March 11, 2015

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

RE: EB-2014-0273 – Union Gas Limited – 2013 DSM Deferrals Interrogatory Responses

Please find attached Union's responses to the interrogatories received in the above noted case.

Confidential copies of the attachments to interrogatories Exhibit B.Staff.6 and Exhibit B.APPrO.2 will be provided to the Board under separate cover. Union requests the Board maintain these documents as confidential per the Practice Direction on Confidential Filings. The information in these two interrogatory responses contains confidential customer information. Please note that APPrO submitted two interrogatories, one was confidential. Both of APPrO's interrogatories were numbered as question one. In order to avoid confusion, Union has renumbered APPrO's confidential interrogatory as Exhibit B.APPrO.2.

Intervenors wishing to view these unredacted documents must execute a Declaration and Undertaking and forward it to Union.

Copies of requested Excel spreadsheets in Exhibit B.Staff.7, Exhibit B.Staff.8 and Exhibit B.Staff.9 will be sent by email to the Board and intervenors.

If you have any questions with respect to this submission please contact me at (519) 436-5334.

Yours truly,

[original signed by]

Vanessa Innis
Manager, Regulatory Initiatives

c.c.: EB-2014-0273 Intervenors
Alexander Smith, Torys
Vince Mazzone, OEB

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 1, Status Update to Recommendation #26, page 107

Please indicate how the following suggestions included in the 2012 Auditor's recommendation were implemented in the 2013 evaluations for custom projects:

1) Simpler verification for projects conducted in the program year. Verify installation and operating conditions and update assumptions with better data and limited measurement.
2) More comprehensive evaluation for projects carried over from the previous program year to allow more time to evaluate. Include a greater degree of billing analysis and independent estimation approaches.
3) Require more details on baselines for projects of a certain savings level (e.g. 1 million m3). Union could involve an evaluator at pre-implementation stage for these projects to review savings calculations and assumptions, determine baseline, and set up an M&V plan for data collection.

Response:

The 2012 Audit Committee, which consists of three intervenor members and one representative from Union, did not agree with all suggestions provided by the 2012 Auditor but agreed that the recommendation for clarifying the roles for CPSV consultants and auditors be brought forward to the Technical Evaluation Committee ("TEC"). The TEC consists of three intervenor members, a representative from Union, a representative from Enbridge and two independent members with technical and other relevant expertise. Union brought forward the recommendation to the TEC for review on December 16, 2013. The TEC did not consider this recommendation a priority and noted that this recommendation would be addressed at the July 2014 TEC meeting. Due to this timing, no changes were made to the 2013 CPSV Terms of Reference to clarify the roles.

Subsequently, the TEC addressed Union and Enbridge audit recommendations during the update process for the 2014 CPSV Terms of Reference at the October 8, 2014 TEC meeting. Several modifications were made to clarify the role of the CPSV consultant and the auditor (e.g. clarifying that the CPSV consultant's basis for assumptions made in developing independent estimates of savings must be documented with appropriate references, and the CPSV consultant indicating the International Performance Measurement and Verification Protocol ("IPMVP") Option it followed in its review). A CPSV Coversheet Summary was also added which outlined the key inputs that the CPSV consultant undertook to determine savings. These process enhancements will ensure the CPSV consultant and auditor have clear roles in 2014 and beyond.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 1, Appendix D, page 143, measure category ESK program

The adjustment factors for 1) bathroom faucet aerator, 2) pipe insulation and 3) showerhead in the ESK Pull, Push and Door-to-Door initiatives appear to be inconsistent with Tables 8.1 to 8.3 (page 87) of the Final DSM 2013 Annual Report, and Tables PLL-3.1 (page 175), PSH-3.1 (page 186) and D2D-3.1 (page 164) in Appendices G to I. Please explain the appeared inconsistencies.

Response:

The figures listed in Exhibit B, Tab 1, Tables 8.1 to 8.3 (page 87) are the correct audited adjustment factors used in the derivation of savings. The values have been transposed in Appendix D (page 143).

The data presented in Exhibit B, Tab 1, Tables PLL-3.1 (page 175), PSH-3.1 (page 186) and D2D-3.1 (page 164) in Appendices G to I are one aspect of the ESK impact evaluation results. Adjustment factors are formulated using data contained in multiple tables in the impact evaluation reports, specifically:

Channels	**Tables**
ESK Pull	PLL-1.1, PLL-3.1 and PLL-3.5
ESK Push	PSH-1.1, PSH-3.1 and PSH-3.5
ESK Door-to-Door	D2D-1.2, D2D-3.1 and D2D-3.4

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 1, Appendix D, page 143, measure category LIMF program

The free ridership rates for the bathroom and kitchen faucet aerators in the LIMF offering appear to be updated. Please indicate what evidence this update was based on.

Response:

The approved free ridership rate for Union on aerators in the LIMF program is 1%, as established in filing EB-2012-0441 (filed December 19, 2012). Union notes a typographical error in EB-2013-0430 (filed April 30, 2014), which displayed the free ridership rate as 0% for both utilities. This will be addressed in the next annual update of Union's Input Assumptions filing.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Appendix N, Low Income Custom Project Verification Final Report, page 371

Please provide the 2013 CPSV Terms of Reference for the Low Income Custom Projects.

Response:

Please see Attachment 1.

Union Gas Limited
DSM Research & Evaluation

Terms of Reference:
2013 Low Income Custom Project Savings Verification

November 26, 2013

2013 Custom Project Savings Verification
Terms of Reference

A. Background

Union Gas Distribution Inc. (Union) operates Demand Side Management (DSM) programs including programs that involve custom projects in the commercial, multi-residential, industrial, agriculture, low income and new construction sectors. Custom projects cover opportunities where savings are linked to unique building specifications, uses and technologies. Each project is assessed individually for participation in the program. For perspective, there were 12 Low Income custom projects in 2012.

Union's DSM activities are regulated by the Ontario Energy Board (OEB) and adhere to the Requirements as laid out in EB-2008-0346 DSM Guidelines for Natural Gas Utilities. For custom projects, the resource savings are determined through engineering calculations that are determined at the project design stage. There is a need to verify the resource savings for gas through a third party engineering review.

Union is eligible to receive a shareholder incentive based on meeting targets as approved by the Ontario Energy Board (OEB). For custom projects, cumulative natural gas savings (m3) determine the DSM incentive. There is a desire to have a high level of confidence in these results.

Custom projects consist of specialized equipment, upgrades, and technology measures for which savings calculations are developed on a project by project basis. For a custom project, tracking requirements will include the type of equipment that was installed, the related savings (gas, electricity, and water), the date of installation, and the installation and/or equipment cost.

B. Requirements / Scope of Work

This verification study will consist of a detailed review of the savings calculations and equipment costs for a representative sample of custom projects in 2013.

a) Sampling:

A random sample of approximately 13 custom projects will be selected by an independent third party (other than the proponent selected). The 2013 custom project savings verification will be conducted in two parts. Wave 1 will be selected from custom projects tracked during January 1st – October 31st of 2013. These projects will be reviewed immediately. Wave 2 will be selected from custom projects completed during Q1-Q4 of 2013. These projects will be reviewed during Q1 of 2014.

b) Environment Health & Safety:

Union Gas highly values the health and safety of our employees, contractors, customers and communities. Union's Environmental, Health & Safety (EHS) Policy establishes principles to protect and advance the corporation's essential interests and to fulfill our commitment to people and the environment. Protecting and responsibly managing natural resources are critical to the quality of life in the areas Union serves as well as the environment.

The consultant will be expected to take responsibility for adhering to Union's EHS Policies, Principles and Vision. This includes not only understanding the safety protocols of Union, but also those of customer sites to be visited for the purpose of this study. The consultant will learn safety

standards when scheduling a site visit, adhere to sign-in requirements, and provide a report/debrief to explain what was done while visiting the customer.

c) Assessment Methodology:

The consultant will conduct on-site visits that will involve:

1. **An interview with the customer to validate installation of equipment and confirm operating conditions**. The consultant should provide to the customer the list of the data that they would like to see as well as an overview of the types of questions that will be asked of the customer prior to the interview. In additional, this information will also be provided to the Audit Committee, the Auditor, and the utility. There may be cases in which the consultant believes that no increase in the accuracy/confidence of the utility's savings estimates would reasonably be expected from a site visit. In such cases (which are expected to be rare) the consultant may complete the assessment without a site visit provided that it clearly documents the rationale for not having a site visit.

2. **Direct measurement of key site, equipment and/or operating characteristics whenever such measurements could be expected to appreciably improve the accuracy of the savings verification and does not overly burden the customer**. Direct measurement could involve both instantaneous measurement and short duration measurement that might require revisiting the site to collect data and devices left on-site. In cases in which the consultant determines that either adequate onsite measurement has already been conducted, or there would be an undue burden on the customer, or the cost of additional onsite measurement would be disproportionately high relative to the benefits, the consultant could choose not to conduct the measurement but is expected to provide the rationale for not doing so

In addition to conducting site visits, the consultant will interview vendors whenever useful for informing the savings verification process.

Using information collected during site-visits and interviews as well as its own expertise, the consultant will develop its own independent estimate of the savings for the project. The independent estimate should be based on the consultants own tools, calculations and assumptions. Note that Union's savings goals are expressed as total lifetime savings. Thus, the consultant's work must address both the reasonableness of estimates of annual savings and the reasonableness of estimates of the life of those savings.

During the review, the consultant will work with Union to address any issues requiring clarification or additional documentation. The consultant will also be expected to work with an independent auditor that will be hired by Union's 2013 "Audit Committee", a body comprised of several stakeholders to assess the reasonableness of Union's 2013 savings claim (looking at all savings, of which commercial custom project savings are just a part). The auditor will be charged, among other things, with providing input to and ultimately passing judgment on the reasonableness of the consultant's work and conclusions.

The consultant is encouraged to propose, either in their initial proposal, or during the review process, alternative or additional methods of verification of results that are expected to increase the accuracy level or confidence of the review results. Any such proposal should include an analysis of the additional benefits versus the incremental costs and any impact on both the customer and project schedule.

C. Deliverables

The project deliverables include the following:

- A Draft Report: In addition to the points outlined below, the Draft Report will also note the date of the interview and the names of individual(s) interviewed.
- A report showing the findings for each custom project review undertaken.
- The review of savings will include the following items in the report for each project:
  - Description of the project
  - Date of installation of equipment;
  - Type of building, building segment or process;
  - Description of the base case scenario used in utility's savings estimate; the reasonableness of the designation of advancement where applicable (i.e. did the utility's program cause old inefficient equipment to be replaced before it otherwise would have been) or replacement (i.e. should savings be based on the efficiency of new standard equipment because the equipment would have been replaced even in the absence of the utility's program) of the claimed base case used in the savings calculation;
  - Discussion of any base case adjustments applied by the consultant, if applicable;
  - Description of other aspects of the approach used by the consultant to estimate savings for the project, including identification of any variables for which on-site data collection or measurement was used and references for other key assumptions;
  - Discussion of the difference between the utility's savings estimate and the consultant's estimate, including a discussion of the relative merits of the methodologies used by both the utility and the consultant and differences in key assumptions used by each;
  - Regarding measure life, commentary on the reasonableness of the measure life applied to the specific project. Where appropriate, comment on future changes to the OEB approved measure lives for custom projects;
  - Discussion of the reasonableness of the results (i.e. gas m3/yr);
  - Any unclaimed gas savings;
  - Where proprietary modeling software is used, the consultant must identify the model and provide support to demonstrate its use as an appropriate and accurate tool for this application. When possible, the consultant should make available to the utility and the auditor for review, the underlying algorithms for any proprietary models used by the consultant to validate the savings calculation. When not possible, the consultant should supply model inputs and assumptions, so that if desired by others, they can compare the proprietary model results to other models or approaches; and
  - Complete documentation of the reviewer's calculations where they differ from the calculations in the original application.

- The report will also include:
  - Any additional data or information collected through the verification process;
  - Report on any discrepancies between the equipment as described in the utility's savings estimates and the equipment as installed;
  - Discussion of changes in the size or use of the building or process that alter the baseline model; and the assumptions that were made to account for these changes;
  - Total claimed and evaluated lifetime gas savings, and incremental costs;
  - Recommendations on steps which could be taken to provide higher level of accuracy/confidence for future reviews;
  - Recommendations on what could have been done earlier in the process to improve the confidence and accuracy of verification results;
  - To the extent that any measurement were taken on-site, list what was actually measured. (The raw data will be made available to the auditor and the utility but will not be included in the report); and
  - Identify areas of greatest confidence and areas with the greatest level of uncertainty.
  - The report will also include a section recommending any refinements for future savings calculations for custom projects.
  - For privacy reasons, the names and addresses of the customers and any specific data or information indicating the type of industry, which could allow the reader to infer the identity of customer, must not be published in any of the reports. Therefore, the

consultant will be required to provide their report with that information included, for internal use, and with that information redacted for public use.

- The consultant will be involved in discussions with an auditor regarding the report during their investigations and after the release of their final report.

D. Schedule

Deadlines for deliverables will be strictly adhered to. Union may impose penalties for failure to meet deadlines, up to 10% of the total cost of the project.

Verification Schedule	
Activity	**Due**
ToR Sent for Consideration	November 26, 2013
Proposal Due	December 6, 2013 - 3:00 p.m. EST
Launch Meeting	Week of January 6, 2014
Verification Work Plan	January 13, 2014
Wave One Draft Report	on or before – February 19, 2014
Second Wave Initiated	on or before January 20, 2014
Wave Two Draft Report	on or before March 10, 2014
Final Custom Project Engineering Review Report	March 28, 2014

E. Proposal Requirements

The proposal should include the following:

- A description of the proposed approach for the Custom Project Savings Verification;
- Suitable information for the Company to determine the qualifications of individuals and their roles in the project;
- A confirmation that the project team will include a Professional Engineer licensed in the Province of Ontario;
- The consultant will submit a proposal for the total cost to complete all the assessments. It is understood that the consultant will have to assume different costs for projects with different levels of complexity. Any additional projects beyond the original scope will be paid on a pro-rata basis;
- The consultant will also include their hourly or daily billing rates;
- Detailed work schedule; and
- Confirmation that the consultant will be able to meet the Utility contractor insurance and WSIB requirements

F. Proposal Deadline

Please forward your proposal in response to this Terms of Reference by **no later than 3:00pm on December 6, 2013** via email to the project contact noted below.

G. Project Contact

Pete Koepfgen
Technical Evaluator, DSM Strategy & Evaluation
Union Gas Limited
777 Bay Street, Suite 2901, Toronto, Ontario, M5G 2C8
Phone: 416.496.5354 / Fax: 416.496.5331 / Email: pkoepfgen@uniongas.com

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Appendix O, Engineering Review of 2013 Commercial/Industrial Custom Projects, page 443

1) Please provide the 2013 CPSV Terms of Reference for the Commercial/Industrial Contract Custom Projects.

2) CI01-2013-IND-0455, pages 459-460

a) Given that these DSM initiatives were part of the company's target of a 25% energy reduction in five years, was the customer planning to undertake DSM anyways? Please explain.

3) CI03-2013-IND-0267, pages 478-479

a) Please indicate how the verifier calculated the base case.
b) What were the specific DSM measures that were implemented due to Union's assistance?
c) Please indicate why the verifier did not use metered data to justify the gas savings claimed.

Response:

1) Please see Attachment 1.

2)
a) This customer has been a longstanding participant in Union's DSM programs and Union has continued to work with the customer to develop its energy efficiency programs for over 15 years. Union's understanding is that the customer's 25% energy reduction objective over five years is based on the expectation that Union's DSM program will be in place to enable the project to proceed.

3)
a) The verifier reviewed the base case calculation method originally prepared by Union using a greenhouse industry accepted simulation tool called "Virtual Grower". The simulation tool incorporates a range of inputs to describe both the base and high efficiency case, and calculates expected gas savings.

b) The specific DSM measures installed for the project are found at Exhibit B, Tab 1, page 478, in the Project Description.

c) The project is a new expansion of an existing greenhouse. Accordingly, baseline metered data is not available to reflect the gas utilization for the newly constructed portion of the greenhouse.

Union Gas Limited
DSM Research & Evaluation

Terms of Reference:
2013 Commercial/Industrial Custom Project Savings Verification

November 26, 2013

2013 Custom Project Savings Verification
Terms of Reference

A. Background

Union Gas Distribution Inc. (Union) operates Demand Side Management (DSM) programs including programs that involve custom projects in the commercial, multi-residential, industrial, agriculture, low income and new construction sectors. Custom projects cover opportunities where savings are linked to unique building specifications, uses and technologies. Each project is assessed individually for participation in the program. For perspective, there were 467 Commercial/Industrial custom projects in 2012.

Union's DSM activities are regulated by the Ontario Energy Board (OEB) and adhere to the requirements as laid out in EB-2008-0346 DSM Guidelines for Natural Gas Utilities.. For custom projects, the resource savings are determined through engineering calculations that are determined at the project design stage. There is a need to verify the resource savings for gas through a third party commercial and industrial engineering review.

Union is eligible to receive a shareholder incentive based on meeting targets as approved by the Ontario Energy Board (OEB). For custom projects, cumulative natural gas savings (m3) determine the DSM incentive. There is a desire to have a high level of confidence in these results.

Custom projects consist of specialized equipment, upgrades, and technology measures for which savings calculations are developed on a project by project basis. For a custom project, tracking requirements will include the type of equipment that was installed, the related savings (gas, electricity, and water), the date of installation, and the installation and/or equipment cost.

B. Requirements / Scope of Work

This verification study will consist of a detailed review of the savings calculations and equipment costs for a representative sample of custom projects in 2013.

a) Sampling:

A random sample of approximately 29 custom projects will be selected by an independent third party (other than the proponent selected). The 2013 custom project savings verification will be conducted in two parts. Wave 1 will be selected from custom projects tracked during January 1st – October 31st of 2013. These projects will be reviewed immediately. Wave 2 will be selected from custom projects completed during Q1-Q4 of 2013. These projects will be reviewed during Q1 of 2014.

b) Environment Health & Safety:

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The consultant will be expected to take responsibility for adhering to Union's EHS Policies, Principles and Vision. This includes not only understanding the safety protocols of Union, but also those of customer sites to be visited for the purpose of this study. The consultant will learn safety

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During the review, the consultant will work with Union to address any issues requiring clarification or additional documentation. The consultant will also be expected to work with an independent auditor that will be hired by Union's 2013 "Audit Committee", a body comprised of several stakeholders to assess the reasonableness of Union's 2013 savings claim (looking at all savings, of which commercial custom project savings are just a part). The auditor will be charged, among other things, with providing input to and ultimately passing judgment on the reasonableness of the consultant's work and conclusions.

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  - Discussion of any base case adjustments applied by the consultant, if applicable;
  - Description of other aspects of the approach used by the consultant to estimate savings for the project, including identification of any variables for which on-site data collection or measurement was used and references for other key assumptions;
  - Discussion of the difference between the utility's savings estimate and the consultant's estimate, including a discussion of the relative merits of the methodologies used by both the utility and the consultant and differences in key assumptions used by each;
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consultant will be required to provide their report with that information included, for internal use, and with that information redacted for public use.

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F. Proposal Deadline

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G. Project Contact

Pete Koepfgen
Technical Evaluator, DSM Strategy & Evaluation
Union Gas Limited 777 Bay Street, Suite 2901 Toronto, Ontario, M5G 2C8
Phone: 416.496.5354 / Fax: 416.496.5331 / Email: pkoepfgen@uniongas.com

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Appendix P, 2013 Evaluation of Distribution Contract Custom Projects, page 569

1) Please provide the 2013 CPSV Terms of Reference for the Large Distribution Contract Custom Projects.

2) 2013-IND-0348, pages 579-582

   a) The savings are calculated based on the life of the [redacted]. Should the savings be calculated based on the life of the [redacted] the [redacted] is supplied to rather than the life of the [redacted]? Please indicate the expected life of the [redacted].
   b) Ref: Independent Audit of 2013 DSM Program Results, page 28
      - The Auditor reduced the estimated savings by 50% to take into account the deterioration of the new [redacted] capacity due to the impurities of the [redacted]. Would these impurities affect the life of the pipeline based on which the cumulative savings were calculated?

3) 2013-IND-0124, pages 639-642

   a. The [redacted] was [redacted]. When it was [redacted], it was assumed that the useful life is [redacted]. What is the useful life of the [redacted] and based on what evidence did the verifier assume that this [redacted] would last for [redacted]?

4) 2013-IND-0450, pages 666-669

   a. It appears that the customer had [redacted] the [redacted] of the [redacted] [redacted]. The estimated savings assumed that the customer would not have replaced the [redacted] [redacted]. Please provide evidence to justify this assumption. Also explain why this DSM initiative was not considered advancement. For advancements, gas savings should be claimed for the period of advancement rather than over the [redacted].
   b. The project description states that [redacted] [redacted]

[redacted]. Since the customer has not met the above requirements to date (i.e. has allowed the existing [redacted]) why it is assumed that the customer will meet these requirements in the future for the [redacted] to last for [redacted]? Please provide evidence for making this assumption.

c. The cumulative savings are calculated over the assumed life of the[redacted]. Should the savings be calculated over the remaining life of the [redacted] etc.? Provide evidence that the life of the [redacted] would exceed the life of the [redacted].

d. Please provide the same information, where applicable, for the following projects:

2013-IND-0451
2013-IND-0179
2013-IND-0072
2013-IND-0204
2013-IND-0117

Response:

1) Please see Attachment 1.

2) – 4) These responses have been provided in confidence under separate cover.

Union Gas Limited
DSM Research & Evaluation

Terms of Reference:
2013 Large Volume Custom Project Savings Verification

November 26, 2013

2013 Custom Project Savings Verification
Terms of Reference

A. Background

Union Gas Distribution Inc. (Union) operates Demand Side Management (DSM) programs including programs that involve custom projects in the commercial, multi-residential, industrial, agriculture, low income and new construction sectors. Custom projects cover opportunities where savings are linked to unique building specifications, uses and technologies. Each project is assessed individually for participation in the program. For perspective, there were 180 Large Volume custom projects in 2012.

Union's DSM activities are regulated by the Ontario Energy Board (OEB) and adhere to the requirements as laid out in EB-2008-0346 While the program offerings remained the same for the Large Volume Industrial Program, new in 2013 was the customer incentive approach for Rate T2 and Rate 100. Rate T1 remained unchanged from 2012. These three rate classes comprise the Large Volume Industrial Program. For custom projects, the resource savings are determined through engineering calculations that are determined at the project design stage. There is a need to verify the resource savings for gas through a third party commercial and industrial engineering review.

Union is eligible to receive a shareholder incentive based on meeting targets as approved by the Ontario Energy Board (OEB). For custom projects, cumulative natural gas savings (m3) determine the DSM incentive. There is a desire to have a high level of confidence in these results.

Custom projects consist of specialized equipment, upgrades, and technology measures for which savings calculations are developed on a project by project basis. For a custom project, tracking requirements will include the type of equipment that was installed, the related savings (gas, electricity, and water), the date of installation, and the installation and/or equipment cost.

B. Requirements / Scope of Work

This verification study will consist of a detailed review of the savings calculations and equipment costs for a representative sample of custom projects in 2013.

a) Sampling:

A random sample of approximately 25 custom projects will be selected by an independent third party (other than the proponent selected). The 2013 custom project savings verification will be conducted in two parts. Wave 1 will be selected from custom projects tracked during January 1st – October 31st of 2013. These projects will be reviewed immediately. Wave 2 will be selected from custom projects completed during Q1-Q4 of 2013. These projects will be reviewed during Q1 of 2014.

b) Environment Health & Safety:

Union Gas highly values the health and safety of our employees, contractors, customers and communities. Union's Environmental, Health & Safety (EHS) Policy establishes principles to protect and advance the corporation's essential interests and to fulfill our commitment to people and the environment. Protecting and responsibly managing natural resources are critical to the quality of life in the areas Union serves as well as the environment.

The consultant will be expected to take responsibility for adhering to Union's EHS Policies, Principles and Vision. This includes not only understanding the safety protocols of Union, but also those of customer sites to be visited for the purpose of this study. The consultant will learn safety

standards when scheduling a site visit, adhere to sign-in requirements, and provide a report/debrief to explain what was done while visiting the customer.

c) Assessment Methodology:

The consultant will conduct on-site visits that will involve:

1. **An interview with the customer to validate installation of equipment and confirm operating conditions**. The consultant should provide to the customer the list of the data that they would like to see as well as an overview of the types of questions that will be asked of the customer prior to the interview. In additional, this information will also be provided to the Audit Committee, the Auditor, and the utility. There may be cases in which the consultant believes that no increase in the accuracy/confidence of the utility's savings estimates would reasonably be expected from a site visit. In such cases (which are expected to be rare) the consultant may complete the assessment without a site visit provided that it clearly documents the rationale for not having a site visit.

2. **Direct measurement of key site, equipment and/or operating characteristics whenever such measurements could be expected to appreciably improve the accuracy of the savings verification and does not overly burden the customer**. Direct measurement could involve both instantaneous measurement and short duration measurement that might require revisiting the site to collect data and devices left on-site. In cases in which the consultant determines that either adequate onsite measurement has already been conducted, or there would be an undue burden on the customer, or the cost of additional onsite measurement would be disproportionately high relative to the benefits, the consultant could choose not to conduct the measurement but is expected to provide the rationale for not doing so

In addition to conducting site visits, the consultant will interview vendors whenever useful for informing the savings verification process.

Using information collected during site-visits and interviews as well as its own expertise, the consultant will develop its own independent estimate of the savings for the project. The independent estimate should be based on the consultants own tools, calculations and assumptions. Note that Union's savings goals are expressed as total lifetime savings. Thus, the consultant's work must address both the reasonableness of estimates of annual savings and the reasonableness of estimates of the life of those savings.

During the review, the consultant will work with Union to address any issues requiring clarification or additional documentation. The consultant will also be expected to work with an independent auditor that will be hired by the utility's 2013 "Audit Committee", a body comprised of several stakeholders to assess the reasonableness of Union's 2013 savings claim (looking at all savings, of which commercial custom project savings are just a part). The auditor will be charged, among other things, with providing input to and ultimately passing judgment on the reasonableness of the consultant's work and conclusions.

The consultant is encouraged to propose, either in their initial proposal, or during the review process, alternative or additional methods of verification of results that are expected to increase the accuracy level or confidence of the review results. Any such proposal should include an analysis of the additional benefits versus the incremental costs and any impact on both the customer and project schedule.

C. Deliverables

The project deliverables include the following:

- A Draft Report: In addition to the points outlined below, the Draft Report will also note the date of the interview and the names of individual(s) interviewed.

- A report showing the findings for each custom project review undertaken.
- The review of savings will include the following items in the report for each project:
  - Description of the project
  - Date of installation of equipment;
  - Type of building, building segment or process;
  - Description of the base case scenario used in utility's savings estimate; the reasonableness of the designation of advancement where applicable (i.e. did the utility's program cause old inefficient equipment to be replaced before it otherwise would have been) or replacement (i.e. should savings be based on the efficiency of new standard equipment because the equipment would have been replaced even in the absence of the utility's program) of the claimed base case used in the savings calculation;
  - Discussion of any base case adjustments applied by the consultant, if applicable;
  - Description of other aspects of the approach used by the consultant to estimate savings for the project, including identification of any variables for which on-site data collection or measurement was used and references for other key assumptions;
  - Discussion of the difference between the utility's savings estimate and the consultant's estimate, including a discussion of the relative merits of the methodologies used by both the utility and the consultant and differences in key assumptions used by each;
  - Regarding measure life, commentary on the reasonableness of the measure life applied to the specific project. Where appropriate, comment on future changes to the OEB approved measure lives for custom projects;
  - Discussion of the reasonableness of the results (i.e. gas m3/yr);
  - Any unclaimed gas savings;
  - Where proprietary modeling software is used, the consultant must identify the model and provide support to demonstrate its use as an appropriate and accurate tool for this application. When possible, the consultant should make available to the utility and the auditor for review, the underlying algorithms for any proprietary models used by the consultant to validate the savings calculation. When not possible, the consultant should supply model inputs and assumptions, so that if desired by others, they can compare the proprietary model results to other models or approaches; and
  - Complete documentation of the reviewer's calculations where they differ from the calculations in the original application.

- The report will also include:
  - Any additional data or information collected through the verification process;
  - Report on any discrepancies between the equipment as described in the utility's savings estimates and the equipment as installed;
  - Discussion of changes in the size or use of the building or process that alter the baseline model; and the assumptions that were made to account for these changes;
  - Total claimed and evaluated lifetime gas savings, and incremental costs;
  - Recommendations on steps which could be taken to provide higher level of accuracy/confidence for future reviews;
  - Recommendations on what could have been done earlier in the process to improve the confidence and accuracy of verification results;
  - To the extent that any measurement were taken on-site, list what was actually measured. (The raw data will be made available to the auditor and the utility but will not be included in the report); and
  - Identify areas of greatest confidence and areas with the greatest level of uncertainty.
  - The report will also include a section recommending any refinements for future savings calculations for custom projects.
  - For privacy reasons, the names and addresses of the customers and any specific data or information indicating the type of industry, which could allow the reader to infer the identity of customer, must not be published in any of the reports. Therefore, the consultant will be required to provide their report with that information included, for internal use, and with that information redacted for public use.
  - The consultant will be involved in discussions with an auditor regarding the report during their investigations and after the release of their final report.

D. Schedule

Deadlines for deliverables will be strictly adhered to. Union may impose penalties for failure to meet deadlines up to 10% of the total cost of the project.

Verification Schedule	
Activity	**Due**
ToR Sent for Consideration	November 26, 2013
Proposal Due	December 6, 2013 - 3:00 p.m. EST
Launch Meeting	Week of January 6, 2014
Verification Work Plan	January 13, 2014
Wave One Draft Report	on or before – February 19, 2014
Second Wave Initiated	on or before January 20, 2014
Wave Two Draft Report	on or before March 10, 2014
Final Custom Project Engineering Review Report	March 28, 2014

E. Proposal Requirements

The proposal should include the following:

- A description of the proposed approach for the Custom Project Savings Verification;
- Suitable information for the Company to determine the qualifications of individuals and their roles in the project;
- A confirmation that the project team will include a Professional Engineer licensed in the Province of Ontario;
- The consultant will submit a proposal for the total cost to complete all the assessments. It is understood that the consultant will have to assume different costs for projects with different levels of complexity. Any additional projects beyond the original scope will be paid on a pro-rata basis;
- The consultant will also include their hourly or daily billing rates;
- Detailed work schedule; and
- Confirmation that the consultant will be able to meet the Utility contractor insurance and WSIB requirements

F. Proposal Deadline

Please forward your proposal in response to this Terms of Reference by **no later than 3:00pm on December 6, 2013** via email to the project contact noted below.

G. Project Contact

Pete Koepfgen
Technical Evaluator, DSM Strategy & Evaluation
Union Gas Limited
777 Bay Street, Suite 2901 Toronto, Ontario, M5G 2C8
Phone: 416.496.5354 / Fax: 416.496.5331 / Email: pkoepfgen@uniongas.com

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, Table 4 (Low Income Custom Projects), page 20

Please provide a new table in Excel format that includes the following:

a) Annual gas savings for each project
b) Annual electricity, water and other savings for each project, if any
c) Total annual cost savings associated with a) and b) above
d) Incremental costs of the project
e) Incentive amount provided to the customer
f) Simple payback based on the information above (before the incentive was provided)

Response:

Please see Attachment 1.

Low Income Custom Projects

Line No.	Project ID	Project Description	Audited m3 Annual Gas Savings (m^3/Yr) a.	Audited Annual Electrical Savings (kWh/Yr) b.	Audited Annual Water Savings (Liters/Yr) c.	Total Annual Cost Savings d.	Audited Incremental Cost ($) e.	Incentive f.	Simple Payback* g.	Rate Class h.	2013 Avg Gas Unit Price[1] ($/$m^3$) i.	2013 Electricity Unit Price[2] ($/kWh) j.	2013 Water Unit Price[2] ($/L) k.
1	2013-COM-0014	High Efficiency Building	20,757	28,970	219,000	$ 7,484	$ 258,200	$ 57,378	34.5	M2	$ 0.21677	$ 0.10299	$0.00000311
2	2013-COM-0013	High Efficiency Building	28,720	80,860	365,000	$ 14,555	$ 254,000	$ 55,341	17.5	M2	$ 0.21677	$ 0.10299	$0.00000311
3	2013-COM-0271	Temperature Controls	20,428	0	0	$ 4,428	$ 71,100	$ 34,050	16.1	M2	$ 0.21677	$ 0.10299	$0.00000311
4	2013-COM-0218	Windows and doors	17,935	423	0	$ 3,859	$ 350,641	$ 25,083	90.9	M1	$ 0.21274	$ 0.10299	$0.00000311
5	2013-COM-0239	Windows	5,995	316	0	$ 1,308	$ 386,303	$ 17,813	295.4	M1	$ 0.21274	$ 0.10299	$0.00000311
6	2013-COM-0172	Windows	5,998	0	0	$ 1,300	$ 148,500	$ 14,611	114.2	M2	$ 0.21677	$ 0.10299	$0.00000311
7	2013-COM-0130	ERV	9,665	34,718	0	$ 6,709	$ 9,720	$ 4,860	1.4	01	$ 0.32417	$ 0.10299	$0.00000311
8	2013-COM-0240	Pipe Insulation	9,554	-72,360	0	-$ 5,381	$ 48,000	$ 10,266	NA[3]	M2	$ 0.21677	$ 0.10299	$0.00000311
9	2013-COM-0128	Windows	4,614	227	0	$ 1,005	$ 91,955	$ 8,748	91.5	M1	$ 0.21274	$ 0.10299	$0.00000311
10	2013-COM-0016	Pipe Insulation	1,098	385	0	$ 278	$ 121,050	$ 4,828	436.0	M2	$ 0.21677	$ 0.10299	$0.00000311
11	2013-COM-0263	Windows	673	1	0	$ 143	$ 7,951	$ 1,241	55.5	M1	$ 0.21274	$ 0.10299	$0.00000311
			125,437	**73,540**	**584,000**	**$ 35,687**	**$ 1,747,420**	**$ 234,218**					

*Simple Payback has been provided for illustrative purposes only and includes all audited project savings.

[1]Average Gas Unit Prices are the average 2013 unit rate per m3 by rate class delivered to customers on system supply exclusive of fixed customer charges (non-fixed charges include delivery, demand, transportation, storage and gas commodity).

[2]Electricity and Water Unit Prices are the 2013 values from the OPA Conservation and Demand Management Cost Effectiveness Guide, October 15, 2010, Appendix A, Ratepayer Assumptions

[3]Increased cost of additional electricity use is greater than cost savings of gas saved.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, Table 6 (Commercial/Industrial Custom Projects), pages 24-25

Please provide a new table in Excel format that includes the following:

a) Annual gas savings for each project
b) Annual electricity, water and other savings for each project, if any
c) Total annual cost savings associated with a) and b) above
d) Incremental costs of the project
e) Incentive amount provided to the customer
f) Simple payback based on the information above (before the incentive was provided)

Response:

Please see Attachment 1.

Commercial/Industrial Custom Projects

Line No.	Project ID	Project Description	Audited m3 Annual Gas Savings (m^3/Yr) a.	Audited Annual Electrical Savings (kWh/Yr) b.	Audited Annual Water Savings (Liters/Yr) c.	Total Annual Cost Savings d.	Audited Incremental Cost ($) e.	Incentive f.	Simple Payback* g.	Rate Class h.	2013 Avg Gas Unit Price[1] ($/$m^3$) i.	2013 Electricity Unit Price[2] ($/kWh) j.	2013 Water Unit Price[2] ($/L) k.
1	2013-COM-0101	New construction warehouse with roof insulation (R-30) exceeding code (R-27)	13,924	0	0	$ 3,018	$ 90,800	$ 1,392	30.1	M2	$ 0.21677	$ 0.10299	$0.00000311
2	2013-IND-0196	Gas leak repairs	0	0	0	$ -	$ 3,000	$ 1,500	N/A[3]	M4	$ 0.20164	$ 0.10299	$0.00000311
3	2013-IND-0045	Starch dryer steam preheater	0	0	0	$ -	$ 95,169	$ 20,000	N/A[4]	20	$ 0.24013	$ 0.10299	$0.00000311
4	2013-IND-0457	Newly constructed asphalt plant to replace 2 nearby aging plants	544,277	0	0	$ 105,539	$ 3,200,000	$ 40,000	30.3	M5	$ 0.19391	$ 0.10299	$0.00000311
5	2013-IND-0256	5.1 acre expansion to an existing 4.6 acre greenhouse.	321,899	0	0	$ 62,418	$ 342,070	$ 32,190	5.5	M5	$ 0.19391	$ 0.10299	$0.00000311
6	2013-IND-0186	Line speed improvements	1,112,600	0	0	$ 224,344	$ 9,291,257	$ 40,000	41.4	M4	$ 0.20164	$ 0.10299	$0.00000311
7	2013-IND-0013	"B" deodorizer project	2,864,979	0	0	$ 555,539	$ 2,874,132	$ 80,000	5.2	M5	$ 0.19391	$ 0.10299	$0.00000311
8	2013-IND-0455	HVAC improvement	5,927,716	0	0	$ 1,181,296	$ 497,200	$ 120,000	0.4	M7	$ 0.19928	$ 0.10299	$0.00000311
9	2013-IND-0267	Greenhouse expansion (22.5 acres)	3,085,122	0	0	$ 598,226	$ 3,844,283	$ 85,000	6.4	M5	$ 0.19391	$ 0.10299	$0.00000311
10	2013-IND-0185	HVAC improvement - space heating	1,741,055	0	0	$ 351,065	$ 83,870	$ 40,000	0.2	M4	$ 0.20164	$ 0.10299	$0.00000311
11	2013-IND-0083	New greenhouse - multiple measures	1,531,967	0	0	$ 297,059	$ 1,188,285	$ 50,000	4.0	M5	$ 0.19391	$ 0.10299	$0.00000311
12	2013-IND-0037	Tank & hot oil pipe insulation	667,000	0	0	$ 134,493	$ 790,008	$ 40,000	5.9	M4	$ 0.20164	$ 0.10299	$0.00000311
13	2013-IND-0046	Spray dryer steam coil preheat	402,543	0	0	$ 96,664	$ 95,131	$ 20,000	1.0	20	$ 0.24013	$ 0.10299	$0.00000311
14	2013-IND-0177	5.2 acre expansion to an existing 4.6 acre greenhouse.	567,304	0	0	$ 110,004	$ 339,980	$ 40,000	3.1	M5	$ 0.19391	$ 0.10299	$0.00000311
15	2013-IND-0055	Pipe & vessel insulation	286,100	0	0	$ 55,477	$ 350,001	$ 38,140	6.3	M5	$ 0.19391	$ 0.10299	$0.00000311
16	2013-COM-0162	Dock door seals	342,886	61,961	0	$ 101,320	$ 297,340	$ 34,973	2.9	10	$ 0.27688	$ 0.10299	$0.00000311
17	2013-IND-0042	Steam leak repairs	158,733	0	2,010,869	$ 30,786	$ 8,793	$ 4,395	0.3	M5	$ 0.19391	$ 0.10299	$0.00000311
18	2013-COM-0026	Grain dryer replacement	11,633	0	0	$ 2,522	$ 58,560	$ 7,977	23.2	M2	$ 0.21677	$ 0.10299	$0.00000311
19	2013-IND-0064	Steam trap replacement	172,935	19,375	358,691	$ 35,530	$ 3,124	$ 1,562	0.1	M5	$ 0.19391	$ 0.10299	$0.00000311
20	2013-COM-0149	Heat transfer improvement	25,660	0	0	$ 5,562	$ 14,895	$ 2,566	2.7	M2	$ 0.21677	$ 0.10299	$0.00000311
21	2013-COM-0069	Window & door replacements	14,480	0	0	$ 3,139	$ 168,436	$ 1,448	53.7	M2	$ 0.21677	$ 0.10299	$0.00000311
			19,792,813	**81,336**	**2,369,560**	**$ 3,954,000**	**$ 23,636,334**	**$ 701,143**					

*Simple Payback has been provided for illustrative purposes only and includes all audited project savings.

[1]Average Gas Unit Prices are the average 2013 unit rate per m3 by rate class delivered to customers on system supply exclusive of fixed customer charges (non-fixed charges include delivery, demand, transportation, storage and gas commodity).

[2]Electricity and Water Unit Prices are the 2013 values from the OPA Conservation and Demand Management Cost Effectiveness Guide, October 15, 2010, Appendix A, Ratepayer Assumptions Table

[3]Savings for this project were removed for reasons of project eligibility.

[4]Savings for this project were removed as a result of the project being removed from service.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, Table 8 (Large Volume Projects), pages 30-31

Please provide a new table in Excel format that includes the following:

a) Annual gas savings for each project
b) Annual electricity, water and other savings for each project, if any
c) Total annual cost savings associated with a) and b) above
d) Incremental costs of the project
e) Incentive amount provided to the customer
f) Simple payback based on the information above (before the incentive was provided)

Response:

Please see Attachment 1.

Large Volume Custom Projects

Line No.	Project ID	Project Description	Audited m3 Annual Gas Savings (m^3/Yr) a.	Audited Annual Electrical Savings (kWh/Yr) b.	Audited Annual Water Savings (Liters/Yr) c.	Total Annual Cost Savings d.	Audited Incremental Cost ($) e.	Incentive f.	Simple Payback* g.	Rate Class h.	2013 Avg Gas Unit Price[1] ($/$m^3$) i.	2013 Electricity Unit Price[2] ($/kWh) j.	2013 Water Unit Price[2] ($/L) k.
1	2013-IND-0348	Coke oven gas pipe replacement	5,820,000	0	0	$ 1,321,114	$ 1,188,280	$ 170,000	0.9	100	$ 0.22700	$ 0.10299	$ 0.00000311
2	2013-IND-0469	Coke oven gas burners installed in an existing boiler	6,940,000	0	0	$ 1,236,062	$ 272,833	$ 40,000	0.2	T2	$ 0.17811	$ 0.10299	$ 0.00000311
3	2013-IND-0120	Steam leak repairs	4,097,000	0	42,920,000	$ 729,838	$ 178,191	$ 20,000	0.2	T2	$ 0.17811	$ 0.10299	$ 0.00000311
4	2013-IND-0121	Steam leak repairs	1,678,000	0	17,570,000	$ 298,918	$ 155,021	$ 20,000	0.5	T2	$ 0.17811	$ 0.10299	$ 0.00000311
5	2013-IND-0416	Steam leak repairs	1,247,000	0	12,305,000	$ 222,138	$ 702,644	$ 15,000	3.2	T2	$ 0.17811	$ 0.10299	$ 0.00000311
6	2013-IND-0074	Steam leak repairs	2,206,000	130,550	25,630,000	$ 424,158	$ 21,250	$ 10,625	0.05	T1	$ 0.18614	$ 0.10299	$ 0.00000311
7	2013-IND-0240	Steam leak repairs	1,934,000	0	30,430,000	$ 344,553	$ 17,709	$ 8,855	0.05	T2	$ 0.17811	$ 0.10299	$ 0.00000311
8	2013-IND-0229	Heat recovery from equipment cooling to boiler feed water	1,707,000	0	826,500,000	$ 320,317	$ 133,469	$ 40,000	0.4	T1	$ 0.18614	$ 0.10299	$ 0.00000311
9	2013-IND-0542	Burner metering equipment upgrades on heat treating furnace	98,580	0	0	$ 18,350	$ 19,542	$ 9,771	1.1	T1	$ 0.18614	$ 0.10299	$ 0.00000311
10	2013-IND-0123	Steam trap repairs	1,116,000	0	3,418,000	$ 198,778	$ 66,475	$ 20,000	0.3	T2	$ 0.17811	$ 0.10299	$ 0.00000311
11	2013-IND-0101	Install heat recovery steam generator (HRSG) on an existing gas turbine generator to offset boiler-generated steam usage; savings claimed for proposed replacement of electric chillers with turbo-chillers which provide for more annual hours of use	3,405,000	0	0	$ 633,819	$ 1,232,775	$ 40,000	1.9	T1	$ 0.18614	$ 0.10299	$ 0.00000311
12	2013-IND-0273	Condensate heat recovery	1,239,000	0	0	$ 281,248	$ 30,073	$ 20,000	0.1	100	$ 0.22700	$ 0.10299	$ 0.00000311
13	2013-IND-0124	Re-commission existing 3rd reaction tower previously bypassed due to worn out screens	32,310,000	0	108,562,869	$ 5,754,972	$ 4,000,000	$ 41,091	0.7	T2	$ 0.17811	$ 0.10299	$ 0.00000311
14	2013-IND-0157	Shut down AHUs, including steam lines, in abandoned portion of plant	2,998,000	0	18,510,000	$ 680,590	$ 35,281	$ 17,641	0.1	100	$ 0.22700	$ 0.10299	$ 0.00000311
15	2013-IND-0205	Implementation of more precise product trimming equipment	2,324,000	0	0	$ 413,920	$ 552,405	$ 40,000	1.3	T2	$ 0.17811	$ 0.10299	$ 0.00000311
16	2013-IND-0117	Greenhouse expansion with efficient materials and heating equipment	2,085,000	0	0	$ 388,109	$ 2,160,899	$ 55,000	5.6	T1	$ 0.18614	$ 0.10299	$ 0.00000311
17	2013-IND-0159	Replacement of steam-heated AHUs with indirect gas-fired units	233,000	0	0	$ 43,371	$ 1,907,390	$ 20,837	44.0	T1	$ 0.18614	$ 0.10299	$ 0.00000311
18	2013-IND-0230	Turbine inlet fogging	236,500	0	0	$ 53,684	$ 57,025	$ 18,609	1.1	100	$ 0.22700	$ 0.10299	$ 0.00000311
19	2013-IND-0450	Replacement of pipe insulation	7,343,000	0	0	$ 1,307,839	$ 564,798	$ 73,646	0.4	T2	$ 0.17811	$ 0.10299	$ 0.00000311
20	2013-IND-0451	Replacement of pipe insulation	4,895,000	0	0	$ 871,833	$ 376,532	$ 49,098	0.4	T2	$ 0.17811	$ 0.10299	$ 0.00000311
21	2013-IND-0179	Replacement of pipe insulation	7,180,000	0	0	$ 1,278,808	$ 583,058	$ 10,000	0.5	T2	$ 0.17811	$ 0.10299	$ 0.00000311
22	2013-IND-0072	Replacement of pipe insulation	477,000	0	0	$ 88,790	$ 39,681	$ 19,841	0.4	T1	$ 0.18614	$ 0.10299	$ 0.00000311
23	2013-IND-0204	Replacement of pipe insulation	155,000	0	0	$ 28,852	$ 168,137	$ 20,000	5.8	T1	$ 0.18614	$ 0.10299	$ 0.00000311
			91,724,080	**130,550**	**1,085,845,869**	**$ 16,940,062**	**$ 14,463,468**	**$ 780,013**					

*Simple Payback has been provided for illustrative purposes only and includes all audited project savings.

[1]Average Gas Unit Prices are the average 2013 unit rate per m3 by rate class delivered to customers on system supply exclusive of fixed customer charges (non-fixed charges include delivery, demand, transportation, storage and gas commodity).

[2]Electricity and Water Unit Prices are the 2013 values from the OPA Conservation and Demand Management Cost Effectiveness Guide, October 15, 2010, Appendix A, Ratepayer Assumptions Table

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Please list and describe the key changes to the input assumptions since the approval of the input assumptions in 2012-2014 DSM Plan (EB-2011-0327) that were used in the calculation of the 2013 natural gas savings.

Response:

Consistent with the 2012-2014 DSM Guidelines (EB-2008-0346), Union files an annual joint application with Enbridge to the Board for updates and/or additions to the set of approved input assumptions. The annual Input Assumptions update includes new and updated information as informed by the evaluation and audit processes. This includes Technical Evaluation Committee negotiations, Technical Reference Manual substantiation documents, and evaluation results from the annual audit process.

Since the approval of the input assumptions in the 2012-2014 DSM Plan (EB-2011-0327), the utilities filed the following updates with the Board:

2012 Annual Update (EB-2012-0441) *Filing Date: December 19, 2012* **Updates and Additions:**	**2013 Annual Update (EB-2013-0430)** *Filing Date: April 30, 2014* **Updates and Additions:**

• Two-stage infrared heater:
  o savings presented separate from the high-intensity and single-stage
• Condensing Make Up Air Units Electricity
  o savings were updated for units that have variable frequency drives
• Prescriptive High Efficiency Boilers
  o updated savings calculation based on results of Boiler Baseline Study
• Prescriptive Boilers: Elementary Schools
  o updated savings calculation based on results of Boiler Baseline Study
• Prescriptive Boilers: Secondary Schools
  o updated savings calculation based on results of Boiler Baseline Study
• Low-Income Multi-Family Bath Aerator
  o existing measure added to the Low-Income Multi-Family segment
• Low-Income Multi-Family Kitchen Aerator
  o existing measure added to the Low
	• Addition of Exposed Floor Insulation as a Major Measure to Home Reno Rebate
	• New Measure addition - High Efficiency Water Heaters
	• Update to Measures - 2.0 GPM Low-Flow Showerheads for Low Income Single Family, Low Income Multi Residential and Multi Residential
	• Update to Measure Life for:
	  o Home Reno Rebate – Installations including a high efficiency furnace
	  o Home Reno Rebate – Installations excluding a high efficiency
	• Update to Measure Life as per 2012 Audit Recommendations
	• Low Income Weatherization
	• Update to Free Ridership Value for Home Reno Rebate

Income Multi-Family segment • Low-Income Multi-Family Showerhead (distributed) o existing measure added to the Low-Income Multi-Family segment • Low-Income Multi-Family Showerhead (replacing 2.0-2.5GPM) o existing measure added to the Low-Income Multi-Family segment • Low-Income Multi-Family Showerhead (replacing 2.6+GPM) o existing measure added to the Low-Income Multi-Family segment • Low-Income Multi-Family Showerhead (replacing 1.5GPM) o existing measure added to the Low-Income Multi-Family segment • Low-Income Multi-Family Showerhead (replacing 2.0GPM) o existing measure added to the Low-Income Multi-Family • Low-Income Showerhead (replacing 2.0GPM) o existing measure added to the Low Income Multi-family segment • High Efficiency Boilers under 300 MBTU o updated savings calculation to reflect new federal standards in boiler baseline efficiency • High Efficiency Condensing Boilers under 300 MBTU o updated savings calculation to reflect new federal standards in boiler baseline efficiency • Free Ridership for all Low-Income Measures o documented in the Measure Assumption Table low-income free ridership for prescriptive and custom measures resulting from 2012 plan negotiations • Low-Income Multi-Family Space Heating o documented in the Measure Assumption Table existing space heating measures applicable to the Low-Income Multi-Family segment	

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Please indicate what free ridership and persistence studies Union is planning to undertake as recommended by the Auditor which will be used in the estimation of the 2014 natural gas savings.

Response:

i) Free Ridership

Free ridership rates were assessed for reasonableness prior to the implementation of the 2012-2014 multi-year plan and deemed appropriate.

The Technical Evaluation Committee ("TEC") was established as per the Terms of Reference on Stakeholder Engagement. The TEC's mandate is to establish DSM technical and evaluation standards for natural gas utilities in Ontario. The TEC's accountabilities involve making recommendations to the Ontario Energy Board ("Board") on the annual Technical Reference Manual ("TRM") Update and establishing evaluation priorities regarding future evaluation studies to be undertaken by the utilities.

The TEC reviewed a list of evaluation priorities in the second quarter of 2012 and one of the outcomes was the Custom Free Ridership and Participant Spillover Jurisdictional Review delivered by Navigant to the TEC in May 2013. The study reported that Union's current free ridership value is well within the range of the average free ridership value of like leading jurisdictions in the US. Moreover, Union's free ridership rate is actually higher than the researched average in many instances. Navigant's results further supported the reasonableness of Union's free ridership value.

A formal Net-to-Gross ("NTG") study, including both free ridership and spillover, was initiated in Q3, 2013. Initial project steps were taken (e.g. consultant selection, methodology discussions with consultant, draft tri-party agreement), however, the study was put on hold in July 2014. TEC resolution could not be obtained on one item relating to the project methodology. Given the imminent new DSM Framework, the TEC felt it prudent to gain clarity prior to continuing with the NTG study. In the Report of the Board - Demand Side Management Framework for Natural Gas Distributors (2015-2020) (EB-2014-0134) the Board outlines its expectations that it will be Board staff that will coordinate the evaluation process throughout the DSM Framework period on a going forward basis.

The 2013 Auditor, Evergreen Economics, recommended that a new custom free ridership study occur every year (beginning in 2014) using a sample from the current year's custom participants. Union's Audit Committee ("AC") agreed that monitoring and adjusting NTG ratios, including free ridership and spillover, for custom projects is an important input to estimating savings for custom projects. A number of the details about how this should be done may be resolved by the parties following the study being planned by the TEC. Subject to the outcome of that study, and a review of the cost-effectiveness of regular NTG studies, the AC agreed that annual studies are preferable due to the large contribution of custom projects to total savings. Given the current initiated TEC endorsed NTG study, the AC agreed that it is not reasonable to conduct a NTG study for use in the 2014 audit.

Union's expectation is that the current NTG study initiated at the TEC will be implemented and completed in 2015 in order to inform the 2016- 2020 DSM Plan.

ii) Persistence

Union's Auditor, Evergreen Economics, did not recommend Union undertake persistence studies for the purposes of estimation of 2014 natural gas savings.

Union's expectation is that persistence will be examined under the new DSM Framework.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 3, overarching recommendation #1, page 3
Exhibit B, Tab 2, Table 4 (Low Income Custom Projects), page 20
Exhibit B, Tab 2, Table 6 (Commercial/Industrial Custom Projects), pages 24-25
Exhibit B, Tab 2, Table 8 (Large Volume Projects), pages 30-31

The Auditor's recommendation #1 suggests additional baseline research.

a) Please request the Auditor to produce a table with the custom projects listed in the references above indicating whether there was an adequate documentation of the baseline conditions based on which the gas savings were estimated.
b) Also in the same table, where applicable, indicate whether a process improvement study, an engineering feasibility study or a steam trap survey was done and financed by Union.
c) In addition, in the same table indicate whether the project was an advancement.

Response:

The Auditor's response to produce a table with the requested custom project specific information on whether the Auditor judged there was "adequate documentation of the baseline conditions based on which gas savings were estimated" has been provided in part a). Please note that while the Auditor has characterized the baseline documentation as either adequate or inadequate, the Auditor's determination that the baseline documentation is "inadequate" does not suggest that the savings claimed are invalid or should be rejected, but rather that the documentation to conclude the reasonableness of the base case had some missing elements. This is more fully illustrated in the 2013 Audit Report (Exhibit B, Tab 2) where adjustments to the realization rates for specific projects are identified. For those projects deemed to have "inadequate baseline documentation", the adjustment in annual gas realization rates for specific projects ranged between a decrease of 50% and an increase of 3%.

The impacts of these audit adjustments are shown at Exhibit B, Tab 3, page 15, Table 1: Impact of Audit Recommendations on 2013 Cumulative Gas Savings (m^3) and Table 2: Impact of Audit Recommendations on 2013 DSM Utility Incentives.

a) Please see Tables 1, 2 and 3 below, which were provided by Evergreen Economics.

Table 1: Low Income Project Baseline Adequacy and Advancement

CPSV ID	Project Description	Adequate Baseline?	Advancement?
2013-COM-0014	High Efficiency Builidng	Inadequate	No
2013-COM-0013	High Efficiency Builidng	Inadequate	No
2013-COM-0271	Temperature Controls	Inadequate	No
2013-COM-0218	Windows and doors	Inadequate	No
2013-COM-0239	Windows	Inadequate	No
2013-COM-0172	Windows	Adequate	No
2013-COM-0130	ERV	Adequate	No
2013-COM-0240	Pipe Insulation	Inadequate	No
2013-COM-0128	Windows	Adequate	No
2013-COM-0016	Pipe Insulation	Inadequate	No
2013-COM-0263	Windows	Inadequate	No

Table 2: Commercial/Industrial Project Baseline Adequacy and Advancement

CPSV ID	Project Description	Adequate Baseline?	Advancement
2013-COM-0101	New construction warehouse with roof insulation (R-30) exceeding code (R-27)	Adequate	No
2013-IND-0196	Gas leak repairs	Adequate	No
2013-IND-0045	Starch dryer steam preheater	Adequate	No
2013-IND-0457	Newly constructed asphalt plant to replace 2 nearby aging plants	Adequate	No
2013-IND-0256	5.1 acre expansion to an existing 4.6 acre greenhouse.	Adequate	No
2013-IND-0186	Line speed improvements	Adequate	No
2013-IND-0013	"B" deoderizer project	Adequate	No
2013-IND-0455	HVAC improvement	Adequate	No
2013-IND-0267	Greenhouse expansion (22.5 acres)	Adequate	No
2013-IND-0185	HVAC improvement - space heating	Adequate	No
2013-IND-0083	New greenhouse - multiple measures	Adequate	No
2013-IND-0037	Tank & hot oil pipe insulation	Inadequate	No
2013-IND-0046	Spray dryer steam coil preheat	Adequate	No
2013-IND-0177	5.2 acre expansion to an existing 4.6 acre greenhouse.	Adequate	No
2013-IND-0055	Pipe & vessel insulation	Inadequate	No
2013-COM-0162	Dock door seals	Inadequate	No
2013-IND-0042	Steam leak repairs	Adequate	No
2013-COM-0026	Grain dryer replacement	Adequate	No
2013-IND-0064	Steam trap replacement	Inadequate	No
2013-COM-0149	Heat transfer improvement	Inadequate	No
2013-COM-0069	Window & door replacements	Adequate	No

Table 3: Large Volume Project Baseline Adequacy and Advancement

CPSV ID	Project Description	Adequate Baseline?	Advancement
2013-IND-0348	Coke oven gas pipe replacement	Adequate	No
2013-IND-0469	Coke oven gas burners installed in an existing boiler	Adequate	No
2013-IND-0120	Steam leak repairs	Adequate	No
2013-IND-0121	Steam leak repairs	Adequate	No
2013-IND-0416	Steam leak repairs	Adequate	No
2013-IND-0074	Steam leak repairs	Adequate	No
2013-IND-0240	Steam leak repairs	Adequate	No
2013-IND-0229	Heat recovery from equipment cooling to boiler feedwater	Adequate	No
2013-IND-0542	Burner metering equipment upgrades on heat treating furnace	Adequate	No
2013-IND-0123	Steam trap repairs	Inadequate	No
2013-IND-0101	Install heat recovery steam generator (HRSG) on an existing gas turbine generator to offset boiler-generated steam usage; savings claimed for proposed replacement of electric chillers with turbo-chillers which provide for more annual hours of use	Inadequate	Yes
2013-IND-0273	Condensate heat recovery	Adequate	No
2013-IND-0124	Re-commission existing 3rd reaction tower previously bypassed due to worn out screens	Adequate	No
2013-IND-0157	Shut down AHUs, including steam lines, in abandoned portion of plant	Adequate	No
2013-IND-0205	Implementation of more precise product trimming equipment	Adequate	Yes
2013-IND-0117	Greenhouse expansion with efficient materials and heating equipment	Adequate	No
2013-IND-0159	Replacement of steam-heated AHUs with indirect gas-fired units	Adequate	Yes
2013-IND-0230	Turbine inlet fogging	Inadequate	No
2013-IND-0450	Replacement of pipe insulation	Inadequate	No
2013-IND-0451	Replacement of pipe insulation	Inadequate	No
2013-IND-0179	Replacement of pipe insulation	Inadequate	No
2013-IND-0072	Replacement of pipe insulation	Inadequate	No
2013-IND-0204	Replacement of pipe insulation	Inadequate	No

b) The summary of studies preceding 2013 audited projects has been provided by Union. Two Low Income projects had preceding engineering feasibility studies. The preceding studies are outlined below:

Market	Project Number	Related Study	Study Number
Low Income	2013-COM-0014	Engineering Feasibility	2010-COM-0344
Low Income	2013-COM-0013	Engineering Feasibility	2010-COM-0343

Three Commercial/Industrial projects had preceding engineering feasibility studies, two had preceding process improvement studies and one had a preceding steam trap survey. The preceding studies are outlined below:

Market	Project Number	Related Study	Study Number
Commercial/Industrial	2013-IND-0045	Process Improvement	2012-IND-0222
Commercial/Industrial	2013-IND-0013	Engineering Feasibility	2012-IND-0607
Commercial/Industrial	2013-IND-0267	Engineering Feasibility	2013-IND-0248
Commercial/Industrial	2013-IND-0046	Process Improvement	2012-IND-0222
Commercial/Industrial	2013-IND-0055	Engineering Feasibility	2012-IND-0598
Commercial/Industrial	2013-IND-0064	Steam Trap Survey	2012-IND-0037

One Large Volume project had a preceding engineering feasibility study, three had preceding process improvement studies and one had a preceding steam trap survey. The preceding studies are outlined below:

Market	Project Number	Related Study	Study Number
Large Volume	2013-IND-0123	Steam Trap Survey	2013-IND-0122
Large Volume	2013-IND-0273	Process Improvement	2011-IND-0262
Large Volume	2013-IND-0124	Process Improvement	2012-IND-0501
Large Volume	2013-IND-0157	Process Improvement	2012-IND-0324
Large Volume	2013-IND-0230	Engineering Feasibility	2013-IND-0153

c) Please see the response to part a).

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, overarching recommendation #2, page 13

Has Union included Auditor's recommendations #2, 11 and 12 in the 2014 CPSV Terms of Reference as suggested by the Audit Committee?

Response:

The 2013 Audit Committee ("AC") accepted the Auditor's recommendations 2, 11 and 12. Union referred these recommendations to the Technical Evaluation Committee ("TEC") for consideration in the 2014 CPSV Terms of Reference ("ToR"). The TEC positions were as follows:

- Recommendation 2: CPSV verifiers should perform according to the TEC endorsed CPSV ToR.

- Recommendation 11: Clarifying language was added to the 2014 CPSV ToR:

  Where the project has multiple measures, the measure life should be a savings weighted average of the lives of the measures

- Recommendation 12: The TEC determined that language within the existing ToR sufficiently covered the recommendation.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, overarching recommendation #3, page 13

Has Union included Auditor's recommendation #3 in the 2014 Auditor RFP as suggested by the Audit Committee?

Response:

Union referred the Auditor's recommendation #3 to the 2014 joint meeting of the respective Union and Enbridge Audit Committees ("AC") for discussion and/or clarification of Auditor expectations in the 2014 Auditor RFP. The conclusion from the joint meeting was to have Union clearly communicate expectations as part of the audit kick-off process. Union made these expectations clear in kick-off meetings held with each of the three 2014 custom project verifiers.

The AC did not accept that one round of review of custom projects is necessarily sufficient to adequately satisfy the audit requirements.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 1, Final DSM 2013 Annual Report, page 69-70

Please provide a table that indicates the total number of studies and the amounts spent for each of the process improvement studies, engineering feasibility studies, and steam trap surveys by Low Income, Commercial/Industrial and Large Volume Custom Projects.

Response:

Year	Market	Study Type	Total Count	Total Incentives
2013	Low Income	Process Improvement	0	$0
2013	Low Income	Engineering Feasibility	21	$79,246.50
2013	Low Income	Steam Trap Survey	0	$0
2013	Commercial/Industrial	Process Improvement	9	$75,134.36
2013	Commercial/Industrial	Engineering Feasibility	52	$173,363.94
2013	Commercial/Industrial	Steam Trap Survey	24	$34,207.38
2013	Large Volume	Process Improvement	15	$168,366.84
2013	Large Volume	Engineering Feasibility	13	$75,376.28
2013	Large Volume	Steam Trap Survey	17	$72,349.80

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference:

i. Exhibit B Tab 1 section 6.1 page 67

The new program includes a shift in the customer incentive budget process for Rate T2/R100 customers to a new Direct Access budget mechanism. In lieu of an aggregate pool approach, at the beginning of the year these customers each have direct access to the full customer incentive budget they pay in rates.
Customers must use these funds to identify and implement energy efficiency projects, or lose the funds which will consequently become available for use by other customers in the same rate class.

ii. Exhibit A Tab 2 page 9

Union's 2013 Auditor, Evergreen Economics, stated in the Auditor's Report that "going through the sample of evaluated projects and removing savings for those projects that might be considered free riders would result in an over-correction for free ridership, as a free ridership adjustment is already being applied to the entire sample of projects. Since the free ridership adjustment is being applied to the entire group, no additional project level adjustment is needed." [Emphasis added]

iii. EB-2013-0109 March 27, 2014 Decision at page 39, the Board said

The Board considers it reasonable to expect that at least a minimal level of scrutiny of the value of incentive investments would occur even though there is a free ridership rate applied to the portfolio overall. The investment in DSM should not occur when it is apparent that the implementation of a proposed project is not being influenced by the DSM incentive contribution. In other words, investments should not knowingly be made in free riders. The Board does not consider Union's approach to its large industrial custom DSM projects to be sufficient in this respect. [Emphasis added.]

iv. Exhibit B Tab 2 page i

We conducted our audit in accordance with the rules and principles set down by the Ontario Energy Board in the DSM Guidelines for Natural Gas Utilities (EB-2008-0346).

Preamble:

The Board approved Union's Direct Access program in EB-2012-0337, but subsequently provided further direction to Union that "investments should not knowingly be made to free riders". Evergreen seems to think that the Board was

wrong and this adjustment would result in an over-correction for free riders. APPrO would like to understand both Union's position on the Board's decision as well as Evergreen's position. APPrO would also like to understand what, if any, changes were made to the administration of the DSM program as a result of this Board decision by Union and also how Evergreen took this into account in their audit.

The following questions are directed to Union:

a) What specific changes did Union make in how it managed its 2014 DSM Direct Access program to reflect the Board's EB-2013-0109 Decision referenced in Reference (iii), above?
b) In the initial stages of discussion with customers about the potential for funding a DSM initiative, how and when does Union make the determination whether or not the energy efficiency measure is additional to business as usual, i.e. would have been completed or not without the DSM funding?
c) Does Union make this determination noted in b) above in each and every case prior to funding?
d) Please provide a table including all of the DSM projects discussed with Direct Access customers in 2014 (after the March 27, 2014 Decision) where DSM funding was considered or requested by customers but rejected by Union as Union considered these to be free riders and therefore not eligible pursuant to EB-2013-0109, and the project description.
e) To which auditor did Union assign the responsibility of ensuring compliance with the Board's direction in Reference (iii)?

Unless otherwise specified, the following questions are directed to the appropriate auditor responsible for compliance with the Board's direction in Reference (iii) above and, in the event that this responsibility was not specifically assigned to an auditor, then these questions should be answered by Evergreen:

f) Please explain the auditor's understanding of the Board's Decision in EB-2013-0109 as provided in Reference (iii) as it relates to a customer that would have undertaken the DSM work independent of the DSM funding.
g) In Reference (iv) Evergreen notes that it conducted its audit pursuant to EB-2008-0346. Please explain in detail how it incorporated the Board's Decision in Reference (iii).
h) For each Direct Access project audited by Evergreen, please describe how the auditor determined if Union exercised the appropriate scrutiny to determine if: (i) the customer was a free rider; and (ii) the project was additional to business as usual activity.

i) Please provide the number of DSM projects that were determined ineligible to receive DSM funding by the auditor as a result of the audit and subsequently rejected eligibility. Please provide a table including each of these projects (names redacted) and provide:
   i. a brief description of each project;
   ii. the rationale for each project rejected; and
   iii. the amount of DSM funding that had been provided to the customer.

Response:

a) In 2014, Union deemed all gas leak projects ineligible for DSM funding.

   2014 was the second program year for Union's Direct Access program. Union continued to work with each Direct Access customer to complete an energy efficiency plan at the beginning of the program year to identify energy conservation opportunities and allocate Direct Access incentive funds. Additional projects were also identified for potential Aggregate Pool incentives. Projects considered to be ineligible for DSM funding by Union have been and will continue to be rejected, as per Union's response to 1 d), below.

b) Union makes the determination on DSM funding eligibility as part of the annual Energy Efficiency Plan review process for Direct Access customers.

c) Yes.

d) Three projects were rejected as being ineligible to receive DSM funding from Union at the internal project review stage described at Exhibit A, Tab 2, pages 15-16. Additional proposed projects have been rejected at earlier stages in the project development process (described at Exhibit A, Tab 2 pages 13-15) by Union's Account Managers or Project Managers when performing their initial project assessments. Potential projects rejected at this earlier stage are not submitted for internal review.

   Customer A

   This project was rejected for DSM funding eligibility since it involved the failure of a safety valve. A safety relief valve on the inlet to a boiler steam turbine drive failed to open and leaked substantial amounts of steam. This caused additional natural gas to be burned in the boiler to make up for the lost steam. The relief valve was replaced in January of 2014.

Estimated Annual Savings	879,168 m^3
Project Upgrade Cost	$5,345.0
Project Life Expectancy	2 years
Potential Incentive	$2,672.5

Customer B

This project was rejected for DSM funding eligibility since it involved a natural gas leak. Natural gas was found to be leaking from two areas of the plant and the leaks were repaired.

Estimated Annual Savings	66,782 m^3
Project Upgrade Cost	$7,615.63
Project Life Expectancy	10 years
Potential Incentive	$ 3,807.82

Customer C

This project was rejected for DSM funding eligibility after review and analysis determined there was no realizable savings after the cleaning took place.

Estimated Annual Savings	224,724 m^3
Project Upgrade Cost	$12,356
Project Life Expectancy	1 year
Potential Incentive	$6,178.13

e) Evergreen Economics reviewed the Decision as part of its 2013 audit of Union's DSM programs. During the 2013 audit, the Auditor explored applying a free ridership rate incremental to the existing custom project portfolio-level free ridership rate. Evergreen Economics concluded that no additional free ridership adjustments should be applied to Union's 2013 custom projects as this would result in an over correction.

The following responses, part f) to part i) were provided by Evergreen Economics:

f) Our understanding of the Decision referenced above is that the Board wants Union to develop a screening process that will identify the most obvious free riders and exclude these projects from receiving a DSM incentive. If a customer has already begun installing some program-eligible equipment prior to learning that an incentive is available, for example, and then applied for an incentive through the Union Gas program, then this project would be considered a free rider. As a consequence, the Board believes that Union should have at least some minimal procedures in place to identify the most obvious cases of free ridership (e.g.,

projects near completion at the time they became aware of the program, projects that would have almost certainly been completed without an incentive, etc.) and exclude them from the program, as the incentive is not having any effect on the customer's decision to install high efficiency equipment. An additional free ridership adjustment would then be applied to all other customers receiving an incentive through the program after this initial screening process is done and the obvious free riders excluded from the program.

g) It is our opinion that the free ridership adjustment factor is an appropriate method for accounting for free ridership, and this understanding is consistent with EB-2008-0346, which allows for the use of a free ridership adjustment factor. As noted in our report, applying a free ridership adjustment factor in addition to removing individual projects that are identified as free riders will likely result in an over-correction for free ridership.

   At the time of the audit, it was our understanding that Union did not have any formal process in place to identify potential free riders and exclude them from the program. Reviewing Union's initial free ridership screening processes therefore was not done as part of the audit as these processes did not exist.

   As part of our comprehensive audit, we reviewed third party verification studies (CPSV reports) and associated documentation. This review included consideration of free ridership, especially for projects of a behavioral and maintenance nature. A full discussion of the considerations for free ridership can be found in the audit report. In an attempt to comply with the newer decision referenced above, we did discuss with Union Gas and the audit subcommittee projects that appeared to be obvious free riders. We have noted in our report one project involving a gas leak where we recommended that savings be disallowed, as this project involved an obvious safety hazard and we believe would have been repaired even if no incentive had been provided.

h) As noted above, it is our understanding that Union Gas does not have a formal process for identifying potential free riders prior to program participation. Consequently, since there was no process in place, we did not attempt to assess whether Union exercised appropriate scrutiny to identify free riders or determine if the project was additional to business as usual activity. As discussed in our report, the inclusion of some free riders in the program is not by itself a problem, as long as an appropriate free ridership adjustment is applied to the final savings values.

   There were projects involving broad classes of maintenance and performance-based measures where we did not believe Union provided an appropriate amount of documentation on whether the project was additional to 'business as usual' activity (i.e., the baseline conditions for these types of projects were not adequately documented). Examples of these are discussed in our audit report and include measures such as steam trap tests, steam leak repairs, thermostat setbacks, and pipe insulation. As mentioned above in our response to part g, we did determine that one project was an obvious free rider and savings were disallowed for that

project, as it was a safety hazard and would have been repaired in the absence of the incentive. Additional information on which projects had inadequate baseline documentation is provided in our response to Exhibit B.Staff.12.

i) The information in the table below was provided by Evergreen Economics, other than the DSM funding amount which Union provided.

CPSV ID	**Project Description**	**Reason for Rejection of Claimed Savings**	**DSM Funding Amount**
2013-IND-0196	Gas leak repairs	The funded measure was to repair a gas leak, which is a safety issue and a maintenance issue that a prudent operator should undertake without need of an incentive	$1,500
2013-IND-0045	Starch dryer steam preheater recommissioning	The funded measure was the recommissioning of a steam preheater in a drying operation. Approximately one year after implementation, the preheater was again taken off-line until appropriate valving and safety lockouts could be installed for safe operation. As of the date of the Audit Report those safety measures had not been installed and the preheater remained out of service. The site was contacted multiple times to determine the status of the preheater during the audit process.	$20,000

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference:

i) CONFIDENTIAL INFORMATION PROVIDED IN APPENDIX P and in particular Pages 94-96
ii) EB-2013-0109 March 27, 2014 Decision at page 39 , the Board said

The Board considers it reasonable to expect that at least a minimal level of scrutiny of the value of incentive investments would occur even though there is a free ridership rate applied to the portfolio overall. The investment in DSM should not occur when it is apparent that the implementation of a proposed project is not being influenced by the DSM incentive contribution. In other words, investments should not knowingly be made in free riders. The Board does not consider Union's approach to its large industrial custom DSM projects to be sufficient in this respect. [Emphasis added]

Response:

a) – n) These responses have been provided in confidence under separate cover.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 5, Schedule 3, Corrected

Union has used an annual volume of 17,228 cubic meters for an M2 customer over the period April 1, 2015 through September 30, 2015. Is this volume associated with a small, mid-sized or large M2 customer or is based on an average sized M2 customer?

Response:

The volume of 17,228 m^3 for the period April 1, 2015 to September 30, 2015 is associated with a typical Rate M2 commercial customer that consumes 73,000 m^3 per year. The annual volume of 73,000 m^3 per year is used for illustrative Rate M2 bill impacts in Union's QRAM filings.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 5, Schedule 3, Corrected

a) Please provide the estimated bill impact on each of a small, mid-sized and large M2 customer.

b) Please provide the estimated cost to a small M4 customer.

Response:

a) Please see Attachment 1.

b) Please see Attachment 2.

Filed: 2015-03-11
EB-2014-0273
Exhibit B.LPMA.2
Attachment 1

UNION GAS LIMITED
General Service Bill Impacts

Line No.	Particulars	Rate Component	Unit Rate for Prospective Recovery/(Refund) (cents/m^3) (1) (a)	Volume (m^3) (2) (b)	Bill Impact ($) (c) = (a x b) / 100
1	Rate M2 - Small	Delivery	0.6072	14,160	85.98
2		Commodity	-		-
3			0.6072		85.98
4	Sales Service				85.98
5	Direct Purchase				85.98
6	Rate M2 - Mid-Sized	Delivery	0.6072	38,940	236.44
7		Commodity	-		-
8			0.6072		236.44
9	Sales Service				236.44
10	Direct Purchase				236.44
11	Rate M2 - Large	Delivery	0.6072	59,000	358.25
12		Commodity	-		-
13			0.6072		358.25
14	Sales Service				358.25
15	Direct Purchase				358.25

Notes:
(1) EB-2014-0273 Exhibit A, Tab 5, Schedule 2 Corrected, page 1, column (c).
(2) Consumption per customer for the period April 1, 2015 to September 30, 2015.
Small customer volume is based on annual consumption of 60,000 m^3.
Mid-sized customer volume is based on annual consumption of 165,000 m^3.
Large customer volume is based on annual consumption of 250,000 m^3.

Estimated Bill Impact for a Small Rate M4 Customer

Line No.	Particulars	Annual Volume (m^3) (1)	Unit Rate for One-Time Adjustment (cents/m^3) (2)	Bill Impact One-Time Adjustment ($)
		(a)	(b)	(c) = (a x b) / 100
1	Small	875,000	0.3870	3,385.90

Note:

(1) For contract rate classes, the deferral account disposition is a one-time adjustment based on 2013 actual volumes by customer.

(2) Exhibit A, Tab 5, Schedule 2 Corrected, page 2.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 5, Schedule 3, Corrected

a) If Board approval for the rate riders for the general service class cannot be obtained in time to allow an April 1, 2015 implementation date, does Union then propose to change the recovery period to July 1, 2015 through December 31, 2015?

b) If yes, please provide a version of Exhibit A, Tab 5, Schedule 3, Corrected and the responses to Interrogatory #2 above to reflect the rate riders calculated for the above noted period. If some other time period is proposed, please provide a version of Exhibit A, Tab 5, Schedule 3, Corrected and the responses to Interrogatory #2 above to reflect the rate riders calculated for the above noted period using the time period proposed by Union.

Response:

a) Yes.

b) Please see Attachments 1 to 4.

Attachment 1 shows the derivation of the unit rates for prospective recovery for general service rate classes based on a July 1, 2015 to December 31, 2015 disposition period.

Attachment 2 shows the bill impacts for general service rate classes consistent with Exhibit A, Tab 5, Schedule 3, Corrected.

Attachment 3 shows the estimated bill impact for each of a small, mid-sized, and large Rate M2 customer.

Attachment 4 shows the estimated bill impact for a small Rate M4 customer. There is no change in the Rate M4 bill impact as the disposition to contract rate classes will be a one-time adjustment based on 2013 actual volumes by customer.

UNION GAS LIMITED
General Service Unit Rates for Prospective Recovery/(Refund) - Delivery
2013 DSM Deferral Account Disposition

Line No.	Particulars	Rate Class	Deferral Balance for Disposition ($000's) (a)	Forecast Volume (10^3m^3) (1) (b)	Unit Rate for Prospective Recovery/(Refund) (cents/m^3) (c) = (a/b)*100
1	Small Volume General Service	01	(172)	359,409	(0.0477)
2	Large Volume General Service	10	451	144,390	0.3123
3	Small Volume General Service	M1	3,206	1,103,164	0.2906
4	Large Volume General Service	M2	1,922	508,675	0.3779

Notes:
(1) Forecast volume for the period July 1, 2015 to December 31, 2015.

Filed: 2015-03-11
EB-2014-0273
Exhibit B.LPMA.3
Attachment 2

UNION GAS LIMITED
General Service Bill Impacts

Line No.	Particulars	Rate Component	Unit Rate for Prospective Recovery/(Refund) (cents/m^3) (1) (a)	Volume (m^3) (2) (b)	Bill Impact ($) (c) = (a x b) / 100
1	Rate 01	Delivery	(0.0477)	857	(0.41)
2		Commodity	-	857	-
3		Transportation	-	857	-
4			(0.0477)		(0.41)
5	Sales Service				(0.41)
6	Direct Purchase Bundled T				(0.41)
7	Rate 10	Delivery	0.3123	38,833	121.28
8		Commodity	-	38,833	-
9		Transportation	-	38,833	-
10			0.3123		121.28
11	Sales Service				121.28
12	Direct Purchase Bundled T				121.28
13	Rate M1	Delivery	0.2906	702	2.04
14		Commodity	-	702	-
15			0.2906		2.04
16	Sales Service				2.04
17	Direct Purchase				2.04
18	Rate M2	Delivery	0.3779	23,871	90.21
19		Commodity	-	23,871	-
20			0.3779		90.21
21	Sales Service				90.21
22	Direct Purchase				90.21

Notes:
(1) Unit rates per Exhibit B.LPMA.3, Attachment 1.
(2) Typical consumption, per customer, for the period July 1, 2015 to December 31, 2015.

UNION GAS LIMITED
General Service Bill Impacts

Line No.	Particulars	Rate Component	Unit Rate for Prospective Recovery/(Refund) (cents/m^3) (1) (a)	Volume (m^3) (2) (b)	Bill Impact ($) (c) = (a x b) / 10
1	Rate M2 - Small	Delivery	0.3779	19,620	74.14
2		Commodity	-		-
3			0.3779		74.14
4	Sales Service				74.14
5	Direct Purchase				74.14
6	Rate M2 - Mid-Sized	Delivery	0.3779	53,955	203.90
7		Commodity	-		-
8			0.3779		203.90
9	Sales Service				203.90
10	Direct Purchase				203.90
11	Rate M2 - Large	Delivery	0.3779	81,750	308.93
12		Commodity	-		-
13			0.3779		308.93
14	Sales Service				308.93
15	Direct Purchase				308.93

Notes:
(1) Unit rates per Exhibit B.LPMA.3, Attachment 1.
(2) Consumption per customer for the period July 1, 2015 to December 31, 2015.
Small customer volume is based on annual consumption of 60,000 m^3.
Mid-sized customer volume is based on annual consumption of 165,000 m^3.
Large customer volume is based on annual consumption of 250,000 m^3.

Estimated Bill Impact for a Small M4 Customer

Line No.	Particulars	Annual Volume (m^3) (1)	Unit Rate for One-Time Adjustment (cents/m^3) (2)	Bill Impact One-Time Adjustment ($)
		(a)	(b)	(c) = (a x b) / 100
1	Small	875,000	0.3870	3,385.90

Note:

(1) For contract rate classes, the deferral account disposition is a one-time adjustment based on 2013 actual volumes by customer.

(2) Exhibit A, Tab 5, Schedule 2 Corrected, page 2.

UNION GAS LIMITED

Answer to Interrogatory from
Ontario Greenhouse Vegetable Growers ("OGVG")

Reference: Exhibit A, Tab 5, Schedule 2

Preamble: We would like to get a better understanding of the impact of deferral accounts on the contract rate classes M4 and M5.

Please provide the annual bill for the following customers using current rates:

a) without the applied for DSM deferral account impact
   i) Contract demand: 11,000 m3/day Annual Volume: 2,500,000 m3
      1) as an M4 customer
      2) as an M5 customer

   ii) Contract demand: 30,000 m3/day Annual Volume: 5,600,000 m3
      1) as an M4 customer
      2) as an M5 customer

b) with the applied for DSM deferral account impact
   i) Contract demand: 11,000 m3/day Annual Volume: 2,500,000 m3
      1) as an M4 customer
      2) as an M5 customer

   ii) Contract demand: 30,000 m3/day Annual Volume: 5,600,000 m3
      1) as an M4 customer
      2) as an M5 customer

c) For each of the respective scenarios, please provide the percentage annual bill impact associated with the applied for DSM account disposition (for the above inquiry, tabular format would be appreciated).

d) Please provide Union's views on options to mitigate these bill impacts for the contract rate classes including the potential to minimize rate class DSM variances (e.g., such as ring-fencing provided to M7/T1 customers in EB-2011-0327).

Response:

a) – c) Please see Attachment 1 and 2.

d) Union typically considers rate mitigation when bill impacts exceed 10% of the total bill. Given that the bill impacts are less than 10%, Union has not considered mitigation.

UNION GAS LIMITED
M4 - Impact of 2013 DSM Deferral Disposition

Line No.	Particulars		Proposed Unit Rate (cents/m^3)	Contract Demand: 11,000 m^3/day Annual Volume: 2,500,000 m^3 Rate M4 Billing Units (m^3)	Rate M4 Annual Bill ($)	Contract Demand: 30,000 m^3/day Annual Volume: 5,600,000 m^3 Rate M4 Billing Units (m^3)	Rate M4 Annual Bill ($)
			(a)	(b)	(c) = (a x b)	(d)	(e) = (a x d)
1	Total Delivery Bill	(1)			81,679		162,815
2	Total Gas Supply Bill	(1)			556,658		1,246,913
3	Total Annual Sales Bill				638,336		1,409,728
4	DSM Deferral Impact	(2)	0.3870	2,500,000	9,674	5,600,000	21,670
5	Annual Bill Impact of 2013 DSM (line 4/line 3)				1.5%		1.5%
6	Total Annual Bill with DSM				648,010		1,431,397

Notes:
(1) Approved rates per EB-2014-0356, Appendix A (January 2015).
(2) Unit rates per EB-2014-0273, Tab 5, Schedule 2, Page 2, Corrected.

UNION GAS LIMITED
M5 - Impact of 2013 DSM Deferral Disposition

Line No.	Particulars		Proposed Unit Rate (cents/m^3)	Contract Demand: 11,000 m^3/day Annual Volume: 2,500,000 m^3 Rate M5A Billing Units (m^3)	Rate M5A Annual Bill ($)	Contract Demand: 30,000 m^3/day Annual Volume: 5,600,000 m^3 Rate M5A Billing Units (m^3)	Rate M5A Annual Bill ($)
			(a)	(b)	(c) = (a x b)	(d)	(e) = (a x d)
1	Total Delivery Bill	(1)			65,824		130,958
2	Total Gas Supply Bill	(1)			556,658		1,246,913
3	Total Annual Sales Bill				622,481		1,377,871
4	DSM Deferral Impact	(2)	0.2500	2,500,000	6,250	5,600,000	14,000
5	Annual Bill Impact of 2013 DSM (line 4/line 3)				1.0%		1.0%
6	Total Annual Bill with DSM				628,731		1,391,871

Notes:
(1) Approved rates per EB-2014-0356, Appendix A (January 2015).
(2) Unit rates per EB-2014-0273, Tab 5, Schedule 2, Page 2, Corrected.

UNION GAS LIMITED

Answer to Interrogatory from
Ontario Greenhouse Vegetable Growers ("OGVG")

Reference: Exhibit A, Tab 5, Schedule 2

Please explain why the 2012 LRAM deferrals are the subject of this proceeding and not a previous proceeding?

Response:

The 2012 audited first year LRAM monthly volumes related to 2012 DSM activities at 2012 rates were addressed in the 2012 DSM Deferral filing EB-2013-0109. The audited 2012 full year DSM activities at 2013 rates for contract rate classes are included in this proceeding as there were no contract rate class LRAM volumes for 2011, 2012 or 2013 included in 2013 rates.

When Union prepared the 2013 contract rate class volume forecast in early 2011, the 2012 LRAM volume savings were not available to be included in the contract rate class volume forecast. However, the 2012 contract rate class volume savings were reflected in delivery rates beginning January 1, 2014 and therefore will not be included in future DSM Deferral filings.