BOARD INTERROGATORY #25

INTERROGATORY

Issue 5 - Cost Recovery

5.1 Is the proposed manner to recover costs reasonable and appropriate?

5.2 Have the customer-related and facility-related charges been presented separately in the tariffs?

Topic: Cost Recovery Statements

Ref: Exhibit G, Tab 1, Schedule 1, App A, pp. 4 - 10

Preamble:

In Tables A4 and A5, Enbridge provides an outline of the proposed facility-related charges (in ¢/m3) by rate class:

- Rates 1, 6, 9, 100, 110, 115 – have a facility-related charge of 0.0337
- Rate 125 – has a facility-related charge of 0.0290
- Rate 125 Dedicated – has a facility-related charge of 0.00018
- Rates 135, 145, 170 – have a facility-related charge of 0.0337
- Rate 200 – has a facility-related charge of 0.0337
- Rate 300, 300 Interruptible – have a facility-related charge of 0.0290
- Rates 315, 316 – have a facility-related charge of 0.0048
- Rate 320 – does not have a facility-related charge
- Rates 325, 330 – have a facility-related charge of 0.0066
- Rates 331, 332 – have a facility-related charge of 0.0018

Questions:

a) Please explain in detail why the above rates have different facility-related charges.

b) Please explain in detail why Rate 320 does not have a facility-related charge.

Witness: A. Kacicnik

RESPONSE

a) In the Report of the Board: Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities the Board outlines cost causality as a guiding principle for recovery of Cap and Trade costs from customers. For example, customer-related costs are driven by gas consumption and facility-related costs are directly related to the delivery of natural gas to customers. The Board determined that facility-related obligation costs will be recovered from all customers. The Board further determined that both sets of Cap and Trade costs will be recovered from customers through volumetric charges.

   While customer-related costs are strictly a function of customers' gas consumption, facility-related costs (at Enbridge) are a function of Company use volumes, unaccounted for gas volumes and compressor fuel volumes.

   In light of the above, the Company determined facility-related charges for each rate class based on cost causation which vary from one rate class to another (for example, not all rate classes cause the Company to incur costs for compressor fuel volumes). Therefore, based on cost causality and depending on the type of service applicable to customers, some customers are not charged for certain components of facility-related costs (i.e., Company Use, UAF and Compressor Fuel). For example, the Company does not provide any compression services to Rate 125, Rate 300, Rate 331 or Rate 332, therefore those customers are not charged for Compressor Fuel in their rates and are not charged for Compressor Fuel in facility-related Cap and Trade charges.

   In this manner, cost causality is maintained between the design of the customers' rates and the design of facility-related Cap and Trade charges.

   As a result, different facility-related charges are shown in Tables A4 and A5.

b) Rate 320: Backstopping Service is a companion service to the Company's other services (i.e., other rates such as Rate 1, Rate 6, and so on). The service is applicable to the Company's direct purchase customers whose delivery of natural gas to the Company for transportation to a Terminal Location (i.e., the customer's location) has been interrupted prior to the delivery of such gas to the Company. In other words, should gas supply arrangement for a direct purchase customer be interrupted upstream of the Company's gas distribution network, the Company can supply (i.e., backstop) the amount of natural gas to the customer whose supply was interrupted (i.e., the supply did not show up).

Since these customers are already charged for facility-related costs in the rates under which they take service (such as Rate 1, Rate 6, and so on), Rate 320 does not need to have a facility-related charge (if it did, the customer would be charged twice for facility related costs).

APPrO INTERROGATORY #6

INTERROGATORY

ISSUE 5 – COST RECOVERY

Reference: Exhibit G, Tab 1, Schedule 1, Page 3, Paragraph 9.

Question:

(a) If the actual WCI auction reserve price published by the Auction Administrator is now known (expected early 2017), please update the relevant parts of the Application to reflect the use of the actual price rather than a forecast.

RESPONSE

a) Subsection 71(1) of the Cap and Trade Regulation states, "The minimum price of an emission allowance in an auction is the higher of the annual auction reserve prices most recently established, as of the day of the auction, for each of Quebec and California." On December 1, 2016, the California Cap and Trade Program and Québec Cap and Trade System released the auction reserve prices based on the pricing formula in the California Regulation, in US dollars, and based on the pricing formula in the Québec Regulation, in Canadian dollars.

Section 71(3) notes,

> *If an annual auction reserve price is listed in a currency other than Canadian dollars, the price is deemed, in Canadian dollars, to be the amount that would be realized by converting to Canadian dollars the amount at the following rate:*
>
> > *1. If, on the day before the day of the auction, the Bank of Canada provided a Canadian dollar exchange rate for that currency, the currency conversion is calculated at that rate.*
> >
> > *2. If paragraph 1 does not apply, the currency conversion is calculated at the Canadian dollar exchange rate for that currency as provided by the Bank of Canada for the date that is before, and is as close as possible to, the day of the auction.*

As a result of Sections 71(1) and 71(3), the actual auction reserve price in Canadian dollars will not be known until the day prior to the auction.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #25

INTERROGATORY

Issue 5

Ref: Issue 5 - Cost Recovery, Exhibit C, Tab 3, Schedule 6

EGD has stated that it will place 2017 administrative costs, both capital and operating, required for the Company to meet its cap and trade obligations in its new deferral account. When does EGD propose to clear the account into rates, in what proceeding and in what year?

RESPONSE

Enbridge Gas Distribution's proposal is to record 2017 administrative costs within its EB-2016-0215 Board approved 2017 Greenhouse Gas Emissions Impact Deferral Account (GGEIDA).

Please refer to Board Staff Interrogatory #24, filed at Exhibit I.4.EGDI.STAFF.24, which articulates Enbridge Gas Distribution's proposal with respect to the disposition of Cap and Trade related deferral and variance accounts.

Witnesses: A. Kacicnik
R. Small

BOMA INTERROGATORY #26

INTERROGATORY

Issue 5

Ref: *Ibid*

Please breakdown the $187,500 annual cost in 2016 and the $160,000 annual cost for each member of the cap and trade group in 2017, as between salary, benefits, travel, and other expenses.

RESPONSE

Please refer to Board Staff Interrogatory #3 filed at Exhibit I.1.EGDI.STAFF.3.

Witness: F. Oliver-Glasford

BOMA INTERROGATORY #27

INTERROGATORY

Issue 5

Ref: Exhibit C, Tab 3, p6

(a) Please provide (i) a copy of the ICF Report which analysed the Ontario Cap and Trade Program; (ii) the contract under which EGD retained ICF.

(b) Please provide a list of the reports that EGD obtained from the Emissions Trading Organization, and provide any reports pertinent to the issues in this case.

(c) Please provide the RFPs used to select each of Alpha Inception and ICF International.

(d) In EGD's view, had the cap and trade charge been a separate item on the customer's bill, with equal priority of payment with the EGD delivery charge, would it have been necessary to increase the bad debt expense?

(e) Please provide a list of the LFE and the voluntary participants in the EGD franchise, together with aggregated volume forecasts and associated GHG for each group.

RESPONSE

(a) Please refer to SEC Interrogatory #4 filed at Exhibit I.1.EGDI.SEC.4 for the ICF Report. Please see attached for the contract under which Enbridge Gas Distribution retained ICF.

(b) The International Emissions Trading Association (IETA) publicly posts a variety of resources including reports on its website at ieta.org.

(c) Due to the urgent timing and uncertainty with respect to requirements and scope of consultant activities, RFPs were not produced before meeting with – and receiving proposals from – Cap and Trade consultants. The need for expert assistance and due diligence surrounding the hiring of consultants is further discussed in Board Staff Interrogatory #4 filed at Exhibit I.1.EGDI.STAFF.4.

Witnesses: M. Kirk
D. McIlwraith
J. Murphy
F. Oliver-Glasford

(d) Yes. The Cap and Trade charge adds incremental billed revenue which ultimately drives incremental bad debt expense.

(e) Please refer to SEC Interrogatory #2(c) filed at Exhibit I.1.EGDI.SEC.2 and Board Staff Interrogatory #10 filed at Exhibit I.1.EGDI.STAFF.10.

Witnesses: M. Kirk
D. McIlwraith
J. Murphy
F. Oliver-Glasford

CONSULTING AGREEMENT

THIS AGREEMENT made effective July 7, 2015.

B E T W E E N:

ENBRIDGE GAS DISTRIBUTION INC.
("Enbridge")

– and –

ICF CONSULTING CANADA, INC.
(the "Consultant")

WITNESSES THAT in consideration of the mutual covenants and agreements herein contained, the parties hereto covenant and agree as follows:

1. **Scope of Services**

   (a) During the term hereof (as hereinafter defined), the Consultant shall provide consulting services to Enbridge, on the terms and conditions set forth below.

   (b) The scope of work for specific projects to be undertaken by the Consultant at the request of Enbridge will be described in separate schedules referencing this Agreement, each of which shall become effective, be incorporated by reference and form an integral part of this Agreement upon the execution of each such schedule by Enbridge and the Consultant. The schedule for each project will specify the names of key individuals, scope of consulting services, deliverables, commencement and completion dates, rate of compensation and payment terms applicable to such project. Each schedule described above shall be prepared using a form similar to the attached Schedule "A".

2. **Compensation**

   In consideration of the consulting services and deliverables to be provided by the Consultant hereunder, and provided that the Consultant is not in default of its obligations hereunder, Enbridge shall remit to the Consultant all amounts required to be paid in accordance with the applicable schedule.

   Consultant shall be responsible for charging, collecting and remitting all applicable federal and provincial sales, use and value-added taxes in respect of the fees paid or payable to Consultant and, in particular, the goods and services tax ("GST") and harmonized sales tax ("HST") imposed under Part IX of the Excise Tax Act (the "ETA"), the Quebec sales tax ("QST") imposed under an Act respecting the Quebec Sales Tax (the "QSTA") and any provincial sales taxes ("PST"); and such taxes, if applicable, shall be shown separately on all invoices. Where Consultant is required to collect any GST/HST, QST or similar tax, Consultant shall provide Enbridge with the documentary evidence as prescribed pursuant to the ETA or QSTA, any successor provision thereto or any similar provision of any other

taxing statute as is required to entitle Enbridge to claim an input tax credit, input tax refund, rebate, refund or any other form of relief in respect of such taxes.

In the event Consultant is a non-resident of Canada and has not obtained and provided to Enbridge a nonresident withholding tax waiver at such time as Enbridge makes any payment to Consultant for the services rendered by it to Enbridge in Canada, Enbridge shall withhold such percentage of any payment made by it for the consulting services as is from time to time mandated under the Income Tax Act (Canada) (the "ITA") and shall remit the withheld amount to Canada Revenue Agency in the manner and at the time required by the ITA. In the event that Enbridge is assessed for any non-resident withholding taxes payable, Consultant agrees to forthwith reimburse Enbridge for such amount together with applicable interest and penalties, if any.

3. **Term**

Subject to earlier termination as provided for herein, the term of this Agreement shall commence on the day set forth above and expires on July 6, 2016 (hereinafter the "Term").

4. **Termination**

(a) Enbridge may terminate this Agreement or any schedule to this Agreement for convenience upon giving two (2) weeks written notice to the Consultant.

(b) Either party may terminate this Agreement in case of a breach by the other party of its obligations hereunder, provided that the breach is not cured within five (5) days of written notification by the non-defaulting party to the defaulting party setting out the particulars of the breach.

(c) Either party may terminate this Agreement upon written notice to the other party, if: (i) the other party is subject to proceedings in bankruptcy, or insolvency, whether voluntary or involuntary, (ii) a receiver is appointed in respect of all or a substantial portion of the other party's assets; or (iii) the other party assigns its property to its creditors or generally becomes unable to pay its debts as they become due.

Upon any termination of this Agreement, the Consultant shall deliver to Enbridge the results of all consulting services provided as of the date of termination, including completed or uncompleted deliverables for which payment has been received in accordance with the terms of this Agreement.

5. **Facilities**

Enbridge shall provide to the Consultant use of such office facilities as may be required by the Consultant, acting reasonably, to perform the consulting services during the Term.

6. **Reimbursement for Expenses**

In addition to the payments to be made pursuant to Section 2 hereof, Enbridge shall reimburse the Consultant for all reasonable expenses properly incurred by the Consultant in connection with the consulting services provided to Enbridge hereunder and that have been pre-approved by Enbridge in writing, including, without limitation, reasonable travel and other costs and expenses in connection therewith. Concurrently with its delivery of invoices to Enbridge as contemplated by Section 2 hereof, the Consultant shall submit to Enbridge

invoices and statements setting out in reasonable detail the nature and amount of the expenses or costs incurred by the Consultant for which the Consultant claims reimbursement, and Enbridge shall within thirty (30) days of the receipt of such invoices and statements reimburse the Consultant for all approved invoiced expenses and costs. The Consultant shall provide to Enbridge copies of all documentation in support of invoiced expenses as Enbridge may request from time to time during the Term hereof.

7. **Independent Contractor**

Notwithstanding anything to the contrary herein contained, the Consultant shall not, for any purpose, be or be deemed to be an employee of Enbridge during the Term or at any time during which the consulting services described in Section 1 hereof are provided to Enbridge nor shall anything in this Agreement create or be construed for any purpose as creating any relationship between Enbridge and the Consultant of employer and employee. Except as expressly provided herein, Enbridge shall not be liable to contribute to any employee benefit or pension plan or pay premiums for any policy or form of insurance whatsoever on behalf of the Consultant nor to pay any amounts or premiums on its behalf in respect of the Canada Pension Plan, Ontario Health Insurance Plan, Workplace Safety and Insurance Board or Employment Insurance, nor to deduct or withhold from source any amount from amounts payable by Enbridge to the Consultant hereunder in respect of any income tax obligation or liability payable by the Consultant to the Canada Revenue Agency. The Consultant agrees to indemnify and hold Enbridge harmless from and against any order, penalty, interest or tax that may be assessed or levied against Enbridge as a result of the failure or delay of the Consultant to file any return or information required to be filed by the Consultant by any law, ordinance or regulation relating to the consulting services performed by the Consultant herein.

8. **Confidential Information and Personal Information**

(a) For the purposes of this Section 8, the following definitions will apply:

(i) "Confidential Information", means all information pertaining to the business and affairs of Enbridge, its affiliates and subsidiaries, whether oral or written, furnished by Enbridge to the Consultant, its employees and representatives, whether furnished or prepared before or after the date of this Agreement, and includes the portion of all analysis, compilations, data, studies, reports or other documents prepared by the Consultant based upon or including any of the information furnished by Enbridge, but does not include information which:

A. is at the time of disclosure or thereafter becomes generally available to the public other than as a result of disclosure by the Consultant or anyone to whom the Consultant transmits the information;

B. is at the time of disclosure or thereafter becomes known or available to the Consultant on a non-confidential basis and not in contravention of applicable law from a source other than Enbridge that is entitled to disclose the information; or

C. is already in the possession of the Consultant or is lawfully acquired, provided that such information is not subject to another confidentiality agreement with, or obligations of secrecy to Enbridge.

(ii) "Person" includes individuals, partnerships, firms and corporations.

(b) Enbridge is furnishing the Confidential Information to the Consultant solely for the purpose of assisting the Consultant in the performance of consulting services which the Consultant provides to Enbridge. The Consultant shall not use the Confidential Information for any purpose other than the performance of consulting services provided to Enbridge.

(c) The Consultant acknowledges that the Confidential Information is the property of Enbridge, which is confidential and material to the interests, business and affairs of Enbridge and that disclosure thereof would be detrimental to the interests, business and affairs of Enbridge. Accordingly, the Consultant agrees that it shall maintain the confidentiality of the Confidential Information and that it shall not disclose the Confidential Information to any Person for any reason whatsoever except as expressly provided herein.

(d) The Consultant may disclose Confidential Information to the extent required by a court of competent jurisdiction or other governmental or regulatory authority or otherwise as required by applicable law, provided that the Consultant first give Enbridge prompt written notice (except where the governmental or regulatory authority has expressly ordered that no notice be given) and co-operate with and assist Enbridge in responding to the request or demand for disclosure.

(e) The Consultant acknowledges and agrees that Enbridge would be irreparably harmed if any provision of this Agreement is not performed by the Consultant in accordance with its terms. Accordingly, Enbridge shall be entitled to an injunction or injunctions to prevent breaches of any of the provisions of this Agreement and may specifically enforce such provisions by an action instituted in a court having jurisdiction. These specific remedies are in addition to any other remedy to which Enbridge may be entitled at law or equity.

(f) If in the course of performing consulting services hereunder, the Consultant obtains or accesses personal information about an individual, including without limitation, a customer, potential customer or employee or contractor of Enbridge ("Personal Information") the Consultant agrees to treat such Personal Information in compliance with all applicable federal or provincial privacy or protection of personal information laws and to use such Personal Information only for purposes of providing the consulting services hereunder. Furthermore, the Consultant acknowledges and agrees that it will:

(i) not otherwise copy, retain, use, modify, manipulate, disclose or make available any Personal Information, except as required by applicable law;

(ii) establish or maintain in place appropriate policies and procedures to protect Personal
Information from unauthorized collection, use or disclosure;

(iii) implement such policies and procedures thoroughly and effectively;

(iv) except as required for purposes of providing the consulting services hereunder, will not develop or derive, for any purpose whatsoever, any

products in machine-readable form or otherwise, that incorporates, modifies, or uses in any manner whatsoever, any Personal Information; and

(v) upon completion of its consulting services for or on behalf of Enbridge, will at Enbridge's direction: A. return; or B. destroy all Personal Information and all copies and records thereof in its possession.

9. **Indemnification**

(a) The Consultant hereby agrees to and shall:

(i) be liable to Enbridge and its directors, officers and employees, for all claims, liabilities, damages, costs, losses and expenses whatsoever which Enbridge or any of its directors, officers and employees may suffer, sustain or incur; and

(ii) indemnify and save harmless Enbridge, Enbridge's affiliated and subsidiary companies, and their directors, officers, agents, employees and representatives from and against any and all liabilities, claims, demands, damages, loss, costs and expenses (including without limitation all applicable solicitors' fees, court costs and disbursements, investigation expenses, adjusters' fees and disbursements) to or which any third party may suffer, sustain or incur,

in respect of all matters or anything which may arise out of any act or omission directly or indirectly related to any breach of this Agreement by the Consultant, its employees or representatives.

(b) Subject to Section 9(c):

(i) the aggregate liability of Consultant under this Agreement shall not exceed 3 times the amount payable hereunder; and

(ii) in no event shall the Consultant be liable for indirect or consequential, exemplary, punitive or special damages under this Agreement even if the Consultant has been advised of the possibility of such damages in advance. This Section will apply irrespective of the nature of the action, demand or claim, including but not limited to, breach of contract (including fundamental breach), negligence, tort or any other legal theory, and will survive a fundamental breach or failure of essential purpose of this Agreement or of any remedy contained herein.

(c) Section 9(b) will not apply to limit the Consultant's liability:

(i) for a breach of Sections 7 (Independent Contractor), 8 Confidential Information and Personal Information), 10(e) (Intellectual Property Infringement Indemnity) or 14 (Compliance with Laws);

(ii) for gross negligence, wilful misconduct or fraud;

(iii) for any damage, loss or destruction of any real, personal or tangible property; and

(iv) for any death or bodily injury of any natural person

10. **Work Product**

(a) For the purposes of this Section 10, "Work Product" shall include any of the following, which are first developed in the course of or arise from the consulting services provided by the Consultant to Enbridge hereunder throughout the Term: (i) any deliverables first produced under any schedule to this Agreement together with any and all notes, reports, research information, compilations, data specifications, designs, programs, documentation, software (including object code and source materials), development tools, products and other materials or things to the extent such items are specified to be delivered to Enbridge in the applicable statement of work.

(b) For the purposes of this Section 10, "Consultant Materials" comprises any of the following, which were developed by the Consultant, at its own cost and expense in advance of and independent of this Agreement and as proven by the Consultant to be the case in the event of a dispute concerning the same: (i) any and all notes, research, information, data, specifications, designs, programs, documentation, software (including object code and source materials), development tools, products and other materials or things; (ii) any and all knowledge, know-how, techniques, inventions, processes, trade secrets, methodologies, approaches and other intangible intellectual property rights; and (iii) all designs, patent applications, issued patents, industrial design registrations, design patents, trade-mark applications, registered trade-marks and copyright which may relate thereto.

(c) All right, title and interest in and to the Work Product shall be the property of Enbridge. The Consultant shall ensure that any agent or employee of the Consultant shall have waived in writing all of his or her moral rights over any such Intellectual Property. During and after the Term of this Agreement, the Consultant shall from time to time as and when requested by Enbridge execute all papers and documents and perform other acts as necessary or appropriate to evidence or further document Enbridge's ownership of the Work Product and the intellectual property rights therein.

(d) The Consultant retains all right, title and interest in and to the Consultant Materials. The Consultant hereby grants to Enbridge a non-exclusive, perpetual, irrevocable, non-terminable, transferable, assignable and royalty-free license to copy, disclose, use, operate, maintain, repair, modify, enhance, make derivative works, license, sub-license and otherwise commercially exploit without limitation or restriction those Consultant Materials used in connection with the delivery of the consulting services or to the extent contained within any Work Product.

(e) The Consultant agrees to fully indemnify and hold harmless Enbridge from and against any and all: (i) claims, demands and actions; (ii) liabilities, damages or losses awarded by a court of competent jurisdiction or as agreed to as part of a settlement; and (iii) litigation costs and/or expenses (including reasonable legal fees and disbursements) reasonably incurred by Enbridge in connection with any claim that the consulting services or Work Product provided hereunder infringe any Canadian or U.S. patent, copyright, trade secret or other right of any third party.

11. **Representations and Warranties**

(a) The Consultant represents, warrants and covenants with Enbridge that: (i) it will perform all consulting services in a good and workmanlike manner using reasonable care (at a level that is at least consistent with industry standards for the provision of similar services) and in accordance with the terms of this Agreement; (ii) it possesses the knowledge, skill and experience necessary for the provision and completion of the consulting services in accordance with the terms of this Agreement; and (iii) any deliverables provided hereunder shall conform to their relevant specifications as described in the applicable schedule.

(b) The Consultant agrees that under no circumstances will it interface a non-Enbridge computing device (including without limitation desktops, laptops, handheld device) with the Enbridge intranet or internet without obtaining the prior written approval of Enbridge. To the extent the deliverables produced hereunder involve the provision or development of any software application, interface or electronic data, the Consultant shall use commercially reasonable efforts to prevent the introduction of any virus to the hardware and computer systems upon which the application, interface or electronic data are to be installed. During the Term of this Agreement, the Consultant shall implement and run virus prevention and detection control procedures in accordance with industry standards.

(c) In addition to the policies described in Section 25, the Consultant shall ensure that it is familiar with and understands all of Enbridge's current policies, procedures and standards that are pertinent to the activities associated with the consulting services and which have been provided to the Consultant in advance of the execution of this Agreement.

(d) Enbridge shall have thirty (30) days to reject in writing all or part of each Deliverable if it is not in conformance with the warranty stated in Section 11 (a), above. Each Deliverable, to the extent not rejected in writing by Enbridge shall be deemed accepted. For any Deliverable which is not accepted, the exclusive remedy, and Consultant's entire liability, shall be the re-performance of the Services, or if Consultant is unable to perform the Services as warranted, Client shall be entitled to recover the fees paid to Consultant for that portion of the Services which fail to conform to the warranty.

12. **Subcontractors**

The Consultant shall not enter into any agreement with any other party to assist in the provision of the consulting services described in Section 1 hereof (hereinafter described as a "Subcontract") nor shall the Consultant allow any other party to perform such consulting services or any part thereof without first obtaining the consent in writing of Enbridge, which consent may be withheld by Enbridge, acting reasonably. Notwithstanding any approval or consent that may be provided by Enbridge in connection with any Subcontract, the Consultant shall not be relieved of any of its liabilities and responsibilities hereunder. Any party which enters into a Subcontract with the Consultant shall be required by the terms of such Subcontract to comply with and be bound by the obligations and responsibilities of the Consultant described hereunder and without restricting the generality of the foregoing, any Subcontract which has been entered into without the prior written consent of Enbridge shall be null and void and without force and effect.

13. **Insurance**

Save and except where Enbridge specifies otherwise in writing, the Consultant shall at its own expense maintain and keep in full force and effect during the Term hereof and for a period of two (2) years following the expiry of the Term or other termination of this Agreement:

(a) Commercial General Liability insurance having a minimum inclusive coverage limit, including personal injury and property damage, of at least Two Million Dollars ($2,000,000) per occurrence. Enbridge Gas Distribution Inc. must be listed as the certificate holder and be added as an additional insured in the insurance policy, which should be extended to cover contractual liability, products/completed operations liability and must also contain a cross liability clause;

(b) Non-Owned Automobile liability insurance and such insurance shall have a limit of at least Two Million Dollars ($2,000,000) in respect of bodily injury (including passenger hazard) and property damage, inclusive in any one accident; and

(c) Professional Liability insurance and such insurance shall have a limit of at least Two Million Dollars ($2,000,000).

The Consultant shall forthwith after entering into this Agreement, and from time to time thereafter at the request of Enbridge, furnish to Enbridge a memorandum of insurance or an insurance certificate setting out the terms and conditions of each policy of insurance (all such policies of insurance being hereinafter described as the "Insurance Policies") maintained by the Consultant in order to satisfy the requirements of this section. At any time and from time to time at the request of Enbridge, the Consultant shall furnish Enbridge with one or more duly completed insurance certificates in the form requested by Enbridge to evidence the details of all the Insurance Policies. The Insurance Policies shall be arranged with insurers acceptable to Enbridge, acting reasonably, and shall contain such terms and conditions as are reasonably acceptable to Enbridge, as defined by A.M. Best rating of "A- VII" or equivalent ratings from another ratings agency. The Consultant shall not cancel, terminate or materially alter the terms of any of the Insurance Policies without giving 15 days prior notice in writing to Enbridge.

14. **Compliance with Law**

The Consultant agrees to comply with the Occupational Health and Safety Act (Ontario) and the Workplace Safety and Insurance Act (Ontario) and with all other prevailing federal, provincial and municipal laws and regulations or any other laws or regulations in force in any jurisdiction where the consulting services are performed (the "Laws") and which are applicable to the Consultant, its subcontractors and the consulting services provided hereunder, and the Consultant shall familiarize itself and procure all required permits and licenses and pay all charges and fees necessary or incidental to the due and lawful prosecution of this Agreement and shall indemnify and save harmless Enbridge, its directors, officers, agents and employees thereof against any claim or liability from or based on the violation of any Laws, whether by the Consultant, its officers, employees, subcontractors, representatives or agents. The Consultant shall, from time to time, if requested by Enbridge, furnish Enbridge with evidence of such compliance, and in particular, evidence from the Workplace Safety and Insurance Board, or the equivalent thereof in any jurisdiction where the consulting services provided hereunder are carried out, that the Consultant and any party with which it has entered into a Subcontract are in compliance with and have paid all

assessments and other amounts owing pursuant to the workers' compensation legislation of such jurisdiction.

Enbridge is committed to compliance with the Accessibility for Ontarians with Disabilities Act, 2005 and O.Reg. 429/07, the Accessibility Standards for Customer Service (collectively the "AODA"). In its delivery of services on behalf of Enbridge, the Consultant shall comply with the AODA. The Consultant shall satisfy Enbridge as to its compliance with the AODA and shall permit Enbridge to monitor its compliance. If requested to so, the Consultant shall provide Enbridge with copies of its policies, practices and procedures, training materials and dates of training, and confirmation the Consultant has reported its compliance to the Ministry of Community and Social Services.

15. **Waiver**

Either the Consultant or Enbridge may, in writing, extend the time for performance by the other and waive non-compliance or non-performance by the other of any of the other's obligations, covenants and agreements under this Agreement and any compliance therewith or performance thereof. However, no such extension or waiver shall operate so as to waive, diminish or reduce the scope of or otherwise affect any obligation, covenant or agreement of such other which is not the subject matter of such extension or waiver or, except to the extent of such extension or waiver, of the obligation, covenant and agreement which is the subject matter of such waiver. No act or failure to act of either the Consultant or Enbridge shall be or be deemed to be an extension or waiver of timely or strict performance by the other of the other's obligations, covenants and agreements under this Agreement except to the extent notice thereof is given to the other.

16. **Notice**

Any notice or other communication to be given under or pursuant to the provisions hereof or in any way concerning this Agreement shall be sufficiently given if reduced to writing and delivered to the person to whom such communication is to be given or sent by facsimile or electronic internet communication, addressed to such person at the address set forth below:

If to Enbridge:

ENBRIDGE GAS DISTRIBUTION INC.
500 Consumers Rd
North York ON M2J 1P8
Attention: Michelle Wasylyshen, Mgr Stkhldr Rls Growth Prjts
Phone: 416-758-4482
Email: michelle.wasylyshen@enbridge.com

With a copy to: Law Department
Facsimle: 416-495-5994

If to the Consultant:

ICF CONSULTING CANADA, INC.
277 Wellington Street West, Suite 808
Toronto Ontario M5V 3E4

Attention: Duncan Rotherham, Vice President Phone: 416-341-0389 Ext.
Email: duncan.rotherham@icfi.com

or at such other address as may be specified therefor by proper notice hereunder. A notice or communication shall be deemed to have been sent and received on the day it is delivered personally or by courier or by facsimile or by electronic internet communication. If such day is not a business day or if the notice or communication is received after 5:00 PM (at the place of receipt) on any business day, the notice or communication shall be deemed to have been sent and received on the immediately following business day.

17. **Interpretation**

This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein. Headings used herein are for the convenience of reference only and shall not be considered in construing or interpreting this Agreement. The words "herein", "hereunder", "hereof" and other similar words refer to this Agreement as a whole and not to any particular paragraph. Any provision herein prohibited by law shall to the extent prohibited be ineffective without invalidating any other provisions hereof. All references to amounts of money in this Agreement and any schedule shall mean lawful currency of Canada.

18. **Assignment**

The Consultant may not assign this Agreement in whole or in part without the express prior consent in writing of Enbridge. This Agreement shall be binding upon and enure to the benefit of the successors and assigns of Enbridge.

19. **Use of Enbridge Name and Logo**

The Consultant shall not use or display Enbridge's name or any symbols, signs, trademarks and other marks denoting and identifying Enbridge in any manner whatsoever without the prior written authorization of Enbridge.

20. **Time of Essence**

Subject to force majeure events, time shall be of the essence in this Agreement.

21. **Survival**

All warranties and indemnities contained in this Agreement, and the obligations contained in Section 8, shall survive the termination of this Agreement irrespective of the time of or party responsible for such termination, and such warranties, indemnities and obligations shall remain in full force and effect and be binding on the Contractor notwithstanding such termination.

22. **Further Assurances**

Each of the parties shall, from the time of the written request of the other party, do all such further acts and execute and deliver or cause to be done, executed or delivered all such further acts, deeds, documents, assurances and things as may be required, acting

reasonably, in order to fully perform and to more effectively implement and carry out the terms of this Agreement.

23. **Entire Agreement**

This Agreement, including any schedules attached hereto, constitutes the entire agreement between the parties with respect to the subject matter set out herein and replaces any prior understandings or agreements, whether written or oral, regarding such subject matter. No change or modification of this Agreement is valid unless it is in writing and signed by both parties. No disclaimers, purchase order documents, invoices or other documents of the Consultant shall be binding upon Enbridge.

24. **Audit**

The Consultant shall, following no less than seven (7) business days advance notice in writing, provide to such auditors (including external auditors and Enbridge's internal audit staff or agents) as Enbridge may designate in writing, supervised access to the data, records and supporting documentation maintained by the Consultant with respect to the Consulting Services solely for the purpose of: (i) performing audits and inspections to enable Enbridge to satisfy applicable regulatory requirements or certify compliance with applicable laws; and (ii) to confirm that the consulting services are being provided in accordance with the terms of this Agreement. Enbridge and its auditors shall use commercially reasonable efforts to conduct such audits in a manner that will result in a minimum of inconvenience and disruption to the Consultant's business operations.

25. **Enbridge Policies**

The Consultant acknowledges receipt of a copy of each of Enbridge Inc.'s Statement on Business Conduct for Enbridge Inc. and its Subsidiaries and Lifesaving Rules, each as amended from time to time (the "Policies"). The Consultant agrees to comply with the Policies in connection with its delivery of the consulting services described in this Agreement, and agrees that, if requested by Enbridge, it will ensure all personnel delivering the consulting services herein attend training on the Lifesaving Rules.

26. **Intentionally Deleted**

27. **Counterparts**

This Agreement may be executed by the parties in separate counterparts, each of which when so executed and delivered will be deemed to be an original, and all such counterparts will together constitute one and the same instrument. Delivery of signed counterparts of this Agreement by fax or other electronic means shall constitute valid and effective delivery.

[Remainder of page intentionally left blank; signature page to follow]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

ICF CONSULTING CANADA, INC.

By: [redacted]

Name: Duncan Rotherham
Title: Vice President

By:

Name:
Title:
(Please print name and title of Signing Officer)

Witness: [redacted]

Name: K. A. Curran

(Witness required if Contractor is a Sole Proprietor)

ENBRIDGE GAS DISTRIBUTION INC.

By: [redacted]

Name: Stephen Mcgill
Title: Sr Mgr Sustnble Growth & MDS

By [redacted]

Name: ~~Fiona Oliver-Glasford~~ Norm Ryckman
Title: ~~Sr Mgr Market Policy Researh~~ Director, Marketing Dev. & Sales

[redacted]

SCHEDULE A

TO THE CONSULTING AGREEMENT BETWEEN ENBRIDGE GAS DISTRIBUTION INC. AND ICF CONSULTING CANADA, INC. Dated July 7, 2015

This Schedule is made under the above referenced consulting agreement (the "Agreement") between ENBRIDGE GAS DISTRIBUTION INC. ("Enbridge") and ICF CONSULTING CANADA, INC. (the "Consultant").

1. **SCOPE OF SERVICES**

The Consultant will undertake the following consulting services:

A detailed technical analysis, on a provincial level and by sector as detailed in the attached Proposal.

The technical analysis will be of the emerging Ontario Climate Change Policy (cap-and-trade). The purpose of the analysis is to assist Enbridge in understanding the impacts on its current business and future plans.
As part of the analysis, the Consultant will develop a short term strategy for Enbridge to respond to Ontario's proposed Climate Change Policy (cap-and trade) that supports Enbridge's internal risk assessment, constructive consultations with the Ontario Ministry of Environment, and Climate Change.

A description of consulting services and key personnel to be provided by the Consultant is set forth in the proposal dated June 25, 2015 prepared by the Consultant, which is attached as Attachment 1 to this Schedule (the "Proposal") and incorporated by reference herein. In the event of a conflict between the terms and conditions set out in the Proposal and those set out in this Agreement, the terms and condition in this Agreement (including this Schedule) will govern and take precedence.

2. **DELIVERABLES**

The Consultant will provide the following deliverables:

Phase 1 – Project Kick-Off, Background Research and Key Policy Considerations
Phase 2 – Enbridge Data Collection
Phase 3 – Key Policy Considerations, Assumptions and Design Scenario
Phase 4 – Ontario Supply and Demand Scenario, Enbridge Analysis; and Final Presentation
Phase 5 – At the request of Enbridge, the Consultant shall provide one additional modelling scenario the particulars of which are to be determined by Enbridge and the Consultant.

3. **TERM AND COMMENCEMENT AND COMPLETION DATES**

This Schedule shall be effective as of July 7, 2015 and expire July 7, 2016, or such other date as the parties may mutually agree in writing.

4. **KEY PERSONNEL**

The Consultant will provide the following personnel to deliver the services set out above under Scope of Services:

Duncan Rotherham, Vice President
Aaron Schroeder, Principal
Julie Tartt, Senior Manager
Jessica Abella, Technical Associate
Other junior staff

5. **FEES AND PAYMENT TERMS**

Fees: As per the attached Proposal. Total estimated fees shall not exceed $70,000 CAD plus applicable taxes.

Expenses: N/A

The above fees and expenses cannot be exceeded without prior written approval from Enbridge.

Fees are payable by Enbridge in monthly installments upon the delivery by the Consultant of an appropriate invoice setting out in reasonable detail the nature of the services provided.

Dated as of July 7, 2015.

ICF CONSULTING CANADA, INC.

By: [redacted]

Name: Duncan Rotherham
Title: Vice President

By: _____

Name:
Title:
(Please print name and title of Signing Officer)

Witness: [redacted]
Name: K. A. Curran

(Witness required if Contractor is a Sole Proprietor)

ENBRIDGE GAS DISTRIBUTION INC.

By: [redacted]

Name: Stephen Mcgill
Title: Sr Mgr Sustnble Growth & MDS

By: [redacted]

Name: ~~Fiona Oliver-Glasford~~ Noxin Ryckman
Title: ~~Sr Mgr Market Policy Researh~~ Director Marketing Dev. & Sales

[redacted]

Enbridge Gas Distribution

Ontario Cap-and-Trade Detailed Technical Analysis

June 25, 2015

Prepared by:
ICF International
277 Wellington Street West, Suite 808
Toronto, ON
M5V 3E4

June 25, 2015

Norm Ryckman and Michelle Wasylyshen
ENBRIDGE GAS DISTRIBUTION INC.
Atria 1, 4th Fl., Suite 410, 2255 Sheppard Ave., E.,
North York, ON M2J 4Y1

RE: Ontario Cap-and-Trade Detailed Technical Analysis

Dear Norm and Michelle,

ICF Consulting Canada, Inc. (ICF) is pleased to provide this proposal aimed at providing a detailed technical analysis (provincial level, sectoral, and EGD specific) of the emerging Ontario Climate Change Policy (cap-and-trade) to ENBRIDGE GAS DISTRIBUTION INC. (EGD). EGD has requested this analysis to understand potential impacts on its business (current and planned), appreciate design options afforded Ontario (based on WCI, California, Quebec) and inform constructive engagement with the province over the coming months.

ICF's team of climate policy experts is poised to assist EGD with the development of a short term strategy to respond to Ontario's proposed cap-and-trade climate change policy with an analysis that will support internal risk assessment and a constructive consultation with the government. We are in a unique position to provide this support in a timely manner as we are currently supporting similar efforts on the part of Union Gas. We will leverage modelling tools already developed and improve the analytics by incorporating EGD's relevant customer and broader demand forecast data (including DSM). As a result the natural gas distribution companies will be in position to lead discussion and ensure the MOECC and other stakeholders are aware of policy options and impacts of policy pathways.

We appreciate the need that EGD has for mid/long term analytical support at this stage we respectfully request a more fulsome discussion on engagement on this after the critical immediate short term work proposed here-in. At that stage (mid-late July) we propose a 3 way discussion with EGD, Union Gas, and ICF to discover opportunities for common messaging at the natural gas distribution level vs. company level (as/where possible). Activities here could include communicating with stakeholders in government and outside developing detailed opportunities/solutions for government that benefit the

gas distribution companies (dedicated funding for DSM programs, RNG, CHP, etc...). Until we deduce opportunity / potential for coordination we have not proposed this portion of a longer term offering.

In addition EGD will be in need of support on implementation (metering, reporting, allowance and offset acquisition support, etc...), ICF would love the opportunity to work with EGD on this component of the process (as policy moved to regulatory reality). Due to the regulatory uncertainty we can carry this work out on a time and materials basis – when the regulation reaches a point that the actionable tasks can be identified and compliance plans developed. Two areas where we could initiate action on immediately (fugitive reporting compliance assessment and ability to meter at city gate vs customer meter).

Sincerely,

Duncan Rotherham
Vice President and Managing Director, ICF International

1. ICF International

Founded in Washington, DC in 1969, ICF International (ICF) has grown to become one of the world's premier environmental consulting firms. With a professional staff of over 5,000 consultants located in offices in Canada (5), the United States, the United Kingdom, Belgium, Poland, China, India, Philippines, Kenya, and Mali ICF (NASDAQ:ICFI) has developed one of the world's largest and most respected global energy and environmental consulting practices.

At ICF, we partner with clients to conceive and implement solutions and services that protect and improve the quality of life, providing lasting answers to society's most challenging management, technology, and policy issues. As a company and individually, we live this mission, as evidenced by our commitment to sustainability and carbon neutrality, contribution to the global community, and dedication to employee growth.

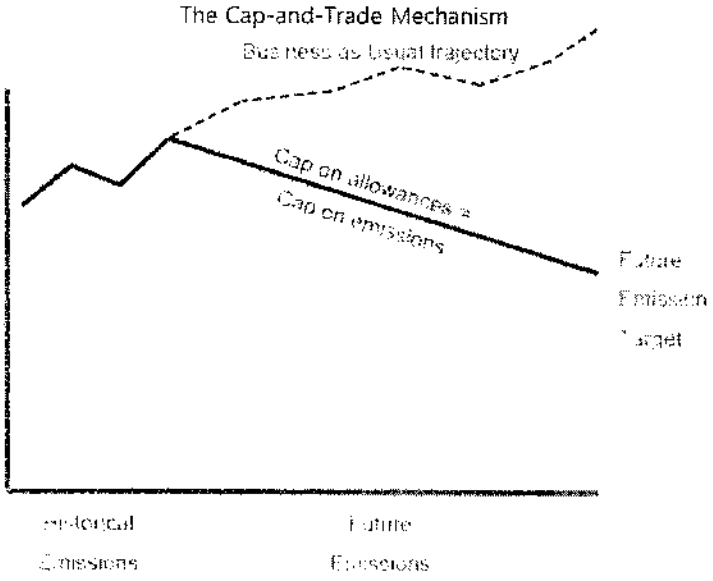
ICF has carefully earned an international reputation in the fields of environmental regulation, energy policy and fuel markets for analytical rigour, in-depth market expertise, and technical integrity. This reputation has been solidified through a wide spectrum of projects undertaken for leading companies (including 60 of the

Global FT 500), financial institutions, multilateral, and national and local governments (in more than 50 countries).

ICF is pleased to provide this proposal aimed at providing a detailed a review of EGD within Ontario's proposed cap-and-trade systems.

2. Introduction

In April 2015, the Wynne government announced that it would establish a cap-and-trade system aimed at reducing greenhouse gas (GHG) emissions in Ontario, and entered into an agreement with Quebec to link the new Ontario system with Quebec's system under the auspices of the Western Climate Initiative (WCI). Together with California (also a party to the WCI), Ontario and Quebec will form the largest regulatory carbon market in North America. Very little has been made public with regard to the important design elements of the cap-and-trade system; however, ICF/EGD can make informed assumptions based on the WCI principles and California and Quebec precedent. Ontario has referenced very significant abatement targets with little detail as to the path to the target. It is important to note that:



- Ontario's own forecast 2020 emissions are 10% greater (15 Mt) than its 2020 target.
- Ontario recently released a 2030 target of 37% below 1990 levels – essentially eliminating the option for any new industrial or fossil-fired electricity generating emission sources over the next 15 years without corresponding deep (50%) reductions in residential commercial natural gas consumption and transport fuel usage.
- The 2050 target (35 Mt) is actually an 88% reduction from BAU (290 Mt).

Ontario-based emissions/energy intensive industries and fuel distributors like EGD are left to consider how the new climate change policy will affect their business, and what steps they should take to prepare or adjust. EGD, in particular, stands to be significantly impacted by the policy given that natural gas infrastructure is a source of carbon-based emissions. If Ontario's 2030 trajectory for emission reduction follows California's recently released target of 40% below 1990 levels, the resulting pathway would almost certainly include a significant reduction in the volume of natural gas consumed in the province.

Furthering the challenge to EGD, ICF's natural gas load forecast (business as usual) for the province predicts that deep reductions in volume would be required of natural gas consumers. EGD would need to re-think all its system expansion plans and assess the viability of its current pipelines and storage assets under this scenario. The viability of natural gas as a clean fuel in transport and power generation would also need to be re-considered given the magnitude and velocity of change required.

The implications for fuel distributors, including EGD, under a cap-and-trade system are significant:

1) EGD distributes approximately 400 bcf of natural gas per annum, which equates to approximately 20 million tonnes of carbon dioxide equivalent emissions (roughly 20% of emissions that will be subject to the cap-and-trade system in Ontario). At $15 per tonne, this equates to $300 million in allowances that will need to be submitted annually.
2) The increased cost of delivered natural gas will affect consumers' consumption, which will impact EGD's revenue.
3) Coverage mechanisms for natural distribution systems will be complicated from point of metering (city gate vs. customer meter) to cap-and-trade coverage mechanism precedent / inconsistency between California and Quebec (and thus impact on EGD business).
4) New and potentially disruptive technologies will provide opportunities and challenges for fuel distribution companies. EGD should be prepared to evolve its business to stay ahead of this changing market.

Accordingly, EGD must be proactive. It should first aim to deepen its knowledge of the dynamics of cap-and-trade markets, and the WCI in particular, and it should assess how a range of scenarios under the new policy could affect its regulated and unregulated business. For example, EGD should develop a view as to what, if any, impact cap-and-trade would have on;

- Customer demand (residential, commercial, industrial),
- Electricity generation demand for natural gas and other generation fuels,
- Efforts to encourage the use of liquefied natural gas in the transportation industry,
- The economics of CHP,
- The competitive landscape among RNG.

The Ontario MOECC will be working on high-level design issues over the next three to six months, including preliminary consultations with industry. More granular design issues will be settled in the following 12

months with a goal of completing detailed regulatory design in mid to late 2016. In the interim, the public and interested parties will have the opportunity to provide feedback to the government as it holds formal and informal consultations over the summer and fall of 2015.

As Ontario gets into the details on design they will realize that the 2020/2030 targets announced politically will not be technically achievable at a reasonable cost and entities like EGD will have a chance to offer solutions. ICF has recently conducted a preliminary analysis of Ontario's cap-and-trade system and over the past three years ICF has performed detailed studies of the impact of Quebec's and California's cap-and-trade regulations on the supply and demand balance for allowances, reduction opportunities (including offsets) and the resulting allowance price trajectory for affected entities. As needed, ICF possesses fully integrated gas and electricity sector modeling capabilities which enable it to trace impacts on fuel, electricity, and allowance markets in specific regions (however we do not anticipate the need to model this level of impact to meet EGD's need).

3. ICF Approach

ICF's analysis will be comprised of four phases:

Phase 1: Project Kick-Off, Background Research, and Key Policy Considerations

Given the short timeline associated with the project, ICF will begin work upon contract execution. ICF proposes to conduct an official project kick-off meeting as soon as possible. We will utilize the kickoff meeting to understand EGD's focus and conduct a preliminary discussion of the cap-and-trade mechanics that ICF believes are most important for EGD (and broader fuel distribution companies) to understand. These will include;

- An appreciation of the target (cap) by compliance period out to 2030.
- Program coverage
- Trading and Market rules
- Offset limits (including an overview of offset treatment under WCI)
- Early action credits
- Allocation of allowance
- Price stability mechanisms (including discussion of price WCI floor/ceiling and pricing dynamics observed to date in Quebec and California)
- Investment of proceeds

ICF recommends that EGD create a working group of four to five members to represent the company's operations and business for this kickoff meeting and to guide the policy analysis process going forward.

ICF will develop a summary of the following cap-and-trade system parameters for discussion and detailed in the final project report:

- High level parameters of WCI cap-and-trade principles and defined options for jurisdictions implementing a system linked to WCI. These parameters include, but are not limited to targets, compliance periods, allowance allocation, containment reserves, price floor/ceiling and offset limitations.
- Cap-and-trade mechanics in California and Quebec particularly as they relate to fuel distribution companies, specifically how EGD is implicated. The treatment of gas utilities and allowance auction vs allocation differs significantly between these jurisdictions, including responsibility for deployment

of proceeds of sale of allowance. ICF will explain these important differences and how they relate to EGD as well as coverage optionality for emitting sectors (industry and power generation) in Ontario.

- The application of complementary measures/initiatives to reach targets. In other jurisdictions, these important complementary measures are designed to achieve emission reductions in sectors that are not well-suited to achieve reduction through a price signal from cap-and-trade alone. Examples of complementary measures include low carbon fuel standards, energy efficiency programs in residential and commercial buildings, zero emitting vehicles, transit initiatives, and vehicle fuel efficiency standards among others.
- Mitigation and transition programs implemented by California and Quebec as part of their programs and identify key mechanism and/or regulations that were designed to lessen the impact of cap-and-trade and ensure the global competitiveness.

ICF will document the primary factors and assumptions that will form the foundation of an Ontario cap-and-trade system, including: Coverage, Proposed Cap (target), Timing (start dates and when fuel distributors would be included), Gratis Allocation (for existing and new facilities at outset and declining thresholds by 2020 and 2030), Available Offsets, Responsiveness to Price and Credit for Early Action.

The objective for this phase will be to provide EGD with an appreciation for the material design options available to the MOECC. This will also set the context that will be used to create an Ontario cap-and-trade design policy scenario (Phase 3) and detail the most important cap and trade dynamics / flexibility mechanisms that the MOECC must address appropriately (from EGD's perspective as a regulated fuel distribution company).

Phase 2: EGD Data Collection

At the outset and in parallel with other activities we will also identify the key data sources we would require of EDG to the provincial cap-and-trade modelling, gas distribution sector and the EGD specific analysis.

The data would include historic and forecast (2020, 2025, 2030) information associated with;

Data Type	
Customers	Residential
	Commercial
	Small Industry, <13,000e3me (by sub-sector)
	Large Industry, >13,000e3m3 (by sub-sector)
New Communities (investment caliber)	
Transportation	
Electricity Generation related demand and Combined Heat & Power (CHP)	
Feedstock (non-combustion input)	
Demand Side Management	Residential
	Commercial
	Small Industry, <13,000e3m3 (by sub-sector)
	Large Industry, >13,000e3m3 (by sub-sector)
Renewable Natural Gas (RNG)	
Emissions (incl. vented/fugitives)	

Collection of data on a realistic but aggressive timeline will need to be discussed and will drive the timeline of the remainder of the project. We will need EGD to identify key staff who can provide data and engage in discussion that will inform forward EGD specific demand and abatement option related assumptions. We currently have proxy data representing this sector in the ICF model that we will replace with EGD informed data wherever possible.

Phase 3: Key Policy Considerations, Assumptions and Design Scenario

In parallel with data collection, we propose a face to face discussion (**shortly after the kick-off meeting**) to discuss and finalize the setup of a EGD informed policy scenario to inform EGD (**the design scenario would only be "run" for EDG once the model is populated with EGD specific activity data wherever possible**).

We will present our design scenario assumptions at this time.

Ontario Cap and Trade Model - Design Case Assumptions

- Start date for Ontario's cap and trade program: January 1, 2017 (no linkage in first year)
- January 1, 2018 – Ontario links with Quebec and California's cap and trade markets for the start of WCI Compliance Period 3
- Ontario coverage from year 1: electricity generation, electricity imports, large industrial emitters, fuel distributors (transportation fuels), natural gas distributors – covering close to 90% of the provincial emissions profile
- Exclusions: all agriculture and waste facilities emitting <25 kt/yr
- Emissions profile based on historical data projected to align with MOECC's forecasts. Also incorporates:
- EGD's natural gas demand forecast
- Includes CHP, new feedstock customer and transportation forecasts
- Long Term Energy Plan (LTEP) forecast for electricity demand
- Electricity generation mix based on LTEP
- EGD's projected conservation potential
- Free allocation of allowances to EITE
- 100% of 2017 process emissions
- 100% of 2017 combustion emissions with declining rate of allocation beyond 2017
- 100% auction of allowances for transportation fuel distributors
- 8% limit on use of offsets for compliance
- Price floor aligned with Quebec and California
- Reserve bank, which dampens the escalation of the market price above fixed high price levels

Phase 4: Ontario Supply and Demand Scenario

ICF will provide the model results for the design scenario (as defined above).

The results will detail emissions and abatement opportunity for EGD and the broader gas distribution sector (residential, commercial, institutional, small industrial natural gas demand, demand/load forecasts, DSM potential at varying DSM budget, NGV, CHP, district energy). In addition we will cover the following sectors of the economy:

- Transportation (natural gas a transition fuel, electrification, fuel efficiency standards);
- Electricity (demand/load forecasts, conservation targets, impact of vehicle electrification and nuclear shutdowns);
- Large industrial emitters (impact on changing free allowance allocation on emissions and energy demand); and,
- Offsets (domestic and exogenous supply potential).

This model will serve as the basis for detailed analysis of the high-level implementation scenarios and provide the platform around which EGD could engage with government and like-minded stakeholders to build consensus, as deemed beneficial.

The specific emission benefits from initiatives such as natural gas vehicles, combined heat and power and district energy (among others) will be calculated within the model. Each of these initiatives will be calculated independently, but will also affect the provincial demand for energy. For example, the penetration of natural gas vehicles will reduce diesel demand and increase natural gas demand. The specific variables associated with each of these initiatives can be analyzed with sensitivity analysis.

Phase 5: EGD Analysis

ICF, working with EGD, will undertake analysis of EGD business-level impacts of cap and trade (design scenario), including the impact on a typical customer from a financial perspective. More specifically, as examples, ICF will support analysis aimed at defining what EGD could contribute to emission reductions via incremental DSM budget (by vintage: 2020, 2025 and 2030), NGV, CHP and district energy. ICF will study the potential opportunity for EGD to manage compliance (emissions reporting, allowance allocation strategy, allowance acquisition optimization) for entities/customers in the awkward 10,000-20,000 tCO2/yr range and

those just above the 25,000 compliance threshold. These customers will also be key stakeholders in building consensus outside government.

Phase 6: Final Presentation

For this final phase, ICF will consolidate the findings from phases 1, 3, 4, and 5 (and document data library collected in phase 2). Based on our cap-and-trade design scenario informed by EGD data we will provide an impact analysis (provincial level, main sector-level, and EGD specific), recommendations and a high-level strategy aimed at influencing logical policy design for EGD in Ontario. This discussion will include:

- The differences in impact/costs between regulated and non-regulated companies (those below or above the threshold);
- Complementary measures that may directly or indirectly affect the natural gas fuel distribution companies; and
- The anticipated timelines associated with all measures and regulations.

We will compile these findings into a draft final presentation in PowerPoint format, which we will deliver to EGD for its feedback by mid to late July. We will then incorporate that feedback into our final presentation. A closing meeting between ICF and EGD will be held in person in Toronto.

ICF intends for the final report to serve as the basis of the high-level platform around which EGD could engage with like-minded stakeholders to build consensus, and with the government. The final report will be approximately 20-30 pages in length and presented in Adobe PDF format. We expect the report to include several illustrative diagrams and figures and therefore, we would be pleased to present the report in narrative prose or as a presentation deck (Power Point format) -- to facilitate internal and external communication and consistency in messaging. We can also offer scenario "what if" analysis in a session with EGD (however cannot provide the model to EGD).

We believe that the proposed kick-off meeting, scenario session, draft report and close out meeting will provide opportunities to provide input and feedback during the short project duration.

4. Ontario Cap-and-Trade Supply and Demand Model (Description)

ICF is currently developing an Ontario cap-and-trade supply and demand general equilibrium model. Analysis of the proposed Ontario cap-and-trade system using this model is limited to a detailed design scenario. This model design context is offered here to ensure EGD appreciates the investment ICF is making to support clients in the future. This caliber of analysis is essential to remain on a level playing field with government in discussing important system design and sector-specific issues in a constructive manner.

The model applies a transparent bottom-up approach and is built with activity data vetted by industry and based on historic and forward emissions and abatement projections. The model is sufficiently flexible to run conduct emissions reduction and complimentary measure scenarios. The analytics produced by the model will inform and enable constructive discussion with the provincial government and other stakeholders.

ICF's supply and demand model is currently under development. Scenario analysis is expected to be conducted in mid-July. To facilitate forecasting and determination of key system implications, ICF is working with key stakeholders in each sector to vet the model data, assumptions and Marginal Abatement Cost Curves. ICF would like to engage with the EGD to ensure relevant/appropriate sector specific information is included and will sign the necessary Non-Disclosure Agreements to protect any sensitive data provided. ICF will not be sharing any sensitive information and will maintain control of the model. This data will allow us to model sector specific design and economic impact scenarios.

The base model calculates the demand for compliance considering:

- The Ontario MOECC business-as-usual emission forecast and the Ontario Long Term Energy Plan;
- Price elasticities for natural gas and electricity demand in residential, commercial, light industrial as well as transportation fuels;
- Marginal abatement opportunities in large industry; and
- Forecasted emission reductions expected to be achieved through complementary initiatives (government programs) and investments of allowance auction revenues.

There are several key implications for EGD that will be considered during the initial design scenario analysis, including:

- Free allocation of allowances (duration and quantity);
- Treatment of facility expansions and allowance allocation mechanisms;

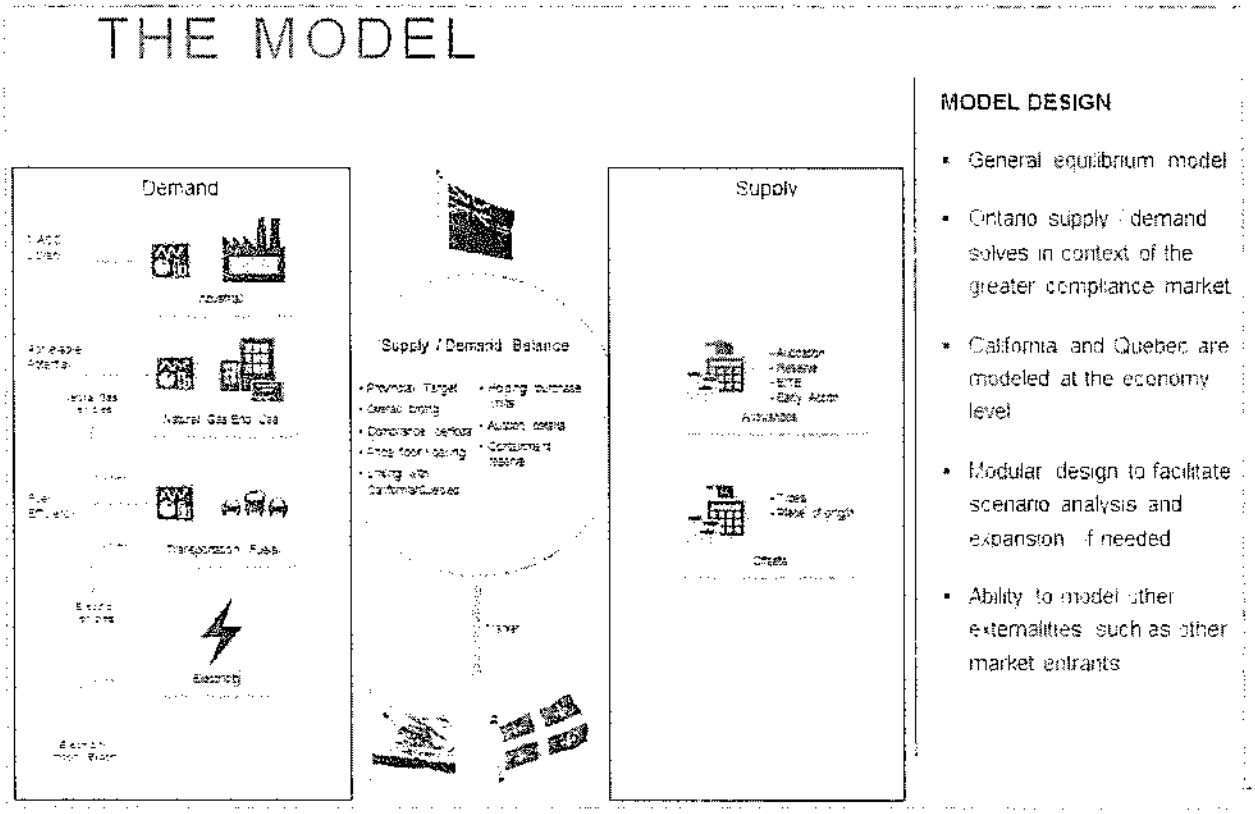
- Development of complementary measures (including Federal programs and regulations), which would reduce the emission reduction expectation of the cap-and-trade system; and
- Marginal abatement – the potential for emission reductions within each sector (industrial, commercial, residential, transportation, electricity).

The provincial-level considerations addressed during the assumptions and scenario development include:

- Ontario cap-and-trade program details (start date, targets, coverage, offsets, flexibility mechanisms);
- Understanding existing analytics (Detailed sector specific MACCs and existing and planned provincial abatement programs/standards);
- Effect of existing complementary measures;
- Distribution of revenue generated through allowance auction (potentially $6B by 2020).

ICF will be conducting sensitivity analysis of key cap-and-trade variables and subsequently developing policy scenarios based on input of ICF experts and industry participants.

We appreciate the need that EGD has for mid/long term analytical support at this stage we respectfully request a more fulsome discussion on engagement on this after the critical immediate short term work proposed here-in. At that stage (mid-late July) we propose a 3 way discussion with EGD, Union Gas, and



ICF to discover opportunities for common messaging at the natural gas distribution level vs. company level (as/where possible).

5. Proposed Project Team

ICF's proposed project team is heavily weighted with carbon market experts with experience working closely with EGD. Our extensive experience evaluating environmental markets for private and public sector clients, particularly those operating in Ontario's WCI partner jurisdictions, provide outstanding value for this work.

Team Member	Roles and Qualifications
 Duncan Rotherham *Carbon Market Expert*	*Role* Duncan Rotherham is a Carbon Market Expert and will advise the project team regarding cap-and-trade and complementary measures. Duncan will attend all meetings. *Biography* Duncan Rotherham is a Vice President and Managing Director of ICF International's Canadian operations (ICF Consulting Canada, Inc.). He has spent his 17 year career working across industry, utilities, and public sector organizations in energy and environmental policy evaluation, design and implementation. Recognized as a leading expert in carbon markets, he has worked on the forefront of emerging markets advising private and public clients on issues ranging from carbon compliance markets (EU ETS, US, Canada, WCI, California, Alberta, BC, QC) to offsets (CDM, JI, Alberta, QC, Greening AAUs, WCI, California, CCX, VCS) to voluntary initiatives (corporate footprints and carbon neutral strategies). Mr. Rotherham has led recent assessments of Climate related policy and regulation at the Federal and Provincial level for large final emitters, industry associations and Provincial governments. For industry he has developed and deployed strategies for operating under evolving environmental market-based mechanisms for financial institutions and regulated companies in a diversity of industrial sectors (oil and gas, utility, aluminum, forest products, manufacturing, and chemical). Mr. Rotherham has worked with over 40 companies to assess impact of policy and regulation, develop emissions management systems, identify gaps, develop robust inventories, implement transparent operating procedures, and tools. Duncan has deployed ICF's proprietary models and developed tools for NA industry to model the price of allowance/compliance ($/tCO2) through a detailed offset supply and demand model. Duncan is an accredited Lead Auditor (ANSI), and leads ICF's verification work in NA working extensively in the Oil and Gas sector and offset assurance. He has a BSc. from the University of Victoria and graduate diploma in Ecotoxicology from Concordia.

Team Member	Roles and Qualifications
 James Brown *Oil and Gas and Petrochemicals Expert*	*Role* James Brown will serve as a Technical Expert and provide key industry and environmental regulatory insight to the project team. *Biography* James Brown has over thirty years of experience within the broader oil & gas sector including oil refining, petro-chemicals, oil sands and the broader oil & gas sector. During that time he has worked in process and project engineering, operations, business management, business development, divestitures, strategy and enterprise risk management, public policy and government relations. Prior to joining ICF most of Mr. Brown's career was with Shell Canada where he assumed a number of senior roles within the corporate, petro-chemicals, refining, supply and distribution divisions including business strategy, upstream and oil sands processing in refineries, Business Manager of Shell's Sarnia refinery, and leading a number of strategic studies in Canada. Since 2009 he has been consulting as an independent consultant and for a major financial services firm. In 2012 he joined ICF as Principal of ICF's Calgary office where he has lead or assumed senior roles on projects related to the impact of provincial and federal environmental regulations on the energy sector, natural gas supply and demand, and enterprise risk management. Mr. Brown is an analytical thinker who assesses situations objectively and critically, using cognitive ability and drawing from my broad background of experience and skills to formulate a logical approach to exploit opportunities and solve problems. Mark Shewfelt is an experienced electrical engineer and energy-efficiency expert who has been at the forefront of the energy efficiency sector for twelve years.
 Julie Tartt *Project Manager and Carbon Market Specialist*	*Role* Julie Tartt will serve as the Project Manager and Carbon Market Specialist. *Biography* Julie Tartt is a Senior Manager in ICF International's Air & Climate practice, providing a wide range of services to public and private sector clients. Julie has extensive expertise in greenhouse gas (GHG) accounting in both the development and verification of GHG emissions inventories, as well as provision of consultative services in emissions reduction strategies and emissions trading opportunities. In 2012 Julie led and managed the development of ICF's ANSI-accredited ISO 14065 Verification Management System (VMS). Julie is the VMS Manager and is a lead verifier in ICF's Verification Body.

Team Member	Roles and Qualifications
	Julie is also recognized for her extensive experience interpreting climate-related policies/regulations in the Canadian context and subsequently administering and managing complex projects to study their impacts. Throughout these studies, Julie worked with several oil and gas and power sector clients to inform them of the potential ramifications of carbon policy. In addition, she has also worked on teams to perform economic analysis of electricity markets across Canada using ICF's proprietary power sector modeling framework, the IPM®, to study implications of climate policy. Prior to joining ICF in 2003, Julie worked as a consultant in the United Kingdom, where she specialized in environmental impact assessments for natural gas pipelines as well as environmental auditing/management at pipeline construction sites. Julie has an Honours Bachelor of Science degree in Environmental Science from the University of Guelph with an area of emphasis in Environmental Degradation.
 Aaron Schroeder, P.Eng *Cap-and-Trade Specialist*	*Role* Aaron Schroeder will serve as a Cap-and-Trade Specialist, advising the project team regarding specific cap-and-trade mechanisms. Aaron will attend the project kick-off meeting and the mid-project half-day working meeting. *Biography* Aaron Schroeder leads ICF International's Canadian Air & Climate practice from ICF's Vancouver office. Over the past eight years, he has developed a specialization in greenhouse gas quantification, mitigation and assurance. He has led projects that have included economic - environmental and power system modeling supporting regulatory development, greenhouse gas life cycle analysis and quantification, and third-party verification. Mr. Schroeder has managed several projects for government and commercial clients that analyzed existing and emerging greenhouse gas and air emissions regulations where he has applied his knowledge of North American electricity, natural gas and environmental markets. This work has included analysis of WCI for the State of California, the Specified Gas Emitters Regulation in Alberta and the draft Greenhouse Gas regulations proposed in Saskatchewan, among others. Mr. Schroeder has worked with numerous industrial clients endeavouring to comply with provincial greenhouse gas regulations as they emerge and develop. Aaron has acted as lead verifier for more than 100 third-party verification assignments through multiple compliance periods under British Columbia's Greenhouse Gas Reporting Regulation and Alberta's Specified Gas Emitters Regulation. Further, Mr. Schroeder has worked with several clients to develop greenhouse gas inventories. He was the primary developer of ICF's proprietary GHG-ID software, a desktop inventory database that has been used by banks, governments, food manufacturing, shipping,

Team Member	Roles and Qualifications
	commercial real estate and service companies.
 Jessica Abella *Technical Associate*	*Role* Jessica Abella will serve as a Technical Associate, working with the project team to summarize existing cap-and-trade system mechanisms. *Biography* Jessica Abella is a skilled and analytical researcher with ten years of experience in technology assessment to inform policy and business decision-making processes in the energy sector. She has developed expertise in assessing environmental tradeoffs of energy decisions on a lifecycle basis including greenhouse gas implications of refining petroleum and technology assessment of mitigation paths. For Natural Resources Canada, Jessica used her expertise in Life Cycle Assessment methods and skills with the use of the Oil Production Greenhouse Gas Emissions Estimator (OPGEE) model to assess the accuracy of the European Union Fuel Quality Directive implementing measure's default emissions intensity value for 'conventional' crude oils. Jessica also has worked on lifecycle analyses with Oil Companies such as ConocoPhillips and MEG Energy in the assessment of technologies for reducing greenhouse gas emissions and with the University of Calgary where Jessica developed and validated the Petroleum Refinery Life-cycle Inventory Model (PRELIM) engineering-based LCA tool for estimating greenhouse gas emissions from the production of petroleum transportation fuels.

6. Project Schedule and Proposed Fees

The proposed work plan is designed to meet the required target date for completion of the project by July 17. ICF understands the urgency of this project to ensure EGD is equipped to engage in constructive consultation with the Ontario Ministry of Environment and Climate Change.

We are prepared to commence work immediately, and commit to meeting the following project milestones:

- Project kick-off meeting: July 3 or 6 (target date; meeting will be held as soon as possible following contract signing)
- Design Scenario presentation; July 17 (assuming data provided by EGD in a timely manner)
- Draft final report: July 24
- Final report: within three business days of receipt of consolidated feedback from EGD

ICF proposes to conduct the work and provide the deliverables described in Section 3 of this proposal on a time and materials basis (rates follow) to a cap of $70,000 CAD plus applicable taxes.

ICF will invoice EGD on a monthly basis following the project kick-off meeting. Any expenses for travel are expected to be modest and would be incremental to the proposed fee and would not be incurred without authorization by EDG.

Hourly Rates

Duncan Rotherham, Vice President

James Brown, Principal

Aaron Schroeder, Principal

Julie Tartt, Senior Manager

Jessica Abella and other junior staff

SCHEDULE B

TO THE CONSULTING AGREEMENT BETWEEN

ENBRIDGE GAS DISTRIBUTION INC. AND ICF CONSULTING CANADA, INC.

Dated JULY 7, 2015

This Schedule is made under the above referenced consulting agreement (the "Agreement") between **ENBRIDGE GAS DISTRIBUTION INC.** ("Enbridge") and **ICF CONSULTING CANADA, INC.** (the "Consultant"). All capitalized terms used in this Schedule have the meaning given to them in the Agreement.

1. SCOPE OF SERVICES

The Consultant will undertake the following work, as further described in the Deliverables Section below:

To conduct a detailed review of the Ontario government's draft *Cap and Trade Program Regulations* released on February 25, 2016 (proposed to be made under the Proposed *Climate Change Mitigation and Low-Carbon Economy Act, 2016* (Bill 172) released on February 24, 2016. This would include identification of issues of relevance in the draft Regulation for Enbridge. With respect to carbon strategy, assist Enbridge to have a deeper understanding of the various moving parts in the draft Regulation and the impact of the issues relevant to Enbridge.

The purpose of the detailed review is for a further refinement and updated analysis is to assist Enbridge to understanding of the impacts on its current business and future plans.

2. DELIVERABLES

The Consultant will provide the following deliverables:

1. Detailed review of the draft regulations including implications to the NG utilities prepared by the Consultant of the Draft Cap-and-Trade Regulation. This will include identification of issues of relevance in the draft Regulation for Enbridge.

2. Carbon strategy - assist Enbridge to have a deeper understanding of the various parts "moving parts" in the draft Regulation and the impact of the issues relevant to Enbridge. This may be provided partially in writing through identification of opportunities and risks in the draft cap and trade and also through discussions that will accompany the results generated through deliverables 1 and 3.

3. Refine and update the analysis completed in 2015 around the implications of cap and trade and understanding of the emission reducing opportunities derived from various complementary measures.

3. COMMENCEMENT AND COMPLETION DATES

This Schedule shall be effective as of February 26, 2016 and continue on July 7, 2016, or such other date as the parties may mutually agree in writing.

4. **KEY PERSONNEL**

The Consultant will provide the following personnel to deliver the services set out above under Scope of Services:

Duncan Rotherham, Vice President
Julie Tartt, Senior Manager
Mabel Fulford, Senior Associate
Erin Williamson, Senior Associate

5. **FEES AND PAYMENT TERMS**

Fees: $30,000 + HST

Expenses: N/A

The above fees and expenses cannot be exceeded without the prior written approval of Enbridge.

Fees are payable by Enbridge in monthly installments upon the delivery by the Consultant of an appropriate invoice setting out in reasonable detail the nature of the services provided.

Dated as of April __, 2016 with the effective date February 26, 2016.

ICF CONSULTING CANADA, INC.

By: [redacted]

Name: Duncan Rotherham

Title: Vice President

By: _____

Name:

Title:

(Please print name and title of Signing Officer)

Witness: [redacted]

Name: K. A. Curran

(Witness required if Contractor is a Sole Proprietor)

ENBRIDGE GAS DISTRIBUTION INC.

By: [redacted]

Name: Fiona Oliver-Glasford

Title: Senior Manager, Carbon Strategy & Implementation & IRP

By: [redacted]

Name: Norm Ryckman

Title: Director, Marketing Development & Sales

[redacted]

[redacted]

Enbridge Gas Distribution
500 Consumers Road
North York, Ontario M2J 1P8
Canada

April 12, 2016

ICF Consulting Canada Inc.
277 Wellington Street West, Suite 808
Toronto Ontario M5V 3E4

Attention: Duncan Rotherham, Vice President

Re: Extension of the Consulting Agreement between Enbridge Gas Distribution Inc. ("Enbridge") and ICF Consulting Canada Inc. (the "Consultant") dated July 7, 2015 (the "Agreement")

As you are aware, the Agreement provides for an expiry date of July 6, 2016.

Enbridge and the Consultant wish to further extend the term of the Agreement beyond July 6, 2016. Through this extension letter, Enbridge and the Consultant agree to amend the Agreement by extending the term of the Agreement to July 6, 2017.

All other terms of the Agreement shall remain in full force and unamended.

If the terms of this extension letter are acceptable, please sign both copies where indicated below returning both originals to us.

Yours Truly,

ENBRIDGE GAS DISTRIBUTION INC.

Per: [redacted]

Name: Fiona Oliver-Glasford
Title: Senior Manager, Carbon Strategy & Implementation & IRP

Per: [redacted]

Name: Norm Ryckman
Title: Director, Marketing Development & Sales

Confirmed and agreed to on the 4th day of May, 2016.

ICF CONSULTING CANADA INC.

Per: [redacted]

Name: Duncan Rotherham
Title: Vice President

BOMA INTERROGATORY #28

INTERROGATORY

Issue 5

Ref: Customer Abatement

Please provide a timetable for the introduction of RNG into the Ontario natural gas mix, showing volumes per year over the first, second, and third compliance period. Please compare the forecast with a cost comparison to the forecast of carbon over the same period.

RESPONSE

Please see the Company's response to Board Staff Interrogatory #16 at Exhibit I.1.EGDI.STAFF.16.

With respect to the timing of the introduction into the Ontario natural gas mix the Company is in the midst of discussions with several potential RNG producers. The Company is also in the process of developing an RNG model that is expected to be presented to the Board for consideration as part of its future Cap and Trade Compliance Plan. Any RNG proposals submitted to the Board for consideration as part of future compliance plans will describe the details and the extent and nature of the Company's involvement.

The extent and timing of the introduction of RNG to the Ontario gas supply mix will be dependent on the willingness of potential producers to proceed with projects, the cost of these projects, the Ontario Energy Board's treatment of any utility costs associated with these projects, the Company's cost of procuring RNG supplies, and the nature of the province's Cap and Trade offset protocols, all of which have yet to be determined.

Witness: S. McGill

BOMA INTERROGATORY #29

INTERROGATORY

Issue 5

Ref: *Ibid*

(a) Please provide the same analysis for the power to gas technology as provided for the RNG.

(b) In addition, please provide further data on the power to gas technology, determining the state of development of the option, locations of pilot or demonstration plants, cost data, and the best assessments of the feasibility of, and timing for, the introduction of the process at scale in Ontario.

RESPONSE

(a) Please see the Company's responses to BOMA Interrogatory #28 filed at Exhibit I.5.EGDI.BOMA.28 and Board Staff Interrogatory #16 filed at Exhibit I.1.EGDI.STAFF.16. Enbridge is currently in the process of evaluating the feasibility of Power-to-Gas technology from both operational and economic perspectives. Once this evaluation is complete and if the Company plans to include this technology as a carbon abatement tool as part of a future Cap and Trade Compliance Plan, it will provide the Board with information concerning the expected timeframe and gas volumes for the introduction of Power-to-Gas into the Ontario energy market at such time.

(b) Power-to-Gas energy storage is being deployed as a form of renewable energy in markets as part of the electricity supply mix. In Europe, approximately 40 projects are operating or under construction. Like other energy storage technologies, such as batteries, the costs are declining with market adoption. In Ontario, power-to-gas has successfully competed in IESO procurements for energy storage that explore how new technologies can provide needed flexibility in support of grid operations. The first North American, utility-scale, power-to-gas plant is being deployed in Ontario, and it will provide power grid support services to the IESO.

Power-to-gas converts electricity to hydrogen which is stored until this energy is needed by the energy markets. Dedicated hydrogen storage will be used in early power-to-gas installations, but to provide long-duration energy storage this renewable hydrogen can also be injected into existing natural gas networks.

Witness: S McGill

Power-to-Gas has the potential to create a wholesale market interconnection between the bulk power grid and the wholesale natural gas grid. This supports the growth of renewable energy in natural gas pipelines to complement the renewable content that can also be derived from RNG. The Ministry of Environment and Climate Change has identified hydrogen injection as one means of increasing the renewable content in Ontario's natural gas system.

Enbridge is working with peer natural gas utilities to define the gas quality standards, design considerations and operational issues that need to be understood and addressed in order to accommodate increased variability in Ontario's natural gas pipeline system. Hydrogen and RNG can be used to support Ontario's growth of renewable energy as pipelines standards are developed to accommodate increased diversity in gas composition. As Power-to-Gas technology matures, and as hydrogen blending standards are established, Ontario is expected to benefit from the ability to deploy Power-to-Gas facilities that could serve as a means of energy storage capacity.

BOMA INTERROGATORY #30

INTERROGATORY

Issue 5

Ref: Exhibit C, Tab 6, Schedule 1

Please provide the report on EGD's evaluation of long term GHG reduction strategies to date, and reference to any consulting contracts EGD has made to further its evaluation, and the approximate timeline for the commencement of the measure.

RESPONSE

Enbridge does not have a formal report specific to the evaluation of potential longer term GHG reduction strategies that the Company may employ at this time. Further, the Company does not currently have any active consulting engagements underway to further such evaluations.

In 2015 Enbridge and Union Gas engaged ICF to undertake an analysis and report on the potential on several GHG abatement opportunities. This report was submitted to the Ontario Energy Board in the EB-2016-0004 community expansion proceeding[1].

In addition to this work, ICF was also engaged jointly by Enbridge and Union Gas in 2016 to undertake an evaluation of potential implications of the province's Climate Change Action Plan and the IESO's Ontario Planning Outlook in support of submissions made by both companies concerning the Ministry of Energy's 2017 Long Term Energy Plan. Please see attached "Electrification and Ontario's Long Term Energy Plan".

With respect to RNG, Enbridge references two studies prepared on behalf of Enbridge and Union Gas in 2011 in support of their EB-2011-0242 / 0283 RNG application[2].

[1] Refer to EB-2016-0004, Exhibit S3.EGDI.OGA.3.

[2] Refer to EB-2011-0242 / 0283, "Potential Production of Renewable Natural Gas from Ontario Waste" report prepared by Alberta Innovates Technology filed at Exhibit B, Tab 1, Appendix 1, and "Economic Study of Renewable Natural Gas Production and Injection Costs in the Natural Gas Distribution Grid in Ontario" report prepared by Electrigaz Technologies Inc. filed at Exhibit B, Tab 1, Appendix 4 and Appendix 5.

Witness: S. McGill

Enbridge Gas Distribution: Ontario's Long Term Energy Plan 2017 Submission

December 16, 2016

Enbridge Gas Distribution

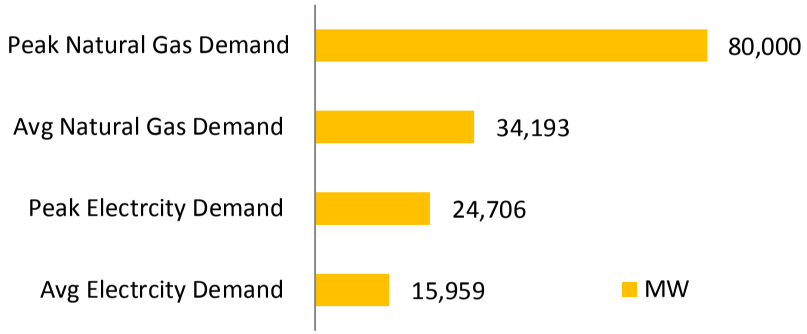
Introduction

Enbridge Gas Distribution ("Enbridge") supports Ontario's transition to a lower-carbon future and is of the view that natural gas will continue to play a key role in that future. Enbridge and its affiliates have demonstrated their commitment to the environment with investments in 2,275 MW of renewable energy projects including roughly 500 MW in Ontario, as well as our successful Demand Side Management (DSM) programs which have reduced emissions by 18 MT over the past 20 years. Enbridge recognizes that in order to continue as a world leader in energy delivery that it will need to evolve and adapt to an energy market that is responding to efforts to mitigate climate change.

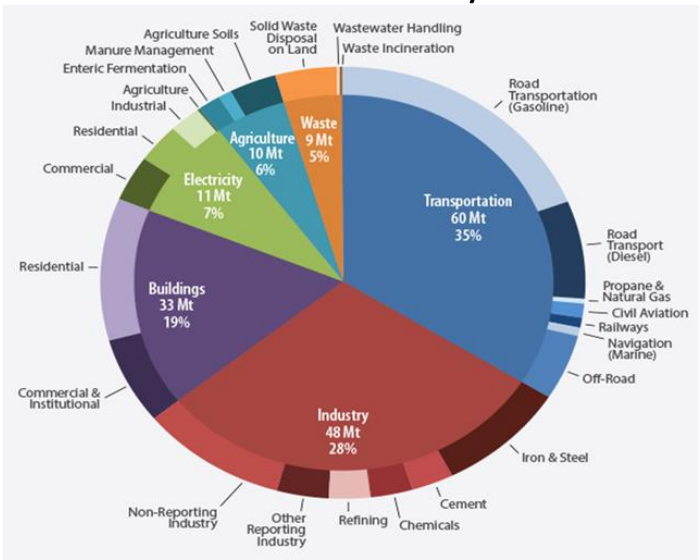
We recognize that the context in which the Long Term Energy Plan (LTEP) will be written has changed because of the government's Climate Change Action Plan (CCAP) and the need to overlay carbon reduction on the other two key priorities of energy system planning: reliability and affordability. **We believe the core theme of the next LTEP should be to meet Ontario's emission reduction objectives while ensuring that our energy systems are as reliable and affordable as possible for consumers.**

Key Facts:
Energy Use and Emissions Profile in Ontario

Ontario Energy Delivery by Infrastructure Type



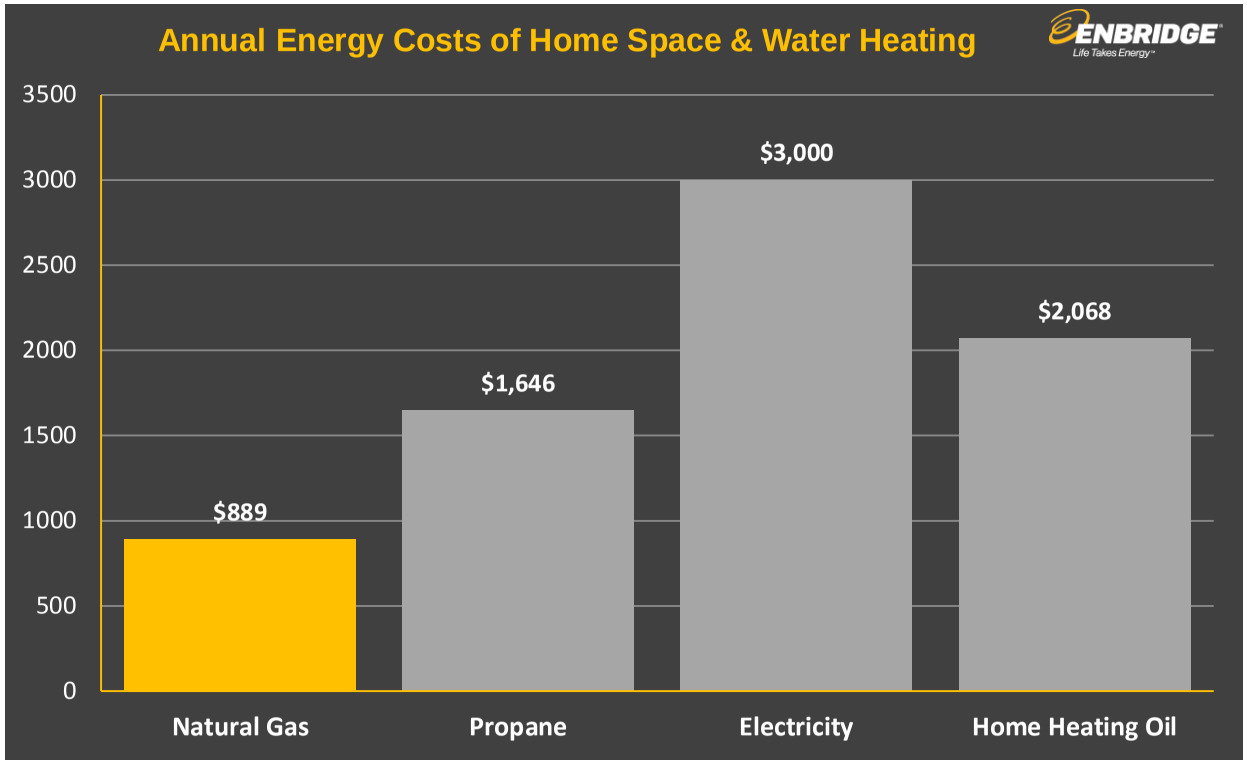
Ontario's 2013 Emissions by Sector



Ontario's natural gas distribution and storage network delivers more than three times the energy on a peak day (equivalent to ~80,000 MW) compared to the electricity system (24,700 MW). In fact, Enbridge alone delivers roughly 10% more energy annually than all of Ontario's electric utilities combined at less than 1/3 the cost.

From an emissions perspective, in 2013 the building sector made up about 33 MT (19%) of Ontario's total emissions, compared to 60 MT (35%) in the transportation sector, 48 MT (28%) for industry, and 11 MT (7%) in the electricity sector.

Affordability & Reliability



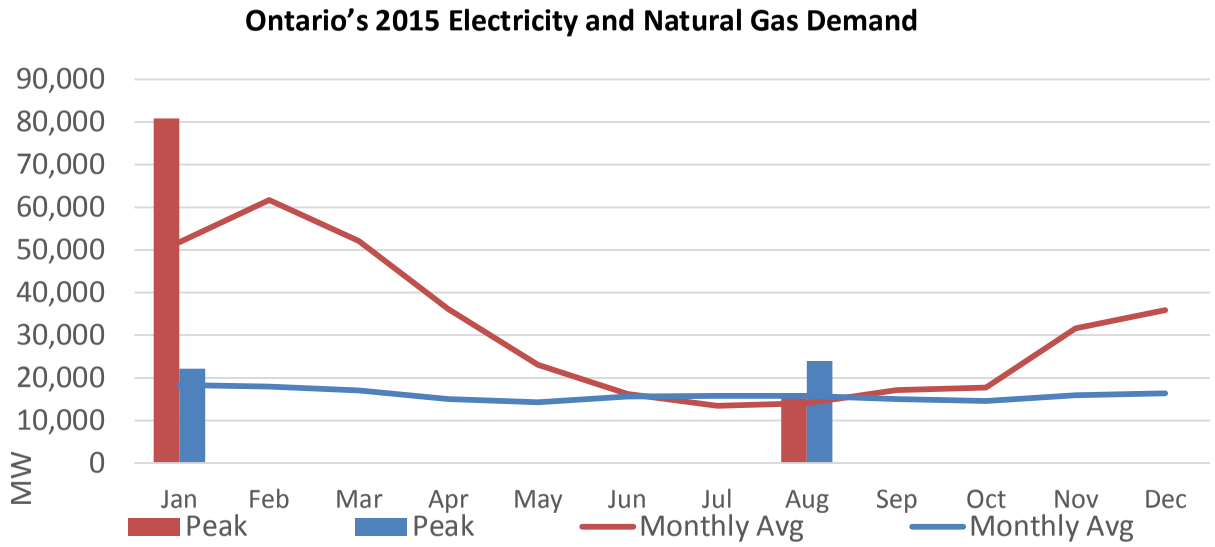
The average residential natural gas user saves more than $2000 annually on space and water heating compared to those using electricity, as well as $757 savings compared to propane, and $1179 compared to heating oil.

The natural gas system is designed to be extremely reliable to avoid service calls which are required when outages happen. The system has never experienced a major outage, even when upstream outages have occurred, thanks in part to the industry's extensive underground infrastructure and Ontario's Dawn and Tecumseh natural gas storage facilities which provide the equivalent of 80 TWh of seasonal storage. Meanwhile, electric distributors experience an average of two unscheduled outages per customer per year with an average duration of 3.52 hours per outage.

The OPO & Adapting to the CCAP

The Ontario Planning Outlook (OPO) modelled four scenarios of electricity demand based on varying degrees of electrification in response to the CCAP. Electrification of the heating load of buildings as contemplated in OPO scenarios "C" and "D" would move Ontario's peak electricity requirement from summer to winter, which would drive the need for significant expansion of the Province's electricity infrastructure and associated costs. Today, from a thermal energy perspective, electricity is used for summer cooling while natural gas is largely used for winter heating. The IESO's OPO report identifies a three-fold increase in residential peak demand as a result of electrification of heating load.

Based on Union Gas and Enbridge's regulator approved design day criteria which dictate gas procurement and infrastructure planning, total natural gas demand represents ~80,000 MWs in equivalent electricity. The figure below depicts actual peak demand for gas and electricity in 2015, which was significantly lower than the design peak that the regulated gas and electric industry are required to adopt for reliability purposes. The difference between actual versus design peak varies considerably from year to year based on demand.



The IESO OPO Report estimates that for Outlook "D" an increase in electricity system capacity of 11,000 MW would cost $70 Billion. These cost estimates include generation and transmission capacity but not the cost of distribution system upgrades.

Assuming a carbon reduction strategy that displaces the natural gas peak with electricity, 50,000 to 80,000 MW would be required, costing from $350 billion to $560 billion, using OPO cost estimates adjusted for distribution system upgrades.

IESO Outlook "C" would require approximately 5,400 MWs of incremental electricity generation, transmission and distribution capacity, while Outlook "D" would require approximately 11,000 MWs incremental capacity.

To improve our understanding of the potential impacts of the CCAP and assess the how the IESO translated these impacts into its OPO, Enbridge and Union Gas jointly engaged ICF Consulting Canada, Inc. to conduct an independent study to quantify the potential implications of certain of the CCAP initiatives on Ontario's electricity system. The ICF study indicates that the impact of converting significant portions of the Province's space and water heating load to electricity as contemplated in the OPO's Outlooks "C" and "D" are significantly understated, both in terms of required infrastructure and cost. Estimated peak impacts from electrifying 25% of single family homes, a subset of Scenario D which includes other residential, commercial and industrial demand, would alone require 12,000 MWs incremental capacity. A copy of the ICF report "Electrification and Ontario's Long Term Energy Plan" is included as an appendix to this submission.

We also submit that assumptions with respect to reductions in GHG emissions through the electrification of heating loads from natural gas do not suitably take into account the "site versus source" issue, which depends on how incremental capacity would be generated. The province requires a significant amount of natural gas fired generation currently. It must be recognized that natural gas used in the home has a GHG intensity of 50 tonnes per terajoule (TJ) and natural gas used to produce grid electricity supply emits 150 tonnes per TJ.

The LTEP should recognize that the electrification of heating loads as contemplated in the IESO's OPO Report scenarios "C" and "D" are unrealistic, and the associated costs are understated. Therefore, we believe that the LTEP should contemplate how to best to prioritize and invest in various CCAP emission reduction activities, with an emphasis on utilizing existing infrastructure.

Solutions:

Beneficial Electrification

The most desirable and cost effective electrification utilizes existing infrastructure and does not create the need for new capacity resources, while at the same time displacing fuels to reduce emissions.

The LTEP should complement and inform the implementation of the CCAP by planning for electrification in applications that align demand with the Province's off-peak electricity supplies, such as prioritizing fuel switching to electricity in vehicles which can be charged overnight with little contribution to peak electricity demand. Using existing off-peak non-emitting surplus electricity capacity to charge electric vehicles will be much

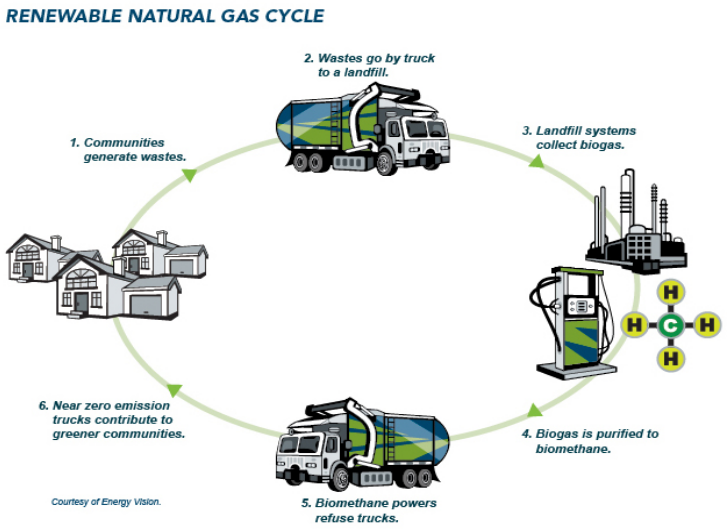
more cost-effective than converting homes from natural gas heating to electric heating. Since home heating loads are coincident with winter peak electricity demand, as noted above, inadequate infrastructure would have serious reliability consequences.

- In 2015 there was 8,500 GWhs of non-emitting surplus power produced in Ontario - enough to power 2.1 million electric vehicles (assumes approximately 4 MWhs per vehicle per year), which would reduce emissions by 8.4 MT per year.

In building heating, the use of an electric Air Source Heat Pump (ASHP) to completely displace natural gas heating in residential and small commercial applications, as was modelled in the OPO, would drive the need for additional electricity capacity in the winter. An "integrated" solution that retains gas heating to meet peaking requirements would be more efficient and cost effective, while still reducing GHG emissions significantly:

- Use an ASHP for summer cooling load and heating load on moderately cold days. Use natural gas supplemental heat to meet loads when outdoor temperatures are -8 C or colder. This solution recognizes that on colder days, ASHP's become much less efficient, meaning they will require more electricity to produce each unit of energy.
- This integrated solution reduces GHG emissions by 60%. Today's average home using natural gas for heating and water heating produces 4.3 tCO_2e whereas the "integrated" home would emit 1.6 tCO_2e, a reduction of 2.7 tCO_2e assuming that electricity consumed by the heat pump is non-GHG emitting. Consistent with OPO Outlook D, if applied to approximately 25% of single family homes in the Province, approximately 790,000 homes, the integrated solution would reduce GHG emissions by 2.1 million tCO2e per year by 2035
- This solution utilizes the existing capacity of the electricity and natural gas systems. It would not require significant infrastructure investment upgrades, but it will help consumers manage energy costs.

The LTEP should seek solutions that utilize existing infrastructure (natural gas and electricity) to the greatest extent possible in order to minimize cost to the Province and consumers, while at the same time reducing GHG emissions.



Decarbonizing Fuels

Renewable Natural Gas (RNG) is created by upgrading biogas that can be found on farms, landfills and food processing facilities to a quality that meets pipeline

injection specifications. RNG can then be transported throughout the natural gas distribution system.

RNG is non-emitting, and can replace up to 15% of conventional gas supply by 2035 according to the ministry's Fuels Technical Report. This would allow the province to reduce building emissions significantly, without having to build new transmission or distribution, at a fraction of the cost of electrification.

- RNG is a cost-effective option to reducing carbon (30% the cost of electricity)
- Climate Change Action Plan estimates a GHG reduction of 1,000,000 tonnes for $5 / tonne
- Timing is critical: Securing supply sources + negotiating terms + building facilities = 1-2 years per project
- Absent government action, 3rd Party developers continue to secure Ontario biogas supply and sell environmental attributes to California

Energy Costs:	
Traditional Natural Gas	2 cents / kWh
RNG (Low-Cost)	4 cents / kWh
RNG (High-Cost)	8 cents / kWh
Electricity (Mid-Peak)	13 cents / kWh
Electricity (On-Peak)	19 cents / kWh

The LTEP should be followed by an implementation directive to the Ontario Energy Board (OEB) which directs them to establish a renewable portfolio standard (RPS) for Ontario's natural gas utilities, which will require them source sufficient RNG to meet 2% of their total supply requirement by 2020 from supply options including, but not limited to landfill, source separated organics, and agricultural waste.

The Board should endorse rate regulated treatment of the upgrading and connection costs associated with these assets and their operation when determining service rates in addition to setting rates for the sale, transmission, distribution and storage of natural gas.

Despite assertions that we can work with the Ontario Energy Board through our Cap and Trade Compliance Plan to start procuring RNG, we believe the government needs to take the lead in driving this initiative forward.

The OEB is an economic regulator, and will evaluate our Compliance Plan and any alternatives to buying allowances against the cost of allowances, rather than the cost of emission abatement options across the economy. **With the release of the CCAP and the broader carbon strategy, the government should recognize that the OEB process typically does not allow for consideration of the cost of RNG against the full suite of abatement options and give the OEB explicit direction as part of the LTEP implementation plan.**

Transportation

While light duty vehicles will be increasingly powered by electricity, natural gas – including increasing amounts of renewable content and hydrogen – is the best solution for lowering emissions with today's medium and heavy-duty vehicles. Natural gas has roughly 25% fewer GHG emissions and is up to 40% less expensive than diesel or gasoline. The CCAP recognized this potential, stating that **"**The province intends to work with the Ontario Trucking Association, Union Gas, Enbridge and others to establish a network of natural gas fueling stations."

Enbridge already owns four public natural gas refueling stations in Ontario, as well as 20 private stations. We are working with municipalities across the province looking to "close the loop" by powering their refuse and bus fleets on RNG produced from organic waste collected in their own communities. Enbridge is also constructing the first power to gas project in North America for commissioning in 2017, which will provide a supply of hydrogen and create the potential to use existing natural gas infrastructure to deliver hydrogen blended with natural gas for a lower carbon footprint.

Due to the extensive coverage of Ontario's urban areas with natural gas pipeline infrastructure, the cost implications of building a network of natural gas refueling stations will be modest, and the fuel can be further decarbonized by integrating RNG and hydrogen produced from power to gas technologies, with the latter able to utilize surplus off-peak electricity. This would count towards the CCAP's goal of 5% of vehicle sales being EV and hydrogen fuel cell. **The LTEP should anticipate Ontario's plan to adopt a broader clean transportation policy and co-ordinate federal and provincial funding to provide certainty for the market.**

Conservation

Natural Gas demand side management (DSM) programs are widely recognized as being a highly cost-effective means of reducing natural gas consumption and in turn GHG emissions in the buildings sector, now and for the foreseeable future. The ministry's Fuels Technical Report identifies approximately 117 PJs of DSM energy savings potential by 2035, which would be a 10% reduction in natural gas use.

Enbridge's 6-year plan from 2015 – 2020 includes:

- Expanded annual budgets totaling $420M with a 2020 goal of reducing natural gas consumption by 12 MT

- Programs for all customers and sectors – including small commercial, multi-residential, residential energy management/behavioral, energy literacy and holistic industrial commercial programming
- Collaboration and Innovation Fund to work with electric LDCs to enable innovation and create conservation pilot projects, which if successful, become full-fledged programs

Ontario's Environmental Commissioner stated that natural gas conservation initiatives are a "good value for society" at $2.43 in savings per dollar spent (2015). Conservation remains one of the lowest emission reduction options and it should be prioritized ahead of electrification and in conjunction with decarbonizing existing fuels.

Enbridge believes that programs funded through the Greenhouse Gas Reduction Account (GGRA) will be most effective if they are delivered in a way that takes full advantage of GHG reduction opportunities in as short a timeframe as possible. We recommend that Ontario takes advantage of proven program delivery models that have formed the basis of utility conservation programs for many years.

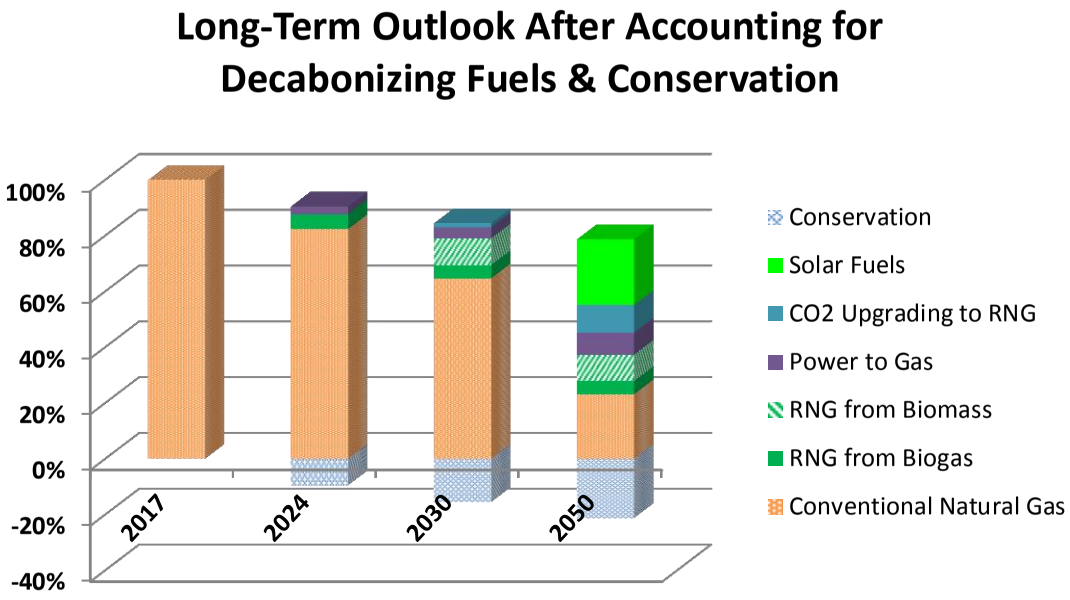
Enbridge believes that in order to successfully deliver CCAP energy efficiency programs effectively, careful coordination between government agencies, the IESO, electricity distributors and natural gas distributors will be critical. If a sufficient level of coordination can be achieved, the CCAP initiatives can be positioned in the market so as to eliminate overlap, gaps and confusion while providing program participants with a seamless and convenient customer experience. **The LTEP should highlight the successes of existing conservation programs and make a long term commitment to utility-lead DSM.**

Technology and Innovation

Just as the ministry drove significant investment in electricity sector innovation through the Smart Grid Fund, storage procurements, and the IESO's Conservation and Innovation Fund, natural gas utilities require leadership from the ministry to ensure that we can make comparable forward-thinking investments. Research, development and commercialization in technologies across the spectrum of efficiency (natural gas heat pumps), carbon sequestration and green gas (gasification, power to gas, methanation) have significant potential to reduce costs and emissions in the medium and long term, while maximizing use of current energy infrastructure.

- In Quebec, the regulator allows for a 50 cent per-customer charge to fund the Natural Gas Technology Centre, which makes investments in innovative natural gas solutions.

Explicit policy direction from the ministry will be required to enable natural gas utilities to make strategic investments in progressive technologies. A $1 per meter per month innovation levy - or a comparable mechanism - would enable Enbridge to make transformative investments.



Through policy direction, regulatory support and funding commitments, the LTEP should enable the natural gas solutions identified in the government's Climate Change Action Plan (CCAP).

The LTEP should identify these initiatives as the most affordable and reliable means of meeting Ontario's GHG reduction targets, and work with MOECC to prioritize and allocate funding to them before more disruptive and expensive options are pursued.

Conclusion

Enbridge believes that the vision for the LTEP which we've outlined above will meet Ontario's emission reduction objectives while ensuring that our energy systems are as reliable and affordable as possible for consumers.

While the CCAP compelled the ministry and the IESO to create the OPO and Fuels Technical Report to address uncertainty in electricity and natural gas demand going forward, we believe that the LTEP needs to inform the CCAP with respect to how best to achieve the Province's GHG reduction targets while striving for reliable, affordable energy in Ontario. The LTEP should contemplate how to best to prioritize GGRA investments in the various CCAP emission reduction initiatives based on the principles of affordability and reliability, with an emphasis on utilizing existing infrastructure.

We thank the ministry for the opportunity to participate in the LTEP consultation process and provide this written submission. We look forward to working with the ministry to continue the progress we've made in the natural gas sector to date, particularly on the opportunities outlined above.

Electrification and Ontario's Long Term Energy Plan

December 1, 2016

Prepared for:
ENBRIDGE GAS DISTRIBUTION AND UNION GAS

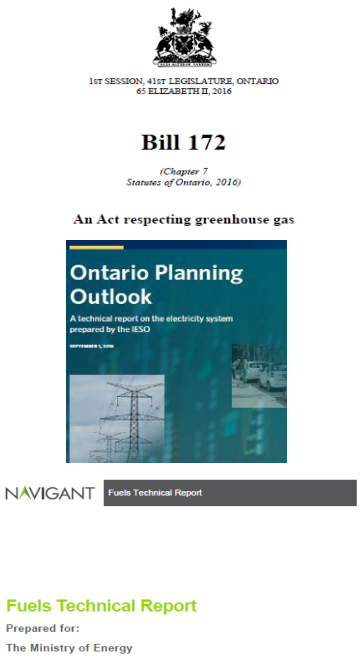
Duncan Rotherham

Key Messages

- The electricity and natural gas systems currently work in a complementary fashion to meet total annual demand (~400TWhs) for energy as well as winter (natural gas 80GW) and summer (electricity 25GW) peak demand.
- Natural gas supplies twice the annual energy of electricity at 20% the cost per unit of energy.
- Electrification measures aimed at natural gas will be challenged by cost effectiveness and the capacity constraints of the existing electrical system. Significant investment in electricity generation, transmission, and distribution required to meet any new winter peak capacity requirement.
- Home heating related measures (e.g. heat pumps) that rely on electricity to operate must be balanced with affordable and reliable natural gas to protect consumers, maximize consumer choice and ensure a reliable, affordable and sustainable energy system.
- An integrated option heats the home with electricity and natural gas without impacting the winter peak day electric demands in Ontario. It would reduce emissions by 60%, minimize the need for additional electric infrastructure (generation, transmission, distribution, in-home) and cost less that half of the full home electrification.
- By focusing on the electrification of vehicles the province can reduce GHG emissions and create value with existing non-emitting generation domestically at little or no cost.

Ontario's Energy and Climate policy must come into synchronicity in the Long Term Energy Plan.

Optimizing existing energy infrastructure and existing / evolving technology will be critical to meeting Ontario's decarbonisation goals in a cost effective manner while ensuring a reliable, affordable and sustainable energy system.



Climate Change Mitigation and Low-carbon Economy Act, 2016

IESO Ontario Planning Outlook (Sept 2016)

MoE Fuels Technical Report (Sept 2016)

As an input to Ontario's Long Term Energy Plan (LTEP) the following considers the viability of opportunities to leverage electrification measures identified in Ontario's Climate Change Action Plan (CCAP) and modeled in the IESO's Ontario Planning Outlook (OPO) electrification scenarios.

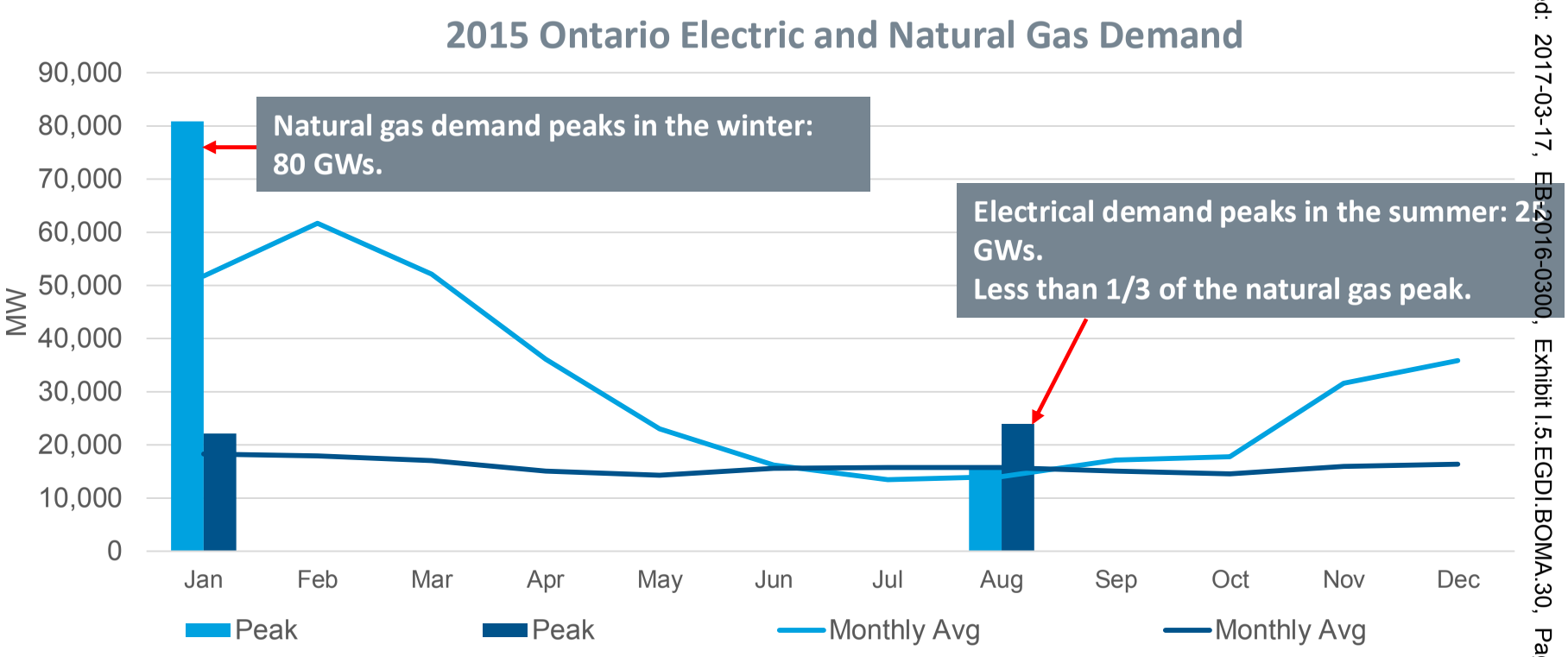
Contents

A) Understanding Ontario's energy systems: Electricity and Natural Gas

- Natural gas meets almost twice the annual energy demand as electricity and over three times the peak day demand.
- The natural gas system provides this energy for 20% the cost on a per unit of energy basis vs. electricity.
    - The natural gas system has a book value of $16.3B. In 2015 it deployed 270 TWhs of energy at cost of $7.7B or $30/MWh.
    - The electricity system has a book value of >$70B. In 2015 it deployed 142.5 TWhs of energy at cost of $20.5B or $142.5/MWh.

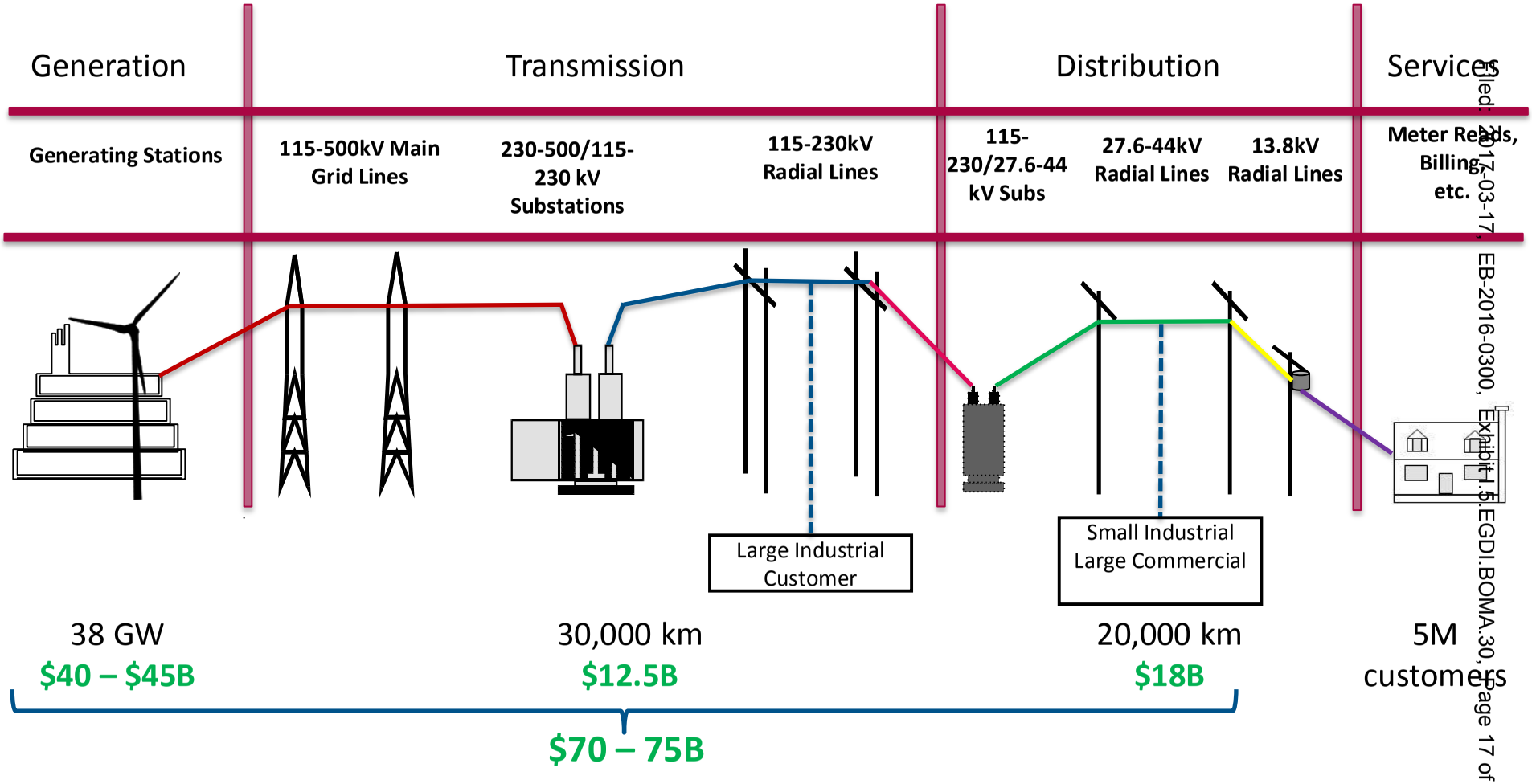
Recognizing the role / importance of natural gas in Ontario.

Natural gas meets over 80% of winter peak day demand and more than twice the annual energy demand of electricity.



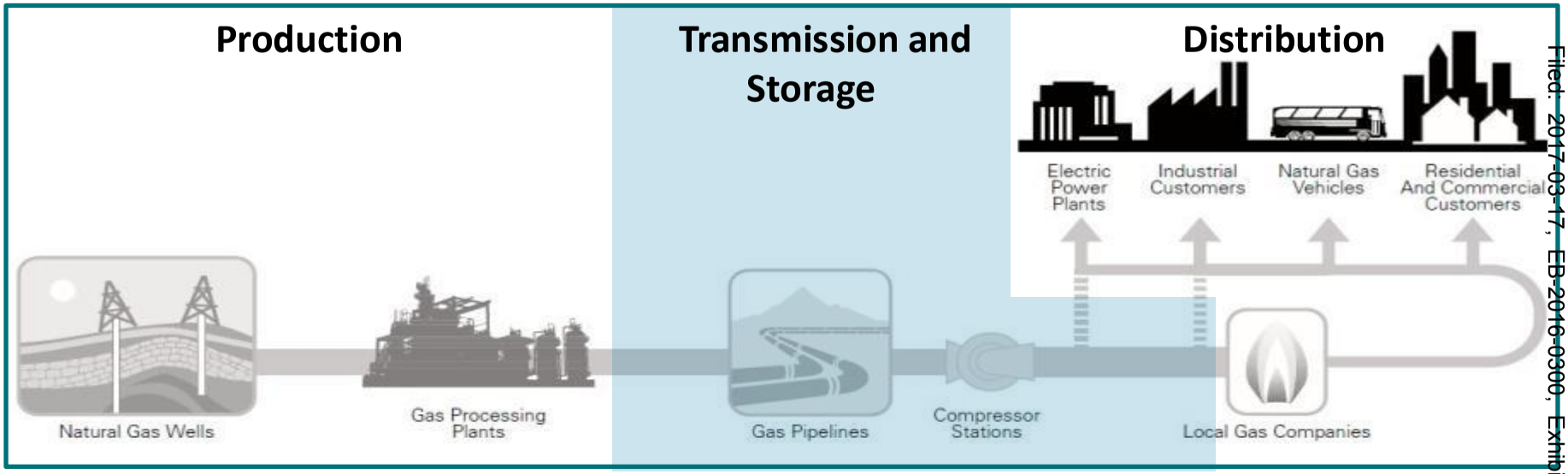
On an annual basis the natural gas system provides 270 TWh (~1,000 PJs) to customers in Ontario while the Ontario electricity system provides 142.5 TWh (~525 PJs) in net energy.

Ontario's electrical system infrastructure book value = $70-75B.



In 2015 the total cost of electricity service was $20.5B/yr with an average unit cost of $142.5/MWh.

Ontario's natural gas system infrastructure book value = $16.3B



Source: Natural Gas Council

Production upstream of Ontario*

13,000 Km
78 compressor stations
80+ TWh energy storage

102,000 km

3.6M customers

$16.3B

In 2015 the total cost of natural gas provided was ~$7.7B/year with an average unit cost of $30/MWh across all residential, commercial and industrial customer classes.

* Costs of gas production and transmission and commodity price have been included in cost analysis

B) Electrification of the winter peak: Challenges and Costs

- Electrification of the winter peak natural gas load will be more significant and costly than initial high level estimate provided by the IESO
- IESO top-down analysis in the Ontario Planning Outlook underestimates peak capacity required to meet greater electrification of the economy and cost.
- Due to day to day and seasonality driven “peakiness” the added winter peaking capacity, while costly and critical for reliability, will rarely be called on.
- Due to the underestimation of the peak capacity requirement the IESO analysis also underestimates the $/MWh impact.
- Due to the above, and the cost of natural gas vs. electricity, electrification measures that impact winter peak will be very costly.

ICF and IESO Reports - Both Provide Valuable Insights and are Complementary

A Difference in Approach

- IESO OPO report reviewed the impact on capacity for a target demand
- ICF built a bottom up analysis for a single home and applied it to all homes included in Outlook D

A Difference in Assumptions

- IESO report assumes normalized weather and considers coincident peak impacts; these peaks may not be coincident
- ICF report assumes peak demand requirements
- ICF report specifies air source heat pump for water and space heating

A Similar Conclusion

- Peak capacity will increase ~11 GW which has a significant capacity impact for Ontario and will be challenging from a cost and practical perspective

11.8 GW of peak capacity to meet demand from full electrification of ~25% of single family homes alone; Full economy impact of 80 GW compared to existing peak electric capacity of 25 GW.

1 home

~790,000 homes

All 3M homes

All NG load

14.7 kW*	**11.8 GW**	44 GW	80 GW	Capacity at peak
	16 - 21 GW	60 - 75 GW	100 GW	Installed capacity to meet peak
	$10 - $12B/yr	$35 - $45B/yr	$65 - $80B/yr	Added annual cost of electricity service

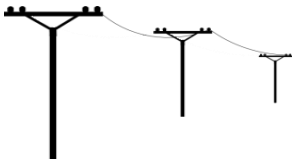
14.7 kW* - assumes complete electrification of the home (heat and hot water) via ASHP and HPWH.

ICF and IESO analysis illustrate electrification impacts peak day; IESO initial analysis may be understated

	IESO Outlook "D"	ICF
Scope	Residential (single and multi-family), commercial, industrial, EVs, public transport.	Single family homes
Key Assumptions (2035)	Electric heat pump, space and water heat gain 50% of res/comm market;10% industrial; 2.4M EVs	25% homes converted by 2035 (790,000 homes)
Peak Impact	+11.3 GW	+11.8 GW
Added Generation	+49 TWh (vs Outlook B); +13 TWhs from residential alone; total 197 TWhs	+8.7 TWhs; total 157 TWhs
Added Annual Cost	+$8.5B/yr for added generation (excluding distribution) Total of $27.5B/yr for system	$10-$12B/yr for added generation (including distribution) Total of $30B/yr for system
$/MWh Cost	$170/MWh for added generation $137-142/MWh for system	$500-600/MWh for added generation $190/MWh for system

Illustrating the impact of added capacity and low load factor (~10%) resulting from the electrification of 25% of single family homes and 2.4M Evs on the cost of electricity ($/MWh)

+ 15-20 TWh/yr



16 - 21 GW capacity installed

$10 - $12B/yr in added cost of electricity service

Added annual demand

=

$500-600* / MWh

Per unit of added supply

vs.

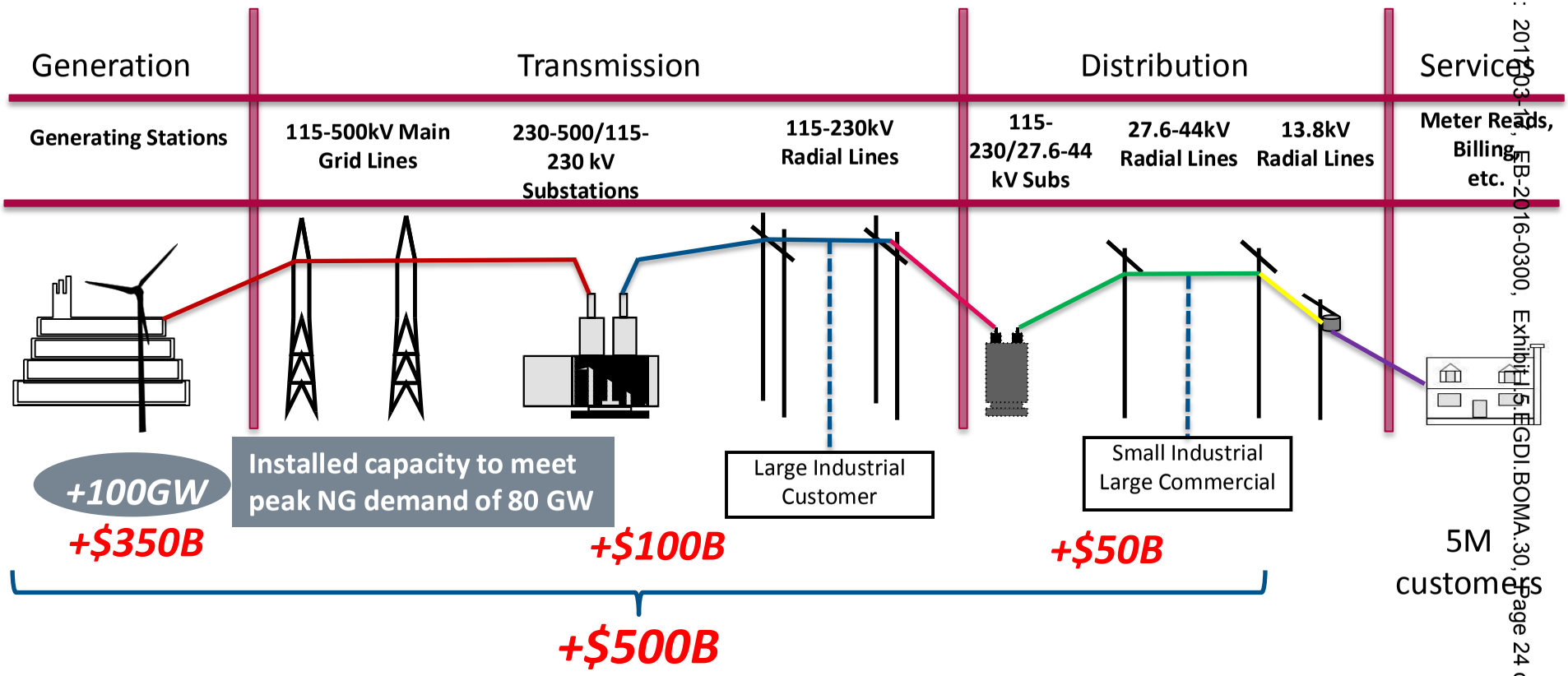
IESO's estimated $170/MWh for added supply

790,000 homes and 2.4M EVs compare with the single family home and transport components of the IESO's Outlook D. IESO's Outlook D demand expected to increase by 49 TWhs and system cost by $8.5B/yr = $170/MWh.

**If overnight EV charging is free, or <$140/MWh, the cost per unit of added supply could be as high as $1,250/MWh*

Illustrative depiction of Ontario's electric system infrastructure under a full electrification scenario. $500B in capital required.

No such energy system transition has been considered in a jurisdiction such as Ontario



The total cost of electricity service could be $100B/yr with an average unit cost of ~$250/MWh.

Compare to 2015: $20.5B/year, average unit cost of $142.5/MWh.

Home Electrification: results for the single family existing home.

The cost (system and rate) of electricity vs. natural gas will make natural gas to electric measures very expensive. And well beyond the expected $18/tCO2 cap and trade price.

Electrification scenario:	Per Home	~25% of Homes
Capital Costs (delta vs NG)	$2,850	$2.25B
Annual Energy Costs (delta vs NG)	$1,000/yr	$0.8B/yr
Total = Capital + Energy Costs (15 yr)	$18,000	$14B
Annual Emissions from NG (tCO_2)	0 / yr	0
Annual Emission Reductions (tCO_2)	4.3 / yr	3.4 M / yr
Increase in Annual Electricity Consumption	11,000 kWh	8.7 TWh
Additional Winter Peak Demand	14.7 kW	**11.8 GW**
Cost of Emission Reduction (tCO_2)	$280 / tCO2	
Cost of upgrade to distribution system (15 yr)	**$6,500**	$5B
Total = Capital + Energy and Dist Costs (15 yr)	$24,500 ($1,600/yr)	$19B ($1.3B/yr)
Cost of Emission Reductions	**$380 / tCO2**	

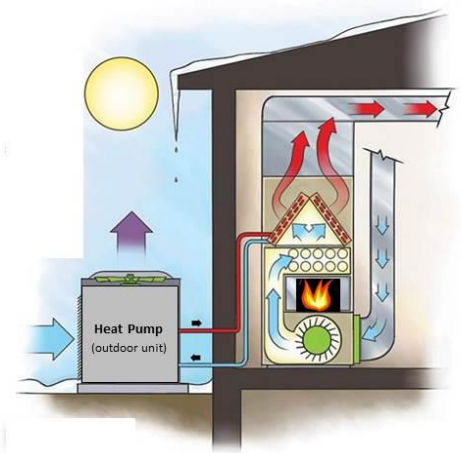
Assuming no need to upgrade the distribution system and no change in price per unit of electricity electrification of an existing home in Ontario would add $18,000 in cost over the 15 year lifetime of the electric technology vs natural gas and reduce emissions at $280/tCO2.

The distribution system would need to be tripled to meet 3X peak system cost would increase $432/yr per home or $6,500 over 15 yrs. Cost per tonne of reduction would rise to $380/tCO2.

C) Utilizing Existing Electricity & Natural Gas Energy Infrastructure to Mitigate Cost of Decarbonisation

- An integrated option can reduce GHG emissions by 60% and optimize existing electricity & natural gas energy effectiveness vs. a full electrification measure.
- The full electrification solution can only yield reductions under the assumption that the electricity is non-emitting. This may become a challenge in the 2020-2035 timeframe with the loss of nuclear baseload capacity.
- Lower cost and higher effectiveness of the integrated solution allows for broader deployment throughout the economy and greater reductions.
- Targeting the new home can further decrease cost.

An Integrated Option: Utilizing Existing Electricity & Natural Gas Infrastructure to Mitigate Cost of Electrification



Source: www.familyhandyman.com

To minimize the need for incremental expensive winter peaking capacity and electric system transmission and distribution upgrades…

- Rather than the full-electric air source heat pump (ASHP) exclusively, leverage ASHP efficiency for spring, fall and most winter days and integrated natural gas fired technology for extreme cold periods.

This option would **reduce GHG emissions by ~60%** versus a home that currently heats with natural gas alone – if applied to **25% of single family homes** by 2035 this solution would reduce annual GHG emissions by **2 Mt CO2e/yr** and **30 Mt CO2e** over the 15yr measure life.

The integration option can be scaled to deliver more reductions at less cost

Electrification scenario:		ASHP + HPWH	Integrated ASHP + NG
# of Homes Converted to Electricity	Existing Homes	680,000	
	New Homes	110,000	
	Total	**790,000**	
Total Measure Spend		$19B	**$7.9B**
Annual Emission Reductions	Zero-Carbon Elec.	3.3 MtCO2e/yr	2.0 MtCO2e/yr
Increase in Annual Electricity Consumption		8,000 GWh	4,500 GWh
Additional Winter Peak Grid Demand		11,800 MW	0 MW
Cost of Emission Reductions		$380 / tCO2	**$250 / tCO2**

Full electrification of 790,000 homes in Ontario would add $19B in cost (vs a conventional NG solution).

An integrated electric – gas option would add $7.9B in cost and minimize requirement for costly added winter peaking electrical capacity to meet load.

- **The integrated option mitigates the cost per portfolio of 790,000 homes (~25% of Ontario) by ~$11B.**
- **Reductions per home are higher under a full electrification ONLY where all added electrical capacity is non-emitting.**

Targeting the new home can further reduce costs.

Ontario adds 25,000 new single family homes per year. Deploying an integrated electric-gas option can mitigate the cost of full electrification.

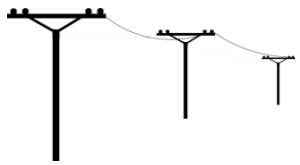
Electrification scenario:	Integrated ASHP + NG
Capital Costs (delta vs NG Base Case)	-$1,000
Annual Energy Costs (delta vs NG Base Case)	$410/yr
Total Measure Spend (= Capital Cost + Lifetime Energy Costs)	**$5,200**
Annual Emissions from NG	1.4 tCO2e/yr
Annual Emission Reductions	1.9 tCO2e/yr
Increase in Annual Electricity Consumption	4,100 kWh/yr
Additional Winter Peak Demand	0 kW
Lifetime Cost of Emission Reduction	**$180 / tCO2**

The integrated option for new homes is $5,200 in added cost per home.
Almost half the cost of an existing home.

Reductions per home are lower under the assumption the new home is more energy efficient, however cost effectiveness is better.

$2B CCAP Funding: The integrated electric – gas option will impact more homes drive more reductions at less cost vs. full electrification

$2B
Funding dedicated to home electrification

			**Emission Reductions tCO_2/yr**
Option1: Full Electrification	**~81,000 homes**	**900 GWhs +1.1 GW peak**	**350,000 t/yr** @ $380/tCO2
Option 2: Integrated: Existing Home	**~200,000 homes**	**1,100 GWhs +0 GW peak**	**540,000 t/y** @ $250/tCO2
Option 3: Integrated: New Home	**~384,000 homes**	**1,600 TWhs +0 GW peak**	**730,000 t/yr** @ $180/tCO2

Cost effective deployment of the proceeds of sale of cap and trade allowance will be critical to meeting Ontario's target and minimizing reliance on exogenous compliance units that transfer wealth.

Electrification of the personal vehicle is much more viable an electrification measure than the home.

But with a goal of reducing emissions cost effectively the market should pick winners and losers not the government.

8 M personal vehicles		3 M single family homes
2.5 M EVs = 8 TWhs/yr	-10Mt CO_2/yr	2.3 M homes = 25 TWhs/yr
~2 GW of capacity Smart charge features predictably peaky		+35 GW capacity Very winter peaky
~\$0/tCO_2 over measure life +\$2B/yr in cost of electricity service		+\$6.5B in capital cost (ASHP+HPWH) ~\$380/tCO_2 over measure life +\$50B/yr in cost of electricity service

Recap: Key Messages

- The electricity and natural gas systems currently work in a complementary fashion to meet total annual demand (~400TWhs) for energy as well as winter (natural gas 80GW) and summer (electricity 25GW) peak demand.
- Natural gas supplies twice the annual energy of electricity and 20% the cost per unit of energy.
- Electrification measures aimed at natural gas will be challenged by cost effectiveness and the capacity constraints of the existing electrical system. Significant investment in electricity generation, transmission, and distribution required to meet any new winter peak capacity requirement.
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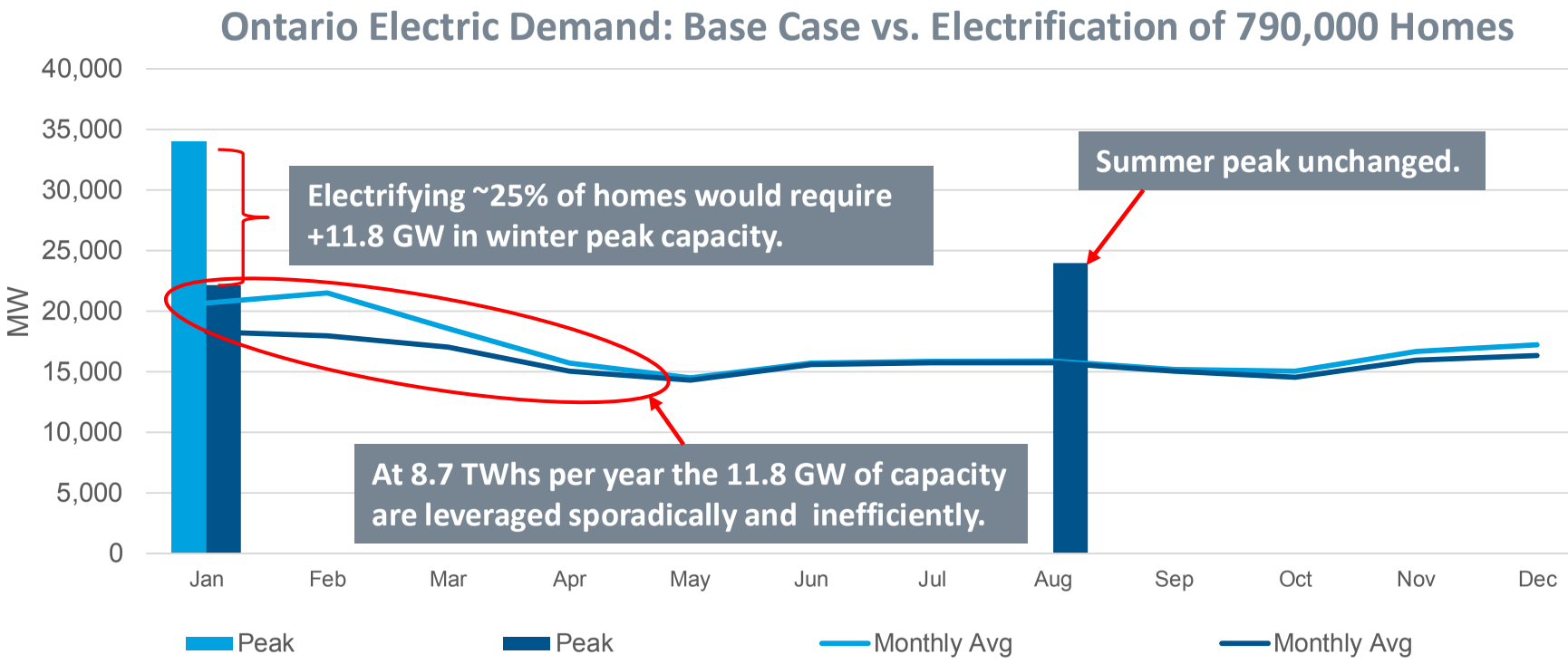
- By focusing on the electrification of vehicles the province can reduce GHG emissions and create value with existing non-emitting generation domestically at little or no cost.
- An integrated option allows gas and electricity to heat the home without impacting the winter peak day electric demands in Ontario. It would reduce emissions by 60%, minimize the need for additional electric infrastructure (generation, transmission, distribution, in-home) and cost less that half of the full home electrification.

Thank you

The addition of new winter peak electrical capacity is critical BUT it will only be leveraged annually at 8%



The IESO estimate of added capacity required to meet economy wide electrification targets under-estimates the challenge:

11 GW of peak winter capacity would be required to electrify 700,000 – or 20-25% of residential single family homes – not the IESO's economy-wide measures.

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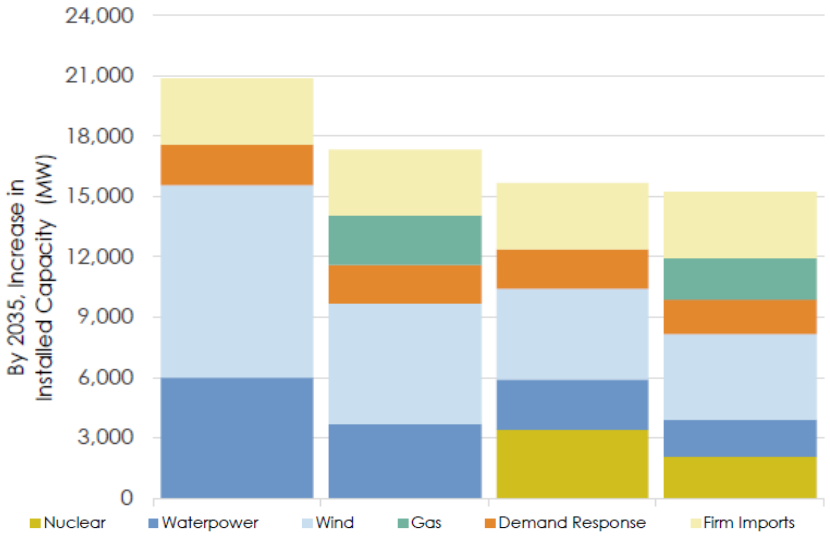
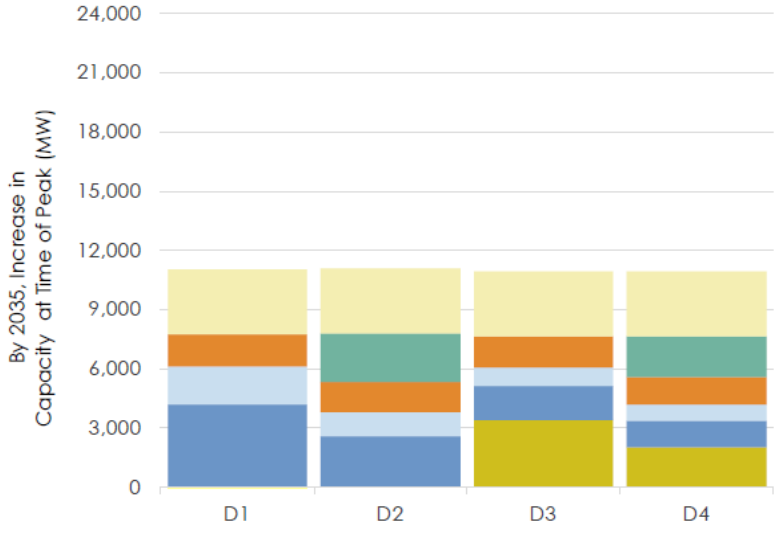


Electrical capacity requirements resulting from electrification (est. 16-21 GW) will require $Bs for generation, transmission and distribution systems

Ontario Planning Outlook: A technical report on the electricity system prepared by the IESO. September 1, 2016.



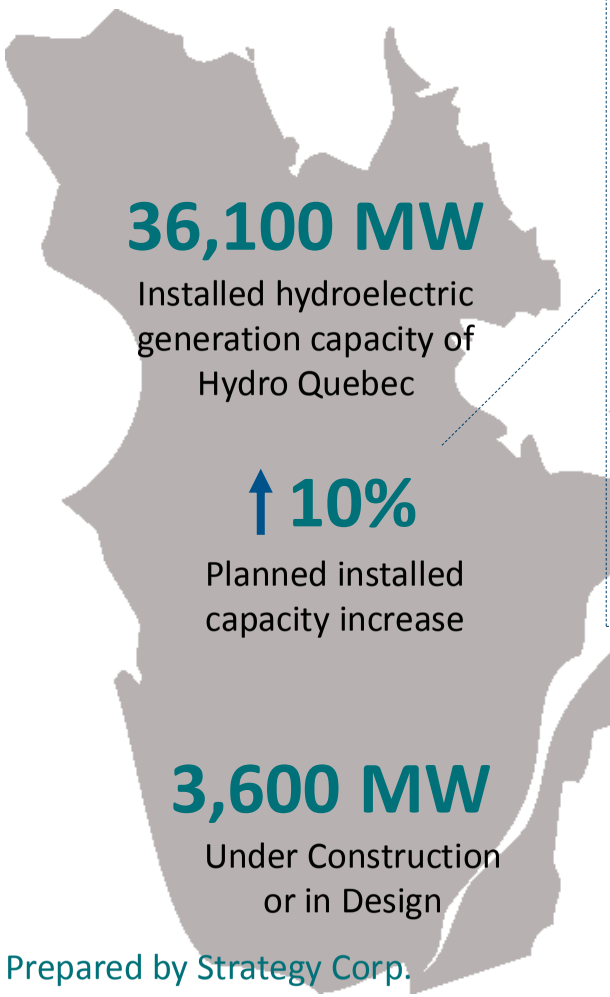
Winter peak capacity estimated to increase from 22 GW (2015) to 33 GW (2035) as a result of electrification measures.
The addition of 11 GW illustrated above would be adequate to meet the peak day demand from ~700K residential homes NOT the "economy".

IESO Assumptions Across Demand Outlooks

Sector	Outlook A	Outlook B	Outlook C	Outlook D
Residential (52 TWh in 2015)	48 TWh in 2035	51 TWh in 2035	Oil heating switches to heat pumps, electric space and water heating gain 25% of gas market share (58 TWh in 2035)*	Oil heating switches to heat pumps, electric space and water heating gain 50% of gas market share (64 TWh in 2035)
Commercial (51 TWh in 2015)	49 TWh in 2035	54 TWh in 2035	Oil heating switches to heat pumps, electric space and water heating gain 25% of gas market share (63 TWh in 2035)	Oil heating switches to heat pumps, electric space and water heating gain 50% of gas market share (69 TWh in 2035)
Industrial (35 TWh in 2015)	29 TWh in 2035	35 TWh in 2035	5% of 2012 fossil energy switches to electric equivalent (43 TWh in 2035)	10% of 2012 fossil energy switches to electric equivalent (51 TWh in 2035)
Electric Vehicles (<1 TWh in 2015)	2 TWh in 2035	3 TWh in 2035	2.4 million electric vehicles (EVs) by 2035 (8 TWh in 2035)	2.4 million EVs by 2035 (8 TWh in 2035)
Transit (<1 TWh in 2015)	1 TWh in 2035	1 TWh in 2035	Planned projects, 2017-2035 (1 TWh in 2035)	Planned projects, 2017-2035 (1 TWh in 2035)
Other**	5 TWh	5 TWh	5 TWh	5 TWh
Total* (143 TWh in 2015)**	**133 TWh in 2035**	**148 TWh in 2035**	**177 TWh in 2035**	**197 TWh in 2035**

Ontario Planning Outlook: A technical report on the electricity system prepared by the IESO. September 1, 2016.

Quebec is expanding its hydro capacity but it will not be enough to meet Ontario's needs on a regular basis



36,100 MW
Installed hydroelectric generation capacity of Hydro Quebec

↑ 10%
Planned installed capacity increase

3,600 MW
Under Construction or in Design

Prepared by Strategy Corp.

Competing Export Jurisdictions

New England

New York

Ontario

Midwest

PMJ Interconnection

- Quebec hydro cannot replace natural gas in Ontario because Quebec's supply is barely sufficient to meet its own internal demand
- Quebec is a winter peak jurisdiction with peak demand of 39,031MW and 38,743 MW in 2013-14 and 2014-15, respectively
- Ontario is becoming a dual peak jurisdiction with winter peak demand of 25,368 MW (2013-14) and 23,219 MW (2014-15) and summer peak demand of 23,297 MW (2013-2014) and 24,855 MW (2014-2015)
- Ontario also has severe infrastructure constraints in accepting firm imports from Quebec

Ontario Infrastructure Upgrade	Estimated Cost	Time
1. 500MW existing firm capacity		
2. 1,000MW firm capacity	$325M	3-5 years
3. 1,800MW firm capacity	$500M	5-7 years
4. 3,300 firm capacity	$1.4B	7-10 years

Filed: 2017-03-17, EB-2016-0300, Exhibit I.5.EGDI.BOMA.30, Page 37 of 37

BOMA INTERROGATORY #31

INTERROGATORY

Issue 5

Ref: Carbon Price

There have been various ten year carbon price forecasts published by consultants, utilities, etc., including ICF. Please provide ICF's most recent ten year carbon price forecast.

RESPONSE

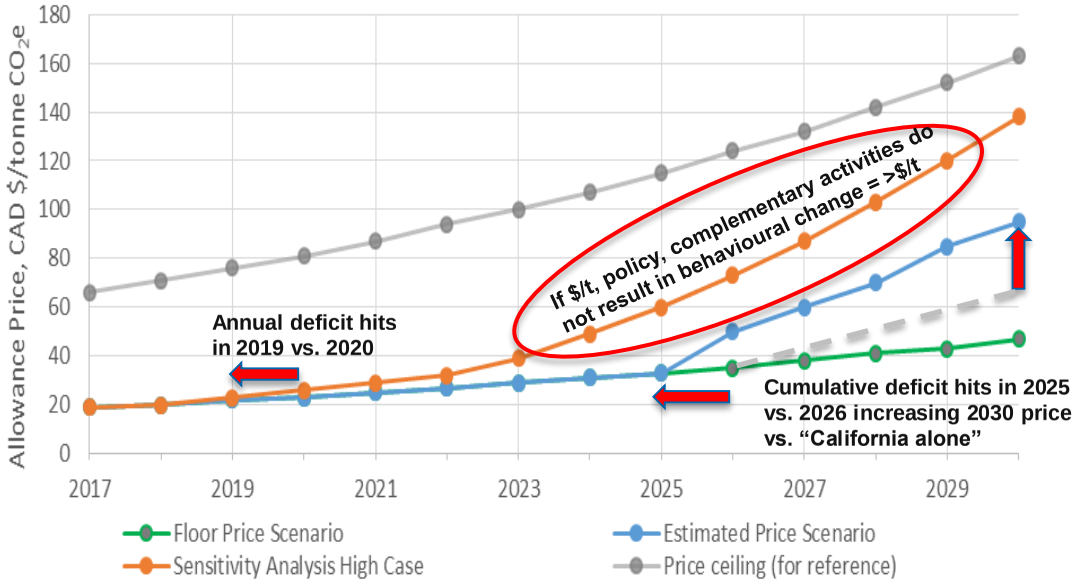
Please refer to attached price forecast titled, “WCI (+Ontario) allowance price forecast”.

This forecast, which was received by Enbridge in April of 2016, is similar to the forecast provided by ICF at the Ontario Energy Association’s seminar “Climate Change: Unravelling the Complexities of COP21” on February 18, 2016. The only difference between the two forecasts is the forecast of the total cost of Ontario’s acquisition of California allowances by 2030.

Witnesses: A. Langstaff
J. Murphy

WCI (+ Ontario) allowance price forecast

Allowance price will remain low through 2022-2025 timeframe and then increase significantly



- Ontario joining WCI "short" moves annual deficit to 2019 (vs 2020) and market in deficit by 2025 (vs 2026).
- Between 2025 and 2030 price moves off floor of $32 to $95 CAD by 2030.
- Higher emissions scenario could drive price to $140 CAD by 2030.
- By 2020 Ontario market will be acquiring $250 – $300M of California allowance/yr.
- By 2030 close to $4B (40Mt by $95).
- Other jurisdictions will likely join WCI pre-2020 for 2020-2030 term market viability.

BOMA INTERROGATORY #32

INTERROGATORY

Issue 5

Ref: Exhibit G, Tab 1, Schedule 1, p1 - Cost Recovery

From which customers will the costs of acquiring natural gas derived from biomass be recovered?

RESPONSE

The Company has not reached a final determination with respect to this question at this time. The Company will address this issue if and when it presents any proposals to the Board concerning the Company's potential procurement of RNG supplies.

Witnesses: A. Kacicnik
S. McGill

BOMA INTERROGATORY #33

INTERROGATORY

Issue 5

Ref: Exhibit A, Tab 2, Schedule 1 – 1.4 Compliance Plan - Issue 5 - Cost Recovery

Preamble: EGD appears to the Board for a determination that the Company's Compliance Plan is compliant with the (Board's) Framework, and is accepted by the Board because ...

> "(b) it is reasonable and has prudently optimized decision making to achieve efficiency and to reasonably manage risk, given the legislative framework of the tools available at this time, and the lack of data around Ontario nascent carbon market.
>
> (c) it demonstrates EGD's planned investment decisions have been prudently prioritized and paced, indicating proposed long term investments. "

(a) Please confirm that EGD is not asking the Board at this time for an "advance ruling" that its 2017 expenditures to comply with its 2017 compliance plan are prudently incurred.

(b) What information, or categories of information, does EGD believe should be treated in confidence because it is commercially and strategically sensitive, other than the specific auction-related information items, the publication of which is prohibited by subsections 32(6) and 32(7) of the Climate Change Mitigation and Low Carbon Economy Act (the "Climate Change Act")?

(c) Please provide examples of information, which if not redacted could be used by a third party to minimize its Compliance Plan and negatively affect ratepayers.

(d) Please use examples, hypothetical, but sufficiently specific to show the likely negative effect on ratepayers.

(e) The MOEE's Auction Notice, passed in January 2017 announced the initial public auction of allowance will be held on March 22, 2017. Is it EGD's view that the auction will be held on that date, or will it be postponed?

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

RESPONSE

a) Enbridge does not understand what is meant by the term "advance ruling". This proceeding will result in final tariffs which will be recovered from ratepayers. The proposed deferral and variance accounts will then be used to recover or return any shortfall or over recovery relative to actuals. The clearance of the amounts in these accounts will require Board approval. This being said, the purpose of this proceeding is to determine the reasonableness of the Company's Compliance Plan. To the extent that it is approved by the Board and Enbridge executes as contemplated in the Compliance Plan, the Company submits that this is evidence of it having acted prudently. There would therefore be no basis to deny the clearance of any amount recorded in the deferral and variance accounts.

b) As directed on page 10 of the Framework, Enbridge has identified confidential information as either "Auction Confidential" or "Market Sensitive" as indicated in Exhibit A, Tab 3, Schedule 1, revised 2017-01-27, page 9, Table 2 and page 10, Table 3. These tables provide a detailed list of the information that Enbridge has indicated as confidential and which if disclosed could compromise the integrity of the markets contrary to the provisions of the *Climate Change Act*.

   Enbridge submits that all confidential information pertaining to its Compliance Plan filing is considered "Auction Confidential" or "Market Sensitive".

c) The information outlined on Tables 1 through 3 filed at Exhibit A, Tab 3, Schedule 1 indicate Exhibits, which if not redacted or identified as confidential could compromise the integrity of the Cap and Trade market. To provide specific examples of information which if not redacted or held in confidence could be used by a third party to potentially manipulate the market and negatively affect ratepayers. As such, Enbridge is not able to provide specific examples of such information.

d) It is premature to speculate on potential negative impacts and effects on ratepayers while the Cap and Trade market is still nascent. However, Enbridge is of the view that releasing market sensitive information could provide inappropriate advantages to market participants that could ultimately increase costs of compliance to Enbridge customers.

e) Enbridge is not in a position to speculate on whether the auction will be postponed or held as scheduled by the government on March 22, 2017.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #34

INTERROGATORY

Issue 5

Ref: Exhibit B, Tab 1, Schedule 1

When, in EGD's view, will the Board make available its ten year carbon price forecast and its Marginal Abatement Cost?

RESPONSE

Enbridge understands the Board's Consultant is working towards a late May early June timeframe for the ten year carbon price forecast, being referred to as the Long Term Carbon Price Forecast (LTCPF), and the Marginal Abatement Cost Curve (MACC).

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #35

INTERROGATORY

Issue 5

Ref: Exhibit B, Tab 2, Schedule 1, p2; and Table 1 on p3

Please explain the use of the term "partially effective volumetric reduction".

RESPONSE

By “partially effective volumetric reduction”, Enbridge refers to reductions realized in the first calendar year of an activity, acknowledging that the activity may have been initiated later than January 1st and therefore was not operational for a full year. By comparison, "fully effective" reductions signal that the activity was operational for the entire calendar year.

Witnesses: M. Lister
F. Oliver-Glasford

BOMA INTERROGATORY #36

INTERROGATORY

Issue 5

Ref: *Ibid*, p3

Please provide the names of the capped participants in Table 1 (link provided to EGD from MOECC an October 7, 2016).

RESPONSE

Please refer to the response to BOMA Interrogatory #27 filed at Exhibit I.1.EGDI.BOMA.27 (e).

Witnesses: A. Langstaff
J. Murphy

BOMA INTERROGATORY #37

INTERROGATORY

Issue 5

Ref: Exhibit B, Tab 4, Schedule 1, p3, 1.3 Carbon Price Forecast

The evidence states:

> "EGD has, per the Board's instructions, calculated a 2017 carbon price forecast based on the ICE settlement prices ($16.50 CDN). That price should be used to calculate the price of allowance available at auction, or otherwise, given that the Board's ten year price is not yet available. The auction reserve price, the lowest price that can be bid in the auction, is established per the Board's policy to be $17.70 CDN" (see Table 3 - B, 4, 1, p7).

Please provide the text of the sentence immediately following under the heading Discussion on Appropriate Price for Rate Setting. As an explanation of what price EGD chose to put in rates, it is a critical input to parties understanding whether EGD is acting prudently and fairly in establishing forecast cost of the Company's program, an amount that will be recovered from ratepayers in 2017 final rates.

RESPONSE

Enbridge is not permitted to provide this information for reasons of confidentiality as set out in the Climate Change Mitigation and Low-carbon Economy Act, 2016 ("Climate Change Act"), Cap and Trade regulations and the Report of the Board in respect of the Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities (EB-2015-0363) ("Framework").

In EB-2016-0300, Exhibit A, Tab 3, Schedule 1, Enbridge indicated that:

> certain activities which Enbridge will necessarily undertake to meet its Cap and Trade obligations must be done in a manner which ensures the integrity of the market and is in confidence. The Climate Change Act contains specific prohibitions against conduct which would constitute a market fraud or market manipulation. It also contains specific prohibitions against the disclosure of certain types of information under Section 32.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

The evidence noted that

> Subsection 32(9) reads: Subsection (6), (7) and (8) do not apply with respect to a disclosure to such persons as may be prescribed. Under Section 65 to Ontario Regulation 144/16 "The Cap and Trade Program" the Board is a prescribed person. It is therefore a statutory requirement that the information identified in subsections 32(6) and (7) must not be disclosed to any person other than the Board.

The evidence indicated that:

> The "Framework recognizes these disclosure limitations and notes at page 9:
>
> The OEB recognizes that the Ontario Cap and Trade market is still nascent, and that the protocols and procedures surrounding confidential information must evolve as the market matures. The OEB believes that, in the early stages of the market's development, the appropriate approach must not only comply with the Climate Change Act and associated regulations, it should also be cautious and have regard to market integrity in order to protect customers from undue costs while still making appropriate information publicly available where possible.
>
> The Board has set two categories of strictly confidential Cap and Trade Information: Auction Confidential and Market Sensitive Confidential information. Specifics and examples of such information are included at page 10 of the Framework. Enbridge notes that where information is either Auction Confidential or Market Sensitive, it will be automatically treated as confidential and will only be reviewed by the Ontario Energy Board."

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #38

INTERROGATORY

Issue 5

Ref: Exhibit C, Tab 1

(a) Why does EGD not have any dedicated specialists in cap and trade, carbon pricing, carbon taxes, on its Carbon Procurement Governance Group, other than Manager Carbon Strategy, and Business Environment Specialist, and Senior Environmental Advisors Carbon Strategy, none of whom are voting members of the CPGG.

(b) Does EGD agree that the cap and trade and emissions reduction subject matter is very different than the natural gas subject matter, in its underlying science, business drivers, policy environment, and financeability?

RESPONSE

a) At the beginning of 2016, there were very few specialists in Cap and Trade, carbon pricing and carbon taxes in Ontario other than those working in consulting firms. Enbridge has been developing expertise in Cap and Trade and carbon pricing over the course of the last year. The members of the CPGG are highly talented, skilled and experienced individuals with relevant experience in legal, financial markets, gas procurement and regulatory matters – expertise and insight which can translate to the new carbon market.

b) Enbridge agrees that the carbon market and gas supply are different markets.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #39

INTERROGATORY

Issue 5

Ref: Exhibit C1, Tab 1, p12

Please provide copies of EGD's last three monthly carbon reports.

RESPONSE

It should be noted that the monthly carbon reports referenced in evidence are internal reports prepared by Enbridge staff for the advice and assistance of management including the CPGG. While the contents of the report will vary each month, the purpose of the report is to provide a summary and comments on relevant matters including Enbridge's evolving procurement strategy. The report may contain data and opinion received under contract from a third party source which was not intended for public disclosure. In addition to the fact that some of this information is strictly confidential as it relates to Enbridge auction and procurement plans, it is intended to generate frank internal management discussions about relevant matters. Enbridge therefore respectfully declines to produce its internal monthly carbon report.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #40

INTERROGATORY

Issue 5

Ref: Exhibit C1, Tab 1, p12

When does EGD expect a decision on whether the Ontario market will be linked to the WCI markets?

RESPONSE

Enbridge respectfully declines to speculate on when a decision will be made by the Government of Ontario regarding the linking of the Ontario market to the WCI markets.

In an Ontario Newsroom communication, dated November 30, 2016, the Ontario government stated that, "Ontario intends to link its program under the WCI in 2018, partnering with Quebec and California"[1].

[1] "How Cap and Trade Works" news.ontario.ca, last modified November 30, 2016, https://news.ontario.ca/ene/en/2016/11/how-cap-and-trade-works-1.html.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #41

INTERROGATORY

Issue 5

Ref: Exhibit Cl, Tab 1, Schedule 1, Appendix A

(a) General - Given that the 2017 cap equals the 2017 available allowances, what could bring about a shortage of allowances for gas utilities in 2017? Please explain fully.

(b) Ibid, p4 (last paragraph) - Please explain the characterization of cap and trade initiatives as a backstop mechanism used primarily to raise revenues for the full Cap and Trade Action Plan which will generate the bulk of the reductions. Please provide a full explanation.

(c) BOMA understands that under the cap and trade legislation/regulation 144, gas utilities are not entitled to free allowance. What, in EGD's view, is the purpose of free allowances and which market participants will be eligible to receive them? How large a share of a total cap of participants will they cover?

(d) Has the government decided who the successful applicants for free allowance are, and how much each received? If public information, please provide.

(e) What is the amount of the strategic allowance reserve for 2017 (number of allowances and percentage of total available allowances)?

(f) Please confirm that the Auction Average Price and related information will be disclosed by the Ministry after each auction, together with the number of allowances sold.

(g) Is EGD eligible for "early reduction credits"? Has the regulation been issued? If so, please provide. If no, when is it expected?

RESPONSE

(a) A shortage of allowances could be realized for several reasons. The MOECC has indicated that the 2017 cap has been set to the forecasted level of emissions for 2017. There is a risk that this forecast could be lower than the actual emissions in 2017, and therefore a shortage would be realized. Additionally, as required by the

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

Cap and Trade Regulation, the MOECC puts five percent of allowances into a strategic reserve. This means these allowances are unavailable at auction and may only be purchased at the higher prices outlined in the regulation. Lastly, the regulation allows for market participants to purchase up to four percent of allowances at auction, and capped participants to purchase up to 25 percent of allowances at auction regardless of their compliance obligation. There is the potential that demand could outpace supply, again leading to a shortage of allowances.

(b) The cap sets the maximum emissions target, and as such is a backstop to make sure that Ontario meets its stated goals. In Ontario, entities that are subject to Cap and Trade may not have a lot of emission mitigation tools at their disposal, other than reducing production or fuel consumption. Available mitigation opportunities may be expensive. The MOECC has indicated that the money raised through Cap and Trade will be used to fund emission reductions, through initiatives outlined in the Climate Change Action Plan. This is where deeper reductions are likely to occur.

(c) Enbridge understands that the MOECC is making free allowances available to capped participants to assist in their transition to Cap and Trade, particularly for those industries which are emission intense and trade exposed. Please refer to Section 85 of the Cap and Trade regulation for an explanation of which participants may be eligible for free allowances. The amount of free allowances which has been distributed is not publicly available, however based on the number of allowances available at the first auction as well as the amount placed into the strategic reserve, Enbridge estimates that approximately 34 million allowances have been awarded free of charge, which is approximately 24% of the allowances created for 2017.

(d) Section 90(4) of the Cap and Trade regulation states that free allowances would be transferred to a participants account between January 1 and February 1, 2017. Enbridge is not aware of a publically available list of entities who have received allowances.

(e) Please refer to Section 54 and 55 of the Cap and Trade regulation. Given the total number of allowances created in 2017 is 142,332,000, the number placed in the strategic reserve is estimated to be 7,116,600 allowances.

(f) Please refer to Section 64 of the Cap and Trade regulation.

(g) Enbridge does not anticipate that it will be eligible for early reduction credits, however the applicable regulation has not been published yet. Enbridge is not aware of the timing for this regulation.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #42

INTERROGATORY

Issue 5

Ref: Ibid, p15

In EGD/Alpha view, what are the holding limits?

RESPONSE

Please refer to the response to BOMA Interrogatory #15 filed at Exhibit I.1.EGDI.BOMA.15.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #43

INTERROGATORY

Issue 5

Ref: Ibid, p18

Alpha has expressed reservations about the California future price (ICE) should be the basis of Ontario and Carbon Price Forecast, noting that "This will result in a poor representation of market levels, the further out in the term than is being evaluated", due to lack of liquidity in the market for California Carbon Allowance futures.

Please elaborate on Alpha's concern and make available the sentence immediately preceding the one quoted above.

RESPONSE

Alpha's main concerns are as follows:

a) Future prices can vary from the Auction Clearing Price; and
b) Utilizing the price of a California Carbon Allowance ("CCA") assumes future linkage between the two markets. This is an inappropriate assumption until CCAs and Ontario Carbon Allowances are fungible.

In regards to the sentence immediately preceding the quote, Enbridge is not permitted to provide this information for reasons of confidentiality as set out in the Climate Change Mitigation and Low-carbon Economy Act, 2016 ("Climate Change Act"), Cap and Trade regulations and the Report of the Board in respect of the Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities (EB-2015-0363) ("Framework").

See the response to BOMA Interrogatory #37 filed at I.5.EGDI.BOMA.37 for details around confidentiality matters.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #44

INTERROGATORY

Issue 5

Ref: Ibid, p33

Has the California Air Review Board presented its findings to the Governor of California recommending linkage with Ontario? If so, please provide a copy, or a link to the documents, and any related documents. Has the Governor's office made a decision on Ontario's eligibility for WCI under California law? If not, when is the decision expected?

RESPONSE

On January 30, 2017, the ARB submitted a letter to provide notice to The Honorable Edmund G. Brown Jr., Governor of California, of the proposed linkage of California and Ontario's Cap and Trade Programs. The letter requested that the Governor consider and make necessary findings to support the linkage. The Governor has 45 days in which to make (or decline to make) the specified findings with consideration to the Attorney General's advice and provide those findings to Legislature. If the findings are made and the Board adopts the amendments to the California Cap and Trade Regulation the linkage with Ontario's Program will begin on January 1, 2018.

Please refer to https://www.arb.ca.gov/cc/capandtrade/linkage/linkage.htm.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

BOMA INTERROGATORY #45

INTERROGATORY

Issue 5

Ref: Ibid, p36

Please provide the redacted pages (pp37 to 48) under the heading, Fundamental Supply and Demand of Cap and Trade, or explain why the information, which appears to be information on characteristics of cap and trade markets, rather than specific auction information or information concerning EGD's choice of policy instruments for its own compliance plan, should not be released.

RESPONSE

Enbridge is not permitted to provide this information for reasons of confidentiality as set out in the Climate Change Mitigation and Low-carbon Economy Act, 2016 ("Climate Change Act"), Cap and Trade Regulations and the Report of the Board in respect of the Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities (EB-2015-0363) ("Framework").

Please refer to BOMA Interrogatory #37 filed at Exhibit I.5.EGDI.BOMA.37 for more discussion on confidentiality.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

CME INTERROGATORY #7

INTERROGATORY

Issue5.2 – Are the tariffs just and reasonable and have the customer-related and facility related charges been presented separately in the tariffs?

Topic: Cost Impacts

Ref: The Calculation of Bill Impacts

Union's compliance plan includes a calculation of sales service and direct purchase bill impacts for typical small and large customers (see EB-2016-0296, Exhibit 7, Schedule 7). That Calculation shows the estimated bill impact on both the delivery charge and the total bill. CME requests that Enbridge provide a similar calculation which shows the impacts on both the delivery charge and the total bill for each rate class.

RESPONSE

Please refer to Enbridge's January 2017 QRAM (EB-2016-0326) filed on December 9, 2016, Exhibit Q1-3, Tab 4, Schedule 7 and Schedule 8 for the customer's typical bill impacts from the Cap and Trade charges.

Schedule 7 shows the estimated bill impacts, inclusive of Cap and Trade charges, on delivery charges and total bills for sales and direct purchase customers who are non-large final emitters.

Schedule 8 shows the estimated bill impacts, inclusive of Cap and Trade charges, on delivery charges and total bills for sales and direct purchase customers who are large final emitters.

Witnesses: A. Kacicnik
A. Langstaff

ENVIRONMENTAL DEFENCE INTERROGATORY #1

INTERROGATORY

Reference: Ex. C, Tab 3, Sch. 4, Pages 2 – 4

Please provide the following information with respect to Enbridge's 2017 a) industrial; b) commercial & institutional; c) residential; and d) low-income DSM programs:

a) Forecast TRC Test benefit/cost ratios;
b) Forecast TRC Test net benefits;
c) Forecast TRC Test benefits;
d) Forecast TRC Test costs;
e) Forecast 2017 DSM savings (cubic metres);
f) Forecast lifetime DSM savings (cubic metres)
g) Forecast 2017 greenhouse gas emission reductions (tonnes);
h) Forecast lifetime greenhouse gas emission reductions (tonnes); and
i) Forecast 2017 program budgets.

When answering this interrogatory please exclude DSM programs and budgets that pertain to Large Final Emitters and "voluntary participants" in the cap and trade program who purchase their own emission allowances.

RESPONSE

Given that it is still only Q1 of 2017, Enbridge is not in a position to provide forecasts of the requested information for 2017. At this point in time, the best evidence of the Company's DSM activities in 2017 by the various rate classes identified in the question is the evidence filed by the Company in support of its Multi-year DSM Plan 2015-2020 (EB-2015-0049). It is the Company's expectation that at this early stage in the year, there would not be a material difference between the 100% targets set out in the approved Multi-year plan and any forecasts which would benefit from only 2 months of program operations.

It is also appropriate to point out the significant effort that would be required to develop such forecasts even if this were possible at this point in time. Such forecasts would require critical inputs that include, but are not limited to:

Witness: M. Lister

- 2017 natural gas savings targets, set according to 2016 audited result (the 2016 audit process has not yet started);
- 2016 Annual Report results;
- Wholesale 2017 electricity rates (available Q2 2017);
- Wholesale 2017 water and sewage rates;
- 2016 program participation rates (available Q2 2017);
- Updates to inputs and assumptions in the Technical Reference Manual; and
- April 2017 Natural Gas Commodity Price.

It would take a great deal of time and resources to capture and collate the above data for the purposes of providing such forecasts. The Company would then have to manually back out of the forecasts the contributions of LFE and known Cap & Trade voluntary participants.

In terms of the forecast impact of DSM on GHG emissions reductions, the Compliance Plan has for the purposes of generating the GHG tariff, netted out the forecast impact of its DSM programs. At this stage, Enbridge does not believe that its forecasts in this regard require change.

ENVIRONMENTAL DEFENCE INTERROGATORY #2

INTERROGATORY

Reference: Ex. C, Tab 3, Sch.4, Pages 2 – 4

Please provide all studies prepared by or for Enbridge with respect to the costs and benefits of increasing its 2017 DSM budget in order to achieve incremental greenhouse gas emission reductions.

RESPONSE

Enbridge has not prepared any studies with respect to the costs and benefits of increasing the 2017 DSM budget in order to achieve incremental greenhouse gas emission reductions. Please also refer to the response to Board Staff Interrogatory #19(b) filed at Exhibit I.1.EGDI.STAFF.19.

Witnesses: M. Lister
F. Oliver-Glasford

ENVIRONMENTAL DEFENCE INTERROGATORY #3

INTERROGATORY

Reference: Ex. G, Tab 1, Sch. 1, Appendix A, Table A3

Please provide your 2017 natural gas commodity charge per cubic metre.

RESPONSE

Based on the January 2017 QRAM (EB-2016-0326), the gas supply commodity charge is 11.45 ¢/m^3.

Witnesses: A. Kacicnik
A. Langstaff

ENVIRONMENTAL DEFENCE INTERROGATORY #4

INTERROGATORY

Reference: Ex. C, Tab 3, Sch. 4

Enbridge states that:

> "[T]he Company has not incorporated incremental ratepayer funded abatement activities into its 2017 Compliance Plan" (p. 2)
>
> "the Company believes the issue of including the existing and any incremental DSM activity into the Company's compliance planning activities is best suited for the Mid-term Review." (p. 4)

In light of the fact that the mid-term review of the DSM Framework will not be completed until June 1, 2018, does Enbridge plan to include incremental ratepayer funded customer abatement activities into its 2018 compliance plan? If yes, please provide an approximate range of the budget level for those activities that Enbridge believes is worth considering. If no, please fully explain and justify that position.

RESPONSE

Please refer to LIEN Interrogatory #4 filed at Exhibit I.1.EGDI.LIEN.4.

Witnesses: M. Lister
J. Tideman

ENVIRONMENTAL DEFENCE INTERROGATORY #5

INTERROGATORY

Reference: Ex. C, Tab 3, Sch. 4

Please make best efforts to provide the following estimated incremental DSM results based on the assumption that Enbridge's 2017 DSM budget was increased by 25%:

a) Forecast TRC Test benefit/cost ratio;
b) Forecast TRC Test net benefits;
c) Forecast TRC Test benefits;
d) Forecast TRC Test costs;
e) Forecast 2017 DSM savings (cubic metres);
f) Forecast lifetime DSM savings (cubic metres)
g) Forecast 2017 greenhouse gas emission reductions (tonnes);
h) Forecast lifetime greenhouse gas emission reductions (tonnes); and
i) Forecast 2017 program budgets.

Please assume that the incremental budget would be spent as efficiently as possible. If possible, please assume that the incremental budget would be spent only in relation to customers whose emissions Enbridge is responsible for under cap and trade legislation. Please make and state any additional assumptions as necessary.

If it is necessary to assume a date on which Enbridge would have begun preparation and planning for the use of the incremental spending, please provide a response for two scenarios (a) the date that the draft regulations under the *Climate Change Act* were released (February 25, 2016); and (b) the date that the Cap and Trade Framework was released (September 26, 2016).

RESPONSE

The question incorrectly presupposes that it is possible to formulaically develop forecasts from a simple increase to the overall DSM budget. As Enbridge witnesses have clearly demonstrated in numerous proceedings before the Board, the generation of forecasts of benefits from DSM activities requires consideration of the specific program in question, the maturity of the program and the extent to which a market has been saturated. These and numerous other variables including the existence and availability of the Company's own resources are factors that must be considered before any credible forecasts could be made.

Please also see the response to Environmental Defence Interrogatory #1, filed at Exhibit I.5.EGDI.ED.1.

Witness: M. Lister

ENVIRONMENTAL DEFENCE INTERROGATORY #6

INTERROGATORY

Reference: Ex. C, Tab 3, Sch. 4

Please make best efforts to provide the following estimated incremental DSM results based on the assumption that Enbridge 2017 DSM budget was increased by 50%:

a) Forecast TRC Test benefit/cost ratio;
b) Forecast TRC Test net benefits;
c) Forecast TRC Test benefits;
d) Forecast TRC Test costs;
e) Forecast 2017 DSM savings (cubic metres);
f) Forecast lifetime DSM savings (cubic metres)
g) Forecast 2017 greenhouse gas emission reductions (tonnes);
h) Forecast lifetime greenhouse gas emission reductions (tonnes); and
i) Forecast 2017 program budgets.

Please assume that the incremental budget would be spent as efficiently as possible. If possible, please assume that the incremental budget would be spent only in relation to customers whose emissions Enbridge is responsible for under cap and trade legislation. Please make and state any additional assumptions as necessary.

If it is necessary to assume a date on which Enbridge would have begun preparation and planning for the use of the incremental spending, please provide a response for two scenarios (a) the date that the regulations under the *Climate Change Act* were issued (May 19, 2016); and (b) the date that the Cap and Trade Framework was issued (September 26, 2016).

RESPONSE

Please see the responses to Environmental Defence Interrogatories #1 and #5, filed at Exhibit I.1.EGDI.ED.1 and Exhibit I.5.EGDI.ED.5.

Witness: M. Lister

ENVIRONMENTAL DEFENCE INTERROGATORY #7

INTERROGATORY

Reference: Ex. C, Tab 3, Sch. 4

Please consider a scenario where the Board directs Enbridge to achieve as many tonnes of incremental greenhouse gas emissions reductions as possible via incremental cost-effective 2017 DSM spending, including through the expansion of budgets for existing programs. Based on that scenario, please estimate:

a) The forecast incremental 2017 greenhouse gas emission reductions (tonnes);
b) The forecast incremental lifetime greenhouse gas emission reductions (tonnes);
c) The estimated cost of purchasing carbon allowances or credits for the tonnes of emission indicated in response to parts (a) and (b) of this interrogatory.

Please assume that the direction is issued by the Board on May 1, 2017. Please state all other assumptions and provide all underlying calculations.

RESPONSE

Please see the responses to Environmental Defence Interrogatories #1 and #5, filed at Exhibit I.5.EGDI.ED.1 and Exhibit I.5.EGDI.ED.5.

Witness: M. Lister

FRPO INTERROGATORY #7

INTERROGATORY

ISSUE 5 – COST RECOVERY

Topic: Accountability and Responsibility for Risk Management Decisions

REF: Exhibits C1, Tab 1, Schedule 1, pages 7-18 and F, Tab 1 and G, Tab 1 & EB-2005-0520 Decision with Reasons, Section 2.3, pg. 13-15

Preamble: We would like to understand Enbridge's views on the allocation of risk associated with the use of forward purchases and structured products.

Given Enbridge's development of risk management procedures and a cross-functional oversight group, the Board's Decision on Gas Supply referenced above and Enbridge's subsequent approach to the forward purchases of the natural gas commodity, please provide Enbridge's views on the allocation of risk between ratepayers and shareholders for:

a) Errors in volume forecast methodologies.
b) Prudence of allowances purchased for offsets in the existing year.
c) Prudence of allowances purchased for offsets for the following year.
d) Prudence of allowances purchased for the period beyond current and following years.
e) Prudence of allowances purchased through the use of Structured products (such as caps, collars, calls, etc.) designed to mitigate cost of forward purchases.
f) Costs of the structured products.

RESPONSE

Please refer to the response to CCC Interrogatory #4 filed at Exhibit I.1.EGDI.CCC.4.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

IGUA INTERROGATORY #7

INTERROGATORY

Issue: Cost Recovery – Is the proposed manner to recover costs reasonable and appropriate?

Reference: Exhibit G, Tab 1, Schedule 2, Page 1.

Preamble: EGD requests a deviation from the methodology identified by the Board in establishing the annual carbon price forecast.

Questions:

(a) Please confirm that the requested deviation applies only to the 2017 Compliance Plan.

(b) Does EGD anticipate making a similar deviation request in future Cap and Trade Compliance Plan applications? Why or why not?

RESPONSE

a) The requested deviation only applies to the 2017 Compliance Plan.

b) Enbridge is unable to comment if such deviation will be required for future Compliance Plan applications. The Company will assess whether a deviation is required at the time of filing future Compliance Plans.

Witnesses: A. Langstaff
J. Murphy
F. Oliver-Glasford

SEC INTERROGATORY #15

INTERROGATORY

With respect to cost recovery:

a. Please explain Enbridge's understanding of when the Cap and Trade variance accounts will be reviewed and cleared.
b. Please explain what information Enbridge believes it will be able to provide to all parties (i.e. not just the Board panel and Board Staff), when it seeks a review of its actual compliance plan costs, that it otherwise is not able to provide in this application.

RESPONSE

a) Please refer to Board Staff Interrogatory #24 filed at Exhibit I.4.EGDI.STAFF.24.

b) When Enbridge seeks review of its actual compliance plan costs, it will provide the necessary information keeping in mind the confidential aspects as required by the *Climate Change Act* and the Board's Cap and Trade Framework.

Witnesses: A. Langstaff
F. Oliver-Glasford
R. Small

TCPL INTERROGATORY #3

INTERROGATORY

Issue 5.1 – Cost Recovery

Reference: 1) EB-2016-0300, Application, Exhibit G, Tab 1, Schedule 1, Appendix A, Page 2 of 10

2) EB-2016-0028, Application, Exhibit B, Page 5 of 13

Preamble: In Reference 1, Enbridge provides the following Cost of CO2e Emissions:

Type	**Cost of CO_2e Emissions**
Company Use	
Fleet	$49,771.3
Buildings	$49,967.6
Boilers	$129,348.0
Total Company Use	**$229,086.9**

In the same Reference, Enbridge calculates the Company Use unit rate to be 0.0018 cents/m^3.

In Reference 2, Enbridge states that 1,200 TJ/d of capacity on the Albion Pipeline will be available for Rate 332 transportation customers. TransCanada subsequently contracted for the full 1,200 TJ/d of Rate 332 service.

TransCanada has concerns regarding the methodology used by Enbridge to recover Company Use emissions costs.

Request: a) Please confirm that given the unit rate in Reference 1, and based on TransCanada's contract demand under Rate 332 in Reference 2, that TransCanada could be responsible for up to $211,710 of the $229,086.9 of forecast Company Use costs. If not confirmed, please provide the correct figure and explain the calculations.

b) Considering Enbridge's response to TransCanada Interrogatory #1 d), please provide the updated total forecast cost in 2017 to

Witness: A. Kacicnik

TransCanada associated with Enbridge Company Use emissions, based on:

i. TransCanada utilizing its contract noted in Reference 2 at 100% load factor.

ii. TransCanada utilizing its contract noted in Reference 2 in accordance with the forecast flow provided in Interrogatory #1c) iii).

iii. Please state the figures provided in b) i) & ii) as a percentage of Enbridge's total Company Use costs for 2017.

c) Please provide the following information, fully explaining the responses:

i. The percentage of Enbridge fleet vehicle use caused by the Albion Pipeline, on which TransCanada has contracted for 60% of the throughput in accordance with Reference 2.

ii. The percentage of Enbridge office and building space dedicated to supporting Rate 332 service on a full-time basis.

iii. The boiler use incurred, described in terms of cost of CO_2e emissions, by Enbridge as a result of Rate 332 service.

iv. The total percentage of Company Use emissions costs that Enbridge forecasts will be incurred as a direct result of the operation, administration, and maintenance for the Albion pipeline, of which 60% is attributable to Rate 332.

v. The dollar amount of Enbridge O&M expense allocated to Rate 332 customers for recovery in 2017.

vi. Enbridge's total forecast O&M expense for 2017.

vii. The percentage share of Enbridge's total O&M expense allocated to Rate 332 customers in 2017.

RESPONSE

a) Not confirmed. Each customer will only be responsible for a portion of the company use emissions obligation costs based on their actual delivery volumes.

   As an example, should the actual 2017 cost of the company use emissions obligation equal the forecast 2017 cost of $229,086 and should the actual Rate 332 delivery volumes equal 10% of the Company's total delivered volumes, then Rate 332 will be responsible for 10% of the cost or about $23,000.

   As noted in response to TCPL Interrogatory #1 d) filed at Exhibit I.1.EGDI.TCPL.1, the Company's proposed 2017 Cap and Trade charges work in conjunction with its proposed 2017 Greenhouse Gas Emissions Customer and Facility Costs Variance Account (GGECFCVA). This approach will ensure that the Company neither over or under recovers its customer-related and facility related emissions obligation costs (said differently, both the customers and the Company will be kept whole with respect to emissions obligation costs).

   In other words, should the Company over-recover its actual company use obligation costs, the customers will be kept whole through the disposition of the 2017 GGECFCVA balance.

b) Please see response to a) above.

c) Please see response to a) above. Also the Company notes that the Board determined that facility-related obligation costs be recovered from all customers based on a simple driver (i.e., delivered volumes). The Company has further segregated its facility-related emissions between company use volumes, unaccounted for volumes and compressor fuel volumes to match how such costs are recovered in its rates, but has not performed (and does not plan to) any assessments or studies that would support responses to sub-questions i. to vii. above.

Witness: A. Kacicnik