

# **Independent Audit of Enbridge Gas Distribution 2014 DSM Program Results**

## **FINAL REPORT**

**Prepared for the  
Enbridge Gas Distribution Audit Committee**

**by  
Optimal Energy, Inc.**

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## CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
Objectives .....	1
Methodology.....	1
Findings .....	3
Savings Verification Statement .....	8
Recommendations .....	9
<b>INTRODUCTION.....</b>	<b>11</b>
Objectives .....	11
Report Layout.....	11
<b>METHODOLOGY .....</b>	<b>13</b>
Overview .....	13
Custom Projects.....	14
Prescriptive Measures.....	19
Residential Community Energy Conservation.....	20
Run It Right .....	20
Market Transformation.....	21
Data Tracking System .....	21
Review of DSMVA, LRAMVA, and DSM Shareholder Incentive Calculations .....	22
<b>AUDIT OF CLAIMED SAVINGS AND OTHER DSM SHAREHOLDER INCENTIVE METRICS.....</b>	<b>23</b>
Introduction .....	23
Resource Acquisition.....	23
Low Income.....	34
Market Transformation.....	35
<b>CALCULATIONS AUDIT.....</b>	<b>37</b>
<b>FINDINGS AND RECOMMENDATIONS.....</b>	<b>40</b>
Findings .....	40
Recommendations .....	40
<b>ATTACHMENT A: OPTIMAL’S APPROVED AUDIT WORK PLAN .....</b>	<b>43</b>
<b>ATTACHMENT B: OPTIMAL DATA/DOCUMENT REQUESTS .....</b>	<b>64</b>

## TABLES

Table 1. Summary of Adjustments: Resource Acquisition.....	6
Table 2. Summary of Adjustments: Low Income.....	7
Table 3. Summary of Adjustments: Market Transformation.....	7
Table 4. Savings Verification Results.....	8
Table 5. Final Resource Acquisition Audit Values .....	23
Table 6. Commercial & Low-Income Multi-Residential CPSV Project Summaries.....	24
Table 7. Industrial CPSV Project Summaries.....	30
Table 8. Commercial and Low-Income Multi-Residential Realization Rates .....	33
Table 9. Industrial Realization Rates.....	33
Table 10. Final Low Income Audit Values.....	34
Table 11. Final Market Transformation Values.....	35
Table 12. Resource Acquisition Values.....	37
Table 13. Low Income Values.....	37
Table 14. Market Transformation Values.....	38
Table 15. DSM Shareholder Incentive Values .....	38
Table 16. DSMVA Values.....	38
Table 17. LRAMVA Values' .....	39

## EXECUTIVE SUMMARY

### OBJECTIVES

The primary objective of the audit performed by Optimal Energy, Inc. (Optimal) was to provide an independent opinion on whether calculations of the DSM Shareholder Incentive, Demand Side Management Variance Account (DSMVA), and the Lost Revenue Adjustment Mechanism Variance Account (LRAMVA), are reasonable and appropriate.

If the Enbridge Gas Distribution (Enbridge) values differed from what Optimal believed to be correct, Optimal calculated revised values.<sup>1</sup> The audit had the additional objective of recommending future evaluation research opportunities to enhance the assumptions used to calculate the DSM Shareholder Incentive and the LRAMVA along with recommendations to improve input assumptions, verification procedures, and the overall audit process.

### METHODOLOGY

The audit tasks were broken down into four main areas:

- Custom Project Savings Verification (CPSV) process
- Verification of prescriptive savings claims
- Review of the Residential and Low Income Single Family results
- Confirmation of the market transformation results

Custom commercial, industrial, and low-income multi-residential projects represented 70% of the total net Cumulative Cubic Meters (CCM) of saved gas consumption claimed by Enbridge.<sup>2</sup> Thus, the CPSV process was the main focus of the audit. Optimal, as the Auditor, was involved in the CPSV review process from the start, and provided input throughout the process. The CPSV process consisted of the following steps:

1. An engineering review of a statistically significant sample of custom projects was completed by one of two independent CPSV Technical Evaluators (CPSV TE), one for commercial and low-income multi-residential projects and a second for industrial projects. Each CPSV TE reviewed Enbridge's savings calculation methodology and performed site visits to gather actual operational information.
2. The CPSV TEs issued detailed reports that provided final project-by-project savings recommendations. For each project, the CPSV TE either agreed with the savings value put forth by Enbridge or provided an alternative value.
3. The final CPSV TE results were used to calculate realization rates by comparing Enbridge's claimed savings value for the sampled project values to the CPSV TE values.

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<sup>1</sup> All of the Enbridge values cited in this audit are from the 2014 Demand Side Management Draft Evaluation Report issued by Enbridge on May 8, 2015.

<sup>2</sup> Enbridge's primary resource acquisition metric is net CCM. Net CCM is defined as the total savings to be achieved over the assumed lifetime of each energy saving measure. It is equal to the annual cubic meters saved after being adjusted for the Ontario Energy Board (OEB) approved free rider rate multiplied by the assumed measure life.

The realization rates were calculated by Optimal in accordance with the methodology established during the Year 2012 audit process and updated in the Year 2013 audit. The realization rates were then applied to all custom savings claimed by Enbridge to produce an overall net CCM custom project value.

4. Optimal and the Enbridge Audit Committee (AC) reviewed the Wave 1 and the Wave 1&2 drafts of both the commercial and industrial CPSV TE reports, as well as the final versions of these reports. Optimal provided extensive recommendations that improved the overall rigor of the CPSV TE process. These recommendations were provided in four separate memos and numerous conference calls with the CPSV TEs and the Audit Committee. Optimal, the AC, and Enbridge also reviewed CPSV spreadsheet savings calculations where applicable. The first wave of CPSV drafts for commercial and industrial projects was received on January 19 and 20. The remaining savings calculations were provided by the CPSV TEs on March 16 and 18. The final CPSV commercial and industrial reports were received on April 13. As part of their reviews of the draft and final CPSV work products, Optimal and the AC also considered the discussions regarding baseline and measure life issues that were raised as part of Enbridge's Year 2012 and 2013 Clearance of Accounts process.<sup>3</sup>
5. Optimal conducted an extensive review of the final CPSV reports including gathering supplementary information from both the CPSV TEs and Enbridge staff. The results of this step were the final audit recommendations for the net CCM values for each of the custom projects.
6. Using the final CPSV audit values, Optimal recalculated final realization rates and the resulting overall custom project net CCM values.

For the prescriptive savings claims, Optimal performed an overall review of Enbridge's program-by-program measure level calculations to confirm that the total net CCM values presented in Enbridge's evaluation report were consistent with these calculations. Optimal selected a sample of individual measures to verify that the deemed values (savings per measure, free rider rate, and measure life) were in compliance with the approved values filed by Enbridge with the Ontario Energy Board (OEB). Optimal also reviewed the deemed savings values filed with the OEB for the prescriptive measures that comprised the bulk (75%) of the commercial prescriptive savings claim. The purpose of this review was to ensure that these deemed values were generally in accordance with industry standards.

Verification of the Market Transformation metrics began with extensive data requests submitted to Enbridge.<sup>4</sup> The data submitted by Enbridge allowed Optimal to confirm that each of the Market Transformation results met all of the OEB approved requirements for each metric.

A sample of projects from the Residential Community Energy Conservation and Low Income Single Family participants was reviewed to confirm the savings, and in the case of the

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<sup>3</sup> OEB file number EB-2014-0277.

<sup>4</sup> See Attachment B Optimal Data/Document Requests for copies of the data request submitted to Enbridge.

Residential Community Energy Conservation deep savings metric, that at least two major measures were installed.

Optimal also reviewed Enbridge's monitoring and tracking administrative procedures and systems. As agreed to by the Audit Committee, and outlined in Optimal's Final Work Plan, Optimal did not perform an on-site review for this year's audit. The Year 2013 audit included an on-site visit by Optimal where interviews, procedure reviews, and live demonstrations of Enbridge's DSM analysis, reporting, and tracking system took place. As part of its Year 2013 audit Optimal concluded that Enbridge's monitoring and tracking procedures and systems resulted in savings and market transformation data was being properly entered into the CCM and the DSM Shareholder Incentive calculation workbooks. For this year's audit, the AC agreed that an on-site review was not required. Instead, Optimal issued a comprehensive written request to Enbridge whose purpose was to ascertain if there were any substantive changes made in 2014.<sup>5</sup> Enbridge, in its answers to the data request, made it clear that there were no substantive changes to its systems that would impact the proper recording of savings and market transformation data. Optimal also reviewed the overall calculation workbooks that summarized Enbridge's DSM database and form the basis of the DSM Shareholder Incentive and LRAMVA values.

Throughout the entire audit process, Optimal audit staff continually considered forward looking recommendations that would improve the overall verification and audit process and enhance savings assumptions through future evaluation and verification studies.

## FINDINGS

Tables 1, 2, and 3 summarize the overall results of Optimal's audit. Each table provides the pre-CPSV value; the post-CPSV value; the final audit value; a brief explanation of the audit adjustments made to the post-CPSV value, where appropriate; and a reference to the page(s) in this report where a complete description of the adjustment is located.<sup>6</sup> It is important to note that Optimal worked extensively with the CPSV firms during the early stages of the audit to help inform the work.

For each of the custom savings categories (commercial, low-income multi-residential, and industrial), the "post-CPSV values" presented below are the adjustments made as a result of the CPSV process. Final audit values were recommended as the result of the Optimal audit.

The report issued by the commercial/low income multi-residential CPSV TE adjusted the savings for 26 of the 27 sampled projects. These adjustments resulted in a 12.4% reduction in savings from Enbridge's pre-CPSV savings estimates for these 27 projects. This resulted in a commercial/low income multi-residential post-CPSV realization rate of 80.8%, meaning

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<sup>5</sup> See Attachment B Optimal Data/Document Requests for copies of the data request submitted to Enbridge.

<sup>6</sup> Pre-CPSV Values are Enbridge's original savings estimates prior to the completion of the CPSV process. Post-CPSV values are the revised savings values after the CPSV process was completed. By its very nature, the CPSV process was designed to only adjust net CCM values for commercial, low-income multi-residential and industrial custom projects. All other metrics were unchanged pre- and post CPSV. The audit process verified all post-CPSV values and made adjustments as warranted to the post-CPSV values.

Enbridge's original savings estimate for the total of all commercial/low income multi-residential custom projects was reduced by 19.2%.<sup>7</sup>

Subsequently, following the completion of Optimal's audit of the sample of custom commercial projects, Optimal adjusted nine commercial custom projects, which resulted in an increase from the post-CPSV realization rate. The final audited realization rate for commercial /low-income multi-residential is 83.7%.

Adjustments to the projects in the sample do not necessarily result in an equivalent change to the portfolio. As seen above, the 12.4% reduction in savings for the sampled commercial custom projects resulted in the greater impact of a 19.2% reduction on the whole commercial custom project portfolio. The reason for this is that the statistical sampling approach<sup>8</sup> requires that changes from the sampled subsets of the projects reviewed by the CSPV firm be applied to different strata of projects (with strata established by size of project). Thus changes to the small projects in the sample are applied to all the small projects in the portfolio, changes to the medium projects in the sample are applied to all the medium projects in the portfolio, and the same is true of large projects.

The report issued by the industrial CPSV TE adjusted the savings for 8 of the 19 sampled projects. These adjustments resulted in an 8.4% increase in savings versus Enbridge's initial savings calculations for these 19 projects, and resulted in an industrial post-CPSV realization rate of 103.3%.

Subsequently, following the completion of Optimal's audit of the sample of custom industrial projects, Optimal adjusted three industrial custom projects, which resulted in an additional increase from the post-CPSV realization rate, such that the realization rate for industrial is 103.5%.

Like with the commercial custom projects, the realization rate for the industrial custom projects is a weighted average. While small decreases in savings to small and medium projects in the sample were outweighed by an increase to one large project, numerically there are a lot more small and medium sized projects in the portfolio. When the changes are applied to the portfolio, the impact of the increase in savings from large projects is tempered by the volume of smaller projects.

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<sup>7</sup> The 12.4% reduction represents the average reduction of the *sample*, whereas the 19.2% reduction represents the *weighted* average reduction to be applied to the entire population. The projects selected for inclusion in the sample represent different strata of the overall population of custom projects, but do not exactly represent the distribution of this population. The realization rate is calculated separately for each strata and the overall realization rate is a weighted average. This can be seen in the data presented in Table 8. As a result the average reduction for the sample does not match the overall weighted average reduction for the overall population. The industrial realization rate was calculated in the same fashion, with the similar result that the overall realization rate is not equal to the sample average adjustment.

<sup>8</sup> For more information, see *A Sampling Methodology for Custom C&I Programs*, prepared for Sub-Committee of the Technical Evaluation Committee for Enbridge Gas Distribution and Union Gas by Navigant Consulting, Inc., dated November 12, 2012.

Generally, the audit adjustments made to the post-CPSV values can be characterized as technical corrections to savings calculations; updated values based on post-CPSV information obtained; and data and process corrections. Overall, the results conformed to OEB approved assumptions and generally accepted industry practices. Optimal found Enbridge's efforts to be rigorous and reflective of a well-managed DSM program that undertakes a thoughtful and good faith effort to estimate actual savings.

The CPSV Process adjusted savings as follows:

- Decreased the Resource Acquisition net CCM by 9.0%
- Decreased the Low Income net CCM by 10.5%

Optimal's audit adjustments that were made to the post-CPSV values:

- Increased the Resource Acquisition net CCM by 1.3%
- Increased the Low Income net CCM by 1.7%

The final audited values as compared to the pre-CPSV numbers:

- Decreased the Resource Acquisition net CCM by 7.8%
- Decreased the Low Income net CCM by 9.0%



**Table 1. Summary of Adjustments: Resource Acquisition<sup>9,10</sup>**

Metric	Pre-CPSV or Pre-Audit Value	Post-CPSV Value	Final Audit Value	Description of Audit Adjustment	Audit Report Reference Page
<b>RESIDENTIAL COMMUNITY ENERGY CONSERVATION</b>					
Net CCM	89,690,562	Not Applicable	89,690,562		
Deep Savings Participants	5,213	Not Applicable	5,213		
<b>COMMERCIAL</b>					
<b>Custom</b>					
Net CCM	367,051,405	296,577,536	307,222,026	Adjusted the net CCM on 9 of 27 sampled projects resulting in revised realization rate	Pages 23 to 27
<b>Prescriptive</b>					
Net CCM	81,487,407	Not Applicable	79,068,251	Minor data entry mistakes: corrected number of installed units and annual savings per unit for Ozone Laundry; corrected annual deemed savings value for one Infrared Heater project; corrected CFM utilized for one ERV project	Page 27
<b>Run It Right</b>					
Net CCM	3,125,440	Not Applicable	3,125,440		
<b>INDUSTRIAL</b>					
<b>Custom</b>					
Net CCM	171,655,513	177,320,144	177,663,455	Adjusted the net CCM on 3 of 19 sampled projects resulting in revised realization rate	Pages 29 to 32
<b>Prescriptive</b>					
Net CCM	7,598,262	Not Applicable	7,598,262		
<b>TOTAL RESOURCE ACQUISITION Net CCM</b>	<b>720,613,802</b>	<b>Not Applicable</b>	<b>664,367,997</b>		

<sup>9</sup> As indicated above the values for pre-CPSV and post-CPSV metrics only vary for custom commercial and industrial savings, which were adjusted through the CPSV process. Changes were made concurrently to the prescriptive savings due to the Enbridge's discovery and correction of data entry errors.

<sup>10</sup> Deep Savings Participants provides the number of customers, as determined by unique addresses.

**Table 2. Summary of Adjustments: Low Income**

Metric	Pre-CPSV or Pre-Audit Value	Post-CPSV Value	Final Audit Value	Description of Audit Adjustment	Audit Report Reference Page
<b>SINGLE FAMILY (PART 9)</b>					
Net CCM	25,673,499	Not Applicable	25,673,482	Corrected minor data entry mistake; non-install factor for Kitchen Aerators input as 66.8%, correct factor is 66.9%.	Page 34
<b>MULTI-RESIDENTIAL (PART 3)</b>					
<b>Custom Multi-Residential</b>					
Net CCM	31,705,762	25,618,256	26,537,723	Adjusted the net CCM on 9 of 27 sampled projects resulting in revised realization rate	Pages 23 to 37
<b>Multi-Residential - Prescriptive</b>					
Net CCM	3,263,435	Not Applicable	3,263,435		
<b>Low Income Building Performance Management</b>					
% of Part 3 Participants Enrolled	74%	Not Applicable	74%		
<b>TOTAL Low Income Net CCM</b>	<b>60,642,696</b>	<b>Not Applicable</b>	<b>55,474,640</b>		

**Table 3. Summary of Adjustments: Market Transformation<sup>11</sup>**

Metric	Pre-Audit Value	Final Audit Value	Description of Audit Adjustment	Audit Report Reference Page
<b>Residential Savings by Design</b>				
Completed Units	1,059	1,059		
Number of Top 80 Builders Enrolled	23	23		
<b>Commercial Savings by Design</b>				
Number of New Developments Enrolled	19	19		
<b>Existing Residential</b>				
Commitments to make a provision for data field to show a home's energy rating for all homes listed by participating realtors	40,040	40,040		
Number of Home Ratings included in MLS of marketing materials	662	662		

<sup>11</sup> Existing Residential home energy rating commitment metric source: Enbridge DSM 2012-2014 Full OEB Plan Filing, Exhibit B, Tab 1, Schedule 3, Page 21

As listed below in Table 4, the adjustments resulted in an increase of \$146,437 or 2.0% to the DSM Shareholder Incentive, which is paid to Enbridge. Based on the final audited savings values, the final audit value for the LRAMVA is \$65,339 to be refunded to ratepayers.<sup>12</sup> Optimal is not recommending any audit adjustment to the DSMVA value.

## SAVINGS VERIFICATION STATEMENT

We have audited the Draft Evaluation Report, Net Cumulative Cubic Meters (CCM) savings, DSM Shareholder Incentive, Lost Revenue Adjustment Mechanism Variance Account (LRAMVA), and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ending December 31, 2014. The Draft Evaluation Report and the calculations of net CCM, DSM Shareholder Incentive, LRAMVA, and DSMVA are the responsibility of the company's management. Our responsibility is to express an opinion on these amounts based on our audit. We conducted our audit in accordance with the rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated June 30, 2011, in EB-2008-0346. Details of the steps taken in this audit process are set forth in the Audit Report that follows, and this opinion is subject to the details and explanations therein described.

In our opinion, and subject to the qualifications set forth above, the following figures are calculated correctly using reasonable assumptions, based on data that has been gathered and recorded using reasonable methods and is accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2014 DSM programs of Enbridge Gas Distribution:

- Net CCM savings of 719,842,637
- DSM Shareholder Incentive amount recoverable of \$7,647,242 (due to Enbridge)
- LRAMVA amount payable of \$65,339 (to be refunded to Enbridge ratepayers)
- DSMVA amount recoverable of \$352,502 (due to Enbridge)

Table 4 below provides a comparison of the final audit values and the post-CPSV values.

**Table 4. Savings Verification Results**

**Positive Value Due to Enbridge/Negative Value Due to Ratepayers<sup>13</sup>**

Account	Pre-CPSV / Pre-Audit Value	Post-CPSV Value	Final Audit Value
DSM Shareholder Incentive	\$ 8,584,612	\$7,500,805	\$7,647,242
LRAMVA	n/a	n/a	(\$65,339)
DSMVA	\$ 352,502	\$352,502	\$352,502

<sup>12</sup> The process agreed to with the AC calls for LRAMVA to be calculated only after the final audit savings values are available.

<sup>13</sup> The LRAMVA is negative, indicating that it is money owed by Enbridge to the ratepayers

## RECOMMENDATIONS

Optimal identified 11 different opportunities for Enbridge to enhance program operation and verification procedures going forward. They are ranked in order of importance.

### CPSV

1. **Have the CPSV TEs and Enbridge hold extended kick-off meetings to carefully review each of the sampled CPSV projects.** The CPSV TE firm would review the file ahead of time and come to the meeting with any questions or clarifications needed. Enbridge staff would do a brief presentation on each project that would be followed up with a Q&A session with the CPSV TE. A set checklist of items could be established that Enbridge would cover in its presentation. If possible the Auditor should also attend these meetings. Given that some of the CPSV projects are very complicated this would streamline the transfer of information and provide greater project-by-project clarity.
2. **If pre and post billing regression analysis is to be used to independently calculate savings by the CPSV TEs, an agreed upon methodology should be established to ensure a consistent approach.** The methodology needs to properly deal with post installation commissioning periods and also properly factor out any pre and post operational changes that could impact the validity of the savings calculation.
3. **CPSV TE Scope of Work should state that CPSV TE should always provide their actual electronic spreadsheet (not pdf) calculations for each project.**
4. **The project summary table included in the CPSV TE Scope of Work should include the Enbridge Claimed Measure Life in addition to the CPSV Recommended Measure Life.**
5. **For Commercial CPSV projects, a standard table should be included with each project that shows the seasonal and non-seasonal gas consumption values for each scenario – existing case, base case and proposed efficiency case.**
6. **A CPSV Glossary of Terms (Existing Case, Base Case, Non-Seasonal load, etc.) should be established.** The glossary could be included in the CPSV TE Scope of Work. This would provide a consistent and common understanding of technical terms for all parties (Auditor, Enbridge staff, CPSV staff and AC) involved.
7. **On boiler replacement projects, if the supply and return temperatures for the new installed efficient boiler are set higher than the existing boiler, the CPSV TE should verify with the customer that they did indeed raise the temperatures for the new system.** It does not make sense that the new boiler would have temperature settings that would make it less efficient. It is possible that the temperatures listed in the Enbridge file for the existing boilers might be incorrect.
8. **If there are a significant number of stockpile yard paving projects in the industrial portfolio, suggest conducting a study of stockpile moisture reduction due to paving in Enbridge's specific territory (i.e., account for precipitation, temperature differences, etc.).** Current estimates are based on research conducted in Tennessee.

## Run It Right

9. **Survey Run It Right participants prior to the installation of any measures, making it part of the start-up paperwork.** This would provide a better set of real time base case information for each project that can be compared to a post-installation survey to see if there were any changes that could impact gas consumption that were outside of the Run It Right program.
10. **Require Run It Right participants to complete a post installation survey as part of allowing the customer to enroll in the program.** Also consider providing the participant with some sort of enticement (gift card, entry into drawing to win prize, etc.) to get the participant to undertake the post installation survey.
11. **Consider not using CCM as the metric for the Run it Right program.** Satisfactorily assessing and interpreting pre- and post-billing consumption data has proven to be difficult. These projects typically involve large buildings that can undergo hard to quantify changes in usage and operation from year-to-year. Using a metric such as number of participants, percent of market and/or number of Run It Right measures implemented would result in an easier and possibly more accurate indication of program effectiveness.

## INTRODUCTION

Enbridge Gas Distribution (Enbridge) operates a series of demand side management (DSM) programs in accordance with its 2012-2014 Multi-Year Plan approved by the Ontario Energy Board (OEB).<sup>14</sup> Enbridge receives a combination of direct cost recovery and shareholder incentive payments associated with its program delivery. The OEB and Enbridge's Audit Committee (AC) require an independent third-party review of Enbridge's Draft Evaluation Report and supporting calculations to ensure that savings claims and shareholder incentive payments calculations are correct.

On behalf of its Audit Committee on November 5, 2014, Enbridge sent a Request for Proposals (RFP) to Optimal to undertake the Year 2014 Audit. Optimal was subsequently awarded the contract and began its work on the 2014 audit with the CPSV kick-off meeting on November 14, 2014. Optimal Energy, Inc. submitted its revised final proposal on December 10, 2014 and a final Work Plan<sup>15</sup> on January 8, 2015.

## OBJECTIVES

The primary objective of this audit was to review Enbridge's calculations for net Cumulative Cubic Meters (CCM) saved, the DSM Shareholder Incentive, the Lost Revenue Adjustment Mechanism Variance Account (LRAMVA), and the Demand Side Management Variance Account (DSMVA) for the calendar year ending December 31, 2014, and to express an independent opinion on these amounts. Where the Enbridge-reported amounts differed from what Optimal believed to be correct, Optimal calculated alternative values. As a secondary objective, Optimal provided recommendations for forward-looking evaluation work and process improvements to be considered.

This audit was conducted under the direction of the AC and in accordance with the rules and principles set down by the OEB in its Decision with Reasons dated June 30, 2011, in EB-2008-0346; and the RFP issued on November 5, 2014.

## REPORT LAYOUT

The audit report is presented in four main sections:

- The "Methodology" section provides information on the steps Optimal performed to complete the audit.
- The "Audit of Claimed Savings and Other DSM Shareholder Incentive Metrics" section details the audit findings for each of Enbridge's net CCM savings claims, its Market Transformation results, and other DSM Shareholder Incentive metrics.

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<sup>14</sup> Settlement Agreement Enbridge Gas Distribution Inc. Demand Side Management Multi-Year Plan 2012-14, OEB Case EB-2011-0295; and Enbridge Gas Distribution Inc. Update to the 2012 to 2014 Demand Side Management Plan Ontario Energy Board, Case EB-2012-0394.

<sup>15</sup> The Work Plan is included as Attachment A.

- The “Calculations Audit” section provides the final audited DSM Shareholder Incentive, LRAMVA, and DSMVA values.
- The “Findings and Recommendations” section presents the main findings along with recommendations for forward looking savings verification and audit process improvements.

## METHODOLOGY

### OVERVIEW

The audit process seeks to verify the accuracy of savings or metrics for the entire DSM portfolio, which includes the following programs:

- Custom Commercial and Industrial offers
- Prescriptive offer
- Residential and Low Income Single Family offers
- Market Transformation program

Optimal staff attended two full days of on-site meetings at Enbridge's offices as part of its Year 2013 audit. The overall purpose of those site visits was to gain a thorough understanding of each of Enbridge's DSM programs. Given that the Year 2014 DSM program offers are essentially the same as the Year 2013 program offers, Optimal did not feel it was cost-effective for its staff to travel to Enbridge's offices to conduct in-person interviews as part of the Year 2014 audit.<sup>16</sup> Instead, Optimal issued a written request to Enbridge to ascertain if any significant changes were made to the Year 2014 DSM programs.<sup>17</sup> This approach was outlined in Optimal's proposal, and in the final Work Plan, and was endorsed by the Audit Committee.

Samples of custom projects are reviewed individually and the on-site conditions are confirmed by the CPSV TE. Changes are made, if necessary, to the individual sample projects. Optimal then reviews the characterizations and assumptions that feed into the projects, the calculations, and then makes additional changes as necessary. This can be an iterative process between the CPSV TE, Enbridge, and Optimal. The impact of the changes to the individual projects is then distributed on a weighted basis by size (CCM savings) across the total custom portfolio. The programs and metrics other than custom projects are confirmed through a combination of interviews, document reviews, spreadsheet calculation reviews, and analysis.

Optimal's approved audit work plan included the following tasks:

- Project management including meetings, data collection, and project planning
- Review and validate CPSV results and calculate realization rates
- Consider and respond to stakeholder comments on the draft Evaluation DSM report
- Review verification and evaluation studies
- Review Enbridge DSM tracking systems
- Verify CCM, LRAM, and DSM shareholder incentive numbers

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<sup>16</sup> Enbridge's Year 2014 programs are part of its OEB-Approved 2012-2014 Multi Year DSM Plan.

<sup>17</sup> See Attachment B Optimal Data/Document Requests for copies of the data request submitted to Enbridge.



- Identify future enhancements
- Issue audit findings, recommendations and report

The actual plan is included in this report as Attachment A. This section of the audit report provides additional details and information on supplementary audit activities over and above what was included in the work plan.

Numerous weekly conference calls were held between Optimal's audit staff, Enbridge staff, CPSV TE staff, and the AC throughout the entire audit time period. These conference calls included the following groups:

- Weekly AC and Optimal audit staff
- Weekly AC, commercial CPSV TE staff, Enbridge commercial staff, and Optimal audit staff
- Weekly AC, industrial CPSV TE staff, Enbridge industrial staff, and Optimal audit staff
- Weekly Optimal audit manager and Enbridge audit project manager

The AC and Optimal conference calls provided Optimal the opportunity to brief the AC on the progress of the audit process, resolve any issues as they arose, and obtain AC feedback throughout the entire audit timeframe. Enbridge prepared the agendas, and Optimal took the minutes, which were reviewed and approved by the AC.

The purpose of the AC, Optimal, and CPSV TE calls was to provide comments and feedback to the CPSV TEs as they were preparing their CPSV TE reports. While the AC was invited to all meetings, the AC did not attend those meetings which were focused on logistics or other lower priority issues.

Overall project management tasks and Optimal's data/document requests were discussed during the calls between Optimal's and Enbridge's audit project manager.

## **CUSTOM PROJECTS**

### **Overall Methodology**

Enbridge's custom projects represented 70% of its total post-CPSV net CCM. As a result, a large share of the overall audit effort was devoted to reviewing these projects. The overall custom project review process was titled the "Custom Savings Verification Process" or "CPSV."

The CPSV involved several different steps completed by different firms. First, an independent third party statistics firm developed a randomly selected and statistically significant sample from the total population of custom projects for inclusion in the savings review, using a sampling methodology initially developed by Navigant Consulting in 2012, revised in 2014 as the result of the 2013 audit, and approved by the Technical Evaluation Committee for Enbridge and Union Gas.<sup>18</sup> Next, Enbridge, in consultation with the AC, contracted two engineering firms (CPSV Technical Evaluators or CPSV TEs) to conduct an

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<sup>18</sup> *A Sampling Methodology for Custom C&I Programs*, prepared for Sub-Committee of the Technical Evaluation Committee for Enbridge Gas Distribution and Union Gas by Navigant Consulting, Inc., dated November 12, 2012.

engineering assessment and evaluation of each of the sampled projects. One CPSV TE was hired for commercial and low-income multi-residential projects, and one for industrial projects. The Audit Committee and Optimal reviewed the terms of reference (the scope of work) provided to the CPSV TEs and provided input to ensure a thorough process. Optimal also made recommendations with respect to how the use of ETools should be treated by the CPSV TEs. Each CPSV TE performed an on-site visit for each sampled project to verify equipment installations, model numbers, and overall equipment operations. Each also verified the operating parameters that formed the basis of savings calculations assumptions. Each CPSV TE reviewed Enbridge's savings calculations and, where feasible, developed an independent savings calculation for each project. As agreed to with the AC, the CPSV TEs recommended revised savings values based on the following guidelines:

- The CPSV TE should always report the results of its independent savings calculations.
- If the CPSV TE savings number is within 5% of Enbridge's number AND the CPSV TE concludes that its methodology is less rigorous than Enbridge's approach, the CPSV TE can let the Enbridge number stand without adjustment.
- It is expected that if the CPSV TE savings number differs by more than 5%, the CPSV TE will recommend adjusting Enbridge's savings claim and be fully prepared to defend its adjusted savings claim. In exceptional cases in which the CPSV firm's savings estimate differs from Enbridge's by more than 5% but the firm elects not to recommend adjusting Enbridge's savings claim, the firm must provide an explanation to defend their recommendation.
- If the CPSV TE uncovers a clear methodological or calculation mistake or other obvious error, then the Enbridge savings claim should always be adjusted regardless of the size of the variance.
- For all projects, the CPSV TE should provide clear reasoning for all recommended savings adjustments.
- A policy on the use of ETools to calculate savings for boiler replacements.<sup>19</sup> See the next section for more details.

At the conclusion of its work, each CPSV TE produced a detailed final report summarizing its methodology and project-by-project findings.<sup>20</sup>

Optimal's audit of Enbridge's custom projects involved reviewing CPSV activities and reports. Optimal staff attended weekly CPSV TE meetings via teleconference. Enbridge staff and the AC also attended as needed. These meetings allowed Optimal to provide input and recommendations to the CPSV TEs prior to the completion of their evaluation work.

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<sup>19</sup> Optimal provided guidance on this issue via memo on December 15, 2014 and this memo was endorsed by the AC on Dec. 17.

<sup>20</sup> Because the CPSV reports contain customer specific data they are considered confidential and are not publically available documents. Optimal signed a non-disclosure agreement allowing it to have full access to all CPSV data.

CPSV reports were completed by the TEs in “waves.” Optimal and the AC reviewed and provided feedback on the draft Wave 1 CPSV reports to ensure that the reports contained the quality and level of data needed to complete its audit tasks. In addition, Optimal provided feedback as to whether or not the CPSV TEs were meeting the requirements of the terms of reference developed by the TEC and included in Enbridge’s RFP for this work. Optimal provided memos on January 30, 2015 and February 6, 2015 to the CPSV TEs and the AC with recommended revisions to be incorporated in the next draft of the CPSV reports. Each of these memos included feedback provided by the AC. These recommendations also included extensive directives on the level of detail that should be included in the CPSV reports and the overall format of the reports to ensure that all relevant project information would be included.

Next, Optimal and the AC reviewed the full combined Wave 1 and Wave 2 draft reports. Informed by AC input, Optimal issued memos providing final comments and feedback on March 18, 2015. Optimal and the AC held two sets of meetings with each CPSV TE to review all of the recommendations to ensure that each CPSV TE fully understood each of the recommendations. As a result of Optimal’s far-reaching involvement in the overall CPSV process, the final CPSV reports were greatly improved.

Once the final CPSV reports were issued, Optimal took the following steps:

- **Reviewed the project-by-project evaluations contained in the CPSV final reports.** For this review Optimal utilized a checklist allowing us to systematically ascertain that key project elements had been reported, were well documented, and were reasonable and appropriate. This checklist included reviews of baselines and measure lives.
- **Examined measure lives, persistence, advancement/replacement, and other baseline characterization assumptions.** Appropriate revisions were recommended if Optimal determined that OEB-approved or industry-accepted methodologies were not utilized in determining baselines or measure lives used for savings calculations.
- **Confirmed or revised CPSV TE final savings recommendations.** If Optimal disagreed with any of the final project CCM savings values put forth by the CPSV TEs, Optimal calculated revised savings claims.

Optimal and the AC were provided the following documents that were filed as part of Enbridge’s Year 2013 Clearance of Accounts proceedings:

- Board Staff Submission on Enbridge Gas Distribution Inc.’s Application for Clearance of the 2013 Demand Side Management Variance Accounts; January 22, 2015; EB-2014-0277
- Enbridge Gas Distribution Inc. (“Enbridge”) EB-2014-0277 – 2013 Demand Side Management (“DSM”) Clearance of Variance Accounts Application - Reply Submission – Redacted; February 5, 2015; EB-2014-0277
- OEB Decision and Order, In The Matter of an application by Enbridge Gas Distribution Inc. for an order or orders approving the final balances and for clearance of certain Demand Side Management Variance Accounts into rates,

within the next available QRAM following the OEB's approval; February 26, 2015; EB-2014-0277.

As part of the review, Optimal considered the comments and conclusions included in the above documents, as well as documentation from the 2012 clearance, regarding persistence, baseline and measure life issues.

Optimal provided preliminary Industrial CPSV audit results to Enbridge and the AC on April 29, 2015, and preliminary Commercial CPSV audit results on May 1, 2015. The AC and Enbridge provided feedback on these preliminary results. One final set of meetings was held with Enbridge and the AC to review the feedback. Optimal then finalized its CPSV results, taking into account all of the feedback and information received from Enbridge and the AC.

### **Boiler Replacements and ETools**

The RFP for each of the CPSV TEs required them not to rely solely on Enbridge's in-house custom project savings calculation software, ETools.<sup>21</sup> Instead, they were requested to re-calculate project savings using alternative methodologies for purposes of independently verifying Enbridge's savings claims.

For boiler replacement projects completed early in 2014 that had at least 12 months of post installation consumption data available, the commercial CPSV TE was able to develop independent savings calculations by performing a regression analysis using pre and post installation gas consumption data.

However, for commercial boiler replacement projects that lacked sufficient consumption data, the commercial CPSV TE did not undertake an independent savings calculation. Instead, as per the ETools memo of Dec 15, 2014 issued by Optimal on this subject, the CPSV verified key ETools savings assumptions. If the assumptions used by Enbridge were determined to be incorrect, the commercial CPSV TE had Enbridge re-run ETools based on the correct assumptions. The commercial CPSV TE used these updated ETools calculations as its final recommendation.

The key variable for boiler replacement projects is the boiler's seasonal efficiency.<sup>22</sup> The commercial CPSV TE did not develop an independent method to calculate seasonal efficiencies. ETools does provide a rigorous calculation of a boiler's seasonal efficiency. Optimal was given a demonstration of the ETools seasonal efficiency module and reviewed the ETools boiler documentation. Enbridge also noted that ASHRAE has yet to finalize guidelines for determining a boiler's application seasonal efficiency.<sup>23</sup> Given these constraints, Optimal

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<sup>21</sup> ETools consists of various modules. This discussion pertains specifically to the commercial boiler sector module of ETools.

<sup>22</sup> Measurements of thermal efficiency are performed at full load with steady-state operation using specific conditions as per testing standards. Seasonal efficiency accounts for operation during various loads, including heat losses when the boiler is off.

<sup>23</sup> ASHRAE Standard 155P was created in 1994 to provide a test method to determine the seasonal efficiency of commercial space heating boiler systems. The latest feedback from the 155P committee is for this standard to be released for public review in the summer of 2014. The 155P Standard has been in various stages of development over the past 20 years.

concluded, and the AC accepted, that it was reasonable for the commercial CPSV TE to rely on ETools for this sub-set of projects.

### **Base Case for Commercial Boiler Replacements**

For purposes of modeling commercial boiler base cases, Enbridge used a boiler with a thermal efficiency of 80.5%, which is 0.5% higher than the minimum required by code, with a traditional indoor/outdoor control. This base case assumed that no other boiler features that improve seasonal efficiency (e.g. staging, intermittent pumping, etc.) were included and that there were no other efficiency related controls installed. The most recent commercial boiler baseline study was performed in 2011 and, Optimal considers it out of date given the rapid changes in the boiler marketplace.

The Ontario Energy Board stated in the 2013 Clearance that the baseline study scheduled to be completed in 2015 should be incorporated into the 2014 audit. However, this study had not been completed at the time of the audit. In the absence of any data from this study, Enbridge, Optimal and the Audit Committee discussed the Board order, and the AC agreed that Optimal should proceed on its current work plan and schedule with the understanding that the boiler study could not be incorporated into the final Audit Report. Consequently, Optimal made the assumptions outlined below to complete the 2014 audit.

In boiler replacement cases where the existing boilers had controls that are not currently required by code, the CPSV TE carried these controls forward and applied them to the base case boiler. This action caused the base case seasonal efficiency to be higher than a minimally code compliant boiler, thereby producing savings estimates that were lower than Enbridge's. During the audit process, there was extensive AC discussion on how to best handle these cases, with some suggesting that the base case should be the minimal boiler required by code.

It is the auditor's opinion that, on average, the actual baseline is almost certainly higher than the minimum required by code. By raising the base case boiler for facilities that had controls and/or other efficiency features in the existing case, it brings the average base case boiler of the entire population of projects closer to the auditor's reasoned opinion that some of the facilities would have installed controls and/or other efficiency features even in the absence of program intervention. Further, it does this in a fairly logical way – the customers that installed non-code required controls on their boilers 15 to 25 years ago would be more likely to install new boilers that also had these same controls. Thus, while it obviously would have been preferable to adjust assumptions based on data from a new boiler baseline study, Optimal believes that its adjustments to baseline assumptions are the most reasonable it could make in the absence of such a study.

Enbridge has pointed out that these assumptions regarding the base case sometimes lead to a base case boiler that is not available on the market. To support this position, Enbridge was asked to provide a list of boilers from their database. In many cases, none of these boilers were exact matches to the one assumed for the base case. Optimal went through the process of trying to select the actual boiler that was closest to the base case used by CPSV TE. However, this process was not helpful – it is impossible to say which, of many similar boilers, is the "closest" to the assumed base case. Further, we do not think that it is a problem if the base case used does

not match up exactly to an actual model. As mentioned earlier, this base case assumption serves to bring the average base case used in the population of projects to a higher level of efficiency than Enbridge's assumed base case. It is not intended to exactly match what each individual customer would do. It is not necessary, then, for each base case to exactly match a specific model of boiler sold in Enbridge's service area.

## PREScriptive MEASURES

Enbridge provided Optimal with a spreadsheet that contained final Year 2014 measure level summary data for all prescriptive savings. The spreadsheet included a complete list of all of the input assumptions and factors relevant to the prescriptive measures and included the following information:

- Measure name
- Number of participants or units installed
- Annual gas savings per unit
- Free rider rate
- Agreed upon reduction rate for non-installs or removals
- Gross annual savings
- Net annual savings
- Measure life
- Gross CCM
- Net CCM

Optimal reviewed measures that represented the largest fraction of total savings<sup>24</sup> and confirmed that the following deemed savings values were based on approved OEB values. Optimal also confirmed that these values listed below are in line with industry standards:

- Gas savings per unit
- Free rider rates
- Agreed upon reduction factors
- Measure lives

As part of its review, Optimal confirmed that the approved reduction rate/non-install factor was accurate and properly applied for all showerhead measures. Optimal also verified that the values from the measure summary spreadsheet were calculated correctly and consistent with the values put forth by Enbridge in its overall net CCM calculation.

Optimal also reviewed the deemed savings values for the high volume measures to ensure that these values represent the current best available information, and for purposes of any forward going recommendations regarding updating these values or possible studies. Optimal concluded that the savings values for these measures are reasonable and appropriate and therefore does not have any recommendations for revising these values either for purposes of this audit or going forward.

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<sup>24</sup> These measures included infrared heaters, hood ventilation control, energy recovery ventilators, dishwashers, energy star fryers, ozone laundry, and boilers.



## RESIDENTIAL COMMUNITY ENERGY CONSERVATION

This program contained two separate DSM Shareholder Incentive metrics: net CCM and the number of “Deep Savings Participants.” For the net CCM metric, Optimal reviewed the spreadsheet containing participant-level data. Optimal verified that the correct free rider rate and agreed upon measure lives were applied and that the total net CCM value for all participants was consistent with the values put forth by Enbridge in its overall net CCM calculation.<sup>25</sup>

The Deep Savings Participants metric required that each participant install a minimum of 2 major measures<sup>26</sup> and that the average annual savings across all participants be a minimum of 25%. Optimal reviewed the spreadsheet that contained the participant-level savings to verify that the average savings across all participants met the 25% threshold. Optimal also reviewed the files for 25 participants out of a total of 5,213 to verify the installation of at least 2 major measures and the annual savings values, and found that all 25 met the program criteria. Optimal agrees with the claimed net savings figures and the quantity of participants.

## RUN IT RIGHT

In accordance with Year 2012 Auditor Resource Acquisition Recommendation 6, Optimal conducted a desk review of a random sample of the Run-It-Right program. Optimal followed the same procedures for this review that it utilized for the Year 2013 audit:

- Review of Enbridge’s written documentation and procedures for claiming Run-It-Right Savings. Optimal will provide its opinion as to whether the procedures used are reasonable, appropriate, and in accordance with industry standards. If warranted, Optimal will make recommendations on alternative procedures to be implemented that will result in a more accurate estimate of savings from this program.
- Review of a statistically significant sample of Run-It-Right projects to verify that the agreed upon savings calculation procedures were followed.
- If warranted, Optimal will recalculate Run-It-Right savings, providing clear justification for the revised savings estimates.

Optimal reviewed Enbridge’s “Run It Right 2013 Regression Analysis Methodology,” dated March 13, 2015, to assess its ability to reasonably estimate savings.<sup>27</sup>

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<sup>25</sup> As per Year 2012 Resource Acquisition Audit Recommendation 8, it was agreed that for Year 2014 a 15 -year measure life would be used for all home retrofits that included a furnace replacement and a 25-year life for all home retrofits that did not include a furnace replacement. See “2012 Demand Side Management Audit Summary Report” dated October 17, 2013.

<sup>26</sup> Qualifying measures include: heating system replacement; foundation insulation; water heating system replacement; air sealing; attic insulation; window replacements; wall insulation; drain water heat recovery; and exposed floor insulation

<sup>27</sup> Savings from Run It Right projects implemented in 2013 are claimed in Year 2014. The savings are based on 12 months of post implementation usage.

Optimal received the complete list of 45 Run It Right projects and selected a random sample of 14 projects for review.

The projects in the sample group were evaluated individually and checked for compliance with Enbridge's savings calculation methodology. The primary criterion was the appropriate application of Enbridge's regression analysis methodology, specifically, that all projects for which savings were claimed had:

- R-Squared Value equal to or greater than 0.80
- F-Value equal to or greater than 120
- Minimum of 12 months of data for both the baseline and reference periods<sup>28</sup>

Projects were also checked to verify that the baseline and reference periods were complete and covered the necessary time periods. Baseline and claimed savings figures from individual reports were verified to match those on the Run It Right program spreadsheet. Optimal agrees with the claimed savings figures.

## MARKET TRANSFORMATION

Enbridge's Market Transformation effort consisted of three separate programs. These include residential new construction, commercial new construction, and a home labeling program. Each program had its own unique DSM Shareholder Incentive metric(s). Optimal reviewed relevant tracking data and documentation (commitment forms, participant lists, completion forms, documented tracking protocols, etc.) specific to each Market Transformation metric. Optimal agrees with the claimed figures.

## DATA TRACKING SYSTEM

Optimal reviewed Enbridge's monitoring and tracking administrative procedures and systems. Optimal did not perform an on-site review for this year's audit. The Year 2013 audit included an on-site visit by Optimal where interviews, procedure reviews, and live demonstrations of Enbridge's DSM analysis, reporting, and tracking system took place. As part of its Year 2013 audit Optimal concluded that Enbridge's monitoring and tracking procedures and systems resulted in savings and market transformation data being properly entered into the CCM and the DSM Shareholder Incentive calculation workbooks. For this year's audit, the AC agreed that an on-site review was not required. Instead, Optimal issued a comprehensive written request to Enbridge whose purpose was to ascertain if there were any substantive changes made in 2014.<sup>29</sup> Enbridge, in its answers to the request, stated that there were no substantive changes to its systems that would impact the proper recording of savings and market transformation data. Optimal also reviewed the overall calculation workbooks that summarized Enbridge's DSM database and form the basis of the DSM Shareholder Incentive and LRAMVA values.

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<sup>28</sup> The R-Squared variable provides an indication of how well data points fit a statistical model. The F-Value tests the overall significance of the regression model.

<sup>29</sup> See Attachment B.



## REVIEW OF DSMVA, LRAMVA, AND DSM SHAREHOLDER INCENTIVE CALCULATIONS

The tasks outlined in the preceding sections provided a reasonable basis for Optimal to confidently make its determination on the validity of the DSMVA, LRAMVA, and DSM Shareholder Incentive calculations. Optimal ensured that OEB-approved methodologies for all of these calculations were properly followed. Optimal also ensured that any recommended adjustments to the final net CCM results were properly incorporated into the LRAMVA and DSM Shareholder Incentive calculations.

Optimal's review of the DSMVA did not include auditing of Enbridge spending documentation. This is a financial auditor's responsibility. Optimal reviewed the calculation of the DSMVA to ensure consistency between actual expenditures included in the variance account calculations and the total DSM expenses reported in Enbridge's financial tracking system. Optimal also verified that the budget used for the DSMVA was the correct value that was built into Enbridge's Year 2014 rates.

For the LRAMVA, Optimal ascertained whether the methodologies and assumptions used to calculate actual sales volume net of installed efficiency measures were consistent with the methodologies and assumptions used to calculate the year's budgeted sales volume in advance. We also ensured that the net volumetric sales were appropriately allocated to each respective rate class.

For DSM Shareholder Incentive, Optimal reviewed the calculation spreadsheet to verify that it was consistent with the OEB-approved values and methodologies. We also ensured that the final audit calculation of DSM Shareholder Incentive contained the final audit values.

## AUDIT OF CLAIMED SAVINGS AND OTHER DSM SHAREHOLDER INCENTIVE METRICS

### INTRODUCTION

This section presents Optimal's final audited value for each of the DSM Shareholder Incentive metrics and a discussion of any recommended adjustments.

### RESOURCE ACQUISITION

Table 5. Final Resource Acquisition Audit Values

Metric	Pre-CPSV or Pre-Audit Value	Post-CPSV Value	Final Audit Value	Increase/ (Decrease)
<b>RESIDENTIAL COMMUNITY ENERGY CONSERVATION</b>				
Net CCM	89,690,562	Not Applicable	89,690,562	0
Deep Savings Participants	5,213	Not Applicable	5,213	0
<b>COMMERCIAL</b>				
<b>Custom</b>				
Net CCM	367,051,405	296,577,536	307,222,026	(59,829,379)
<b>Prescriptive</b>				
Net CCM	81,487,407	Not Applicable	79,068,251	(2,419,156)
<b>Run It Right</b>				
Net CCM	3,125,440	Not Applicable	3,125,440	0
<b>INDUSTRIAL</b>				
<b>Custom</b>				
Net CCM	171,655,513	177,320,144	177,663,455	6,007,943
<b>Prescriptive</b>				
Net CCM	7,598,262	Not Applicable	7,598,262	0
<b>TOTAL RESOURCE ACQUISITION Net CCM</b>	<b>720,613,802</b>	<b>Not Applicable</b>	<b>664,373,210</b>	<b>(56,240,592)</b>

### Residential Community Energy Conservation

No audit adjustments were made to Enbridge's Residential Community Energy Conservation Net CCM savings value or the number of deep savings participants.

### Commercial

#### Custom Projects

Commercial custom projects contributed 45% of Enbridge's Resource Acquisition post-CPSV Net CCM. In accordance with the Technical Evaluation Committee approved methodology, an independent statistical firm selected 27 commercial and low-income multi-residential projects to

be evaluated by the CPSV TE.<sup>30</sup> The final report issued by the CPSV TE adjusted the savings on 26 of these projects. These adjustments resulted in a 12.4% reduction in savings versus Enbridge's initial savings calculations for these projects. The difference between Enbridge's initial savings values and the CPSV TE adjusted values was used to calculate a realization rate that was subsequently applied to all of the commercial and low-income multi-residential custom project savings values. The adjusted commercial/low income multi-residential realization rate was 80.8%, resulting in a 19.2% savings reduction from Enbridge's original savings estimates for the total of all commercial and low income multi-residential custom projects.

Optimal adjusted the final savings values put forward by the CPSV TE on 9 projects. These adjustments resulted in a net increase in savings versus the CPSV TE values for the 27 sampled projects. The adjusted projects are listed in the table below. Following the table we provide our justification for these adjustments.

**Table 6. Commercial & Low-Income Multi-Residential CPSV Project Summaries<sup>31</sup>**

Enbridge Project Code	CPSV TE Gross CCM Value	Final Audit Gross CCM Value	Gross CCM Increase/ (Decrease)
RA.MR.EX.OO1.14	2,579,525	1,873,429	(706,096)
RA.MR.EX.O35.14	1,364,500	2,312,050	947,550
RA.MR.EX.O49.14	59,225	177,675	118,450
RA.MR.EX.O60.14	1,979,025	2,120,475	141,450
RA.MR.EX.O75.14	1,956,575	2,171,725	215,150
RA.MR.EX.O94.14	482,190	536,850	54,660
RA.REC.EX.002.14	231,675	265,175	33,500
RA.SCH.EX.030.14	1,614,300	1,919,325	305,025
RA.UNIV.EX.016.14	16,891,905	17,868,795	976,890

<sup>30</sup> The custom program for low-income multi-residential buildings was essentially the same as non-low-income multi-residential buildings. The main difference was the incentive levels and the marketing techniques. These projects were subject to the same type of energy savings calculations (ETools) and same level of review by Enbridge's commercial technical engineering staff. As a result, these building were included in the overall commercial sampling process and technical review conducted by the CPSV TE.

<sup>31</sup> While all final DSM Shareholder Incentive savings value are net CCM, savings for the CPSV sampled projects are stated in gross CCM. The realization rates for custom projects are calculated using gross CCM prior to the application of the free rider rate. The realization rate is first applied to total custom project gross CCM, after which the free rider rate is applied to arrive at the net CCM value used for the DSM Shareholder Incentive.

#### **RA.MR.EX.O35.14, RA.SCH.EX.030.14, RA.MR.EX.O60.14**

When Enbridge originally calculated savings for the boiler replacement projects, they used supply and return water temperature values from the project application to calculate savings that were unconfirmed by any measurements. In three non-condensing boiler projects, as part of the post installation inspection, the CPSV firm measured supply and return water temperatures that were higher than what was found in the application. As a result of these findings, the CPSV firm re-ran ETools with higher water temperatures for the efficient case. However, since the CPSV firm could only measure water temperatures in the post-retrofit efficient case, they only changed the water temperature for the efficient case and not the baseline or existing case. This approach assumes that the building operator raised the water temperatures after installation of the new efficient boiler. Optimal disagrees with this assumption and believes that the person filling out the application did not know the existing water temperatures, or did not put down the correct existing water temperatures. Based on this logic, and to ensure consistency, Optimal changed the existing/baseline supply water temperature to match the post-project efficient case temperature. As a result, savings as compared to the CPSV calculations for RA.MR.035.14 went from 1,364,500 CCM to 2,312,050 CCM, savings for RA.SCH.EX.030.14 went from 1,614,300 CCM to 1,919,325 CCM, and savings for RA.MR.EX.060.14 went from 1,979,025 CCM to 2,120,475 CCM. The net result is that two of these projects saw decreases from the original Enbridge calculation, and one project saw an increase between the Enbridge calculation and the audited adjustment.

To avoid this problem in the future, Optimal makes the following recommendation, which also appears in the summaries: On boiler replacement projects, if the supply and return temperatures for the new installed efficient boiler are set higher than the existing boiler, the CPSV TE should verify with the customer that they did indeed raise the temperatures for the new system.

Optimal also reviewed the rest of the custom boiler projects to see if there was the potential for additional temperature recording errors. Optimal is confident that the temperatures for the rest of the projects either remained unchanged throughout the CPSV and audit process, or were adjusted appropriately as a result of the CPSV findings. When a boiler is upgraded, supply and return water temperatures often remain the same and unchanged for both the existing and efficient non-condensing boilers. When a condensing boiler is installed, the supply and return water temperatures may need to be lowered in order to allow the boiler to work most efficiently and condense vapor in the exhaust. The temperature data for the rest of the custom boiler projects was examined and found to be within the range of Optimal's expectations.

#### **RA.MR.EX.001.14**

This project was a typical boiler replacement, but it was performed relatively early on in the program year, giving sufficient post-retrofit billing data to estimate savings using a billing regression analysis. The CPSV firm therefore estimated savings by comparing the billing data in the pre-retrofit period to the billing data in the post-retrofit period. There were a couple changes made to this. First, it was determined that the months immediately following the installation were inappropriate to include in the post-billing period due to ongoing commissioning where

the boiler was not running at peak efficiency. Starting the post-retrofit period a couple of months after installation would therefore increase the savings (if it was the only adjustment made). Second, this approach calculates savings based on the existing boiler. However, the project was a lost opportunity project, and the savings should therefore be calculated based on a new baseline boiler. We therefore adjusted the annual savings based on the difference in savings in going from the new base case boiler to an efficient boiler, as compared to going from the existing boiler to an efficient boiler, as found in the ETools simulation. The net result of these two changes was a reduction in savings from 2,579,525 CCM to 1,873,429 CCM.

#### **RA.MR.EX.049.14**

This project involved installing controls allowing intermittent pumping in the heating and DHW boiler pumps, as well as VFDs in the makeup air unit. The intermittent pumping stops water flow when the boiler is not firing, drastically reducing stand by losses. The VFD in the MUA modulates the flow of fresh air according to a preset schedule, thus reducing fan energy. The CPSV firm noted that, although these controls were new, they were installed on equipment that is almost 30 years old and would thus need to be replaced soon. As a result, the CPSV firm reduced the measure life from 15 years, which is the OEB approved measure life for controls, to 5 years. However, it is unlikely that the building operator bought new controls just to get rid of them when the boilers would be replaced a few years later, and it goes against the general assumption made through this process that existing controls carry over to newly installed boilers. Further, it was confirmed via email and photos that the controls in this project are separate from the equipment they control, and can easily be maintained when new boilers are put in place. We therefore raised the measure life of the project from 5 years back to 15 years. This caused an increase in savings from 59,225 CCM to 177,675 CCM.

#### **RA.MR.EX.075.14**

This project involved a boiler replacement that included a control upgrade that allowed the new boiler to turn off its pumps when the boiler is not firing. This dramatically reduces standby losses from the boiler, increasing seasonal efficiency. On the site visit, the CPSV firm observed that the pumps were not taking advantage of this feature, and were instead running continuously. They therefore instructed Enbridge to update ETools using continuous pumping instead of intermittent pumping for the new boiler. However, since the CPSV report was released, new information has come to light that the pumps were only running continuously because the boiler was still in commissioning phase. It was confirmed that the default operation for these boilers is intermittent pumping, and the facility manager has given assurances that he intends to run the pumps intermittently once the boiler is fully commissioned. We therefore changed the savings of the project to reflect intermittent pumping in the new boiler. This increased the savings from 1,956,575 CCM to 2,171,725 CCM.

#### **RA.MR.EX.094.14**

This project involved installing a variable frequency drive (VFD) on the building's makeup air unit (MUA), and reducing the set point of the supply air to 65 degrees during off peak hours and 68 degrees during peak hours. The CPSV firm calculated savings from the

lower set point using a delta T based on the estimated balance point of the building. However, during the review Enbridge provided information showing that there are no sensors in the rooms themselves or controls on the MUA units that allow them to vary flow based on the interior temperature. Instead, the MUA units are controlled solely by the supply air temperature. As a result, the supply air temperature set point should be used to calculate the delta T, and not the building balance point. We updated the calculations based on this change, and the resulting savings increased from 482,190 CCM to 536,850 CCM.

#### **RA.REC.EX.002.14**

This project was a boiler replacement in a recreational facility. To derive the baseline boiler load, the CPSV firm estimated the load from two large gas dryers to subtract from the total gas usage. However, to arrive at this estimate, the CPSV firm assumed that the gas dryers would run with a 100% duty cycle during the entire period of operation. This is not realistic. We therefore adjusted the estimate of the gas dryer usage based on a CPUC study investigating typical commercial dryer usage. As a result of this adjustment, the DHW load assumed in the calculations increased, thus increasing the savings from 231,675 CCM to 265,175 CCM.

#### **RA.UNIV.EX.016.14**

This project involved adding variable frequency drives (VFDs) to all supply and return air fans in the facility. This allows the facility to reduce airflow according to a preset schedule. The CPSV firm estimated the load on the rooftop units in part by subtracting out the estimated DHW usage from the total gas usage. However, we were unable to reproduce the CPSV firm's DHW usage, which seemed an order of magnitude higher than what could be expected both from CBECs benchmarking data and from a bottom up estimate of usage based on the total number of sinks in the facility (which is the only hot water load). We therefore updated the DHW use estimate based on NREL DHW assessment guidelines, and assumed additional loss due to continuous circulation of the DHW water. The lower DHW estimate meant more steam allocated to space heating, and thus more savings. In addition, we could not replicate MMM's estimate of total steam usage. The analysis was re-run using the most recent 12 months of data (compared to the calendar year that the CPSV firm used). The net result of these adjustments was an increase of savings from 16,891,905 CCM to 17,868,795 CCM.

#### **Prescriptive**

Enbridge uncovered three minor data entry mistakes when providing detailed measure level values to Optimal in response to a data request. The first error related to the Ozone Laundry measure. The number of installed units and the savings per unit needed to be updated. A further error involved correcting the cubic feet per minute (CFM) figure used for one Energy Recovery Ventilation (ERV) project and finally an error was corrected in the tracking of the gas savings for one of the Infrared projects. Optimal agreed with these corrections and adjusted the Net CCM for these measures accordingly.

#### **Run It Right**

The results of Optimal's desk review indicated that Enbridge properly implemented its savings calculation methodology on all 14 projects selected for the review.



### ***Free Rider Rate***

To date, a free rider rate has not been approved for this program. Enbridge was asked to recommend a free rider rate along with a justification for the proposed rate. Based on its own internal research, Enbridge proposed a free rider rate of 0%.

As part of its Year 2013 Audit Optimal reviewed EM&V reports of other retro-commissioning gas programs. Results from eight different programs suggest that free ridership estimates were wide ranging (8-32%). Three of these calculations also included estimates of spillover, which ranged from 10 to 20%. When using either the average or median values of the free rider rate and the spillover rates, the net-to-gross calculation equals 0.96 or 96%. It is likely that a pre/post billing analysis would inherently include short term participant spillover. It is also possible that the program will lead to longer term participant spillover that is not currently captured in the billing analysis. In addition, it is likely that continued program efforts will lead to non-participant spillover in the long run by building market expertise and creating more service providers and demand for retro-commissioning services. Thus, Optimal feels that spillover should be included in the overall review of Enbridge's free rider rate.

Because the average net-to-gross value is close to one, Optimal supports using a NTG of 1.0, consistent with Enbridge's recommended free rider rate assumption of 0%. However, Optimal continues to also recommend that additional efforts be made to better estimate free rider and spillover rates for this offer.

### ***Savings Calculation Methodology and Final Audit Value***

Optimal reviewed the "Run It Right 2013 Regression Analysis Methodology" ("Analysis"), dated March 13, 2015, which Enbridge used to calculate the Run It Right savings estimates. The Analysis claimed a total of 3,125,440 net CCM from Run It Right projects implemented in Year 2013. Optimal found that the Analysis methodology was well explained and professionally done.

The regression analysis results were broken down into three groups:

- Positive Savings: 31 of the projects consumed less natural gas during the reference period.
- Negative Savings: 14 of the projects consumed more natural gas during the reference period.
- Failed: 8 of the projects failed the regression analysis parameters or had capital projects and therefore no results could be established.

Enbridge correctly did not count any savings from the eight projects that failed. And unlike Year 2013, Enbridge did not exclude or otherwise try to include any assumed average savings from the 14 projects where consumption increased. Optimal agrees with this approach and is not adjusting the savings claimed for the Run It Right program.

Enbridge did hire a third-party firm in 2015 to do a post-installation survey of the 45 projects that either had positive or negative savings. Documentation was reviewed by Optimal and the AC; and input and comments from both Optimal and the AC were provided regarding the survey and the scope of work. The objectives of the survey were to:

- Determine whether the participant implemented the measures recommended in the timeframe indicated.
- Determine whether the participant made any significant changes to the facility, its operations, or equipment outside of the run It Right program.
- Collect basic participant characteristics, including building type, occupancy load, usage, and size.
- For each project, provide a recommendation to accept, adjust or exclude and provide the basis for that recommendation.
- Determine a potential adjustment factor that might be applied at the aggregate level and provide the basis for that recommendation.

Only 9 out of the total of 45 projects responded to the survey.<sup>32</sup> Despite this attempt to gain insights through the survey, due to this low sample size there continues to be no determination on a clear methodology to calculate the Run It Right savings. Further, the third party firm concluded that the survey did not provide any objective or statistically valid basis for making any savings adjustment. Optimal agreed with that conclusion and is not recommending any adjustments to the Run It Right savings claim. Further, there are no recommendations with respect to changing the savings calculation methodology at this time if the metric continues to be cubic meters of gas saved. However, there are recommendations in the Recommendations Section that suggest surveying participants before participation, as part of the paperwork required to sign up for the program, and agreeing to completion of a post-participation survey as a prerequisite for participation. This will help achieve a larger sample size for surveys in future years which can be used as a basis of methodological changes. Alternatively, the program metric could be changed to be participation instead of gas saved.

## Industrial

### Custom

Industrial custom projects contributed 27% of Enbridge's Resource Acquisition post-CPSV net CCM. In accordance with the Technical Evaluation Committee approved methodology, an independent statistical firm selected 19 industrial projects to be evaluated by the CPSV TE. The final report issued by the CPSV TE adjusted the savings on eight of these projects. These adjustments resulted in an 8.4% increase in savings versus Enbridge's initial savings calculations. The difference between Enbridge's initial savings values and the CPSV TE adjusted values was used to calculate a realization rate that was subsequently applied to all of the industrial custom project savings values. This resulted in an industrial realization rate of 103.3%, meaning Enbridge's original savings estimate for the total of all industrial custom projects was increased by 3.3%.

Optimal adjusted the final savings values put forward by the CPSV TE on three projects. These adjustments resulted in an increase in savings versus the CPSV TE values for the 19 sampled projects. The adjusted projects are listed in the table below. Following the table we provide our justification for these adjustments.

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<sup>32</sup> Run It Right Post Installation Survey Results 2014 Participants, May 8, 2015.



**Table 7. Industrial CPSV Project Summaries**

Enbridge Project Code	CPSV TE Gross CCM Value	Final Audit Gross CCM Value	Gross CCM Increase/ (Decrease)
RA.IND.NRT.023.14	5,063,831	4,367,480	(696,351)
RA.IND.NRT.049.14	2,224,074	1,245,482	(978,592)
RA.IND.RT.038.14	27,183,680	33,542,792	6,359,112

***RA.IND.NRT.023.14***

This project involved transferring heat from one area of the facility, which had a surplus of heat from a production process, to a heated warehouse. The surplus heat is generated by a quantity of injection molding machines, and required mechanical ventilation to exhaust the heat to the outdoors. By transferring this heat to the warehouse instead, the warehouse heaters could be turned off, thus saving energy. A set of three fabric socks act as ducts, and guide heated air to the warehouse. The air is moved through the socks by fans.

The CPSV TE performed an analysis that incorporated post installation gas use data, and came up with a higher savings estimate than Enbridge. This calculation determined the difference between monthly usage year over year, based on the assumption that the post-installation year was colder than average. The CPSV TE calculation increased annual savings from the Enbridge figure of 201,887 to 253,192 cubic meters of gas. The CPSV calculation assumed a baseline, non-heating gas usage by using the average actual gas usage for August during the 2012-2014 time period. Stated another way, there is a certain amount of gas usage at the facility that is not related to heating degree days (HDD), and therefore is not used for space heat.

The data provided in the analysis included natural gas usage and heating degree days for pre- and post-installation time periods. The availability of this data prompted Optimal to run a regression analysis to develop mathematical models for pre and post-installation performance with respect to the amount of energy required per heating degree day. The pre-installation model indicated a good model fit with an R2 value of 0.802, and indicated a bit higher baseline, non-space heat usage than was assumed by the CPSV TE. The post-installation regression indicated a very good model fit with an R2 of 0.992. The difference in gas usage per HDD for the pre and post-installation usage, multiplied by the annual heating degree days yielded an estimated savings figure of 218,374 cubic meters. This figure was less than the CPSV TE and greater than the Enbridge calculation. It was chosen for use as the final recommended number for savings. The Optimal figure is 8% higher than the Enbridge number and 16% lower than the CPSV number. Optimal Energy agrees with the Enbridge and CPSV TE measure life.

**RA.IND.NRT.049.14**

This project involved the installation of two fast acting doors at either end of a vestibule that provides access from a warehouse to the outdoors. Forklifts move in and out of the warehouse through the doors an average of 854 times per day. The time taken opening and closing the previous, older doors, allowed heat from the warehouse to escape, thus wasting energy. The old doors took 30 seconds to open or close, whereas the new fast acting doors can open or close in 6 seconds. Based on the hours of operation of the facility, the doors are expected to cycle 213,817 times per year.

Enbridge proposed and the CPSV TE agreed on a 25 year measure life. The reasons given for a life of this length included:

- These doors are part of the exterior shell of the building, and exterior shell measures are deemed to have a life of 25 years
- A dedicated maintenance program, contracted by the customer with the supplier, would keep the doors in service for the 25 year life
- These doors are designed for cold storage applications, where the temperature differential across the door is typically greater than the average temperature differential across the doors in this application

Optimal took the reasons listed above into account, but wanted more information on the typical life of a door in this type of application, with an expected annual cycle count of almost 214,000. Optimal Energy contacted the vendor, who provided the following information:

*"We design and test our doors to last over 1,000,000 cycles. As an example, a typical freezer door will see 500,000+ cycles per year and generally last 5-10 years before needing major parts replacements.*

*I've seen doors with several million cycles and I've also seen doors last 10-20+ years. However, the actual expected life will depend on how well the door is maintained. A regular planned maintenance program will go a long way to extending the useful life."*

Based on the manufacturer response, Optimal chose to interpret the claim of "several million cycles" as three million. Dividing the three million cycle lifetime by 213,817 cycles per year yields an expected life of 14 years. Fourteen years also falls into the range of doors lasting "10-20+ years," as per the manufacturer. Optimal therefore recommends a measure life of 14 years, which changes the lifetime savings claim from 2,224,074 CCM to 1,245,482 CCM.

**RA.IND.RT.038.14**

The project involved the purchase of a more efficient food roaster to replace one older roaster. The facility has a total of five roasters, and the project involved the replacement of one roaster. The new roaster, named "New #3," replaced "Old #3." Old roaster #3 had a capacity of 2,300 pounds of food per hour (lbs./hr.). It was removed from the facility to make room for New #3, which has a capacity of 6,300 lbs./hr. Because of the increased capacity of New #3, Enbridge calculated savings based on the assumption that the new roaster would not only replace Old #3, but also roaster #1 in terms of production capacity. Roaster #1 is the same size as Old #3, at 2300 lbs./hr. The facility runs the roasters approximately 7,635 hours per year. Multiplying 7,635

annual hours by the capacity of 2,300 lbs./hr., times two roasters, yields an annual production of 35,121,000 pounds attributable to roaster 1 and Old #3. This is considered the baseline for production. The savings were calculated based on this baseline production using New #3. Because of its greater capacity, New #3 was assumed to only take about 5,575 hours per year to roast 35,121,000 pounds.

Optimal asked if the increased capacity of New #3 was really being limited to 5,575 hours per year, as opposed to the facility production hours of 7,635 hours annually. It does not logically make sense to limit the hours of use for the newest, most efficient roaster. Optimal suspected that the new roaster was actually being utilized at a rate equal to 7,635 annual hours, and was either increasing the overall roasting capacity of the plant or displacing capacity from additional, older less efficient roasters. Optimal requested additional information and a new savings calculation based on the assumption that new roaster #3 was displacing capacity from another existing roaster. As requested by Optimal, Enbridge contacted the customer who provided the production data, which showed that as the training and commissioning for New #3 progressed, roaster #1 was phased out. The data also showed that once New #3 was being fully utilized, starting in August, it was also displacing capacity from roaster #2. The production data also showed no increase in the average quantity roasted each month, indicating that the increased capacity from New #3 was not being used to increase overall plant production.

Enbridge recalculated saving by comparing the fuel use of the full production capacity of New #3 at 6300 lbs./hr. to the sum of fuel use of roaster #1 (2300 lbs./hr.), old #3 (2300 lbs./hr.), and a portion of #2 (actual capacity is 4400 lbs./hr., but only 1700 lbs./hr. was assumed). The result was an increase in savings from the original lifetime savings of 27,183,680 to 33,542,792 CCM. Optimal agrees with the new Enbridge calculation.

### **Prescriptive**

Optimal is not recommending any adjustments to the Industrial Prescriptive net CCM claimed by Enbridge.

### **Realization Rate**

Optimal re-calculated the Realization Rates for both the Commercial and the Industrial CPSV projects based on the final audited savings for these projects. Optimal's calculations were consistent with the methodology agreed to as part of the 2012 Audit.

**Table 8. Commercial and Low-Income Multi-Residential Realization Rates**

Post CPSV Value		
Strata	Gross Realization Rate	Gross CCM
Large	95.5%	90,813,113
Medium	75.8%	133,637,371
Small	78.0%	145,681,074
<b>Weighted Average</b>	<b>80.8%</b>	<b>370,131,558</b>

Final Audit Value		
Strata	Gross Realization Rate	Gross CCM
Large	97.8%	92,952,427
Medium	80.1%	141,162,782
Small	80.0%	149,600,263
<b>Weighted Average</b>	<b>83.7%</b>	<b>383,715,472</b>

**Table 9. Industrial Realization Rates**

Post CPSV Value		
Strata	Gross Realization Rate	Gross CCM
Large	111.3%	143,045,112
Medium	101.6%	128,999,332
Small	92.2%	68,102,404
<b>Weighted Average</b>	<b>103.3%</b>	<b>340,146,849</b>

Final Audit Value		
Strata	Gross Realization Rate	Gross CCM
Large	118.3%	152,121,530
Medium	95.1%	120,697,422
Small	92.2%	68,102,404
<b>Weighted Average</b>	<b>103.5%</b>	<b>340,921,356</b>

## LOW INCOME

**Table 10. Final Low Income Audit Values**

Metric	Pre-CPSV or Pre-Audit Value	Post-CPSV Values	Final Audit Value	Increase/ (Decrease)
<b>SINGLE FAMILY (PART 9)</b>				
Net CCM	25,673,499	Not Applicable	25,673,482	(17)
<b>MULTI-RESIDENTIAL (PART 3)</b>				
<b>Custom Multi-Residential</b>				
Net CCM	31,705,762	25,618,256	26,537,723	(5,168,039)
<b>Multi-Residential - Prescriptive</b>				
Net CCM	3,263,435	Not Applicable	3,263,435	0
<b>Low Income Building Performance Management</b>				
% of Part 3 Buildings Enrolled	74%	Not Applicable	74%	0%
<b>TOTAL Low Income Net CCM</b>	<b>60,642,696</b>	<b>Not Applicable</b>	<b>55,474,640</b>	<b>(5,168,056)</b>

### Part 9: Single-Family

Optimal uncovered a minor data entry mistake as part of its verification of the non-install rates. The non-install rate for kitchen aerators was entered as 66.8%. The correct rate is 66.9%. Optimal made this correction and adjusted the overall savings accordingly.

### Part 3: Custom Multi-Residential Projects

The low-income custom multi-residential projects are included in the overall commercial CPSV process as stated above. The adjusted commercial realization rate was applied to the total savings for this offer to obtain the final audited net CCM value.

### Part 3: Multi-Residential Showerheads

Optimal reviewed a spreadsheet containing a list of the units installed and confirmed that Enbridge used the correct deemed savings values. Optimal also verified that the Year 2012 verification report non-install adjustment factor of 12.3%, as agreed to with the AC, was correctly applied to 2014 units.

Based on its review, Optimal is not recommending any adjustments to the net CCM claimed by Enbridge.

### Part 3: Multi-Residential – Low-Income Building Performance Management

Optimal reviewed the spreadsheet containing the metric calculation and confirmed that it conformed to the OEB approved formula. Based on its review, Optimal is not recommending any adjustments to this metric.

## MARKET TRANSFORMATION

**Table 11. Final Market Transformation Values**

Metric	Pre Audit Values	Final Audit Value	Increase/ (Decrease)
<b>RESIDENTIAL SAVINGS BY DESIGN</b>			
Completed Units	1,059	1,059	0
Number of Top 80 Builders Enrolled	23	23	0
<b>COMMERCIAL SAVINGS BY DESIGN</b>			
Number of New Development Enrolled	19	19	0
<b>EXISTING RESIDENTIAL</b>			
Commitments to make a provision for data field to show a home's energy rating for all homes listed by participating realtors	40,040	40,040	0
Number of Home Ratings included in MLS or marketing materials	662	662	0

### Residential New Construction Savings by Design

The metrics tracked for the Residential New Construction Savings by Design program are the number of completed units and the number of builders enrolled in the program who are among the top 80 home builders (based on home completions). Optimal reviewed the spreadsheet to confirm that homes counted were built by builders enrolled in program. Optimal also reviewed the EnerQuality report outputs for 25 randomly selected homes by five different builders (five homes per builder). The EnerQuality report evaluates whether or not the home was built to achieve savings that are 25% over code.

As agreed to in the Year 2013 Audit, a builder who has built a minimum of 50 homes in the prior year is considered one of the top 80 builders in Enbridge's service area. Enbridge provided letters from the builders that stated they had met the criteria. Optimal reviewed these letters and confirmed that 23 builders supplied letters stating they had completed 50 or more homes in Enbridge territory in 2013.

Additionally, Optimal reviewed all 23 memoranda of understanding to confirm that they complied with the requirements for this metric.

Based on these review activities, Optimal confirmed the Residential Savings by Design metric values claimed by Enbridge.

### Commercial New Construction Savings by Design

The metric tracked for the Commercial New Construction Savings by Design program is the number of new developments enrolled. To verify the value claimed for this metric, Optimal reviewed randomly selected memoranda of understanding to confirm that they included a five-

year commitment, commitment to building to IDP standard within five years, and that each development was greater than 100,000 square feet.

Based on these review activities, Optimal confirmed the Commercial Savings by Design metric values claimed by Enbridge.

### Existing Residential Home Rating

The two metrics tracked for the Existing Residential Home Rating program are as follows:

- The annual number of commitments to make a provision for data field to show a home's energy rating for all homes listed by participating realtors<sup>33</sup>
- The actual number of home energy ratings included in home listings or related marketing materials.

Optimal reviewed the spreadsheet listing each of the real estate brokerage firms that committed to list energy ratings, along with the number of listings per broker. There were 34 brokerage firms in total who made commitments. Optimal also was provided with and reviewed a copy of the signed commitment forms for each of the 34 brokerage firms. Each of these forms included the number of committed listings for each brokerage firm. The total number of committed listings from the 34 real estate brokers is 40,040 listings. Optimal agrees with this figure.

Enbridge's value for the number of actual listings or related marketing materials that included an energy rating was 662, below the lower threshold of 750. Although the achievement level for this metric was low, the other Existing Residential Home Rating metric, number of committed listings, was 450% over the upper threshold. Enbridge earned the entire maximum DSM Shareholder Incentive based on the listings metric alone. The energy rating metric had no impact on the incentive earned.

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<sup>33</sup> The goal is to achieve an "industry-wide commitment to include such a field on MLS or similar listing service and/or individual realtors' commitment to do so with all the homes they list on their own websites, handouts, and other consumer material" from the 2012-14 Plan Filing, PDF page 68



## CALCULATIONS AUDIT

Optimal reviewed the calculations of the DSM Shareholder Incentive, LRAMVA, and DSMVA in detail. Based on this review, Optimal determined that the calculations were properly applied in accordance with Enbridge's applicable OEB plan filings. There was consistency between actual expenditures included in the variance account calculations and the total DSM expenses reported in Enbridge's financial tracking system and the Draft Evaluation Report. Additionally, for the LRAMVA calculation, the actual sales volume, net of installed efficiency measures, was consistent with the methodologies and assumptions used to calculate the year's budgeted sales volume in advance. Net volumetric sales were appropriately allocated to each respective rate class.

Optimal recalculated the DSM Shareholder Incentive based on the final audit adjustments described in the preceding sections. Enbridge calculated the LRAMVA using the final audited savings values. Optimal reviewed and verified the LRAMVA calculation.

The tables below summarize the final audit values and present the recalculated DSM Shareholder Incentive, and DSMVA amounts and the calculated LRAMVA amounts.

**Table 12. Resource Acquisition Values<sup>34</sup>**

Program	Pre-Audit Value	Post-CPSV Value	Final Audit Value	Increase/ (Decrease)
Residential Community Energy Conservation - Net CCM	89,690,562	89,690,562	89,690,562	0
Commercial - Net CCM	451,664,252	381,190,383	389,415,717	(62,248,535)
Industrial - Net CCM	179,253,775	184,918,407	185,261,718	6,007,943
<b>TOTAL Net CCM</b>	<b>720,608,589</b>	<b>655,799,351</b>	<b>664,367,997</b>	<b>(56,240,592)</b>
Residential Community Energy Retrofit Deep Savings Participants	5,213	5,213	5,213	0

**Table 13. Low Income Values<sup>35</sup>**

Program	Pre-Audit Value	Post-CPSV	Final Audit Value	Increase/ (Decrease)
Single Family(Part 9) - Net CCM	25,673,499	25,673,499	25,673,482	(17)
Multi-Residential (Part 3) - Net CCM	34,969,197	28,881,691	29,801,158	(5,168,039)
<b>TOTAL Net CCM</b>	<b>60,642,696</b>	<b>54,555,190</b>	<b>55,474,640</b>	<b>(5,168,056)</b>
Multi-Residential (Part 3) Low Income Bldg. Performance Mgmt. - % of Part 3 Building Installed	74%	74%	74%	0%

<sup>34</sup> CPSV adjustments are only applicable to Commercial and Industrial custom projects.

<sup>35</sup> CPSV adjustments are only applicable to Multi-Residential custom projects.



**Table 14. Market Transformation Values**

Program	Metric	Pre Audit Value	Final Audit Value	Increase/ (Decrease)
Residential Savings by Design	Completed Units	1,059	1,059	0
Residential Savings by Design	Number of Top 80 Builders Enrolled	23	23	0
Commercial Savings by Design	Number of New Developments Enrolled	19	19	0
Existing Residential	Commitments to make a provision for data field to show a home's energy rating for all homes listed by participating realtors	40,040	40,040	0
Existing Residential	Number of Home Ratings included in MLS of marketing materials	662	662	0

**Table 15. DSM Shareholder Incentive Values**

Program	Pre-CPSV Value	Post-CPSV Value	Final Audit Value
Resource Acquisition	\$ 5,963,753	\$5,081,211	\$5,202,419
Low Income	\$ 516,873	\$349,830	\$375,059
Market Transformation	\$ 2,069,764	\$2,069,764	\$2,069,764
<b>TOTALS</b>	<b>\$8,550,390</b>	<b>\$7,500,805</b>	<b>\$7,647,242</b>

**Table 16. DSMVA Values**

	Pre Audit Value	Final Audit Value	Increase/ (Decrease)
OEB Approved Budget Built Into Rates	\$32,158,764	\$32,158,764	\$0
Actual Enbridge Year 2014 Spending	\$32,511,266	\$32,511,266	\$0
<b>DSMVA - Negative Due to Ratepayers/Positive Due to Enbridge</b>	<b>\$352,502</b>	<b>\$352,502</b>	<b>\$0</b>

**Table 17. LRAMVA Values<sup>36,37</sup>**

Rate Class	Net Partially Effective Annual Cubic Meters Built into Year 2014 Rates	Actual Year 2014 Net Partially Effective Annual Cubic Meters	Annual Cubic Meter Variance	Distribution Margin per Cubic Meter	Monetized Value of Annual Cubic Meter Variance
Rate 110	2,065,678	1,237,361	(828,317)	\$0.01428	(\$11,825)
Rate 115	1,314,523	846,042	(468,480)	\$0.00790	(\$3,701)
Rate 135	0	51,608	51,608	\$0.01275	\$658
Rate 145	2,428,288	467,549	(1,960,739)	\$0.01540	(\$30,189)
Rate 170	4,942,907	707,329	(4,235,578)	\$0.00479	(\$20,282)
<b>TOTAL LRAMVA (Positive due to Enbridge/Negative Due to Ratepayers)</b>					<b>(\$65,339)</b>

<sup>36</sup> The agreed upon process with the AC called for Enbridge to only calculate LRAMVA once the final audit savings values were available.

<sup>37</sup> Annual Cubic Meters is the unit for the purposes of LRAMVA because Enbridge's rates are based on sales of annual cubic meters not CCM. The cubic meter values are "Net Partial Effective." This is the process that accounts for the fact that measures are installed throughout the year. For example, a measure implemented in October would generate three months' worth of savings for the 2014 calendar year. The number included in the LRAMVA calculation for this measure is therefore the average monthly gas savings multiplied by three.

## FINDINGS AND RECOMMENDATIONS

### FINDINGS

We have audited the Draft Evaluation Report, Net Cumulative Cubic Meters (CCM) savings, DSM Shareholder Incentive, Lost Revenue Adjustment Mechanism Variance Account (LRAMVA), and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ending December 31, 2014. The Draft Evaluation Report and the calculations of CCM, DSM Shareholder Incentive, LRAMVA, and DSMVA are the responsibility of the company's management. Our responsibility is to express an opinion on these amounts based on our audit. We conducted our audit in accordance with the rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated June 30, 2011, in EB-2008-0346.

In our opinion, using the best available information and subject to the qualifications set forth above, the following figures are calculated correctly using reasonable assumptions, based on data that has been gathered and recorded using reasonable methods and is accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2014 DSM programs of Enbridge Gas Distribution:

- Net CCM savings of 719,842,637
- DSM Shareholder Incentive amount recoverable of \$7,647,242 (due to Enbridge)
- LRAMVA amount payable of \$65,339 (to be refunded to Enbridge ratepayers)
- DSMVA amount recoverable of \$352,502 (due to Enbridge)

### RECOMMENDATIONS

Throughout the performance of this audit we noted areas that would improve the overall verification and audit process and enhance savings assumptions through future evaluation and verification studies. These recommendations are listed below. They are sorted by category and ranked by relative importance.

#### CPSV

1. **Have the CPSV TEs and Enbridge hold extended kick-off meetings to carefully review each of the sampled CPSV projects.** The CPSV TE firm would review the file ahead of time and come to the meeting with any questions or clarifications needed. Enbridge staff would do a brief presentation on each project that would be followed up with a Q&A session with the CPSV TE. A set checklist of items could be established that Enbridge would cover in its presentation. If possible the Auditor should also attend these meetings. Given that some of the CPSV projects are very complicated this would streamline the transfer of information and provide greater project-by-project clarity.
2. **If pre and post billing regression analysis is to be used to independently calculate savings by the CPSV TEs, an agreed upon methodology should be established to ensure a consistent approach.** The methodology needs to properly deal with post

installation commissioning periods and also properly factor out any pre and post operational changes that could impact the validity of the savings calculation.

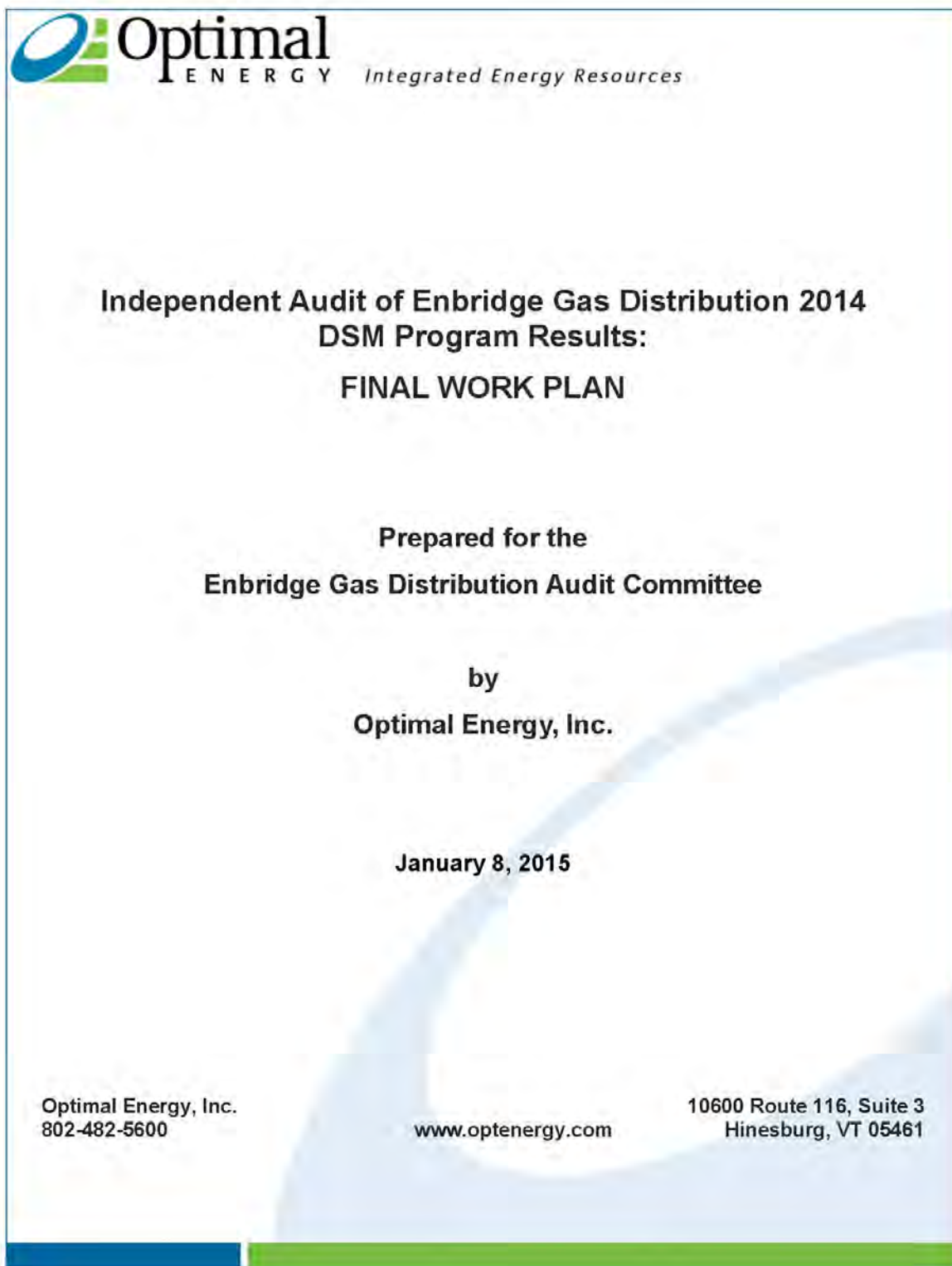
3. **CPSV TE Scope of Work should state that CPSV TE should always provide their actual electronic spreadsheet (not pdf) calculations for each project.**
4. **The project summary table included in the CPSV TE Scope of Work should include the Enbridge Claimed Measure Life in addition to the CPSV Recommended Measure Life.**
5. **For Commercial CPSV projects, a standard table should be included with each project that shows the seasonal and non-seasonal gas consumption values for each scenario – existing case, base case and proposed efficiency case.**
6. **A CPSV Glossary of Terms (Existing Case, Base Case, Non-Seasonal load, etc.) should be established.** The glossary could be included in the CPSV TE Scope of Work. This would provide a consistent and common understanding of technical terms for all parties (Auditor, Enbridge staff, CPSV staff and AC) involved.
7. **On boiler replacement projects, if the supply and return temperatures for the new installed efficient boiler are set higher than the existing boiler, the CPSV TE should verify with the customer that they did indeed raise the temperatures for the new system.** It does not make sense that the new boiler would have temperature settings that would make it less efficient. It is possible that the temperatures listed in the Enbridge file for the existing boilers might be incorrect.
8. **If there are a significant number of stockpile yard paving projects in the industrial portfolio, suggest conducting a study of stockpile moisture reduction due to paving in Enbridge's specific territory (i.e., account for precipitation, temperature differences, etc.).** Current estimates are based on research conducted in Tennessee.

## **Run It Right**

9. **Survey Run It Right participants prior to the installation of any measures, making it part of the start-up paperwork.** This would provide a better set of real time base case information for each project that can be compared to a post installation survey to see if there were any changes that could impact gas consumption that were outside of the Run It Right program.
10. **Require Run It Right participants to complete a post installation survey as part of allowing the customer to enroll in the program.** Also consider providing the participant with some sort of enticement (gift card, entry into drawing to win prize, etc.) to get them to undertake the post installation survey.
11. **Consider not using CCM as the metric for the Run it Right program.** Satisfactorily assessing and interpreting pre- and post-billing consumption data has proven to be difficult. These projects typically involve large buildings that can undergo hard to quantify changes in usage and operation from year-to-year. Using a metric such as number of participants, percent of market and/or number of Run It Right measures

implemented would result in an easier and possibly more accurate indication of program effectiveness.

## ATTACHMENT A: OPTIMAL'S APPROVED AUDIT WORK PLAN



## CONTENTS

<b>INTRODUCTION AND OBJECTIVES .....</b>	<b>1</b>
<b>TASK 1: PLANNING, MEETINGS AND WORK PLAN .....</b>	<b>2</b>
Task 1.1 – Audit Kick-Off Conference Call .....	2
Task 1.2 – Final Work Plan .....	2
Task 1.3 – CPSV Kick-Off Conference Calls .....	2
Task 1.4 – Data and Document Collection .....	3
Task 1.5 – Weekly Meetings .....	4
<b>TASK 2: REVIEW &amp; VALIDATE CPSV RESULTS AND CALCULATE REALIZATION RATES .....</b>	<b>5</b>
Task 2.1 – Review Wave One Draft CPSV Reports .....	5
Task 2.2 – Review Combined Wave One and Wave Two Draft CPSV Reports .....	6
Task 2.3 – Calculation of Custom Project CPSV TE Realization Rates .....	6
Task 2.4 – Full Examination of Final CPSV Reports .....	7
Task 2.5 – Calculation of Custom Project Audited Realization Rates .....	8
<b>TASK 3: CONSIDER/RESPOND TO STAKEHOLDER COMMENTS ON DRAFT EVALUATION DSM REPORT .....</b>	<b>9</b>
<b>TASK 4: REVIEW VERIFICATION AND EVALUATION STUDIES .....</b>	<b>10</b>
<b>TASK 5: REVIEW ENBRIDGE’S DSM TRACKING SYSTEMS .....</b>	<b>11</b>
<b>TASK 6: VERIFY CCM, LRAM AND DSM SHAREHOLDER INCENTIVE .....</b>	<b>12</b>
Task 6.1 – Compare Assumptions to Relevant Sources .....	12
Task 6.2 – Review Market Transformation DSM Shareholder Incentive Metrics .....	12
Task 6.3 – Review CCM Calculations .....	12
Task 6.4 – Review DSMVA, LRAM, and DSM Shareholder Incentive Calculations .....	13
<b>TASK 7: IDENTIFY FUTURE ENHANCEMENTS .....</b>	<b>15</b>
<b>TASK 8: ISSUE AUDIT FINDINGS, RECOMMENDATIONS AND REPORT .....</b>	<b>16</b>
Task 8.1 – Resolve Issues Prior to Audit Completion .....	16
Task 8.2 – Issue Draft Audit Report .....	16
Task 8.3 – Issue Final Audit Report .....	16
<b>TASK SCHEDULE .....</b>	<b>18</b>

Optimal Energy, Inc.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

## INTRODUCTION AND OBJECTIVES

Enbridge Gas Distribution (Enbridge) operates a series of demand side management (DSM) programs in accordance with its 2012-2014 Multi-Year Plan approved by the Ontario Energy Board (OEB).<sup>1</sup> Enbridge receives a combination of direct cost recovery and performance-based payments associated with its program delivery. The OEB and Enbridge's Audit Committee (AC) require an independent third-party review of Enbridge's DSM Evaluation Report and supporting calculations to ensure that savings claims and performance-based payment calculations are correct.

Enbridge issued a Request for Proposal to Optimal (RFP) on behalf of its Audit Committee to undertake the Year 2014 Audit on November 5, 2014. Optimal Energy Inc. submitted its initial proposal on November 12, 2014 and a final proposal on December 12, 2014. Optimal was subsequently awarded the contract.

The primary objective of this audit is to review Enbridge's calculations for Cumulative Cubic Meters (CCM) saved, the DSM Shareholder Incentive, the Lost Revenue Adjustment Mechanism (LRAM), and the Demand Side Management Variance Account (DSMVA) for the calendar year ended December 31, 2014, and to express an independent opinion on these amounts. If the Enbridge-reported amounts differ from what Optimal believes to be correct, Optimal will present alternative values. As required in the RFP, the auditor has a secondary role to recommend any forward-looking evaluation work for consideration.

This audit will be conducted under the direction of the AC and in accordance with the:

- rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated June 30, 2011, in EB-2008-0346;
- Joint Terms of Reference for Stakeholder Engagement for DSM Activities, OEB File No.: EB-2011-0295, Exhibit B Tab 2 Schedule 9, Appendix A dated November 14, 2011; and
- Enbridge Gas Distribution Request for Proposal for Independent Audit of 2014 DSM Program Results issued on November 5, 2014.

Optimal will perform this audit as further described below.

<sup>1</sup> Settlement Agreement Enbridge Gas Distribution Inc. Demand Side Management Multi-Year Plan 2012-14, Exhibit B, Tab 2, Schedule 9 OEB Case EB-2011-0295 and Enbridge Gas Distribution Inc. Update to the 2012 to 2014 Demand Side Management Plan OEB File No.: EB-2012-0394

## **TASK 1: PLANNING, MEETINGS AND WORK PLAN**

### **TASK 1.1 – AUDIT KICK-OFF CONFERENCE CALL**

Optimal staff will participate in a kick-off conference call with Enbridge's DSM staff and the Audit Committee (AC). The purpose of this meeting will be to:

- Re-introduce the Optimal team and the roles for each of its staff
- Obtain feedback from the AC as to any particular areas of focus for this year's audit

#### **Deliverable**

Optimal will provide summary meeting minutes intended to capture action items or decisions within three days following the conference call.

#### **Schedule**

The kick-off conference call was held on December 8, 2014.

### **TASK 1.2 - FINAL WORK PLAN**

Optimal will submit a draft work plan to Enbridge and the AC subsequent to the Audit Kick-Off Conference call. The work plan will be based on the RFP requirements and in accordance with OEB procedures. Optimal will finalize the work plan based on AC feedback.

#### **Deliverables**

1. Draft work plan
2. Final work plan

#### **Schedule**

The draft work plan was submitted on December 12, 2014. Enbridge and the AC reviewed and provided comments on the draft plan by January 5, 2014. Optimal revised the work plan and submitted the final work plan on January 8, 2015.

### **TASK 1.3 – CPSV KICK-OFF CONFERENCE CALLS**

Optimal staff will participate in both the commercial and industrial CPSV kick-off meetings via teleconference. These meetings will include Enbridge staff and the two independent CPSV Technical Evaluators (CPSV TE), one each for commercial and industrial projects. Optimal will carefully review the CPSV TE request for proposals prior to these meetings.

Involvement at each of these kick-off meetings will allow Optimal to ensure that expectations for each CPSV TE are clearly set. This will help ensure that their verification work will meet OEB requirements and industry standards; will encompass the level and quality of project information that will allow Optimal to provide its independent audit opinion as to the CPSV savings claims; and that all parties are clear on the objective of the CPSV TEs to provide their independent, professional opinion and recommendation regarding the savings estimates

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

for the projects they have been tasked with evaluating. This is an enhancement from last year, when Optimal did not begin its work until after the CPSV TEs had completed their "Wave One" draft reports.

**Deliverables**

There are no deliverables for Task 1.3.

**Schedule**

The commercial CPSV kick-off conference call was held on November 13, 2014.

The industrial CPSV kick-off conference call was held on November 17, 2014.

**TASK 1.4 – DATA AND DOCUMENT COLLECTION**

Optimal will not be conducting an on-site visit. Given that the Year 2014 DSM programs are essentially the same as the Year 2013 programs, Optimal does not feel it is cost-effective for staff to travel to Enbridge's offices to conduct in-person interviews and data collection. In addition, Optimal already has on-hand all of the pertinent OEB orders, approved filed input assumptions, and DSM plan filings for Enbridge's OEB Approved 2012-2014 Multi-Year DSM Plan.

The first step for this year's audit this task will be to ascertain if any significant changes were made to Year 2014 DSM programs. Optimal staff will query each of Enbridge's DSM Managers regarding any program changes implemented in 2014. If changes were made, Optimal will collect all relevant materials that document these changes. Next, Optimal will request any new verification or evaluation studies that were performed in 2014. Finally, Optimal will request the full set of measure level savings data and Enbridge's DSMVA, LRAM and DSM Shareholder Incentive calculation workbooks.

**Deliverables**

1. Brief written data request for each Enbridge DSM manager regarding Year 2014 program changes.
2. Data request to obtain verification and evaluation studies.
3. Data request to obtain measure level data and calculation workbooks.

**Schedule**

1. Program change data request will be submitted by Optimal to Enbridge on January 30, 2015. Optimal requests that Enbridge provide its response by February 20, 2015.
2. Data request to obtain verification and evaluation studies will be submitted by Optimal to Enbridge on February 27, 2015. Optimal requests that Enbridge provide its response by March 31, 2015.
3. Data request to obtain measure level data and calculation workbooks will be submitted by Optimal to Enbridge on March 31, 2015. Optimal requests that Enbridge provide its response by April 10, 2015.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

**TASK 1.5 - WEEKLY MEETINGS**

Optimal staff will participate in weekly AC and CPSV TE meetings via teleconference. In addition weekly project management conference calls will be held between Optimal's Audit Manager and Enbridge's Audit Manager.

The AC meetings will allow Optimal to raise any audit related issues and obtain AC feedback and suggestions as to their resolution. Optimal will recommend agenda items as they pertain to the audit and will issue meeting notes or action items following each meeting.

The CPSV meetings will allow Optimal to provide input and recommendations to the CPSV contractors prior to the completion of their verification work. These meetings will also allow Optimal to request, if needed, that additional project specific information be included in the CPSV reports. This should result in less effort by Optimal to obtain additional project information after the final CPSV reports are issued.

Overall project management tasks and Optimal's data/document requests will be discussed during the calls between Optimal and Enbridge's Audit Managers.

**Deliverables**

1. Weekly agenda items, as needed
2. AC Meeting notes and action items

**Schedule**

AC Meetings will be scheduled by Enbridge staff and will be held once per week on an as-needed basis from November 17, 2014 to June 12, 2015.

Commercial CPSV Meetings will be scheduled by Enbridge staff and will be held once per week on an as-needed basis from November 17, 2014 to March 16, 2015.

Industrial CPSV Meetings will be scheduled by Enbridge staff and will be held once per week on an as-needed basis from November 17, 2014 to March 16, 2015.

Optimal and Enbridge Project Management meetings will be held once per week on an as-needed basis beginning the week of January 5, 2015 and continuing until the week of June 12, 2015.

## **TASK 2: REVIEW & VALIDATE CPSV RESULTS AND CALCULATE REALIZATION RATES**

Enbridge's custom projects typically represent a large share of its total savings. In 2013 custom projects were 77% of the CCM total. As a result, a large share of Optimal's overall audit effort will be devoted to this task.

The CPSV process involves several different steps completed by different firms. First, Enbridge's independent statistics firm will develop a randomly selected and statistically significant sample from the total population of custom projects. Enbridge, in consultation with the AC, will hire two engineering firms (the CPSV TEs) who will conduct engineering assessments and evaluations for each of the sampled projects. Each CPSV TE will issue a final CPSV report at the end of this work summarizing its independent findings. The key element will be the CPSV TEs' evaluation of Enbridge's project-by-project savings claim. The CPSV TEs will either agree with Enbridge's savings claim or will provide revised savings amounts for each project. Optimal will work with the AC to provide clear guidelines that the CPSV TEs will use in deciding whether or not to revise Enbridge's savings claims. These guidelines will provide a consistent decision making framework for the CPSV TEs.

The CPSV TEs will perform their work in two "Waves." Wave One covers projects sampled from the start of 2014 through the end September 2014. Wave Two will cover projects sampled from the entire year through the end of 2014.

### **TASK 2.1 – REVIEW WAVE ONE DRAFT CPSV REPORTS**

Optimal will review the draft Wave One CPSV reports to provide feedback on the quality, reasonableness and accuracy of the project savings estimates. We will also ensure that the contractors are meeting the requirements of the CPSV TE RFPs. Optimal's recommendations are intended to ensure that the final Wave One reports and the subsequent Wave Two reports are of a high quality that will allow Optimal to provide its independent audit opinion as to the CPSV savings claims.

Optimal acknowledges that the AC will also want to review and comment on the Wave One CPSV draft and review the final reports. Optimal will work with the CPSV TEs and the AC to ensure that the AC has ample time to undertake its review. Optimal will address AC comments as part of its Wave One draft report review process.

#### **Deliverable**

Memo summarizing findings and recommendations regarding the Wave One draft CPSV reports.

#### **Schedule**

The Memo will be submitted by January 30, 2015 contingent on the Wave One draft CPSV reports being issued no later than January 16, 2015.

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

To ensure that the entire audit schedule can be adhered to, AC comments on the Wave One draft should be submitted by the AC directly to Optimal no later than January 23, 2015.

**TASK 2.2 – REVIEW COMBINED WAVE ONE AND WAVE TWO DRAFT CPSV REPORTS**

Optimal will review the draft of the combined Wave One and Wave Two reports to ensure that the final CPSV reports will contain the level and quality of project information that will allow Optimal to provide its independent audit opinion as to the CPSV savings claims.

Optimal acknowledges that the AC will also want to review and comment on the combined Wave One and Wave Two CPSV draft and review the final reports. Optimal will work with the CPSV TEs and the AC to ensure that the AC has ample time to undertake its review.

**Deliverable**

Memo providing recommended revisions to be incorporated in the final CPSV Reports.

**Schedule**

The memo will be submitted by March 13, 2015 contingent on the Combined Wave One and Wave Two draft CPSV reports being issued no later than March 6, 2015.

To ensure that the entire audit schedule can be adhered to, AC comments on the Combined Wave One and Wave Two draft CPSV reports should be submitted by the AC to Optimal no later than March 11, 2015.

**TASK 2.3 – CALCULATION OF CUSTOM PROJECT CPSV TE REALIZATION RATES**

Optimal will calculate the realization rates for custom projects (low income, commercial, and industrial) using the values put forth by the CPSV TEs in their final reports. Optimal will utilize the agreed upon methodology<sup>2</sup> to calculate the realization rates that will be applied to Enbridge's entire population of custom projects to determine total custom program savings. Optimal will utilize its realization rate calculation workbooks developed during the Year 2013 Audit. Enbridge will need to provide Optimal with its Year 2014 custom project data set for the inputs to Optimal's calculation workbooks. Enbridge will use these realization rates to calculate its total custom project CCM for incorporation into its Draft Evaluation Report.

**Deliverable**

Table of post CPSV (pre-audited) custom project realization rates.

**Schedule**

The CPSV realization rates will be issued by March 27, 2015. This date is contingent on the final CPSV TE reports being issued no later than March 20, 2015 and Enbridge providing its draft evaluation report custom project data set no later than March 13, 2015.

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<sup>2</sup> The realization rate calculation methodology was agreed to as part of the Year 2012 audit. One of Optimal's Year 2013 Audit recommendations was to formally document this process.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

#### **TASK 2.4 – FULL EXAMINATION OF FINAL CPSV REPORTS**

Optimal will perform the following CPSV sub-tasks on a project-by-project basis in its examination of the final CPSV report results.

- **Review each of the project evaluations contained in the CPSV final reports.** For this review we will utilize a checklist allowing us to systematically ascertain that key project and measure assumptions regarding annual savings estimates and measure lifetimes have been reported, are well documented, and are reasonable and appropriate. If additional information is needed, Optimal may request the full Enbridge project file.
- **Examine measure lives, advancement/early retirement, and other baseline characterization assumptions.** Appropriate revisions will be recommended if it is determined that OEB-approved or industry-accepted methodologies or assumptions were not utilized in determining baselines or measure lives used for savings calculations.
- **Confirm or revise CPSV TE final CCM Recommendations.** If Optimal disagrees with any of the final project cumulative cubic meters (CCM) savings values put forth by the CPSV TEs, Optimal will calculate revised savings claims.<sup>3</sup> When this occurs, Optimal will provide a clear written justification for the revision.

We will utilize both in-house data developed from our engagements with custom project reviews for other clients and published evaluation work to compare assumptions, methodologies, and savings results. All pertinent studies relevant to industrial and commercial custom projects that have been completed in support of the Enbridge's Year 2014 DSM program will be reviewed and utilized in making our final recommendations.

We will also make recommendations regarding Enbridge's custom program initiatives and future savings documentation practices as part of work under Task 7 – Identify Future Enhancements.

#### **Deliverables**

1. Preliminary CPSV audit results providing details on recommended adjustments to individual projects' savings calculations.
2. Finalized CPSV project-by-project audited savings including final calculations for any adjusted project savings.

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<sup>3</sup> CCM is Enbridge's custom project metric for purposes of its DSM Shareholder Incentive. This is equal to the annual savings estimate multiplied by the estimated measure life.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

**Schedule**

Preliminary CPSV audit recommendations will be provided by April 17, 2015. This date is contingent on the final CPSV reports being completed by the CPSV TEs no later than March 20, 2015.

Final CPSV audit recommendations will be provided by May 8, 2015. This date is contingent on AC review of preliminary recommendations being completed no later than May 1, 2015.

**TASK 2.5 – CALCULATION OF CUSTOM PROJECT AUDITED REALIZATION RATES**

Optimal will calculate the realization rates for custom projects (low income, commercial, and industrial) using the final audited CPSV project savings from Task 2.4 above. Optimal will utilize the agreed upon methodology to calculate the realization rates that will be applied to the Enbridge's entire population of custom projects to determine total custom program savings. Optimal will utilize its realization rate calculation workbooks developed during the Year 2013 Audit. Enbridge will need to provide Optimal with its final Year 2014 custom project data set for the inputs to Optimal's calculation workbooks.

**Deliverable**

Table of audited custom project realization rates.

**Schedule**

The final audited custom project realization rates will be issued by May 8, 2015. This date is contingent on AC review of preliminary CPSV recommendations being completed no later than May 1, 2015 and Enbridge providing its final custom project data set no later than April 10, 2015.

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

**TASK 3: CONSIDER/RESPOND TO STAKEHOLDER COMMENTS ON DRAFT EVALUATION DSM REPORT**

Optimal will review and respond to stakeholder and AC comments on Enbridge's draft Year 2014 DSM Evaluation Report.

**Deliverable**

Memo providing Optimal's response and feedback regarding comments provided by stakeholders and AC.

**Schedule**

Memo will be provided by May 1, 2015. This due date is contingent upon:

- 2014 DSM Evaluation Report being issued on April 10, 2015; and
- Stakeholder and AC comments being provided no later than April 17, 2015.

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

#### **TASK 4: REVIEW VERIFICATION AND EVALUATION STUDIES**

Optimal will review all Year 2014 verification and evaluation studies to verify that any assumptions, conclusions, and adjustment factors contained in these studies have been properly incorporated into Enbridge's Year 2014 savings calculations. Optimal will also ensure that any approved adjustment factors that resulted from any Year 2012 studies have been properly incorporated into the Year 2014 CCM calculations.<sup>4</sup>

##### **Deliverables**

N/A

##### **Schedule**

Optimal will review any new verification and evaluation studies in in time to inform Task 6: Verify CCM, LRAM AND DSM Shareholder Incentive.

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<sup>4</sup> There were no Year 2013 Studies performed. Year 2012 studies apply to Year 2014 based on the fact that Enbridge's OEB approved DSM programs cover three years from 2012 to 2014.

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

## **TASK 5: REVIEW ENBRIDGE'S DSM TRACKING SYSTEMS**

Optimal conducted and participated in on-site interviews, procedure reviews, and live demonstrations of Enbridge's DSM analysis, reporting, and tracking system (DARTS) as part of its Year 2013 audit. For Year 2014 Optimal will verify that the systems and procedures continue to be properly implemented. This verification will be accomplished via schedule phone interviews with appropriate Enbridge staff and review of any updated procedures related documentation. Optimal will also ascertain if any changes have been made and will review the impact of any changes. The overall goal of this task is to determine if DARTS savings data are being properly entered into the CCM and the DSM Shareholder Incentive calculation workbooks. These calculation workbooks form the basis of the results reported in Enbridge's Year 2014 Evaluation DSM Report.

### **Deliverable**

The results of this review will inform and will be incorporated into Task 6 and 8 deliverables.

### **Schedule**

Optimal will interview Enbridge staff the week of February 23, 2015.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

## **TASK 6: VERIFY CCM, LRAM AND DSM SHAREHOLDER INCENTIVE**

The previous tasks lay the groundwork for proceeding with the primary objective of the audit:

*to provide an independent opinion to DSM stakeholders that serves to determine if the DSMVA, LRAM and utility DSM Shareholder Incentive calculations are appropriate.*

To verify the relevant savings and account calculations, Optimal will first determine whether reported savings values are based on reasonable and accurate measure inputs, assumptions, and calculations. This will proceed in a series of sub-tasks. Note that the process to verify final CPSV results is described in Task 2, above. The findings from Task 2 will be incorporated into the reviews and verification conducted under this task.

### **TASK 6.1 - COMPARE ASSUMPTIONS TO RELEVANT SOURCES**

For this task Optimal will begin by checking Enbridge's measure characterizations and savings calculations against OEB and/or Technical Evaluation Committee (TEC) approved values. Optimal will also undertake a high level review for consistency with industry standards. In cases in which our review raise any concerns regarding the reasonableness of the assumptions – particularly for measures that account for a significant portion of claimed prescriptive savings – Optimal will examine the assumptions more closely and, as appropriate, recommend alternatives. Optimal will fully document any recommended changes. Any recommendations will be incorporated into Task 8, below.

### **TASK 6.2 – REVIEW MARKET TRANSFORMATION DSM SHAREHOLDER INCENTIVE METRICS**

Enbridge's Market Transformation efforts consist of a number of separate programs. Each of these programs has its own unique DSM Shareholder Incentive metric(s). Optimal will review relevant tracking data and documentation (commitment forms, participant lists, completion forms, documented tracking protocols, etc.) specific to each Market Transformation metric. Verification will also include interviews with Enbridge's Market Transformation staff.

### **TASK 6.3 - REVIEW CCM CALCULATIONS**

All of the foregoing information and data will be brought together to verify the calculation of CCM in order to support the further calculations of the cost recovery and incentive mechanisms. As noted above, this will also include incorporating the findings of the CPSV review (Task 2). Our review and validation will cover all aspects of the calculations across all programs and measures.

As part of the CCM review process and in accordance with Year 2012 Auditor Resource Acquisition Recommendation 6, Optimal will conduct a desk review of a random sample of the Run-It-Right program to verify the reasonableness of the claimed savings for this program. Optimal will follow the same procedures for this review that it utilized for the Year 2013 audit:

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

- Review of Enbridge's written documentation and procedures for claiming Run-It-Right Savings. Optimal will provide its opinion as to whether the procedures used are reasonable, appropriate, and in accordance with industry standards. If warranted, Optimal will make recommendations on alternative procedures to be implemented that will result in a more accurate estimate of savings from this program.
- Optimal will review a statistically significant sample of Run-It-Right projects to verify that the agreed upon savings calculation procedures were followed.
- If warranted, Optimal will recalculate Run-It-Right savings, providing clear justification for the revised savings estimates.

For prescriptive measures Optimal will review measures that represent the largest fraction of total prescriptive savings. We will confirm that the following deemed savings values were based on approved OEB or TEC values:

- Gas savings per unit
- Free rider rates
- Agreed upon reduction factors
- Measure lives

If as part of its work under Task 6.1 above Optimal recommends alternative deemed savings values we will recalculate the savings using these updated values.

As part of its review, Optimal will confirm that all approved reduction rate/non-install factors are accurate and have been properly applied.

**TASK 6.4 - REVIEW DSMVA, LRAM, AND DSM SHAREHOLDER INCENTIVE CALCULATIONS**

The tasks outlined in the preceding sections provide a reasonable basis for Optimal to confidently make its determination of the validity of the DSMVA, LRAM, and DSM Shareholder Incentive. We will ensure that OEB approved methodologies for all of these calculations are properly followed. We will also ensure that any recommended adjustments to the final CCM results are properly incorporated into the LRAM and DSM Shareholder Incentive.

Optimal's review of the DSMVA will not include auditing of Enbridge spending documentation. This is a financial auditor's responsibility. Optimal will review the calculation of the DSMVA to ensure consistency between actual expenditures included in the variance account calculations and the total DSM expenses reported in Enbridge's financial tracking system and the 2014 DSM Evaluation Report.

For the LRAM, we will also ascertain whether the methodologies and assumptions used to calculate actual sales volume net of installed efficiency measures are consistent with the methodologies and assumptions used to calculate the year's budgeted sales volume in advance. We will also ensure that the net volumetric sales are appropriately allocated to each respective customer class.

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

For the DSM Shareholder Incentive, Optimal will review the calculation spreadsheet to verify that it is consistent with the OEB-approved values and methodologies. We will also ensure that the final audit calculation of the DSM Shareholder Incentive contains the final audit values.

**Task 6 Deliverable**

Preliminary recommendations for any adjustments to the CCM, DSM Shareholder Incentive, and the DSMVA will be provided to the AC for their review and consideration. Optimal will review the LRAM methodology to be used by Enbridge. However, given that LRAM values are a direct result of the final CCM results, preliminary LRAM results will not be issued. All final results will be incorporated into Task 8 below.

**Schedule**

Preliminary recommendations will be provided no later than May 8, 2015. This due date is contingent upon the 2014 DSM Draft Evaluation Report being issued on April 10, 2015.



*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

## **TASK 7: IDENTIFY FUTURE ENHANCEMENTS**

Throughout the performance of this audit we will note areas where future enhancements in either evaluation procedures, assumptions, or implementation practices that might result in more accurate calculations, simpler verification procedures, or improved confidence in the results reported in the 2014 DSM Evaluation Report. These will be gathered together in one document and sorted by the type of recommendation (e.g., procedural change vs. quantitative assumptions) and ranked by relative importance. Optimal will also identify future evaluation research opportunities to enhance the assumptions used to calculate CCM, the DSM Shareholder Incentive and LRAM.

### **Deliverable**

The suggested enhancements will be included in the draft and final audit report issued under Task 8.

### **Schedule**

Future enhancements will be tracked and developed throughout the duration of the audit.

*Optimal Energy, Inc.*

15

*Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

## **TASK 8: ISSUE AUDIT FINDINGS, RECOMMENDATIONS AND REPORT**

Upon the successful completion of the above-noted tasks, we shall provide the AC with an independent opinion regarding the values for CCM, DSM Shareholder Incentive, LRAM and DSMVA.

### **TASK 8.1 - RESOLVE ISSUES PRIOR TO AUDIT COMPLETION**

Through the weekly meetings and regular updates, Optimal will work with AC members to resolve any relevant issues prior to preparation of the draft audit report.

### **TASK 8.2 – ISSUE DRAFT AUDIT REPORT**

Incorporating the adjustments, results, and recommendations from the tasks leading up to this point, Optimal will prepare a draft audit report for review and comment by Enbridge staff and the AC. The draft report will provide the required audit opinion as to whether the CCM, DSM Shareholder Incentive, LRAM, and DSMVA calculations and results are correct and reasonable as submitted in Enbridge's 2014 DSM Evaluation Report. If necessary, the report will provide independently developed alternative calculations for these accounts. The report will fully explain our decision processes and how and where we used our judgment to develop our opinions. If Optimal provides independently developed alternative calculations, the report will provide clear documentation and justification for these alternative values.

#### **Deliverable**

Draft Year 2014 Audit Report

#### **Schedule**

The Draft Year 2014 Audit Report will be issued no later than May 22, 2015. This due date is contingent upon the 2014 DSM Draft Evaluation Report being issued on April 10, 2015.

### **TASK 8.3 – ISSUE FINAL AUDIT REPORT**

Once Optimal has received the draft audit report response from the AC, a final audit report will be prepared and submitted. The final report will include the following statements:

*We have audited the Evaluation Report, DSM Shareholder Incentive, Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA) of the utility for the calendar year ended December 31, 2014. The Evaluation Report and the calculations of DSM Shareholder Incentive, LRAM, and DSMVA are the responsibility of the company's management. Our responsibility is to express an opinion on these amounts based on our audit. 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). Details of the steps taken in this audit process are set forth in the Audit Report that follows, and this opinion is subject to the details and explanations*

Optimal Energy, Inc.

16

#### *Optimal Energy Inc. Year 2014 DSM Audit Work Plan*

*therein described. In our opinion, and subject to the qualifications set forth above, the following figures are calculated correctly using reasonable assumptions, based on data that has been gathered and recorded using reasonable methods and accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2014 DSM programs of the utility:*

*DSM Shareholder Incentive Amount Recoverable - \$ x,xxx,xxx*

*LRAM Amount Recoverable - \$ x,xxx,xxx*

*DSMVA Amount Recoverable - \$ x,xxx,xxx*

The final report will contain the full and final list of forward-looking recommendations.

If necessary, we will make available an expert witness to defend or describe our findings, opinions, and recommendation at an OEB hearing at the hourly rates contained in our proposal. We expect that Philip Mosenthal would serve as this witness, potentially supplemented with engineering experts.

#### **Deliverables**

1. Final Draft Year 2014 DSM Audit Report
2. Final Year 2014 DSM Audit Report

#### **Schedule**

The Final Draft Year 2014 Audit Report will be submitted no later than June 5, 2015. This due date is contingent upon receiving the AC's response to the initial draft no later than May 29, 2015.

The Final Year 2014 Audit Report will be submitted no later than June 19, 2015. This due date is contingent upon receiving the AC's response to the final draft no later than June 12, 2015.

The preliminary LRAM calculation will be submitted to the auditor for review by May 22, 2015. This due date is contingent upon receiving the preliminary recommendations from the auditor for any adjustments to the CCM, DSM Shareholder Incentive, and the DSMVA no later than May 8, 2015. The final LRAM calculation will be confirmed once all of the CCM, DSM Shareholder Incentive and DSMVA amounts are finalized.

Optimal Energy Inc. Year 2014 DSM Audit Work Plan

**TASK SCHEDULE**

TASK	Week Ending													
	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec	19-Dec	9-Jan	16-Jan	23-Jan	30-Jan	6-Feb	13-Feb	20-Feb	27-Feb
1.1 - Audit Kick-Off Conference Call														
1.2 - Work Plan														
1.3 - CPSV Kick-Off Meetings														
1.4 - Data and Document Collection														
1.5 - Weekly Meetings														
2.1 - Wave 1 Draft CPSV Reports														
2.2 - Wave 1 & 2 Draft CPSV Reports														
2.3 - CPSV TE Realization Rate Calculations														
2.4 - Final CPSV Reports														
2.5 - Audited Realization Rate Calculations														
3 - Respond to Comments on Draft DSM Report														
4 - Review Studies														
5 - Review DSM Tracking System														
6.1 - Compare Assumptions to Relevant Sources														
6.2 - Review Market Transformation Metrics														
6.3 - Review TCM Calculations														
6.4 - Review DSMVA, TRAM and DSM Shareholder Incentive Calculations														
7 - Identify Future Enhancements														
Task 8.1 - Resolve Issues														
Task 8.2 - Issue Draft Audit Report														
Task 8.3 - Issue Final Audit Report														



Optimal Energy Inc. Year 2014 DSM Audit Work Plan

TASK	Week Ending													
	13-Mar	20-Mar	3-Apr	10-Apr	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun
1.1 - Audit Kick-Off Conference Call														
1.2 - Work Plan														
1.3 - CPSV Kick-Off Meetings														
1.4 - Data and Document Collection			D											
1.5 - Weekly Meetings			M	M	M	M	M	M	M	M	M	M	M	M
2.1 - Wave 1 Draft CPSV Reports														
2.2 - Wave 1 & 2 Draft CPSV Reports														
2.3 - CPSV TE Realization Rate Calculations			D											
2.4 - Final CPSV Reports					D									
2.5 - Audited Realization Rate Calculations														
3 - Respond to Comments on Draft DSM Report							D							
4 - Review Studies														
5 - Review DSM Tracking System														
6.1 - Compare Assumptions to Relevant Sources														
6.2 - Review Market Transformation Metrics														
6.3 - Review CCM Calculations														
6.4 - Review DSMVA, LRAM and DSM Shareholder Incentive Calculations								D						
7 - Identify Future Enhancements														
Task 8.1 - Resolve Issues														
Task 8.2 - Issue Draft Audit Report										D				
Task 8.3 - Issue Final Audit Report												D		D

## ATTACHMENT B: OPTIMAL DATA/DOCUMENT REQUESTS



### MEMORANDUM

To: Deborah Bullock, Enbridge Gas Distribution  
From: David Bardaglio  
Date: January 30, 2015  
Subject: Request for Information Regarding Enbridge DSM Program Changes  
Implemented for Year 2014

As stated in Optimal's Year 2014 Audit Work Plan, we will not be conducting an on-site visit to interview Enbridge DSM program managers. It is our understanding that Year 2014 programs are essentially the same as the Year 2013 programs, as they are part of Enbridge's OEB-Approved 2012-2014 Multi Year DSM Plan.

The purpose of this memo is to ascertain if any significant changes were made to the Year 2014 DSM programs.

### ENBRIDGE DSM PLAN FILINGS AND ONTARIO ENERGY (OEB) DSM ORDERS

Optimal has the following Enbridge DSM Plan documents:

- Enbridge Gas Distribution Inc. 2012 to 2014 Demand Side Management Plan; November 9, 2011; EB-2011-0295
- 2012-2014 Demand Side Management Plan Settlement Agreement on Terms of Reference for Stakeholder Engagement; November 10, 2011; EB-2011-0327
- Enbridge Gas Distribution Inc. Update to the 2012 to 2014 Demand Side Management Plan; February 28, 2013; EB-2012-0394
- New and Updated DSM Measures Joint Submission from Enbridge Gas Distribution Inc. and Union Gas Ltd.; December 19, 2012; EB-2012-0441
- New and Updated DSM Measures Joint Submission from Enbridge Gas Distribution Inc. and Union Gas Ltd.; April 30, 2014; EB-2013-0430

With regards to DSM Plan Filings:

1. Has Enbridge filed any additional updates to its 2012-2014 Demand Side Management Plan? If yes please provide the updated DSM plans filed with the OEB and provide their current approval status.

2. Was the “New and Updated DSM Measures Joint Submission from Enbridge Gas Distribution Inc. and Union Gas Ltd., April 30, 2014, EB-2013-0430” approved by the OEB as filed?
3. Has Enbridge filed any additional updated measure lists? If yes please provide the updated measure list filed with the OEB and provide its current approval status.

Optimal has the following OEB DSM Order on hand:

- Demand Side Management Guidelines for Natural Gas Utilities; June 30, 2011; EB-2008-0346

With regards to OEB DSM Orders:

1. Have any DSM Board Orders been issued subsequent to the June 30, 2011 order? If yes please provide copies of these orders.

## RESOURCE ACQUISITION PROGRAMS

1. Were any new resource acquisition programs initiated in 2014? If yes please provide a full description for each new program. The program description should include details on the markets served, program delivery mechanism(s), the process for capturing and tracking savings data, and details on how savings are calculated.
2. Were any resource acquisition programs terminated in 2014? If yes please provide the name of the 2013 program that was not carried forward to 2014.
3. For each of the 2014 resource acquisition programs please provide details on the following:
  - Any significant changes that were made in how each program was delivered.
  - Any significant changes made to how savings were captured, calculated and entered in Enbridge’s DSM tracking system.

## MARKET TRANSFORMATION PROGRAMS

1. Were any new market transformation programs initiated in 2014? If yes please provide a full description for each new program. The program description should include details on the markets served, shareholder incentive metric established for the new program and the procedure used to confirm achievement towards the shareholder incentive metric.
2. Were any market transformation programs terminated in 2014? If yes please provide the name of the 2013 program that was not carried forward to 2014.
3. For each of the 2014 market transformation program please provide details on the following:
  - Any significant changes that were made in how each program was delivered.
  - Any change made to the composition/type of shareholder incentive metric employed.



- Any significant changes made to the procedure used to confirm achievement towards the shareholder incentive metric.

## MEMORANDUM

To: Deborah Bullock, Enbridge Gas Distribution  
From: David Bardaglio  
Date: February 27, 2015  
Subject: Request for Verification and Evaluation Studies Undertaken for Year 2014

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If Enbridge undertook any Year 2014 Verification and Evaluation Studies please provide a list that includes the name of each of the new studies and the name of the Enbridge program that it applied to. In addition also please provide a copy of the final study report. If no new studies were undertaken please confirm this. Please provide the responses to this request by March 31, 2015.

Optimal is already aware that a survey and subsequent report will be undertaken of all Run It Right (RIR) participants. Optimal requests that when this report is finalized it be provided along with the claimed savings data for each RIR participant.

As part of Optimal's Year 2013 Audit Enbridge informed Optimal that there were no Year 2013 Verification and Evaluation Studies. As a result Optimal's Year 2013 audit task was to confirm that all Year 2012 studies were properly applied to Year 2013 savings calculations. If no Year 2014 studies were conducted please confirm that the following Year 2012 study was used to calculate Multi-Residential Low Income showerhead savings for Year 2014:

- 2012 Multi-Residential Low Income Showerhead Verification, March 28, 2013

Thank you.

## MEMORANDUM

To: Deborah Bullock, Enbridge Gas Distribution  
From: David Bardaglio  
Date: February 27, 2015  
Subject: Request for Updates/Changes to Enbridge's DSM Tracking Processes

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As part of its Year 2013 Audit work plan Optimal conducted an extensive review of Enbridge's DSM tracking system. The purpose of this review was to determine if the DSM program results were being properly recorded in Enbridge's DSM database. This included an on-site demonstration of Enbridge's DSM tracking software, interviews of Enbridge's DSM tracking staff, and review of Enbridge's written operational and quality assurance procedures. Based on its review Optimal concluded that Enbridge's DSM tracking systems and procedures did result in Enbridge's Year 2013 DSM program results being properly recorded in tis DSM database.

Optimal's task for the Year 2014 audit is to:

- Confirm that the Year 2013 procedures continued to be applied in 2014 and/or;
- Ascertain if any DSM tracking systems or procedures were changed in Year 2014 and confirm that these changes continue to result in the proper recording of Enbridge's DSM program results

Enbridge provided extensive written documentation on its DSM tracking systems as part of the Year 2013 audit. This included the following:

- PowerPoint overview of Enbridge's 2013 DSM Tracking Processes
- Commercial Custom Project Process Map
- Industrial Custom Project Process Map
- Industrial Custom Project Process Instructions
- Incentive Process Map
- DSM Custom Project Flow Chart
- DSM Monthly Reconciliation Processes
- Demand Side Management (DSM) Darts User's Manual; September 2008; Version 2.2

These documents are sent along with this memo. Optimal requests that the appropriate Enbridge staff review each of these documents and provide Optimal with any changes that were made in Year 2014 to the DSM tracking processes and procedures detailed in these documents. Note that Enbridge only needs to provide changes as it relates to its DSM tracking

processes and procedures. Optimal has previously requested and received information on any changes to Enbridge's DSM programs.

Optimal will review any changes noted by Enbridge to its DSM tracking procedures to confirm that these changes continue to result in the proper recording of Enbridge's DSM program results into its DSM database. As part of this review Optimal may wish to follow-up with interviews of the appropriate Enbridge staff. Optimal will work with you to schedule these interviews as needed.

Key to the successful operation of any tracking and reporting process is the staff that implements it. As part of its Year 2013 Audit Optimal interviewed key Enbridge DSM Reporting staff. Optimal concluded that these staff were fully trained and were properly implementing Enbridge's DSM tracking procedures. As part of this year's audit Optimal requests that Enbridge provide a list of any DSM tracking staff turnover. If Enbridge did bring in new DSM tracking staff Optimal also requests that it be provided with information on the training and supervision that was provided for its new staff to ensure that they were fully capable of implementing Enbridge's DSM tracking procedures.

Optimal request that Enbridge provide its response to these requests by March 31, 2015.

Thank you.



## MEMORANDUM

To: Deborah Bullock, Enbridge Gas Distribution  
From: David Bardaglio  
Date: May 5, 2015  
Subject: Request for Verification Information for Residential Community Energy Conservation, Low-Income Single Family and Market Transformation Metrics

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### RESIDENTIAL COMMUNITY ENERGY CONSERVATION

Please provide the following:

- Spreadsheet listing all 5,213 participants. Spreadsheet should contain the following data fields:
  - Project number and/or address
  - Base Case cubic meter consumption (annual cubic meters)
  - Calculated Consumption after upgrade (annual cubic meters)
  - Measure Life for each project
  - Confirmation that each project contained the required minimum two major measures

Please provide this spreadsheet by May 15, 2015. Once Optimal receives this spreadsheet 25 random projects will be chosen. For each of these 25 projects Optimal will need to be sent the actual HOT2000 outputs to confirm the savings and the installation of at least two major measures.

### LOW INCOME – SINGLE FAMILY (PART 9)

Please provide the following:

- Spreadsheet listing all 1,107 participants. Spreadsheet should contain the following data fields:
  - Project number and/or address
  - Calculated CCM savings per participant

Please provide this spreadsheet by May 15, 2015. Once Optimal receives this spreadsheet one random project will be chosen. For this projects Optimal will need to be sent the actual HOT2000 outputs to confirm the savings.

## **MARKET TRANSFORMATION - RESIDENTIAL SAVINGS BY DESIGN**

Please provide the list containing the names of the 23 participating builders who are considered Top 80 builders. In 2013 Enbridge was unable to obtain a definitive list of the top 80 builders (based on number of home completions) in its service territory. Instead it was agreed that any builder who completed more than 50 homes per year would be considered in the top 80. Thus, for Year 2014 please provide confirmation that each of these 23 builders completed 50 or more homes in 2013.

Please provide the list of completed homes per builder that supports the total of 1,059 homes.

Please provide this data by May 15, 2015. Optimal will then randomly select one audited home to receive full data to confirm the savings achieved is 25% over code. Optimal will also randomly select one builder to review the memorandum of understanding signed with the builder to confirm that its meets the applicable requirements to be counted towards this metric.

## **MARKET TRANSFORMATION - COMMERCIAL SAVINGS BY DESIGN**

Please provide the list of builders enrolled and the development name to support the 19 new developments claimed for this metric. Optimal will also randomly select one builder to review the enrollment and participation materials to confirm that its meets the applicable requirements to be counted towards this metric.

## **MARKET TRANSFORMATION –EXISTING RESIDENTIAL HOME RATING**

Please provide copies of the commitment letters with each of the various real estate brokers to confirm the total number of real estate home sale listings committed to list energy rating information equal to 40,040. Please provide this documentation by May 15, 2015.