, ANALYSIS AND SCENARIO DEVELOPMENT		
Mandatory 54 to 56 must illustrate how E3NA will be tested to allow for analysis and scenario development.		
		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	DEMONSTRATED EXPERIENCE
Mandatory 54	<p>Testing of E3NA—E3NA must be tested to ensure:</p> <ol style="list-style-type: none"> 1. Iterative process: Testing must be an iterative process and is deemed successful when tested simulations <ol style="list-style-type: none"> a) Do not fail due to technical glitches. b) Produce reasonable a priori results. c) Convergence must be minimal during this testing; issues of non-convergence must be solved as necessary. 2. Minimize Simulation Failure—Testing must be designed to minimize the chances of simulation failure when E3NA is being used operationally by ECCC. This will include: <ol style="list-style-type: none"> a) Testing jointly requires inputs from the Canadian macroeconomic modeling and ENERGY2020 teams at ECCC). b) Testing follows the same process as testing E3MC and E3US in that the system will be 'stress-tested'. 3. Integration testing—E3NA must be tested to ensure the successful integration of the E3MC and E3US. E3MC and E3US must interact simultaneously to create a fully-integrated North American modeling solution, E3NA. The objective is to test the entire modeling solution so that all information flows operate simultaneously. There are several dimensions to this: <ol style="list-style-type: none"> a) Compatibility: The data framework and structure of behaviour in E3MC and E3US must be compatible if not necessarily the same. b) Data Exchange: Data measures and executable code must be exchanged between the two models. 4. Policy Initiatives: Introduction of policy initiatives (for example regulatory, market based, fiscal, etc.) has direct impacts on any model within each modeling solution and will take forms that are unique for each of the two models. It is necessary to ensure that the initiatives are the same 	<p><i>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</i></p>

	and that direct impacts are equivalently introduced into each models.	
Mandatory 55	<p>Policy Testing—E3NA must provide the capacity to develop policy test case(s) for varying values into the Canadian and US macroeconomic models.</p> <p>Tests must be carried out to determine if the Canadian macroeconomic model responds as expected to changes transferred from the US macroeconomic model. The goal is to ensure that ECCC is in a position to anticipate the details of environmental and energy policy analysis. This includes but is not limited to:</p> <ol style="list-style-type: none"> 1. Anticipating changes in global and continental energy prices. 2. Anticipating changes to fiscal and monetary policy. 3. Anticipating exchange rate changes with major trading partners (specifically the US). <ol style="list-style-type: none"> a) Anticipating major shocks to the costs of production in energy-intensive industries. These shocks can occur on a US-only, Canada-only and/or joint basis. 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Mandatory 56	<p>Regional Simulation—Successful testing must result in the creation of an integrated energy, emissions and economy modeling solution that has the capacity to be run at various regional levels (as a North American model, as a Canada or US model, as a stand-alone provincial or territorial, or a US regional or state model).</p>	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
OTHER REQUIRED SERVICES		
Mandatory 57 to 60 must illustrate how the Bidder will offer other required services. These must be delivered within 30 months of contract signing.		
		BIDDER'S RESPONSE
	TECHNICAL REQUIREMENT	
Mandatory 57	<p>Documentation—The Contractor must provide a 'User's Guide' of E3MC, E3US and E3NA. This must include:</p> <ol style="list-style-type: none"> 1. Base Case Set-Up: Instructions on setting up a base case or policy runs. 2. Detail on Inputs and Outputs: Detail the inputs and outputs to each model, the primary uses of this data in each modeling solution, the execution process (including the order in which the modeling solutions are called) and the flow of data between the models. 	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)

	<p>3. Operating Instructions: Provide step-by-step instructions on the operation of each model individually and the operation of the integrated modeling solutions.</p> <p>4. Impact on Alternative Variables: In the case of policy development, alternative variables may need to be sent over to the macroeconomic models.</p> <p>Documentation must provide a description of how to incorporate new policies using the macroeconomic models including instructions for determining which macroeconomic model variables will be impacted by a new policy.</p>	
<p>Mandatory 58</p>	<p>On-Demand and As-Required Support—This requirement may range from intensive support (up to 500 hours per year) to less intensive (up to 200 hours per year). Main items for this requirement will be undertaken during the option periods associated with the request.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)</p>

<p>Mandat ory 59</p>	<p>On-line Support—This requirement is designed to access the Contractor’s staff on an ‘as-needed or as–required’ basis.</p> <p>On-line support must be provided to ECCC’s Analysis and Modeling Division, as well as to the modeling teams at the NEB and NRCan.</p> <p>This requirement includes:</p> <ol style="list-style-type: none"> 1. Responding in a time-dependent manner to requests for support. 2. Making recommendations and suggestions on how best to implement specific changes to macroeconomic variables and policy assumptions. 3. Providing advice on the interpretation of specific results. 4. Making ‘selected’ modifications to model code to ensure that the policy impacts are being correctly modeled and interpreted. 5. Providing advice on ECCC’s modeling infrastructure development strategy. <p>This requirement may range from intensive support (up to 500 hours per year) to less intensive (up to 200 hours per year). Main items for this requirement will be undertaken during the option periods associated with the request.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>
<p>Mandat ory 60</p>	<p>In-house Training—Upon request, provide in-house training.</p>	<p>(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATI ON CAN BE FOUND WITHIN THEIR BID)</p>

2.0 Rated Requirements

Rated Criteria for E3MC Modeling Solution				
	DESCRIPTION	EVALUATION CRITERIA	POINTS	BIDDER'S RESPONSE
Rated 1	The off-the-shelf Canadian macroeconomic model excellence is recognized in Canada and internationally	The off-the-shelf Canadian macroeconomic model is use by: 1. Only the bidder 2. 1 to 2 public and private organizations in Canada 3. 1 to 2 public and private organizations – international 4. 3 or more public and private organizations in Canada and internationally	The Bid provides details that the model is used by Only the bidder = 1 point 1 to 2 public and private organizations in Canada = 2 points 1 to 2 public and private international organizations = 3 points 3 or more public and private organizations = 5 points	
Rated 2	The customized macroeconomic model that is based on the latest information and structures from Statistics Canada.	The methodology and approach provide an explanation of how the Bidder will: Build a dynamic macroeconomic model of Canada with a regional disaggregation that fully reflects Statistics Canada's 2007 input-output tables at the national- and provincial-level. Build a dynamic macroeconomic model of Canada with a regional	The Bid provides no details on the input-output. = 0 points The Bid explains that the 2007 input-output will be used. = 5 points The Bid explains that	

		<p>disaggregation that fully reflects Statistics Canada's 2011 input-output tables at the national- and provincial-level.</p> <p>Build a dynamic macroeconomic model of Canada with a regional disaggregation that fully reflects Statistics Canada's input-output tables at the national- and provincial-level released in November 2016.</p>	<p>the 2011 input-output tables will be used. = 10 points</p> <p>The Bid explains that the input-output tables released in November 2016 will be used. = 15 points</p>	
Rated 3	The Bid explicitly outlines how each major economic concept and block will be built in the model.	The methodology and approach provide an explanation of how each major economic concept and block will be built into the model.	<p>The Bidder has addressed up to 4 of the major concepts blocks. = 0 points</p> <p>The Bidder has addressed up to 8 of the major concepts and blocks. = 10 points</p> <p>The Bidder has addressed 9 (or more) of the major concepts and blocks. = 25 points</p>	
Rated 4	The Bidder should demonstrate its understanding of building the Canadian Interface Module by producing a global methodology and approach.	<p>1. The methodology and approach provide an explanation of how variables are exchanged between ENERGY2020-Canada and the Canadian macroeconomic model in a dynamic* and integrated manner.</p> <p>2. The methodology and approach provide an explanation of how changes</p>	<p>The Bidder has addressed all 5 items. = 25 points</p> <p>The Bidder has addressed 4 of the 5 items. = 20 points</p>	

		<p>introduced through energy and macroeconomic variables interact to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>3. The methodology and approach provide an explanation of how the integrated model (E3MC) will be executed to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>4. The methodology and approach provide an explanation of how E3MC solves the model for a given year allowing for between-model simultaneous solution.</p> <p>5. The methodology and approach provide an explanation of convergence and convergence testing of a set of variables or other conditions that constitute a “stopping rule”.</p> <p>*Dynamic in this instance is defined as the <u>‘real-time’</u> or <u>instantaneous</u> process by which model one uses (solved) output from model two as input into its own simulation to produce a general equilibrium solution.</p>	<p>The Bidder has addressed 3 of the 5 items. = 14 points</p> <p>The Bidder has addressed 2 of the 5 items. = 10 points</p> <p>The Bidder has addressed 1 of the 5 items. = 5 points</p> <p>The Bidder has addressed 0 of the 5 items. = 0 points</p>	
Rated 5	The Bidder explicitly outlines how each method of accounting for GDP will be built into the model.	The methodology and approach provide an explanation of how each method of accounting for GDP will be built into the model.	The Bidder has addressed 1 out of 4 of the methods of accounting for GDP. = 0 points	

			<p>The Bidder has addressed 2 out of 4 of the methods of accounting for GDP. = 5 points</p> <p>The Bidder has addressed 3 out of 4 of the methods of accounting for GDP. = 20 points</p>	
Rated 6	<p>The Bidder explicitly outlines the data transfer approach and mechanisms for ensuring compatibility between the ENERGY2020-Canada and the macroeconomic model and vice versa.</p>	<p>The bid provides a mapping of ENERGY2020 variables to the macroeconomic model variables</p> <p>The bid identifies which variables will be operational to allow for a dynamic general equilibrium solution.</p> <p>The bid identifies variables to be passed from the macroeconomic model to ENERGY2020-Canada</p> <p>The bid identifies variables to be passed from ENERGY2020-Canada to the macroeconomic model</p> <p>The bid identifies how ENERGY2020-Canada variables will be converted to be consistent and compatible with the variables in the macroeconomic.</p> <p>The bid must illustrate how the interface module will ensure a dynamic and seamless integration.</p>	<p>The Bidder has addressed up to 2 of the major concepts. = 0 points</p> <p>The Bidder has addressed up to 4 of the major concepts. = 10 points</p> <p>The Bidder has addressed 6 (or more) of the major concepts. = 25 points</p>	

	MAX. TECHNICAL POINTS		100	
	MIN. POINTS REQUIRED		60	
	TOTAL TECHNICAL SCORE ACHIEVED			
Rated Criteria for E3US Modeling Solution				
	DESCRIPTION	EVALUATION CRITERIA	POINTS	
Rated 1	The off-the-shelf US macroeconomic model excellence is recognized internationally	<p>The off-the-shelf US macroeconomic model is use by:</p> <ol style="list-style-type: none"> 1. Only the bidder 2. 1 to 2 public and private organizations in Canada 3. 1 to 2 public and private organizations – international 4. 3 or more public and private organizations in Canada and internationally 	<p>The Bid provides details that the model is used by Only the bidder = 1 point</p> <p>1 to 2 public and private organizations in Canada = 2 points</p> <p>1 to 2 public and private international organizations = 3 points</p> <p>3 or more public and private organizations = 5 points</p>	
Rated 2	The Bidder provides an off-the-shelf US Macroeconomic Model	<p>The bidder will provide a model based on the following 2 regions: North-South or East-West</p> <p>The bidder will provide a model based on the following nine census divisions:</p> <ol style="list-style-type: none"> 1. New England 2. Middle Atlantic 3. South Atlantic 4. East North Central 5. East South Central 6. West North Central 7. West South Central 8. Mountain 9. Pacific 	<p>The Bidder provides a 2 region model. = 2 points</p> <p>The Bidder provides a model with nine census divisions. = 5 points</p> <p>The Bidder provides a model with nine census divisions,</p>	

		<p>The bidder will provide a model based on nine census divisions, California and the RGGI states</p> <p>The bidder will provide a model based on nine census divisions, 50 states and the District of Columbia that can be adapted to any state/regional combination</p>	<p>California and RGGI. = 7 points</p> <p>The Bidder provides a model with nine census divisions, California and RGGI. = 10 points</p>	
Rated 3	<p>The Bidder should demonstrate its understanding of building the US Interface Module by producing a global methodology and approach.</p>	<p>1. The methodology and approach provide an explanation of how variables are exchanged between ENERGY2020-US and the Canadian macroeconomic model in a dynamic* and integrated manner.</p> <p>2. The methodology and approach provide an explanation of how changes introduced through energy and macroeconomic variables interact to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>3. The methodology and approach provide an explanation of how the integrated model (E3US) will be executed to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>4. The methodology and approach provide an explanation of how E3US solves the model for a given year allowing for between-model simultaneous solution.</p> <p>5. The methodology and approach provide an explanation of convergence and convergence testing of a set of variables or</p>	<p>The Bidder has addressed all 5 items. = 25 points</p> <p>The Bidder has addressed 4 of the 5 items. = 20 points</p> <p>The Bidder has addressed 3 of the 5 items. = 14 points</p> <p>The Bidder has addressed 2 of the 5 items. = 10 points</p> <p>The Bidder has addressed 1 of the 5 items. = 5 points</p> <p>The Bidder has addressed 0 of the 5 items. = 0 points</p>	

		<p>other conditions that constitute a “stopping rule”.</p> <p>*Dynamic in this instance is defined as the ‘<u>real-time</u>’ or <u>instantaneous</u> process by which model one uses (solved) output from model two as input into its own simulation to produce a general equilibrium solution.</p>		
Rated 4	<p>The Bidder explicitly outlines the data transfer approach and mechanisms for ensuring compatibility between the ENERGY2020-US and the macroeconomic model and vice versa.</p>	<p>The bid provides a mapping of ENERGY2020-US variables to the macroeconomic model variables</p> <p>The bid identifies which variables will be operational to allow for a dynamic general equilibrium solution.</p> <p>The bid identifies variables to be passed from the macroeconomic model to ENERGY2020-US</p> <p>The bid identifies variables to be passed from ENERGY2020-US to the macroeconomic model</p> <p>The bid identifies how ENERGY2020-US variables will be converted to be consistent and compatible with the variables in the macroeconomic.</p> <p>The bid must illustrate how the interface module will ensure a dynamic and seamless integration.</p>	<p>The Bidder has addressed up to 2 of the major concepts. = 0 points</p> <p>The Bidder has addressed up to 4 of the major concepts. = 10 points</p> <p>The Bidder has addressed 6 (or more) of the major concepts. = 25 points</p>	
	MAX. TECHNICAL POINTS		65	
	MIN. POINTS REQUIRED		39	
	TOTAL TECHNICAL SCORE ACHIEVED			

Rated Criteria for E3NA Modeling Solution				
	DESCRIPTION	EVALUATION CRITERIA	POINTS	
Rated 1	The bidder demonstrates how their proposed solution represents a dynamic, interactive and integrated North American energy, emissions and economy model.	<ol style="list-style-type: none"> 1. The Canadian and US macroeconomic models are on two separate platforms with different operating languages and are integrated via an integrating module with key variables being exchanged. 2. The Canadian and US macroeconomic models are on two separate platforms with different operating languages and are integrated via an integrating module with all variables being exchanged. 3. The Canadian and US macroeconomic models are part on one common platform and common operating language with all variables being exchanged. 4. The Canadian and US macroeconomic models are part global macroeconomic model with international linkages fully operational and the ability to integrate Mexico. 	<p>Integrating interface with partial linkage = 2 points</p> <p>Integrating interface with full linkage = 5 points</p> <p>Common platform with full linkage = 7 points</p> <p>Full Global macroeconomic model = 10 points</p>	
Rated 2	The Bidder should demonstrate its understanding of Figure 1 by producing a detailed global methodology. It must clearly detail how they interpret building each element of Figure 1. This must be illustrated by way of text, diagrams, equations, and any other documentation that aids in demonstrating the Bidders' understanding of the requirement.	<ol style="list-style-type: none"> 1. The global methodology provides a detailed understanding of Figure 1. 2. The global methodology clearly details the Bidders' interpretation of each element of Figure 1. 3. The global methodology is illustrated by way of: <ul style="list-style-type: none"> - text - diagrams - equations - any other documentation that aids in demonstrating the Bidders' of the requirement 	<p>The Bidder has addressed all 3 items. = 20 points</p> <p>The Bidder has addressed 2 of the 3 items. = 10 points</p> <p>The Bidder has addressed 1 of the 3 items. = 5 points</p>	

	This methodology and approach must address Evaluation Criteria 1 to 3.			
Rated 2	<p>The Bidder should demonstrate its understanding of Mandatories 47 and 48 by producing a global methodology and approach.</p> <p>This methodology and approach must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating the Bidder's proposed approach to delivering those Mandatories.</p>	<p>1. The methodology and approach provide an explanation of how variables are exchanged between E3MC and E3US in a dynamic and integrated manner.</p> <p>2. The methodology and approach provide an explanation of how changes introduced through energy and macroeconomic variables interact to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>3. The methodology and approach provide an explanation of how the integrated model (E3NA) will be executed to produce a unique integrated energy, emissions and economic projection in a dynamic and integrated manner.</p> <p>4. The methodology and approach provide an explanation of how E3NA solves the model for a given year allowing for between-model simultaneous solution.</p> <p>5. The methodology and approach provide an explanation of: Convergence Convergence testing of a set of variables or other conditions that constitute a 'stopping rule'.</p>	<p>The Bidder has addressed all 5 items. = 25 points</p> <p>The Bidder has addressed 4 of the 5 items. = 20 points</p> <p>The Bidder has addressed 3 of the 5 items. = 14 points</p> <p>The Bidder has addressed 2 of the 5 items. = 10 points</p> <p>The Bidder has addressed 1 of the 5 items. = 5 points</p> <p>The Bidder has addressed 0 of the 5 items. = 0 points</p>	
	MAX. TECHNICAL POINTS		55	
	MIN. POINTS REQUIRED		33	
	TOTAL TECHNICAL SCORE ACHIEVED			

ATTACHMENT 3.2

CORPORATE EVALUATION CRITERIA

1.0 CORPORATE MANDATORY REQUIREMENTS

		BIDDER'S RESPONSE
ITEM #	MANDATORY REQUIREMENT	DEMONSTRATED EXPERIENCE (BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
M1	<p>The Bidder must demonstrate its experience in developing multi-regional macroeconomic models (for example provincial or sub-national level) to create a national bottom-up* macroeconomic forecasting model.</p> <p>*A national bottom-up model is a system of regional models whereby the sum of the regions equals the nation. For example, the sum of Canada's provinces and territories equals the Canada total.</p> <p>In order to demonstrate such experience, the Bidder must provide two project experiences where a multi-regional macroeconomic model was developed by the Bidder. These two project experiences must also demonstrate the forecasts generated by the developed macroeconomic model. Both project experiences must have taken place within the last 5 years, prior to the solicitation closing date.</p> <p>Furthermore, for each project experience the Bidder must provide the name and phone number of its client.</p>	

M2	<p>The Bidder must demonstrate its experience in linking macroeconomic models to energy technology simulation models to create a dynamic and integrated energy, emissions and macroeconomic forecasting model.</p> <p>In order to demonstrate such experience, the Bidder must provide at least one project experiences where a linked energy, emissions and economy model was developed by the Bidder and/or the sub-contractor included in the bid. The project experience must have taken place within the last 5 years, prior to the solicitation closing date.</p> <p>Furthermore, for each project experience the Bidder must provide the name and phone number of its client.</p>	
M3	<p>The Bidder must demonstrate that it currently has five (or more) Economists* as employee. These Economists will be the resources that form the team for this Requirement.</p> <p>*An Economist is defined as a professional in the social science discipline of economics. The individual may also study, develop, and apply theories and concepts from economics and write about economic policy.</p> <p>The information for each of these five Economists must include details of work experience, education and relevant competencies.</p>	

M4	<p>The Bidder must demonstrate that it currently has a Software Programmer* as an employee; this resource may be a permanent employee or is employed by as a contractor on a temporary basis. This resource will form part of the team for this Requirement.</p> <p>*A Software Programmer is a professional that plays a key role in the design, installation, testing and maintenance of software systems. A Software Programmer may be responsible for writing and coding individual programmes or providing an entirely new software resource.</p> <p>The information for each of these five Economists must include details of work experience, education and relevant competencies.</p>	
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2.0 CORPORATE RATED CRITERIA

			BIDDER'S RESPONSE	
ITEM #	RATED CRITERIA	MAX PTS.	Eval. Criteria	DEMONSTRATED EXPERIENCE (BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
R1	The Bidder demonstrates it has experience in developing long-term macroeconomic forecasts for Canada, its provinces, and territories.	10	Less than 5 year experience = 0 points 5+ years to 7 years of experience = 5 points 7+ years to 10 years of experience = 7 points 10+ year of experience = 10 points	
R2	The Bidder demonstrates it has experience in developing long-term international macroeconomic forecasts.	10	Less than 5 year experience = 0 points 5+ years to 7 years of experience = 5 points 7+ years to 10 years of experience = 7 points 10+ year of experience = 10 points	

R3	<p>The Bidder demonstrates it has experience in linking macroeconomic models to energy models to develop simultaneous* integrated** energy and economy models.</p> <p>*Simultaneous in this instance is defined as one or more models solving at the same time. For example, model one uses (solved) output from model two as input into its own simulation to produce an (integrated**) solution.</p> <p>**Integrated describes the process by which solved results from one model (e.g., energy technology simulation model) are read into a second model (e.g., macroeconomic model) by way of an interface to produce a general equilibrium (solution) in both models.</p>	15	<p>No experience = 0 points</p> <p>Demonstrated experience in linking macroeconomic models to energy models to develop simultaneous integrated energy and economy models for one solution = 10 points</p> <p>Demonstrated experience in linking macroeconomic models to energy models to develop simultaneous integrated energy and economy models for more than one solution = 15 points</p>	
R4	<p>The Bidder demonstrates it has experience in producing long-term integrated energy supply and demand projections including emission projections by region, sector, fuel, and end-use.</p>	10	<p>Less than 5 year experience = 0 points 5+ years to 7 years of experience = 5 points 7+ years to 10 years of experience = 7 points 10+ year of experience = 10 points</p>	
	MAX. TECHNICAL POINTS	45		
	MIN. POINTS REQUIRED	27		
	TOTAL TECHNICAL SCORE ACHIEVED			

ATTACHMENT 3.3

RESOURCES EVALUATION CRITERIA

SENIOR ECONOMIST – RESOURCE NO. 1			
NAME OF PROPOSED RESOURCE: _____			
THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED SENIOR ECONOMIST RESOURCE HAS:			
CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 10 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	A valid post-secondary degree from a recognized Canadian university or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

ECONOMIST – RESOURCE NO. 2

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED ECONOMIST RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 5 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	A valid post-secondary degree from a recognized Canadian university or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

ECONOMIST – RESOURCE NO. 3

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED ECONOMIST RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 5 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	A valid post-secondary degree from a recognized Canadian university or equivalent as established by the		

ECONOMIST – RESOURCE NO. 3

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED ECONOMIST RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
	Canadian Information Centre for International Credentials (www.cicic.ca).		

ECONOMIST – RESOURCE NO. 4

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED ECONOMIST RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 5 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	A valid post-secondary degree from a recognized Canadian university or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

ECONOMIST – RESOURCE NO. 5

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED ECONOMIST RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 5 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	A valid post-secondary degree from a recognized Canadian university or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

PROJECT MANAGER – RESOURCE NO. 6 (MAY BE THE SAME INDIVIDUAL AS THE SENIOR ECONOMIST)

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED PROJECT MANAGER RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 15 years of experience in the field of economics, macroeconomic projections and econometrics.		
M2	At least 5 years of experience managing econometric model-building and forecasting projects.		
M3	A post-secondary degree from a recognized Canadian university or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

SOFTWARE PROGRAMMER – RESOURCE NO. 7

NAME OF PROPOSED RESOURCE: _____

THE BIDDER MUST DEMONSTRATE THAT THE PROPOSED SOFTWARE PROGRAMMER RESOURCE HAS:

CRITERIA	MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
		DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
M1	At least 5 years of experience developing software programs (executable code), in common software languages such as Assembly, COBOL, C, C++, C#, Java, Lisp, Promula (used by ENERGY2020), Python, etc.		
M2	A post-secondary degree from a recognized Canadian university, college, trade school or equivalent as established by the Canadian Information Centre for International Credentials (www.cicic.ca).		

ATTACHMENT 3.4

FINANCIAL BID

BIDDERS MUST INCLUDE THE FOLLOWING PRICING INFORMATION FOR ALL DELIVERABLES IN CANADIAN CURRENCY.

The Bidder must not make any assumptions, which have not been validated by the Contracting Authority prior to the Bid closing date. The Bidder must refer to Part 3 – Bid Preparation Instructions.

TABLE 1 CANADIAN MODELING SOLUTION (E3MC), US MODELING SOLUTION (E3US), and NORTH AMERICAN MODELING SOLUTION (E3NA) MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price in Can \$
1	Licenses for 10 users of commercial off-the-shelf Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 3 of Table 2 of Article 12 of the statement of work.	\$ _____
2	Licenses for 10 users of commercial off-the-shelf US Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 32 of Table 2 of Article 12 of the statement of work.	\$ _____
3	Modified Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 4 to Mandatory 18 of Table 2 of the statement of work.	\$ _____
4	ENERGY2020 (Canada) and Canadian macroeconomic model Interface Module. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 19 to Mandatory 29 of Table 2 of Article 12 of the statement of work.	\$ _____
5	Modified US Regional or State Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 33 to Mandatory 39 of Table 2 of Article 12 of the statement of work.	\$ _____
6	ENERGY2020 (US) and US macroeconomic model Interface Module. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 40 to Mandatory 49 of Table 2 of Article 12 of the statement of work.	\$ _____

7	Linking of the Canadian and US integrated model to create a simultaneous integrated energy, emissions and economy model of North America. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 52 to Mandatory 56 of Table 2 of Article 12 of the statement of work.	\$ _____
8	Documentation of E3MC, E3US, E3NA. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 57 of Table 2 of Article 12 of the statement of work.	\$ _____
9	Total of Items 1 to 8	\$ _____

TABLE 2 ADDITIONAL LICENSES (beyond the 10 initial licenses) MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price for 1 user in Can \$ (A)
1	Canadian Modeling Solution (E3MC)	\$ _____
2	US Modeling Solution (E3US)	\$ _____
3	North American Modeling Solution (E3NA)	\$ _____

TABLE 3 PROFESSIONAL AND TRAINING SERVICES FIRM ALL-INCLUSIVE PER DIEM RATES (Can \$)		
ITEM NO.	DESCRIPTION RESOURCE CATEGORIES	FIRM ALL-INCLUSIVE RATE During Contract Period
1	Senior Economist	\$ _____ (A)
2	Economist	\$ _____ (B)
3	Project Manager	\$ _____ (C)
4	Software Programmer	\$ _____ (D)

ATTACHMENT 3.5

DESIRABLE ITEMS (FOR INFORMATION PURPOSES ONLY)

1. Global Macroeconomic Model

ECCC invites each Bidder to present an overview of their global macroeconomic model, should they be in possession of one.

If a Bidder is in possession of a global macroeconomic model, the Bidder may propose enhancements to this model which aim to:

- a) **Provide access** to a stand-alone global macroeconomic model where Canada and the US are explicitly modeled.
- b) **Provide capacity** to assess the impact of rest-of-the world actions on Canada by incorporating the outputs of E3NA.

The Bidder is also invited to present an overall cost of:

- a) **Providing a licence** to their current (off-the-shelf) Global macroeconomic model.
- b) **An estimate of the cost** of making changes that provides capacity (as listed above).

2. Floor Space

The Bidder is invited to propose and outline a detailed methodology for creating historical and forecast estimates of Commercial Floor Space by Building Type.

The Bidder is also invited to present an overall cost of this section.

3. Mexico Module Linkage

The Bidder is invited to propose and outline a detailed methodology, with full notional costing, for linking Energy 2020-Mexico to a Mexican Macroeconomic Model (E3MX) and to link E3MX to E3MC and E3US. The approach required to complete this linkage are similar in-principle to activities listed in Mandatory 33 to Mandatory 49 and in Mandatory 52 to Mandatory 56 of Table 2 of Article 12 of the statement of work.

The Bidder is also invited to present an overall cost of this section.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria. There are several steps in the evaluation process, which are described below. Even though the evaluation and selection will be conducted in steps, the fact that Canada has proceeded to a later step does not mean that Canada has conclusively determined that the Bidder has successfully passed all the previous steps. Canada may conduct steps of the evaluation in parallel.
- (b) An evaluation team composed of representatives of the Client and PWGSC will evaluate the bids on behalf of Canada. Canada may hire any independent consultant, or use any Government resources, to evaluate any bid. Not all members of the evaluation team will necessarily participate in all aspects of the evaluation.
- (c) In addition to any other time periods established in the bid solicitation:
- (i) **Requests for Clarifications:** If Canada seeks clarification or verification from the Bidder about its bid, the Bidder will have 2 working days (or a longer period if specified in writing by the Contracting Authority) to provide the necessary information to Canada. Failure to meet this deadline will result in the bid being declared non-responsive.
- (ii) **Requests for Further Information:** If Canada requires additional information in order to do any of the following pursuant to the Section entitled "Conduct of Evaluation" in 2003, Standard Instructions - Goods or Services - Competitive Requirements:
- (A) verify any or all information provided by the Bidder in its bid; or
- (B) contact any or all references supplied by the Bidder (e.g., references named in the résumés of individual resources) to verify and validate any information submitted by the Bidder,
- the Bidder must provide the information requested by Canada within 2 working days of a request by the Contracting Authority.
- (iii) **Extension of Time:** If additional time is required by the Bidder, the Contracting Authority may grant an extension in his or her sole discretion.

4.2 Technical Evaluation

- (a) **Mandatory Technical Criteria:**
- (i) Each bid will be reviewed for compliance with the mandatory requirements of the bid solicitation. Any element of the bid solicitation that is identified specifically with the words "must" or "mandatory" is a mandatory requirement. Bids that do not comply with each and every mandatory requirement will be declared non-responsive and be disqualified.
- (ii) The mandatory technical criteria are described in Attachment 3.1, Attachment 3.2 and Attachment 3.3 of Part 3 of this RFP.
- (b) **Point-Rated Technical Criteria:**
- Each bid will be rated by assigning a score to the rated requirements, which are identified in the bid solicitation by the word "rated" or by reference to a score. Bidders who fail to submit complete bids with all the information requested by this bid solicitation will be rated accordingly.

The point-rated technical criteria are described in Attachment 3.1 and Attachment 3.2 of Part 3 of this RFP.

(c) **Desirable Items (for information purposes only):**

The technical bid should include Desirable Items as described in Attachment 3.5 – Desirable Items of Part 3 of this RFP. All items in this Attachment 3.5 will be for information only and will not be evaluated.

(d) **Reference Checks:**

- (i) For reference checks, Canada will conduct the reference check in writing by e-mail. Canada will send all e-mail reference check requests to contacts supplied by all the Bidders on the same day using the e-mail address provided in the bid. Canada will not award any points and/or a bidder will not meet the mandatory experience requirement (as applicable) unless the response is received within 5 working days of the date that Canada's e-mail was sent.
- (ii) On the third working day after sending out the reference check request, if Canada has not received a response, Canada will notify the Bidder by e-mail, to allow the Bidder to contact its reference directly to ensure that it responds to Canada within 5 working days. If the individual named by a Bidder is unavailable when required during the evaluation period, the Bidder may provide the name and e-mail address of an alternate contact person from the same customer. Bidders will only be provided with this opportunity once for each customer, and only if the originally named individual is unavailable to respond (i.e., the Bidder will not be provided with an opportunity to submit the name of an alternate contact person if the original contact person indicates that he or she is unwilling or unable to respond). The Bidder will have 24 hours to submit the name of a new contact. That contact will again be given 5 working days to respond once Canada sends its reference check request.
- (iii) Wherever information provided by a reference differs from the information supplied by the Bidder, the information supplied by the reference will be the information evaluated.
- (iv) Points will not be allocated and/or a bidder will not meet the mandatory experience requirement (as applicable) if (1) the reference customer states he or she is unable or unwilling to provide the information requested, or (2) the customer reference is not a customer of the Bidder itself (for example, the customer cannot be the customer of an affiliate of the Bidder instead of being a customer of the Bidder itself). Nor will points be allocated or a mandatory met if the customer is itself an affiliate or other entity that does not deal at arm's length with the Bidder.
- (v) Whether or not to conduct reference checks is discretionary. However, if PWGSC chooses to conduct reference checks for any given rated or mandatory requirement, it will check the references for that requirement for all bidders to be recommended for contract award.

(e) **Proof of Proposal Test for Top-Ranked Bid:**

- (i) Through the Proof of Proposal (PoP) test, Canada may test the solution proposed in the top-ranked bid (identified after the financial evaluation) to confirm both that it will function as described in the bid and that it meets the technical functionality requirements described in Attachment 3.1 of Part 3 of the RFP. The PoP test may take place at a site in the National Capital Region provided by Canada that recreates the technical environment described in the Annex A - Statement of Work is requirement, or the PoP test may take place at a location in Canada selected by the top-ranked Bidder, if that location is agreed to by the Contracting Authority and if the Bidder assumes all

responsibility for recreating the technical environment described in the Annex A - Statement of Work (it is within the Contracting Authority's sole discretion to determine whether the Bidder has accurately recreated this environment for the test). Canada will pay its own travel and salary costs associated with any PoP test.

- (ii) After being notified by the Contracting Authority, the Bidder will be given a maximum of 7 working days to start the installation of the proposed solution. The installation must be completed and functional within 5 working days of the Bidder starting the installation (7.5 hrs/day during normal working hours, to be determined by the Contracting Authority). Canada will then conduct the PoP test. Up to 3 representatives of the Bidder may be present during the PoP test. The representative(s) named in the bid to provide technical support during the PoP test should be available by telephone for technical advice and clarification during the PoP test; however, Canada is not required to delay the PoP test if an individual is unavailable.
 - (iii) Canada will document the results of the PoP Test. If Canada determines that the proposed solution does not meet any mandatory requirement of the bid solicitation, the bid will fail the PoP Test and the bid will be disqualified. Canada may, as a result of the PoP test, reduce the score of the Bidder on any rated requirement, if the PoP test indicates that the score provided to the Bidder on the basis of its written bid is not validated by the PoP test. The Bidder's score will not be increased as a result of the PoP test. If the Bidder's score is reduced as a result of the PoP test, Canada will reassess the ranking of all bidders.
 - (iv) In connection with the PoP testing, the Bidder grants to Canada a limited license to use the Bidder's proposed software solution for testing and evaluation purposes.
 - (v) If, during the initial installation of the software for the PoP test, the Bidder discovers that there are missing and/or corrupt files for software components identified in the technical bid, the Bidder must cease the installation process and inform the Contracting Authority. If the Contracting Authority determines that the missing and/or corrupt files are for components identified in the technical bid, the Bidder may be permitted to submit to the Contracting Authority the missing files and/or replacements for the corrupt files on electronic media or by referring to a web site where the files can be downloaded. These files must have been commercially released to the public before the bid closing date. Upon receiving the files on electronic media or downloading them from a corporate web site, the Contracting Authority will verify that (i) the files were commercially released to the public before the bid closing date; (ii) the files do not include new releases or versions of the software; (iii) the files belong to software components identified in the technical bid; and (iv) the software will not need to be recompiled to make use of the files. The Contracting Authority will have the sole discretion to decide if the additional files may be installed for the PoP test. Under no circumstances will files required to correct flaws in the software programming or code be permitted. This process can be used only a single time, and only during the initial installation of the software for the PoP test.
- (f) **Consideration of Additional Software Use Terms included in Top-Ranked Bid** (following financial evaluation):
- (i) Acceptance of all the terms and conditions contained in Part 7 - Resulting Contract Clauses (including those relating to software licensing and those incorporated by reference) is a mandatory requirement of this bid solicitation.
 - (ii) However, Bidders may, as part of their bid, submit additional software use terms. Whether or not those software use terms will be included in any resulting contract (as an Annex in accordance with the Article entitled "Priority of Documents" in the Resulting Contract Clauses) will be determined using the process described below. Whether or

not any proposed additional software use terms are acceptable to Canada is a matter solely within the discretion of Canada.

- (iii) The process is as follows:
- (A) Bids may include additional software use terms that are proposed to supplement the terms of the Resulting Contract Clauses. Bidders should not submit a software publisher's full standard license terms (because full standard license terms generally contain provisions that deal with more than simply how the software can be used; for example, they frequently deal with issues such as limitation of liability or warranty, neither of which are software use terms);
 - (B) In cases where the Bidder has submitted a software publisher's full standard license terms, Canada will require that the Bidder remove these terms and submit only the software use terms that the Bidder would like Canada to consider;
 - (C) Canada will review the additional software use terms proposed by the top-ranked Bidder (identified after the financial evaluation) to determine if there are any provisions proposed by the Bidder that are unacceptable to Canada;
 - (D) If Canada determines that any proposed software use term is unacceptable to Canada, Canada will notify the Bidder, in writing, and will provide the Bidder with an opportunity to remove that provision from its bid or to propose alternate language for consideration by Canada. Canada may set a time limit for the Bidder to respond; if the Bidder submits alternate language, if Canada does not find the alternate language acceptable, Canada is not required to allow the Bidder to submit further alternate language;
 - (E) If the Bidder refuses to remove provisions unacceptable to Canada from its bid within the time limit set by Canada in its notice, the bid will be considered non-responsive and be disqualified; Canada may then proceed to the next-ranked bid; and
 - (F) If the Bidder agrees to remove the provisions that are unacceptable to Canada and it is awarded any resulting contract, the proposed additional software use terms (as revised) will be incorporated as an annex to the contract, as set out in the Article entitled "Priority of Documents" in the Resulting Contract Clauses.
- (iv) For greater certainty and to ensure that only additional software use terms that have been approved by both parties are incorporated into any resulting contract, unless the additional software use terms proposed by the Bidder are included as a separate annex to the Contract and initialed by both parties, they will not be considered part of any resulting contract (even if they are part of the bid that is incorporated by reference into the resulting contract). The fact that some additional terms and conditions or software use terms were included in the bid will not result in those terms applying to any resulting contract, regardless of whether or not Canada has objected to them under the procedures described above.

4.3 Financial Evaluation

- (a) The financial evaluation will be conducted by calculating the Total Bid Price using the Pricing Tables as completed by the bidders at Attachment 3.4 of Part 3 of this RFP. The Bidders must be aware that the data included in the Table are for the purpose of evaluating Bidders' financial bid only. These numbers do not represent a commitment from Canada nor represent Canada's usage during the Contract Period.

TOTAL BID PRICE					
(to be completed by the Contracting Authority during evaluation process)					
ITEM NO.	REFERENCE	DESCRIPTION	SCENARIO DESCRIPTION	SCENARION CALCULATION	TOTAL AS PER BIDDER'S FINANCIAL BID
1	Table 1 of Attachment 3.4 – Financial Bid	Canadian Modeling Solution (E3MC), US Modeling Solution (E3US), and North American Modeling Solution (E3NA) as per item 9 of Table 1 of Attachment 3.4 – Financial Bid			\$ _____
2	Table 2 of Attachment 3.4 – Financial Bid	Additional licenses as per item 1 of Table 2 of Attachment 3.4 – Financial Bid	25 users for Canadian Modeling Solution (E3MC)	Firm All-inclusive lot price as per item # 1 of Table 2 x 25 x 8 years	\$ _____
3		Additional licenses as per item 2 of Table 2 of Attachment 3.4 – Financial Bid	25 users for US Modeling Solution (E3US)	Firm All-inclusive lot price as per item # 2 of Table 2 x 25 x 8 years	\$ _____
4		Additional licenses as per item 3 of Table 2 of Attachment 3.4 – Financial Bid	25 users for North American Modeling Solution (E3NA)	Firm All-inclusive lot price as per item # 3 of Table 2 x 25 x 8 years	\$ _____
5	Table 3 of Attachment 3.4 – Financial Bid	Requirement for Senior Economist	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 1 of Table 3 x 11 days/year x 8 years	\$ _____
6		Requirement for Economist	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 2 of Table 3 x 11	\$ _____

				days/year x 8 years	
7		Requirement for Project Manager	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 3 of Table 3 x 11 days/year x 8 years	\$ _____
8		Requirement for Software Programmer	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 4 of Table 3 x 11 days/year x 8 years	\$ _____
TOTAL BID PRICE (Total of items 1+2+3+4+5+6+7+8)					\$ _____

(b) Formulae in Pricing Tables

If the pricing tables provided to bidders include any formulae, Canada may re-input the prices provided by bidders into a fresh table, if Canada believes that the formulae may no longer be functioning properly in the version submitted by a Bidder.

(c) Substantiation of Professional Services Rates

In Canada's experience, bidders will from time to time propose rates at the time of bidding for one or more categories of resources that they later refuse to honour, on the basis that these rates do not allow them to recover their own costs and/or make a profit. When evaluating the rates bid for professional services, Canada may, but will have no obligation to, require price support in accordance with this Article. If Canada requests price support, it will be requested from all otherwise responsive bidders who have proposed a rate that is at least 20% lower than the median rate bid by all responsive bidders for the relevant resource category or categories. If Canada requests price support, the Bidder must provide the following information:

- (i) an invoice (referencing a contract serial number or other unique contract identifier) that shows that the Bidder has provided and invoiced a customer (with whom the Bidder deals at arm's length) for services performed for that customer similar to the services that would be provided in the relevant resource category, where those services were provided for at least three months within the twelve months before the bid solicitation closing date, and the fees charged were equal to or less than the rate offered to Canada;
- (ii) in relation to the invoice in (i), evidence from the Bidder's customer that the services identified in the invoice include at least 50% of the tasks listed in the Statement of Work for the category of resource being assessed for an unreasonably low rate. This evidence must consist of either a copy of the contract (which must describe the services to be provided and demonstrate that at least 50% of the tasks to be performed are the same as those to be performed under the Statement of Work in this bid solicitation) or the customer's signed certification that the services subject to the charges in the invoice included at least 50% of the same tasks to be performed under the Statement of Work in this bid solicitation;
- (iii) in respect of each contract for which an invoice is submitted as substantiation, a résumé for the resource that provided the services under that contract that demonstrates that,

in relation to the resource category for which the rates are being substantiated, the resource would meet the mandatory requirements and achieve any required pass mark for any rated criteria; and

- (iv) the name, telephone number and, if available, e-mail address of a contact person at the customer who received each invoice submitted under (i), so that Canada may verify any information provided by the Bidder.

Once Canada requests substantiation of the rates bid for any resource category, it is the sole responsibility of the Bidder to submit information (as described above and as otherwise may be requested by Canada, including information that would allow Canada to verify information with the resource proposed) that will allow Canada to determine whether it can rely, with confidence, on the Bidder's ability to provide the required services at the rates bid. If Canada determines that the information provided by the Bidder does not adequately substantiate the unreasonably low rates, the bid will be declared non-responsive.

4.4 Basis of Selection

- a) To be declared responsive, a bid must:
 - i. comply with all the requirements of the bid solicitation; and
 - ii. meet all mandatory evaluation criteria; and
 - iii. obtain the required minimum of 14 points for each of the Rated Requirements of Attachment 3.1 – Bid Evaluation Criteria - Technical Compliance; the rating is performed on a scale of 25 points for each of the Rated Requirements;
 - iv. obtain the required minimum of 31 points overall for the Corporate Rated Requirements as stated in Attachment 3.2 of Part 3; the rating is performed on a scale of 45 points;
- b) Bids not meeting (i), (ii), (iii) and (iv) will be declared non-responsive.
- c) The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 70% for the technical merit and 30% for the price.
- d) To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 70 %.
- e) To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 30 %.
- f) For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
- g) Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.
- h) The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 70/30 ratio of technical merit and price, respectively. The total available points equals 135 and the lowest evaluated price is \$45,000 (45).

Basis of Selection - Highest Combined Rating Technical Merit (70%) and Price (30%)

		Bidder 1	Bidder 2	Bidder 3
Overall Technical Score		115/135	89/135	92/135
Bid Evaluated Price		\$55,000.00	\$50,000.00	\$45,000.00
Calculations	Technical Merit Score	$115/135 \times 70 = 59.63$	$89/135 \times 70 = 46.15$	$92/135 \times 70 = 47.70$
	Pricing Score	$45/55 \times 30 = 24.55$	$45/50 \times 30 = 27$	$45/45 \times 30 = 30$
Combined Rating		84.18	73.15	77.70
Overall Rating		1st	3rd	2nd

- i) Bidders should note that all contract awards are subject to Canada's internal approvals process, which includes a requirement to approve funding in the amount of any proposed contract. Despite the fact that the Bidder may have been recommended for contract award, a contract will only be awarded if internal approval is granted according to Canada's internal policies. If approval is not granted, no contract will be awarded.
- j) In the event of identical Total Bidder Scores occurring, then the bid with the highest Total Technical Score will become the top-ranked bidder.

PART 5 - CERTIFICATIONS AND ADDITIONAL INFORMATION

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

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

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

5.1 Certifications Required with Bid

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

I. Declaration of Convicted Offences

As applicable, pursuant to subsection Declaration of Convicted Offences of section 01 of the Standard Instructions, the Bidder must provide with its bid, a completed Declaration Form 4, to be given further consideration in the procurement process.

5.1 Certifications Precedent to Contract Award and Additional Information

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

(a) Integrity Provisions – List of Names

Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder.

Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the names of the owner(s).

Bidders bidding as societies, firms or partnerships do not need to provide lists of names.

The Bidder must provide the Contracting Authority with a completed Form 5 List of Names Form, before contract award.

(b) Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from [Employment and Social Development Canada \(ESDC\)](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) - Labour's website.

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex Form 6 [Federal Contractors Program for Employment Equity - Certification](#), before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

(c) **Professional Services Resources**

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

No more than one substitute will be considered for any given individual proposed in the bid. In response to the Bidder's proposed substitution, the Contracting Authority may elect in its sole discretion either to:

- (A) set aside the bid and give it no further consideration; or
- (B) evaluate the replacement in accordance with the requirements of the bid solicitation in the place of the original resource as if that replacement had originally been proposed in the bid, with any necessary adjustments being made to the evaluation results, including the rank of the bid vis-à-vis other bids.

If no substitute is proposed the Contracting Authority will set aside the bid and give it no further consideration.

- (iv) If a Bidder has proposed any individual who is not an employee of the Bidder, by submitting a bid, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her 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.

(d) **Bidder Certifies that Equipment and Software is "Off-the-Shelf"**

Any equipment and software bid to meet this requirement must be "off-the-shelf" (unless otherwise stated in this bid solicitation), meaning that each item of equipment and software is commercially available and requires no further research or development and is part of an existing product line with a field-proven operational history (that is, it has not simply been tested in a laboratory or experimental environment). If any of the equipment or software bid is a fully compatible extension of a field-proven product line, it must have been publicly announced on or before the bid closing date. By submitting a bid, the Bidder is certifying that all the equipment and software bid is off-the-shelf.

The Bidder must provide the Contracting Authority with a completed Form 2 – Software Publisher Certification Form, before contract award.

(e) **Software Publisher Certification and Software Publisher Authorization**

(i) If the Bidder is the Software Publisher for any of the proprietary software products it bids, Canada requires that the Bidder confirm in writing that it is the Software Publisher. Bidders are requested to use the Software Publisher Certification Form included with the bid solicitation. Although all the contents of the Software Publisher Certification Form are required, using the form itself to provide this information is not mandatory. For bidders who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided. Alterations to the statements in the form may result in the bid being declared non-responsive.

(ii) Any Bidder that is not the Software Publisher of all the proprietary software products proposed in its bid is required to submit proof of the Software Publisher's authorization, which must be signed by the Software Publisher (not the Bidder). No Contract will be awarded to a Bidder who is not the Software Publisher of all of the proprietary software it proposes to supply to Canada, unless proof of this authorization has been provided to Canada. If the proprietary software proposed by the Bidder originates with multiple Software Publishers, authorization is required from each Software Publisher. Bidders are requested to use the Software Publisher Authorization Form included with the bid solicitation. Although all the contents of the Software Publisher Authorization Form are required, using the form itself to provide this information is not mandatory. For Bidders/Software Publishers who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided. Alterations to the statements in the form may result in the bid being declared non-responsive.

(iii) In this bid solicitation, "Software Publisher" means the owner of the copyright in any software products proposed in the bid, who has the right to license (and authorize others to license/sub-license) its software products.

The Bidder must provide the Contracting Authority with a completed Form 3 – Software Publisher Authorization Form, before contract award.

(f) **Certification of Language - English Essential**

By submitting a bid, the Bidder certifies that, should it be awarded a contract as result of the bid solicitation, every individual proposed in its bid will be fluent in English. The individual(s) proposed must be able to communicate orally and in writing in English without any assistance and with minimal errors.

PART 6 - FINANCIAL AND OTHER REQUIREMENTS

6.1 Financial Capability

- (a) SACC Manual clause A9033T (2012-07-16) Financial Capability applies, except that subsection 3 is deleted and replaced with the following: "If the Bidder is a subsidiary of another company, then any financial information required by the Contracting Authority in 1(a) to (f) must also be provided by each level of parent company, up to and including the ultimate parent company. The financial information of a parent company does not satisfy the requirement for the provision of the financial information of the Bidder; however, if the Bidder is a subsidiary of a company and, in the normal course of business, the required financial information is not generated separately for the subsidiary, the financial information of the parent company must be provided. If Canada determines that the Bidder is not financially capable but the parent company is, or if Canada is unable to perform a separate assessment of the Bidder's financial capability because its financial information has been combined with its parent's, Canada may, in its sole discretion, award the contract to the Bidder on the condition that one or more parent companies grant a performance guarantee to Canada."
- (b) In the case of a joint venture bidder, each member of the joint venture must meet the financial capability requirements.

PART 7 - RESULTING CONTRACT CLAUSES

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

7.1 Requirement

- (a) _____ (the "**Contractor**") agrees to supply to the Client the goods and services described in the Contract, including the Statement of Work, in accordance with, and at the prices set out in, the Contract. This includes:
- (i) granting the license to use the Unified Energy, Emissions, and Economy Modeling Solution (the "**E3NA Solution**"), described in the Contract;
 - (ii) providing the Software Documentation;
 - (iii) providing maintenance and support for the Licensed Software during the Software Support Period;
 - (iv) providing professional services, as and when requested by Canada;
 - (v) providing training, as and when requested by Canada;
- to one or more locations to be designated by Canada, excluding any locations in areas subject to any of the Comprehensive Land Claims Agreements.
- (b) **Client:** The initial Client is Environment and Climate Change Canada (ECCC). However, this contract will also allow Canada to make the Software Solution available to Natural Resources Canada (NRCan) and the National Energy Board (NEB).
- (c) **Reorganization of Client:** The Contractor's obligation to perform the Work will not be affected by (and no additional fees will be payable as a result of) the renaming, reorganization, reconfiguration, or restructuring of any Client. The reorganization, reconfiguration and restructuring of the Client includes the privatization of the Client, its merger with another entity, or its dissolution, where that dissolution is followed by the creation of another entity or entities with mandates similar to the original Client. In connection with any form of reorganization, Canada may designate another department or government body as the Contracting Authority or Technical Authority, as required to reflect the new roles and responsibilities associated with the reorganization.

7.2 Task Authorization

- (a) **As-and-when-requested Task Authorizations:** The Work or a portion of the Work to be performed under the Contract will be on an "as-and-when-requested basis" using a Task Authorization (TA). To be clear, this clause is only to be used for any work or training services that is required beyond the implementation of the solution described in this contract. The Work described in the TA must be in accordance with the scope of the Contract. The Contractor must not commence work until a validly issued TA has been issued by Canada and received by the Contractor. The Contractor acknowledges that any work performed before such issuance and receipt will be done at the Contractor's own risk.
- (b) **Form and Content of draft Task Authorization:**
- (i) The Technical Authority will provide the Contractor with a description of the task using the "Task Authorization Form" specified in Annex A.

- (ii) The draft Task Authorization will contain the details of the activities to be performed, a description of the deliverables, and a schedule indicating completion dates for the major activities or submission dates for the deliverables. The draft TA will also include the applicable bases and methods of payment as specified in the Contract.
- (iii) A draft Task Authorization must also contain the following information, if applicable:
 - (A) the task number;
 - (B) The date by which the Contractor's response must be received (which will appear in the draft Task Authorization, but not the issued Task Authorization);
 - (C) the details of any financial coding to be used;
 - (D) the categories of resources and the number required;
 - (E) a description of the work for the task outlining the activities to be performed and identifying any deliverables (such as reports);
 - (F) the start and completion dates;
 - (G) milestone dates for deliverables and payments (if applicable);
 - (H) the number of person-days of effort required;
 - (I) whether the work requires on-site activities and the location;
 - (J) the language profile of the resources required;
 - (K) the level of security clearance required of resources;
 - (L) the price payable to the Contractor for performing the task, with an indication of whether it is a firm price or a maximum TA price (and, for maximum price task authorizations, the TA must indicate how the final amount payable will be determined; where the TA does not indicate how the final amount payable will be determined, the amount payable is the amount, up to the maximum, that the Contractor demonstrates was actually worked on the project, by submitting time sheets filled in at the time of the work by the individual resources to support the charges); and
 - (M) any other constraints that might affect the completion of the task.
- (c) **Contractor's Response to Draft Task Authorization:** The Contractor must provide to the Technical Authority, within 2 working days of receiving the draft Task Authorization (or within any longer time period specified in the draft TA), the proposed total price for performing the task and a breakdown of that cost, established in accordance with the Basis of Payment specified in the Contract. The Contractor's quotation must be based on the rates set out in the Contract. The Contractor will not be paid for preparing or providing its response or for providing other information required to prepare and validly issue the TA.
- (d) **Task Authorization Limit and Authorities for Validly Issuing Task Authorizations:**

To be validly issued, a TA must include the following signatures:

 - (i) for any TA with a value, inclusive of revisions, of less than or equal to \$250,000.00 (including Applicable Taxes), the TA must be signed by:
 - (A) the Technical Authority;

(ii) for any TA with a value greater than this amount, a TA must include the following signatures:

- (A) the Technical Authority; and
- (B) the Contracting Authority.

Any TA that does not bear the appropriate signatures is not validly issued by Canada. Any work performed by the Contractor without receiving a validly issued TA is done at the Contractor's own risk. If the Contractor receives a TA that is not appropriately signed, the Contractor must notify the Contracting Authority. By providing written notice to the Contractor, the Contracting Authority may suspend the Client's ability to issue TAs at any time, or reduce the dollar value threshold described in sub-article (A) above; any suspension or reduction notice is effective upon receipt.

(e) **Periodic Usage Reports:**

(i) The Contractor must compile and maintain records on its provision of services to the federal government under the Task Authorizations validly issued under the Contract. The Contractor must provide this data to Canada in accordance with the reporting requirements detailed below. If some data is not available, the reason must be indicated. If services are not provided during a given period, the Contractor must still provide a "NIL" report. The data must be submitted on a "quarterly basis" to the Contracting Authority. From time to time, the Contracting Authority may also require an interim report during a reporting period.

(ii) The quarterly periods are defined as follows:

- (A) 1st quarter: April 1 to June 30;
- (B) 2nd quarter: July 1 to September 30;
- (C) 3rd quarter: October 1 to December 31; and
- (D) 4th quarter: January 1 to March 31.

The data must be submitted to the Contracting Authority no later than 10 calendar days after the end of the reporting period.

(iii) Each report must contain the following information for each validly issued TA (as revised):

- (A) the Task Authorization number and the Task Authorization Revision number(s), if applicable;
- (B) a title or a brief description of each authorized task;
- (C) the name, Category of Personnel of each resource involved in performing the TA, as applicable;
- (D) the total estimated cost specified in the validly issued TA of each task, exclusive of Applicable Taxes;
- (E) the total amount, exclusive of Applicable Taxes, expended to date against each authorized task;
- (F) the start and completion date for each authorized task; and

- (G) the active status of each authorized task as applicable (e.g., indicate whether work is in progress or if Canada has cancelled or suspended the TA, etc.).
- (iv) Each report must also contain the following cumulative information for all the validly issued TAs (as revised):
 - (A) the amount, exclusive of Applicable Taxes, specified in the Contract (as last revised, as applicable) as Canada's total liability to the Contractor for all authorized TAs; and
 - (B) the total amount, exclusive of Applicable Taxes, expended to date against all validly issued tasks.
- (f) **Refusal of Task Authorizations:** The Contractor is not required to submit a response to every draft TA sent to it by Canada. However, in addition to Canada's other rights to terminate the Contract, Canada may immediately, and without further notice, terminate the Contract for default in accordance with the General Conditions if the Contractor in at least three instances has either not responded or has not submitted a valid response when sent a draft TA. A valid response is one that is submitted within the required time period and meets all requirements of the draft TA issued, including proposing the required number of resources who each meet the minimum experience and other requirements of the categories identified in the draft TA at pricing not exceeding the rates set out in Annex B. Each time the Contractor does not submit a valid response, the Contractor agrees Canada may at its option decrease the Minimum Contract Value in the clause titled "Minimum Work Guarantee" by 2%. This decrease will be evidenced for administrative purposes only through a contract amendment issued by the Contracting Authority (which does not require the agreement of the Contractor).
- (g) **Consolidation of TAs for Administrative Purposes:** The Contract may be amended from time to time to reflect all validly issued Task Authorizations to date, to document the Work performed under those TAs for administrative purposes.

7.3 Minimum Work Guarantee

- (a) In this clause,
 - (i) **"Maximum Contract Value"** means the amount specified in the **"Limitation of Expenditure"** clause set out in the Contract (excluding Applicable Taxes); and
 - (ii) **"Minimum Contract Value"** means \$20,000.00, excluding Applicable Taxes.
- (b) Canada's obligation under the Contract is to request Work in the amount of the Minimum Contract Value or, at Canada's option, to pay the Contractor at the end of the Contract in accordance with sub-article (c), subject to sub-article (d). In consideration of such obligation, the Contractor agrees to stand in readiness throughout the Contract Period to perform the Work described in the Contract. Canada's maximum liability for work performed under the Contract must not exceed the Maximum Contract Value, unless an increase is authorized in writing by the Contracting Authority.
- (c) In the event that Canada does not request work in the amount of the Minimum Contract Value during the Contract Period, Canada must pay the Contractor the difference between the Minimum Contract Value and the total cost of the Work requested.
- (d) Canada will have no obligation to the Contractor under this article if Canada terminates the entire Contract
 - (i) for default;
 - (ii) for convenience as a result of any decision or recommendation of a tribunal or court that the contract be cancelled, re-tendered or awarded to another supplier; or
 - (iii) for convenience within ten business days of Contract award.

7.4 Standard Clauses and Conditions

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

(a) **General Conditions:**

- (i) 2030 (2016-04-04), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

(b) **Supplemental General Conditions:**

The following Supplemental General Conditions:

- (i) 4002 (2010-08-16), Supplemental General Conditions - Software Development or Modification Services;
- (ii) 4003 (2010-08-16), Supplemental General Conditions - Licensed Software;
- (iii) 4004 (2013-04-25), Supplemental General Conditions - Maintenance and Support Services for Licensed Software;
- (iv) 4006 (2010-08-16), Supplemental General Conditions - Contractor to Own Intellectual Property Rights in Foreground Information;

apply to and form part of the Contract.

7.5 Escort Requirement

NIL security screening required, no access to sensitive information or assets. Contractor personnel will be escorted in specific areas of the facility or site as and where required by Environment and Climate Change Canada (ECCC) personnel or those authorized by ECCC to do so on its behalf.

7.6 Contract Period

- (a) **Contract Period:** The "**Contract Period**" is the entire period of time during which the Contractor is obliged to perform the Work, which includes:

- (i) The "**Initial Contract Period**", which begins on the date the Contract is awarded and ends 2 year(s) later; and
- (ii) The period during which the Contract is extended, if Canada chooses to exercise any options set out in the Contract.

(b) **Option to Extend the Contract:**

- (i) The Contractor grants to Canada the irrevocable option to extend the term of the Contract by up to 8 additional one-year period(s) under the same terms and conditions. The Contractor agrees that, during the extended period of the Contract, it will be paid in accordance with the applicable provisions set out in the Basis of Payment.
- (ii) Canada may exercise this option at any time by sending a written notice to the Contractor before the expiry date of the Contract. The option may only be exercised by the Contracting Authority, and will be evidenced, for administrative purposes only, through a contract amendment.

7.7 Authorities

(a) Contracting Authority

The Contracting Authority for the Contract is:

Name: Nabil Ghaddab
Title: Contracting Authority
Public Works and Government Services Canada
Acquisitions Branch
Directorate: Space, Innovation, and Informatics Projects Directorate
Address: 11 Laurier St., Gatineau, Québec
Telephone: 873.469.4984
E-mail address: nabil.ghaddab@tpsgc-pwgsc.gc.ca

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

(b) Technical Authority

The Technical Authority for the Contract is:

Name: _____
Title: _____
Organization: _____
Address: _____
Telephone: _____
Facsimile: _____
E-mail address: _____

In this person's absence, the Technical Authority is:

Name: _____
Title: _____
Organization: _____
Address: _____
Telephone: _____
Facsimile: _____
E-mail address: _____

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

(c) Contractor's Representative

Name: _____
Title: _____
Organization: _____

Address: _____
Telephone: _____
Facsimile: _____
E-mail address: _____

7.8 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 web sites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2012-2 of the Treasury Board Secretariat of Canada.

7.9 Payment

(a) Basis of Payment

- (i) **Firm Price:** Canada will pay the Contractor the firm prices set out in Annex B, Applicable Taxes extra.
- (ii) **Optional Additional Software Licenses:** For additional licenses for additional Users to use the Licensed Software, if Canada exercises its option, Canada will pay the Contractor the firm price per user set out in Annex B, FOB destination, including all customs duties, Applicable Taxes extra.
- (iii) **Optional Software Support:** If Canada exercises its option to extend the Software Support Period, Canada will pay the Contractor the firm annual price set out in Annex B, FOB destination, including all customs duties, Applicable Taxes extra.
- (iv) **Professional Services and Training provided under a Task Authorization with a Maximum Price:** For professional services requested by Canada, in accordance with a validly issued Task Authorization, Canada will pay the Contractor, in arrears, up to the Maximum Price for the TA, for actual time worked and any resulting deliverables in accordance with the firm all-inclusive per diem rates set out in Annex B, Basis of Payment, Applicable Taxes extra. Partial days will be prorated based on actual hours worked based on a 7.5-hour workday.
- (v) **Travel and Living Expenses – National Joint Council Travel Directive:** The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the National Joint Council Travel Directive and with the other provisions of the directive referring to “travellers”, rather than those referring to “employees”. All travel must have the prior authorization of the Technical Authority. All payments are subject to government audit.
- (vi) **Competitive Award:** The Contractor acknowledges that the Contract has been awarded as a result of a competitive process. No additional charges will be allowed to compensate for errors, oversights, misconceptions or underestimates made by the Contractor when bidding for the Contract.
- (vii) **Professional Services Rates:** In Canada's experience, bidders from time to time propose rates at the time of bidding for one or more categories of resources that they later refuse to honour, on the basis that these rates do not allow them to recover their own costs and/or make a profit. This denies Canada of the benefit of the awarded contract. If the Contractor does not respond or refuses to provide an individual with the qualifications described in the Contract within the time described in the Contract (or

proposes instead to provide someone from an alternate category at a different rate), whether or not Canada terminates the Contract as a whole or in part or chooses to exercise any of the rights provided to it under the General Conditions, Canada may impose sanctions or take other measures in accordance with the PWGSC Vendor Performance Corrective Measure Policy (or equivalent) then in effect, which measures may include an assessment that results in conditions applied against the Contractor to be fulfilled before doing further business with Canada, or full debarment of the Contractor from bidding on future requirements.

- (viii) **Purpose of Estimates:** All estimated costs contained in the Contract are included solely for the administrative purposes of Canada and do not represent a commitment on the part of Canada to purchase goods or services in these amounts. Any commitment to purchase specific amounts or values of goods or services is described elsewhere in the Contract.

(b) **Limitation of Expenditure**

- (i) Canada's total liability to the Contractor under the Contract must not exceed the amount set out on page 1 of the Contract, less any Applicable Taxes. With respect to the amount set out on page 1 of the Contract, Customs duties are included and Applicable Taxes are included. Any commitments to purchase specific amounts or values of goods or services are described elsewhere in the Contract.
- (ii) No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:
- (A) when it is 75 percent committed, or
- (B) 4 months before the Contract expiry date, or
- (C) as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work,
- whichever comes first.
- (iii) If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Providing this information does not increase Canada's liability.

Please also make sure that method of payment chronologically follows what was said in the Basis of Payment)

(c) **Method of Payment for Firm Price - Milestone Payments**

- (i) Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract if:
- (A) an accurate and complete claim for milestone payment using form PWGSC-TPSGC 1111 <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/1111-eng.html> and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract.

- (B) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives; and
- (C) all work associated with the milestone and any deliverable required have been completed, delivered, and accepted by Canada.
- (ii) The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

Milestone No.	Description	Firm Amount Percentage of item 9 of Table 1 of Annex B – Basis of Payment	Due Date
1	Licenses for 10 users of commercial off-the-shelf Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 3 of Table 2 of Article 12 of the statement of work.	5%	After completion and approval by the Technical Authority
2	Licenses for 10 users of commercial off-the-shelf US Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 32 of Table 2 of Article 12 of the statement of work.	5%	
3	Modified Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 4 to Mandatory 18 of Table 2 of Article 12 of the statement of work.	25%	
4	ENERGY2020 (Canada) and Canadian macroeconomic model Interface Module. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 19 to Mandatory 29 of Table 2 of Article 12 of the statement of work.	15%	
5	Modified US Regional or State Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 33 to Mandatory 39 of Table 2 of Article 12 of the statement of work.	15%	
6	ENERGY2020 (US) and US macroeconomic model Interface Module.	15%	

	This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 40 to Mandatory 49 of Table 2 of Article 12 of the statement of work.		
7	Linking of the Canadian and US integrated model to create a simultaneous integrated energy, emissions and economy model of North America. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 52 to Mandatory 56 of Table 2 of Article 12 of the statement of work.	15%	
8	Documentation of E3MC, E3US, E3NA. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 57 of Table 2 of Article 12 of the statement of work.	5%	

- (d) **Method of Payment for Firm Price - Lump Sum Payment on Completion:** Canada will pay the Contractor upon completion and delivery of all the Work and in accordance with the payment provisions of the Contract if:
- (i) an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
 - (ii) all such documents have been verified by Canada;
 - (iii) the Work delivered has been accepted by Canada.
- (e) **Method of Payment for Task Authorizations with a Maximum Price:** For each Task Authorization validly issued under the Contract that contains a maximum price:
- (i) Canada will pay the Contractor no more frequently than once a month in accordance with the Basis of Payment. The Contractor must submit time sheets for each resource showing the days and hours worked to support the charges claimed in the invoice.
 - (ii) Once Canada has paid the maximum TA price, Canada will not be required to make any further payment, but the Contractor must complete all the work described in the TA, all of which is required to be performed for the maximum TA price. If the work described in the TA is completed in less time than anticipated, and the actual time worked (as supported by the time sheets) at the rates set out in the Contract is less than the maximum TA price, Canada is only required to pay for the time spent performing the work related to that TA.
- (f) **Payment Credits**
- (i) If the Contractor does not provide a required professional services resource that has all the required qualifications within the time prescribed by the Contract or validly issued Task Authorization, the Contractor must credit to Canada an amount equal to the per diem rate (based on a 7.5-hour workday) of the required resource for each day (or partial day) of delay in providing the resource, up to a maximum of 10 days.
 - (ii) **Corrective Measures:** If credits are payable under this Article for two consecutive months or for three months in any 12-month period, the Contractor must submit a written action plan describing measures it will implement or actions it will undertake to eliminate the recurrence of the problem. The Contractor will have five working days to deliver the

action plan to the Client and the Contracting Authority and 20 working days to rectify the underlying problem.

(iii) **Termination for Failure to Meet Availability Level:** In addition to any other rights it has under the Contract, Canada may terminate the Contract for default in accordance with the General Conditions by giving the Contractor three months' written notice of its intent, if any of the following apply:

(A) the total amount of credits for a given monthly billing cycle reach a level of 10% of the total billing for that month; or

(B) the corrective measures required of the Contractor described above are not met.

This termination will be effective when the three-month notice period expires, unless determines that the Contractor has implemented the corrective measures to Canada's satisfaction during those three months.

(iv) **Credits represent Liquidated Damages:** The Parties agree that the credits are liquidated damages and represent their best pre-estimate of the loss to Canada in the event of the applicable failure. No credit is intended to be, nor will it be construed as, a penalty.

(v) **Canada's Right to Obtain Payment:** The Parties agree that these credits are a liquidated debt. To collect the credits, Canada has the right to hold back, draw back, deduct or set off from and against any money Canada owes to the Contractor from time to time.

(vi) **Canada's Rights & Remedies not Limited:** The Parties agree that nothing in this Article limits any other rights or remedies to which Canada is entitled under the Contract (including the right to terminate the Contract for default) or under the law generally.

(vii) **Audit Rights:** The Contractor's calculation of credits under the Contract is subject to verification by government audit, at the Contracting Authority's discretion, before or after payment is made to the Contractor. The Contractor must cooperate fully with Canada during the conduct of any audit by providing Canada with access to any records and systems that Canada considers necessary to ensure that all credits have been accurately credited to Canada in the Contractor's invoices. If an audit demonstrates that past invoices contained errors in the calculation of the credits, the Contractor must pay to Canada the amount the audit reveals was required to be credited to Canada, plus interest, from the date Canada remitted the excess payment until the date of the refund (the interest rate is the Bank of Canada's discount annual rate of interest in effect on the date the credit was first owed to Canada, plus 1.25% per year). If, as a result of conducting an audit, Canada determines that the Contractor's records or systems for identifying, calculating or recording the credits are inadequate, the Contractor must implement any additional measures required by the Contracting Authority.

7.10 Invoicing Instructions

- (a) The Contractor must submit invoices in accordance with the information required in the General Conditions.
- (b) The Contractor's invoice must include a separate line item for each subparagraph in the Basis of Payment provision.
- (c) By submitting invoices, the Contractor is certifying that the goods and services have been delivered and that all charges are in accordance with the Basis of Payment provision of the Contract, including any charges for work performed by subcontractors.

- (d) The Contractor must provide the original of each invoice to the Technical Authority, and a copy to the Contracting Authority.

7.11 Certifications

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing additional information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, or fails to provide the additional information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

7.12 Federal Contractors Program for Employment Equity - Default by Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "[FCP Limited Eligibility to Bid](#)" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

7.13 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____.

7.14 Priority of Documents

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

- (a) these Articles of Agreement, including any individual SACC Manual clauses incorporated by reference in these Articles of Agreement;
- (b) supplemental general conditions, in the following order:
 - (i) 4002 (2010-08-16) - Software Development or Modification Services (2010-08-16) 4002;
 - (ii) 4003 (2010-08-16) - Licensed Software (2010-08-16) 4003
 - (iii) 4004 (2013-04-25) - Maintenance and Support Services for Licensed Software (2013-04-25) 4004
 - (iv) 4006 (2010-08-16) - Contractor to Own Intellectual Property Rights in Foreground Information (2010-08-16) 4006
- (c) 2030 (2016-04-04), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.
- (d) Annex A, Statement of Work including; including its Appendices as follows:
 - (i) Appendix 1 to Annex A – Sector Structure;
 - (ii) Appendix 2 to Annex A – E3MC and NAICS Sector;
 - (iii) Appendix 3 to Annex A – General overview of the Energy 2020 (Canada) Model;

- (iv) Appendix 4 to Annex A – US Macroeconomic Model Regions and Sector specification;
- (v) Appendix 5 to Annex A – Task Authorization Form.
- (e) Annex B, Basis of Payment;
- (f) the signed Task Authorizations and any Certifications they required;
- (g) Annex , Additional Software Use Terms Approved by Canada (if any), which are only binding on Canada if they have been initialed by both parties in the signed copy of the Contract;
- (h) the Contractor's bid dated _____ .

7.15 Foreign Nationals (Canadian Contractor)

- (a) SACC Manual clause A2000C (2006-06-16) Foreign Nationals (Canadian Contractor)

Note to Bidders: *Either this clause or the one that follows, whichever applies (based on whether the successful Bidder is a Canadian Contractor or Foreign Contractor), will be included in any resulting contract*

7.16 Foreign Nationals (Foreign Contractor)

- (a) SACC Manual clause A2001C (2006-06-16) Foreign Nationals (Foreign Contractor)

7.17 Insurance Requirements

- (a) SACC Manual clause G1005C (2008-05-12) Insurance Requirements

7.18 Limitation of Liability - Information Management/Information Technology

- (a) This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees. This section applies regardless of whether the claim is based in contract, tort, or another cause of action. The Contractor is not liable to Canada with respect to the performance of or failure to perform the Contract, except as described in this section and in any section of the Contract pre-establishing any liquidated damages. The Contractor is only liable for indirect, special or consequential damages to the extent described in this Article, even if it has been made aware of the potential for those damages.
- (b) **First Party Liability:**
 - (i) The Contractor is fully liable for all damages to Canada, including indirect, special or consequential damages, caused by the Contractor's performance or failure to perform the Contract that relate to:
 - (A) any infringement of intellectual property rights to the extent the Contractor breaches the section of the General Conditions entitled "Intellectual Property Infringement and Royalties";
 - (B) physical injury, including death.
 - (ii) The Contractor is liable for all direct damages caused by the Contractor's performance or failure to perform the Contract affecting real or tangible personal property owned, possessed, or occupied by Canada.

- (iii) Each of the Parties is liable for all direct damages resulting from its breach of confidentiality under the Contract. Each of the Parties is also liable for all indirect, special or consequential damages in respect of its unauthorized disclosure of the other Party's trade secrets (or trade secrets of a third party provided by one Party to another under the Contract) relating to information technology.
- (iv) The Contractor is liable for all direct damages relating to any encumbrance or claim relating to any portion of the Work for which Canada has made any payment. This does not apply to encumbrances or claims relating to intellectual property rights, which are addressed under (i)(A) above.
- (v) The Contractor is also liable for any other direct damages to Canada caused by the Contractor's performance or failure to perform the Contract that relate to:
 - (A) any breach of the warranty obligations under the Contract, up to the total amount paid by Canada (including any applicable taxes) for the goods and services affected by the breach of warranty; and
 - (B) any other direct damages, including all identifiable direct costs to Canada associated with re-procuring the Work from another party if the Contract is terminated by Canada either in whole or in part for default, up to an aggregate maximum for this subparagraph (B) of the greater of .75 times the total estimated cost (meaning the dollar amount shown on the first page of the Contract in the cell titled "Total Estimated Cost" or shown on each call-up, purchase order or other document used to order goods or services under this instrument), or \$1,000,000.

In any case, the total liability of the Contractor under subparagraph (v) will not exceed the total estimated cost (as defined above) for the Contract or \$1,000,000, whichever is more.

- (vi) If Canada's records or data are harmed as a result of the Contractor's negligence or willful act, the Contractor's only liability is, at the Contractor's own expense, to restore Canada's records and data using the most recent back-up kept by Canada. Canada is responsible for maintaining an adequate back-up of its records and data.
- (c) **Third Party Claims:**
- (i) Regardless of whether a third party makes its claim against Canada or the Contractor, each Party agrees that it is liable for any damages that it causes to any third party in connection with the Contract as set out in a settlement agreement or as finally determined by a court of competent jurisdiction, where the court determines that the Parties are jointly and severally liable or that one Party is solely and directly liable to the third party. The amount of the liability will be the amount set out in the settlement agreement or determined by the court to have been the Party's portion of the damages to the third party. No settlement agreement is binding on a Party unless its authorized representative has approved the agreement in writing.
 - (ii) If Canada is required, as a result of joint and several liability or joint and solidarily liable, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada by the amount finally determined by a court of competent jurisdiction to be the Contractor's portion of the damages to the third party. However, despite Sub-article (i), with respect to special, indirect, and consequential damages of third parties covered by this Section, the Contractor is only liable for reimbursing Canada for the Contractor's portion of those damages that Canada is required by a court to pay to a third party as a result of joint and several liability that relate to the infringement of a third party's intellectual property rights; physical injury of a third party, including death;

damages affecting a third party's real or tangible personal property; liens or encumbrances on any portion of the Work; or breach of confidentiality.

- (iii) The Parties are only liable to one another for damages to third parties to the extent described in this Sub-article (c).

7.19 Joint Venture Contractor

- (a) The Contractor confirms that the name of the joint venture is _____ and that it is comprised of the following members: *[list all the joint venture members named in the Contractor's original bid]*.
- (b) With respect to the relationship among the members of the joint venture Contractor, each member agrees, represents and warrants (as applicable) that:
- (i) _____ has been appointed as the "representative member" of the joint venture Contractor and has full authority to act as agent for each member regarding all matters relating to the Contract;
- (ii) by giving notice to the representative member, Canada will be considered to have given notice to all the members of the joint venture Contractor; and
- (iii) all payments made by Canada to the representative member will act as a release by all the members.
- (c) All the members agree that Canada may terminate the Contract in its discretion if there is a dispute among the members that, in Canada's opinion, affects the performance of the Work in any way.
- (d) All the members are jointly and severally or solidarily liable for the performance of the entire Contract.
- (e) The Contractor acknowledges that any change in the membership of the joint venture (i.e., a change in the number of members or the substitution of another legal entity for an existing member) constitutes an assignment and is subject to the assignment provisions of the General Conditions.
- (f) The Contractor acknowledges that all security and controlled goods requirements in the Contract, if any, apply to each member of the joint venture Contractor.

Note to Bidders: This Article will be deleted if the Bidder awarded the contract is not a joint venture. If the contractor is a joint venture, this clause will be completed with information provided in its bid.

7.20 Licensed Software

- (a) With respect to the provisions of Supplemental General Conditions 4003:

Licensed Software	The Licensed Software, which is defined in 4003, includes all the products offered by the Contractor in its bid, and any other software code required for those products to function in accordance with the Software Documentation and the Specifications, including without limitation all of the following products: _____ [this information will be completed at contract award using information in the Contractor's bid]
Type of License being Granted	User License
Number of Users Licensed	10
Option to Purchase Licenses for Additional Users	The Contractor grants to Canada the irrevocable option to purchase licenses for additional Users at the price set out in Annex B on the same terms and conditions as the initial User licenses granted under the Contract. This option may be exercised at any time during the Contract Period, as many times as Canada chooses. This option may only be exercised by the Contracting Authority by notice in writing and will be evidenced, for administrative purposes only, by a contract amendment.
Language of Licensed Software	English
Delivery Location	Client Location
Media on which Licensed Software must be Delivered	download or CD-ROM
Term of License	Annual
Software Warranty Period	24-months (duration of contract)
Source Code Escrow Required	Yes

- (b) **On-going Maintenance of Software Code:** The Contractor must continue to maintain the version of the Licensed Software (i.e., the version or "build" originally licensed under the Contract) as a commercial product (i.e., the Contractor or the software publisher must be continuing to develop new code in respect of the Licensed Software to maintain its functionality, enhance it, and deal with Software Errors) for at least 10 years from the date the Contract is awarded. After that time, if the Contractor or the software publisher decides to discontinue or no longer maintain the then-current version or "build" of the Licensed Software and, instead, decides to provide upgrades to the Licensed Software as part of the Software Support, the Contractor must provide written notice to Canada at least 12 months in advance of the discontinuation.

7.21 Licensed Software Maintenance and Support

- (a) With respect to the provisions of Supplemental General Conditions 4004:

Licensed Programs	Off-the-shelf Canadian macro model; off-the-shelf US macro model; E3MC, E3US, E3NA
Software Support Period	Contract period
Software Support Period when Additional Licenses added during Contract Period	For any additional licenses purchased in accordance with the Contract, the Software Support Period currently underway will apply to the additional licenses purchased, so that the Software Support Period ends on the same date for all licences supported under the Contract.
Option to Extend Software Support Period	The Contractor grants to Canada the irrevocable option(s) to extend the Software Support Period by 8 additional 12-month periods, exercisable at any time during the Contract Period. The Contractor agrees that, during the entire Software Support Period, the prices will be those set out in Annex B. The option(s) may only be exercised by the Contracting Authority by notice in writing and will be evidenced, for administrative purposes only, by a contract amendment.
Hours for Providing Support Services	The Contractor's personnel must be available from 7 a.m. until 6 p.m., local time, at the site where the Licensed Programs are installed, Monday through Friday, exclusive of statutory holidays observed by Canada at the site where the service is required.
Contractor must provide On-site Support Services	Yes, on an as-needed and required basis.
Contractor must provide Swift Action Tactical (SWAT) services	No
Contractor must install Software Error corrections and Maintenance Releases and upgrades	Yes
Contractor must keep track of software releases for the purpose of configuration control	Yes

<p>Contact Information for Accessing the Contractor's Support Services</p>	<p>In accordance with Section 5 of 4004, the Contractor will make its Support Services available through the following: Toll-free Telephone Access: _____ Toll-free Fax Access: _____ Email _____ Access: _____ The Contractor must respond to all telephone, fax or email communications (with a live service agent) within 60 minutes of the initial time of the Client or User's initial communication. [Note to Bidders: to be completed with information from the Contractor at the time of award. Bidders are requested to provide this information in their bids].</p>
<p>Website</p>	<p>In accordance with Section 5 of 4004, the Contractor must make Support Services available over the Internet. To do so, the Contractor must include, as a minimum, frequently asked questions and on-line software diagnostic routines and support tools. Despite the Hours for Providing Support Services, the Contractor's website must be available to Canada's users 24 hours a day, 365 days a year, and must be available 99% of the time. The Contractor's website address for web support is _____. [Note to Bidders: to be completed with information from the Contractor at the time of award. Bidders are requested to provide this information in their bids].</p>
<p>Language of Support Services</p>	<p>The Support Services must be provided in English.</p>

- (b) **Option to Add Other Clients for Maintenance and Support Only:** The Contractor grants to Canada the option to extend the maintenance and support services for the Licensed Software to other Government of Canada users who are already licensed to use the Licensed Software under another contract, but who require maintenance and support services for that Licensed Software, at the price set out in the Basis of Payment. This option applies to any users within any department or Crown corporation described in the Financial Administration Act, as amended from time to time, or any other party for which the Department of Public Works and Government Services may be authorized to act from time to time under section 16 of the Department of Public Works and Government Services Act. This option may be exercised at any time during the Contract Period, as many times as Canada chooses. This option may only be exercised by the Contracting Authority by notice in writing and will be evidenced, for administrative purposes only, by a contract amendment.

7.22 Training

- (a) **Providing Training:** The Contractor must provide training on the software Solution on an "as-and-when-requested" basis during the Contract Period when a Task Authorization for training is issued in accordance with the Contract.
- (b) The training may be provided at various locations across Canada, as requested in the Task Authorization.

- (c) The training must be available within 15 working days of the Task Authorization being issued.
- (d) The training, including both the instruction and the course materials, must be provided in English.
- (e) Before providing any training, at least 10 working days in advance of the first training session, the Contractor must submit the course syllabus and schedule, the training materials, and the names and qualifications of the instructors to the Technical Authority for approval.

7.23 Professional Services - General

- (a) The Contractor must provide professional services on request as specified in this Contract.

All resources provided by the Contractor must meet the qualifications described in the Contract (including those relating to previous experience, professional designation, education, language proficiency and security clearance) and must be competent to provide the required services by any delivery dates described in the Contract.

- (b) If the Contractor fails to deliver any deliverable (excluding delivery of an individual) or complete any task described in the Contract on time, in addition to any other rights or remedies available to Canada under the Contract or the law, Canada may notify the Contractor of the deficiency, in which case the Contractor must submit a written plan to the Technical Authority within ten working days detailing the actions that the Contractor will undertake to remedy the deficiency. The Contractor must prepare and implement the plan at its own expense.
- (c) In General Conditions 2030, Section 09 titled "Replacement of Specific Individuals" is deleted and the following applies instead:

Replacement of Specific Individuals

- (i) If the Contractor is unable to provide the services of any specific individual identified in the Contract to perform the services, the Contractor must within five working days of the individual's departure or failure to commence Work (or, if Canada has requested the replacement, within ten working days of Canada's notice of the requirement for a replacement) provide to the Contracting Authority:
 - (A) the name, qualifications and experience of a proposed replacement immediately available for Work; and
 - (B) security information on the proposed replacement as specified by Canada, if applicable.

The replacement must have qualifications and experience that meet or exceed the score obtained for the original resource.

- (ii) Subject to an Excusable Delay, where Canada becomes aware that a specific individual identified under the Contract to provide the services has not been provided or is not performing, the Contracting Authority may elect to:
 - (A) exercise Canada's rights or remedies under the Contract or at law, including terminating the Contract in whole or in part for default under the Section titled "Default of the Contractor", or
 - (B) assess the information provided under (c) (i) above or, if it has not yet been provided, require the Contractor propose a replacement to be rated by the Technical Authority. The replacement must have qualifications and experience

that meet or exceed those obtained for the original resource and be acceptable to Canada. Upon assessment of the replacement, Canada may accept the replacement, exercise the rights in (ii) (A) above, or require another replacement in accordance with this subarticle (c).

Where an Excusable Delay applies, Canada may require (c) (ii) (B) above instead of terminating under the Excusable Delay Section. An Excusable Delay does not include resource unavailability due to allocation of the resource to another Contract or project (including those for the Crown) being performed by the Contractor or any of its affiliates.

- (iii) The Contractor must not, in any event, allow performance of the Work by unauthorized replacement persons. The Contracting Authority may order that an original or replacement resource stop performing the Work. In such a case, the Contractor must immediately comply with the order. The fact that the Contracting Authority does not order that a resource stop performing the Work does not relieve the Contractor from its responsibility to meet the requirements of the Contract.
- (iv) The obligations in this article apply despite any changes that Canada may have made to the Client's operating environment.

7.24 Safeguarding Electronic Media

- (a) Before using them on Canada's equipment or sending them to Canada, the Contractor must use a regularly updated product to scan electronically all electronic media used to perform the Work for computer viruses and other coding intended to cause malfunctions. The Contractor must notify Canada if any electronic media used for the Work are found to contain computer viruses or other coding intended to cause malfunctions.
- (b) If magnetically recorded information or documentation is damaged or lost while in the Contractor's care or at any time before it is delivered to Canada in accordance with the Contract, including accidental erasure, the Contractor must immediately replace it at its own expense.

7.25 Representations and Warranties

The Contractor made statements regarding its and its proposed resources' experience and expertise in its bid that resulted in the award of the Contract and the issuance of TA's. The Contractor represents and warrants that all those statements are true and acknowledges that Canada relied on those statements in awarding the Contract and through TA's. The Contractor also represents and warrants that it has, and all its resources and subcontractors that perform the Work have, and at all times during the Contract Period they will have, the skills, qualifications, expertise and experience necessary to perform and manage the Work in accordance with the Contract, and that the Contractor (and any resources or subcontractors it uses) has previously performed similar services for other customers.

7.26 Access to Canada's Property and Facilities

Canada's property, facilities, equipment, documentation, and personnel are not automatically available to the Contractor. If the Contractor would like access to any of these, it is responsible for making a request to the Technical Authority. Unless expressly stated in the Contract, Canada has no obligation to provide any of these to the Contractor. If Canada chooses, in its discretion, to make its property, facilities, equipment, documentation or personnel available to the Contractor to perform the Work, Canada may require an adjustment to the Basis of Payment and additional security requirements may apply.

7.27 Transition Services at End of Contract Period

The Contractor agrees that, in the period leading up to the end of the Contract Period, it will make all reasonable efforts to assist Canada in the transition from the Contract to a new contract with another supplier. The Contractor agrees that there will be no charge for these services.

7.28 Termination for Convenience

With respect to Section 32 of 2030, if applicable, subsection 4 is deleted and replaced with the following subsections 4, 5 and 6:

4. The total of the amounts, to which the Contractor is entitled to be paid under this section, together with any amounts paid, due or becoming due to the Contractor must not exceed the Contract Price.
5. Where the Contracting Authority terminates the entire Contract and the Articles of Agreement include a Minimum Work Guarantee, the total amount to be paid to the Contractor under the Contract will not exceed the greater of
 - (a) the total amount the Contractor may be paid under this section, together with any amounts paid, becoming due other than payable under the Minimum Revenue Guarantee, or due to the Contractor as of the date of termination, or
 - (b) the amount payable under the Minimum Work Guarantee, less any amounts paid, due or otherwise becoming due to the Contractor as of the date of termination.
6. The Contractor will have no claim for damages, compensation, loss of profit, allowance arising out of any termination notice given by Canada under this section except to the extent that this section expressly provides. The Contractor agrees to repay immediately to Canada the portion of any advance payment that is unliquidated at the date of the termination.

7.29 Identification Protocol Responsibilities

The Contractor will be responsible for ensuring that each of its agents, representatives or subcontractors (hereinafter referred to as Contractor Representatives) complies with the following self-identification requirements:

- (a) Contractor Representatives who attend a Government of Canada meeting (whether internal or external to Canada's offices) must identify themselves as Contractor Representatives prior to the commencement of the meeting, to ensure that each meeting participant is aware of the fact that the individual is not an employee of the Government of Canada;
- (b) During the performance of any Work at a Government of Canada site, each Contractor Representative must be clearly identified at all times as being a Contractor Representative; and
- (c) If a Contractor Representative requires the use of the Government of Canada's e-mail system in the performance of the Work, then the individual must clearly identify him or herself as an agent or subcontractor of the Contractor in all electronic mail in the signature block as well as under "Properties." This identification protocol must also be used in all other correspondence, communication, and documentation.
- (d) If Canada determines that the Contractor is in breach of any obligation stated in this Article, upon written notice from Canada the Contractor must submit a written action plan describing corrective measures it will implement to eliminate the recurrence of the problem. The

Solicitation No. - N° de l'invitation
K1A12-160736/A
Client Ref. No. - N° de réf. du client
K1A12-160736

Amd. No. - N° de la modif.
File No. - N° du dossier
615eIK1A12-160736

Buyer ID - Id de l'acheteur
615eI
CCC No./N° CCC - FMS No./N° VME

Contractor will have five working days to deliver the action plan to the Client and the Contracting Authority, and twenty working days to rectify the underlying problem.

- (e) In addition to any other rights it has under the Contract, Canada may terminate the Contract for default if the corrective measures required of the Contractor described above are not met.

ANNEX A – Statement of Work (SOW)

Unified Energy, Emissions and Economy Modeling Solution (E3NA)

1. REQUIREMENTS:

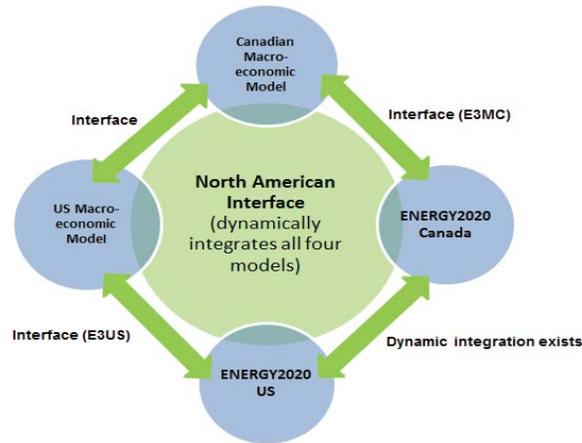
The Contractor must provide Canada with the following three modeling solutions:

1. A **Canadian** energy, emissions and economy modeling solution (E3MC), which must consist of:
 - a) A Canadian macroeconomic model. The Model must serve two purposes: forecasting and simulation analysis.
 - b) An interface module that allows the user to dynamically integrate the Canadian macroeconomic model with ENERGY2020-Canada **and** allows the macroeconomic model and ENERGY2020-Canada to be operated on a **stand-alone and dynamically-integrated basis**
2. A **US** energy, emissions and economy modeling solution (E3US), which must consist of:
 - a) A US macroeconomic model. The Model must serve two purposes: forecasting and simulation analysis.
 - b) An interface module that allows the user to dynamically integrate the US macroeconomic model with ENERGY2020-US **and** allows the macroeconomic model and ENERGY2020-US to be operated on a **stand-alone and dynamically-integrated basis**
3. A **North American** energy, emissions and economy modeling solution (E3NA), which must consist of:
 - a) An integration of the E3MC and E3US modeling solution to create the dynamic E3NA solution
 - b) An interface module that allows the user to dynamically integrate the results of E3MC and E3US such that it will result in a North American energy, emissions and economy solution (see Figure 1)

The contractor must also provide Canada with on-going on-demand and as required technical support for:

1. The Canadian and US macroeconomic models
2. The integrated modeling solution (i.e., ensure that a general equilibrium is obtained for the reference and various policy simulations)
3. Provision of semi-annual macroeconomic reference cases aligned with the most recent macroeconomic consensus projection

Figure 1: Energy, Emissions and Economy Modeling Solutions: E3MC, E3US and E3NA.



1.1 Current Situation

Canada requires the modernization of its current Canadian energy, emissions and economic modeling solution, E3MC, such that it can continue to be one of the premier integrated¹ energy, emissions and economy modeling solutions used in Canada. In addition, Canada requires the enhancements of its integrated energy, emission and economic modeling capacity to assess environment and energy-related issues at the North American regional level.

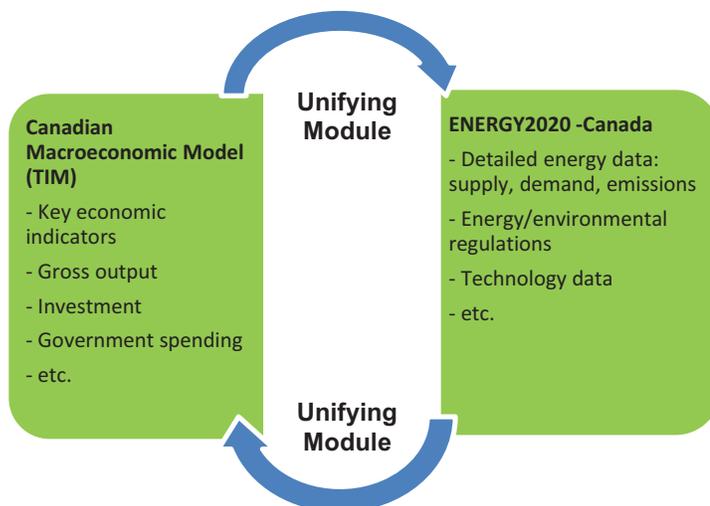
With respect to its Canadian energy, emissions and economic modeling capacity, E3MC currently consists of two key proprietary models which are licensed to the Government of Canada, plus a unifying interface module that dynamically links the results of each model (see Figure 2):

- i. **ENERGY2020-Canada**, a highly detailed and technology-rich end-use technology model that simulates energy supply and demand and associated emissions, is maintained by Systematic Solutions, Inc. (SSI).
- ii. **The Informetrica Model (TIM)**, a highly detailed macroeconomic model that was, until 2011, maintained by Informetrica Limited. TIM needs to be replaced as its input-output structure is no longer compatible with Statistics Canada's new Canadian System of National Accounts, 2012 (CSNA2012).

¹ 'Integrated' describes the process by which solved results from one model (e.g., energy technology simulation model) are read into a second model (e.g., macroeconomic model) by way of an interface to produce a dynamic general equilibrium in both models. This is accomplished in real time. Dynamic integration ensures that as one model is solved, its results are fed into the receiving model; the receiving model is solved and its results fed back into the original model. This integration is done for each year the model is dynamically solved into the future.

- iii. A unifying interface module through which solved results from ENERGY2020-Canada are read into TIM and vice versa to produce a dynamic general equilibrium in both models.

Figure 2: Current Canadian Modeling Solution, E3MC.



1.2 Managed Program

1.21 Canada requires the modernization of its current Canadian unifying energy, emissions and economic modeling solution, E3MC. This consists of:

- a) A Canadian macroeconomic model that is fully aligned with Statistics Canada's System of National Accounts and is based on the most recently available national, provincial and territorial input-output Tables. The Model must serve two purposes: forecasting and simulation analysis.
- b) A unifying interface module which will dynamically link the provincial/territorial based macroeconomic model with ENERGY2020-Canada. A key feature of this integrating module is that it must allow the macroeconomic model's energy block to be a "slave" to the ENERGY2020-Canada model. That is, when the two models are dynamically linked, the macroeconomic model's energy block will be driven by ENERGY2020-Canada. For the other blocks, ENERGY2020-Canada is slave to the macroeconomic model.

1.22 Canada also requires the creation of a US unifying energy, emissions and economic modeling solution, herein known as the E3US solution. This consists of:

- a) A US macroeconomic model. The Model must serve two purposes: forecasting and simulation analysis.
- b) A unifying interface module which will dynamically link the US macroeconomic model with ENERGY2020-US. A key feature of this integrating module is that it

must allow the macroeconomic model's energy block to be a "slave" to the ENERGY2020-US model. That is, when the two models are dynamically linked, the macroeconomic model's energy block will be driven by ENERGY2020-US. For the other blocks, ENERGY2020-US is slave to the macroeconomic model.

1.23 When used in a dynamic and linked combination, the solutions obtained from E3MC and E3US will be used to create a North American energy, emissions and economy modeling solution, E3NA (see Figure 1). In other words, E3NA will dynamically link the results from E3MC and E3US to produce a North American general equilibrium. Hence, the supplier is required to deliver and support the list of delivery, acceptance and considerations that are itemized in detail in Section 12 of the SOW.

2. SCOPE:

2.1 The Contractor must complete and provide the following main requirements:

1. An integrated energy, emissions and economy model for Canada. This consists of two main deliverables:
 - **A 10 province and 3 Territory Canadian Macroeconomic Model.**
 - **Canadian Unifying Integrating Module**—This module dynamically links the results from ENERGY2020-Canada and the Canadian macroeconomic model to create an integrated energy, emissions and economy model for Canada (E3MC) that produces a simultaneous equilibrium solution in both models (macroeconomic and ENERGY2020-Canada).
2. An integrated energy, emissions and economy model for the United States of America. This consists of two main deliverables:
 - **A US Macroeconomic Model.**
 - **A US Unifying Integrating Module**—This module dynamically links the results from ENERGY2020-US and the US macroeconomic model to create an integrated energy, emissions and economy model for the US (E3US) that produces a simultaneous equilibrium solution in both models (US macroeconomic and ENERGY2020-US).
3. **A North American Integrating Module**—This module dynamically links the results from E3MC and E3US to create an integrated energy, emissions and economy model for North America (E3NA) that produces a simultaneous equilibrium solution in both integrated models (E3MC and E3US). As an option to the E3NA solution, the Contractor may be requested to dynamically linking the results from ENERGY2020-Mexico to a Mexican macroeconomic model to E3MC and E3US.
4. **A Detailed and Comprehensive Methodology**—This must clearly illustrate the Contractor's understanding of all elements of Figure 1 (see Requirement 3 above.)
5. **Other Services**—These consist of documentation, on-demand and as-required technical support, semi-annual macroeconomic reference cases and other.

2.2 In addition to the above mentioned requirements, the Contractor is requested to provide information on the following optional requirements. *This article will be deleted if not applicable.*

1. **Global Macroeconomic Model:** This section, if applicable, will include access to an existing global macroeconomic model. (This section will be completed prior to the contract award. It will be based on what the Bidder proposes in Attachment 3.5 of Part 3 of the RFP). *This article is to be deleted if not applicable.*
2. **Floor Space:** This section, if applicable, will include a detailed methodology for creating historical and forecast estimates of Commercial Floor Space by Building Type. (This section will be completed prior to the contract award. It will be based on what the Bidder proposes in Attachment 3.5 of Part 3 of the RFP). *This article will be deleted if not applicable.*
3. **Mexico Module Linkage:** This section, if applicable, will include a detailed methodology, with full notional costing, for the option to linking Energy 2020-Mexico to a Mexican Macroeconomic Model (E3MX) and to link E3MX to E3MC and E3US. (This section will be completed prior to the contract award. It will be based on what the Bidder proposes in Attachment 3.5 of Part 3 of the RFP). *This article will be deleted if not applicable.*

2.3 This requirement has two distinct, while highly interconnected elements.

1. A software development element where the Contractor will develop a:
 - Customized 10-province and 3 Territory Canadian Macroeconomic Model.
 - Unifying integrating module that links ENERGY2020-Canada and the Canadian macroeconomic model to create the modeling solution E3MC.
 - Unifying integrating module that links ENERGY2020-US and the US macroeconomic model to create the modeling solution E3US.
 - Unifying integrating module that links the modeling solutions E3MC to E3E3US to create an integrated energy, emissions and economy model for North America (E3NA).
2. A professional services element where the Contractor will:
 - Test and demonstrated proof of capacity of the customized 10-province and 3 Territory Canadian Macroeconomic Model to develop macroeconomic forecasts on a standalone basis and when linked to ENERGY2020-Canada.
 - Test and demonstrated proof of capacity of the US Macroeconomic Model to develop macroeconomic forecasts on a standalone basis and when linked to ENERGY2020-US.
 - Test and demonstrated proof of capacity of E3MC to develop integrated energy, emissions and economic baselines whenever a variable is changed in either the macroeconomic model or the energy model.
 - Test and demonstrated proof of capacity of E3US to develop integrated energy, emissions and economic baselines whenever a variable is changed in either the macroeconomic model or the energy model.

- Test and demonstrated proof of capacity of E3NA to develop integrated energy, emissions and economic baselines whenever a variable is changed in either the macroeconomic model or the energy model.
- Provide Government of Canada specified macroeconomic baselines for Canada and the US.
- Provide technical support on a “on-demand and as-required” basis.

3. GOALS, OBJECTIVES AND PURPOSE

3.1 A key goal of this requirement is to replace E3MC's current Canadian macroeconomic model component, TIM. TIM is currently anchored in 1997 input-output tables and Statistics Canada has discontinued publishing chain-weighted 1997 data. Moreover, Statistics Canada is in the process of revising all data associated with the Canadian System of National Accounts (CSNA) due to the implementation of the new international standards published in System of National Accounts 2008. Environment and Climate Change (ECCC) Canada, working with Natural Resources Canada (NRCan) and the National Energy Board (NEB), has initiated work towards the replacement of TIM. The customized macroeconomic model developed under this requirement would then be dynamically linked to ENERGY2020-Canada to create a modernized energy, emissions and economy model for Canada (E3MC).

3.2 ENERGY2020-Canada has been used to support economic analysis of the Government's domestic and international clean air initiatives for well over a decade. In 2002, a federal, provincial and territorial analysis and modeling working group reviewed a series of energy simulation models and selected ENERGY2020-Canada as the most diverse to help develop a package of policies and measures to reduce greenhouse gas emissions. Since then, ENERGY2020-Canada has been ECCC's primary analytical tool to analyze policies and measures to reduce greenhouse gas emissions. The structure and databases of ENERGY2020-Canada are updated annually to reflect the best available information and to accommodate the sector-by-sector regulatory agenda.

3.3 The dynamic integration of the new customized Canadian macroeconomic model to ENERGY2020-Canada requires an integrating interface module. The interface module is to be constructed in a manner that will allow the customized macroeconomic model-ENERGY 2020-Canada linkage to allow for the real-time transfer of key variables from the macro model to ENERGY2020-Canada and vice versa. The same approach and philosophy would apply to the US Macro model-ENERGY2020-US linkage.

3.4 ENERGY2020 (Canada, US and Mexico) uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. Transferring data from ENERGY2020 to the macro model and vice versa requires an identification of key variables that will be interactively transferred between the models. While not an exhaustive list, key variables that are interactively transferred from the macro model to ENERGY2020 should include:

1. Economic output and GDP by Economic Category
2. Total Personal Income
3. Real Disposable Personal Income

4. Investment, by business, residential and asset type
5. Inventory Changes, according to data availability
6. Residential Housing, by stock, starts and value
7. Commercial Buildings, by stock, starts and value, according to data availability
8. Consumer Price Index
9. GDP Deflator
10. Exchange Rates
11. Government Compensation

The ENERGY2020 variables that are typically passed to the macro model include but are not be limited to:

1. Energy production for each energy sector (electricity, oil, gas, coal, etc.)
2. Energy expenditures by economic category (fuel and capital)
3. Energy use per \$ of economic output by economic category and fuel
4. Emissions permit costs by economic category and fuel
5. Investments related to energy production or to meet environmental or energy related policies.
6. Investments by structure, by equipment, by process for each economic category
7. Energy related trade flow

3.5 As ENERGY2020 is an energy model, many of the variables produced are in energy-related units (i.e., barrel, cubic metres, litres, kilowatt-hours, joules and British thermal units), as wells as value of energy use. These variables are highly disaggregated. In contrast, the vast majority macroeconomic model variables are in dollar values and are reported according to the model's sector aggregation (e.g., conventional oil and gas extraction, non-conventional oil extraction, utilities, etc.). Transferring data from ENERGY2020 to the macro model and vice versa requires protocols to ensure data compatibility. For example, ENERGY2020 generates barrels or petajoules/TBTUs of conventional crude oil productions (i.e., light, heavy and frontier) and unconventional (i.e., primary oil sands, oil sands mining, in-situ) and upgraded oil sands. The integrating module must have the capacity to convert these energy-unit based outputs into dollar value output that corresponds to the correct macroeconomic model sector.

3.6 Another key objective of this requirement is to enhance the Government's integrated energy, emission and economic modeling capacity to assess environment and energy-related issues at the North American regional level. This will be achieved through the development of a modeling solution that develops integrated energy, emissions and economic baselines for the US (E3US) and integrated energy, emissions and economic baselines for North America (E3NA).

3.7 ECCC will use its integrated modeling capacity to generate a baseline forecast and to undertake policy analysis which seeks to answer questions such as: What are the economic impacts of an initiative or policy change? To this end, the objective of the new modeling solutions must provide Canada with:

- i. **A Base Case**—Typically a 'business as usual' scenario.

- ii. **Model-Based Tools that Represent Policy Initiatives**—These tools generally represent policy initiatives, e.g. changes to regulations, standards, financial incentives, information and enforcement programs, and changes to markets exercised through changes to market rules (permit systems) or government tax and subsidy rules.
- iii. **Model-Based Tools that Translate Policy Initiatives into Direct Impacts**—Direct impacts affect specified sources of economic demand such as consumers, businesses and governments. They also affect economy-wide impacts that reflect the interactions of all internal and external sources of demand, production, price formation, and these in the context of effects on the financial system.

3.8 The purpose of the combination of ENERGY2020-Canada and a Canadian macroeconomic model is to allow ECCC, NRCan and the NEB to carry out environment and energy-related simulations in an integrated fashion, capturing the complex interactions between the economy, the energy sector and the environment. ECCC must continue to meet United Nations Framework on Climate Change (UNFCCC) reporting obligations, including annual reporting on GHG emission levels, quadrennial National Communications reporting, and a new obligation to report biennially on progress towards our national climate change goals. Canada must continue to provide data to the Organization for Economic Co-operation and Development (OECD) and the Commission for Environmental Cooperation (CEC) to support research and analysis as part of international efforts to address climate change.

3.9 The integrated modeling solutions will provide the Government with a unique capacity to allow for energy and environmental considerations into the development and implementation of federal economic policies. At the same time, the modeling solutions ensure that economic considerations are factored into energy and environmental regulations and policies.

4. CONTEXTUAL INFORMATION

4.1 The Contractor must consider and factor the following information as operationally relevant to the requirements.

4.2 ECCC and NRCan currently apply a range of tools to establish an analytical foundation for policy development in their respective departments. The analytical tools being applied are those which are best suited to address the issues at hand. Issues that will impact many different sectors of the economy, with feedback loops and system-effects arising from the interactions between producers and consumers of various goods, are being addressed using this comprehensive and fully-integrated energy, emissions and economy modeling solution. Issues that are more limited in their potential feedback effects and cross-linkages between sectors or firms are being analyzed using micro or 'partial equilibrium' models or spreadsheet tools.

4.3 Since 2006, ECCC has used E3MC to support the development of environmental policy. The NEB has used a variant of E3MC since 2006 (and prior) for its periodic long term projections of energy demand and supply. NRCan has been using energy models

for the preparation of long-term energy projections for the last 30 years. Over the years, the emphasis among topics and the use of models has changed depending on evolving and emerging issues in the Canadian energy markets. Recently, NRCAN has switched to using the same modeling platform as ECCC and NEB.

4.4 The macroeconomic link provided by the macroeconomic is essential for influencing the manner in which ENERGY2020 (Canada, US and Mexico) resolves the energy and emissions impacts of a specific policy action. ENERGY2020 (Canada, US and Mexico) determines the response of the energy market to changes in events or policies. Energy markets are detailed by the consuming and producing sectors, with energy demand detailed by fuel type and capital and other spending that is consistent with the change in energy demand. Policy impacts include a variety of direct effects on industry and consumer price formation, capital spending and both industry and consumer current spending.

4.5 The energy impacts (prices, quantities and energy-related expenditures) must be passed to the macroeconomic model to estimate how the economy will react (i.e. to produce an altered set of macroeconomic responses). These altered macroeconomic responses (variables) are then passed back to ENERGY2020 (Canada, US and Mexico) to fully estimate the impact of the policy. This interaction will be completed dynamically and instantaneously.

5. PRIORITIES

5.1 The unifying modeling solutions (E3MC, E3US and E3NA) must deliver and support a solution that contributes to ECCC delivering their current Programs, Plans and Priorities in the following context.

5.2 Environmental issues have wide-ranging implications for social and economic decisions. ECCC collaborates extensively across jurisdictions and sectors and supports broader federal government efforts to improve the environmentally responsible development of Canada's natural resources through initiatives to reduce air pollution. For example, ECCC collaborates extensively with provincial/territorial governments, Aboriginal governments, environmental non-governmental organizations, the government of the United States and of other nations, and international organizations.

5.3 Of the five key environmental indicators that were developed to represent, at a high level, progress in delivering a clean, safe and sustainable environment for Canadians, the CLEAN Stewardship Mandate (or priority) is perhaps the most relevant for determining how macroeconomic activity affects GHG emissions. The plan for meeting this priority includes:

1. **Delivering a Pan-Canadian approach** to reducing Canada's GHG emissions by developing and implementing national and provincial actions to reducing greenhouse gas (GHG) emissions—including those from major-emitting sectors of the economy—in consultation with provinces, territories and stakeholders. This

work builds on achievements to date in progress made towards achieving Canada's international commitment, as well as province-specific commitments.

2. **Participating in international fora** to advance Canada's environmental goals related to climate change and air quality by way of collaboration with other nations who are also committed to addressing climate change. This includes exploring a North American approach to reducing greenhouse with Canada's partners in the United States and Mexico. Commitments made under the UNFCCC form the basis of Canada's commitments.

5.4 ECCC's collaborative approach (at home and abroad) to regulating reductions in greenhouse gas emissions and air pollutants helps to protect the health of Canadians and their environment. The Department also provides information about air emissions to decision makers at all levels of government, and to the public and private sectors, thus supporting informed decisions for the benefit of Canadians. ECCC analyzes the environmental performance of new and emerging technologies and helps ensure that federal technology programs maximize environmental benefits.

5.5 In order to meet its obligations, E3MC, E3US, and E3NA must enable ECCC to develop answers to questions such as:

1. What are the national, provincial and territorial impacts of various policy initiatives in both the near and longer term?
2. What are the economic impacts of growth in energy production, for both producing regions (such as Alberta and B.C.) as well as spillover impacts for other provinces?
3. What are the economic impacts of changes in North American or global wholesale energy prices (natural gas, crude oil, coal)? What are the impacts of changing global trade patterns?
4. What are the economic impacts of changing demographics, emerging urban development trends, changing consumer preferences or technological development on the energy demand side (for example increased investment in energy efficient technology, alternative fuels, or changes in driving frequency)?
5. What is the impact of regional energy price differentials resulting from changing flow, infrastructure, and demand issues?
6. What are the economic impacts of the development of major energy projects (for example Hydro projects, LNG export terminals and oil exporting terminals)?
7. What are the economic impacts to industry and consumers in achieving environmental policies such as Canada's greenhouse gas emissions reduction objectives and policies aimed at reducing air pollutants and improving air quality and human health?
8. What are the economic implications of Canada-US action to address climate change and clean air issues? What are the competitiveness implications of harmonized actions? What are the benefits of harmonized GHG and CAC emissions trading systems?
9. How will industry and consumers respond to various environmental issues (e.g., climate change, air quality, toxins and others) that directly impact economic sectors?

10. What are the benefits (for example reduced health costs and reduced damage to infrastructure) of addressing climate change and clean air?

6. TECHNICAL ENVIRONMENT

6.1 To enhance ECCC's analytical capacity, ECCC requires the items as listed in the Scope. This includes a customized Canadian, provincial and territorial macroeconomic model and a US-based macroeconomic model. The macroeconomic models must serve two purposes: forecasting and simulation analysis.

6.2 The customized Canadian macroeconomic model and the US macroeconomic model will be dynamically linked² to ENERGY2020-Canada and ENERGY2020-US.

6.3 ENERGY2020 (Canada and US) is a commodity-based energy model with a detailed industry and household classification system. The customized Canadian macroeconomic model must be a highly-detailed macroeconomic model and its results must be fully-integrated (or unifying) with the results from ENERGY2020 (Canada and US).

6.4 The new integrated modeling solutions (i.e., E3MC and E3US) must be configured in a manner in which the two models – ENERGY2020-Canada and the macroeconomic models – operate in a fully-integrated and dynamic manner to arrive at an equilibrium solution at an annual level. This ensures that there is a technical endogeneity³ between the two models.

6.5 In general, energy and emissions models such as ENERGY2020 are characterized as 'partial equilibrium models' in the sense that the economics of demand, supply, and price formation focus on specific details of the energy system and limit interaction to that which occurs within the energy system.

6.6 As such, development of a base case for ENERGY2020 (Canada and US) requires information that is exogenous to its framework, including measures of the income and activity of industries and households, detailed expenditure and revenue flows of federal and provincial (state) governments, and potentially, a number of domestic and foreign prices and financial market variables. These macroeconomic variables must be provided by the macroeconomic model. Likewise, development of impacts of initiatives requires that measures that are exogenous to the energy model must be adjusted to reflect economy-wide interactions and foreign linkages so that output from the energy model reflects these. Furthermore, implications for general measures of effect (on total

² 'Dynamically linked' is used interchangeably with 'integrated' as they define the same procedure.

³ Customized macro model must respond to changes in assumptions generated by ENERGY2020 (Canada) as it iterates to meet a specified set of policy actions.

output, employment, incomes, and prices, and on government and other savings) will need to be solved within the integrated modeling solution.

6.7 A rigorous analytical approach to long-term planning helps ensure that policy development at ECCC and NRCan effectively addresses the challenges and opportunities that Canada will face as a global energy leader. There is an important role for analysis and modeling to underpin the country's policy decision-making in this area.

6.8 Analysis and modeling also facilitates the regulatory mandate of the NEB, specifically in understanding how Canada's energy future could unfold, and the context in which regulatory decisions are made. Analysis and modeling is a key element of the NEB's Energy Futures series, a biennial public report that provides long-term energy supply and demand projections for the Canadian economy.

7. Global Work Plan

A global work plan is required for each of the following three models:

- A. Canada macroeconomic model;
- B. US macroeconomic model; and
- C. North American interface module.

The Contractor must prepare and submit each global work plan, in accordance with the following:

- i. Each initial global work plan has to be submitted with the bid. The Technical Authority will provide feedback after contract award, during the kick-off meeting.
- ii. The Contractor must finalize and submit each global work plan within 20 working days following the kick-off meeting.
- iii. The Contractor must update and re-submit each global work plan as necessary.
- iv. Each global work plan must be in the Contractor's format.
- v. Each global work plan must outline in details how the Contractor proposes to carry out:
 - A. for Canada macroeconomic model: Mandatory 3 to 29;
 - B. for US macroeconomic model: Mandatory 33 to 49; and
 - C. for North American interface module: Mandatory 52 to 56,as described in article 12, to achieve the project objectives. Each global work plan must include as a minimum, visuals such as diagrams, tables, graphics or screenshots.

The following items must be addressed:

- Overview:
 - a. Purpose, Background, Scope and Objectives;

- b. Assumptions, Constraints and Risks;
- c. Contract Deliverables;
- d. Organization Summary; and
- e. Schedule Summary.

The Contractor must include high-level estimate of the timeline, such as the number of weeks or months, required to deliver Mandatory 4 to 18, Mandatory 19 to 29, Mandatory 33 to 39 Mandatory 40 to 49, and Mandatory 52 to 56 accordingly, as described in article 12.

- Management Processes:
 - f. Project Management Approach and Procedures;
 - g. Schedule Control;
 - h. Budget Control;
 - i. Reporting;
 - j. Problem Resolution;
 - k. Project Work Tasks/Elements Closing;
 - l. Support.

The Contractor must perform the work in accordance with each accepted work plan. The Contractor must manage all management plans, sub-plans, programs and systems contained in the SOW in accordance with each accepted work plan.

8. Meetings

8.1 Kick-off Meeting

The Contractor must host a Kick-off Meeting that will be held either by teleconference or at Environment and Climate Change facilities within ten working days following Contract Award to begin the work. The Contractor must include, but not be limited to, the following Kick-off meeting agenda items:

- a. Project Phases;
- b. Project Management;
- c. Risk Management;
- d. Schedule and Milestones;
- e. Technical Requirements;
- f. Support;
- g. Training; and
- h. Hardware, Software and data deliverables;

8.2 Progress Review Meetings (PRM)

The Contractor must convene the first PRM within three (3) months following the Kick-Off Meeting and subsequent meetings no less frequent than on a quarterly basis in order to formally report progress to Canada. All PRMs must be held at the Contractor's facility unless an alternative location is agreed to between the Contractor and Canada.

All PRMs will be co-chaired by the Contractor and the Technical Authority. Canada may be accompanied to these meetings by non-governmental personnel, such as outside consultants, providing support services to Canada. The Contractor must conduct unscheduled PRMs, as agreed to and co-ordinated between the Contractor and the Technical Authority, to examine specific problems, provide decisions if needed, or assess progress in specific areas of the Contract.

9. Resource Requirement

9.1 General

The Contractor must provide professional services support on an “as-and-when-requested” basis as outlined in this SOW, at article 12, Mandatory 58 to 60.

The resources listed in table 1, will be required on an “as-and-when-requested basis” through the issue of Task Authorizations. These tasks may be issued for work that is limited in scope or is of a fixed duration. Each Task Authorization will outline the required tasks and required deliverables.

TABLE 1 PROFESSIONAL AND TRAINING SERVICES		
ITEM NO.	DESCRIPTION RESOURCE CATEGORIES	Estimated number of resources
1	Senior Economist	1
2	Economist	3
3	Project Manager	1
4	Software Programmer	1

9.2 Expected Resource Responsibilities

9.2.1 Senior Economist

Responsibilities could include but are not limited to:

- a. Directing the work related to the development of the customized macroeconomic model.
- b. Directing the work related to the development of the country-specific macroeconomic forecast.
- c. Directing work related to the interface of the macroeconomic model and Energy 2020.
- d. Directing work related to the convergence and attainment of a year-to-year equilibrium between content interfaces of the macroeconomic model and Energy 2020.
- e. Directing the production and expansion of scenarios demanded by clients.

- f. Directing the development and production of ad-hoc macroeconomic scenarios for client.
- g. Dealing with risk and scenario-related client queries.
- h. Planning and leading training for the client.

9.2.2 Economist

Responsibilities could include but are not limited to:

- a. Developing and modifying macroeconomic model building blocks.
- b. Collecting, gathering, generating and inserting economic data required for the customized model.
- c. Maintaining the interfaces of the macroeconomic model and Energy 2020.
- d. Ensuring convergence and attainment of a year-to-year equilibrium between content interfaces of the macroeconomic model and Energy 2020.
- e. Supporting the production and expansion of scenarios demanded by clients.
- f. Developing and producing ad-hoc macroeconomic scenarios for client.
- g. Dealing with risk and scenario-related client queries.
- h. Conducting training for the client.

9.2.3 Project Manager

Responsibilities could include but are not limited to:

- a. Directing and leading the development all modifications of the macro model structure.
- b. Managing of all content interfaces of the macroeconomic model and Energy 2020
- c. Managing all work related to the integration of the macroeconomic model and Energy 2020
- d. Ensuring project remains on schedule and on budget.
- e. Manage econometric model-building and forecasting projects

9.2.4 Software Programmer

Responsibilities could include but are not limited to:

- a. Develop software programs (executable code), in common software languages such as Assembly, COBOL, C, C++, C#, JAVA, LISP, PROMULA (used by ENERGY2020), Python, ETC
- b. Develop software to ensure the interfaces of the macroeconomic model and Energy 2020.
- c. Develop procedures to ensure convergence and attainment of a year-to-year equilibrium between content interfaces of the macroeconomic model and Energy 2020.
- d. Undertake modifications to ensure convergence and attainment of a year-to-year equilibrium between content interfaces of the macroeconomic model and Energy 2020 when running alternative simulations.

10. Language

All work will be performed and delivered in English. This could include but not limited to the following:

- 1. Documentations and Manuals;

2. Training;
3. On-Line Support;
4. On demand support;

The resources must be fluent in the English Language. Fluent means that the individual must be able to communicate orally and in writing without any assistance.

11. Travel

The contractor will travel to Environment and Climate Change Canada premises (200 Boulevard Sacré-Coeur, Gatineau, Quebec) at critical phases which will be determined in collaboration with Environment and Climate Change Canada's project lead and to provide on-site training. Travel could include but are not limited to:

- Beta testing of the customized Canadian macro-economic model
- Beta testing of the integrated E3MC
- Beta testing of the integrated E3US
- Beta testing of the integrated E3NA
- On-site training

12. List of Delivery, Acceptance, Considerations of the Contract

Integrated Energy, Emissions and Economy Modeling Solutions for Canada and the United States

TABLE 2

CANADIAN MODELING SOLUTION (E3MC)

E3MC must, in a dynamic and interactive manner, respond to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection related to any change in either energy-related or economic-related variables. These variables are fed in from the Canadian macroeconomic model and ENERGY2020-Canada.

E3MC is a Canadian energy, emissions and economic modeling solution that dynamically links **ENERGY2020-Canada** to a customized **Canadian macroeconomic model** and provides the users with:

1. **Functionality**, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness**, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met.
3. **Compliance**, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities.

4. **Innovation**, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities.
5. **Conformity** to Government of Canada's Operating Environment, such that it operates on
 - a) Microsoft Windows XP or higher, and
 - b) Windows Excel 2007, 2010 or 2013, and
 - c) Office 2010 and higher.
6. **Data sharing flexibility**, such that the it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls,xlsx, cvs, txt, accdb and dbf.
7. **Timing of Deliverables**, such that the Contractor provides ECCC with
 - a) A licence to their current off-the-shelf Canadian macroeconomic model (Mandatory 3 and 4) at **contract signing**.
 - b) All future required functionalities listed (Mandatory 5 to Mandatory 29) **within 30 months of contract signing**.

CANADIAN MACROECONOMIC MODEL

Mandatories 3 to 18 represent the requirements for the Canadian macroeconomic model to be delivered **within 30 months of contract signing**.

Mandatory 1	The Contractor must perform the work in accordance to the accepted global work plan that outlines in detail how the contractor will carry out Mandatory 3 to 29 to achieve the project objectives.
Mandatory 2	The Contractor must conform to the timeline stipulated in the global work plan to deliver Mandatory 3 to 29.
Mandatory 3	At contract awarding, the Contractor must provide a licence to their current off-the-shelf CANADIAN MACROECONOMIC MODEL
Mandatory 4	At contract awarding, the Contractor must provide a user training and information session and model documentation (e.g., variable definitions and user manual) on their current off-the-shelf CANADIAN MACROECONOMIC MODEL
Mandatory 5	<p>Within 30 months of contract signing, the Contractor must provide ECCC with a customized MACROECONOMIC MODEL that will be:</p> <ol style="list-style-type: none"> 1. A 10-province and 3-territory dynamic macroeconomic model of the Canadian economy with foreign and regional linkages. 2. Based on Statistics Canada's latest* input-output tables at the national- and provincial-level including all interprovincial and international trade flows (http://www5.statcan.gc.ca/subject-sujet/resultat.action?pid=3764&id=2745&lang=eng&type=DAILYART&pageNum=1&more=0). 3. Fully aligned with Statistics Canada's Canadian National System of Accounts (CSNA2012). 4. Reflects Statistics Canada's latest** North American Industrial Classification System (NAICS).

	<p>*The latest input-output tables were released in November/December 2016.</p> <p>**The latest reference year for NAICS is 2007.</p>
Mandatory 6	<p>Model I/O Dimension– The model must link final demand with the supply-side activities at national, provincial and territorial levels.</p> <p>The Contractor must integrate the input-output relationships into the model.</p>
Mandatory 7	<p>Model Purpose– The customized macroeconomic model must serve two purposes: forecasting and simulation analysis.</p>
Mandatory 8	<p>Model Operation– The customized macroeconomic model must run as a Stand-Alone Model and in combination with ENERGY2020 – Canada.</p> <p>The Standalone feature will include options to run a stand-alone provincial or regional economic model. The model must solve uniquely for each province and territory using their respective input-output tables. The Contractor must clearly demonstrate how they will integrate the input-output relationships into the model.</p> <p>Note: Final demand feeds into a demand-for-energy converter matrix plus a technology matrix. The output of this feeds into the input-output estimate of gross output; gross output feeds into a value-added share matrix to produce gross domestic product at basic prices. The provincial and territorial models are required to sum-up to Canada.</p>
Mandatory 9	<p>Major Blocks–Major blocks must be built into the model. Example of major blocks include:</p> <ol style="list-style-type: none"> 1. Aggregate Demand 2. Labour 3. Price/Wage 4. Income/Saving and Wealth 5. Government 6. Financial 7. Foreign
Mandatory 10	<p>Model Sectors and Concepts-The customized model must capture the dynamics of the following broad sectors and concepts:</p> <ul style="list-style-type: none"> • Firms employ intermediate materials, capital, and labour to produce an output and supply financial instruments • Households consume domestic and foreign products, supply labour and demand financial assets • Governments collect taxes, purchase domestic and foreign products, produce output and supply financial instruments

	<ul style="list-style-type: none"> • Foreigners or agents out the province purchase products produced in the province, supply foreign products, and demand and supply financial instruments • Markets correspond to the domestic and foreign products, the labour market and financial market. Each of these markets is concerned with the determination of demand, supplies and prices.
<p>Mandatory 11</p>	<p>Model Structure-The customized model must respond to the figure below.</p>
<p>Mandatory 12</p>	<p>Industrial Sector Dimension– The Contractor must provide a detailed of the industrial sector dimensions in the model. The industrial and detailed energy sector dimensions in the macro model must be mapped to the ENERGY2020-CANADA sectors (Appendix 2).</p>
<p>Mandatory 13</p>	<p>The Contractor must specify the function for the following concepts:</p> <ol style="list-style-type: none"> 1. Consumer spending is driven by real income, wealth and interest rates. 2. Investment is driven by the return on investment and changes in capacity utilization. 3. Exports and imports reflecting domestic demand and competitiveness. 4. Wages move with inflation, productivity and unemployment relative to the natural rate. 5. Prices are a mark-up on unit costs, and profit margins are a function of the output gap. 6. Monetary policy is modelled to reflect central bank behaviour. 7. Exchange rates are determined by relative productivity and net external assets in the long run, and by movements in relative interest rates in the short run.
<p>Mandatory 14</p>	<p>Gross Domestic Product–The Contractor must explicitly illustrate how the model calculates national and provincial GDP in the following ways:</p> <ol style="list-style-type: none"> 1. Expenditure Based 2. Income Based

	<p>3. Factor Cost 4. Chained Weighted</p> <p>Note: GDP at Factor Cost must be produced as listed in Appendix 1. Where the data is suppressed or confidential, the Contractor must clearly illustrate the methodology that will be used to produce reasonable estimates for those suppressed data series. In addition, the national, provincial and territorial models must have at least the sectors listed in Appendix 2 and these sectors must be fully aligned to Statistics Canada's new CSNA2012.</p>
<p>Mandatory 15</p>	<p>Indicators—Key economic indicators must be provided by the macroeconomic model. These should be a direct reflection of the major blocks and concepts listed in Mandatory 11 and must include:</p> <ol style="list-style-type: none"> 1. Price Indexes, GDP expenditure-based, income-based, and at factor cost 2. Interest Rates, major short- and long-term 3. Consumer Price Indexes, by detailed final consumption category 4. Commodity Prices and Indices 5. Exchange Rates, by major trading partner 6. Population 7. Labour Supply, Employment and Unemployment 8. Migration, International and Interprovincial
<p>Mandatory 16</p>	<p>Forecast Calibration and Tuning—The macroeconomic reference forecast must be:</p> <ol style="list-style-type: none"> 1. Calibrated in the short-term: align the short-term projection with the projections outlined in Finance Canada's most recently available Budget or Fiscal and Economic Update projections. 2. Calibrated in the long-term: align the long-term Canadian forecast to Finance Canada's long-term forecast. 3. Tuned: detailed industry and demand variables must be fine-tuned for near-term expectations. <p>Note: This forecast will be used to send initial parameters to ENERGY2020 Canada. ENERGY2020 Canada contains detailed energy-related information. When the macroeconomic model is linked to ENERGY2020-Canada and the two models iterate, a new integrated equilibrium solution will be reached. The model must allow for the fine-tuning of the resulting macroeconomic projection to Finance Canada's short-term and long-term economic indicators.</p>
<p>Mandatory 17</p>	<p>Simulation Features— The model must incorporate the policy initiatives and structural changes (e.g. new investment by business) made in a province or territory and how their impacts will be transformed across other provinces, territories and at national level.</p>
<p>Mandatory 18</p>	<p>The customized model must include the following standard features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios.

	<ol style="list-style-type: none"> 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios.
<p>CANADIAN INTERFACE MODULE</p> <p>Mandatory 19 to 23 represent the requirements related to the unifying interface module that must be built to dynamically integrate the Canadian macroeconomic model with ENERGY2020-Canada. These must be delivered within 30 months of contract signing.</p>	
<p>Mandatory 19</p>	<p>Developing Automated Interface Module—The Contractor must develop an automated linking interface module between ENERGY2020-Canada and the macroeconomic model.</p>
<p>Mandatory 20</p>	<p>Seamless Integration—The interface module must ensure a dynamic and seamless integration.</p>
<p>Mandatory 21</p>	<p>Interface Module—A key feature of the interface module is that ENERGY2020-Canada will be the ‘command’ program, controlling the execution of ENERGY2020-Canada and the macroeconomic model. This interface module must:</p> <ol style="list-style-type: none"> 1. Override the macroeconomic model’s energy block and allow ENERGY2020-Canada energy block to drive the macroeconomic model. 2. Iterate variables between the Canadian macroeconomic model and ENERGY2020-Canada until both models reach convergence. 3. Ensure that the Canadian macroeconomic model and ENERGY2020-Canada respond in a dynamic and interactive manner to changes introduced through energy and macroeconomic projection and reporting variables to produce a unique integrated energy, emissions and economic projection. These projection and reporting variables must be sensitive to the analysis of energy, environment, and environment-related proposals and candidate initiatives of the Government of Canada. 4. Linkages between ENERGY2020-Canada and the macroeconomic model must allow for simulation of the real-time impact of energy and environmental concerns on the economy and vice versa. ENERGY2020-Canada uses macroeconomic data to drive energy demands in the residential, commercial, industrial,

	<p>and transportation sectors. Appendix 3 outlines the current sector structure of E3MC.</p> <p>5. An integrating program will need to be written to parse the output from the macroeconomic model output files and read the economic variables into a Promula database (see Note below). The code for the data transfers must be incorporated into the interface module between ENERGY2020-Canada and macroeconomic model.</p> <p>Note: ENERGY2020-Canada is the 'command program' and is written in Promula programming language while the existing interface module is written in Visual Basic. This interface module provides the ability to project ENERGY2020-Canada variables using executable code originating from the macroeconomic model.</p>
<p>Mandatory 22</p>	<p>Interface Module Operation and Solution—To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020-Canada on a dynamic and integrated basis. As the modeling solution solves, each iteration must include:</p> <ol style="list-style-type: none"> 1. Extracting the data from the macroeconomic model. 2. Transferring the data to ENERGY2020-Canada. 3. Executing ENERGY2020-Canada. 4. Extracting data from ENERGY2020-Canada. 5. Transferring the data to the macroeconomic model. 6. Executing the macroeconomic model. <p>Note: The 'iteration' can be repeated as many times as needed.</p>
<p>Mandatory 23</p>	<p>Data Transfer—Specific variables to be sent between ENERGY2020-Canada and the macroeconomic model will vary based on the policy being analyzed. The Contractor must identify:</p> <ol style="list-style-type: none"> a) Key macroeconomic variables to be passed from the macroeconomic model to ENERGY2020-Canada. b) Key energy market related variables to be passed from ENERGY2020-Canada to the macroeconomic. c) How data will be Transferred—Variables in ENERGY2020-Canada will need to be aggregated into the macroeconomic model regions and mapped to the macroeconomic model economic categories before sending them as input. For example, ENERGY2020 reports barrels or BTUs of crude oil by type, while the macroeconomic model reports \$ value of crude oil.

E3MC TESTING, ANALYSIS, SCENARIO DEVELOPMENT AND OTHER

Mandatory 24 to 29 must illustrate how E3MC will allow ECCC to test, analyze and develop scenarios. These must be delivered **within 30 months of contract signing**

Mandatory 24

Successful Integration Process—To ensure a successful integration process, the following must be accomplished:

1. **Inserting and Extracting Data**—Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020-Canada.
2. **Coding:**
 - a) Write code to insert data, extract data, and execute the macroeconomic model. Debug and test this code to ensure the results match the test case.
 - b) Write code to extract data from the output of the model 'run(s)' such that it can be called directly into the transfer routine.
 - c) Generate code for ENERGY2020-Canada to insert data into the macroeconomic model directly via the selected transfer routine and language.
 - d) Combine the code which inserts data, extracts data, and executes the macroeconomic model with the code which inserts data, extracts data, and executes ENERGY2020-Canada to create an integrated solution
3. **Convergence Criteria**—Convergence rules may be required to limit the number of iterations needed to create a solution
4. **Endogenous Interaction**—ENERGY2020-Canada and the macroeconomic model must interact endogenously through changes in energy variables such as production, prices, energy intensities, investment in energy industries, as well as macroeconomic variables. For each iteration period, energy supply and demand results from ENERGY2020-Canada will be automatically transferred to the macroeconomic model via the interface module.
5. **Testing**—Create a test case of output data generated by modifying the macroeconomic input data.

Note: A successful integrated solution is achieved when the macroeconomic model incorporates energy results from ENERGY2020-Canada into a new macroeconomic projection for that period. The new macroeconomic data is returned to ENERGY2020-Canada to create a new energy projection for the next iteration period. This process of using output from one iteration as input to the next is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy

<p>Mandatory 25</p>	<p>E3MC Testing—Once the interconnections are established between the macroeconomic model and ENERGY2020-Canada, E3MC must undergo extensive testing to ensure that the new structure can assess the impact of multiple policy options. Testing must ensure that:</p> <ol style="list-style-type: none"> 1. Response Signals—Each model is responding to signals being sent from the other model. 2. Integration Failure—There will not be failure during the integration procedure between the two models. <p>Note: ECCC staff must be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the testing and review of output from both ENERGY2020-Canada and the macroeconomic model.</p>
<p>Mandatory 26</p>	<p>Stress Testing—E3MC must be tested to ensure the successful interconnection of the customized macroeconomic model to ENERGY2020-Canada.</p> <p>Once the interconnections are established between the customized macroeconomic model and ENERGY2020-Canada, the integrated modeling solution (E3MC) must undergo extensive testing to ensure that the new structure correctly assesses the impact of multiple policy options. This must include:</p> <ol style="list-style-type: none"> 1. Stress-Testing of Modeling Solution: Testing must ensure that each model is responding reasonably to signals being sent from the other model. Stress-testing must ensure that there will not be failure during the interaction between the two models. 2. Consistency between macro model and ENERGY2020: The Contractor must ensure the thorough review of and adjustments to inputs and outputs, including: <ol style="list-style-type: none"> a) Financial input variables b) Financial output files c) Electricity and natural gas dispatch routines d) Commodity trading inflow/outflow including CO2 permit trading <p>Note: ECCC staff must be involved at all stages of testing to ensure that the model meets expectations. This includes design of the test and review of output from ENERGY2020-Canada and the customized macroeconomic model.</p>
<p>Mandatory 27</p>	<p>Integrated Reference Development—When the Canadian macroeconomic model is fully calibrated (aligned with Finance Canada’s forecast) and used as input to the ENERGY2020-Canada model, the new macroeconomic reference case forecast will be used for the following main functions:</p> <ol style="list-style-type: none"> 1. Policy Analysis: The model must have the capacity and flexibility to address ECCC regulatory or incentive policy at the required national- and provincial-level of sector detail. This includes regulatory analyses for oil, gas and emissions intensive trade

	<p>exposed industries (EITE), and oil, gas and electricity. Note: Statistics Canada's CANSIM Table 379-0030 provides the provincial-level of sector detail.</p> <ol style="list-style-type: none"> 2. Policy Scenario-Building: Scenarios are built and tested by adjusting parameters such as device and process efficiency, capital costs, market shares, device lifetimes, non-price factors, emission coefficients, taxes, etc. Scenarios with multiple policies are run simultaneously and the model keeps track of interaction effects, rebound effects, etc. 3. Emission Trends Update: For the residential, commercial, manufacturing, oil and gas, transportation and electricity sectors as well as process emissions, prices and air pollutants.
<p>Mandatory 28</p>	<p>Scenario Development and Analysis—E3MC must allow for the following types of scenario development and analysis:</p> <ol style="list-style-type: none"> 1. Long-term Scenarios—Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation. 2. Regional Analysis—Analyze the regional, provincial and aggregate macroeconomic impacts (for example gross domestic product, industry gross output, employment, personal disposable income, tax interaction, government revenues/expenditures, and sector-specified competitiveness effects) of a range of energy and environment policy initiatives 3. Analyze Spillover Effects—Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US. 4. Analyze Joint Initiatives—Analyze joint Canada-US environment and energy policy initiatives. 5. Analyze Alternative Proposals—Analyze alternative provincial and industry proposals for achieving environmental goals.
<p>Mandatory 29</p>	<p>The integrated E3MC model must include the following standard features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios.

US MODELING SOLUTION (E3US)

E3US is a US energy, emissions and economic modeling solution that links **ENERGY2020-US** to a customized **US macroeconomic model** and provides the users of E3US with:

1. **Functionality**, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness**, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met.
3. **Compliance**, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities.
4. **Innovation**, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities.
5. **Conformity to Government of Canada's Operating Environment**, such that it operates on
 - d) Microsoft Windows XP or higher, and
 - e) Windows Excel 2007, 2010 or 2013, and
 - f) Office 2010 and higher.
6. **Data sharing flexibility**, such that the it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls, xlsx, cvs, txt, accdb and dbf.
7. **Timing of Deliverables**, such that the Contractor provides ECCC with
 - a) A licence to their current off-the-shelf American macroeconomic model (Mandatory 32 and 33) at **contract signing**.
 - b) All future required functionalities listed (Mandatory 34 to Mandatory 49) **within 30 months of contract signing**.

US MACROECONOMIC MODEL

Mandatory 32 to 39 represent the requirements for the US macroeconomic model. These must be delivered **within 30 months of contract signing**.

Mandatory 30	The Contractor must perform the work in accordance to the accepted global work plan that outlines in detail how the contractor will carry out Mandatory 34 to 39 to achieve the project objectives.
Mandatory 31	The Contractor must conform to the timeline stipulated in the global work plan to deliver Mandatory 32 to 39.
Mandatory 32	At contract awarding, the Contractor must provide a licence to their current off-the-shelf US MACROECONOMIC MODEL
Mandatory 33	At contract awarding, the Contractor must provide a user training and information session and model documentation (e.g., variable definitions and user manual) on their current off-the-shelf US MACROECONOMIC MODEL
Mandatory 34	The US macroeconomic models must serve two purposes: forecasting and simulation analysis.

Mandatory 35	<p>Model Operation– The US macroeconomic model must run as a Stand-Alone Model and in combination with ENERGY2020 –US.</p> <p>The Standalone feature will include options to run a stand-alone state or regional economic model. The model must solve uniquely for each state or region using their respective input-output tables. The Contractor must clearly demonstrate how they will integrate the input-output relationships into the model.</p>
Mandatory 36	<p>Model Sectors and Concepts-The US macroeconomic model must capture the following broad sectors and concepts:</p> <ul style="list-style-type: none"> • Firms employ intermediate materials, capital, and labour to produce an output and supply financial instruments • Households consume domestic and foreign products, supply labour and demand financial assets • Governments collect taxes, purchase domestic and foreign products, produce output and supply financial instruments • Foreigners or agents out the state purchase products produced in the province, supply foreign products, and demand and supply financial instruments • Markets correspond to the domestic and foreign products, the labour market and financial market. Each of these markets is concerned with the determination of demand, supplies and prices.
Mandatory 37	<p>Forecast Calibration and Tuning–The macroeconomic must have the flexibility to allow ECCC to calibrate and fine-tune the model’s macroeconomic to official US forecasts.</p>
Mandatory 38	<p>Simulation Features– The model must incorporate the policy initiatives and structural changes (e.g. new investment by business) made in a province or territory and how their impacts will be transformed across other provinces, territories and at national level.</p>
Mandatory 39	<p>The US macroeconomic model must include the following features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios.

US INTERFACE MODULE	
Mandatory 40 to 44 represent the requirements related to the unifying interface module that will be used to integrate the US macroeconomic model with ENERGY 2020 (US). These must be delivered within 30 months of contract signing.	
Mandatory 40	Developing an Automated Interface Module –The Contractor must develop an automated linking interface module between ENERGY2020-US and the US macroeconomic model.
Mandatory 41	Seamless Integration –The interface module must ensure a dynamic and seamless integration.
Mandatory 42	<p>Interface Module–A key feature of the interface module is that ENERGY2020-US will be the ‘command’ program, controlling the execution of ENERGY2020-US and the macroeconomic model. This interface module must:</p> <ol style="list-style-type: none"> 1. Override the macroeconomic model’s energy block and allow ENERGY2020-US energy block to drive the macroeconomic model. 2. Iterate variables between the macroeconomic model and ENERGY2020-US until both models reach convergence. 3. Ensure that the macroeconomic model and ENERGY2020-US respond in a dynamic and interactive manner to changes introduced through energy and macroeconomic projection and reporting variables to produce a unique integrated energy, emissions and economic projection. 4. Linkages between ENERGY2020-US and the macroeconomic model must allow for simulation of the real-time impact of energy and environmental concerns on the economy and vice versa. ENERGY2020-US uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. Appendix 3 outlines the current sector structure of E3MC. 5. An integrating program will need to be written to parse the output from the macroeconomic model output files and read the economic variables into a Promula database (see Note below). The code for the data transfers must be incorporated into the interface module between ENERGY2020-US and macroeconomic model. <p>Note: ENERGY2020-US is the ‘command program’ and is written in Promula programming language while the existing interface module is written in Visual Basic. This interface module provides the ability to project ENERGY2020-Canada variables using executable code originating from the macroeconomic model.</p>
Mandatory 43	Interface Module Operation and Solution –To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020-US on a dynamic and

	<p>integrated basis. As the modeling solution solves, each iteration must include:</p> <ol style="list-style-type: none"> 1. Extracting the data from the macroeconomic model. 2. Transferring the data to ENERGY2020-US. 3. Executing ENERGY2020-US. 4. Extracting data from ENERGY2020-US. 5. Transferring the data to the macroeconomic model. 6. Executing the macroeconomic model. <p>Note: The 'iteration' can be repeated as many times as needed.</p>
<p>Mandatory 44</p>	<p>Data Transfer—Specific variables to be sent between ENERGY2020-US and the macroeconomic model will vary based on the policy being analyzed. The Contractor must identify:</p> <ol style="list-style-type: none"> a) Key macroeconomic variables to be passed from the macroeconomic model to ENERGY2020-US. b) Key energy market related variables to be passed from ENERGY2020-US to the macroeconomic. c) How data will be Transferred—Variables in ENERGY2020-Canada will need to be aggregated into the macroeconomic model regions and mapped to the macroeconomic model economic categories before sending them as input. For example, ENERGY2020 reports barrels or BTUs of crude oil by type, while the macroeconomic model reports \$ value of crude oil.
<p>E3US TESTING, ANALYSIS AND OTHER</p> <p>Mandatory 45 to 49 must illustrate how E3US will allow ECCC to test, analyze and develop scenarios.</p>	
<p>Mandatory 45</p>	<p>Successful Integration Process—To ensure a successful integration process, the following must be accomplished:</p> <ol style="list-style-type: none"> 1. Inserting and Extracting Data—Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020-US. 2. Coding: <ol style="list-style-type: none"> a) Write code to insert data, extract data, and execute the macroeconomic model. Debug and test this code to ensure the results match the test case. b) Write code to extract data from the output of the model 'run(s)' such that it can be called directly into the transfer routine.

	<p>c) Generate code for ENERGY2020-US to insert data into the macroeconomic model directly via the selected transfer routine and language.</p> <p>d) Combine the code which inserts data, extracts data, and executes the macroeconomic model with the code which inserts data, extracts data, and executes ENERGY2020-US to create an integrated solution</p> <p>3. Convergence Criteria—Convergence rules may be required to limit the number of iterations needed to create a solution</p> <p>4. Endogenous Interaction—ENERGY2020-US and the macroeconomic model must interact endogenously through changes in energy variables such as production, prices, energy intensities, investment in energy industries, as well as macroeconomic variables. For each iteration period, energy supply and demand results from ENERGY2020-US will be automatically transferred to the macroeconomic model via the interface module.</p> <p>5. Testing—Create a test case of output data generated by modifying the macroeconomic input data.</p> <p>Note: A successful integrated solution is achieved when the macroeconomic model incorporates energy results from ENERGY2020-US into a new macroeconomic projection for that period. The new macroeconomic data is returned to ENERGY2020-US to create a new energy projection for the next iteration period. This process of using output from one iteration as input to the next is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy</p>
<p>Mandatory 46</p>	<p>E3US Testing—Once the interconnections are established between the macroeconomic model and ENERGY2020-US, E3US must undergo extensive testing to ensure that the new structure can assess the impact of multiple policy options. Testing must ensure that:</p> <p>1. Response Signals—Each model is responding to signals being sent from the other model.</p> <p>2. Integration Failure—There will not be failure during the integration procedure between the two models.</p> <p>Note: ECCC staff must be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the testing and review of output from both ENERGY2020-Canada and the macroeconomic model.</p>
<p>Mandatory 47</p>	<p>Stress Testing—E3US must be tested to ensure the successful interconnection of the US macroeconomic model to ENERGY2020-US. Once the interconnections are established between the US macroeconomic model and ENERGY2020-US, the integrated modeling solution (E3US) must undergo extensive testing to ensure that the new structure correctly assesses the impact of multiple policy options. This must include:</p>

	<ol style="list-style-type: none"> 1. Stress-Testing of Modeling Solution: Testing must ensure that each model is responding reasonably to signals being sent from the other model. Stress-testing must ensure that there will not be failure during the interaction between the two models. 2. Consistency between macro model and ENERGY2020: The Contractor must ensure the thorough review of and adjustments to inputs and outputs, including: <ol style="list-style-type: none"> a) Financial input variables b) Financial output files c) Electricity and natural gas dispatch routines d) Commodity trading inflow/outflow including CO2 permit trading <p>Note: ECCC staff must be involved at all stages of testing to ensure that the model meets expectations. This includes design of the test and review of output from ENERGY2020-US and the US macroeconomic model.</p>
<p>Mandatory 48</p>	<p>Scenario Development and Analysis—E3US must allow for the following types of scenario development and analysis:</p> <ol style="list-style-type: none"> 1. Long-term Scenarios—Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation. 2. Regional Analysis—Analyze the regional, provincial and aggregate macroeconomic impacts (for example gross domestic product, industry gross output, employment, personal disposable income, tax interaction, government revenues/expenditures, and sector-specified competitiveness effects) of a range of energy and environment policy initiatives 3. Analyze Spillover Effects—Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US. 4. Analyze Joint Initiatives—Analyze joint Canada-US environment and energy policy initiatives. 5. Analyze Alternative Proposals—Analyze alternative provincial and industry proposals for achieving environmental goals.
<p>Mandatory 49</p>	<p>The integrated E3MC model must include the following standard features:</p> <ol style="list-style-type: none"> 1. Allow the user to change economic, socioeconomic and demographic assumptions to produce new forecasts or scenarios. 2. Allow the user to produce a number of standard tables from any database. 3. Allows the user to implement a number of standard shocks to perform scenario analysis 4. Allow the user to download data into spreadsheets and other data handling packages. 5. Allow the user to compare data across alternative scenarios.

NORTH AMERICAN MODELING SOLUTION (E3NA)

E3NA must, in a dynamic and interactive manner, respond to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection related to any change in either energy-related or economic-related variables fed into **E3MC** and **E3US**.

E3NA is a North American energy, emission and economic modeling solution that dynamically links **E3MC** and **E3US** to provide the users of E3NA with:

1. **Functionality**, such that it enables ECCC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness**, such that it provides ECCC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are fully met.
3. **Compliance**, such that it, including all software, tools and utilities provided, supports ECCC in meeting its Programs, Plans and Priorities.
4. **Innovation**, such that it provides ECCC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plans and Priorities.
5. **Conformity to Government of Canada's Operating Environment**, such that it operates on
 - d) Microsoft Windows XP or higher, and
 - e) Windows Excel 2007, 2010 or 2013, and
 - f) Office 2010 and higher.
6. **Data sharing flexibility**, such that the it provides ECCC with the flexibility to transfer data to and from the solution using files with extensions xls,xlsx, cvs, txt, accdb and dbf.
7. **Timing of Deliverables**, such that the Contractor provides ECCC with all future required functionalities listed (Mandatory 50 to Mandatory 60) **within 30 months of contract signing**.

NORTH AMERICAN INTERFACE MODULE

Mandatory 52 to 53 represent the requirements related to the interface module that will integrate the Canada and US macroeconomic models and E3MC and E3US in a dynamic and interactive manner.

Mandatory 50	The Contractor must perform the work in accordance to the accepted global work plan that outlines in detail how the contractor proposes to carry out Mandatory 52 to 56 to achieve the project objectives.
Mandatory 51	The Contractor must conform to the timeline stipulated in the global work plan to deliver Mandatory 52 to 56.
Mandatory 52	Developing an Integrated Automated North American Interface Module —The Contractor must develop an interface module that links the

	customized Canadian and US macro models and E3MC and E3US in a dynamic and interactive manner.
Mandatory 53	Integrated North American Model – The proposed solution must represent a dynamic, interactive and integrated North American energy, emissions and economy model.
E3NA TESTING, ANALYSIS AND SCENARIO DEVELOPMENT	
Mandatory 54 to 56 must illustrate how E3NA will be tested to allow for analysis and scenario development.	
Mandatory 54	<p>Testing of E3NA–E3NA must be tested to ensure:</p> <ol style="list-style-type: none"> 1. Iterative process: Testing must be an iterative process and is deemed successful when tested simulations <ol style="list-style-type: none"> a) Do not fail due to technical glitches. b) Produce reasonable a priori results. c) Convergence must be minimal during this testing; issues of non-convergence must be solved as necessary. 2. Minimize Simulation Failure–Testing must be designed to minimize the chances of simulation failure when E3NA is being used operationally by ECCC. This will include: <ol style="list-style-type: none"> a) Testing jointly requires inputs from the Canadian macroeconomic modeling and ENERGY2020 teams at ECCC). b) Testing follows the same process as testing E3MC and E3US in that the system will be ‘stress-tested’. 3. Integration testing–E3NA must be tested to ensure the successful integration of the E3MC and E3US. E3MC and E3US must interact simultaneously to create a fully-integrated North American modeling solution, E3NA. The objective is to test the entire modeling solution so that all information flows operate simultaneously. There are several dimensions to this: <ol style="list-style-type: none"> a) Compatibility: The data framework and structure of behaviour in E3MC and E3US must be compatible if not necessarily the same. b) Data Exchange: Data measures and executable code must be exchanged between the two models. 4. Policy Initiatives: Introduction of policy initiatives (for example regulatory, market based, fiscal, etc.) has direct impacts on any model within each modeling solution and will take forms that are unique for each of the two models. It is necessary to ensure that the initiatives are the same and that direct impacts are equivalently introduced into each models.
Mandatory 55	Policy Testing –E3NA must provide the capacity to develop policy test case(s) for varying values into the Canadian and US macroeconomic models.

	<p>Tests must be carried out to determine if the Canadian macroeconomic model responds as expected to changes transferred from the US macroeconomic model. The goal is to ensure that ECCC is in a position to anticipate the details of environmental and energy policy analysis. This includes but is not limited to:</p> <ol style="list-style-type: none"> 1. Anticipating changes in global and continental energy prices. 2. Anticipating changes to fiscal and monetary policy. 3. Anticipating exchange rate changes with major trading partners (specifically the US). <ol style="list-style-type: none"> a) Anticipating major shocks to the costs of production in energy-intensive industries. These shocks can occur on a US-only, Canada-only and/or joint basis.
<p>Mandatory 56</p>	<p>Regional Simulation—Successful testing must result in the creation of an integrated energy, emissions and economy modeling solution that has the capacity to be run at various regional levels (as a North American model, as a Canada or US model, as a stand-alone provincial or territorial, or a US regional or state model).</p>
<p>OTHER REQUIRED SERVICES</p> <p>Mandatory 57 to 60 must illustrate how the Bidder will offer other required services. These must be delivered within 30 months of contract signing.</p>	
<p>Mandatory 57</p>	<p>Documentation—The Contractor must provide a ‘User’s Guide’ of E3MC, E3US and E3NA in English. This must include:</p> <ol style="list-style-type: none"> 1. Base Case Set-Up: Instructions on setting up a base case or policy runs. 2. Detail on Inputs and Outputs: Detail the inputs and outputs to each model, the primary uses of this data in each modeling solution, the execution process (including the order in which the modeling solutions are called) and the flow of data between the models. 3. Operating Instructions: Provide step-by-step instructions on the operation of each model individually and the operation of the integrated modeling solutions. 4. Impact on Alternative Variables: In the case of policy development, alternative variables may need to be sent over to the macroeconomic models. Documentation must provide a description of how to incorporate new policies using the macroeconomic models including instructions for determining which macroeconomic model variables will be impacted by a new policy.
<p>Mandatory 58</p>	<p>On-Demand and As-Required Support—This requirement may range from intensive support (up to 500 hours per year) to less intensive (up to 200 hours per year). Main items for this requirement will be</p>

	undertaken during the option periods associated with the request. All requests will be done in English.
Mandatory 59	<p>On-line Support—This requirement is designed to access the Contractor’s staff on an ‘as-needed or as-required’ basis. All support will be done in English.</p> <p>On-line support must be provided to ECCC’s Analysis and Modeling Division, as well as to the modeling teams at the NEB and NRCan.</p> <p>This requirement includes:</p> <ol style="list-style-type: none"> 1. Responding in a time-dependent manner to requests for support. 2. Making recommendations and suggestions on how best to implement specific changes to macroeconomic variables and policy assumptions. 3. Providing advice on the interpretation of specific results. 4. Making ‘selected’ modifications to model code to ensure that the policy impacts are being correctly modeled and interpreted. 5. Providing advice on ECCC’s modeling infrastructure development strategy. <p>This requirement may range from intensive support (up to 500 hours per year) to less intensive (up to 200 hours per year). Main items for this requirement will be undertaken during the option periods associated with the request.</p>
Mandatory 60	<p>In-house Training—Upon request, provide in-house training. Training will be done in English.</p>

Appendix 1

Sector Structure

To meet the analytical demands required to support the Government's policy agenda with respect to energy, environment and environment-energy related policy objectives and the development of an integrated energy, emissions and economy forecast, a highly disaggregated model is required. The ideal disaggregated is one that is aligned to Statistics Canada's CANSIM Table 379-0030 Gross domestic product (GDP) at basic prices, by North American Industry Classification System, provinces and territories.

Statistics Canada's CANSIM Table 379-0030

Statistics Canada's CANSIM Table 379-0030 Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories, annual (dollars x 1,000,000)(1,2)

All industries [T001] (3)
Goods-producing industries [T002] (4)
Service-producing industries [T003] (5)
Industrial production [T010] (6)
Non-durable manufacturing industries [T011] (7)
Durable manufacturing industries [T012] (8)
Information and communication technology sector [T013] (9)
Information and communication technology, manufacturing [T014] (10)
Information and communication technology, services [T015] (11)
Energy sector [T016] (12)
Agriculture, forestry, fishing and hunting [11]
Crop and animal production [11A] (13)
Crop production [111]
Greenhouse, nursery and floriculture production [1114]
Crop production (except greenhouse, nursery and floriculture production) [111A] (14)
Animal production [112]
Forestry and logging [113]
Fishing, hunting and trapping [114]
Support activities for agriculture and forestry [115]
Support activities for forestry [1153]
Support activities for crop and animal production [115A] (15)
Mining, quarrying, and oil and gas extraction [21]
Oil and gas extraction [211]
Conventional oil and gas extraction [21113]
Non-conventional oil extraction [21114]
Mining and quarrying (except oil and gas) [212]
Coal mining [2121]
Metal ore mining [2122]
Iron ore mining [21221]

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Gold and silver ore mining [21222]
Copper, nickel, lead and zinc ore mining [21223]
Other metal ore mining [21229]
Non-metallic mineral mining and quarrying [2123]
Stone mining and quarrying [21231]
Sand, gravel, clay, and ceramic and refractory minerals mining and quarrying [21232]
Diamond mining [212392]
Potash mining [212396]
Other non-metallic mineral mining and quarrying (except diamond and potash) [21239A] (16)
Support activities for mining and oil and gas extraction [213]
Support activities for oil and gas extraction [21311A] (17)
Support activities for mining [21311B] (18)
Utilities [22]
Electric power generation, transmission and distribution [2211]
Natural gas distribution, water, sewage and other systems [221A] (19)
Natural gas distribution [2212]
Water, sewage and other systems [2213]
Construction [23]
Residential building construction [23A] (20)
Non-residential building construction [23B] (20)
Engineering construction [23C] (20)
Transportation engineering construction [23C1] (20)
Oil and gas engineering construction [23C2] (20)
Electric power engineering construction [23C3] (20)
Communication engineering construction [23C4] (20)
Other engineering construction [23C5] (20)
Repair construction [23D] (20)
Other activities of the construction industry [23E] (20)
Manufacturing [31-33]
Food manufacturing [311]
Animal food manufacturing [3111]
Sugar and confectionery product manufacturing [3113]
Fruit and vegetable preserving and specialty food manufacturing [3114]
Dairy product manufacturing [3115]
Meat product manufacturing [3116]
Seafood product preparation and packaging [3117]
Miscellaneous food manufacturing [311A] (21)
Grain and oilseed milling [3112]
Bakeries and tortilla manufacturing [3118]
Other food manufacturing [3119]
Beverage and tobacco product manufacturing [312]
Soft drink and ice manufacturing [31211]
Breweries [31212]

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Wineries and distilleries [3121A] (22)
Tobacco manufacturing [3122]
Textile and textile product mills [31A] (23)
Clothing and leather and allied product manufacturing [31B] (24)
Wood product manufacturing [321]
Sawmills and wood preservation [3211]
Veneer, plywood and engineered wood product manufacturing [3212]
Other wood product manufacturing [3219]
Paper manufacturing [322]
Pulp, paper and paperboard mills [3221]
Converted paper product manufacturing [3222]
Printing and related support activities [323]
Petroleum and coal product manufacturing [324]
Petroleum refineries [32411]
Petroleum and coal products manufacturing (except petroleum refineries) [3241A] (25)
Chemical manufacturing [325]
Basic chemical manufacturing [3251]
Resin, synthetic rubber, and artificial and synthetic fibres and filaments manufacturing [3252]
Pesticide, fertilizer and other agricultural chemical manufacturing [3253]
Pharmaceutical and medicine manufacturing [3254]
Miscellaneous chemical product manufacturing [325A] (26)
Paint, coating and adhesive manufacturing [3255]
Soap, cleaning compound and toilet preparation manufacturing [3256]
Other chemical product manufacturing [3259]
Plastics and rubber products manufacturing [326]
Plastic product manufacturing [3261]
Rubber product manufacturing [3262]
Non-metallic mineral product manufacturing [327]
Cement and concrete product manufacturing [3273]
Non-metallic mineral product manufacturing (except cement and concrete products) [327A] (27)
Primary metal manufacturing [331]
Iron and steel mills and ferro-alloy manufacturing [3311]
Steel product manufacturing from purchased steel [3312]
Alumina and aluminum production and processing [3313]
Non-ferrous metal (except aluminum) production and processing [3314]
Foundries [3315]
Fabricated metal product manufacturing [332]
Forging and stamping [3321]
Architectural and structural metals manufacturing [3323]
Boiler, tank and shipping container manufacturing [3324]
Hardware manufacturing [3325]
Spring and wire product manufacturing [3326]
Machine shops, turned product, and screw, nut and bolt manufacturing [3327]

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Coating, engraving, heat treating and allied activities [3328]
Cutlery, hand tools and other fabricated metal product manufacturing [332A] (28)
Machinery manufacturing [333]
Agricultural, construction and mining machinery manufacturing [3331]
Industrial, commercial and service industry machinery manufacturing [333A] (29)
Industrial machinery manufacturing [3332]
Commercial and service industry machinery manufacturing [3333]
Ventilation, heating, air-conditioning and commercial refrigeration equipment manufacturing [3334]
Metalworking machinery manufacturing [3335]
Engine, turbine and power transmission equipment manufacturing [3336]
Other general-purpose machinery manufacturing [3339]
Computer and electronic product manufacturing [334]
Computer and peripheral equipment manufacturing [3341]
Communications equipment manufacturing [3342]
Semiconductor and other electronic component manufacturing [3344]
Other electronic product manufacturing [334A] (30)
Electrical equipment, appliance and component manufacturing [335]
Electric lighting equipment manufacturing [3351]
Household appliance manufacturing [3352]
Electrical equipment manufacturing [3353]
Other electrical equipment and component manufacturing [3359]
Transportation equipment manufacturing [336]
Motor vehicle manufacturing [3361]
Automobile and light-duty motor vehicle manufacturing [33611]
Heavy-duty truck manufacturing [33612]
Motor vehicle body and trailer manufacturing [3362]
Motor vehicle parts manufacturing [3363]
Motor vehicle gasoline engine and engine parts manufacturing [33631]
Motor vehicle electrical and electronic equipment manufacturing [33632]
Motor vehicle steering and suspension components (except spring) manufacturing [33633]
Motor vehicle brake system manufacturing [33634]
Motor vehicle transmission and power train parts manufacturing [33635]
Motor vehicle seating and interior trim manufacturing [33636]
Motor vehicle metal stamping [33637]
Other motor vehicle parts manufacturing [33639]
Aerospace product and parts manufacturing [3364]
Railroad rolling stock manufacturing [3365]
Ship and boat building [3366]
Other transportation equipment manufacturing [3369]
Furniture and related product manufacturing [337]
Household and institutional furniture and kitchen cabinet manufacturing [3371]
Office furniture (including fixtures) manufacturing [3372]
Other furniture-related product manufacturing [3379]

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Miscellaneous manufacturing [339]
Medical equipment and supplies manufacturing [3391]
Other miscellaneous manufacturing [3399]
Wholesale trade [41]
Farm product wholesaler-distributors [411]
Petroleum product wholesaler-distributors [412]
Food, beverage and tobacco wholesaler-distributors [413]
Personal and household goods wholesaler-distributors [414]
Motor vehicle and parts wholesaler-distributors [415]
Building material and supplies wholesaler-distributors [416]
Machinery, equipment and supplies wholesaler-distributors [417]
Miscellaneous wholesaler-distributors [418]
Wholesale electronic markets, and agents and brokers [419]
Retail trade [44-45]
Motor vehicle and parts dealers [441]
Furniture and home furnishings stores [442]
Electronics and appliance stores [443]
Building material and garden equipment and supplies dealers [444]
Food and beverage stores [445]
Health and personal care stores [446]
Gasoline stations [447]
Clothing and clothing accessories stores [448]
Sporting goods, hobby, book and music stores [451]
General merchandise stores [452]
Miscellaneous store retailers [453]
Non-store retailers [454]
Transportation and warehousing [48-49]
Air transportation [481]
Rail transportation [482]
Water transportation [483]
Truck transportation [484]
Transit, ground passenger and scenic and sightseeing transportation [48Z] (31)
Urban transit systems [4851]
Taxi and limousine service [4853]
Other transit and ground passenger transportation and scenic and sightseeing transportation [48A] (32)
Support activities for transportation [488]
Pipeline transportation [486]
Pipeline transportation of natural gas [4862]
Crude oil and other pipeline transportation [486A] (33)
Postal service and couriers and messengers [49A] (34)
Postal service [491]
Couriers and messengers [492]
Warehousing and storage [493]

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Information and cultural industries [51]
Publishing industries (except internet) [511]
Newspaper publishers [51111]
Periodical, book and directory publishers [5111A] (35)
Software publishers [5112]
Motion picture and sound recording industries [512]
Motion picture and video exhibition [51213]
Motion picture and video industries (except exhibition) [5121A] (36)
Sound recording industries [5122]
Broadcasting (except internet) [515]
Radio and television broadcasting [5151]
Pay and specialty television [5152]
Telecommunications [517]
Data processing, hosting, and related services [518]
Other information services [519]
Finance and insurance [52]
Depository credit intermediation and monetary authorities [52B] (37)
Monetary authorities - central bank [521]
Local credit unions [52213]
Banking and other depository credit intermediation [5221A] (38)
Non-depository credit intermediation [5222]
Activities related to credit intermediation [5223]
Insurance carriers and related activities [524]
Insurance carriers [5241]
Agencies, brokerages and other insurance related activities [5242]
Financial investment services, funds and other financial vehicles [52A] (39)
Real estate and rental and leasing [53]
Real estate [531]
Lessors of real estate [5311] (40)
Owner-occupied dwellings [5311A] (41)
Offices of real estate agents and brokers and activities related to real estate [531A] (42)
Rental and leasing services [532]
Automotive equipment rental and leasing [5321]
Rental and leasing services (except automotive equipment) [532A] (43)
Lessors of non-financial intangible assets (except copyrighted works) [533]
Professional, scientific and technical services [54]
Legal, accounting and related services [541A] (44)
Legal services [5411]
Accounting, tax preparation, bookkeeping and payroll services [5412]
Architectural, engineering and related services [5413]
Other professional, scientific and technical services including scientific research and development [541B] (45)
Specialized design services [5414]
Management, scientific and technical consulting services [5416]

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Scientific research and development services [5417]
Other professional, scientific and technical services [5419]
Computer systems design and related services [5415]
Advertising, public relations, and related services [5418]
Management of companies and enterprises [55]
Administrative and support, waste management and remediation services [56]
Administrative and support services [561]
Office administrative services [5611]
Employment services [5613]
Business support services [5614]
Travel arrangement and reservation services [5615]
Investigation and security services [5616]
Services to buildings and dwellings [5617]
Facilities and other support services [561A] (46)
Waste management and remediation services [562]
Educational services [61]
Universities [6113]
Educational services (except universities) [611B] (47)
Elementary and secondary schools [6111]
Community colleges and C.E.G.E.P.s [6112]
Other educational services [611A] (48)
Health care and social assistance [62]
Health care [62X] (49)
Ambulatory health care services [621]
Offices of physicians [6211]
Offices of dentists [6212]
Miscellaneous ambulatory health care services [621A] (50)
Hospitals [622]
Nursing and residential care facilities [623]
Social assistance [624]
Arts, entertainment and recreation [71]
Performing arts, spectator sports and related industries, and heritage institutions [71A] (51)
Amusement, gambling and recreation industries [713]
Gambling industries [7132]
Amusement and recreation industries [713A] (52)
Accommodation and food services [72]
Accommodation services [721]
Traveler accommodation [7211]
RV (recreational vehicle) parks, recreational camps, and rooming and boarding houses [721A] (53)
Food services and drinking places [722]
Other services (except public administration) [81]
Repair and maintenance [811]
Automotive repair and maintenance [8111]

Repair and maintenance (except automotive) [811A] (54)
Personal services and private households [81A] (55)
Personal and laundry services [812]
Funeral services [8122]
Dry cleaning and laundry services [8123]
Personal care services and other personal services [812A] (56)
Private households [814]
Religious, grant-making, civic, and professional and similar organizations [813]
Religious organizations [8131]
Grant-making, civic, and professional and similar organizations [813A] (57)
Public administration [91]
Federal government public administration [911]
Defense services [9111]
Federal government public administration (except defense) [911A] (58)
Provincial and territorial public administration [912]
Local, municipal, regional and aboriginal public administration [91A] (59)
Local, municipal and regional public administration [913]
Aboriginal public administration [914]

Footnotes

- 1 For the gross domestic product (GDP) by industry refer to CANSIM tables 379-0027 and 379-0031 for Canada in chained dollars, 379-0029 for Canada in current dollars, 379-0028 for provinces and territories in percentage share.
- 2 For the chained dollars, the aggregates are not equal to the sum of their components.
- 3 This combines the North American Industry Classification System (NAICS) codes 11-91.
- 4 This combines the North American Industry Classification System (NAICS) codes 11-33.
- 5 This combines the North American Industry Classification System (NAICS) codes 41-91.
- 6 This combines the North American Industry Classification System (NAICS) codes 21, 22, 31-33, 562.
- 7 This combines the North American Industry Classification System (NAICS) codes 311-316, 322-326.
- 8 This combines the North American Industry Classification System (NAICS) codes 321, 327-339.
- 9 This combines the North American Industry Classification System (NAICS) codes 334 excl. 3345, 4173, 5112, 517, 518, 5415, 8112.
- 10 This combines the North American Industry Classification System (NAICS) code 334 excl. 3345.
- 11 This combines the North American Industry Classification System (NAICS) codes 4173, 5112, 517, 518, 5415, 8112.
- 12 This combines the North American Industry Classification System (NAICS) codes 211, 2121, 212291, 213111, 213118, 2211, 2212, 32411, 486.
- 13 This combines the North American Industry Classification System (NAICS) codes 111, 112.
- 14 This combines the North American Industry Classification System (NAICS) code 111 excl. 1114.
- 15 This combines the North American Industry Classification System (NAICS) codes 1151, 1152.
- 16 This combines the North American Industry Classification System (NAICS) codes 212393, 212394, 212395, 212397, 212398.
- 17 This combines the North American Industry Classification System (NAICS) codes 213111, 213118.
- 18 This combines the North American Industry Classification System (NAICS) codes 213117, 213119.
- 19 This combines the North American Industry Classification System (NAICS) codes 2212, 2213.
- 20 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 23.

- 21 This combines the North American Industry Classification System (NAICS) codes 3112, 3118, 3119.
- 22 This combines the North American Industry Classification System (NAICS) codes 31213, 31214.
- 23 This combines the North American Industry Classification System (NAICS) codes 313, 314.
- 24 This combines the North American Industry Classification System (NAICS) codes 315, 316.
- 25 This combines the North American Industry Classification System (NAICS) code 324 excl. 32411.
- 26 This combines the North American Industry Classification System (NAICS) codes 3255, 3256, 3259.
- 27 This combines the North American Industry Classification System (NAICS) code 327 excl. 3273.
- 28 This combines the North American Industry Classification System (NAICS) codes 3322, 3329.
- 29 This combines the North American Industry Classification System (NAICS) codes 3332, 3333.
- 30 This combines the North American Industry Classification System (NAICS) codes 3343, 3345, 3346.
- 31 This combines the North American Industry Classification System (NAICS) codes 485, 487.
- 32 This combines the North American Industry Classification System (NAICS) codes 4852, 4854, 4855, 4859, 487.
- 33 This combines the North American Industry Classification System (NAICS) codes 4861, 4869.
- 34 This combines the North American Industry Classification System (NAICS) codes 491, 492.
- 35 This combines the North American Industry Classification System (NAICS) codes 51112, 51113, 51114, 51119.
- 36 This combines the North American Industry Classification System (NAICS) codes 51211, 51212, 51219.
- 37 This combines the North American Industry Classification System (NAICS) codes 521, 5221.
- 38 This combines the North American Industry Classification System (NAICS) codes 52211, 52219.
- 39 This combines the North American Industry Classification System (NAICS) codes 523, 526.
- 40 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 5311 and to Input-Output code BS531100.
- 41 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 5311 and to Input-Output code BS5311A0.
- 42 This combines the North American Industry Classification System (NAICS) codes 5312, 5313.
- 43 This combines the North American Industry Classification System (NAICS) code 532, excl. 5321.
- 44 This combines the North American Industry Classification System (NAICS) codes 5411, 5412.
- 45 This combines the North American Industry Classification System (NAICS) codes 5414, 5416, 5417, 5419.
- 46 This combines the North American Industry Classification System (NAICS) codes 5612, 5619.
- 47 This combines the North American Industry Classification System (NAICS) code 61 excl. 6113.
- 48 This combines the North American Industry Classification System (NAICS) codes 6114-6117.
- 49 This combines the North American Industry Classification System (NAICS) code 62 excl. 624.
- 50 This combines the North American Industry Classification System (NAICS) codes 6213, 6214, 6215, 6216, 6219.
- 51 This combines the North American Industry Classification System (NAICS) codes 711, 712.
- 52 This combines the North American Industry Classification System (NAICS) codes 7131, 7139.
- 53 This combines the North American Industry Classification System (NAICS) codes 7212, 7213.
- 54 This combines the North American Industry Classification System (NAICS) codes 8112, 8113, 8114.
- 55 This combines the North American Industry Classification System (NAICS) codes 812, 814.
- 56 This combines the North American Industry Classification System (NAICS) codes 8121, 8129.
- 57 This combines the North American Industry Classification System (NAICS) code 813 excl. 8131.
- 58 This combines the North American Industry Classification System (NAICS) code 911 excl. 9111.
- 59 This combines the North American Industry Classification System (NAICS) codes 913, 914.

Source:

Statistics Canada. Table 379-0030 - Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories, annual (dollars)

Appendix 2

E3MC and NAICS Sector

Detailed E3MC Sectors	NAICS
Single Family	NA
Multi Family	NA
Other Residential	NA
Wholesale Trade	Wholesale (41)
Retail Trade	Retail (44-45)
Warehousing and Storage	Postal Services & Couriers & Messengers (491-492) Warehousing & Storage (493)
Information and Cultural Industries	Information & Culture Industries (51)
Offices	FIRE (52-53, 55) Professional, Scientific & Technical Services (54) Administrative & Support, Waste Management & Remediation (56) Public Administration (91)
Educational Services	Educational Services (61)
Health Care and Social Assistance	Health Care & Social Assistance (62)
Arts, Accommodation, Food, Other	Scenic & Sightseeing & Support Activities (487-488) Arts, Entertainment & Recreation (71) Accommodation & Food Services (72) Other Services (excl. Public Administration) (81)
Natural Gas Distribution	Natural Gas (2212)
Oil Pipelines	Pipeline Transportation: Oil and Other (4861, 4869)
Natural Gas Pipelines	Pipeline Transportation: Gas (4862)
Petroleum Products	Refineries & Other Petroleum & Coal Products (32411, 32419)
Light Oil Mining	Oil & Gas Mining (211)
Heavy Oil Mining	
Frontier Oil Mining	Oil & Gas Mining (211)
Sweet Gas Production	
Sour Gas Production	
Sweet Gas Processing	
Sour Gas Processing	
Primary Oil Sands	Oil & Gas Mining (211)
SAGD Oil Sands	
CSS Oil Sands	
Oil Sands Mining	
Oil Sands Upgraders	
Iron Ore Mining	Iron Ore (21221)

Non-Metal Mining	Non-metallic Minerals & Quarrying (2123) Support Activities for Mining (213)
Pulp and Paper Mills	Pulp, Paper & Paperboard (3221)
Petrochemicals	Petrochemical (32511)
Industrial Gas	Industrial Gas (32512)
Other Chemicals	Synthetic Dye & Pigments (32513) Other Basic Chemicals (32518-32519) Pharmaceutical & Medicine (3254) Other Chemicals (3252,3255-3259)
Fertilizer	Pesticide, Fertilizer & Other Agriculture Chemicals (3253)
Cement	Cement (32731)
Lime & Gypsum	Lime & Gypsum Product (3274)
Iron & Steel	Iron & Steel Mills (3311) Iron & Steel Pipes & Tubes from Purchased Steel (33121) Rolling & Drawing of Purchased Steel (33122) Ferrous Metal (33151)
Aluminum	Primary Alumina & Aluminum (331313)
Other Nonferrous Metal	Smelting & Refining (33141)
Food & Tobacco	Food (311) Beverage & Tobacco Products (312)
Textiles	Textile Mills (313) Textile Product Mills (314)
Apparel	Clothing (315)
Lumber	Wood (321)
Furniture	Furniture & Related Product (337)
Converted Paper	Converted paper Products (3222)
Printing	Printing & Related Support Activities (323)
Rubber	Plastics & Rubber Products (326)
Leather	Leather & Allied Products (316)
Glass	Glass (3272)
Other Non-Metallic	Ready-mix Concrete (32732) Other Concrete Product (32732, 32733, 32739) Clay Product & Refractory (3271) Other Non-metallic Mineral Products (3279)
Fabricated Metals	Fabricated Metal Product (332)
Machines	Machinery (333)
Computers	Computer & Electronic Product (334)
Electric Equipment	Electrical Equipment, Appliances & Components (335)
Transport Equipment	Transportation Equipment (336)
Other Manufacturing	Rolling, Drawing, Extruding & Alloying (331317) Rolling, Drawing, Extruding (33142-33149)

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	Non-Ferrous Metal (33152) Miscellaneous (339)
Other Metal Mining	Gold & Silver Ore (21222) Copper, Nickel, Lead & Zinc Ore (21223) Other Metal Ore (21223, 21229)
Coal Mining	Coal (2121)
Construction	Construction (23)
Forestry	Forestry & Logging (113) Support Activities for Agriculture & Forestry (115)
Solid Waste Waste Water Incineration	Water, Sewage & Other Systems (2213)
On Farm Fuel Use	Agriculture incl. Crop & Animal(111-112)
Crop Production	Crops (ex. Greenhouse, Nursery & Floricult. (1111-1113, 1119) Greenhouse, Nursery & Floriculture (1114)
Animal Production	Animal Aquaculture (1125) Animal Production (excpt. Animal Aquaculture) (1121-1124, 1129) Fishing, Hunting & Trapping (114)
Passenger	Transit & Ground Passenger Transportation (485) Rail (482)
Freight	Rail (482) Water (483) Truck (484)
Air Passenger Air Freight	Air (481)
Foreign Passenger	Air (481)
Foreign Freight	Air (481) Water (483)
Residential Off Road	Transit & Ground Passenger Transportation (485)
Commercial Off Road	Truck (484)
Utility Electric Generation Industry Electric Generation Steam Generation	Electric Power Generation, Transmission & Distribution (2211)

Appendix 3

General Overview of the ENERGY2020-Canada Model

In ENERGY2020-Canada, energy demand is created from five model sectors: residential, commercial, industrial, agriculture and transportation. Most versions of ENERGY2020-Canada have at least the first three sectors operating. In addition to these basic demand model sectors, ENERGY2020-Canada directly models cogeneration.

Demand is dynamically simulated by end-use and economic sectors for all fuels (electric, gas, oil, LPG, coal, biomass and solar). The disaggregation of end-use and economic sector can be as detailed as the user can accommodate - a "typical" model has a few residential and commercial classes, industrial demand divided into two digit SIC code subclasses, transportation demand modeled by class and mode, and about six to eight end-uses for each class. Oil, gas, alcohol, and electric vehicles are modeled. Marginal and average energy intensities at both the process and device levels are determined. ENERGY2020-Canada's unique capability to model how consumers make fuel and efficiency choices in the face of personal preference, price, and utility incentives is critical to demand-side management (DSM) and competitive analysis.

Independent power producer and cogeneration behavior (across ten technologies) as well as pollution generation (across eight pollutants) both at the end-use and supply level are dynamically calculated. Additional pollutant types and technologies to represent land and water pollution can be added as desired.

The other half of the energy demand market, the supply sector, is modeled in several parts as well, depending on client needs. The two most common are the electric and gas utility sectors which generate energy used to meet energy demands. The renewable resources sector usually impacts the electric utility sector but also affects the demand sectors as well through such things as solar water heat and biomass process heat. Less used, but also available are a complete oil and gas refining sector which tracks the exploration, refining, production and storage of oil and gas as well as a similar sector for coal supply. Any supply sectors not specifically modeled are captured in a generic supply sector that generates fuel prices and availability.

ENERGY2020-Canada addresses both demand-side and (conventional and renewable-fuel) supply option impacts on financial health, rates, and the customer. Peak and off-peak avoided, marginal, and incremental costs are calculated. Transmission, distribution, and cogeneration issues are also addressed. ENERGY2020-Canada provides a complete, realistic description of supply and demand processes, options, and issues that must be considered for adequate Integrated Resource Planning and Least-Cost Planning (LCP) assessment.

ENERGY2020-Canada is automatically calibrated to a specific service area or region with minimal data requirements - much of the data are on default databases specified by region. The model also calculates the market penetration, sales/load impacts, program costs, reliability impacts, revenue impacts, cost/benefit figures of merit, etc. of DSM options. Peak and off-peak avoided, marginal, and incremental costs can be calculated. T&D and cogeneration issues are also addressed. Peak clipping, valley filling, load shifting, strategic conservation, and strategic load growth (by day and season) options can be specified. Consideration of focus (small versus large customer) and level (aggressive versus limited implementation) are part of the DSM option selection process.

In general, ENERGY2020-Canada provides a complete and realistic description of the demand processes, options, and issues that organizations must consider for adequate demand-side option assessment.

In summary, ENERGY2020-Canada's integrated planning framework simulates the dynamics interactions within the energy sector under various plans and uncertainties (scenarios). The ENERGY2020-Canada framework can be automatically calibrated, using generally available data, and modified to represent any particular energy source, utility company, or geographical area. It then becomes a descriptive tool that dynamically simulates current and future conditions. It provides a laboratory in which planners can examine the long-range implications of programs and policies.

There are compelling reasons for the Government of Canada's preference for continued use of the ENERGY2020-Canada model. These reasons include the following:

1. **Model structures and logic are customized specifically to needs of EC.** For 15 years the specific needs and concerns of the Government of Canada have been continuously integrated into the structure and logic of ENERGY2020-Canada. Literally thousands of changes have been incorporated into the model in response to changes in Canadian regulations, policy, and shifting priorities. Because it has been customized in this way, ENERGY2020-Canada is able to provide policy analysis that takes into account the immediate positions and interests of Canada both domestically and in the global marketplace.

As support to the Government of Canada's sector-by-sector regulatory approach, ENERGY2020-Canada has customized structural enhancements, such as increasing the level of detail in its economic sectors, fuels, pollutants, technologies, electric utility plants, and cogeneration. Additionally, model logic and technical refinements have been customized, including endogenous cogeneration building and restructuring for the oil sands as well as methodology changes for future oil sands production mixes. Appendix 1 provides more examples of model structures and logic that have been customized to EC's policy analysis needs over the years.

All these customized enhancements ensure that the necessary model structures and logic are in place to be able to quickly simulate and provide thorough analysis for a comprehensive set of policy questions.

2. **Existing Canada regulations and policies have already been modeled and tested.** Because Canadian existing regulations and policies have already been modeled and tested within ENERGY2020-Canada, ECCC is able to conduct policy analysis in a timely and efficient manner. Based on its unique circumstances, each province and territory in Canada has adopted its own emission reductions target, its own climate change action plan, or both. And each of these plans has been modeled and incorporated into ENERGY2020-Canada. Simulation and testing of these regulations and policies into model code requires extensive time and testing. This work has already been done with ENERGY2020-Canada. These existing policies enable ECCC to simulate any number of potential policies and get quick preliminary results.

The extensive list of federal and provincial/territorial measures that have been modeled includes the electricity performance standard for coal-fired generation, renewable fuel content regulations, light-duty vehicle GHG regulations, and provincial measures such as the BC carbon tax, Ontario's coal-fired electricity phase-out, Nova Scotia's cap on electricity sector emissions, Quebec's cap and trade program and carbon levy, and Alberta's Specified Gas Emitters Regulation.

3. **Strength of methodology allows for causal explanations understandable to policymakers.** ENERGY2020-Canada's strong and comprehensive methodology has enhanced, and continues to enhance, EC's ability to present critical information to policymakers in ways that are both understandable and serviceable. The responsiveness of ENERGY2020-Canada and the familiarity of ECCC personnel with the model together help facilitate the communication of meaningful data to those tasked with ultimate policy decisions.

ENERGY2020-Canada provides a detailed representation of technologies that produce goods and services throughout the economy, and can simulate, in a realistic way, capital stock turnover and choices among technologies. The model also includes a representation of equilibrium feedbacks,

such that supply and demand for energy are adjusted to reflect policy. ENERGY2020-Canada has the capability to produce both a business-as-usual forecast as well as a policy forecast. Its methodology is ideal for policy analysis due to its causal simulation. Key advantages include:

1. **Realistic simulation of consumer decisions:** ENERGY2020-Canada is very different from many of the energy and emissions models in use today. It does not contain elasticities and obscurely specified parameters. To make model results understandable and realistic, a one to one relationship always exists between the model and the real world. For example, customer responses to relative price changes are not modeled using the traditional price and income elasticities. Instead, all the factors that determine the choices consumers make when making a purchase, such as the amount of money available, consumer preferences, and how well informed they are about other prices, are all explicitly modeled in ENERGY2020-Canada. By stressing causality, its methodology allows for rational explanations of how policies impact the real world. ENERGY2020-Canada adapts the decision-making process for each economic actor to simulate real-world factors. For instance, a utility dispatches electricity optimally, usually with the help of a linear program; ENERGY2020-Canada uses this same methodology when simulating the dispatch for plants into the future. However, a consumer choosing a new appliance or car generally does not act optimally, but rather makes a decision based on the limited information available. ENERGY2020-Canada is designed to reproduce this decision making process, allowing it to capture the nuances of device selection that a standard optimization model is likely to miss by simulating actual, not assumed, responses.
2. **Simulation of capital stock turnover:** As a technology vintage model, ENERGY2020-Canada tracks the evolution of capital stocks over time through retirements, retrofits, and new purchases, in which consumers and businesses make sequential acquisitions with limited foresight about the future. This is particularly important for understanding the implications of alternative time paths for emissions reductions.
3. **Bottom-up approach:** ENERGY2020-Canada is a "bottom-up" technology model used to forecast the effect of policies on emissions. In this bottom-up approach, the individual elements of the Canada-US energy system have been specified in great detail. These elements then are linked using detailed equations to form larger relationships which are then, in turn, linked until the complete energy system is formed. For policy analysis, a bottom-up approach is favored over a top-down approach which may fail to illuminate elementary relationships or be detailed enough to make realistic explanations of relationships within the system. As an example, a policy targeted to just one industry and one province in the energy system is sure to have impacts on other industries and other provinces. The use of a bottom-up approach will incorporate the relationships among the industry and provinces to allow for a realistic explanation of the impact of the targeted policy; whereas, a top-down approach is likely to show only an impact to that one industry and province in which the policy was targeted.
4. **Feedback responses among the supply sector, consumer demand, and the economy:** The strength of ENERGY2020-Canada's policy analysis capabilities lies in its being a comprehensive, integrated model focused on interactions between sectors and policies. ENERGY2020-Canada, when linked to a macroeconomic model, uniquely captures the feedback among energy consumers, energy suppliers, and the economy. For each fuel and consuming sector, the model balances energy supply and demand, accounting for economic competition among the various energy sources. For example, a change in price affects demand that then affects future supply and price. Increased economic activity increases demand; increased demand increases the investment in new supplies. The new investment affects the economy and energy prices. The energy prices also affect the economy. Given the feedback responses, the impact of potential changes in technical characteristics such as cost, lifetime, operating costs and efficiency are able to be realistically addressed.

5. Accounts for major interaction and behavioural effects: Estimates of the net impact of government measures incorporated into the modeling scenarios need to take into account major interaction and behavioural effects. The analytical approach permitted by ENERGY2020-Canada addresses each of the key modeling challenges of additionality, free ridership, the rebound effect, and policy interaction effects.
 - a) ENERGY2020-Canada controls for additionality by basing its structure on incremental or marginal decision-making. ENERGY2020-Canada assumes a specific energy efficiency or emission intensity profile at the sector and end-use point (e.g., space heating, lighting, or auxiliary power). Under the ENERGY2020-Canada modeling philosophy, if the initiative in question were to increase the efficiency of a furnace, for example, only the efficiency of a new furnace will be changed. The efficiency of older furnaces will not change unless those furnaces are retired and replaced with higher-efficiency ones. As such, any change in the model is incremental to what is reflected in the business-as-usual assumptions.
 - b) In the ENERGY2020-Canada model, the behaviour of free riders has already been accounted for in the reference case. Thus, their emissions are not counted toward the impact of the policy. Instead, ENERGY2020-Canada counts only the incremental take-up of the emissions-reducing technology
 - c) The ENERGY2020-Canada has mechanisms for fuel choice, process efficiency, device efficiency, short-term budget constraints, and cogeneration, which all react to changes in energy and emissions costs in different time frames. All of these structures work to simulate the rebound effect.

6. EC's years of experience using ENERGY2020-Canada has built strong confidence in the model and will enable success in future forecasting and policy analysis efforts. The established and time-tested relationship with ENERGY2020-Canada allows ECCC personnel to make consistent comparisons over time, as well as to develop simulations of future policies quickly and confidently. The Environmental Canada staff has been working with ENERGY2020-Canada for 15 years and has developed an experienced staff able to work with all aspects of ENERGY2020-Canada to generate forecasts and conduct policy analysis with over 50 person-years of experience with the model.

ENERGY2020-Canada's structures and logic have been designed specifically for EC's (as well as for the NEB and NRCan) regulatory and policy analysis since 1999. A multitude of national and provincial policies and regulations have already been developed and tested using ENERGY2020-Canada. The methodology used by ENERGY2020-Canada is designed specifically for policy analysis, stresses causation and realistic explanations of policy impacts. And finally, the ECCC personnel (as well as the NEB and NRCan staff) have many years of experience generating forecasts and conducting policy analysis using ENERGY2020-Canada allowing for quick development and understanding of not-yet-developed policies.

Appendix 4 US Macroeconomic Model Regions and Sector Specifications

Regional Dimensions

One possible option for regional specification is to adopt the United States' Energy Information Administration Census Regions:

- New England
- Middle Atlantic
- South Atlantic
- East South Central
- East North Central
- West North Central
- West South Central
- Mountain
- Pacific

Industry Sector Dimension

US Department of Commerce (2013): Regional Economic Accounts: GDP by State, Bureau of Economic Analysis (web-site).
<<http://www.bea.gov/regional/downloadzip.cfm>.

101	All industry total
102	Private industries
103	Agriculture, forestry, fishing, and hunting
104	Crop and animal production (Farms)
105	Forestry, fishing, and related activities
106	Mining
107	Oil and gas extraction
108	Mining (except oil and gas)
109	Support activities for mining
110	Utilities
111	Construction
112	Manufacturing
113	Durable goods
114	Wood product manufacturing
115	Nonmetallic mineral product manufacturing
116	Primary metal manufacturing
117	Fabricated metal product manufacturing
118	Machinery manufacturing
119	Computer and electronic product manufacturing
120	Electrical equipment, appliance, and component manufacturing
121	Motor vehicle, body, trailer, and parts manufacturing
122	Other transportation equipment manufacturing
123	Furniture and related product manufacturing
124	Miscellaneous manufacturing
125	Nondurable goods

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126	Food and beverage and tobacco product manufacturing
127	Textile mills and textile product mills
128	Apparel and leather and allied product manufacturing
129	Paper manufacturing
130	Printing and related support activities
131	Petroleum and coal products manufacturing
132	Chemical manufacturing
133	Plastics and rubber products manufacturing
134	Wholesale trade
135	Retail trade
136	Transportation and warehousing
137	Air transportation
138	Rail transportation
139	Water transportation
140	Truck transportation
141	Transit and ground passenger transportation
142	Pipeline transportation
143	Other transportation and support activities
144	Warehousing and storage
145	Information
146	Publishing industries, except Internet
147	Motion picture and sound recording industries
148	Broadcasting and telecommunications
149	Information and data processing services
150	Finance and insurance
151	Federal Reserve banks, credit intermediation and related services
152	Securities, commodity contracts, investments
153	Insurance carriers and related activities
154	Funds, trusts, and other financial vehicles
155	Real estate and rental and leasing
156	Real estate
157	Rental and leasing services and lessors of intangible assets
158	Professional, scientific, and technical services
159	Legal services
160	Computer systems design and related services
161	Other professional, scientific and technical services
162	Management of companies and enterprises
163	Administrative and waste management services
164	Administrative and support services
165	Waste management and remediation services
166	Educational services
167	Health care and social assistance
168	Ambulatory health care services

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169 Hospitals and nursing and residential care facilities
170 Social assistance
171 Arts, entertainment, and recreation
172 Performing arts, spectator sports, museums, and related services
173 Amusement, gambling, and recreation
174 Accommodation and food services
175 Accommodation
176 Food services and drinking places
177 Other services, except government
178 Government
179 Federal civilian
180 Federal military
181 State and local
199 Natural resources and mining
200 Trade
201 Transportation and utilities
202 Financial activities
203 Professional and business services
204 Education and health services
205 Leisure and hospitality
206 Information, Communication, and Technology (ICT)
208 Private goods-producing industries
209 Private services-providing industries

APPENDIX 5 TO ANNEX A

TASK AUTHORIZATION (TA) FORM				
Contractor:		Contract Number:		
Commitment: #		Financial Coding:		
Task Number (Amendment):		Issue Date:	Response Require By:	
1. Statement of Work (Work Activities, Certifications and Deliverables)				
See attached for Statement of Work and Certifications required.				
2. Period of Service:	From (Date)		To (Date)	
3. Work Location:				
4. Travel Requirements:				
5. Language Requirement:				
6. Other Conditions/Constraints:				
7. Level of Security Clearance required for the Contractor Personnel:				
8. Contractor's Response:				
Category and Name of Proposed Resource	PWGSC Security File Number	Per Diem Rate	Estimated # of Days	Total Cost
			Estimated Cost	
			Applicable Taxes	
			Total Labour Cost	
			Total Travel & Living Cost	
			Firm Price or Maximum TA Price	
Contractor's Signature				

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TASK AUTHORIZATION (TA) FORM	
Name, Title and Signature of Individual Authorized to sign on behalf of the Contractor (type or print) _____	Signature: _____ Date: _____
Approval – Signing Authority	
Signatures (Client) Name, Title and Signature of Individual Authorized to sign: Technical Authority: _____ Date: _____	Signatures (PWGSC) Contracting Authority ¹ : _____ Date: _____
¹ Signature required for TA valued at \$250,000 or more, Applicable Taxes included.	
You are requested to sell to her Majesty the Queen in Right of Canada, in accordance with the terms and conditions set out herein, referred to herein, or attached hereto, the services listed herein and in any attached sheets at the price set out thereof.	

ANNEX B

BASIS OF PAYMENT

The Contractor will be paid in accordance with the following Basis of Payment for work performed pursuant to the resulting Contract, GST/HST (if applicable) extra.

TABLE 1 CANADIAN MODELING SOLUTION (E3MC), US MODELING SOLUTION (E3US), and NORTH AMERICAN MODELING SOLUTION (E3NA) MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price in Can \$
1	Licenses for 10 users of commercial off-the-shelf Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 3 of Table 2 of Article 12 of the statement of work.	\$ _____
2	Licenses for 10 users of commercial off-the-shelf US Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 32 of Table 2 of Article 12 of the statement of work.	\$ _____
3	Modified Canadian Provincial and Territorial Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 4 to Mandatory 18 of Table 2 of the statement of work.	\$ _____
4	ENERGY2020 (Canada) and Canadian macroeconomic model Interface Module. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 19 to Mandatory 29 of Table 2 of Article 12 of the statement of work.	\$ _____
5	Modified US Regional or State Macroeconomic Model. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 33 to Mandatory 39 of Table 2 of Article 12 of the statement of work.	\$ _____
6	ENERGY2020 (US) and US macroeconomic model Interface Module. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 40 to Mandatory 49 of Table 2 of Article 12 of the statement of work.	\$ _____
7	Linking of the Canadian and US integrated model to create a simultaneous integrated energy, emissions and economy model of North America.	\$ _____

	This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 52 to Mandatory 56 of Table 2 of Article 12 of the statement of work.	
8	Documentation of E3MC, E3US, E3NA. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 57 of Table 2 of Article 12 of the statement of work.	\$ _____
9	Total of Items 1 to 8	\$ _____

TABLE 2 ADDITIONAL LICENSES (beyond the 10 initial licenses) MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price for 1 user in Can \$ (A)
1	Canadian Modeling Solution (E3MC)	\$ _____
2	US Modeling Solution (E3US)	\$ _____
3	North American Modeling Solution (E3NA)	\$ _____

TABLE 3 PROFESSIONAL AND TRAINING SERVICES FIRM ALL-INCLUSIVE PER DIEM RATES (Can \$)		
ITEM NO.	DESCRIPTION RESOURCE CATEGORIES	FIRM ALL-INCLUSIVE RATE During Contract Period
1	Senior Economist	\$ _____ (A)
2	Economist	\$ _____ (B)
3	Project Manager	\$ _____ (C)
4	Software Programmer	\$ _____ (D)

BIDDER FORMS

FORM 1 - BID SUBMISSION FORM

FORM 1 - BID SUBMISSION FORM													
<p>Bidder's full legal name</p> <p><i>[Note to Bidders: Bidders who are part of a corporate group should take care to identify the correct corporation as the Bidder.]</i></p>													
<p>Authorized Representative of Bidder for evaluation purposes (e.g., clarifications)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Name:</td> <td></td> </tr> <tr> <td>Title:</td> <td></td> </tr> <tr> <td>Address:</td> <td></td> </tr> <tr> <td>Telephone #:</td> <td></td> </tr> <tr> <td>Fax #:</td> <td></td> </tr> <tr> <td>Email:</td> <td></td> </tr> </table>	Name:		Title:		Address:		Telephone #:		Fax #:		Email:	
Name:													
Title:													
Address:													
Telephone #:													
Fax #:													
Email:													
<p>Bidder's Procurement Business Number (PBN)</p> <p><i>[see the Standard Instructions 2003]</i></p> <p><i>[Note to Bidders: Please ensure that the PBN you provide matches the legal name under which you have submitted your bid. If it does not, the Bidder will be determined based on the legal name provided, not based on the PBN, and the Bidder will be required to submit the PBN that matches the legal name of the Bidder.]</i></p>													
<p>Jurisdiction of Contract:</p> <p>Province or Territory in Canada the Bidder wishes to be the legal jurisdiction applicable to any resulting contract (if other than as specified in solicitation)</p>													
<p>Former Public Servants</p> <p>See the Article in Part 2 of the bid solicitation entitled "Former Public Servant" for a definition of "Former Public Servant".</p>	<p>Is the Bidder a FPS in receipt of a pension as defined in the bid solicitation?</p> <p>Yes ____ No ____</p> <p>If yes, provide the information required by the Article in Part 2 entitled "Former Public Servant "</p> <hr/> <p>Is the Bidder a FPS who received a lump sum payment under the terms of the terms of the Work Force Adjustment Directive?</p> <p>Yes ____ No ____</p> <p>If yes, provide the information required by the Article in Part 2 entitled "Former Public Servant "</p>												

FORM 1 - BID SUBMISSION FORM									
Canadian Content Certification As described in the solicitation, bids with at least 80% Canadian content are being given a preference. <i>[For the definition of Canadian goods and services, consult the PWGSC SACC clause A3050T]</i>	On behalf of the Bidder, by signing below, I confirm that <i>[check the box that applies]:</i>								
	<table border="1" style="width: 100%;"> <tr> <td style="width: 80%;">At least 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)</td> <td style="width: 20%;"></td> </tr> <tr> <td>Less than 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)</td> <td></td> </tr> </table>	At least 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)		Less than 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)					
	At least 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)								
Less than 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)									
Hardware: <i>(Contracting Authority should only insert when Supplemental General Conditions 4001 have been inserted in Part 7).</i>	<table border="1" style="width: 100%;"> <tr> <td style="width: 60%;">Toll-Free Telephone Number for maintenance services:</td> <td></td> </tr> <tr> <td>Website for maintenance services:</td> <td></td> </tr> </table>	Toll-Free Telephone Number for maintenance services:		Website for maintenance services:					
	Toll-Free Telephone Number for maintenance services:								
Website for maintenance services:									
Licensed Software Maintenance and Support: <i>(Contracting Authority should only insert when supplemental General Conditions 4004 has been inserted in Part 7).</i>	<table border="1" style="width: 100%;"> <tr> <td style="width: 60%;">Toll-free Telephone Access:</td> <td></td> </tr> <tr> <td>Toll-Free Fax Access:</td> <td></td> </tr> <tr> <td>E-Mail Access:</td> <td></td> </tr> <tr> <td>Website address for web support:</td> <td></td> </tr> </table>	Toll-free Telephone Access:		Toll-Free Fax Access:		E-Mail Access:		Website address for web support:	
	Toll-free Telephone Access:								
	Toll-Free Fax Access:								
	E-Mail Access:								
Website address for web support:									
Security Clearance Level of Bidder [include both the level and the date it was granted] [Note to Bidders: Please ensure that the security clearance matches the legal name of the Bidder. If it does not, the security clearance is not valid for the Bidder.]									
On behalf of the Bidder, by signing below, I confirm that I have read the entire bid solicitation including the documents incorporated by reference into the bid solicitation and I certify that:									
<ol style="list-style-type: none"> 1. The Bidder considers itself and its products able to meet all the mandatory requirements described in the bid solicitation; 2. This bid is valid for the period requested in the bid solicitation; 3. All the information provided in the bid is complete, true and accurate; and 4. If the Bidder is awarded a contract, it will accept all the terms and conditions set out in the resulting contract clauses included in the bid solicitation. 									
Signature of Authorized Representative of Bidder	<hr style="border: 0; border-top: 1px solid black; width: 100%;"/>								

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Form 2
Software Publisher Certification Form
(to be used where the Bidder itself is the Software Publisher)

The Bidder certifies that it is the software publisher of all the following software products and that it has all the rights necessary to license them (and any non-proprietary sub-components incorporated into the software) on a royalty-free basis to Canada pursuant to the terms set out in the resulting contract:

[Bidders should add or remove lines as needed]

Form 3
Software Publisher Authorization Form
(to be used where the Bidder is not the Software Publisher)

This confirms that the software publisher identified below has authorized the Bidder named below to license its proprietary software products under the contract resulting from the bid solicitation identified below. The software publisher acknowledges that no shrink-wrap or click-wrap or other terms and conditions will apply, and that the contract resulting from the bid solicitation (as amended from time to time by its parties) will represent the entire agreement, including with respect to the license of the software products of the software publisher listed below. The software publisher further acknowledges that, if the method of delivery (such as download) requires a user to "click through" or otherwise acknowledge the application of terms and conditions not included in the bid solicitation, those terms and conditions do not apply to Canada's use of the software products of the software publisher listed below, despite the user clicking "I accept" or signalling in any other way agreement with the additional terms and conditions.

This authorization applies to the following software products:

[Bidders should add or remove lines as needed]

Name of Software Publisher (SP) _____

Signature of authorized signatory of SP _____

Print Name of authorized signatory of SP _____

Print Title of authorized signatory of SP _____

Address for authorized signatory of SP _____

Telephone no. for authorized signatory of SP _____

Fax no. for authorized signatory of SP _____

Date signed _____

Solicitation Number _____

Name of Bidder _____

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Form 4 Declaration Form

This declaration form must be submitted as part of the bidding process. Please complete and submit in a sealed envelope labelled "Protected" to the attention of Integrity, Departmental Oversight Branch, PWGSC, 11 Laurier Street, Place du Portage, Phase III, Tower A, 10A1, Room 108, Gatineau (Québec) Canada K1A 0S5. Include the sealed envelope with your bid submission. This form is considered "Protected B" when completed.	
Complete Legal Name of Company:	
Company's address:	
Company's Procurement Business Number (PBN):	
Bid Number:	
Date of Bid: (YY-MM-DD)	

Have you ever, as the bidder, your affiliates or as one of your directors, been convicted or have pleaded guilty of an offence in Canada or similar offence elsewhere under any of the following provisions ¹ :			
	Yes	No	Comments
Financial Administration Act 80(1) d): False entry, certificate or return 80(2): Fraud against Her Majesty 154.01: Fraud against Her Majesty	<input type="checkbox"/>	<input type="checkbox"/>	
Criminal Code 121: Frauds on the government and contractor subscribing to election fund 124: Selling or Purchasing Office 380: Fraud – committed against Her Majesty 418: Selling defective stores to Her Majesty	<input type="checkbox"/>	<input type="checkbox"/>	
In the last 3 years, have you, as the bidder, your affiliates or one of your directors, been convicted or have pleaded guilty of an offence in Canada or elsewhere under any of the following provisions ¹ :			
Criminal Code 119: Bribery of judicial officers,... 120: Bribery of officers 346: Extortion 366 to 368: Forgery and other offences resembling forgery 382: Fraudulent manipulation of stock exchange transactions 382.1: Prohibited insider trading 397: Falsification of books and documents 422: Criminal breach of Contract 426: Secret commissions 462.31 Laundering proceeds of crime 467.11 to 467.13: Participation in activities of criminal organization	<input type="checkbox"/>	<input type="checkbox"/>	
Competition Act 45: Conspiracies, agreements or arrangements between competitors 46: Foreign directives 47: Bid rigging 49: Agreements or arrangements of federal financial institutions	<input type="checkbox"/>	<input type="checkbox"/>	

¹ for which no pardon or equivalent has been received.

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	Yes	No	Comments
52: False or misleading representation 53: deceptive notice of winning a prize			
Corruption of Foreign Public Officials Act 3: Bribing a foreign public official 4: Accounting 5: Offence committed outside Canada	<input type="checkbox"/>	<input type="checkbox"/>	
Controlled Drugs and Substance Act 5: Trafficking in substance 6: Importing and exporting 7: Production of substance	<input type="checkbox"/>	<input type="checkbox"/>	
Other Acts 239: False or deceptive statements of the Income Tax Act 327: False or deceptive statements of the Excise Tax Act	<input type="checkbox"/>	<input type="checkbox"/>	

Additional Comment

I, (name) _____, (position) _____, of (company name bidder) _____ authorise PWGSC to collect and use the information provided, in addition to any other information that may be required to make a determination of ineligibility and to publicly disseminate the results.

I, (name) _____, (position) _____, of (company name bidder) _____ certify that the information provided in this form is, to the best of my knowledge, true and complete. Moreover, I am aware that any erroneous or missing information could result in the cancellation of my bid as well as a determination of ineligibility/suspension.

We appreciate your interest in doing business with The Government of Canada and your understanding on the additional steps that we need to take to protect the integrity of PWGSC's procurement process.

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Form 5 List of Names Form

In accordance with Part 5, Article 5.1 (a) – Integrity Provision – List of Names, please complete the Form below.

Complete Legal Name of Company	
Company's address	
Company's Procurement Business Number (PBN)	
Solicitation number	
Board of Directors (Use Format – first name last name) Or put the list as an attachment	
1. Director	
2. Director	
3. Director	
4. Director	
5. Director	
6. Director	
7. Director	
8. Director	
9. Director	
10. Director	
Other members	
Comments	

Form 6
FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION

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

For further information on the Federal Contractors Program for [Employment and Social Development Canada \(ESDC\)](#) - Labours' website.

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

Complete both A and B.

A. Check only one of the following:

- A1. The Bidder certifies having no work force in Canada.
- A2. The Bidder certifies being a public sector employer.
- A3. The Bidder certifies being a [federally regulated employer](#) being subject to the *Employment Equity Act*.
- A4. The Bidder certifies having a combined work force in Canada of less than 100 employees (combined work force includes: permanent full-time, permanent part-time and temporary employees [temporary employees only includes those who have worked 12 weeks or more during a calendar year and who are not full-time students]).
- A5. The Bidder has a combined workforce in Canada of 100 or more employees; and
 - A5.1 The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with ESDC -Labour.

OR

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

B. Check only one of the following:

- B1 The Bidder is not a Joint Venture.

OR

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