

26 January 2018

Ontario Energy Board  
2300 Yonge St., 27<sup>th</sup> Floor  
Toronto, ON  
M4P 1E4

Attn: Ms Kirsten Walli  
Board Secretary

By electronic filing and e-mail

Dear Ms Walli:

**Re: EB-2017-0224, EB-2017-0255, EB-2017-0275 – GEC Interrogatories to Union**

Attached please find GEC's interrogatories to Union.

Sincerely,

A handwritten signature in black ink, appearing to read 'David Poch', with a stylized flourish at the end.

David Poch

Cc:  
Enbridge  
Union  
Valerie Bennett  
Ljuba Djurdjevic  
Lawren Murray  
all parties

## **Ontario Energy Board**

**EB-2017-0224  
EB-2017-0255  
EB-2017-0275**

**Enbridge Gas Distribution Inc.  
Union Gas Limited  
EPCOR Natural Gas Limited Partnership  
Applications for approval of the cost consequences  
of 2018 cap and trade compliance plans**

### **Interrogatories from GEC to Union Gas Limited**

**Issue 1.4 - Has the gas utility reasonably and appropriately conducted its Compliance Plan option analysis and optimization of decision making?**

1. At Exh. 3, T1, p. 5, Union states that it “views a cost-effective Compliance Plan as one that achieves a reasonable cost of compliance for ratepayers compared to the carbon market price for compliance options and abatement alternatives available to Ontario entities.”
  - a. Please elaborate on what the Company means by “cost of compliance for ratepayers” in this statement. Is it solely the utility cost of compliance (that will be passed onto ratepayers), or does it include other costs that ratepayers will incur in the form of payments they make out of their own pockets for measures, taxes they pay to government to pay for Government subsidies of measures and/or any other costs? In other words, when Union is assessing cost-effectiveness of its cap and trade compliance plan, is it using something akin to the Utility Cost Test (UCT) or something more akin to the TRC or Societal Cost Tests? Please explain the rationale for the perspective being used.
  - b. In developing its 2018 Compliance Plan, did the Company assign value to measures or strategies that if implemented in 2018 would provide carbon emission reductions not only in 2018 but in subsequent years as well? In other words, did the Company value a strategy that reduced carbon emissions for 5 years more than one that reduced carbon emissions – or enabled the Company to meet carbon emission obligations, such as through purchase of emission allowances – for only one year.

- c. If the answer to part “b” of this question is yes, how was that done? For example, did the Company develop estimates of multi-year streams of costs, carbon emission reductions, and other benefits for each measure or strategy considered for implementation in 2018 and then compare the net present value (NPV) of costs per lifetime ton of carbon emissions avoided or offset? Or did it compute a levelized cost per ton of carbon emissions avoided or offset? If it did neither of these things, what form of analysis did it perform to compare the relative costs of different potential strategies? Please provide copies of all such analyses, in Excel with formulae intact. If parts of any such analyses are deemed confidential, please provide portions that are not confidential, as well as a hypothetical example of how the confidential portions of the analyses were conducted (i.e. absent the confidential assumptions).

**Issue 1.10 - Are the gas utility’s proposed greenhouse gas abatement activities reasonable and appropriate?**

2. At Exh 2, p. 5, Union states that the DSM volume impact removed amounts to 98,317,116 m<sup>3</sup> which “corresponds to the 2016-2020 DSM plan approved by the OEB”.
  - a. Is that a “partially effective volumetric reduction” associated with the Company’s 2018 DSM plan, or the full annual reduction.
  - b. Is that volume only for non-capped customers? If not, please explain.
  - c. Please provide the specific assumptions and calculations that led to the estimate of 98,317,116 m<sup>3</sup>. Please provide them in Excel, with formulae intact.
  - d. Please provide a breakdown of the 98,317,116 m<sup>3</sup> by program.
3. Exhibit 2, Schedule 1, p. 1 shows total DSM volume saved in 2018 as 323,134,370 m<sup>3</sup>.
  - a. Are those incremental annual savings?
  - b. Please provide the specific reference to Union’s 2015-2020 DSM plan – or the related Board order – from which that value is derived.
4. Exhibit 3, Tab 4, Schedule 1, p. 1
  - a. In the above referenced table Union appears to equate the cost of DSM driven carbon abatement to the DSM program cost per CO<sub>2</sub>e tonne abated. Have we read that correctly (if not please elaborate)?

- b. Does Union agree that to determine whether marginal DSM that would abate emissions is cost-effective it would be appropriate to count all avoided costs, not just the avoided cost of allowance or credit procurements?
  - c. If the answer to b. is yes, has Union done such an analysis? If so, please provide.
  - d. If the answer to b. is no, please explain.
- 5. Exhibit 3, Tab 4, Appendix A, Page 3
  - a. What is Union's understanding of how the free-rider rate is treated in the CPS Constrained and Unconstrained scenarios?
  - b. In utilizing the CPS data what free-rider rate did Union utilize for each customer segment? Specifically, what free-rider rates did Union use in the unconstrained scenario and the constrained scenario in its comparisons?
  - c. Does Union agree that moving from a constrained to an unconstrained DSM program spend (whether funded by rates or by government funding) would enable higher customer incentives that could lower the free-rider rate, and thereby improve program cost-effectiveness and increase abatement in a non-linear manner (i.e. more than in proportion to the increased program spend)?
- 6. Exhibit 3, Tab 4, Appendix A, Page 4
  - a. Union indicates that the MACC data was utilized by applying sectoral net to gross rates. Is this consistent with an assumption of customer incentive rates similar to those utilized within Union's current DSM portfolio?
  - b. If government funding was leveraged (similar to the approach that Union proposes for RNG) could net to gross rates be improved by increasing customer incentives?
  - c. The results Union provides for its MACC-based analysis suggest that there is cost-effective incremental residential DSM-driven abatement potential. Has Union compared the cost of each component of that potential abatement to the cost of each element of its C&T compliance plan (if so, please provide)?
  - d. Is it the company's understanding that the MACC includes or excludes the avoided costs of DSM (apart from the avoided C&T compliance costs)?
  - e. Does the company agree that DSM can be cost effective even though the utility costs of the DSM are higher than the avoided cost of allowances or credits?
- 7. At Exh 3, tab 1, p. 4, Union states that "there is no cost-effective incremental efficiency program that would be prudent to pursue at this time within the DSM Framework."

- a. Does the reference to “incremental efficiency **program**” include consideration of expansion of existing programs, or just consideration of new programs not already included in Union’s plan? If it only considers new programs not already included in Union’s plan, please explain why expansion of existing – i.e. increased aggressiveness through higher incentives, additional marketing and/or other means – was not considered.
- b. What is the qualifier “that would be prudent” intended to convey? Are there cost-effective incremental energy efficiency programs that would *not* be prudent to pursue? What would render a cost-effective new program imprudent to pursue?
- c. What is the purpose of the qualifier “within the DSM framework”? Is the Company suggesting that additional efficiency could only be pursued within the DSM framework, even if less expensive than other carbon emission compliance strategies? If so, why?
- d. How does Union define the term “cost-effective” as used in this statement? Does it mean TRC cost-effective, or Utility Cost Test (UCT) cost-effective, or something else. For clarity, please state which of the following potential categories of benefits and costs are included:

Benefits

- i. Avoided carbon emission permit costs,
- ii. avoided energy costs,
- iii. avoided T&D costs,
- iv. price suppression effects from lower demand,
- v. any other gas utility system cost savings,
- vi. electricity or water cost savings,
- vii. customer non-energy benefits (e.g. improved comfort or improved business productivity)
- viii. societal non-energy benefits (e.g. reduced emissions of pollutants other than greenhouse gases)
- ix. other (please specify)

Costs

- i. DSM program costs,
- ii. Customer contributions to measure costs (i.e. the portion of measure cost not covered by utility financial incentives)
- iii. Other (please specify)

Whatever the response, please explain why Union is defining cost-effective in that way for the purpose of determining which abatement options to consider.

8. At Exh 3, tab 1, p. 4, Union states that “There were a few incremental cost-effective measures that could be pursued for residential customers if the existing DSM budget and DSM framework were revised.
  - a. How much incremental additional savings would these measures provide?
  - b. How much additional lifetime savings would these measures provide?
  - c. How much would it cost to acquire these additional savings in 2018?
  - d. What would be the net present value of the avoided gas cost (both energy and infrastructure) associated with the savings estimated in response to parts “a” and “b” of this question?
  - e. What would be the cost per ton of carbon emissions reduced – net of all avoided gas costs – from pursuing these measures in 2018. Please provide all assumptions and calculations supporting the response.
  - f. Why does the DSM budget and DSM framework need to be revised to pursue these measures? Why would it not have been possible for Union to propose them as part of its 2018 Compliance Plan and get approval to pay for them through this proceeding?
9. Exhibit 3, Tab 4, Page 43 Union states: “Union did, however, identify cost-effective abatement opportunities incremental to Union’s existing DSM programs within the Residential sector in all carbon price forecast scenarios. Union will assess the incremental opportunity and pursue it through the DSM Framework where possible.”

Has Union assessed that incremental opportunity as part of its Mid-Term DSM filing, and if so, what added savings and carbon abatement has been identified and what added savings and carbon abatement (and related measures, targets and budgets) have been proposed in that filing?
10. At Exhibit 3, Tab 1, Page 5 of 24 Union states: “Union is also proactively addressing cost-effectiveness by working collaboratively with government to pursue funding that will allow customer abatement initiatives (such as RNG) to proceed.”
  - a. Please list and briefly describe the topics discussed in all meetings between the company and government entities during 2016 and 2017 where government or utility energy efficiency or other (non-RNG) GHG reduction efforts or potential efforts were discussed.

- b. Please provide copies of all correspondence sent or received between the company and government entities during 2016 and 2017 where government or utility energy efficiency or other (non-RNG) GHG reduction efforts or potential efforts were discussed.
- 11. At Exh. 3, T1, p 20, Union states that one limitation of the MACC study is that its analysis of efficiency measures is inclusive of the impacts of existing DSM programs and that it “would be faulty to assume that future projects will cost the same as existing ones”.
  - a. In making this statement, is Union talking about utility cost or TRC/Societal cost? If the latter, why would the costs per unit of savings change appreciably?
  - b. Does Union believe that the utility costs of acquiring incremental efficiency would be greater than those to acquire the efficiency resources already being captured by its current DSM plan? If so, what is the basis for that belief? Has the Company performed any analysis to confirm it? If so, did that analysis consider the potential for lowering free rider rates by more aggressively seeking increases in program participation? If so, how?
  - c. Please provide any analysis conducted by the Company to support its response to part “b” of this question. Please provide it in Excel, with formulae intact.
- 12. At Exh. 3, T1, p 21, Union states that one limitation of the MACC study is that it focused “only on impacts to natural gas utilities” and did not consider other customer impacts.
  - a. Is Union making the point that the MACC essentially used the Utility Cost Test (UCT) rather than the more expansive TRC or Societal Cost tests?
  - b. If the answer to part “a” of this question is “yes”, why is this a limitation if the utility is using the UCT to assess the relative cost-effectiveness of other compliance options?
- 13. At Exhibit 3, Tab 1, Page 23 of 24 Union notes: “The MACC does not consider alternative sources of funding available (i.e. provincial funding, CCAP, GreenON, and federal programs), which could impact the economics of programs from the Utilities’ perspectives. For example, based on the MACC alone, RNG would not be feasible for Union to pursue within the existing regulatory construct rooted in cost prudence.” And at Exhibit 3, Tab 4, Page 7 of 60 it is noted that “Union and EGD have worked together to develop the following abatement guiding principles:

1. Funding: Abatement programs should be able to draw on a variety of funding sources, including CCAP or GreenON funding, incremental amounts tracked through the GGEIDA and other Government funding (provincial or federal) to support projects that do not meet regulated measures for cost prudence.”

Please explain why the MACC was not seen as a constraint for proposing an RNG plan that relies on external funding but was seen as a constraint on proposing enhancement of existing DSM programs in 2018 or thereafter (for example, by supplementing customer incentive levels with government program funds to increase participation and reduce free ridership)?

14. At Exh 3, T 4, pp. 6-7, Union states that “abatement programs should be able to draw on a variety of funding sources...” and “where appropriate, an abatement program proposal will be supported by an assessment which may use a range of funding models and appropriate valuations and assumptions.”
- Is Union suggesting that the ability to “draw on a variety of funding sources” presented is a desirable “end” or rather that attempting to leverage other funding sources should be a standard practice to keep ratepayer costs as low as possible (i.e. a “means to an end”)? For example, if hypothetical Strategy A had to be paid for entirely by gas ratepayers and cost \$10 per ton of carbon emission reduced, would it not be preferable over hypothetical strategy B whose costs would be split 50/50 between gas ratepayers and other sources but had a total cost of \$30 (and therefore \$15 of ratepayer funds) per ton of carbon emission reduced.
  - When choosing between strategies, does Union believe it is appropriate to consider only the utility cost per unit of carbon emission reduction, or the full societal cost per unit of carbon emission reduction, when determining which strategies are preferable? For example, would hypothetical Strategy A that had to be paid for entire by gas ratepayers and cost \$10 per ton of carbon emission reduction be preferable or less desirable than hypothetical Strategy C whose costs would be split 20/80 between gas ratepayers and government and/or other funding sources but had a total cost of \$25 (and therefore \$5 of ratepayers funds) per ton of carbon reduced. Please explain the Company’s rationale.
  - What does the term “assessment” in the cited text mean? Is it a comparative analysis of costs per unit of carbon emission reduction? If not, what is it?
  - Under what conditions does the Company believe that it would be “appropriate” for an abatement program proposal to be supported by an assessment?



- e. Please provide copies of all such “assessments” of compliance options conducted by Enbridge for its 2018 Compliance Plan.
- 
- 15. At Ex. 3, Tab 4, pp. 6-8 Union lists attributes of its Abatement Construct, including: “Efficient and rational development: Abatement programs should balance customer cost impacts by leveraging existing infrastructures (particularly utility infrastructure, including physical, brand, billing, program delivery) where appropriate and by not duplicating existing frameworks (e.g. DSM).” Please elaborate on the goal of not duplicating the existing DSM framework. Specifically:
    - a. Would increasing participation and reducing free ridership by using government program funding to increase customer incentives comply with or conflict with this goal? Please explain the reasoning for the Company’s answer.
    - b. Would increasing financial incentive levels currently paid by the Company (or planned to be paid under its current DSM plan) in order to increase participation, savings and therefore carbon emission reductions from a given measure, set of measures or programs comply with or conflict with this goal? Please explain the reasoning for the Company’s answer.
    - c. Would promoting a new technology or program not currently part of the Company’s approved DSM plan in order to generate additional savings and carbon emission reductions comply with or conflict with this goal? Please explain the reasoning for the Company’s answer.
  - 16. At Exh 3, T4, pp. 19-22, Union’s describes how its proposed RNG procurement model would work. Why is the Company not asking for approval of a similar model for funding additional energy efficiency resources?
  - 17. At Exh 3, Tab 4, pp. 27-28, Union discusses its proposed Ground Source Heat Pump initiative. Under which conditions would the Company believe it to be appropriate to promote geothermal heating and cooling to its customers. For example, if cold climate air source heat pumps would be more economical for any categories of buildings, would the Company promote them instead? If not please explain why not?
  - 18. At Exh 3, Tab 4, pp. 28-30, Union discusses the net zero ready (NZR) program. On p. 29, line 10, the Company suggests that an NZR home requires “natural gas to provide supplemental energy on the coldest days.” In Please explain how a building could be net zero energy if it is burning natural gas on-site to meet its energy needs. Why wouldn’t the Company instead promote new construction practices that were

efficient enough to rely exclusively on the newest generation of very efficient, cold climate electric heat pumps, with enough on-site renewable energy generation to offset the building's entire electric load?

19. At Exh. 3, Tab 4, p. 13, Union provides a list of proposed 2018 projects, organized by Stage (1, 2 or 3). These projects are each described in more detail in ensuing pages. However, little information is provided regarding the likely levels of carbon emission reduction and costs.
- a. For each option included in Stages 1 through 3, please provide the following:
    - i. The average annual change in gas, electricity and any other fuel consumption relative to a baseline technology, building or situation.
    - ii. The “measure life” of the technology or building in the application being considered.
    - iii. The annual carbon emission reduction per unit (e.g. per piece of equipment, per building, per vehicle or per whatever of unit of measurement is appropriate)
    - iv. The incremental cost of the technology or building or process, relative to the baseline condition.
    - v. The portion of the incremental cost that Union would propose to cover in 2018.
    - vi. The portion of the incremental cost that Union envisions gas ratepayers would be asked to cover in the future.
    - vii. The levelized societal cost per tonne of carbon emission reduction.
    - viii. The levelized utility cost per tonne of carbon emission reduction.
  - b. Did Union conduct a comparative analysis of the relative cost-effectiveness of carbon emission reductions – or even of future carbon emission reduction potential – for each of the items included in Table 1 and/or for any other abatement options considered but not included in Table 1 (e.g. expanding existing DSM programs)? If so, please provide the analysis in Excel form, with all assumptions and formulae intact.
  - c. If the Company did not conduct the analysis referenced in part “b” of this question, please explain:
    - i. Why it did not?
    - ii. How it could come to the conclusion that the strategies and investments proposed in table 1 are the best ones to pursue?

20. At Exh 3, Tab 4, p. 40, Union summarizes three recommendations it has made for the DSM mid-term review which it believes will “ensure aggressive pursuance of DSM results and to continue to maximize benefits for ratepayers.” The second of those recommendations is to “adjust DSM budgets and targets to recognize the importance of DSM in the energy efficiency market as a result of Cap and Trade”. Please clarify what the Company means by this statement.
- Is the Company suggesting that DSM budgets and targets should be increased? If not, what is the Company suggesting with regards to how DSM budgets and savings targets should change to reflect “the importance of DSM in the energy efficiency market as a result of Cap and Trade”?
  - If the Company is suggesting that DSM budget and targets should be increased, what principles does the Company believe should guide decisions regarding how much they should be increased? For example, does the Company believe that they should be increased to the point where all efficiency resources that are cost-effective (including avoided need to purchase carbon emission allowances) should be acquired? If so, using what definition of cost-effectiveness? If not, why not?
21. At Exhibit 3, Tab 4, pp. 40-41, Union states that it has “evaluated what additional incremental energy efficiency abatement exists”, first “determining where incremental cost-effective opportunity versus non cost-effective opportunity should be pursued”, then completing “an analysis to understand what incremental abatement opportunity exists, what of this incremental opportunity is cost-effective and what is not cost-effective.”
- What does the Company mean by first determining “where incremental cost-effective opportunity versus non cost-effective opportunity should be pursued.” Does the “where pursued” language refer to different policy constructs, like the cap and trade plan versus the DSM Plan? If so, how was that determination made? If not, what does the sentence mean?
  - In assessing whether an incremental cost-effective opportunity for abatement exists, how did the Company define “cost-effective”?
  - Please provide copies of all the analyses referenced, including both assumptions and calculations in Excel form with formulae intact.
22. At Exhibit 3, Tab 4, p. 41, Union states that it “believes that any cost-effective opportunity identified through the CPA and/or MACC analysis should not be pursued via the 2018 Compliance plan”, but instead through the DSM framework. Why?

Why couldn't or shouldn't additional energy efficiency that is less expensive than other compliance options be included in the Company's Compliance plan?

23. At Exhibit 3, Tab 4, p. 42, Union states that it "did not identify any cost-effective abatement opportunity at the LTCPF's minimum or mid-range price scenarios." Please explain how this determination was made.
  - a. Did Union consider both new programs and the expansion of programs already in its DSM Plan?
  - b. Did Union compare the costs of additional incremental efficiency to just the forecast cost of carbon emissions – i.e. without considering the value of the avoided energy and other avoided gas infrastructure costs – or did it net out from the cost all such gas system benefits? How was this done?
  - c. Please provide a copy of the analysis conducted by Union in Excel, including all assumptions and with all formulae intact.
24. At Exhibit 3, Tab 4, p. 43, Union states "through the CPS and MACC analyses, Union has determined that it is not appropriate to include incremental DSM abatement opportunities in the 2018 Compliance Plan."
  - a. Were those results of the CPS and MACC the sole bases on which Union arrived at this conclusion? If not, what other references and or analyses were used as well. Please provide any such additional analyses.
  - b. Is it accurate to say that the MACC study relied heavily upon efficiency potential identified in the Conservation Potential Study?
  - c. Is it accurate to say that the Conservation Potential Study (CPS) quantified efficiency that was cost-effective based on the TRC test?
  - d. Is it accurate to say that the Company is assessing cost-effectiveness of potential carbon abatement strategies using the equivalent of the utility cost test (UCT) – i.e. by comparing only the cost the utility must incur to reduce or offset carbon emissions, and not including other costs borne by Government and/or other parties for those measures or strategies?
  - e. If the answers to the three previous questions above are all "yes", wouldn't the CPS and MACC study understate cost-effective efficiency potential – perhaps even by a very large amount – because it did not consider how much savings could be acquired if cost-effectiveness was based on the UCT (given that utility costs are often much lower than TRC cost)?
25. The MACC results are presented in terms of utility costs rather than societal costs.
  - a. Does Union agree that "utility cost" is the best cost metric for informing decisions regarding which carbon emission compliance options should be pursued? If not, why not?

- b. If the answer to part “a” of this question is yes, does the Company believe that the test Ontario uses to assess cost-effectiveness of energy efficiency be changed to the Utility Cost Test? If not, why should the test used to determine which efficiency resource merit investment be different than the test used to determine which other gas utility resources merit investment?
  - c. If the answer to part “a” of this question is yes, does the Company agree that any efficiency resource whose utility cost per ton of GHG emission reduction is lower than other alternatives should be procured? If not, why not?
- 26. Regarding Union’s recent energy efficiency program performance, please provide an Excel file with all of the different efficiency measures promoted by the Company, the number of participants by measure and program, both gross and net savings per measure and program, rebate/incentive dollars per measure and program, other costs per program, measure life per measure and program, NPV of the value of savings per measure and program, and NPV of TRC costs per measure and program for all of 2017 and all of 2016 (separately for each year). The information for custom C&I can be provided in aggregate for the program (rather than by measure or project).