

ENBRIDGE INTERROGATORY 1

1. Reference: page 2

Preamble:

Reference to a “new National Standard Practice Manual for cost-effectiveness screening of energy efficiency measures, programs and portfolios, which was published in May 2017”

Request:

- a) Please provide a copy of the document referenced at Section I, page 2, line 20.

**RESPONSE:**

The manual can be found at the following web address:

[https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM\\_May-2017\\_final.pdf](https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf)

ENBRIDGE INTERROGATORY 2

2. Reference: page 2

Preamble:

Mr. Neme notes that he was appointed as an expert member on the 2017 Marginal Abatement Cost Curve Study. In other words he was part of the Technical Advisory Group (the "TAG").

Request:

- a) Please provide all written communications involving GEC, ED and/or Mr. Neme to and from the Board Staff and ICF in respect of development of your evidence. Please also provide all written communications involving GEC, ED and/or Mr. Neme to and from the Board Staff and ICF in respect of the development of the MACC (the TAG process).

**RESPONSE:**

Mr. Neme did not submit written material as part of his involvement in the MACC TAG. His feedback was provided verbally during TAG meetings/calls with the OEB and ICF.

Mr. Neme had several email exchanges with ICF regarding the assumptions and results of the CPS and MACC studies. A copy of those exchanges is provided in Attachment A to this response. He also received two emails from Board Staff in response to questions he posed over the phone regarding where certain Enbridge and Union information may be in the public record (i.e. to save time and money in tracking down information), one from Board Staff in response to a question he posed regarding how the MACC and CPS studies quantified savings potential differently and a couple of others from Board Staff regarding contact information for the ICF person responsible for the MACC (one of which resulted in a response of acknowledgement from Mr. Neme). Copies of all of those emails are provided in Attachment B to this response.

Other written communication is irrelevant, privileged, and/or already on the record.

## Chris Neme

---

**From:** Tartt, Julie <Julie.Tartt@icf.com>  
**Sent:** Friday, March 16, 2018 1:49 PM  
**To:** Chris Neme  
**Subject:** RE: Questions on Ontario MACC

I cannot today, but should be able to on Monday (when my colleague with knowledge of the industrial sector for the CPS is available).

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**From:** Chris Neme [mailto:[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)]  
**Sent:** Friday, March 16, 2018 1:43 PM  
**To:** Tartt, Julie <Julie.Tartt@icf.com>  
**Subject:** RE: Questions on Ontario MACC

Thanks Julie. Can you tell me what the nature of the error was and what the correct values should be?

Chris

Chris Neme  
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---

**From:** Tartt, Julie [mailto:[Julie.Tartt@icf.com](mailto:Julie.Tartt@icf.com)]  
**Sent:** Friday, March 16, 2018 1:42 PM  
**To:** Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)>  
**Subject:** RE: Questions on Ontario MACC

Hi Chris –

There does appear to be an error in that table. That, however, would not have affected the MACC study analytics. The MACC study used underlying data from the CPS such as the annual savings associated with each measure and the lifetime of each measure. The MACC study did not use the results presented in, for example, Table ES 17.

Best,  
Julie

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**From:** Chris Neme [mailto:[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)]  
**Sent:** Thursday, March 15, 2018 1:19 PM

To: Tartt, Julie <[Julie.Tartt@icf.com](mailto:Julie.Tartt@icf.com)>  
Subject: RE: Questions on Ontario MACC

Julie:

I have one more question for you, this time on the Conservation Potential Study. Table ES17 summarizes savings potential for large emitters. In looking more closely at this, there is a result that seems really counter-intuitive (if not impossible). Specifically, while first year savings in 2020 go up about one-third (183 to 241), lifetime savings go up by a factor of about 3.5. The implication of that is that the average life of the additional savings is nearly 50 years. See the table pasted below. That can't be possible, can it? What's going on here? Is there a typo somewhere?

Many thanks for any help.

Chris

Large Emitters 2020 (from ES 17)			
	Semi- Constrained	Constrained	Increment btw Semi-C and C
Annual m3	241	183	58
Lifetime m3	3999	1174	2825
Avg lfe	16.6	6.4	48.7

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---

From: Tartt, Julie [<mailto:Julie.Tartt@icf.com>]  
Sent: Wednesday, March 14, 2018 2:20 PM  
To: Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)>  
Subject: RE: Questions on Ontario MACC

Hi Chris,  
You are correct. We did say that the MACC study provided estimate savings only for the customers not directly covered under the Ontario cap and trade regulation. *Customers directly covered by the c&t regulation include, for example, large and some mid-sized industrials and some large and mid-sized commercial facilities such as universities/hospitals (institutions).*

I have re-familiarized myself with the datasets and there is nothing I am able to share with you regarding the portion of savings associated with the customers not directly covered under the c&t regulation. I did go back to the UG and EGD compliance plans, and they do provide an indication of the proportion of NG consumption by large final emitters (non-covered customers).

I hope this helps.

Julie

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**From:** Chris Neme [<mailto:cneme@energyfuturesgroup.com>]  
**Sent:** Wednesday, March 14, 2018 1:20 PM  
**To:** Tartt, Julie <[Julie.Tartt@icf.com](mailto:Julie.Tartt@icf.com)>  
**Subject:** RE: Questions on Ontario MACC

Julie:

Thanks again for taking the time to talk with me this morning. You (or maybe Mabel) said something that I want to make sure I got correctly. Specifically, you said (I think) that the MACC study provided estimates of savings only for the customers not subject to direct regulation of carbon emissions (i.e. excluding the largest customers). Is that right? I'm pretty sure that is correct since you were going to look to see if there was any data you could share quickly regarding the portion of the potential study savings that was associated with such larger customers, but I wanted to make sure.

Thanks again.

Chris

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**From:** Tartt, Julie [<mailto:Julie.Tartt@icf.com>]  
**Sent:** Tuesday, March 13, 2018 6:43 PM  
**To:** Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)>  
**Subject:** Re: Questions on Ontario MACC

Thanks Chris. Speak to you tomorrow.

On Mar 13, 2018, at 6:42 PM, Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)> wrote:

Julie:

10 a.m. on my office line would be great. Thanks!

My questions relate to a couple things:

1. Confirmation these are savings net of naturally occurring EE (net, not gross in EE parlance).

2. Clarification on how PACT approach was applied to development of MACC, including for measures that failed TRC in the potential study but would pass with rebate less than full cost.
3. Why total savings adds up to so much less than TRC unconstrained levels in potential study (since more should pass under PACT than TRC, especially with carbon cost avoidance).

Chris

Sent from my iPhone

On Mar 13, 2018, at 5:53 PM, Tartt, Julie <[Julie.Tartt@icf.com](mailto:Julie.Tartt@icf.com)> wrote:

Hi Chris -  
I can call you at 10am tomorrow - shall I call your office line?  
Are you able to give me any sense as to the nature of the questions you would like to discuss?  
Cheers,  
Julie

On Mar 13, 2018, at 4:52 PM, Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)> wrote:

Julie:

I have some questions I'd like to run by you regarding the methodology of the Ontario MACC study you led. Are you available to talk tomorrow morning? I'm pretty flexible before noon.

Many thanks...

Chris

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<image001.png>

## Chris Neme

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**From:** Chris Neme  
**Sent:** Tuesday, March 13, 2018 4:50 PM  
**To:** 'Valerie Bennett'  
**Subject:** RE: Julie's contact information

OK. Will do.

Thanks...

Chris

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---

**From:** Valerie Bennett [mailto:Valerie.Bennett@oeb.ca]  
**Sent:** Tuesday, March 13, 2018 4:05 PM  
**To:** Chris Neme <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)>  
**Subject:** RE: Julie's contact information

Hi Chris – if you haven't already contacted Julie, she's asked that you contact her via email to setup a call, rather than calling directly. She wants to make sure she has someone there to take a few notes and doesn't miss anything.

Thanks,

Valerie

**Valerie Bennett, P. Eng, CMVP**  
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Fax: 416 440-7656  
E-mail: **NEW!** [valerie.bennett@oeb.ca](mailto:valerie.bennett@oeb.ca)

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**From:** Valerie Bennett  
**Sent:** Tuesday, March 13, 2018 1:36 PM  
**To:** Chris Neme ([cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)) <[cneme@energyfuturesgroup.com](mailto:cneme@energyfuturesgroup.com)>  
**Subject:** Julie's contact information

Hi Chris – see below. I left her a voicemail to let her know you'd be reaching out.

**JULIE TARTT** | Senior Manager, ICF Canada | +1.416.341.0127 direct | [julie.tartt@icf.com](mailto:julie.tartt@icf.com) | [icf.com/Canada](http://icf.com/Canada)  
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## Chris Neme

---

**From:** Valerie Bennett <Valerie.Bennett@oeb.ca>  
**Sent:** Tuesday, March 13, 2018 1:36 PM  
**To:** Chris Neme  
**Subject:** Julie's contact information

Hi Chris – see below. I left her a voicemail to let her know you'd be reaching out.

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## Chris Neme

---

**From:** Valerie Bennett <Valerie.Bennett@oeb.ca>  
**Sent:** Wednesday, March 14, 2018 2:51 PM  
**To:** Chris Neme  
**Subject:** TWG documents showing makeup of achievable potential scenarios  
**Attachments:** 26 Residential\_Report\_Exhibits.xlsx; 28 Commercial\_Report\_Exhibits.xlsx; 30 Industrial\_Report\_Exhibits.xlsm

hi Chris –

As discussed, please find attached the supply curves for res/comm/industrial. As I mentioned, these were draft working documents, but do demonstrate that even constrained potential considered a large portion of measures with aggressive incentive levels. The MACC used only “BAU” incentive levels so that cost-effectiveness values for each measure reflected “realistic” incentive levels, but adding all those up means that the MACC shows lower potential than the APS.

Thanks  
Valerie

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## Chris Neme

---

**From:** Valerie Bennett <Valerie.Bennett@oeb.ca>  
**Sent:** Wednesday, March 14, 2018 3:24 PM  
**To:** Chris Neme  
**Subject:** 2018/19/20 DSM calculations  
**Attachments:** UNION\_IRR\_staff.31.pdf

Hi Chris – for Union, the response to staff.31b) may help with the review of DSM savings for 2019 and 2020. I've attached it for your reference.

For EGD, I haven't found the same level of detail where we asked the same question in staff.28, which refers you back to staff.24 and its attachments 1 and 2 (and back to the original evidence Exhibit C, tab 5, Schedule 2, p 25-26). None of these seem to provide the year over year savings associated with DSM.

Valerie

### **Valerie Bennett, P. Eng, CMVP**

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## Chris Neme

---

**From:** Valerie Bennett <Valerie.Bennett@oeb.ca>  
**Sent:** Friday, March 16, 2018 1:56 PM  
**To:** Chris Neme  
**Subject:** 2018 sales volumes forecast by rate class

Hi Chris –

Take a look at Schedule 4 in the Rate Order Working Papers in the settlement agreement below. It's for the 2018 UG rates case:

<http://www.rds.oeb.ca/HPECMWebDrawer/Record/594767/File/document>

Speak to you shortly,

Valerie

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ENBRIDGE INTERROGATORY 3

3. Reference: page 16 and page 30, Figure 1

Preamble:

Page 30 - The evidence shown in Figure 1: Comparison of Renewable Gas Proposal Cost-Effectiveness Test Results

Request:

- a) Please confirm that the Utility Cost Test (UCT) does not include the incremental cost that a customer must pay for efficiency measures.

**RESPONSE:**

The UCT does not include any non-utility system costs or benefits that accrue to program participants. On the cost side of things, that means it includes neither the portion of the measure cost not covered by a utility program rebate nor the portion covered by government subsidies that are ultimately funded – at least in part – by taxes paid by gas utility customers. On the benefits side of the equation, the UCT excludes the value of electricity and/or other fuel savings; water savings; operation and maintenance cost savings; other improvements to business productivity; improvements to comfort, health and safety, building durability and/or other non-energy benefits.

#### ENBRIDGE INTERROGATORY 4

4. Reference: page 34

Preamble:

“In ballpark terms, I think that about half of those extra savings (8 million m3) – and therefore about half of the cost savings (\$9 million) – could have been realized by each utility.”

Request:

- a) What are your assumptions and calculations in that assessment?
- b) What part of the \$9 million of forecast savings will directly benefit ratepayers who do not choose to participate in such incremental energy efficiency programs?

**RESPONSE:**

- a) See GEC/ED response to Staff.1
- b) As noted in the GEC/ED response to Staff.1, I made a calculation error in stating that the gas customers of each utility could save \$9 million. The correct value is \$18 million per utility. The \$18 million value is half of the \$36 million I estimated to be the net benefits (benefits minus costs) of one year’s worth of incremental impact between the CPS constrained and semi-constrained scenarios.

As can be seen on p. 32 of my testimony, the incremental cost of the additional efficiency savings was estimated to be \$37 million, but the estimated benefits were estimated to be \$73 million. Of the \$73 million in benefits, \$17 million were associated with avoided carbon emission allowance purchases, which should accrue to all customers whether they participate in the programs or not. As noted in my testimony, that is probably a conservatively low value. Of the remaining \$56 million in avoided gas costs, it appears as if roughly 4% (i.e. on the order of \$2 million) is associated with avoided gas distribution system costs,<sup>1</sup> the benefits of which should accrue to all customers, including DSM non-participants. However, that estimate of avoided distribution system costs may be significantly understated, perhaps by a factor of 3 or more.<sup>2</sup> Another 10-15% (i.e. \$6-8 million) are associated with avoided “upstream capacity costs”. I am unfamiliar with how those costs are allocated, so I cannot speak to whether such savings would accrue to all customers or not. Furthermore, my analysis of the net benefits of additional efficiency did not account for the benefits such additional savings would produce for all gas customers (including DSM non-participants) by suppressing market clearing prices for

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<sup>1</sup> Based on average of the 15 year NPV (2016-2030) values for weather sensitive avoided costs (about 6% being avoided distribution system costs) and baseload avoided costs (about 2% being avoided distribution system costs) as shown in CPS p. 26.

<sup>2</sup> EB-2015-0029/0049, Exhibit L.GEC.2

natural gas. Finally, as also noted in my testimony, my analysis conservatively focused on the differences in costs and savings for the CPS constrained and semi-constrained scenarios. That analysis likely significantly overstates the incremental utility cost per unit of additional savings because it implicitly assumes that the constrained scenario is a proxy for the utilities currently planned levels of budget and savings. In reality, though the CPS constrained scenario was designed assuming a budget limit equal to the utilities' current DSM budgets, the utilities are currently planning to achieve less savings from non-large volume customers than estimated in the CPS constrained scenario. Thus, a more detailed analysis would be required to estimate the impacts of additional efficiency program spending on non-participants.

It should also be noted that one of the best ways to address any concerns about impacts on non-participants would be to construct an efficiency program portfolio that minimized the number of non-participants over time. That usually requires more spending, not less. Of course, if programs are required to be cost-effective, it also means more net benefits will accrue to customers as a whole.

ENBRIDGE INTERROGATORY 5

5. Reference: page 26, footnote 32

Preamble:

Footnote 32 states that the 1 ½% actual average savings in 2016 of gas utilities in the four states Mr. Neme selects for his paper is a “straight average across the four states”.

Request:

- a) Please provide the report referenced.

**RESPONSE:**

To be clear, my testimony states that the average across the four states is 1.2%, not 1½% as suggested in the question. The weblink to the requested report was provided in footnote 32.

ENBRIDGE INTERROGATORY 6

6. Reference: Ontario Energy Board's Cap and Trade Framework, page 28 (EB-2015-0363)

Preamble:

Excerpt taken from the Board's Cap and Trade Framework: "The OEB is confident that any potential overlap can be appropriately addressed through the robust EM&V process of the DSM Framework. The DSM Framework also includes a mid-term review provision (to be completed by June 1, 2018) that will provide an appropriate opportunity to assess the DSM Framework in light of the Cap and Trade program."

Request:

- a) Please confirm GEC and ED's involvement in the development of the Cap and Trade Framework. Please provide copies of all GEC and ED submissions, formal or informal to the Board in this matter.

**RESPONSE:**

The requested information is not relevant to Mr. Neme's evidence.

Regardless, the submissions of GEC and ED regarding the Cap and Trade Framework can be found on the Board's Advanced Regulatory Document Search (RDS) website for EB-2015-0363:

<http://www.rds.oeb.ca/HPECMWebDrawer/Record?q=CaseNumber:EB-2015-0363&sortBy=recRegisteredOn-&pageSize=400>

## ENBRIDGE INTERROGATORY 7

7. Reference: page 23

Preamble:

Taken from the evidence - “Second, the DSM mid-term review process, at least as currently outlined by the Board, does not allow for meaningful review of utility plans.

Request:

Please provide copies of all, formal or informal submissions to the Board in both the DSM mid-term review (EB-2017-0128) and the 2017 Compliance Plan (EB-2016-0300).

### **RESPONSE**

The requested information is not relevant to Mr. Neme’s evidence.

Regardless, the submissions to the Board in the DSM mid-term review (EB-2017-0128) and the 2017 Compliance Plan (EB-2016-0300) can be found on the Board’s Advanced Regulatory Document Search (RDS) website for EB-2016-0300 and EB-2017-0128:

- <http://www.rds.oeb.ca/HPECMWebDrawer/Record?q=CaseNumber:eb-2016-0300&sortBy=recRegisteredOn-&pageSize=400>
- <http://www.rds.oeb.ca/HPECMWebDrawer/Record?q=CaseNumber:eb-2017-0128&sortBy=recRegisteredOn-&pageSize=400>

UNION INTERROGATORY 1

1. Reference: EB-2017-0255, Exhibit L, p. 8

Preamble: Mr. Neme states that *“The companies’ failure to pursue these additional cost-effective energy savings in 2018 likely means that each Company’s customers will bear an additional \$9 million in energy costs (about half of which is associated with otherwise unnecessary purchases of carbon emission allowances). This is likely a conservatively low estimate.”*

Union seeks to understand the analysis performed by Mr. Neme to develop this estimate.

Question: Please provide references and/or calculations along with all assumptions used to quantify the estimated \$9 million in energy costs.

**RESPONSE:**

See GEC/ED response to Staff.1 (which notes that the reference to \$9 million per utility is incorrect and that the correct value is \$18 million per utility)

UNION INTERROGATORY 2

2. Reference: EB-2017-0255, Exhibit L, p. 21
- Preamble: Mr. Neme references the term Utility Cost Test (“UCT”).
- Question: Has the OEB, through Cap-and-Trade proceedings, specifically directed the Utilities to apply the UCT to their 2018 Compliance Plans? If yes, please provide the supporting Cap-and-Trade proceeding references.

**RESPONSE:**

The Board’s Cap and Trade Framework speaks for itself. An interpretation of the Framework is a matter for submissions. That said, it is worth noting that the MACC, which was developed under direction of the Board, is based on the application of the UCT. Furthermore, as noted in my testimony, it appears as if both Union and Enbridge have effectively applied the UCT to their analysis of the cost-effectiveness of renewable gas.

UNION INTERROGATORY 3

3. Reference: EB-2017-0255, Exhibit L, p. 32, Table 1
- Preamble: In Table 1, Mr. Neme provides his calculations of the UCT Cost-Effectiveness of Incremental CPS Efficiency.
- Question: Please provide all supporting references and calculations along with all assumptions used to arrive at each figured presented in Table 1.

**RESPONSE:**

See GEC/ED response to Staff.1

## FRPO INTERROGATORY 1

Preamble: From our perspective, an overview of the evidence and interrogatories provided by the utilities seem to point to their preference to perform conservation in their DSM programs where they are incented and not as abatement under Carbon Cap & Trade Compliance where there is no financial reward.

- 1) From Mr. Neme's experience in other jurisdictions, are there jurisdictions that have a similar construct with the utility being financially incented in conservation, yet held to a compliance obligations that could benefit from conservation-based abatement initiatives without financial incentive?
  - a) If so, what lessons can be learned from those jurisdictions?
  - b) If not, what are your views on appropriate constructs that could provide a delineation of what could be incented under DSM and what is an obligation under compliance?

### **RESPONSE:**

One obvious analogue to the Ontario situation is California, which is part of the same carbon cap and trade market as Ontario and also has extensive utility ratepayer-funded efficiency programs for which the utilities are eligible to earn shareholder incentives. However, I'm not familiar enough with the details of how the California utility shareholder mechanism is structured to offer "lessons learned".

I would note that some jurisdictions that offer utility shareholder incentives for successful delivery of efficiency programs also obligate those same utilities to do integrated resource planning and to pursue alternatives to capital investments in new power plants or transmission and distribution system upgrades whenever such alternatives – including efficiency resources – are less expensive. That can result in decisions to increase levels of investment in efficiency over and above levels previously established in pure DSM proceedings. Michigan is one example of a jurisdiction with such a policy framework. Other jurisdictions, such as Massachusetts, simply require their utilities to pursue all cost-effective efficiency and provide shareholder incentives if the utilities meet or exceed savings targets estimated to be consistent with an all cost-effective mandate. In other words, efficiency must be pursued to the extent possible to minimize cost of meeting all utility obligations, with the utility being rewarded if they do that successfully.

That seems eminently reasonable to me. I have heard some argue that when utilities face an obligation, such as compliance with carbon emissions policy and/or delivering reliable energy service, such an obligation would preclude the need to offer financial incentives for one of the least cost options (e.g. efficiency) for meeting those obligations. I disagree. Utilities will always attempt to tilt their responses to their obligations to the kinds of resources that provide more profit for their shareholders. That can hurt ratepayers. Shareholder incentives for effective

efficiency programs, if structured well, help level the playing field, ensuring the utilities have a profit motive for pursuing efficiency when it is a least cost resource.

Ultimately, I see several factors as key to an appropriate construct for governing the role of efficiency programs in the context of any set of policy obligations:

- The primary objective of the utility should be to pursue the least cost solution for meeting its obligations. This may be tempered by some secondary considerations (e.g. risk, energy security, local job creation, etc.), to the extent they are not already factored in cost-effectiveness analyses. However, any such secondary considerations need to be made clear up front by policy-makers, with guidance on how to balance such secondary considerations against the primary objective of minimizing cost (again, to the extent that the secondary considerations are not monetized and included in the assessment of cost-effectiveness) and against other secondary considerations.
- Efficiency needs to be treated as a resource that is an option considered for meeting obligations, just like supply-side options (and, for that matter, other demand-side options, such as demand response).
- The approach to assessing what is least cost – i.e. the cost-effectiveness test being used – should be the same for all resource investment and resource allocation decisions. The use of one test to meet a carbon obligation and a different test to determine how much efficiency resource merits acquisition will necessarily result in economically sub-optimal investment decisions and therefore greater cost for utility ratepayers.
- As new obligations arise and/or as needs to make new investments to meet existing obligations arise, previous decisions regarding levels of investment in efficiency (and/or other resources) need to be reconsidered as part of new investment decision-making.
- The utilities need a business model in which they can be profitable when pursuing the least cost resources for meeting their various obligations.

In short, I do not necessarily see the need to delineate between what can be incented under DSM and what is an obligation for a utility and therefore does not need to be incented. All utility investment decisions should ideally be considered in a holistic and integrated way. Again, to do otherwise will result in economically sub-optimal investment decisions – i.e. increased cost for ratepayers. And utility shareholder incentives should ideally be tied to overall performance in delivering efficiency at levels necessary to meet all of the utility's obligations at the lowest cost to ratepayers. That said, while I generally support the notion that utility shareholders should have their incentives tied to the entirety of their performance in acquiring cost-effective energy resources, a policy decision to not incent them for some efficiency investments should not be an excuse for a regulated monopoly to limit investment in efficiency, particularly when acquisition of greater levels of efficiency would lower costs of compliance with statutory and/or regulatory obligations.

STAFF INTERROGATORY 1

Topic: Testimony Summary

Ref. p. 8

Preamble: “The Companies’ failure to pursue these additional cost-effective energy savings in 2018 likely means that each Company’s customers will bear an additional \$9 million in energy costs (about half of which is associated with otherwise unnecessary purchases of carbon emission allowances).”

Questions:

- a) Please provide your calculations supporting this conclusion, including how the economic value of the incremental avoided gas cost was calculated, and the net present value of the avoided carbon emission allowance purchases.

**RESPONSE:**

There is a calculation error in this statement from p. 8, lines 3-6 of my testimony. It should have said “...that each Company’s customers will bear an additional \$18 million in energy costs (about half of which is associated with otherwise unnecessary purchases of carbon emission allowances).” The same correction – i.e. changing the reference from \$9 million in savings per utility to \$18 million in savings per utility – should also be made on p. 34, line 7 of my testimony.

As explained on pp. 33-34 of my testimony, it is reasonable to assume that together the two utilities could have achieved additional incremental annual savings from non-capped customers in 2018 – over and above what they are currently planning to achieve in their approved DSM plans for 2018 – equal to one year’s worth of the difference between the CPS constrained and semi-constrained scenarios. As shown in Table 1 of my testimony (p. 32) the average difference in incremental annual savings between the CPS constrained and semi-constrained scenarios, excluding large volume customers, is 16 million m<sup>3</sup>. As also shown on Table 1 of my testimony (p. 32), I estimate the net economic benefit of that level of additional incremental annual savings to be worth about \$36 million in net present value (NPV) terms. Attachment A to this response provides the NPV calculations underpinning those values.

I assume that half of that amount of additional savings (i.e. 8 million m<sup>3</sup>) – and therefore half of the net economic benefit – could be realized by each utility. That would represent about a 12% increase above Enbridge’s average annual savings from non-capped customers. It would likely represent somewhere between 10% and 16% increase in average annual savings from Union’s

non-capped customers.<sup>3</sup> In other words, if the increase in savings was split equally between the two utilities, there would be similar percentage increases in their savings from uncapped customers.

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<sup>3</sup> I am unaware of any estimate of DSM savings from Union's uncapped customers. However, Union has provided data indicating that its planned 2018 savings from general service customers is about 50 million first year m<sup>3</sup> and its savings from all non-large volume customers is about 80 million first year m<sup>3</sup> (Union response to GEC.2 Attachment A). I would expect its savings from uncapped customers to be somewhere in between those two values.

## STAFF INTERROGATORY 2

Topic: Abatement Program Selection Criteria

Ref: pp. 10-12

Preamble:

“Most importantly, the criterion that I would suggest should be the most important – minimizing total costs to ratepayers – is not among the five primary criteria put forward by the Companies”. Further, Mr. Neme argues that cost-effectiveness (however measured) appears to have been relegated to an optional secondary consideration.

Questions:

- a) In addition to cost-effectiveness, please discuss the criteria that Enbridge Gas and Union Gas should use to select abatement opportunities.
  - i. Are all the criteria (discussed above) equally important or are some of the criteria more important than others? Please explain.

### **RESPONSE:**

I have not attempted to delineate all of the potential criteria that it may be useful to consider. I have simply suggested that cost-effectiveness should be the most important criterion. However, assessment of cost-effectiveness needs to include consideration of all cost impacts on gas customers – not just the impact of reducing carbon compliance costs. This is consistent with the principle the OEB articulated in its Cap and Trade framework in directing the utilities to develop compliance strategies “in an integrated manner that extracts maximum value from commitments that integrate multiple benefits” (p. 21).

A second important criterion would be risk minimization. This can encompass several other principles articulated in the OEB’s Cap and Trade framework, including diversification of compliance options (all else being equal, the more diverse any portfolio is, the more risk mitigating it is because it reduces exposure to uncertainty associated with any one element of the portfolio) and flexibility to adapt to market, policy and other changes. It should also account for other risk mitigating benefits of different compliance options (e.g. reducing customers’ exposure to future fuel price volatility). As noted in my testimony, efficiency investments are inherently risk mitigating.

The applicability and importance of any additional secondary criteria – e.g. other environmental impacts, job and economic development impacts, impacts on low income customers, etc. –

should be a function of the Board's policy objectives and articulated by the Board in its Cap and Trade framework.

### STAFF INTERROGATORY 3

Topic: DSM Gas Savings

Ref. pp. 13-23

Questions:

- a) Please provide your calculations of the cumulative cubic meter savings associated with the DSM Plan Savings for 2018-2020 for both Union Gas and Enbridge Gas. Please indicate any assumptions used.
- b) Using the DSM budgets approved in EB-2015-0029 / 49 for 2018-2020, please indicate the cost per cumulative tonne of greenhouse gas of the DSM Plan savings for Union Gas and Enbridge Gas, on an aggregate and per-sector basis.

#### **RESPONSE:**

- a) It is not clear which “calculations” Staff is referencing. I did not calculate or make reference to 2018-2020 cumulative cubic meter savings. I did discuss both Enbridge’s and Union’s comparisons of incremental annual savings potential estimated in the CPS to both utilities’ planned incremental annual savings values. With respect to Enbridge, I relied up on Enbridge’s estimates of incremental annual savings provided in response to Staff.24 (Attachment 1). As noted in footnote #9 (pp. 14-15) of me testimony, I estimated that at least 17% of those savings are likely to be from capped customers. See Attachment A to GED/ED response to Staff.1 for that calculation. I relied on Union’s estimates of 2018 incremental annual savings as provided in response to GEC.2 (including Attachment A), as well as its response to Staff.31.
- b) The table below provides my calculations of the net cost per tonne of carbon emission reduction, computed in the same way that I computed the incremental cost per tonne of carbon emission reduction shown on the last row of Table 1 of my testimony (p. 32). The sources of savings and budgets used in the analysis are provided below the table. There are several other key assumptions worth noting:
  - I made the simplifying assumption that the average measure life for the savings is 15 years, both for each sector and for the portfolio as a whole. If the actual average is lower or higher than that, then the costs per tonne of carbon emission reduction would be correspondingly lower or higher.

- I used the NPV of 15 years of avoided costs starting for a measure installed in 2018 as a proxy for computing the value of avoided gas costs for all three years of program savings.
- I included the entirety of each utilities efficiency portfolio budgets in the calculations, including budgets for market transformation, education and overhead costs that for which no direct savings have been estimated by the utilities. Overhead costs were allocated in proportion to program costs by sector.

For all programs except Union’s residential program the net costs per tonne are negative because the avoided gas costs outweigh the program costs. In other words, the figures represent net savings.

Utility/Sector	Annual Savings (million m3)	Budget (millions \$)	Lifetime Carbon Avoided (tonnes)	Avoided Gas Costs (millions \$)	Net Cost (millions \$)	Net cost per Tonne Carbon
<b>Enbridge</b>						
Res	56.2	\$115.9	1,580,625	\$154.0	(\$38.2)	(\$24)
C&I	169.3	\$85.9	4,761,563	\$464.0	(\$378.1)	(\$79)
Total	225.5	\$201.7	6,342,188	\$618.0	(\$416.2)	(\$66)
<b>Union (excluding Large Volume)</b>						
Res	20.4	\$86.3	573,750	\$55.9	\$30.4	\$53
C&I	192.8	\$92.7	5,422,500	\$528.4	(\$435.6)	(\$80)
Total	213.2	\$179.0	5,996,250	\$584.3	(\$405.3)	(\$68)

**Notes**

- 1 Enbridge Assumptions : savings by sector from EGD Exh C/T5/S2 p. 26; assumes avg 15 year life; budget from OEB Revised order w/overheads allocated in proportion to program budgets*
- 2 Union Assumptions : savings by sector from Union Response to Staff.31; assumes avg 15 year life; budget from OEB Revised order w/overheads allocated in proportion to program budgets*
- 3 Net cost is program cost minus avoided gas costs.*

#### STAFF INTERROGATORY 4

Topic: Adjustments to account for Climate Change Action Plan

Ref: p. 19

Preamble:

“Union argues that it made such NTG adjustments because the CPS only partially adjusted for free ridership, citing a statement in the CPS study that stated it did not account for any initiatives in the provincial Climate Change Action Plan. However, the Company provided no analysis to suggest that the specific NTG adjustments it proposed.”

Questions:

- a) Please provide an indication of what a more appropriate adjustment would have been, if any, to account for Climate Change Action Plan (CCAP) initiatives in the 2018-2020 period. Please indicate whether these adjustments would vary by sector or end-use, based on any CCAP initiatives in place that overlap with approved 2018-2020 DSM programs or measures.

#### **RESPONSE:**

To estimate how accounting for CCAP initiatives would have affected MACC net savings potential would require careful consideration and analysis of the specific CCAP initiatives. Specifically, it would require estimating:

- the total savings each initiative would be expected to produce in each year,
- the portion of those savings that would have been considered by the CPS – and therefore implicitly by the MACC – to be part of naturally-occurring conservation (i.e. part of a free rider rate for the CCAP initiatives),
- the portion of the remaining (non-naturally occurring) savings that would have occurred through the utilities approved DSM programs (another form of CCAP free ridership),
- the resulting subset of each CCAP initiative savings that would not have occurred absent the CCAP initiative,
- the subset of those remaining “non-free rider” CCAP initiative savings that would have been produced from non-capped customers (which are excluded from the MACC),

- the subset of those remaining non-free rider, non-capped customer CCAP initiative savings that were included in the MACC (which included even less savings than the CPS constrained scenario),<sup>4</sup> and
- the subset of those remaining non-free rider, non-capped, included in MACC savings that were cost-effective relative to the forecast carbon price.

Needless to say, such an analysis is not simple and would require some time and effort to conduct. I have not done the analysis; nor, apparently, have the utilities.

That said, it is important to emphasize that Union implicitly assumes that more than half – 54% – of the commercial and industrial savings potential identified in the MACC would be acquired through CCAP initiatives. It is hard to imagine that anything close to that amount – particularly in 2018 – could be acquired through initiatives that are both not comprehensively addressing the market (i.e. they are clearly targeting specific markets like hospitals, schools and social housing) and also just getting off the ground. In my experience, when starting from scratch, such initiatives take time to begin penetrating the market at anything close to the level necessary to acquire more than half the cost-effective savings potential.

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<sup>4</sup> For the 2018-2020 period, the MACC included only 292 million m<sup>3</sup> of savings – 97 million from the residential sector, 99 million from the commercial sector and 96 million from the industrial sector (Union response to Staff.31). In contrast, *in its most constrained scenario*, the CPS estimated total savings potential over the same three years of 632 million m<sup>3</sup> (CPS Exh. ES 7) – or more than twice as much. And that is despite the fact that the CPS used a more constraining cost-effectiveness test (the TRC plus vs. the UCT used in the MACC). While some of the difference can be attributed to the exclusion of capped customers from the MACC (they are included in the CPS), that cannot come close to accounting for the huge differences. For example, the MACC savings potential from the residential sector, which should have no capped customers, is still only about half of what the CPS found for its constrained scenario.

## STAFF INTERROGATORY 5

Topic: Abatement program ramp-up period

Ref: p. 27

### Preamble:

“In my experience it would be reasonable to plan for that kind of increase to be achieved over a 2-year or 3-year ramp up period. If they had planned for such an increase in late 2017, an increase in savings on the order of 25% would likely have been reasonable for 2018.”

### Questions:

- a) Please explain why a 25% increase in savings would be a reasonable target for the gas utilities' 2018 plan if the gas utilities had started planning abatement programs in late 2017, based on your comparison with Consumers Energy in Michigan.
- b) Please explain how the 2-year or 3-year ramp up period for abatement program development (and corresponding percentage savings increase in 2018) would vary if a new abatement program was developed, versus an abatement program that leveraged an existing DSM program (e.g., by providing funding for measures that do not pass the total resource cost test, but are still cost effective in comparison to the purchase of an allowance).

### **RESPONSE:**

- a) The point of my comparison to Consumers Energy is to demonstrate that a utility that was already among the North American leaders in the level of savings being achieved could increase savings substantially – in Consumers Energy's case, by 27% - relatively quickly. Note that Consumers Energy is just one example. To give another example, the Massachusetts utilities nearly doubled their first year gas savings in three years – between 2011 (15.2 million therms)<sup>5</sup> and 2014 (28.6 million therms). More than half of that increase occurred in the first year (between 2011 and 2012).<sup>6</sup> These increases were achieved in response to a statutory mandate to acquire all cost-effective efficiency resources.
- b) To begin with, the premise of this question seems flawed. The choice would not be just between (1) a brand new program and (2) leveraging of an existing program by providing funding for measures that do not pass the TRC but are cost-effective under Cap and

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<sup>5</sup> This represented about 0.6% of total gas sales in Massachusetts, or about the same rate of savings as I estimate in my testimony that Enbridge is planning for this year from uncapped customers.

<sup>6</sup> Massachusetts annual savings reports can be found at <http://ma-eeac.org/results-reporting/>.

Trade framework (e.g. under the UCT). In fact, I would expect that the majority – probably a large majority – of additional savings potential would be from more aggressive promotion (e.g. higher incentive levels and/or more marketing) of efficiency measures that are TRC cost-effective and already included in the utilities’ program portfolios. With respect to brand new programs, the ramp up period would be very dependent on the nature of the measures being promoted, the target market, and the program design. Some new programs could be launched and begin approaching their maximum savings potential very quickly – even within just one year. Residential behavior programs are one such example. Others – e.g. upstream HVAC programs – may take 6 to 12 months to develop, but could begin approaching their maximum savings potential by their second year. Still others – e.g. new approaches to promoting efficiency in new construction markets – may ramp up more gradually.