



**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 K1A12-149071/A	Date 2015-11-20
Client Reference No. - N° de référence du client K1A12-149071	
GETS Reference No. - N° de référence de SEAG PW-\$SEL-615-29626	
File No. - N° de dossier 615el.K1A12-149071	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-01-05	
Time Zone Fuseau horaire Eastern Standard Time EST	
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 (819) 956-5925
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF THE ENVIRONMENT 24TH FL. 10 WELLINGTON ST ATT: Nick Macaluso GATINEAU Quebec K1A0H3 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

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

Issuing Office - Bureau de distribution

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

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

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Solicitation No. - N° de l'invitation
K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

Amd. No. - N° de la modif.
File No. - N° du dossier
615e1K1A12-149071

Buyer ID - Id de l'acheteur
615e1
CCC No./N° CCC - FMS No./N° VME

List of Annexes to the Resulting Contract:

Annex A Statement of Work
Annex B Basis of Payment
Annex C Security Requirements Check List

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

BID SOLICITATION

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

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 any other annexes.

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 option(s) 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) There are security requirements associated with this requirement. For additional information, consult Part 6 - Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses. For more information on personnel and organizational security screening or security clauses, Bidders should refer to the Industrial and Security Program (ISP) of Public Works and Government Services Canada (<http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>) website.
- (d) 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).
- (e) 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".

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 (2015-07-03) 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 copies and 1 soft copies on as CD or DVD or USB key)
- (iii) Section III: Certifications (1 hard copies)

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 submitted this information within the period set by the Contracting Authority, its bid will be declared non-responsive.

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

- 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) **Security :** Bidders are requested to submit the following security information for each of the proposed resources with their bids on or before the bid closing date:

SECURITY INFORMATION	
Name of individual as it appears on security clearance application form	
Level of security clearance obtained	
Validity period of security clearance obtained	
Security Screening Certificate and Briefing Form file number	

If the Bidder has not included the security information in its bid, the Contracting Authority will provide an opportunity to the Bidder to submit the security information during the evaluation period. If the Bidder has not submitted the security information within the period set by the Contracting Authority, its bid will be declared non-responsive.

- (iii) **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 – Technical Compliance, Attachment 3.2 – Corporate Evaluation Criteria and Attachment 3.3 – Resources Evaluation Criteria, which is the requested formats for providing the substantiation. The substantiation

must not simply be a repetition of the requirement(s), but must explain and demonstrate how the Bidder will meet 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.

- (iv) **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.
- (v) **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.
- (vi) **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.

(vii) **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.

(viii) **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, 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.

Solicitation No. - N° de l'invitation
K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

Amd. No. - N° de la modif.
File No. - N° du dossier
615e1K1A12-149071

Buyer ID - Id de l'acheteur
615e1
CCC No./N° CCC - FMS No./N° VME

ATTACHMENT 3.1

BID EVALUATION CRITERIA – TECHNICAL COMPLIANCE

(See next page)

Solicitation No. - N° de l'invitation
K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

Amd. No. - N° de la modif.
File No. - N° du dossier
615elK1A12-149071

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

		BIDDER'S RESPONSE
TECHNICAL REQUIREMENT		DEMONSTRATED EXPERIENCE
		(BIDDER TO INSERT DATA OR INSERT PAGE WHERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
CANADIAN MODELING SOLUTION (E3MC)		
MANDATORY REQUIREMENT		
<p>Technical Component The proposal must include a description of future required functionalities (Mandatory 2 to Mandatory 41) by providing items 1 to 4. Note: Items 1 to 4 may illustrate Mandatory 2 to Mandatory 41 globally, individually or as a combination thereof.</p> <ol style="list-style-type: none"> 1. A statement of understanding of the work to be undertaken and why it has been requested. 2. A methodology that will be used to respond to EC's requirement for an integrated and dynamic energy, emissions and economy modeling solution. The methodology must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating the Bidder's proposed approach to delivering the future required functionalities (Mandatory 2 to Mandatory 41). 3. A work plan that describes in detail how the Bidder proposes to carry out the Mandatories to achieve the project objectives. The work plan must include visuals such as diagrams, tables, graphics or screenshots, etc. 4. A high-level estimate of the timeline such as the number of weeks or months required to deliver the future required functionalities (Mandatory 2 to Mandatory 41) listed above in 7. Timing of Deliverables. <p>Company Expertise Component The proposal must identify:</p> <ol style="list-style-type: none"> 1. The professional staff to be assigned to the project and their expected contribution to the project. 2. Staff experience directly relevant to the work. 3. Relevant company experience directly related to the work (for prime and sub-Bidder). 		
Mandatory 1	At contract awarding , the Bidder must provide a licence to their current off-the-shelf CANADIAN	

	<p>MACROECONOMIC MODEL that is:</p> <ol style="list-style-type: none"> 1. A 10-province and 3-territory Canadian dynamic macroeconomic model with foreign and regional linkages. 2. Aligned with Statistics Canada's Canadian National System of Accounts (2012). 3. And which will be customized to include the future required functionalities (M2 to M41) to be delivered within 30 months of contract awarding. 	
<p>Mandatory 2</p>	<p>Macroeconomic Projections ENERGY2020 (Canada) requires macroeconomic projection mechanisms and reporting variables at the provincial level as well as a select set of nationally measured variables. These projections must be sensitive to the analysis of energy, environment, and environment-related proposals and candidate initiatives of the Government of Canada.</p>	
<p>Mandatory 3</p>	<p>Dynamic Integration To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020 (Canada) on a stand-alone and on a dynamic integrated basis.</p> <p>In order to dynamically integrate the Canada macroeconomic model and ENERGY2020 (Canada), an INTERFACE MODULE must be developed. This interface must iterate variables between the Canadian macroeconomic model and ENERGY2020 (Canada) until both models reach convergence. This ensures that both models respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection.</p> <p>Note: ENERGY2020 (Canada) is the 'command program', and is written in Promula programming language, while the existing interface is written in Visual Basic. The interface provides the ability to</p>	

	project ENERGY2020 (Canada) variables using executable code originating from the macroeconomic model.	
Mandatory 4	Stand-Alone Model Include options to run a stand-alone provincial or regional economic model.	
Mandatory 5	Bottom-Up Approach The model must follow a bottom-up approach to accounting for each province and territory separately with Canada being the sum of regions. Canada will still evaluate a top-down approach whereby the Canada results are 'attributed' or 'shared' to each province based on their relative economic strengths and weaknesses	
Mandatory 6	Logically Presented The model must be illustrated by way of diagrams that clearly show the concepts, flows and linkages of information within the model. The model's equations and blocks must be contained, described and easily accessible within the modeling solution software or programs.	
Mandatory 7	Provincial and Territorial Dimension The model must solve uniquely for each province and territory using distinct Input-Output tables. The Bidder must clearly demonstrate how they will integrate the Input-Output relationships into the model. 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.	
Mandatory 8	Trade Flows The provincial and territorial sub-models must capture all inter-provincial and international trade flows. Note: Consideration will be given to using a national model based on the most recently available Input-Output tables and then share-weighted to the provinces and territories based on their respective Input-Output tables. If this share-weighted approach is used, the	

	macroeconomic model must ensure that when policy touches only one sector in a specific province (for example petroleum refining in Nova Scotia), the direct effect is focused only on that province.	
Mandatory 9	Multiplier Effects The model must capture the indirect, induced and multiplier effects that affect other sectors and provinces. In the case of share-weighting, the sum of the provincial macroeconomic parameters, including the province with the impact, must equal the national macroeconomic parameters.	
Mandatory 10	Industrial Sector Dimension The industrial detail in the macroeconomic model must reflect the industrial detail in ENERGY2020 (Canada). At a minimum, it must represent NAICS industries or sectors listed in Appendix 2. In order to meet EC and NRCan analytical requirements, it will be necessary to disaggregate selective industries or sectors to a finer NAICS-digit level. The industries requiring this finer level of detail (to aid in pinpointing direct impacts from policy initiatives) will be determined based on data availability. Note: EC's current macroeconomic model contains more than 150 sector categories covering agricultural and forest activities, energy resource extraction, manufacturing, business services, government and others. Given most recent changes to Statistics Canada National System of Accounts, EC acknowledges that the current level of sector dimension is more limited in scope. EC is prepared to discuss a more restricted set of regions and sectors that contains the functionality required to provide the prerequisite analysis. The national, provincial and territorial models must have at least the sectors listed in Appendix 2 and these sectors must be aligned to Statistics Canada's new System of National Accounts.	
Mandatory 11	Address Policies The model must have the capacity and flexibility to	

	<p>address regulatory and incentive policies at the required level of sectoral definition at the provincial and national level. Statistics Canada's CANSIM Table 379-0030 provides the level of sector detail at the provincial level.</p>	
Mandatory 12	<p>Energy Sectors Dimension The macroeconomic model must capture energy sub-sector disaggregation directly or indirectly. The current system of national accounts provides information for key energy sectors at various NAICS levels. For example:</p> <ul style="list-style-type: none"> a. Oil and gas extraction [211] b. Conventional oil and gas extraction [211113] c. Non-conventional oil extraction [211114] d. Coal mining [2121] e. Electric power generation, transmission and distribution [2211] f. As part of its impact assessment, EC requires a disaggregated representation of the key energy sectors such as separate tracking of oil and gas extraction as well as separate tracking within oil extraction (i.e. light and heavy). The macroeconomic model must capture this sub-sector disaggregation either directly or indirectly. 	
Mandatory 13	<p>Standard Features The model must include, but not be limited to:</p> <ul style="list-style-type: none"> a. Base year = \$2007 or \$2010 b. Millions of Canadian Dollars c. Energy demand (by type and by energy-using sector) d. Alignment with Statistics Canada's new System of National Accounts (the International 2008 System of National Accounts) e. NAICS 2007 f. Forecast or simulation period (from most current historical year to 2050 or 2075) 	
Mandatory 14	<p>Major Blocks The model must capture, but not be limited to:</p> <ul style="list-style-type: none"> a. Demography 	

	<ul style="list-style-type: none"> b. Foreign Linkages c. Government Savings and Finance Sector d. Stocks of Wealth e. Labour Force f. Disposable Incomes g. Final Demand h. Final Demand Prices i. Major Aggregates j. Industry Prices and Wages k. Industry Output, Employment and Capital Stock l. Government Revenue, Expenditure, Redistribution m. Earned Income 	
<p>Mandatory 15</p>	<p>Major Concepts The following concepts must be included in the model:</p> <ol style="list-style-type: none"> 1. Household Expenditures Variables are to be disaggregated at the most detailed level and must include real, nominal and relative prices for personal consumption. 2. Investment By asset type, sector, industry: <ul style="list-style-type: none"> a. Business: structures and machinery and equipment; structures by buildings and engineering type; machinery and equipment by type of equipment available; intellectual property products; Investment by asset type and industry. b. Residential: new construction, renovations, ownership transfer costs, housing starts, housing stock and sales of new and existing dwellings. 3. Inventory change By farm and non-farm, sector, industry: <ul style="list-style-type: none"> a) Manufacturing: inventory cases must be at the same level of disaggregation as GDP, gross output and investment b) Wholesale c) Retail 4. Non-profit Institutions Serving 	

	<p>households' consumption expenditure.</p> <p>5. Exports and Imports By goods and services, by direction with the US and the rest of the world, at the level of detail available in the System of National Accounts.</p> <p>6. Current and Capital Accounts By province and territory (where available), for households, non-profit institutions serving households, corporations (including undistributed corporate profits), general government and non-residents.</p> <p>7. Government Revenue, Expenditure and Budgetary Balances By province and territory.</p> <p>Note: This information is available from the System of National Accounts on the CANSIM (Table 384-0040, Current accounts, households, provincial and territorial, annual) plus from the provincial and territorial governments.</p> <p>8. Detailed Government Revenues and Expenditures By province and type of government entity</p> <p>Note: Available in Government Financial Statistics; detailed taxation data can be acquired from provincial and territorial governments.</p> <p>9. Other Government Expenditures Net current expenditure on goods and services and sales of goods and services by level of government (including health expenditure) as per the detail in the provincial economic accounts.</p>	
<p>Mandatory 16</p>	<p>Indicators The following indicators, at a minimum, must be provided by the macroeconomic model:</p> <ol style="list-style-type: none"> 1. GDP Price Index 2. Long-term Bond Rate 3. Consumer Price Index 4. Exchange Rates 	

	<ol style="list-style-type: none"> 5. Interprovincial Migration 6. International Migration 7. Population 8. GDP By sector and by province 9. Note: GDP by industry and province 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 aligned to Statistics Canada's new System of National Accounts. 10. Gross Output by NAICS sector by province. 11. Employment by NAICS sector by province. 12. Wage Indicators by NAICS sector by province. 13. Major Purchased Inputs by Sector. 14. Taxes Corporate, personal and indirect (HST, GST and PST) and transfer payments 15. Household Expenditures 16. Real Disposable Income 17. Investment by asset type and industry 18. Investment Prices by asset type and industry 19. Housing Stock by type, by value and by physical units 20. Housing Starts by type, by value and by physical units 21. Commercial Building Starts by type by value and by physical units 22. Commercial Building Stock by type by value and by physical units 23. Vehicle Sales by type 	
<p>Mandatory 17</p>	<p>Templates The macroeconomic model must have the capacity to generate pre-defined or user-defined reports or tables (templates from which to read data</p>	

	series) on key data.	
Mandatory 18	<p>Forecast Calibration The macroeconomic reference forecast must be calibrated:</p> <ol style="list-style-type: none"> Short-Term Align the short-term simulation with the projections outlined in Finance Canada's most recently available Budget or Fiscal and Economic Update projections. Long-Term Align the long-term Canadian forecast to Finance Canada's long-term forecast. 	
Mandatory 19	<p>Forecast Tuning The detailed industry and demand variables must be fine-tuned for near-term expectations. This forecast will be used to send initial parameters to ENERGY2020 Canada.</p> <p>Note: ENERGY2020 Canada contains detailed energy-related information. When it is linked to the macroeconomic model and the two models iterate, a new integrated equilibrium solution will be reached. This new equilibrium will result in integrated projections value for energy, emissions and the macro-economy.</p>	
Mandatory 20	<p>Reference Case Forecast When the Canadian macroeconomic model is 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"> Policy Analysis Regulatory analyses for oil, gas and emissions intensive trade exposed industries (EITE), and oil, gas and electricity. 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. 	

	<p>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 21	<p>Linkages ENERGY2020 (Canada) uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. 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. Appendix 3 outlines the current sector structure of E3MC.</p>	
Mandatory 22	<p>Identify Variables to be Transferred Transferring data from ENERGY2020 (Canada) to the macroeconomic model requires files that are read by both models. These files will contain the changes caused by a specific energy or emissions policy to a set of model variables as calculated by ENERGY2020 (Canada). The files will then be imported into the macroeconomic model, and the macroeconomic model will be executed to obtain a revised macroeconomic forecast given these new assumptions. The specific variables that are sent from ENERGY2020 (Canada) to the macroeconomic model will vary based on the policy being analyzed. The Bidder must identify which variables will be operational to allow for the dynamic general equilibrium solution</p>	
Mandatory 23	<p>Identify 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. The Bidder has the option to exchange information as changes from the base case or from levels relative to the base case. In either case, the proposal must clearly illustrate how</p>	

	this information exchange from will be performed.	
Mandatory 24	Direct, Indirect and Induced Effects As part of its impact assessment exercises, EC requires separate reporting of direct, indirect and induced macroeconomic effects of policy changes. For example GDP, employment, investment and gross output multipliers will need to be reported.	
Mandatory 25	Demonstrate Data-Transfer Capabilities The Bidder must illustrate the level of effort for building data-transfer capabilities between ENERGY2020 (Canada) and macroeconomic model. The Bidder must demonstrate in detail how the interface between the two models will ensure a dynamic and seamless integration.	
Mandatory 26	Interactive Data Transfer Output from the macroeconomic model must be interactively transferred to ENERGY2020 (Canada). 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 (ENERGY2020 (Canada) programming language). The code for the data transfers must be incorporated into the interface between ENERGY2020 (Canada) and macroeconomic model.	
Mandatory 27	Identify Macroeconomic Variables to be Transferred The initial list of macroeconomic variables to be passed from the macroeconomic model to ENERGY2020 (Canada) must include, but not be limited to: 1. Economic Output 2. GDP by Economic Category 3. Total Personal Income 4. Real Disposable Personal Income 5. Consumer Price Index 6. GDP Deflator 7. Exchange Rates 8. Government Compensation	
Mandatory 28	Identify ENERGY 2020 (Canada) Variables to be Transferred The initial list of variables that will be passed from ENERGY2020 (Canada) to the macroeconomic model must include, but not be limited to:	

	<ol style="list-style-type: none"> 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 (by structure, equipment, process for each economic category). 6. Exchange Rate Information Used for energy-related trade flows in ENERGY2020 (Canada). 	
<p>Mandatory 29</p>	<p>Extraction of Detailed Data The Bidder must illustrate in detail how data from the macroeconomic model will be extracted and transferred to ENERGY2020 (Canada). This includes, but is not limited to:</p> <ol style="list-style-type: none"> 1. The generation of output tables (or custom reports), which must be created during each execution of the macroeconomic model. 2. A post-process that illustrates how data from the macroeconomic model (in its industrial structure) is mapped to data in ENERGY2020 (Canada)'s industrial structure. 	
<p>Mandatory 30</p>	<p>Collaborate on Developing Automated Linking Interface The Bidder must collaborate to create an automated linking interface between ENERGY2020 (Canada) and the macroeconomic model. ENERGY2020 (Canada) will be the "command" program, controlling the execution of ENERGY2020 (Canada) and the macroeconomic model.</p> <p>The macroeconomic model "base case" will be created as an initial reference case that has not yet been integrated with ENERGY2020</p>	

	<p>(Canada). As the modeling solution solves, each iteration of the framework must include, but is not limited to:</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.7. This single "iteration" can be repeated as many times as needed.	
<p>Mandatory 31</p>	<p>Successful Integration Process To ensure a successful integration process, the following must be achieved:</p> <ol style="list-style-type: none">1. Testing Create a test case of output data generated by modifying the macroeconomic input data.2. Inserting and Extracting Data Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020 (Canada).3. 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.	

	<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 (Canada) to create an integrated solution</p> <p>4. Convergence Criteria Convergence rules may be required to limit the number of iterations needed to create a solution.</p>	
Mandatory 32	<p>Endogenous Interaction ENERGY2020 (Canada) and the macroeconomic model must interact endogenously through changes in energy variables such as production, prices, energy intensities, investments 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. Note: ENERGY2020 (Canada) produces annual projections as such the macroeconomic model must produce annual projections.</p>	
Mandatory 33	<p>Achieve an Integrated Solution The macroeconomic model will incorporate these energy results 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. The process of using output from one iteration as input to the next iteration is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy.</p>	
Mandatory 34	<p>Direct, Indirect (Induced) Impacts The integrated modeling solution must capture both direct and indirect (induced) impacts on Canadian industries and consumers of the Canadian and the US climate change and clean air policy initiatives. A key technical objective is to ensure accounting and</p>	

	behavioural consistency between the 'micro' representation of energy markets in ENERGY2020 (Canada) and the 'macro' (plus industrial organization) detail of the macroeconomic model at each single regional level.	
Mandatory 35	Perform 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.	
Mandatory 36	Scenario Development Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation.	
Mandatory 37	Analyze Spillover Effects Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US.	
Mandatory 38	Analyze Joint Initiatives Analyze joint Canada-US environment and energy policy initiatives.	
Mandatory 39	Analyze Alternative Proposals Analyze alternative provincial and industry proposals for achieving environmental goals.	
Mandatory 40	Collaboration The Bidder must collaborate on developing the interface module. The Bidder must ensure the E3MC interface module is created in such a way that the two models are dynamically linked and produce integrated results.	
Mandatory 41	EM3C 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. Stress-testing must ensure that: <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 	

	<p>the two models.</p> <p>3. EC Staff EC staff will be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the test and review of output from both ENERGY2020 (Canada) and the macroeconomic model.</p>	
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Rated Requirement

	Description	Evaluation Criteria	Points	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Rated 1	<p>The Bidders should demonstrate its understanding of Mandatories 3, 31, 32, 33 and 34 by producing a global methodology and approach.</p> <p>This methodology and approach must address Evaluation Criteria 1 to 5.</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 ENERGY2020 (Canada) and the Canadian macroeconomic model in a dynamic*** and integrated manner.</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>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 (E3MC) will be executed to produce a unique integrated energy,</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</p>	

		<p>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:</p> <p>a. Convergence and;</p> <p>b. Convergence testing of a set of variables or other conditions that constitute a “stopping rule”.</p>	<p>has addressed 0 of the 5 items. = 0 points</p>	
	MAX. TECHNICAL POINTS	25		
	MIN. POINTS REQUIRED	14		
	TOTAL TECHNICAL SCORE ACHIEVED			

US MODELING SOLUTION (E3US)

Mandatory Requirement

Technical Component

The proposal must include a description of **future required functionalities** (Mandatories M43 to M57) by providing items 1 to 4.

Note: items 1 to 4 can present M43 to M57 **globally, individually** or a **combination** thereof.

1. **A statement of understanding** of the work to be undertaken and why it has been requested.
2. **A methodology** that will be used to respond to EC’s requirement for an integrated and dynamic energy, emissions and economy modeling solution. The methodology must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating the Bidder’s proposed approach to delivering the future Mandatories (M43 to M57) listed below.
3. **A work plan** that describes in detail how the Bidder proposes to carry out the requirements to achieve the project objectives. The work plan must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating how the Bidder will achieve the project objective.

<p>4. A high-level estimate of the timeline such as the number of weeks or months required to deliver the future required functionalities (M43 to M57) within the timeframe listed above in 7. Timing of Deliverables.</p> <p>Company Expertise Component The proposal must identify:</p> <ol style="list-style-type: none"> 1. The professional staff to be assigned to the project and their expected contribution to the project. 2. Staff experience directly relevant to the work. 3. Relevant company experience directly related to the work (for prime and sub-Bidders). 		
<p>Mandatory 42</p>	<p>At contract awarding, the Bidder must provide a licence to their current off-the-shelf US MACROECONOMIC MODEL that is:</p> <ol style="list-style-type: none"> 1. An open-economy dynamic macroeconomic model with a level of regional disaggregation that can be integrated with the ENERGY2020 (US) model. 2. And which will be customized to include the future required functionalities (M43 to M57) to be delivered within 30 months of contract awarding. 	
<p>Mandatory 43</p>	<p>Regional and Sector Breakdown The US macroeconomic model will simulate 9 regions (US Census Divisions) and 160-Sectors. Appendix 4 provides an example of the regional and sector breakdown for the US macroeconomic model. EC is prepared to discuss a more restricted set of regions and sectors that will still provide the functionality required to provide the prerequisite analysis. Note: ENERGY2020 (US) is a state-by-state model than can be aggregated to create multiple regional dimensions suitable for specific policy purposes. The Bidder must ensure that the US macroeconomic model reflects the regional dimensions created by ENERGY2020 (US). Examples of regional dimensions or aggregations include those defined by the US Federal Energy</p>	

	Regulatory Commission (FERC) or the Western Climate Initiative (WCI).	
Mandatory 44	Industrial Detail The industrial detail in the US macroeconomic model must be commensurate with the industrial detail in ENERGY2020 (US). At the minimum, it must represent NAICS industries or sectors listed in Annex 2. In each macroeconomic model it will be desirable to distinguish a finer level of detail to aid in pinpointing direct impacts from policy initiatives.	
Mandatory 45	Generate Reports The US macroeconomic model must have the ability to generate pre-defined or user-defined reports (i.e. templates from which to read data series) on key data.	
Mandatory 46	E3US must provide a US macroeconomic model REFERENCE FORECAST that is calibrated to official US energy forecasts. This forecast must be calibrated in two ways: <ol style="list-style-type: none"> Alignment to EIA Align the short-term simulation with the projections from most recently available US Energy Information Administration's (EIA) official short-term energy forecast. Calibration to EIA Calibrate the long-term US forecast to the most recently available US EIA official energy forecast. This forecast is appropriate for the overall macroeconomic activity. The detailed industry and demand variables must be fine-tuned for near-term expectations. 	
Mandatory 47	E3US must SECURLY TRANSFER DATA from E2020 (US) to the US macroeconomic model. ENERGY2020 (US) uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. The linkages between ENERGY2020 (US) and the US macroeconomic model will allow for simulation of the real-time impact of energy and environmental concerns on the economy and vice versa. As such,	

	<p>the following will need to be achieved:</p> <ol style="list-style-type: none"> 1. Readable Files Transferring data from ENERGY2020 (US) to the US macroeconomic model requires files that are readable by both models. These files will contain the changes caused by a specific energy or emissions policy to a set of model variables as calculated by ENERGY2020 (US). The files will be imported into the US macroeconomic model, and the macroeconomic model will then be executed to obtain a revised macroeconomic forecast given these new assumptions. The specific variables that are sent from ENERGY2020 (US) to the US macroeconomic model will vary based on the policy being analyzed. 2. Aggregation of Variables The variables in ENERGY2020 (US) will need to be aggregated to reflect the regions in the US macroeconomic model and then mapped to the economic categories in the same model (before sending them back to ENERGY2020 (US) as input). 3. Information Exchange the Bidder must exchange information as levels relative to the base case. It must be clearly articulated how this information exchange will be performed. 	
<p>Mandatory 48</p>	<p>E3US must SECURLY TRANSFER DATA from the US macroeconomic model to E2020 (US). Output from the US macroeconomic model must be interactively transferred to ENERGY2020 (US), hence the following will need to be achieved:</p> <ol style="list-style-type: none"> 1. Write Code to Transfer Data to ENERGY2020 (US) a routine is required to parse the output from the US macroeconomic model output files and read the 	

	<p>economic variables into a Promula database (the programming language used by ENERGY2020 (US)).</p> <p>2. Incorporate Code into the Interface Code for data transfers must be incorporated into the interface between ENERGY2020 (US) and the US macroeconomic model.</p> <p>3. Identify Variables to be Transferred The macroeconomic variables that must be passed from the US macroeconomic model to ENERGY2020 (US) will include, but not be limited to:</p> <ul style="list-style-type: none"> a. Inflation Rate (Index) b. Private Nonfarm Employment c. Government Non-civilian Employment d. Gross Regional Product e. Total capital output f. Government Compensation g. Population h. Total Personal Income i. Real Disposable Personal Income 	
<p>Mandatory 49</p>	<p>It must be illustrated in detail how data from the US macroeconomic model will be extracted and transferred to ENERGY2020 (US). This includes, but is not limited to:</p> <p>1. Generation of Tables The generation of output tables (or custom reports) must be created during each execution of the macroeconomic model.</p> <p>2. Data Comparability A post-process must be created that illustrates how data from the macroeconomic model (in its industrial structure) is mapped to data in ENERGY2020 (US) (in its industrial structure).</p>	
<p>Mandatory 50</p>	<p>An INTERFACE MODULE must be developed that dynamically integrates the results of the US macroeconomic model and ENERGY2020 (US). This interface module must iterate variables between the US macroeconomic</p>	

	<p>model and ENERGY2020 (US) until both models reach convergence. This ensures that both models respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection.</p> <p>Formal integration of the US macroeconomic model with ENERGY2020 (US), where ENERGY2020 (US) provides the “command program”, requires software development. Currently, ENERGY2020 (US) is written in Promula. An interface module must be developed that takes into consideration:</p> <ol style="list-style-type: none">1. Stand-alone or Integrated Operation The Bidder must ensure that each model operates on a stand-alone and integrated basis in order to facilitate a wide spectrum of policy measures and programmes.2. Operation in Distinct Software ENERGY2020 (US) and the US macroeconomic model may operate in distinct software systems.	
<p>Mandatory 51</p>	<p>E3US must be TESTED to ensure the successful interconnection of the US macroeconomic model to ENERGY2020 (US).</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. This stress-testing must ensure that there will not be failures during	

	<p>the interaction between the two models.</p> <p>2. Collaboration with EC it is necessary that EC officials 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 52</p>	<p>The following must be met to ensure successful operation between the Canadian macroeconomic model and ENERGY2020 (Canada) and the US macroeconomic model and ENERGY2020 (US):</p> <ol style="list-style-type: none"> 1. Process and Device Investment Historical and forecast values for process and device (or equipment) investments (in ENERGY20202) must be reconciled with the outputs of the Canadian and US macroeconomic models to ensure consistency between the two modeling solutions. 2. Note: Process and device capital costs in ENERGY2020 (Canada) and ENERGY2020 (US) need to be adjusted. The Canadian and US macroeconomic models must support these changes as ENERGY2020 (Canada) and ENERGY2020 (US) contain more detail on end-use and technology level compared to the macroeconomic models. 3. Develop Calibration Process A calibration procedure must be developed such that it enables the direct transfer of process and device (or equipment) investments to each macroeconomic model. 	
<p>Mandatory 53</p>	<p>ENERGY2020 (Canada) executes with all prices in US dollars. ENERGY2020 (Canada) needs to be adjusted to execute the Canada-specific parts of the model in Canadian dollars while the US-specific parts will remain</p>	

	executable with US dollars. Hence, the exchange rate will be needed only for energy-related trade flows between the two countries (electricity, natural gas, oil, and coal imports and exports).	
Mandatory 54	<p>Consistency between the two modeling solutions is necessary. As such, the Bidder must ensure the thorough review of and adjustments to inputs and outputs, including:</p> <ol style="list-style-type: none"> 1. Financial input variables 2. Financial output files 3. Electricity and natural gas dispatch routines 4. Commodity trading inflow/outflow including CO2 permit trading 	
Mandatory 55	<p>Reduce Execution Time E3MC and E3US must iterate to find a consistent solution between ENERGY2020 (Canada), ENERGY2020 (US) and the two macroeconomic models. As such, options to reduce the execution time must be explored.</p> <p>Note: This must be achieved by identifying procedures which only need to be executed during the first iteration of each model(s) and by passing emission allowance permit information between iterations.</p>	
Mandatory 56	<p>Electric Generating Capacity The procedure which constructs new electric generating capacity (in ENERGY 2020 (Canada)) requires a significant amount of execution time yet only needs to be executed once per iteration. This is due to the fact that changes to the current year macroeconomic variables do not have a significant impact on that procedure. That specific procedure (and any other procedures identified) must be isolated so that it is executed only during the first iteration.</p>	
Mandatory 57	<p>Cap and Trade Runs When ENERGY2020 (Canada) is linked to a macroeconomic model, the longest runs are the emission cap and trade runs. A range of options must be explored and tested that will be aimed at reducing the ENERGY2020 (Canada) iterations. This may include an automated process to</p>	

	<p>provide the model with an emissions permit price which is close to the solution in the previous iteration.</p> <p>Note: During such a run, the model must first iterate to find the emission permit prices and then must iterate with the macroeconomic model. In the past, the macroeconomic model required 5 iterations while the GHG cap and trade runs required up to 12 iterations of ENERGY2020 (Canada). This resulted in 60 iterations to complete one run.</p>	
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Rated Criteria

	Description	Evaluation Criteria	Points	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Rated 2	<p>The Bidders should demonstrate its understanding of Mandatories 50 and 51 by producing a global methodology and approach.</p> <p>This methodology and approach must address Evaluation Criteria 1 to 5.</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>	<ol style="list-style-type: none"> 1. The methodology and approach provide an explanation of how variables are exchanged between ENERGY2020 (US) and the US macroeconomic model in a dynamic and integrated manner. 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. 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. 4. The methodology and approach provide an 	<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</p>	

		<p>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</p> <p>a) Convergence; and</p> <p>b) Convergence testing of a set of variables or other conditions that constitute a “stopping rule”.</p>	<p>items. = 5 points</p> <p>The Bidder has addressed 0 of the 5 items. = 0 points</p>	
MAX. TECHNICAL POINTS		25		
MIN POINTS REQUIRED		14		
TOTAL TECHNICAL SCORE ACHIEVED				
NORTH AMERICAN MODELING SOLUTION (E3NA)				
Mandatory Requirement				
<p>Technical Component</p> <p>The proposal must include a description of future required functionalities (Mandatories M58 to M64) by providing items 1 to 4.</p> <p>Note: items 1 to 4 can present M58 to M64 globally, individually or a combination thereof.</p> <ol style="list-style-type: none"> A statement of understanding of the work to be undertaken and why it has been requested. A methodology that will be used to respond to EC’s requirement for an integrated and dynamic energy, emissions and economy modeling solution. The methodology must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating the Bidder’s proposed approach to delivering the future Mandatories (M58 to M64) listed below. A work plan that describes in detail how the Bidder proposes to carry out the requirements to achieve the project objectives. The work plan must include visuals such as diagrams, tables, graphics or screenshots, etc., as a way of illustrating how the Bidder will achieve the project objective. A high-level estimate of the timeline such as the number of weeks or months required to deliver the future required functionalities (M58 to M64) within the 				

<p>timeframe listed above in 7. Timing of Deliverables.</p> <p>Company Expertise Component The proposal must identify:</p> <ol style="list-style-type: none"> The professional staff to be assigned to the project and their expected contribution to the project. Staff experience directly relevant to the work. Relevant company experience directly related to the work (for prime and sub-Bidders). 		
<p>Mandatory 58</p>	<p>North American INTERFACE MODULE In order to integrate the Canada and US macroeconomic models, an interface module must be developed that iterates variables between the Canadian and US macroeconomic models until both models reach convergence. This ensures that E3MC and E3US respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables and produce a unique integrated energy, emissions and economic projection. See Figure 2.</p>	
<p>Mandatory 59</p>	<p>Integrated North American forecasts must capture the Canada-US trading relationship, as well as other key Canada-US macroeconomic relationships in the following manner:</p> <ol style="list-style-type: none"> Compatibility of Variables Review of the Canadian and US model structures to map variables across the two models. Key Macroeconomic Indicators Establish the responsiveness of Canada-US exchange rates, export/import dynamics and other key macroeconomic relationships. Enable Transfer Capability Modify each model structure as necessary to enable transfer of data and input across the models. Write Code Write code to transfer data from the US to the Canadian macroeconomic 	

	model.	
Mandatory 60	<p>Test Responses The modelling solution must provide the capacity to develop policy test case(s) for varying values into the Canadian and US macroeconomic models. 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 EC 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). 4. 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. 	
Mandatory 61	<p>E3NA must be tested to ensure successful interconnections. Testing must be an iterative process and is deemed successful when "tested" simulations:</p> <ol style="list-style-type: none"> 1. Do not fail due to technical glitches. 2. Produce reasonable a priori results. 3. Convergence must be minimal during this testing. Issues of non-convergence must be solved as necessary. 	
Mandatory 62	<p>E3NA must be tested to ensure the successful integration of the integrated modeling solutions E3MC and E3US. E3MC and E3US must interact simultaneously to create a 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:</p> <ol style="list-style-type: none"> 1. Compatibility The data framework and structure of 	

	<p>behaviour in the two models must be compatible if not necessarily the same.</p> <p>2. Capital Stocks and Flows The dimensions and levels of the capital stocks and flows must be comparable in both ENERGY2020 (Canada) and the macroeconomic model.</p> <p>3. Note: The historical level of investment in equipment, buildings and production processes must be comparable, and that the future capital flows and investments must be identical to allow for robust policy analysis. Data Exchange Data measures and executable code must be exchanged between the two models.</p> <p>4. Note: The program used to execute ENERGY2020 (Canada) and ENERGY2020 (US) will be the “command” program. The macroeconomic model need not be written in the same language as ENERGY2020 (Canada) and ENERGY2020 (US).</p> <p>5. 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.</p>	
<p>Mandatory 63</p>	<p>Minimize Simulation Failure Testing E3NA must be designed to minimize the chances of simulation failure when the system is being used operationally by EC. This testing jointly requires inputs from the Canadian macroeconomic modeling and ENERGY2020 teams (in EC).</p> <p>Testing follows the same process as the individual model testing in that the system will be “stress-tested”. Testing will be an iterative process</p>	

	and deemed complete when “tested” simulations: 1. Do not fail due to technical glitches. 2. Produce robust a priori results.	
Mandatory 64	Regional Simulation Testing will 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).	

Rated Criteria

	Description	Evaluation Criteria	Points	(BIDDER TO INSERT DATA OR INSERT PAGE WERE THE DEMONSTRATION CAN BE FOUND WITHIN THEIR BID)
Rated 3	<p>The Bidders should demonstrate its understanding of Mandatories 58 and 62 by producing a global methodology and approach.</p> <p>This methodology and approach must address Evaluation Criteria 1 to 5.</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</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</p>	

		for a given year allowing for between-model simultaneous solution.	items. = 5 points	
		5. The methodology and approach provide an explanation of: a) Convergence; and b) Convergence testing of a set of variables or other conditions that constitute a "stopping rule".	The Bidder has addressed 0 of the 5 items. = 0 points	
MAX. TECHNICAL POINTS		25		
MIN POINTS REQUIRED		14		
TOTAL TECHNICAL SCORE ACHIEVED				
OTHER REQUIRED SERVICES				
Mandatory 65	<p>Documentation The Bidder must provide a 'User's Guide' of E3MC, E3US and E3NA. This must include, but not be limited to:</p> <ol style="list-style-type: none"> Base Case Set-Up Instructions on setting up a base case or policy runs. Detail on Inputs and Outputs Detail the inputs and outputs to each model, the primary uses of this data in each model, and the execution process including the order the models are called and the flow of data between the models. Operating Instructions Provide step-by-step instructions on the operation of each model individually and the operation of the integrated modeling solutions. 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.	
Mandatory 66	<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 options associated with the request.</p>	
Mandatory 67	<p>Macroeconomic Base Case Development This requirement is designed to support the development of an initial macroeconomic base case and will serve as the economic driver to the EC's Energy and Emissions Outlook. Note: For this initial base case, the Bidder will use a predefined consensus macroeconomic forecast. Starting from this macroeconomic forecast, revisions to key assumptions must be made. These revisions will ensure that the macroeconomic base case reflects advice provided to the Government of Canada by its stakeholders. This requirement includes, but is not limited to:</p> <ol style="list-style-type: none"> 1. Liaising with Stakeholders Participation in discussions with selected industry associations and companies. Review and modify the short-term and long-term view of economic growth, including modification of economic parameters, based on industry consultations. 2. Develop and Test Macroeconomic Assumptions Development and testing of the macroeconomic assumption files to ensure that they are correctly reflecting the advice provided by the industry association and that they are properly interacting with ENERGY2020 (Canada) and ENERGY2020 (US). 	
Mandatory 68	<p>On-line Support This requirement is designed to access the Bidder's staff on an 'as-needed or as-required' basis. On-line support must be provided to EC's Analysis and Modeling Division, as well as to</p>	

	<p>the modeling teams at the NEB and NRCan. This requirement includes, but is not limited to:</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. 	
Mandatory 69	<p>Alternative Macroeconomic Scenario Development Upon request, provide technical support and advice on issues related to development of alternative baselines and on the running of the model. EC staff will provide direction to the Bidder’s staff.</p>	
Mandatory 70	<p>Analytic Approach Development Upon request, provide technical support and advice on the development of a methodology for translating \$ value gross output into physical values (such as tonnes of steel or cement). EC will provide direction to the Bidder’s staff.</p>	
Mandatory 71	<p>In-house Training Upon request, provide in-house training to staff within EC’s Analysis and Modeling Division, as well as modeling teams at the NEB and NRCan.</p>	
Mandatory 72	<p>Advise on Modeling Infrastructure Upon request, advice and consult on the strategic development of modeling infrastructure required by the EC staff. For example, the Analysis and Modeling Division has developed an economic analysis strategy to guide its modeling activities. As this strategy is implemented, EC staff may require the assistance of outside modeling experts.</p>	
Mandatory 73	<p>The E3NA solution must have the capacity to provide semi-annual macroeconomic reference cases aligned with the most recent</p>	

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	<p>macroeconomic consensus projection:</p> <ol style="list-style-type: none">1. Reflect Finance Canada Assumptions Canadian reference cases must reflect the most recent Finance Canada Budget or Fiscal and Economic Update parameters.2. Reflect US Consensus and EIA Forecasts US reference cases must reflect the most recent US consensus forecast or the case used in the most up-to-date EIA Annual Energy Outlook or Early Release.	
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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 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 Curriculum Vitae (CV) of each of these five Economists must include details of work experience, education and relevant competencies as required in Attachment 3.3.</p>	

M3	<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 Curriculum Vitae (CV) of this Software Programmer must include details of work experience, education and relevant competencies as required in Attachment 3.3.</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 (at least 20 years) 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 (at least 20 years) 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</p> <p>5+ years to 7 years of experience = 5 points</p> <p>7+ years to 10 years of experience = 7 points</p> <p>10+ year of experience = 10 points</p>	
	MAX. TECHNICAL POINTS	45		
	MIN. POINTS REQUIRED	31		
	TOTAL TECHNICAL SCORE ACHIEVED			

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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:

MANDATORY REQUIREMENTS	BIDDER'S RESPONSE	
	DEMONSTRATED EXPERIENCE (BIDDERS TO INSERT DATA)	INSERT PAGE # OF RESUME
At least 10 years of experience in the field of economics, macroeconomic projections and econometrics.		
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		

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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
	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

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CCC No./N° CCC - FMS No./N° VME

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 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

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615e1K1A12-149071

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615e1
CCC No./N° CCC - FMS No./N° VME

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

Solicitation No. - N° de l'invitation
K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

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

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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
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Solicitation No. - N° de l'invitation
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		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	<p>Licenses for 10 users of commercial off-the-shelf Canadian Provincial and Territorial Macroeconomic Model.</p> <p>This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 1 of Table 1 of the statement of work.</p>	\$ _____
2	<p>Licenses for 10 users of commercial off-the-shelf US Macroeconomic Model.</p> <p>This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirement of Mandatory 42 of Table 1 of the statement of work.</p>	\$ _____
3	<p>Modified Canadian Provincial and Territorial Macroeconomic Model.</p> <p>This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 2 to Mandatory 41 of Table 1 of the statement of work.</p>	\$ _____
4	<p>ENERGY2020 (Canada) Modifications and Enhancement.</p> <p>This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 2 to Mandatory 41 of Table 1 of the statement of work.</p>	\$ _____
5	<p>ENERGY2020 (Canada) and Canadian macroeconomic model Interface Module.</p> <p>This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 2 to Mandatory 41 of Table 1 of the statement of work.</p>	\$ _____

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6	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 43 to Mandatory 57 of Table 1 of the statement of work.	\$ _____
7	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 43 to Mandatory 57 of Table 1 of the statement of work.	\$ _____
8	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 58 to Mandatory 64 of Table 1 of the statement of work.	\$ _____
9	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 65 of Table 1 of the statement of work.	\$ _____
10	Maintenance, support and training. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 66 to Mandatory 73 of Table 1 of the statement of work.	\$ _____
11	Total of Items 1 to 10	\$ _____

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)	\$ _____

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TABLE 3 ANNUAL MAINTENANCE AND SUPPORT SERVICES FOR THE ADDITIONAL LICENSES MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price for 1 user in Can \$
1	Maintenance and support services for the Canadian Modeling Solution (E3MC)	\$ _____
2	Maintenance and support services for US Modeling Solution (E3US)	\$ _____
3	Maintenance and support services for North American Modeling Solution (E3NA)	\$ _____

TABLE 4 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

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

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	SCENARIO 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 11 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	Maintenance and Support Service as per item 1 of Table 3 of Attachment 3.4 – Financial Bid	Annual Maintenance and support services for the Canadian Modeling Solution (E3MC)	Firm All-inclusive lot price as per item # 1 of Table 3 x 25 x 8 years	\$ _____

6	Attachment 3.4 – Financial Bid	Maintenance and Support Service as per item 2 of Table 3 of Attachment 3.4 – Financial Bid	Annual Maintenance and support services for US Modeling Solution (E3US)	Firm All-inclusive lot price as per item # 2 of Table 3 x 25 x 8 years	\$ _____
7		Maintenance and Support Service as per item 3 of Table 3 of Attachment 3.4 – Financial Bid	Annual Maintenance and support services for North American Modeling Solution (E3NA)	Firm All-inclusive lot price as per item # 3 of Table 3 x 25 x 8 years	\$ _____
8	Table 4 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 4 x 11 days/year x 8 years	\$ _____
9		Requirement for Economist	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 2 of Table 4 x 11 days/year x 8 years	\$ _____
10		Requirement for Project Manager	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 3 of Table 4 x 11 days/year x 8 years	\$ _____
11		Requirement for Software Programmer	Provision of 11 days of professional services per year	Applicable Firm per Diem rate as per item 4 of Table 4 x 11 days/year x 8 years	\$ _____
TOTAL BID PRICE (Total of items 1+2+3+4+5+6+7+8+9+10+11)					\$ _____

(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 x 70 = 59.63	89/135 x 70 = 46.15	92/135 x 70 = 47.70
	Pricing Score	45/55 x 30 = 24.55	45/50 x 30 = 27	45/45 x 30 = 30
Combined Rating		84.18	73.15	77.70
Overall Rating		1st	3rd	2nd

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File No. - N° du dossier
615e1K1A12-149071

Buyer ID - Id de l'acheteur
615e1
CCC No./N° CCC - FMS No./N° VME

- 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" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Employment and Social Development Canada (ESDC) - 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" 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**

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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 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Security Requirement

- (a) Before award of a contract, the following conditions must be met:
- (i) the Bidder must hold a valid organization security clearance as indicated in Part 7 - Resulting Contract Clauses;
 - (ii) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work site(s) must meet the security requirements as indicated in Part 7 - Resulting Contract Clauses; and
 - (iii) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites. delete or list which roles/resources will require access to perform the Work]
 - (iv) the Bidder's proposed location of work performance and document safeguarding must meet the security requirements as indicated in Part 7 - Resulting Contract Clauses;
 - (v) the Bidder must provide the address(es) of proposed site(s) or premises of work performance and document safeguarding as indicated in Part 3 - Section IV, Additional Information.
- (b) Bidders are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful Bidder to obtain the required clearance will be at the entire discretion of the Contracting Authority.
- (c) For additional information on security requirements, Bidders should refer to the Industrial Security Program (ISP) of Public Works and Government Services Canada (<http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>) website.
- (d) In the case of a joint venture bidder, each member of the joint venture must meet the security requirements.

6.2 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 (EC). 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 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>) issued by Public Works and Government Services Canada.

(a) **General Conditions:**

- (i) 2030 (2015-09-03), 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.

7.4 Security Requirement

The following security requirements apply and forms part of the Contract.

SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:

1. The Contractor must, at all times during the performance of the Contract, hold a valid **Designated Organization Screening (DOS)**, issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).
2. The Contractor personnel requiring access to sensitive work site(s) must EACH hold a valid **RELIABILITY STATUS**, granted or approved by CISD/PWGSC.
3. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of CISD/PWGSC.
4. The Contractor must comply with the provisions of the:
 - (a) Security Requirements Check List and security guide (if applicable), attached at Annex C;
 - (b) Industrial Security Manual (Latest Edition).

SECURITY REQUIREMENT FOR FOREIGN SUPPLIER:

The Foreign recipient **Contractor / Subcontractor** defined as an individual or legal entity possessing the legal capacity to enter into a contract, shall provide confirmation of compliance with the below terms and condition, in writing, to the Canadian DSA, prior to the execution of the works, services or performance, of which requires or involves access to Canadian restricted sites.

1. The Canadian Designated Security Authority (DSA) (Canadian DSA) is the International Industrial Security Directorate (IISD), Public Works and Government Services Canada (PWGSC).
2. The **Contractor** and/or any and all **subcontractors** must be from a country within the North Atlantic Treaty Organization (NATO), the European Union (EU) or from a country with which Canada has an International bilateral industrial security instrument. The Industrial Security Program (ISP) has international bilateral industrial security instruments with countries listed on the following PWGSC website: <http://ssi-iss.tpsgc-pwgsc.gc.ca/gvrnmnt/risi-iisr-eng.html>
3. The Foreign **Contractor / Subcontractor**, shall not begin the work, services or performance until the Canadian DSA is satisfied that all contract security requirement conditions have been met. Canadian DSA confirmation shall be provided, in writing, to the Foreign recipient **Contractor / Subcontractor** in an Attestation form, to provide confirmation of compliance and authorization for services to be performed.
4. The Foreign Recipient **Contractor / Subcontractor** shall not permit access to Canadian restricted sites, except to its personnel subject to the following conditions:

- a. Personnel have a need-to-know for the performance of the **Contract / Subcontract**;
 - b. Personnel have been subject to a criminal record check, with favourable results, from a recognized Governmental agency in their country as well as a background verification. The approved verifications for the required criminal record check and background verification are listed at Appendix A.
 - c. The Foreign Recipient **Contractor / Subcontractor** will ensure that its Chief Executive Officer (CEO) or Senior Official of the company will appoint a Contract Security Officer (CSO) and/or an Alternate Contract Security Officer (ACSO) in order to ensure compliance with all contracting security requirements.
 - d. The Foreign Recipient **Contractor / Subcontractor** shall ensure that personnel provide consent to share results of the Criminal record Background Check with the Canadian DSA and other Canadian Government Officials, if requested;
 - e. The Government of Canada reserves the right to deny access to Canadian Protected information and/ or assets to a Foreign Recipient **Contractor / Subcontractor** for cause.
5. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of the Canadian DSA.
 6. The Foreign recipient **Contractor / Subcontractor** visiting Canadian Government, under this contract, will submit a Request for Visit form to the Departmental Security Officer of Environment and Climate Change Canada.
 7. The Foreign recipient **Contractor / Subcontractor** must comply with the provisions of the Security Requirements Check List attached at Annex C.

APPENDIX A

The Foreign Recipient **Contractor / Subcontractor** must perform a security screening of all its personnel who will need access to Canadian restricted sites:

- a) Identity check
 - i. Copies of two of valid original pieces of government issued identity documentation, one of which must include a photo
 - ii. Surname (last name)
 - iii. Full given names (first name) – underline or circle usual name used
 - iv. Family name at birth
 - v. All other names used (aliases)
 - vi. Name changes
 1. Must include the name they changed from and the name they changed to, the place of change and the institution changed through
 - vii. Sex
 - viii. Date of birth
 - ix. Place of birth (city, province/state/region, and country)
 - x. Citizenship(s)
 - xi. Marital status/common-law partnership
 1. Current Status (married, common-law, separated, widowed, divorced, single)
 2. All current spouses (if applicable)

- a. Surname (last name)
 - b. Full given names (first name) – underline or circle usual name used
 - c. Date and duration of marriage/common-law partnership
 - d. Date of birth
 - e. Family name at birth
 - f. Place of birth (city, province/state/region, and country)
 - g. Citizenship
- b) Residency check
- i. The last five (5) years of residency history starting from most recent with no gaps in time.
 - 1. Apartment number, street number, street name, city, province or state, postal code or zip code, country, from-to dates
- c) Educational check
- i. The educational establishments attended and the corresponding dates.
- d) Employment history check
- i. The last five (5) years of employment history starting from most recent with no gaps in time.
 - ii. Three (3) employment reference checks from the last five (5) years.
- e) Criminal records check:
- i. report(s) containing all criminal convictions for the last five (5) years in and outside of the candidate's country of residence.

7.5 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.

7.6 Authorities

- (a) **Contracting Authority**

The Contracting Authority for the Contract is:

Name: _____
Title: _____
Public Works and Government Services Canada
Acquisitions Branch
Directorate: _____
Address: _____
Telephone: _____
Facsimile: _____
E-mail address: _____

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: _____

7.7 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.

7.8 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

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(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 11 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 1 of Table 1 of the statement of work.	10%	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 42 of Table 1 of the statement of work.	10%	
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 2 to Mandatory 41 of Table 1 of the statement of work.	20%	
4	ENERGY2020 (Canada) Modifications and Enhancement. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 2 to Mandatory 41 of Table 1 of the statement of work.	5%	
5	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 2 to Mandatory 41 of Table 1 of the statement of work.	5%	
6	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 43 to Mandatory 57 of Table 1 of the statement of work.	7%	

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7	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 43 to Mandatory 57 of Table 1 of the statement of work.	6%	
8	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 58 to Mandatory 64 of Table 1 of the statement of work.	9%	
9	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 65 of Table 1 of the statement of work.	2%	
10	Maintenance, support and training. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 66 to Mandatory 73 of Table 1 of the statement of work.	26%	

- (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.

7.9 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.

7.10 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.

7.11 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.

7.12 Applicable Laws

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

7.13 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 (2015-09-03), 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) Annex C, Security Requirements Check List;
- (g) the signed Task Authorizations and any Certifications they required;
- (h) 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;
- (i) the Contractor's bid dated _____ .

7.14 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*

7.15 Foreign Nationals (Foreign Contractor)

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

7.16 Insurance Requirements

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

7.17 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).

7.18 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.

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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.

7.19 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)

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Source Code Escrow Required	Yes
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- (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.

7.20 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
Contact Information for Accessing the Contractor's Support Services	<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.</p> <p>[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>
Website	<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 _____.</p> <p>[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>
Language of Support Services	The Support Services must be provided in English.

- (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.

7.21 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.

7.22 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.

7.23 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.

7.24 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.

7.25 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.

7.26 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.

7.27 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.

7.28 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;

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K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

Amd. No. - N° de la modif.
File No. - N° du dossier
615e1K1A12-149071

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

- (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 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 a Unified Energy, Emissions, and Economy Modeling Solution, herein known as the **E3NA Solution**. The E3NA Solution must work, be complete and be responsive to the requirements of this statement of work and have the following as part of the list of deliverables:

1.1 Managed Program

First, Canada requires the replacement of its Canadian unified 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.

E3MC consists of two key proprietary models which are licensed to the Government of Canada, plus a unifying integrating module (interface) that dynamically links the results of each model (see Figure 1):

- 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 recently, maintained by Informetrica Limited. TIM needs to be replaced as its operating system (Input-Output structure) is no longer compatible with Statistics Canada's System of National Accounts)
- iii. **E3MC**, a software solution through which solved results from,ENERGY2020-(Canada) are read into the Canadian macroeconomic model by way of a unifying integrating module (interface) to produce a dynamic general equilibrium in both models.

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.

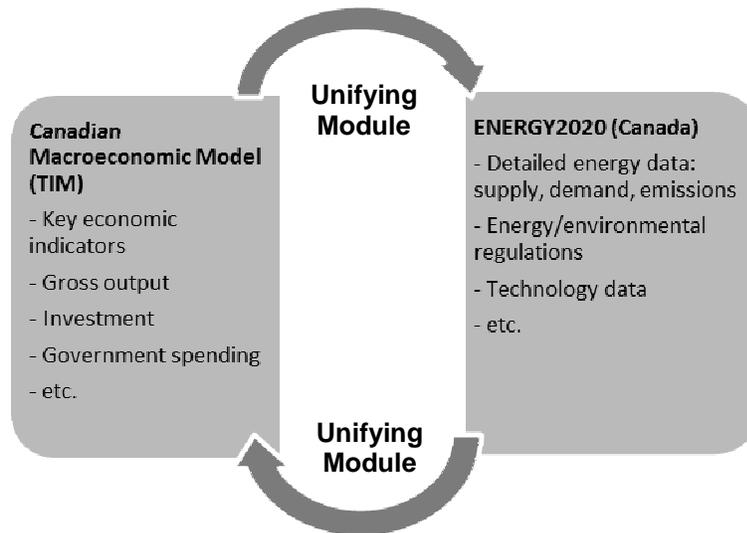


Figure 1: E3MC Canadian Modeling Solution

1.1 The replacement of E3MC consists of providing Canada with:

- a) a Canadian macroeconomic model that is aligned with Statistics Canada's System of National Accounts and based on the most recently available national, provincial and territorial Input-Output Tables, and
- b) a unifying integrating module (interface) to be used with ENERGY2020 (Canada)

1.2 Second, Canada also requires the creation of a unified energy, emissions and economic modeling solution for the US, E3US. This consists of:

- a) a US macroeconomic model, and
- b) a unifying integrating v module (interface) to be used with ENERGY2020 (US)

1.3 Third, when used in combination, E3MC and E3US will lead to the creation of the unified North American energy, emissions and economy modeling solution, the E3NA Solution, by way of a unifying integrating module (interface) (see Figure 2).

1.4 Specifically the supplier is required to deliver, allow and support the following list of delivery, acceptance and considerations that are itemized in detail in Section 7 of the RFP/Contract.

Figure 2: E3NA North American Modeling Solution

2. SCOPE

2.1 The main requirements of the **E3NA Solution** consist of:

1. **A Canadian Macroeconomic Model.**
2. **A Canadian Unifying Integrating Module** This interface module dynamically links the results from ENERGY2020 (Canada) and the Canadian macroeconomic model to produce a general equilibrium in both models (E3MC).
3. **A US Macroeconomic Model.**
4. **A US Unifying Integrating Module** This interface module dynamically links the results from ENERGY2020 (US) and the US macroeconomic model to produce a general equilibrium in both models (E3US).
5. **A North American Unifying Integrating Module** This interface module dynamically links the results from E3MC and E3US to produce a North American general equilibrium (E3NA).
6. **Other Required Services** Consists of documentation, on-demand and as-required technical support and training, semi-annual macroeconomic reference cases and other.
7. **Optional Items** See Appendix 5 of Annex A - Statement of Work.

3. GOALS, OBJECTIVES AND PURPOSE

3.1 The goal is to replace E3MC's current Canadian macroeconomic model (TIM) as well as the unifying integrating module. TIM is currently anchored in 1997 Input-Output tables and Statistics Canada has discontinued publishing chain-weighted 1997 data.

Moreover, Statistics Canada is revising all data associated with the Canadian System of National Accounts due to the implementation of the new international standards published in System of National Accounts 2008. Environment and Climate Change (EC) Canada, working with Natural Resources Canada (NRCan) and the National Energy Board (NEB), has initiated work towards the replacement of TIM.

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 EC'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 EC must continue to meet 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 and the Commission for Environmental Cooperation to support research and analysis as part of international efforts to address climate change.

3.4 The purpose of the combination of ENERGY2020 (Canada) and a macroeconomic model is to allow EC, NRCan and the NEB to carry out these environment and energy-related simulations in an integrated fashion, capturing the complex interactions between the economy, the energy sector and the environment. E3MC provides each user with a unique capacity to allow for energy and environmental considerations into the development and implementation of federal economic policies. At the same time, this modeling solution ensures that economic considerations are factored into energy and environmental regulations and policies.

3.5 E3MC is used 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 new modeling solution 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.

4. CONTEXTUAL INFORMATION

4.1 The E3NA Solution must consider and factor the following information as relevant to the requirements operationally.

4.2 EC 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, EC 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 EC and NEB.

4.4 The macroeconomic link provided by TIM is essential for influencing the manner in which ENERGY2020 (Canada) resolves the energy and emissions impacts of a specific policy action. ENERGY2020 (Canada) 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) to estimate the impact of the policy. This interaction will be completed dynamically and instantaneously.

5. PRIORITIES

5.1 The E3NA Solution must deliver, allow and support a solution that contributes to EC delivering their current Programs, Plans and Priorities in the following context.

5.2 Environmental issues have wide-ranging implications for social and economic decisions. EC 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, EC 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 a 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 will build 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 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 United Nations Framework Convention on Climate Change (UNFCCC) form the basis of Canada's commitments.

5.4 EC'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. EC 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, the E3NA Solution and its constituent elements E3MC and E3US, must enable EC 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 EC's analytical capacity, EC requires the items as listed in the Scope. This includes a customized Canadian, provincial and territorial macroeconomic model that will be dynamically linked² to ENERGY2020 (Canada).

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

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

6.3 E3MC must be configured in a manner in which the two models – ENERGY2020 (Canada) and the customized macroeconomic model – operate in an 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.

6.4 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.

6.5 As such, development of a base case for ENERGY2020 (Canada) 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 governments, and potentially, a number of domestic and foreign prices and financial market variables. These macroeconomic variables must be provided by the customized 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 output, employment, incomes, and prices, and on government and other savings) will need to be solved within E3MC.

6.6 A rigorous analytical approach to long-term planning helps ensure that policy development at EC 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.

6.7 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.

6.8 The table below provides detail for addressing the requirements.

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

TABLE 1
MANDATORY REQUIREMENT

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 must consist of a Canadian Energy, Emission and Economic Modeling Solution that links **ENERGY2020 (Canada)** to a customized **Canadian macroeconomic model** that delivers, allows and supports the users of E3MC with:

1. **Functionality** such that it enables EC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.
2. **Completeness** such that it provides EC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are met.
3. **Compliance** such that the Solution, including software, tools and utilities provided will help support EC in meeting its Programs, Plans and Priorities.
4. **Innovation** such that it will provide EC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plan and Priorities.
5. **Conformity to Government of Canada's Operating Environment** such that the Solution 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 solutions provides EC with the flexibility to transfer data to and from the solution using files with extensions xls, xlsx, cvs, txt, accdb and dbf.

Mandatory 1	At contract awarding , the Contractor must provide a licence to their current off-the-shelf CANADIAN MACROECONOMIC MODEL that is: <ol style="list-style-type: none"> 1. A 10-province and 3-territory Canadian dynamic macroeconomic model with foreign and regional linkages. 2. Aligned with Statistics Canada's Canadian National System of Accounts (2012). 3. And which will be customized to include the future required functionalities (M2 to M41) to be delivered within 30 months of contract awarding.
Mandatory 2	Macroeconomic Projections ENERGY2020 (Canada) requires macroeconomic

	<p>projection mechanisms and reporting variables at the provincial level as well as a select set of nationally measured variables. These projections must be sensitive to the analysis of energy, environment, and environment-related proposals and candidate initiatives of the Government of Canada.</p>
Mandatory 3	<p>Dynamic Integration To facilitate a wide spectrum of policy measures and programmes, the macroeconomic model must operate with ENERGY2020 (Canada) on a stand-alone and on a dynamic integrated basis.</p> <p>In order to dynamically integrate the Canada macroeconomic model and ENERGY2020 (Canada), an INTERFACE MODULE must be developed. This interface must iterate variables between the Canadian macroeconomic model and ENERGY2020 (Canada) until both models reach convergence. This ensures that both models respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection.</p> <p>Note: ENERGY2020 (Canada) is the 'command program', and is written in Promula programming language, while the existing interface is written in Visual Basic. The interface provides the ability to project ENERGY2020 (Canada) variables using executable code originating from the macroeconomic model.</p>
Mandatory 4	<p>Stand-Alone Model Include options to run a stand-alone provincial or regional economic model.</p>
Mandatory 5	<p>Bottom-Up Approach The model must follow a bottom-up approach to accounting for each province and territory separately with Canada being the sum of regions. Canada will still evaluate a top-down approach whereby the Canada results are 'attributed' or 'shared' to each province based on their relative economic strengths and weaknesses</p>
Mandatory 6	<p>Logically Presented The model must be illustrated by way of diagrams that clearly show the concepts, flows and linkages of information within the model. The model's equations and blocks must be contained, described and easily accessible within the modeling solution software or programs.</p>
Mandatory 7	<p>Provincial and Territorial Dimension The model must solve uniquely for each province and territory using distinct 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 8	<p>Trade Flows The provincial and territorial sub-models must capture all inter-provincial and international trade flows.</p>

	<p>Note: Consideration will be given to using a national model based on the most recently available Input-Output tables and then share-weighted to the provinces and territories based on their respective Input-Output tables. If this share-weighted approach is used, the macroeconomic model must ensure that when policy touches only one sector in a specific province (for example petroleum refining in Nova Scotia), the direct effect is focused only on that province.</p>
Mandatory 9	<p>Multiplier Effects The model must capture the indirect, induced and multiplier effects that affect other sectors and provinces. In the case of share-weighting, the sum of the provincial macroeconomic parameters, including the province with the impact, must equal the national macroeconomic parameters.</p>
Mandatory 10	<p>Industrial Sector Dimension The industrial detail in the macroeconomic model must reflect the industrial detail in ENERGY2020 (Canada). At a minimum, it must represent NAICS industries or sectors listed in Appendix 2. In order to meet EC and NRCan analytical requirements, it will be necessary to disaggregate selective industries or sectors to a finer NAICS-digit level. The industries requiring this finer level of detail (to aid in pinpointing direct impacts from policy initiatives) will be determined based on data availability. Note: EC's current macroeconomic model contains more than 150 sector categories covering agricultural and forest activities, energy resource extraction, manufacturing, business services, government and others. Given most recent changes to Statistics Canada National System of Accounts, EC acknowledges that the current level of sector dimension is more limited in scope. EC is prepared to discuss a more restricted set of regions and sectors that contains the functionality required to provide the prerequisite analysis. The national, provincial and territorial models must have at least the sectors listed in Appendix 2 and these sectors must be aligned to Statistics Canada's new System of National Accounts.</p>
Mandatory 11	<p>Address Policies The model must have the capacity and flexibility to address regulatory and incentive policies at the required level of sectoral definition at the provincial and national level. Statistics Canada's CANSIM Table 379-0030 provides the level of sector detail at the provincial level.</p>
Mandatory 12	<p>Energy Sectors Dimension The macroeconomic model must capture energy sub-sector disaggregation directly or indirectly. The current system of national accounts provides information for key energy sectors at various NAICS levels. For example:</p> <ol style="list-style-type: none"> 1. Oil and gas extraction [211] 2. Conventional oil and gas extraction [211113] 3. Non-conventional oil extraction [211114] 4. Coal mining [2121] 5. Electric power generation, transmission and distribution [2211] <p>As part of its impact assessment, EC requires a disaggregated representation</p>

	of the key energy sectors such as separate tracking of oil and gas extraction as well as separate tracking within oil extraction (i.e. light and heavy). The macroeconomic model must capture this sub-sector disaggregation either directly or indirectly.
Mandatory 13	<p>Standard Features The model must include, but not be limited to:</p> <ol style="list-style-type: none"> 1. Base year = \$2007 or \$2010 2. Millions of Canadian Dollars 3. Energy demand (by type and by energy-using sector) 4. Alignment with Statistics Canada's new System of National Accounts (the International 2008 System of National Accounts) 5. NAICS 2007 6. Forecast or simulation period (from most current historical year to 2050 or 2075)
Mandatory 14	<p>Major Blocks The model must capture, but not be limited to:</p> <ol style="list-style-type: none"> 1. Demography 2. Foreign Linkages 3. Government Savings and Finance Sector 4. Stocks of Wealth 5. Labour Force 6. Disposable Incomes 7. Final Demand 8. Final Demand Prices 9. Major Aggregates 10. Industry Prices and Wages 11. Industry Output, Employment and Capital Stock 12. Government Revenue, Expenditure, Redistribution 13. Earned Income
Mandatory 15	<p>Major Concepts The following concepts must be included in the model:</p> <ol style="list-style-type: none"> 1. Household Expenditures Variables are to be disaggregated at the most detailed level and must include real, nominal and relative prices for personal consumption. 2. Investment By asset type, sector, industry: <ol style="list-style-type: none"> a) Business: structures and machinery and equipment; structures by buildings and engineering type; machinery and equipment by type of equipment available; intellectual property products; Investment by asset type and industry. b) Residential: new construction, renovations, ownership transfer costs, housing starts, housing stock and sales of new and existing dwellings. 3. Inventory change By farm and non-farm, sector, industry:

	<p>d) Manufacturing: inventory cases must be at the same level of disaggregation as GDP, gross output and investment</p> <p>e) Wholesale</p> <p>f) Retail</p> <p>4. Non-profit Institutions Serving households' consumption expenditure.</p> <p>5. Exports and Imports By goods and services, by direction with the US and the rest of the world, at the level of detail available in the System of National Accounts.</p> <p>6. Current and Capital Accounts By province and territory (where available), for households, non-profit institutions serving households, corporations (including undistributed corporate profits), general government and non-residents.</p> <p>7. Government Revenue, Expenditure and Budgetary Balances By province and territory.</p> <p>Note: This information is available from the System of National Accounts on the CANSIM (Table 384-0040, Current accounts, households, provincial and territorial, annual) plus from the provincial and territorial governments.</p> <p>8. Detailed Government Revenues and Expenditures By province and type of government entity</p> <p>Note: Available in Government Financial Statistics; detailed taxation data can be acquired from provincial and territorial governments.</p> <p>9. Other Government Expenditures Net current expenditure on goods and services and sales of goods and services by level of government (including health expenditure) as per the detail in the provincial economic accounts.</p>
<p>Mandatory 16</p>	<p>Indicators The following indicators, at a minimum, must be provided by the macroeconomic model:</p> <ol style="list-style-type: none"> 1. GDP Price Index 2. Long-term Bond Rate 3. Consumer Price Index 4. Exchange Rates 5. Interprovincial Migration 6. International Migration 7. Population 8. GDP By sector and by province <p>Note: GDP by industry and province 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</p>

	<p>national, provincial and territorial models must have at least the sectors listed in Appendix 2 and these sectors must be aligned to Statistics Canada's new System of National Accounts.</p> <ol style="list-style-type: none"> 9. Gross Output by NAICS sector by province. 10. Employment by NAICS sector by province. 11. Wage Indicators by NAICS sector by province. 12. Major Purchased Inputs by Sector. 13. Taxes Corporate, personal and indirect (HST, GST and PST) and transfer payments 14. Household Expenditures 15. Real Disposable Income 16. Investment by asset type and industry 17. Investment Prices by asset type and industry 18. Housing Stock by type, by value and by physical units 19. Housing Starts by type, by value and by physical units 20. Commercial Building Starts by type by value and by physical units 21. Commercial Building Stock by type by value and by physical units 22. Vehicle Sales by type
<p>Mandatory 17</p>	<p>Templates The macroeconomic model must have the capacity to generate pre-defined or user-defined reports or tables (templates from which to read data series) on key data.</p>
<p>Mandatory 18</p>	<p>Forecast Calibration The macroeconomic reference forecast must be calibrated:</p> <ol style="list-style-type: none"> 1. Short-Term Align the short-term simulation with the projections outlined in Finance Canada's most recently available Budget or Fiscal and Economic Update projections. 2. Long-Term Align the long-term Canadian forecast to Finance Canada's long-term forecast.
<p>Mandatory 19</p>	<p>Forecast Tuning The detailed industry and demand variables must be fine-tuned for near-term expectations. This forecast will be used to send initial parameters to ENERGY2020 Canada.</p> <p>Note: ENERGY2020 Canada contains detailed energy-related information. When it is linked to the macroeconomic model and the two models iterate, a new integrated equilibrium solution will be reached. This new equilibrium will result in integrated projections value for energy, emissions and the macro-economy.</p>
<p>Mandatory 20</p>	<p>Reference Case Forecast When the Canadian macroeconomic model is 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 Regulatory analyses for oil, gas and emissions intensive trade exposed industries (EITE), and oil, gas and electricity. 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.
Mandatory 21	<p>Linkages ENERGY2020 (Canada) uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. 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. Appendix 3 outlines the current sector structure of E3MC.</p>
Mandatory 22	<p>Identify Variables to be Transferred Transferring data from ENERGY2020 (Canada) to the macroeconomic model requires files that are read by both models. These files will contain the changes caused by a specific energy or emissions policy to a set of model variables as calculated by ENERGY2020 (Canada). The files will then be imported into the macroeconomic model, and the macroeconomic model will be executed to obtain a revised macroeconomic forecast given these new assumptions. The specific variables that are sent from ENERGY2020 (Canada) to the macroeconomic model will vary based on the policy being analyzed. The Contractor must identify which variables will be operational to allow for the dynamic general equilibrium solution</p>
Mandatory 23	<p>Identify 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. The Contractor has the option to exchange information as changes from the base case or from levels relative to the base case.</p>
Mandatory 24	<p>Direct, Indirect and Induced Effects As part of its impact assessment exercises, EC requires separate reporting of direct, indirect and induced macroeconomic effects of policy changes. For example GDP, employment, investment and gross output multipliers will need to be reported.</p>
Mandatory 25	<p>Demonstrate Data-Transfer Capabilities The Contractor must illustrate the level of effort for building data-transfer capabilities between ENERGY2020 (Canada) and macroeconomic model. The Contractor must demonstrate in detail how the interface between the two models will ensure a dynamic and seamless integration.</p>

Mandatory 26	Interactive Data Transfer Output from the macroeconomic model must be interactively transferred to ENERGY2020 (Canada). 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 (ENERGY2020 (Canada) programming language). The code for the data transfers must be incorporated into the interface between ENERGY2020 (Canada) and macroeconomic model.
Mandatory 27	Identify Macroeconomic Variables to be Transferred The initial list of macroeconomic variables to be passed from the macroeconomic model to ENERGY2020 (Canada) must include, but not be limited to: <ol style="list-style-type: none"> 1. Economic Output 2. GDP by Economic Category 3. Total Personal Income 4. Real Disposable Personal Income 5. Consumer Price Index 6. GDP Deflator 7. Exchange Rates 8. Government Compensation
Mandatory 28	Identify ENERGY 2020 (Canada) Variables to be Transferred The initial list of variables that will be passed from ENERGY2020 (Canada) to the macroeconomic model must include, but not be limited to: <ol style="list-style-type: none"> 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 (by structure, equipment, process for each economic category). 6. Exchange Rate Information Used for energy-related trade flows in ENERGY2020 (Canada).
Mandatory 29	Extraction of Detailed Data The Contractor must illustrate in detail how data from the macroeconomic model will be extracted and transferred to ENERGY2020 (Canada). This includes, but is not limited to: <ol style="list-style-type: none"> 1. The generation of output tables (or custom reports), which must be created during each execution of the macroeconomic model. 2. A post-process that illustrates how data from the macroeconomic model (in its industrial structure) is mapped to data in ENERGY2020 (Canada)'s industrial structure.
Mandatory 30	Collaborate on Developing Automated Linking Interface The Contractor must collaborate to create an automated linking interface between

	<p>ENERGY2020 (Canada) and the macroeconomic model. ENERGY2020 (Canada) will be the “command” program, controlling the execution of ENERGY2020 (Canada) and the macroeconomic model.</p> <p>The macroeconomic model “base case” will be created as an initial reference case that has not yet been integrated with ENERGY2020 (Canada). As the modeling solution solves, each iteration of the framework must include, but is not limited to:</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. 7. This single “iteration” can be repeated as many times as needed.
<p>Mandatory 31</p>	<p>Successful Integration Process To ensure a successful integration process, the following must be achieved:</p> <ol style="list-style-type: none"> 1. Testing Create a test case of output data generated by modifying the macroeconomic input data. 2. Inserting and Extracting Data Determine the location within the macroeconomic model (or database) for inserting and extracting the data for ENERGY2020 (Canada). 3. 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 4. Convergence Criteria Convergence rules may be required to limit the number of iterations needed to create a solution.
<p>Mandatory 32</p>	<p>Endogenous Interaction ENERGY2020 (Canada) and the macroeconomic model must interact endogenously through changes in energy variables such</p>

	<p>as production, prices, energy intensities, investments 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. Note: ENERGY2020 (Canada) produces annual projections as such the macroeconomic model must produce annual projections.</p>
Mandatory 33	<p>Achieve an Integrated Solution The macroeconomic model will incorporate these energy results 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. The process of using output from one iteration as input to the next iteration is undertaken to achieve an integrated annual equilibrium solution in all energy markets and the economy.</p>
Mandatory 34	<p>Direct, Indirect (Induced) Impacts The integrated modeling solution must capture both direct and indirect (induced) impacts on Canadian industries and consumers of the Canadian and the US climate change and clean air policy initiatives. A key technical objective is to ensure accounting and behavioural consistency between the 'micro' representation of energy markets in ENERGY2020 (Canada) and the 'macro' (plus industrial organization) detail of the macroeconomic model at each single regional level.</p>
Mandatory 35	<p>Perform 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.</p>
Mandatory 36	<p>Scenario Development Develop alternative long-term energy and emissions scenarios for each representative region as well as for the nation.</p>
Mandatory 37	<p>Analyze Spillover Effects Analyze the spillover effects in Canada of environmental and energy policy initiatives taken in the US.</p>
Mandatory 38	<p>Analyze Joint Initiatives Analyze joint Canada-US environment and energy policy initiatives.</p>
Mandatory 39	<p>Analyze Alternative Proposals Analyze alternative provincial and industry proposals for achieving environmental goals.</p>
Mandatory 40	<p>Collaboration The Contractor must collaborate on developing the interface module. The Contractor must ensure the E3MC interface module is created in such a way that the two models are dynamically linked and produce integrated results.</p>
Mandatory 41	<p>EM3C 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. Stress-testing must ensure that:</p> <ol style="list-style-type: none"> 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.
 3. **EC Staff** EC staff will be involved at all stages of stress-testing to ensure that the modeling framework meets expectations. This will include design of the test and review of output from both ENERGY2020 (Canada) and the macroeconomic model.

US MODELING SOLUTION (E3US)

E3US 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 US macroeconomic model and ENERGY2020 (US).

E3US must consist of a US Energy, Emission and Economic Modeling Solution that links **ENERGY2020 (US)** to a **US macroeconomic model** that delivers, allows and supports the users of E3US with:

1. **Functionality** such that it enables EC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document;
2. **Completeness** such that it provides EC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are met.
3. **Compliance** such that the Solution, including software, tools and utilities provided will help support EC in meeting its Programs, Plans and Priorities.
4. **Innovation** such that it will provide EC with the flexibility/technology to respond in a timely and innovative manner to future Programs, Plan and Priorities.
5. **Conformity to Government of Canada's Operating Environment** such that the Solution 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 solutions provides EC 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** The Contractor must provide EC with:
 - a) A licence to their current off-the-shelf US macroeconomic model (Mandatory 42) at **contract awarding**.
 - b) All future required functionalities listed (Mandatory 43 to Mandatory 57) **within 30 months of contract awarding**.

Mandatory 42	At contract awarding , the Contractor must provide a licence to their current off-the-shelf US MACROECONOMIC MODEL that is: <ol style="list-style-type: none"> 1. An open-economy dynamic macroeconomic model with a level of
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	<p>regional disaggregation that can be integrated with the ENERGY2020 (US) model.</p> <p>2. And which will be customized to include the future required functionalities (M43 to M57) to be delivered within 30 months of contract awarding.</p>
Mandatory 43	<p>Regional and Sector Breakdown The US macroeconomic model will simulate 9 regions (US Census Divisions) and 160-Sectors. Appendix 4 provides an example of the regional and sector breakdown for the US macroeconomic model. EC is prepared to discuss a more restricted set of regions and sectors that will still provide the functionality required to provide the prerequisite analysis.</p> <p>Note: ENERY2020 (US) is a state-by-state model than can be aggregated to create multiple regional dimensions suitable for specific policy purposes. The contractor must ensure that the US macroeconomic model reflects the regional dimensions created by ENERGY2020 (US). Examples of regional dimensions or aggregations include those defined by the US Federal Energy Regulatory Commission (FERC) or the Western Climate Initiative (WCI).</p>
Mandatory 44	<p>Industrial Detail The industrial detail in the US macroeconomic model must be commensurate with the industrial detail in ENERGY2020 (US). At the minimum, it must represent NAICS industries or sectors listed in Annex 2. In each macroeconomic model it will be desirable to distinguish a finer level of detail to aid in pinpointing direct impacts from policy initiatives.</p>
Mandatory 45	<p>Generate Reports The US macroeconomic model must have the ability to generate pre-defined or user-defined reports (i.e. templates from which to read data series) on key data.</p>
Mandatory 46	<p>E3US must provide a US macroeconomic model REFERENCE FORECAST that is calibrated to official US energy forecasts. This forecast must be calibrated in two ways:</p> <ol style="list-style-type: none"> Alignment to EIA Align the short-term simulation with the projections from most recently available US Energy Information Administration's (EIA) official short-term energy forecast. Calibration to EIA Calibrate the long-term US forecast to the most recently available US EIA official energy forecast. This forecast is appropriate for the overall macroeconomic activity. The detailed industry and demand variables must be fine-tuned for near-term expectations.
Mandatory 47	<p>E3US must SECURLY TRANSFER DATA from E2020 (US) to the US macroeconomic model.</p> <p>ENERGY2020 (US) uses macroeconomic data to drive energy demands in the residential, commercial, industrial, and transportation sectors. The linkages between ENERGY2020 (US) and the US macroeconomic model will allow for simulation of the real-time impact of energy and environmental concerns on</p>

	<p>the economy and vice versa. As such, the following will need to be achieved:</p> <ol style="list-style-type: none">1. Readable Files Transferring data from ENERGY2020 (US) to the US macroeconomic model requires files that are readable by both models. These files will contain the changes caused by a specific energy or emissions policy to a set of model variables as calculated by ENERGY2020 (US). The files will be imported into the US macroeconomic model, and the macroeconomic model will then be executed to obtain a revised macroeconomic forecast given these new assumptions. The specific variables that are sent from ENERGY2020 (US) to the US macroeconomic model will vary based on the policy being analyzed.2. Aggregation of Variables The variables in ENERGY2020 (US) will need to be aggregated to reflect the regions in the US macroeconomic model and then mapped to the economic categories in the same model (before sending them back to ENERGY2020 (US) as input).3. Information Exchange The Contractor must exchange information as levels relative to the base case. It must be clearly articulated how this information exchange will be performed.
Mandatory 48	<p>E3US must SECURLY TRANSFER DATA from the US macroeconomic model to E2020 (US). Output from the US macroeconomic model must be interactively transferred to ENERGY2020 (US), hence the following will need to be achieved:</p> <ol style="list-style-type: none">1. Write Code to Transfer Data to ENERGY2020 (US) A routine is required to parse the output from the US macroeconomic model output files and read the economic variables into a Promula database (the programming language used by ENERGY2020 (US)).2. Incorporate Code into the Interface Code for data transfers must be incorporated into the interface between ENERGY2020 (US) and the US macroeconomic model.3. Identify Variables to be Transferred The macroeconomic variables that must be passed from the US macroeconomic model to ENERGY2020 (US) will include, but not be limited to:<ol style="list-style-type: none">a) Inflation Rate (Index)b) Private Nonfarm Employmentc) Government Non-civilian Employmentd) Gross Regional Producte) Total capital outputf) Government Compensationg) Population

	<p>h) Total Personal Income</p> <p>i) Real Disposable Personal Income</p>
Mandatory 49	<p>It must be illustrated in detail how data from the US macroeconomic model will be extracted and transferred to ENERGY2020 (US). This includes, but is not limited to:</p> <ol style="list-style-type: none"> 1. Generation of Tables The generation of output tables (or custom reports) must be created during each execution of the macroeconomic model. 2. Data Comparability A post-process must be created that illustrates how data from the macroeconomic model (in its industrial structure) is mapped to data in ENERGY2020 (US) (in its industrial structure).
Mandatory 50	<p>An INTERFACE MODULE must be developed that dynamically integrates the results of the US macroeconomic model and ENERGY2020 (US). This interface module must iterate variables between the US macroeconomic model and ENERGY2020 (US) until both models reach convergence. This ensures that both models respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables to produce a unique integrated energy, emissions and economic projection.</p> <p>Formal integration of the US macroeconomic model with ENERGY2020 (US), where ENERGY2020 (US) provides the “command program”, requires software development. Currently, ENERGY2020 (US) is written in Promula. An interface module must be developed that takes into consideration:</p> <ol style="list-style-type: none"> 1. Stand-alone or Integrated Operation The Contractor must ensure that each model operates on a stand-alone and integrated basis in order to facilitate a wide spectrum of policy measures and programmes. 2. Operation in Distinct Software ENERGY2020 (US) and the US macroeconomic model may operate in distinct software systems.
Mandatory 51	<p>E3US must be TESTED to ensure the successful interconnection of the US macroeconomic model to ENERGY2020 (US).</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. This stress-testing must ensure that there will not be failures during the interaction between the two models. 2. Collaboration with EC it is necessary that EC officials 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.
Mandatory 52	<p>The following must be met to ensure successful operation between the Canadian macroeconomic model and ENERGY2020 (Canada) and the US macroeconomic model and ENERGY2020 (US):</p> <ol style="list-style-type: none"> Process and Device Investment Historical and forecast values for process and device (or equipment) investments (in ENERGY2020) must be reconciled with the outputs of the Canadian and US macroeconomic models to ensure consistency between the two modeling solutions. Note: Process and device capital costs in ENERGY2020 (Canada) and ENERGY2020 (US) need to be adjusted. The Canadian and US macroeconomic models must support these changes as ENERGY2020 (Canada) and ENERGY2020 (US) contain more detail on end-use and technology level compared to the macroeconomic models. Develop Calibration Process A calibration procedure must be developed such that it enables the direct transfer of process and device (or equipment) investments to each macroeconomic model.
Mandatory 53	ENERGY2020 (Canada) executes with all prices in US dollars. ENERGY2020 (Canada) needs to be adjusted to execute the Canada-specific parts of the model in Canadian dollars while the US-specific parts will remain executable with US dollars. Hence, the exchange rate will be needed only for energy-related trade flows between the two countries (electricity, natural gas, oil, and coal imports and exports).
Mandatory 54	<p>Consistency between the two modeling solutions is necessary. As such, the Contractor must ensure the thorough review of and adjustments to inputs and outputs, including:</p> <ol style="list-style-type: none"> Financial input variables Financial output files Electricity and natural gas dispatch routines Commodity trading inflow/outflow including CO2 permit trading
Mandatory 55	<p>Reduce Execution Time E3MC and E3US must iterate to find a consistent solution between ENERGY2020 (Canada), ENERGY2020 (US) and the two macroeconomic models. As such, options to reduce the execution time must be explored.</p> <p>Note: This must be achieved by identifying procedures which only need to be executed during the first iteration of each model(s) and by passing emission allowance permit information between iterations.</p>
Mandatory 56	<p>Electric Generating Capacity The procedure which constructs new electric generating capacity (in ENERGY 2020 (Canada)) requires a significant amount of execution time yet only needs to be executed once per iteration. This is due to the fact that changes to the current year macroeconomic variables do</p>

	not have a significant impact on that procedure. That specific procedure (and any other procedures identified) must be isolated so that it is executed only during the first iteration.
Mandatory 57	<p>Cap and Trade Runs When ENERGY2020 (Canada) is linked to a macroeconomic model, the longest runs are the emission cap and trade runs. A range of options must be explored and tested that will be aimed at reducing the ENERGY2020 (Canada) iterations. This may include an automated process to provide the model with an emissions permit price which is close to the solution in the previous iteration.</p> <p>Note: During such a run, the model must first iterate to find the emission permit prices and then must iterate with the macroeconomic model. In the past, the macroeconomic model required 5 iterations while the GHG cap and trade runs required up to 12 iterations of ENERGY2020 (Canada). This resulted in 60 iterations to complete one run.</p>
NORTH AMERICAN MODELING SOLUTION (E3NA)	
<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 in E3MC and E3US.</p> <p>E3NA must consist of a North American Energy, Emission and Economic Modeling Solution that links E3MC and E3US to deliver, allow and support the users of E3NA with:</p> <ol style="list-style-type: none">1. Functionality such that it enables EC to deliver its Programs in accordance to its Priorities outlined in Section 5 of this document.2. Completeness such that it provides EC with the necessary and functional tools to implement the Plan(s) that will ensure its Priorities are met.3. Compliancy such that the Solution, including software, tools and utilities provided will help support EC in meeting its Programs, Plans and Priorities.4. Innovation such that it will provide EC with the flexibility and technology to respond in a timely and innovative manner to future Programs, Plan and Priorities.5. Conformity to Government of Canada's Operating Environment such that the Solution operates on<ol style="list-style-type: none">a) Microsoft Windows XP or higher, andb) Windows Excel 2007, 2010 or 2013, andc) Office 2010 and higher.6. Data sharing flexibility such that the solutions provides EC 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 The Contractor must provide EC with all future required functionalities listed (Mandatory 58 to Mandatory 64) within 30 months of contract awarding.	

Mandatory 58	North American INTERFACE MODULE In order to integrate the Canada and US macroeconomic models, an interface module must be developed that iterates variables between the Canadian and US macroeconomic models until both models reach convergence. This ensures that E3MC and E3US respond, in a dynamic and interactive manner, to changes introduced through energy and macroeconomic variables and produce a unique integrated energy, emissions and economic projection. See Figure 2.
Mandatory 59	Integrated North American forecasts must capture the Canada-US trading relationship, as well as other key Canada-US macroeconomic relationships in the following manner: <ol style="list-style-type: none"> 1. Compatibility of Variables Review of the Canadian and US model structures to map variables across the two models. 2. Key Macroeconomic Indicators Establish the responsiveness of Canada-US exchange rates, export/import dynamics and other key macroeconomic relationships. 3. Enable Transfer Capability Modify each model structure as necessary to enable transfer of data and input across the models. 4. Write Code Write code to transfer data from the US to the Canadian macroeconomic model.
Mandatory 60	Test Responses The modelling solution must provide the capacity to develop policy test case(s) for varying values into the Canadian and US macroeconomic models. 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 EC is in a position to anticipate the details of environmental and energy policy analysis. This includes but is not limited to: <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). 4. 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.
Mandatory 61	E3NA must be tested to ensure successful interconnections . Testing must be an iterative process and is deemed successful when “tested” simulations: <ol style="list-style-type: none"> 1. Do not fail due to technical glitches. 2. Produce reasonable a priori results. 3. Convergence must be minimal during this testing. Issues of non-convergence must be solved as necessary.
Mandatory 62	E3NA must be tested to ensure the successful integration of the integrated

	<p>modeling solutions E3MC and E3US. E3MC and E3US must interact simultaneously to create a 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:</p> <ol style="list-style-type: none"> 1. Compatibility The data framework and structure of behaviour in the two models must be compatible if not necessarily the same. 2. Capital Stocks and Flows The dimensions and levels of the capital stocks and flows must be comparable in both ENERGY2020 (Canada) and the macroeconomic model. Note: The historical level of investment in equipment, buildings and production processes must be comparable, and that the future capital flows and investments must be identical to allow for robust policy analysis. Data Exchange Data measures and executable code must be exchanged between the two models. Note: The program used to execute ENERGY2020 (Canada) and ENERGY2020 (US) will be the “command” program. The macroeconomic model need not be written in the same language as ENERGY2020 (Canada) and ENERGY2020 (US). 3. 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.
<p>Mandatory 63</p>	<p>Minimize Simulation Failure Testing E3NA must be designed to minimize the chances of simulation failure when the system is being used operationally by EC. This testing jointly requires inputs from the Canadian macroeconomic modeling and ENERGY2020 teams (in EC).</p> <p>Testing follows the same process as the individual model testing in that the system will be “stress-tested”. Testing will be an iterative process and deemed complete when “tested” simulations:</p> <ol style="list-style-type: none"> 1. Do not fail due to technical glitches. 2. Produce robust a priori results.
<p>Mandatory 64</p>	<p>Regional Simulation Testing will 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 65</p>	<p>Documentation The Contractor must provide a 'User's Guide' of E3MC, E3US and E3NA. This must include, but not be limited to:</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 model, and the execution process including the order the models 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 66</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 options associated with the request.</p>
<p>Mandatory 67</p>	<p>Macroeconomic Base Case Development This requirement is designed to support the development of an initial macroeconomic base case and will serve as the economic driver to the EC's Energy and Emissions Outlook. Note: For this initial base case, the Contractor will use a predefined consensus macroeconomic forecast. Starting from this macroeconomic forecast, revisions to key assumptions must be made. These revisions will ensure that the macroeconomic base case reflects advice provided to the Government of Canada by its stakeholders. This requirement includes, but is not limited to:</p> <ol style="list-style-type: none"> 1. Liaising with Stakeholders Participation in discussions with selected industry associations and companies. Review and modify the short-term and long-term view of economic growth, including modification of economic parameters, based on industry consultations. 2. Develop and Test Macroeconomic Assumptions Development and testing of the macroeconomic assumption files to ensure that they are correctly reflecting the advice provided by the industry association and that they are properly interacting with ENERGY2020 (Canada) and ENERGY2020 (US).
<p>Mandatory 68</p>	<p>On-line Support This requirement is designed to access the Contractor's staff on an 'as-needed or as-required' basis. On-line support must be provided to</p>

	<p>EC's Analysis and Modeling Division, as well as to the modeling teams at the NEB and NRCan. This requirement includes, but is not limited to:</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.
Mandatory 69	<p>Alternative Macroeconomic Scenario Development Upon request, provide technical support and advice on issues related to development of alternative baselines and on the running of the model. EC staff will provide direction to the Contractor's staff.</p>
Mandatory 70	<p>Analytic Approach Development Upon request, provide technical support and advice on the development of a methodology for translating \$ value gross output into physical values (such as tonnes of steel or cement). EC will provide direction to the Contractor's staff.</p>
Mandatory 71	<p>In-house Training Upon request, provide in-house training to staff within EC's Analysis and Modeling Division, as well as modeling teams at the NEB and NRCan.</p>
Mandatory 72	<p>Advise on Modeling Infrastructure Upon request, advise and consult on the strategic development of modeling infrastructure required by the EC staff. For example, the Analysis and Modeling Division has developed an economic analysis strategy to guide its modeling activities. As this strategy is implemented, EC staff may require the assistance of outside modeling experts.</p>
Mandatory 73	<p>The E3NA solution must have the capacity to provide semi-annual macroeconomic reference cases aligned with the most recent macroeconomic consensus projection:</p> <ol style="list-style-type: none"> 1. Reflect Finance Canada Assumptions Canadian reference cases must reflect the most recent Finance Canada Budget or Fiscal and Economic Update parameters. 2. Reflect US Consensus and EIA Forecasts US reference cases must reflect the most recent US consensus forecast or the case used in the most up-to-date EIA Annual Energy Outlook or Early Release.

APPENDIX 1 TO ANNEX A

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 developed 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 [211113]
Non-conventional oil extraction [211114]
Mining and quarrying (except oil and gas) [212]
Coal mining [2121]
Metal ore mining [2122]
Iron ore mining [21221]
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]

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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]
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]

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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]
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]
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]

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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]
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]

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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]
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

- 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.
- 1 For the chained dollars, the aggregates are not equal to the sum of their components.
- 2 This combines the North American Industry Classification System (NAICS) codes 11-91.
- 3 This combines the North American Industry Classification System (NAICS) codes 11-33.
- 4 This combines the North American Industry Classification System (NAICS) codes 41-91.
- 5 This combines the North American Industry Classification System (NAICS) codes 21, 22, 31-33, 562.
- 6 This combines the North American Industry Classification System (NAICS) codes 311-316, 322-326.
- 7 This combines the North American Industry Classification System (NAICS) codes 321, 327-339.
- 8 This combines the North American Industry Classification System (NAICS) codes 334 excl. 3345, 4173, 5112, 517, 518, 5415, 8112.
- 9 This combines the North American Industry Classification System (NAICS) code 334 excl. 3345.
- 10 This combines the North American Industry Classification System (NAICS) codes 4173, 5112, 517, 518, 5415, 8112.
- 11 This combines the North American Industry Classification System (NAICS) codes 211, 2121, 212291, 213111, 213118, 2211, 2212, 32411, 486.
- 12 This combines the North American Industry Classification System (NAICS) codes 111, 112.
- 13 This combines the North American Industry Classification System (NAICS) code 111 excl. 1114.
- 14 This combines the North American Industry Classification System (NAICS) codes 1151, 1152.
- 15 This combines the North American Industry Classification System (NAICS) codes 212393, 212394, 212395, 212397, 212398.
- 16 This combines the North American Industry Classification System (NAICS) codes 213111, 213118.
- 17 This combines the North American Industry Classification System (NAICS) codes 213117, 213119.
- 18 This combines the North American Industry Classification System (NAICS) codes 2212, 2213.
- 19 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 23.
- 20 This combines the North American Industry Classification System (NAICS) codes 3112, 3118, 3119.
- 21 This combines the North American Industry Classification System (NAICS) codes 31213, 31214.
- 22 This combines the North American Industry Classification System (NAICS) codes 313, 314.
- 23 This combines the North American Industry Classification System (NAICS) codes 315, 316.
- 24 This combines the North American Industry Classification System (NAICS) code 324 excl. 32411.
- 25 This combines the North American Industry Classification System (NAICS) codes 3255, 3256, 3259.
- 26 This combines the North American Industry Classification System (NAICS) code 327 excl. 3273.
- 27 This combines the North American Industry Classification System (NAICS) codes 3322, 3329.
- 28 This combines the North American Industry Classification System (NAICS) codes 3332, 3333.
- 29 This combines the North American Industry Classification System (NAICS) codes 3343, 3345, 3346.
- 30 This combines the North American Industry Classification System (NAICS) codes 485, 487.
- 31 This combines the North American Industry Classification System (NAICS) codes 4852, 4854, 4855, 4859, 487.
- 32 This combines the North American Industry Classification System (NAICS) codes 4861, 4869.
- 33 This combines the North American Industry Classification System (NAICS) codes 491, 492.
- 34 This combines the North American Industry Classification System (NAICS) codes 51112, 51113, 51114, 51119.
- 35 This combines the North American Industry Classification System (NAICS) codes 51211, 51212, 51219.
- 36 This combines the North American Industry Classification System (NAICS) codes 521, 5221.
- 37 This combines the North American Industry Classification System (NAICS) codes 52211, 52219.
- 38 This combines the North American Industry Classification System (NAICS) codes 523, 526.
- 39 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 5311 and to Input-Output code BS531100.
- 40 Special hybrid: corresponds to sections of the North American Industry Classification System (NAICS) code 5311 and to Input-Output code BS5311A0.
- 41 This combines the North American Industry Classification System (NAICS) codes 5312, 5313.
- 42 This combines the North American Industry Classification System (NAICS) code 532, excl. 5321.
- 43 This combines the North American Industry Classification System (NAICS) codes 5411, 5412.
- 44 This combines the North American Industry Classification System (NAICS) codes 5414, 5416, 5417, 5419.
- 45 This combines the North American Industry Classification System (NAICS) codes 5612, 5619.
- 46 This combines the North American Industry Classification System (NAICS) code 61 excl. 6113.
- 47 This combines the North American Industry Classification System (NAICS) codes 6114-6117.
- 48 This combines the North American Industry Classification System (NAICS) code 62 excl. 624.
- 49 This combines the North American Industry Classification System (NAICS) codes 6213, 6214, 6215, 6216, 6219.
- 50 This combines the North American Industry Classification System (NAICS) codes 711, 712.
- 51 This combines the North American Industry Classification System (NAICS) codes 7131, 7139.
- 52 This combines the North American Industry Classification System (NAICS) codes 7212, 7213.
- 53 This combines the North American Industry Classification System (NAICS) codes 8112, 8113, 8114.
- 54 This combines the North American Industry Classification System (NAICS) codes 812, 814.
- 55 This combines the North American Industry Classification System (NAICS) codes 8121, 8129.
- 56 This combines the North American Industry Classification System (NAICS) code 813 excl. 8131.
- 57

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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)

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APPENDIX 2 TO ANNEX A

E3MC and NAICS Sectors

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 Heavy Oil Mining Frontier Oil Mining	Oil & Gas Mining (211)
Sweet Gas Production Sour Gas Production Sweet Gas Processing Sour Gas Processing	Oil & Gas Mining (211)
Primary Oil Sands SAGD Oil Sands CSS Oil Sands Oil Sands Mining Oil Sands Upgraders	Oil & Gas Mining (211)
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)

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	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) 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 Commercial Off Road	Transit & Ground Passenger Transportation (485) Truck (484)
Utility Electric Generation Industry Electric Generation Steam Generation	Electric Power Generation, Transmission & Distribution (2211)

APPENDIX 3 TO ANNEX A

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), EC 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 EC 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 EC 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 EC 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 EC personnel (as well as the NEB and NRCan staff) have many years of experience generating forecasts and conducting policy analysis

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using ENERGY2020 (Canada) allowing for quick development and understanding of not-yet-developed policies.

APPENDIX 4 TO ANNEX A

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
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

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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
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

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**TASK AUTHORIZATION
(TA) FORM**

Firm Price or Maximum TA Price

Contractor's Signature

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.

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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 1 of Table 1 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 42 of Table 1 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 2 to Mandatory 41 of Table 1 of the statement of work.	\$ _____
4	ENERGY2020 (Canada) Modifications and Enhancement. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of all applicable Mandatory 2 to Mandatory 41 of Table 1 of the statement of work.	\$ _____
5	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 2 to Mandatory 41 of Table 1 of the statement of work.	\$ _____
6	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 43 to Mandatory 57 of Table 1 of the statement of work.	\$ _____

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7	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 43 to Mandatory 57 of Table 1 of the statement of work.	\$ _____
8	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 58 to Mandatory 64 of Table 1 of the statement of work.	\$ _____
9	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 65 of Table 1 of the statement of work.	\$ _____
10	Maintenance, support and training. This item must cover all costs, activities and level of effort incurred by the Contractor to deliver the requirements of Mandatory 66 to Mandatory 73 of Table 1 of the statement of work.	\$ _____
11	Total of Items 1 to 10	\$ _____

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 ANNUAL MAINTENANCE AND SUPPORT SERVICES FOR THE ADDITIONAL LICENSES MAXIMUM ALL-INCLUSIVE LOT PRICE (Can \$)		
Item #	Item Description	Firm all-inclusive lot price for 1 user in Can \$
1	Maintenance and support services for the Canadian Modeling	\$ _____

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	Solution (E3MC)	
2	Maintenance and support services for US Modeling Solution (E3US)	\$ _____
3	Maintenance and support services for North American Modeling Solution (E3NA)	\$ _____

TABLE 4 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)

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ANNEX C

SECURITY REQUIREMENTS CHECK LIST

(See attached hereto)

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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: 30%;">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>												

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FORM 1 - BID SUBMISSION FORM

	<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>	
<p>Canadian Content Certification</p> <p>As described in the solicitation, bids with at least 80% Canadian content are being given a preference.</p> <p><i>[For the definition of Canadian goods and services, consult the PWGSC SACC clause A3050T]</i></p>	<p>On behalf of the Bidder, by signing below, I confirm that <i>[check the box that applies]:</i></p>	
	<p>At least 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)</p>	
	<p>Less than 80 percent of the bid price consists of Canadian goods and services (as defined in the solicitation)</p>	
<p>Hardware:</p> <p><i>(Contracting Authority should only insert when Supplemental General Conditions 4001 have been inserted in Part 7).</i></p>	<p>Toll-Free Telephone Number for maintenance services:</p>	
	<p>Website for maintenance services:</p>	
<p>Licensed Software Maintenance and Support:</p> <p><i>(Contracting Authority should only insert when supplemental General Conditions 4004 has been inserted in Part 7).</i></p>	<p>Toll-free Telephone Access:</p>	
	<p>Toll-Free Fax Access:</p>	
	<p>E-Mail Access:</p>	
	<p>Website address for web support:</p>	
<p>Security Clearance Level of Bidder</p> <p>[include both the level and the date it was granted]</p> <p><i>[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.]</i></p>		
<p>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:</p> <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. 		

Solicitation No. - N° de l'invitation
K1A12-149071/A
Client Ref. No. - N° de réf. du client
K1A12-149071

Amd. No. - N° de la modif.
File No. - N° du dossier
615elK1A12-149071

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

FORM 1 - BID SUBMISSION FORM

Signature of Authorized Representative of Bidder

Solicitation No. - N° de l'invitation
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Client Ref. No. - N° de réf. du client
K1A12-149071

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615e1K1A12-149071

Buyer ID - Id de l'acheteur
615e1
CCC No./N° CCC - FMS No./N° VME

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]

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615e1
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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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	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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615elK1A12-149071

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

**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	

Solicitation No. - N° de l'invitation
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615e1K1A12-149071

Buyer ID - Id de l'acheteur
615e1
CCC No./N° CCC - FMS No./N° VME

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).

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OCT 15 2015



Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat KIA12-14-9071
Security Classification / Classification de sécurité Unclassified

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE		
1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine ENVIRONMENT	2. Branch or Directorate / Direction générale ou Direction ECONOMIC ANALYSIS DIRECTORATE	
3. a) Subcontract Number / Numéro du contrat de sous-traitance	3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant	
4. Brief Description of Work / Brève description du travail TO MODERNIZE / CREATE AN INTEGRATED ENERGY, EMISSIONS AND MACROECONOMIC MODEL(S) THAT CAN BE RUN IN VARIOUS REGIONAL LEVELS		
5. a) Will the supplier require access to Controlled Goods? / Le fournisseur aura-t-il accès à des marchandises contrôlées? <input checked="" type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui		
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? / Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques? <input checked="" type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui		
6. Indicate the type of access required / Indiquer le type d'accès requis		
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? / Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) / (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c) <input checked="" type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui		
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. / Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé. <input type="checkbox"/> No / Non <input checked="" type="checkbox"/> Yes / Oui		
6. c) Is this a commercial courier or delivery requirement with no overnight storage? / S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit? <input checked="" type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui		
7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès		
Canada <input checked="" type="checkbox"/>	NATO / OTAN <input type="checkbox"/>	
Foreign / Étranger <input checked="" type="checkbox"/>		
7. b) Release restrictions / Restrictions relatives à la diffusion		
No release restrictions / Aucune restriction relative à la diffusion <input checked="" type="checkbox"/>	All NATO countries / Tous les pays de l'OTAN <input type="checkbox"/>	
Not releasable / À ne pas diffuser <input type="checkbox"/>	Restricted to: / Limité à: <input type="checkbox"/>	
Specify country(ies): / Préciser le(s) pays:	Specify country(ies): / Préciser le(s) pays:	
7. c) Level of information / Niveau d'information		
PROTECTED A / PROTÉGÉ A <input type="checkbox"/>	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ <input type="checkbox"/>	PROTECTED A / PROTÉGÉ A <input type="checkbox"/>
PROTECTED B / PROTÉGÉ B <input type="checkbox"/>	NATO RESTRICTED / NATO DIFFUSION RESTREINTE <input type="checkbox"/>	PROTECTED B / PROTÉGÉ B <input type="checkbox"/>
PROTECTED C / PROTÉGÉ C <input type="checkbox"/>	NATO CONFIDENTIAL / NATO CONFIDENTIEL <input type="checkbox"/>	PROTECTED C / PROTÉGÉ C <input type="checkbox"/>
CONFIDENTIAL / CONFIDENTIEL <input type="checkbox"/>	NATO SECRET / NATO SECRET <input type="checkbox"/>	CONFIDENTIAL / CONFIDENTIEL <input type="checkbox"/>
SECRET / SECRET <input type="checkbox"/>	COSMIC TOP SECRET / COSMIC TRÈS SECRET <input type="checkbox"/>	SECRET / SECRET <input type="checkbox"/>
TOP SECRET / TRÈS SECRET <input type="checkbox"/>		TOP SECRET / TRÈS SECRET <input type="checkbox"/>
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) <input type="checkbox"/>		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) <input type="checkbox"/>

Security Classification / Classification de sécurité
Unclassified



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Unclassified

PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS? No / Non Yes / Oui

If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets?
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate? No / Non Yes / Oui

Short Title(s) of material / Titre(s) abrégé(s) du matériel :
Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

- | | | | |
|---|---|---|--|
| <input checked="" type="checkbox"/> RELIABILITY STATUS
COTE DE FIABILITÉ | <input type="checkbox"/> CONFIDENTIAL
CONFIDENTIEL | <input type="checkbox"/> SECRET
SECRET | <input type="checkbox"/> TOP SECRET
TRÈS SECRET |
| <input type="checkbox"/> TOP SECRET- SIGINT
TRÈS SECRET - SIGINT | <input type="checkbox"/> NATO CONFIDENTIAL
NATO CONFIDENTIEL | <input type="checkbox"/> NATO SECRET
NATO SECRET | <input type="checkbox"/> COSMIC TOP SECRET
COSMIC TRÈS SECRET |
| <input type="checkbox"/> SITE ACCESS
ACCÈS AUX EMPLACEMENTS | | | |

Special comments:
Commentaires spéciaux :

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work?
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail? No / Non Yes / Oui

If Yes, will unscreened personnel be escorted?
Dans l'affirmative, le personnel en question sera-t-il escorté? No / Non Yes / Oui

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises?
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS? No / Non Yes / Oui

11. b) Will the supplier be required to safeguard COMSEC information or assets?
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC? No / Non Yes / Oui

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises?
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ? No / Non Yes / Oui

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data?
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS? No / Non Yes / Oui

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency?
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale? No / Non Yes / Oui

TBS/SCT 350-103(2004/12)

Security Classification / Classification de sécurité

Unclassified

Canada



Government of Canada / Gouvernement du Canada

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Unclassified

PART C - (continued) / PARTIE C - (suite)

For users completing the form manually use the summary chart below to indicate the category(les) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire manuellement doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form online (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire en ligne (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC						
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED	NATO CONFIDENTIAL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ			CONFIDENTIAL	SECRET	TOP SECRET / TRÈS SECRET	
							NATO DIFFUSION RESTRICTÉE	NATO CONFIDENTIEL	A		B	C					
Information / Aspects Renseignements / Sites Production																	
IT Media / Support IT																	
IT Link / Lien électronique																	

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE? No / Non Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE? No / Non Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquez qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).



Government of Canada / Gouvernement du Canada

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Security Classification / Classification de sécurité Unclassified

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme			
Name (print) - Nom (en lettres moulées) NICK MACALUSO		Title - Titre DIRECTOR	Signature <i>Nick Macaluso</i>
Telephone No. - N° de téléphone 819-953-1772	Facsimile No. - N° de télécopieur 819-956-5168	E-mail address - Adresse courriel Nick.Macaluso@ec.gc.ca	Date 03-03-2015
14. Organization Security Authority / Responsable de la sécurité de l'organisme			
Name (print) - Nom (en lettres moulées) Behrooz Amoli		Title - Titre Security Officer	Signature <i>Behrooz Amoli</i>
Telephone No. - N° de téléphone (819)938-4162	Facsimile No. - N° de télécopieur (819)934-2225	E-mail address - Adresse courriel Behrooz.Amoli@ec.gc.ca	Date March 13, 2015
15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached? Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes? <input type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui			
16. Procurement Officer / Agent d'approvisionnement			
Name (print) - Nom (en lettres moulées) Mitchel Easey		Title - Titre Manager	Signature <i>M. Easey</i>
Telephone No. - N° de téléphone 819-938-4857	Facsimile No. - N° de télécopieur 819-938-4848	E-mail address - Adresse courriel mitchel.easey@ec.gc.ca	Date 17/03/15
17. Contracting Security Authority / Autorité contractante en matière de sécurité			
Name (print) - Nom (en lettres moulées) Nathan Howell		Title - Titre	Signature <i>Nathan Howell</i>
Agent à la Sécurité des contrats Contract Security Officer Secteur de la Sécurité industrielle, TPSGC Industrial Security Sector, PWGSC Nathan.Howell@tpsgc-pwgsc.gc.ca Téléphone : 613 952-1541		E-mail address - Adresse courriel	Date OCT 20 2015