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July 17, 2013

VIA COURIER, EMAIL, RESS

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Re: Enbridge Gas Distribution Inc. (the "Company" or "Enbridge")
EB-2013-0075 - Clearance of DSM Variance Accounts Application

Enbridge is filing an application with the Ontario Energy Board (the "Board") for an order or orders approving the balances and clearance of certain Demand Side Management Variance Accounts into rates in the October QRAM, pending Board approval.

Enbridge provided the results of the independent audit to the Evaluation Audit Committee (EAC). The EAC made recommendations in the Audit Summary Report respecting the clearance of the DSM variance accounts. The Company agreed to the recommendations and the Audit Summary Report received the endorsement of the DSM Consultative. Based upon this, it is the belief of Enbridge that no member of the DSM Consultative is opposed to the Board approving the amounts set out in the application and clearing these amounts through to rates.

Enclosed please find two copies of the evidence filed by Enbridge. The application and evidence have also been submitted through the Board's Regulatory Electronic Submission System ("RESS"). A copy of the on-line confirmation RESS submission reference number has also been included in this package.

Please contact the undersigned if you have any questions.

Yours truly,

(Original Signed)

Stephanie Allman
Regulatory Coordinator

cc: Dennis O'Leary, Aird & Berlis

EXHIBIT LIST

A - ADMINISTRATION

EXHIBIT	TAB	SCHEDULE	DESCRIPTION
A	1	1	Exhibit List
		2	Application
		3	Summary of Application

EXHIBIT B – EVIDENCE

EXHIBIT	TAB	SCHEDULE	DESCRIPTION
B	1	1	2011 DSM Annual Report
	2	1	Final Report: Independent Audit of 2011 DSM Program Results
	3	1	2011 DSM EAC Audit Summary Report
	4	1	2011 Rate Allocation by Account

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998,* S.O. 1998, c. 15, Schedule. B, as amended;

AND IN THE MATTER OF an application by Enbridge Gas Distribution Inc. for an order or orders approving the balances and clearance of certain Demand Side Management Variance Accounts into rates, within the next available QRAM following the Board's approval.

APPLICATION

1. Enbridge Gas Distribution Inc. ("Enbridge Gas Distribution" or the "Company") is an Ontario corporation with its head office in the City of Toronto. It carries on the business of selling, distributing, transmitting and storing natural gas within Ontario. The Company also undertakes Demand Side Management ("DSM") activities.

2. Enbridge Gas Distribution hereby applies to the Ontario Energy Board (the "OEB" or the "Board"), pursuant to section 36 of the *Ontario Energy Board Act, 1998,* as amended (the "Act"), for an Order or Orders approving the final balances in the following accounts and the disposition of these balances:

SSM Amount Recoverable (Resource Acquisition)	$5,914,951
SSM Amount Recoverable (Market Transformation)	$854,584
LRAM (Reimbursable to Ratepayers)	($55,273)
DSMVA Amount (Reimbursable to Enbridge)	$535,805

3. Enbridge Gas Distribution applies to the Board for such final and interim orders and/or accounting orders as may be necessary in relation to clearance of the accounts which are the subject of this Application, within the next available QRAM following the Board's approval. The Company further applies to the Board pursuant to the provisions of the Act and the Board's *Rules of Practice and Procedure* for such final and interim Orders and directions as may be necessary in relation to this Application and the proper conduct of this proceeding.

4. The persons affected by this Application are the customers of Enbridge Gas Distribution. It is impractical to set out the names and address of the customers because they are too numerous.

5. Enbridge requests that a copy of all documents filed with the Board by each party to this proceeding be served on the Applicant and the Applicant's counsel, as follows:

Mr. Norm Ryckman
Director, Regulatory Affairs
Enbridge Gas Distribution Inc.

Address for personal service:	500 Consumers Road Willowdale, ON M2J 1P8
Mailing Address:	P.O. Box 650 Scarborough, ON M1K 5E3
Telephone:	416.495-5499
Facsimile:	416.495-6072
E-mail:	EGDRegulatoryProceedings@enbridge.com

Please quote the name or docket number of the proceeding in all communications.

The Applicant's counsel:

Mr. Dennis M. O'Leary
Aird & Berlis LLP

Address for personal service and mailing address: Brookfield Place, Box 754
Suite 1800, 181 Bay Street
Toronto, ON M5J 2T9

Telephone: 416-865-4711
Facsimile: 416-863-1515
E-mail: doleary@airdberlis.com

Dated: 2013-07-17 at Toronto, Ontario.

ENBRIDGE GAS DISTRIBUTION INC.

(Original Signed)

Per:

SUMMARY OF APPLICATION

1. Enbridge Gas Distribution Inc. ("Enbridge Gas Distribution" or the "Company") is applying to the Ontario Energy Board (the "OEB" or the "Board") pursuant to Section 36 of the *Ontario Energy Board Act, 1998*, as amended (the "Act") for an Order or Orders approving the final balances in certain 2011 Demand Side Management ("DSM") Variance Accounts. The Company is also seeking the disposition of the balances in these accounts and the inclusion into rates, within the next available QRAM following the Board's approval. The accounts which are the subject of this Application and the balances recorded are as follows:

SSM Amount Recoverable (Resource Acquisition)	$5,914,951
SSM Amount Recoverable (Market Transformation)	$854,584
LRAM (Reimbursable to Ratepayers)	($55,273)
DSMVA Amount (Reimbursable to Enbridge)	$535,805
Total Amount Recoverable	$7,250,067

2. The net impact of the three 2011 DSM accounts is $7,250,067. The Company seeks approval from the Board for clearance of this amount through to rates, in the next available QRAM, pending Board Approval.

DSM Framework

3. The variance accounts which are the subject of this proceeding relate to DSM activities in 2011. This was the fifth year of operation of the DSM Framework approved by the Board by its Decision with Reasons ("Decision") dated August 25,

2006, in the Natural Gas DSM Generic Issues proceeding (EB-2006-0021) ("Generic Proceeding"). The methodologies used by the Company to determine the amounts recorded in each of the 2011 DSMVA, LRAM, and SSM were the subject of the Generic Proceeding and were approved by the Decision.

4. The approved framework also provided for certain stakeholder consultation and monitoring and evaluation steps in respect of a year's DSM activities. This Application summarizes the actions taken by the Company in compliance with the Decision.

Summary of Facts and Events

5. The DSM Consultative elected an Evaluation and Audit Committee ("EAC") for 2011 consisting of representatives from the Green Energy Coalition ("GEC"), Low Income Energy Network ("LIEN"), and the School Energy Coalition ("SEC").

6. As required by the Decision at Issue 12.2, the Company arranged for an independent evaluation of its custom projects. Prior to retaining the independent evaluator, the Company first consulted the EAC about the terms of reference for this evaluation. An agreement was subsequently reached between the Company and the EAC in respect of the terms of reference. The review was completed by two independent engineering firms and the results were provided to the Auditor.

7. Consistent with the Decision at Issue 9.1, the Company prepared an evaluation report for 2011 titled 2011 DSM Draft Annual Report (the "Annual Report") which summarized the savings achieved, the amounts spent and how the results were evaluated. The results of the independent review of custom projects were included in the Draft Annual Report. The Draft Annual Report also includes calculations for the 2011 SSM and DSMVA.

8. The Draft Annual Report was circulated on April 13, 2012.

9. The DSM framework approved by the Decision at Issue 9.3 requires the Company to subject its DSM results to an independent audit. The Company consulted the EAC on the terms of reference for the audit and the selection of the independent Auditor. After consultation with the EAC, it was agreed that Energy & Resource Solutions Inc. ("ERS") would be the 2011 DSM Auditor.

10. The Company consulted the EAC on the Audit Work Plan and the reports prepared by ERS.

11. The Auditor verified the calculations underlying the proposed SSM, LRAM, and DSMVA amounts and made various recommendations. The Audit Report is filed at Exhibit B, Tab 2, Schedule 1.

12. The EAC subsequently made recommendations respecting the clearance of the DSM variance accounts which were ultimately accepted by the Company.

13. A copy of the Final Annual Report which reflects the post audit results is filed at Exhibit B, Tab 1, Schedule 1.

2011 Demand Side Management Variance Account

14. The final DSMVA is the amount of $535,805 recoverable from ratepayers.

Lost Revenue Adjustment Mechanism Variance Account

15. The final LRAM is the amount of ($55,273) reimbursable to ratepayers.

Shared Savings Mechanism Deferral Account

16. The Decision in the Generic Proceeding provided for the method of calculating the SSM. This included an SSM cap of $8.9 million for 2007 and increasing annually

by the Ontario CPI as determined in October. The Draft Annual Report calculated an SSM of $5,911,273 for Resource Acquisition programs. In addition, the Draft Annual Report included an incentive claim of $956,638 with respect to Market Transformation programs. The Auditor made recommendations with regard to the following measures that the Company and the EAC accepted:

i) Adjustment factors for TAPS program in Existing Homes

ii) Adjustment factors for Low Income TAPS program

iii) Commercial and Multi-Residential Custom Project savings

iv) Industrial Custom Project Savings

This resulted in an auditor recommended SSM of $5,834,044 for Resource Acquisition programs.

16. The review of 2011 Market Transformation programs resulted in an auditor recommended SSM of $854,584.

Recommendations of the Evaluation Audit Committee

18. Following its review of the Draft Annual Report and the Audit Report, the EAC made the following recommendations regarding the 2011 DSMVA, SSM and LRAM:

a. The EAC recommended accepting the Company's DSMVA calculation of $535,805 being reimbursable to ratepayers. The Company agrees.
b. Regarding SSM for Resource Acquisition programs, the EAC recommended accepting the auditor's recommended adjustments with one exception. The auditor recommended two changes to the custom project results: a.) changes to results for individual projects and b.) a

different method for extrapolating adjustments on the sampled projects to the whole population of custom projects. The EAC recommended that the Company continue with the current method of applying the adjustments and refer the auditor's recommendation for consideration in 2012. This approach resulted in an SSM for Resource Acquisition programs of $5,914,951. The Company agrees.

c. The EAC recommended a Market Transformation SSM of $854,584 as recommended by the auditor. The Company agrees.
d. The EAC accepted the LRAM of ($55,273) being reimbursable to ratepayers. The Company agrees.

19. The following table summarizes the claims in the Draft Annual Report, the Auditor's Recommendations, and finally, the post-audit amounts that are the subject of full agreement by intervenors as previously mentioned.

	2010 Draft DSM Annual Report	Audit Report (June 2012)	Post Audit Results
TRC Savings	$173,119,113	$171,770,167	$173,183,348
SSM Amount Recoverable (Resource Acquisition)	$5,911,273	$5,834,044	$5,914,951
SSM Amount Recoverable (Market Transformation)	$956,638	$854,584	$854,584
LRAM (Reimbursable to Ratepayers)	($55,619)	($54,905)	($55,273)
DSMVA (Recoverable from Ratepayers)	$535,805	$535,805	$535,805

20. During the audit, the Auditor verified the calculations underlying the Company's claims regarding the DSMVA and SSM. The LRAM amount was re-calculated and approved by the EAC post-audit. The EAC Audit Summary Report is filed at Exhibit B, Tab 3, Schedule 1.

Proposal for Clearance

21. The net amount which the Company proposes for clearance through to rates is $7,250,067. The Company respectfully requests that these amounts be included in rates, within the next available QRAM following the Board's approval.

22. The allocation methodology applied by the Company was approved by the Decision in EB 2006-0021. Specifically, the methodologies applied were:

- The actual DSMVA spending variance amount versus budget targeted to each customer class was allocated to that customer class for rate recovery purposes (Issue 6.5).
- The LRAM amount is recovered in rates on the same basis as the lost revenues were experienced so that the LRAM ends up being a full true-up by rate class (Issue 4.5).
- DSM shareholder incentive amounts (SSM) are allocated to the rate classes in proportion to the net TRC benefits attributable to the respective rate classes (Issue 5.4).

A breakdown of these allocations is attached at Exhibit B, Tab 4, Schedule 1.

Benefits to Ratepayers

23. The Company's DSM activities in 2011 generated an estimated natural gas savings of 77.4 million m^3 (76.6 million m^3 Resource Acquisition and 0.82 million m^3 Market Transformation). Net TRC benefits from the programs implemented in 2011 totaled approximately $173.2 million.

ENBRIDGE GAS DISTRIBUTION INC.

DEMAND SIDE MANAGEMENT

2011 DSM ANNUAL REPORT

PREPARED BY:

Enbridge Gas Distribution Inc.,

DSM Research and Evaluation

April, 2012

Updated July, 2013

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1.0 Executive Summary

In alignment with the Report of the Ontario Energy Board (OEB), Enbridge Gas Distribution Inc. ("the Company" or "EGD") has been delivering Demand Side Management (DSM) programs for the past 17 years. DSM initiatives over this time period have resulted in approximately 980 million m^3 of natural gas savings which is equivalent to more than $1.974 billion in net benefits to society, based on the Total Resource Cost Test (TRC test).

As 2011 was the fifth year of an extended multi – year plan, originally designed to cover the 3 year period of 2007 – 2009, adjustments were made to the TRC and SSM calculations. Section 6 of the report provides an overview of the adjusted calculations.

The total DSM expenditure in 2011 was $ 27 million dollars, including Resource Acquisition Programs, Market Transformation and Scorecard Programs, and Overheads. The 2011 Resource Acquisition portfolio generated 76.6 million m^3 in natural gas savings which resulted in a TRC net benefit to the customers of $ 173 million. These results translate into a performance incentive, Shared Saving Mechanism adjustment (SSM), to the Company of $ 5.9 million for the Resource Acquisition programs. Market Transformation and Scorecard Programs resulted in an additional 824,773 m^3 in natural gas savings and an additional SSM of $854,584, bringing the total 2011 gas savings to 77.4 million m^3 and the total SSM to $6.77 million.

This year produced higher gas savings compared to 2010 as there were large increases in the Commercial Prescriptive (57%), Large New Construction (66%) and the Multi-Residential sectors (49%).

The main contributors to the total TRC results were Commercial Custom projects at 20%, Multi-Residential at 24% and Residential at 27%. Although the Residential market becomes increasingly harder to reach with TRC positive programs, the Residential portfolio contributed a major share of the total TRC results and accounted for 94% of overall participants.

Table 1: 2011 Summary of Program Results

Program Area	Participants	Gas Savings (m3)	DSM Fixed and Variable Costs	Net TRC Results
EXISTING HOMES	615,874	7,685,917	$ 4,362,835	$ 48,461,257
RESIDENTIAL NEW CONSTRUCTION	2,205	1,167,239	$ 167,497	$ 1,125,396
LOW INCOME	5,003	84,700	$ 55,079	$ 423,000
Total Residential	**623,082**	**8,937,855**	**$ 4,585,411**	**$ 50,009,653**
COMMERCIAL PRESCRIPTIVE	4,571	6,357,308	$ 1,213,489	$ 12,666,641
COMMERCIAL CUSTOM	393	17,968,440	$ 3,056,467	$ 35,107,055
MULTI RESIDENTIAL	467	20,604,452	$ 3,881,375	$ 37,656,852
Multi-Residential Water Conservation	26,125	1,386,859	$ 333,191	$ 5,845,837
LARGE NEW CONSTRUCTION	56	3,706,499	$ 776,517	$ 9,840,561
INDUSTRIAL	127	17,643,484	$ 2,827,939	$ 28,170,403
Total Business Markets	**31,739**	**67,667,042**	**$ 12,088,977**	**$ 129,287,349**
DWHR - Market Transformation			$ 1,851,730	$ -
Low Income Weatherization Scorecard	599	824,773	$ 2,604,100	$ -
Prog. Dev. & Market Research			$ 124,960	$ (124,960)
Overheads			$ 5,988,693	$ (5,988,693)
TOTAL ALL PROGRAMS	**655,420**	**77,429,670**	**$ 27,243,872**	**$ 173,183,348**

Note:

- Gas savings shown represent the gas savings used to calculate the SSM.
- Net TRC results were calculated using avoided costs updated for each year to reflect changes in commodity costs as per the Board Guidelines.
- Total TRC results from Resource Acquisition programs (exclusive of overhead costs) were $179,297,002.
- In the Residential Existing Homes program the value in the “Participants” column represents the total number of devices installed in homes.
- The TRC target for 2010 was $202,342,433. The TRC target for 2011 was $139,735,115.

1.1 Introduction and Report Overview

1.1.1 Introduction

Enbridge Gas Distribution Inc. ("the Company" or "EGD") has been delivering DSM programs to its customers since 1995 in alignment with the Report of the Ontario Energy Board (the OEB) in EBO 169-III. In 1999, the Company sought and was granted approval to receive a financial incentive for DSM activities in the form of the Shared Savings Mechanism (SSM). In addition, through prior decisions of the Board, the DSM framework also includes a Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA). The LRAM "is a mechanism to adjust for margins the utility loses if its DSM Program is more successful in the period after rates are set than was planned in setting the rates."[1] The DSMVA allows the Company to exceed the DSM budget in a given year, provided that the Company meets the Board approved target. It also allows for the return to ratepayers of any unspent budget amounts.

The 2011 DSM Annual Report (the Report) provides a summary of the year's DSM program results together with the associated SSM, LRAM and DSMVA calculations. The Report is reviewed through an independent audit and the process culminates in the Company filing the SSM, LRAM and DSMVA claims with the Board.

The DSM Regulatory process involves several steps. In 2006, the Company's Multi-year DSM plan for 2007-2009 was approved by the Ontario Energy Board (OEB). The DSM Plan provided detail on the DSM programs and measures, the planned budget expenditure, natural gas savings, and the associated societal benefits (TRC results). The original 3 year Multi-year DSM plan (2007-2009) was extended for an additional year to 2010 and again to 2011 at the request of the Ontario Energy Board.

The 2011 DSM plan (EB-2010-0175) was filed in May 2010 following extensive consultation with a working group of intervenors and the full DSM Consultative. The plan adjusted the budget allocation between Resource Acquisition and Market Transformation programs and the TRC target and SSM calculation accordingly, while retaining the maximum SSM allowable as developed through EB-2006-0021 formulas. It also included an update with new programs and some new measure assumptions.

In November 2010, Enbridge submitted an amendment to the 2011 Low Income Weatherization program in response to the Board's directive to reflect the Government's policy to increase conservation programs for low income customers.

1 EBRO 495, Decision, Page 100

This work was completed by a Low Income Working group chosen by the Enbridge DSM Consultative. This amendment included a scorecard approach and an increase in budget for the home weatherization program.

In July 2011 an Update to the 2011 DSM measure assumptions was submitted to the Ontario Energy Board and later approved. The Update can be found in Appendix B, (EB-2011-0254).

1.1.2 Report Overview

This report presents the results of the Company's DSM program activity for 2011. The Company's DSM portfolio of programs in 2011 included both resource acquisition programs and market transformation initiatives. The resource acquisition programs are of two types – prescriptive and custom programs. Results for prescriptive programs are calculated based on the number of units installed together with the deemed savings and related assumptions for specific DSM measures as approved by the Board in the DSM Plan. Board approved assumptions for 2011 are presented in Appendix B. Results for custom programs are based on calculations for each individual site where efficiency improvements were made.

In addition to the Company's monitoring results, this report also incorporates and presents the results of research activities and third party evaluations undertaken in support of the programs as well as information in support of the Company's 2011 SSM claim and its 2011 DSMVA claim and LRAM claim. The Report is structured as follows:

Section 1	Executive Summary and Introduction
Section 2	Description of Programs
Section 3	Verification Studies
Section 4	Natural Gas Savings
Section 5	LRAM Statement
Section 6	SSM and TRC Statement
Section 7	DSMVA Statement
Section 8	Status Updates - 2010 Auditor and EAC recommendations
Appendix A	Summary Overviews of 2011 DSM Program
Appendix B	Approved 2011 Assumptions

1.2 DSM Program Results Summary

Within its portfolio of DSM programs, the Company strives to ensure that all customer classes are provided access to energy efficiency programs that are cost-effective and that the programs use appropriate design to optimize results.

1.2.1 Results for 2011 Resource Acquisition Programs

Results for 2011 Resource Acquisition Programs are shown below.

Table 2: 2011 DSM Resource Acquisition Program Results

	2010			2011		
Program Area	**Participants**	**Gas Savings (m3)**	**Net TRC Results**	**Participants**	**Gas Savings (m3)**	**Net TRC Results**
EXISTING HOMES	788,039	8,125,183	$ 47,342,481	615,874	7,685,917	$ 48,461,257
RESIDENTIAL NEW CONSTRUCTION	16,080	1,581,307	$ 1,772,919	2,205	1,167,239	$ 1,125,396
LOW INCOME	7,523	319,353	$ 677,798	5,003	84,700	$ 423,000
Total Residential	**811,642**	**10,025,843**	**$ 49,793,198**	**623,082**	**8,937,855**	**$ 50,009,653**
COMMERCIAL PRESCRIPTIVE	7,279	4,038,642	$ 11,210,656	4,571	6,357,308	$ 12,666,641
COMMERCIAL CUSTOM	305	16,126,217	$ 41,570,211	393	17,968,440	$ 35,107,055
MULTI RESIDENTIAL	32,446	14,687,999	$ 35,569,221	26,592	21,991,311	$ 43,502,690
LARGE NEW CONSTRUCTION	43	2,228,424	$ 7,348,643	56	3,706,499	$ 9,840,561
INDUSTRIAL	123	18,547,131	$ 45,176,787	127	17,643,484	$ 28,170,403
Total Business Markets	**40,196**	**55,628,413**	**$ 140,875,518**	**31,739**	**67,667,042**	**$ 129,287,349**
NPDC			**$ (220,152)**			**$ (124,960)**
Overheads	**0**	**-**	**$ (5,855,521)**	**0**	**-**	**$ (5,988,693)**
TOTAL RESOURCE ACQUISITION PROGRAMS	**851,838**	**65,654,256**	**$ 184,593,043**	**655,420**	**76,604,897**	**$ 173,183,348**

Figure 1: 2011 DSM Participant Results

Sectors	Participants
EXISTING HOMES	94.2%
RESIDENTIAL NEW CONSTRUCTION	1.5%
LOW INCOME	0.6%
COMMERCIAL PRESCRIPTIVE	3.0%
COMMERCIAL CUSTOM	0.3%
MULTI RESIDENTIAL	0.3%
LARGE NEW CONSTRUCTION	0.0%
INDUSTRIAL	0.1%

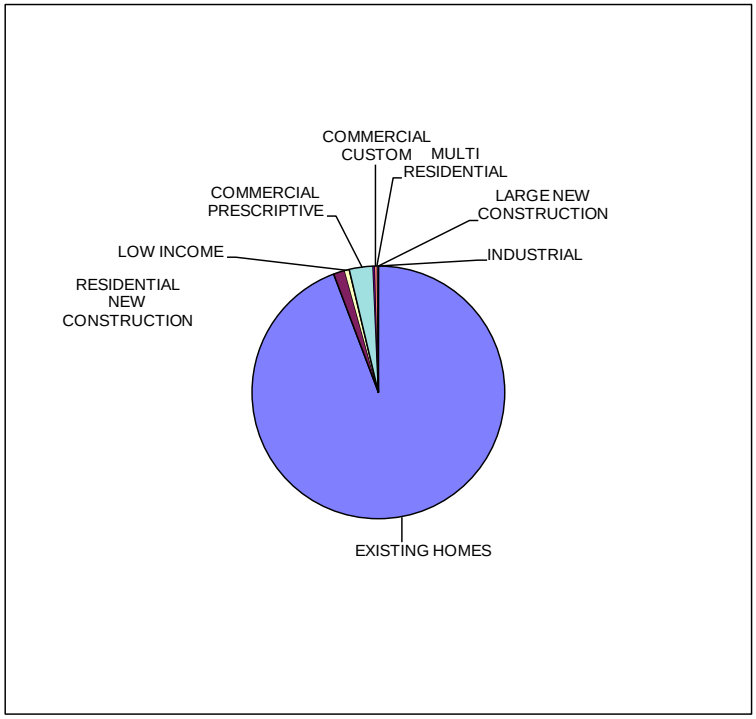


Figure 2: Gas Savings (m^3) by Sector

Sectors	Gas Savings
EXISTING HOMES	10.2%
RESIDENTIAL NEW CONSTRUCTION	1.5%
LOW INCOME	0.1%
COMMERCIAL PRESCRIPTIVE	8.3%
COMMERCIAL CUSTOM	23.5%
MULTI RESIDENTIAL	28.7%
LARGE NEW CONSTRUCTION	4.8%
INDUSTRIAL	22.9%

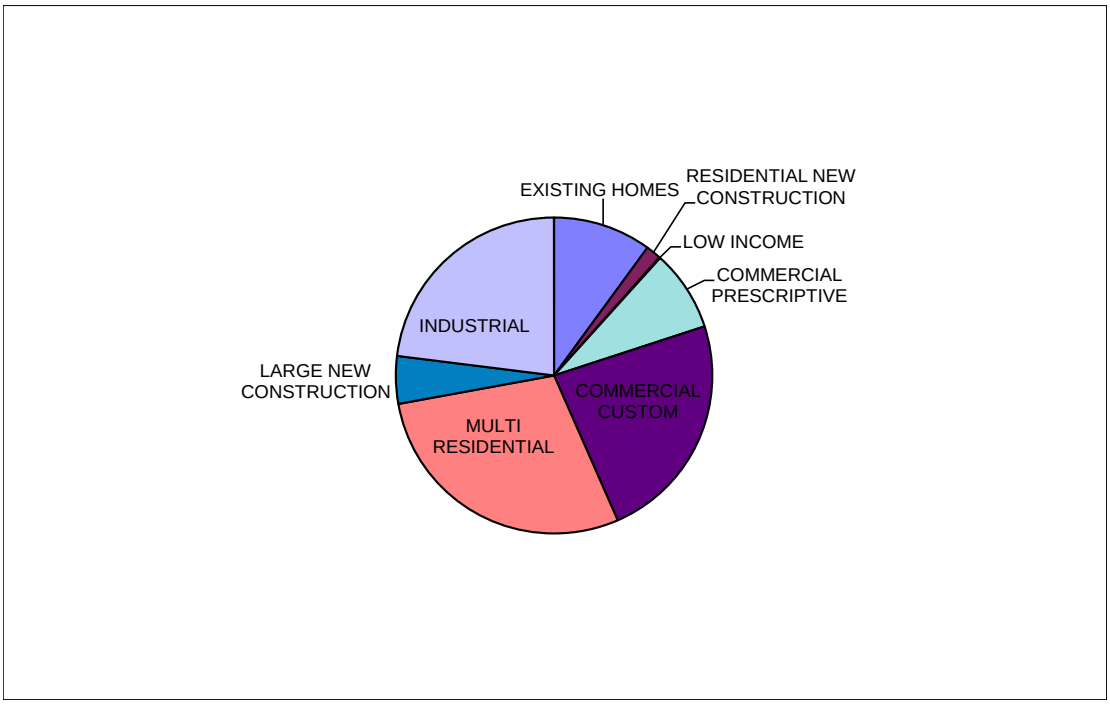
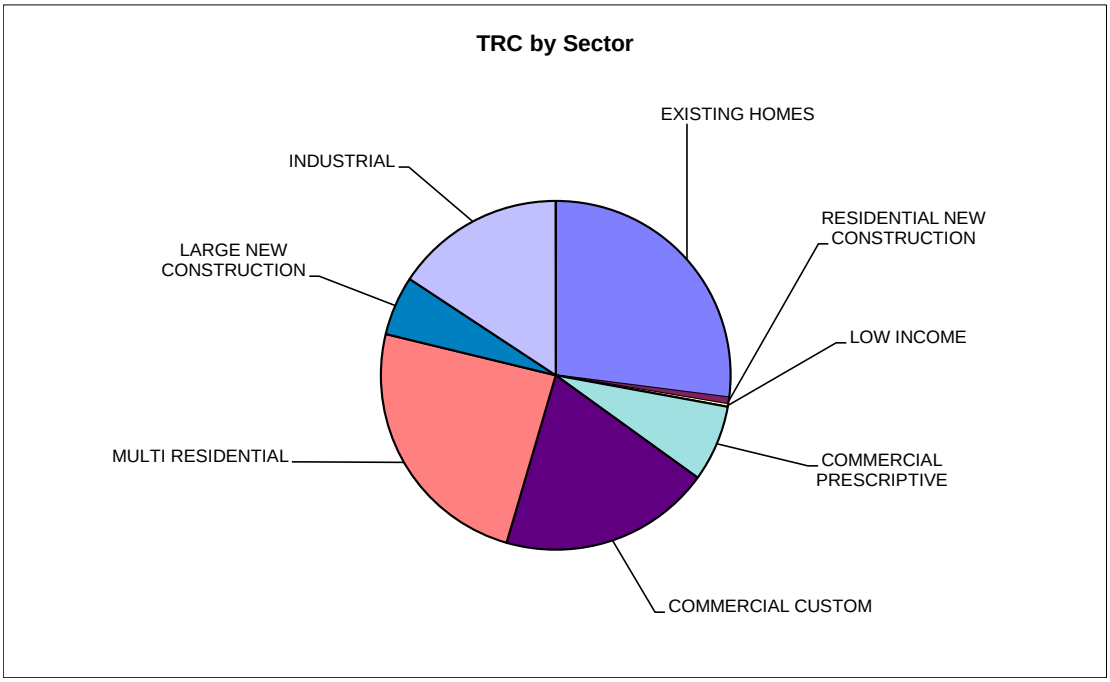


Figure 3: TRC by Sector

	% of Total
EXISTING HOMES	27%
RESIDENTIAL NEW CONSTRUCTION	1%
LOW INCOME	0%
COMMERCIAL PRESCRIPTIVE	7%
COMMERCIAL CUSTOM	20%
MULTI RESIDENTIAL	24%
LARGE NEW CONSTRUCTION	5%
INDUSTRIAL	16%



As reflected in the tables and figures above, the Residential Market accounts for the majority of customers (94%) of the Resource Acquisition portfolio. However, the Residential sector accounts for less than 12% of the gas savings and 28% of the TRC results.

The Business Markets, despite the small number of participants, generates over 88% of the gas savings and 72% of TRC results with the majority brought in through the Large Commercial, Multi-Residential and Industrial sectors.

Appendix A provides summary tables for the 2011 DSM Programs and presents the following information:

1. Net TRC Benefits ($)
2. Net Natural Gas Savings (m^3)
3. Net Electricity Savings (kWh)
4. Net Water Savings (m^3)
5. Number of Participants or Units Installed
6. Average Measure Life
7. Incremental Costs
8. Total Incentive Payments

This data is presented by program category and by technology. Separate tables have been presented for custom programs and prescriptive programs.

2.0 Description of Programs

This section provides an overview of EGD 2011 DSM programs including Resource Acquisition programs and Market Transformation, Awareness and Scorecard programs.

Each description includes the:

- targeted customer class or group (sectors)
- the objectives of the program,
- activities associated with the program, and
- program performance in terms of number of participants or units installed and net TRC benefits (for Resource Acquistion programs) or program specific metrics (for Market Transformation and Scorecard programs)

The Resource Acquisition programs are grouped in the following sectors:

- Residential (including Existing Homes, Residential New Construction, and Low Income)
- Commercial (including Multi-Residential, Small Commercial and Large New Construction)
- Industrial (including Agricultural)

2.1 Residential

2.1.1 Residential Existing Homes

Water Conservation

Description: The TAPS program offers no-charge installation of a variety of water and energy savings measures. The program relies on six contractors (TAPS Partners) for program delivery and reporting. Participating contractors visit customers' homes to install low flow showerheads (1.25 gpm) and to provide low flow faucet kitchen and bathroom aerators and four 13W compact fluorescent light bulbs (CFLs) for self-installation.

In 2011, EGD continued offering Energy Savings Kits (ESK) to targeted residential customers through a bill insert. In addition, in 2011, Enbridge introduced a direct mail offer that included 20 bonus Air Miles. Both kits provided low flow aerators, low flow showerheads and CFLs for self-installation. The targeted marketing effort for each campaign was implemented to penetrate a highly saturated area where traditional door to door marketing efforts were not proving effective.

Highlights: Energy Savings Kit (ESK) introduced in 2011 through direct mail was extremely successful.

Objectives: To capture energy savings related to hot water use and lighting.

Metrics: The TAPS program results are tracked by the number of participating households. The Energy Savings Kits are tracked by the number of customer households which received an ESK.

Tracking Methodology: Monthly reports from the TAPS contractors, return bill inserts from the customers who requested an ESK and the contractor report for ESK direct mail customers.

Evaluation Activities: Quarterly and year end Verification studies of TAPS participants are conducted. An ESK Verification study including both direct mail and bill insert participants was also completed at year end. These studies are summarized in Section 3 of this report.

Program Results:

Table 3: Water Conservation Program Results

Water Conservation	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Tankless					7,053	$ (2,178,367)				
TAPS ESK Showerheads 2.1 - 2.5							541	70,810	9,865	$ 1,243,312
ESK Kitchen Aerator							541	28,127	9,865	$ 431,925
ESK Bathroom Aerator							1,082	10,721	19,730	$ 144,546
TAPS ESK CFL 13w (4 bulbs)							541	37,735	9,865	$ 737,200
TAPS Partners - 13W CFLs (4 bulbs)					135,236	$ 7,407,364	153,172	$ 9,579,293	142,203	$ 8,912,444
TAPS Partners - Bathroom Aerator			170,949	$ 1,346,180	146,337	$ 1,750,444	153,110	$ 1,790,626	142,213	$ 1,718,877
TAPS Partners - Kitchen Aerator			170,949	$ 6,618,072	146,537	$ 8,671,259	153,148	$ 8,466,024	142,222	$ 7,876,848
TAPS Partners Program over 2.5 gpm	70,912	$ 50,608,233	120,115	$ 18,941,332	95,393	$ 25,981,316	98,683	$ 21,034,365	95,506	$ 20,925,767
TAPS Pipe Wrap	63,076	$ 2,019,251	161,137	$ 4,923,676	0	$ -				
TAPS Showerheads 2.0 gpm	348	$ 86,106	371	$ 26,555	0	$ -				
TAPS Showerheads 2.1 - 2.5 gpm	20,860	$ 6,985,369	50,463	$ 5,232,555	51,409	$ 8,042,756	53,721	$ 6,321,674	44,405	$ 6,470,338
Water Conservation Total	**155,196**	**$ 59,698,959**	**673,984**	**$ 37,088,371**	**581,965**	**$ 49,674,772**	**614,539**	**$ 47,339,374**	**615,874**	**$ 48,461,257**

Note: The TAPS program results are tracked by the number of households.

Comments:

- The Water Conservation program exceeded target due to the ESK direct mail offer overachievement.
- The direct mail offer included 20 bonus Air Miles when a customer visited a dedicated web portal to request the kit. This campaign proved highly successful with over 84% of the ESK participants stemming from this marketing stream.
- The TAPS program has been delivered to close to 70% of the existing residential customer base. As a part of the defined 3 year exit strategy, the direct install stream of the TAPS program will end in 2014. EGD will continue with a door to door delivery of a kit (ESK) and the targeted direct mail campaign, both for self-install. (NOTE: subsequent to the April publication of this Annual Report, the Ontario Energy Board approved the Company's 2013-2014 DSM Plan Update which included a provision to end the TAPS program in 2013.)

2.1.2 Residential New Construction

***Description**:* EGD continued to offer initiatives in the New Home Program portfolio in 2011 supporting the ENERGY STAR® label. The ENERGY STAR® for New Homes (ESNH) program encourages builders to consider building envelope and other energy efficiency improvements by offering $100 to builders for each ENERGY STAR® labelled house. Enbridge claims the savings associated with each home after the home is built. To obtain an ENERGY STAR® label the house must meet a required level of energy efficiency as measured through the ENERGY STAR® Version 3 system. Due to changes in the Ontario Building Code in 2012, 2011 is the last year to build a Version 3 ENERGY STAR® home, this program will not be available in 2012.

In 2011, EGD continued offering Energy savings Kits (ESKs) to customers in newly built homes where the builder's subdivision qualified. Customers were eligible to receive a kit containing 8 13W CFLs, 1 programmable thermostat, 3 aerators (1 kitchen, 2 bathroom), and 2 showerheads (1.25 and 1.5 gpm) depending on the results of their builder's screening survey.

Highlights: Owing to problems discovered in the internal tracking system, no results are claimed for the Energy Savings Kits in 2011.

***Objectives**:* The objective of the ENERGY STAR® program in 2011 is to encourage builders to construct homes to the ENERGY STAR® standard. The Energy Savings Kits were offered to encourage builders who are currently not in the ENERGY STAR® ® for New Homes initiative to adopt energy efficiency measures.

***Metrics**:* The number of homes that pass the ENERGY STAR® inspection.

Tracking Methodology: EnerQuality receives paperwork from builders for houses which pass inspection for an ENERGY STAR® label. EnerQuality prepares a report which lists all houses that have passed inspection.

***Evaluation Activities**:* The EnerQuality report is sent to NRCan, Natural Resources Canada, and after the house is added to their system then EnerQuality adds the house to the report provided to EGD.

Program Results:

Table 4: Residential New Construction Program Results

Residential New Construction	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
EnerGuide for New Houses	227	$ 195,135	0	$ (94,452)	0	$ -	0	$ -		
ESK Kitchen Aerator							2,851	$ 85,404		
ESK Bathroom Aerator							2,851	$ 90,850		
ESK Showerhead 1.25							1,427	$ 147,247		
ESK Showerhead 1.5 Handheld							1,424	$ 91,895		
ESK CFL (13w) 6 bulbs							744	$ 81,774		
ESK CFL (13w) 8 bulbs							2,085	$ 278,634		
ESK Programmable Thermostat							2,016	$ 114,930		$ (12,697)
EnergyStar for New Houses	864	$ 578,020	1,768	$ 592,959	2,199	$ 2,218,179	2,682	$ 882,185	2,205	$ 1,138,093
Res New Construction Total	**1,091**	**$ 773,155**	**1,768**	**$ 498,507**	**2,199**	**$ 2,218,179**	**16,080**	**$ 1,772,919**	**2,205**	**$ 1,125,396**

Comments*:* As noted above, no results are claimed in 2011 for the ESKs.

Assumption changes in the 2011 Update submission for the ENERGY STAR® for New Homes program positively impacted the TRC Net Benefits in 2011.

2.1.3 Low Income

Description: The Low Income program aims to reduce water and energy use through the installation of retrofit measures offered free of charge to low income customers. The Enhanced TAPS program includes a programmable thermostat and a split of the four CFLs into 2 13W and 2 23W bulbs in the standard TAPS offering and uses the TAPS network of approved contractors for delivery and reporting in low income neighborhoods.

Objectives*:* To capture energy savings through the reduction of hot water use.

Metrics: Number of households for the TAPS program.

Tracking Methodology: Monthly reports sent to EGD by contractors were reviewed to track program results.

Evaluation Activities: In 2011, a year end verification study was completed and the results are presented in Section 3 of this report.

Program Results:

Table 5: Low Income Program Results

Low Income	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
TAPS Low Income - 13W CFLs					3,703	$ 103,804	1,231	$ 52,147	904	$ 39,053
TAPS Low Income - 23W CFLs					3,703	$ 114,646	1,231	$ 57,941	885	$ 42,480
Low Income Kitchen Aerator			2,838	$ 164,500	1,824	$ 93,677	984	$ 74,331	874	$ 87,167
Low Income Bathroom Aerator			2,838	$ 33,594	1,824	$ 15,418	984	$ 16,596	874	$ 19,098
Low Income Pipe Wrap	2,718	$ 88,687	2,510	$ 77,765	0	$ -				
Low Income Showerheads 2.0	6	$ 1,569	1	$ 70	0	$ -				
Low Income Showerheads 2.1	1,265	$ 446,817	436	$ 45,614	22	$ 2,949	101	$ 12,678	214	$ 37,506
Low Income Thermostats	4,007	$ 2,435,369	2,665	$ 274,732	3,952	$ 1,456,024	896	$ 33,183	602	$ 26,416
Low Income Weatherization	61	$ 76,299	208	$ 218,273	361	$ 724,840	201	$ 234,741	599	
Low-Income Showerheads	2,838	$ 2,174,088	2,401	$ 369,605	1,704	$ 533,898	871	$ 196,181	650	$ 171,281
Low Income Total	**10,895**	**$ 5,222,829**	**13,897**	**$ 1,184,153**	**17,093**	**$ 3,045,256**	**6,499**	**$ 677,798**	**5,602**	**$ 423,000**

Note: Low Income Weatherization was tracked as a Market Transformation program in 2011 and TRC benefts from the 824,73m3 of gas savings were not included in the Resource Acquisition TRC Benefits

Note: The TAPS program results are tracked by the number of households

Highlights: The Enhanced or Low Income TAPS program fell shy of target due to difficulties in hiring licensed gas fitters to install the thermostats.

Low Income TAPS will be rolled into the Weatherization program going forward as delivery agents can use the basic measure program as a lead generator for the weatherization program.

New DSM Guidelines which allow participation of social housing tenants who do not pay their own utilities will enable EGD to expand the low income program to the multi-residential social housing sector.

2.2 Residential Lessons learned

- In the case of the TAPS program as the franchise area becomes more saturated, it is becoming increasingly more difficult to deliver the program door to door. Approximately 70% of the households within the franchise area have participated in the TAPs program.

- The target for the TAPS program will need to be adjusted downward over the next few years to take into account this market saturation and to reflect the exit strategy for the program.

- In response to the increasing difficulty in gaining admittance to homes in a saturated market, in 2011 the Company introduced delivery of the TAPS program through customer self-installation. Through a campaign of direct mail and bill inserts customers were invited to order TAPS kits for self-installation.

- The experience of the TAPS self-install kits in 2011 led to a further program change for neighourhood campaigns in 2012. Neighbourhood campaigns will continue in 2012, but rather than direct install, the door to door campaign will offer customers a drop off kit for self-installation.

- Internal tracking systems require process review each year.

2.3 Commercial

2.3.1 Large Commercial

Description: The Large Commercial program offers incentives for third party energy audits, equipment retrofits and operational improvements in targeted segments. Delivery channels include performance and HVAC contractors, consulting engineers and designers and energy management firms.

Enbridge Energy Solutions Consultants (ESCs) provide advice on customized energy solutions to suit the customer's business needs. ESC's are company representatives with extensive technical training who maintain contact with customers and also with commercial HVAC contractors, engineering firms, designers and others who serve the Commercial and Industrial markets. Their strong relationships, sales and technical skill sets are critical to enabling energy efficiency solutions and program success. Retrofit measures include boiler retrofits, improvements to HVAC systems, building automation systems, building envelope improvements and steam trap replacement.

Programs are promoted through strong representation at numerous key industry tradeshows, speaker engagements, event sponsorships, the Company's website, e-marketing, print material such as case studies and magazine articles, direct mail, and some print advertising. Retrofit measures include boiler retrofits, improvements to HVAC systems, building automation systems, building envelope improvements and steam trap replacement.

Examples of 2011 Company initiatives that support sector specific strategies, incorporate 3rd party benchmarking and provide an avenue for stimulating, capturing and rewarding operational improvements are:

- Toronto Region Conservation Authority's Greening Healthcare Program,
- Mayor's Megawatt Challenge, and
- Toronto Civic Action's Race To Reduce initiative for offices.

In 2011, the Company continued to make inroads with its Energy Compass Program. This program which originated as a benchmarking like service to the Large Commercial sector is evolving to be more of a portfolio diagnostics tool. Its core purpose is to identify potential energy efficiency opportunities relative to other buildings within a portfolio. Its numerical output is stated as percentage of consumption (over and under) relative to other buildings in a portfolio. Many traditional benchmarking approaches focus more on a numerical value assigned to each building.

This service is based on a multi variable statistical model, developed by Enbridge, which benchmarks the energy performance of buildings within a property

management portfolio. The statistical model is automated to capture a large number of participants while minimizing the need for manual processes. The analysis identifies capital and operational opportunities with measure specific recommendations for consideration. ESCs follow up with on-site reviews of buildings that require the most attention. Participating sectors included Multi- Residential, Warehouses, and Long Term Care facilities.

Highlights: 2011 ended with marked increase and unprecedented results in the Commercial Sector. Approximately, 40% of the Company's TRC results in this sector closed in the final 3 months of the year. Two major projects account for approximately 11% of the sector's TRC results.

Another important contributor to the results was a Variable Frequency Drives (VFD) campaign. Building on results in 2010, Enbridge re-launched and extended a promotion around this technology, offering a time limited "Double Your Incentive" campaign. With the Company's sales staff focusing on this promotion, the campaign accounted for approximately 20% of the Commercial sector's record breaking year.

In 2011 Enbridge sponsored Civic Action's Race to Reduce, a volunteer based industry initiative represented by key leaders in the office sector. Enbridge also became a standing member of the initiative's Commercial Building Energy Initiative Leadership Council, allowing the Company to enhance its working relationships at a more senior level. The Office sector, combined with the VFD Campaign, witnessed an approximate 5 fold increase to TRC in the Commercial segment.

The Accommodation sector also saw a 12 fold increase to TRC over 2010 levels; one very large project was a significant factor in these results.

In the Multi-Residential sector, the Company undertook a key account approach in the Nonprofit sector resulting in an almost 3 fold increase in TRC. As well, Enbridge undertook a direct install showerhead program with excellent results.

Healthcare TRC, however, dropped by half over 2010 due to a delay in commissioning a very large project.

Other sectors performed relatively comparable to other years.

The Company restructured its marketing department putting more structure and discipline around program and campaign developments and further refined its program development processes. This resulted in quicker to market campaigns and enhanced processes for better results.

Objectives: To capture energy savings in the Large Commercial segment through retrofit of building components.

Metrics: Number of projects and per project savings. The savings for each customer project are calculated on an individual basis.

Tracking Methodology: Monthly tracking utilizing EGD's sales tracking software.

Evaluation Activities: An internal review was conducted of project applications and savings calculations. In addition, a third party engineering review was conducted for a sample of projects from the Commercial sector. The third party review is summarized in Section 3. Program results as reported include adjustments recommended by the engineering review.

Program Results:

Table 6: Large Commercial Program Results

Large Commercial	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Hospitals	8	$ 5,222,073	30	$ 9,192,867	21	$ 11,062,072	28	$ 8,734,046	31	$ 4,301,760
Hotel/Motel	6	$ 1,275,414	11	$ 3,901,189	7	$ 1,583,604	6	$ 410,897	10	$ 5,113,671
Long Term Care	3	$ 94,921	3	$ 172,324	14	$ 1,333,817	23	$ 670,239	3	$ 226,714
Municipalities	15	$ 6,108,253	13	$ 1,997,712	81	$ 6,641,941	34	$ 7,295,675	31	$ 1,457,160
Offices	14	$ 1,986,198	28	$ 4,224,856	38	$ 4,288,542	45	$ 4,755,113	55	$ 9,846,154
Other Commercial Sectors	24	$ 911,621	15	$ 2,416,894	14	$ 4,507,286	30	$ 9,027,506	32	$ 7,091,831
Retail	6	$ 515,694	4	$ 84,995	16	$ 801,806	2	$ 367,406	11	$ 352,393
Recommissioning							1	$ 161,397		
Schools	46	$ 2,627,321	96	$ 6,638,753	110	$ 5,597,300	105	$ 5,238,385	187	$ 3,691,669
Universities	14	$ 1,383,333	9	$ 4,187,542	7	$ 1,069,242	15	$ 4,142,820	13	$ 1,644,559
Warehouses	5	$ 627,730	10	$ 741,881	10	$ 570,598	16	$ 766,728	20	$ 1,468,760
Cross Sector Promotion										$ (87,614)
Large Commercial Total	**141**	**$ 20,752,558**	**219**	**$ 33,559,011**	**318**	**$ 37,456,208**	**305**	**$ 41,570,211**	**393**	**$ 35,107,055**

Comments: Strategically marketing and targeting a campaign or technology to specific sectors with limited time offers continued to be a successful strategy. Examples of this can be seen in the increased participation in the warehouse sector, traditionally a hard to reach market segment.

2.3.2 Small Commercial

Description: The Small Commercial program in 2011 increased the number of program offerings reflecting the Board approved measures added through the 2011 update filing. The new offerings for 2011 were:

- Air Doors
- Ozone Laundry System
- ENERGY STAR® Dishwashers
- ENERGY STAR® Fryers
- ENERGY STAR® Steam Cookers
- High-Efficiency Natural Gas Under-Fired Boilers
- Condensing Boilers <300MBH
- High Efficiency Boilers <300 MBH

Highlights: The direct install pre-rinse spray valve program proved to be a significant contributor, however verification results decreased the TRC approximately $4 million dollars. The Verification Results are presented under Section 3 of this report.

Demand Control Ventilation and Infrareds provided the largest TRC results among small commercial measures at over $2 million TRC each.

As in previous years, the delivery of the small commercial program primarily relied on external business partners, Channel Consultants and manufacturers.

The EGD Channel Consultants are company representatives who maintain contact with builders, HVAC contractors and others who serve the residential and small commercial markets. In 2011 the Channel Consultants focused heavily on the Small Commercial market with some Channel Consultants assigned responsibilities for specific products.

The programs in 2011 were targeted to both the business partner (contractor) and the end use customer to help increase the number of units installed.

The addition of prescriptive boilers offset the discontinuation of the thermostat program which was due to market transformation and diminished TRC savings. As well, the introduction of the food services equipment offers also made up for decreased participation with other products. The ENERGY STAR® foodservice programs were added to the list of Small Commercial offerings in the 3rd and 4th quarters of 2011.

Objectives: To capture energy savings in the Small Commercial segment through installation of specific prescriptive technologies.

Metrics: Number of units installed.

Tracking Methodology: Monthly tracking reports provided by EGD's DSM Reporting and Analysis department.

Program Results:

Table 7: Small Commercial Program Results

Small Commercial	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Energy Recovery Ventilators (ERV)					37	$ 612,258	44	$ 489,004	31	$ 303,711
Heat Recovery Ventilator (HRV)					5	$ 7,919	67	$ 409,764	46	$ 824,361
Ozone Laundry									65	$ 1,417,262
SC High Efficiency Boiler									120	1,427,954
Infrared Heaters					144	$ 693,551	723	$ 2,557,777	1,028	$ 2,442,018
Condensing Boiler							71	$ 261,474	59	$ 237,269
Condensing Unit Heater							11	$ 10,053	0	$ -
Demand Control Kitchen Ventilation	21	$ 646,879	15	$ 448,615	9	$ 108,415	22	$ 275,189	40	$ 424,367
Kitchen Ventilation - Tier 2	0	$ -	11	$ 304,913	18	$ 802,274	33	$ 1,391,817	44	$ 1,438,845
Kitchen Ventilation - Tier 3	0	$ -	3	$ 158,053	2	$ 153,256	13	$ 943,155	13	$ 739,780
Pre-Rinse Spray Valve	290	$ 1,106,662	627	$ 3,215,331	1,961	$ 2,557,104	2,036	$ 2,626,531	2,529	$ 1,569,220
Rooftop Units	21	$ 35,462	157	$ 412,466	564	$ 258,232	369	$ 132,725	0	$ -
Small Commercial Hi Eff Furnace - Custo	101	$ 59,771	109	$ 79,444	117	$ 90,989			0	$ -
Tankless Water Heaters	67	$ 6,049	11	$ 2,642	30	$ 47,763	116	$ 177,108	81	$ 112,355
Thermostats	141	$ 260,702	111	$ 183,419	334	$ 123,851	3,735	$ 1,896,353	0	$ -
Air Doors			10	$ 9,840	40	$ 63,391	39	$ 89,358	51	$ 136,708
Small Commercial General			0	$ (1,458)	-	$ (46,028)	-	$ (44,010)		$ (277,426)
Small Commercial Restaurants			-	$ (4,263)	-	$ (59,637)		$ (5,640)	464	1,870,218
Small Commercial Total	**641**	**$ 2,115,525**	**1,040**	**$ 4,346,038**	**3,261**	**$ 5,413,335**	**7,279**	**$ 11,210,656**	**4,571**	**$ 12,666,641**

Note: Units in the table above refer to the number of measures installed. It is possible that one business owner installed more than one measure.

Comments: The Small Commercial sector showed a significant decrease in participants and a slight increase to TRC compared to 2010 results.

2.3.3 Multi-Residential

Description: The Multi-Residential sector was comprised of prescriptive and custom measure incentives. Promotion and awareness of the incentives available were delivered through the Energy Solutions Consultants (ESCs) who leveraged their contacts in the marketplace, both public and private.

Highlights: In 2011 the Company experimented with a direct install program for showerheads. This program contributed over $5 million in TRC.

The Company also launched a promotion around reflective panels within the custom projects.

Objectives: To capture energy savings in the Multi-Residential segment through the delivery of a combination of custom and prescriptive measures.

Metrics*:* Number of prescriptive measures installed, number of custom projects and per project savings.

Tracking Methodology: Monthly tracking as part of EGD's sales tracking software and as part of rebate processing.

Evaluation Activities: An internal review was conducted of custom project applications and savings calculations. In addition, a third party engineering review was conducted of a sample of projects from the Commercial sector. Site visits were conducted on a random sample of Multi-Residential buildings to verify the number of showerhead installations. These verification studies are summarized in Section 3. Program results as reported include adjustments from the verification studies.

Program Results:

Table 8: Multi-Residential Program Results

Multi-Residential	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Multi-Residential Non-Profit	7	$ 619,182	20	$ 1,420,257	11	$ 730,875	53	$ 3,859,601	147	$ 10,600,717
Multi-Residential Private	273	$ 27,289,152	235	$ 25,312,293	257	$ 31,285,441	275	$ 26,087,753	320	$ 27,056,136
Multi-Residential Recommissioning	1	$ (6,635)	0	$ (5,009)	0	$ (5,782)				
Showerheads/Aerators	26,678	$ 11,894,381	22,312	$ 5,037,352	40,332	$ 3,025,332	31,508	$ 5,313,161	25,727	$ 5,609,459
Front Load Washers	1,471	$ 1,206,261	1,170	$ 1,006,222	453	$ 229,508	610	$ 308,707	398	$ 236,379
Multi-Residential Total	**28,430**	**$ 41,002,341**	**23,737**	**$ 32,771,114**	**41,053**	**$ 35,265,374**	**32,446**	**$ 35,569,221**	**26,592**	**$ 43,502,690**

Note: Results for custom projects in the Multi-Residential sector are tracked by participant or building. Units in the table above for Multi-Residential Non-Profit and Multi-Residential Private indicate the number of buildings. The prescriptive programs for low-flow showerheads and front load washers are tracked by number of units installed as shown in the table above.

Comments: The portfolio based marketing approach which focuses on property managers who are responsible for multiple buildings, aided in the success in this market sector. In addition, creating campaigns for measures such as VFD, Multi-Residential showerheads and Reflector panels also assisted in this market sector.

2.3.4 Large New Construction

Description: In agreement with the Ontario Power Authority (OPA), EGD continued delivering a High Performance New Construction Program which allowed delivery of both the gas and electric programs simultaneously. The New Construction program encourages the design and construction of large new buildings to higher levels of energy efficiency and environmental performance than Ontario Building Code 2006.

This approach was well received by the marketplace as it allowed for economies of scale and encouraged the building community to participate in both programs.

The New Construction program has four components:

- The Design Assistance Program (DAP) - directed towards the integrated design of a building ensuring that an energy simulation model is run and design activities undertaken aimed at improving a building's energy and environmental performance, whether it is a new building, an addition to an existing building, or a major renovation.
- The New Building Construction Program (NBCP) - targets actual implementation of more efficient options, and helps offset the costs of building more energy efficient buildings for commercial, institutional or multi-family use. Energy savings are defined by energy modeling of the proposed building.
- As part of NBCP, Enbridge offers Business Partner Implementation Support to ensure that support and proper documentation is provided for each technology within the design. This program feature helps to support design decision-makers and encourages building owners to implement energy efficient design.
- The Enbridge New Construction Program (NCP) - provides an incentive for energy savings that result from adding energy efficient natural gas equipment to a new building design; energy efficiency savings are defined by engineering calculations. Projects undertaken through the NPC are not modeled whereas buildings participating in the NBCP are.

Highlights: 2011 NBCP targets were met. Future program design will focus on targeting the decision makers to encourage participation in the Integrated Design Process (IDP) in 2012.

Objectives: To capture energy savings in the Large New Construction segment by encouraging designers and builders to "go beyond" the energy performance requirements of the existing Building Code.

Metrics: Number of projects and per project savings.

Tracking Methodology*:* Monthly tracking of custom projects as part of EGD's sales tracking software.

Evaluation Activities*:* An internal review was conducted of project applications and savings calculations. In addition, a third party engineering review was conducted of a sample of projects from the Commercial sector, including new construction projects, and any resulting adjustments were applied to all projects in the sector.

Program Results:

Table 9: Large New Construction Program Results

Large New Construction	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Audited TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
NBCP	56	$ 5,360,755	59	$ 11,667,996	21	$ 7,906,422	43	$ 7,348,643	56	$ 9,840,561
Large New Construction Total	**56**	**$ 5,360,755**	**59**	**$ 11,667,996**	**21**	**$ 7,906,422**	**43**	**$ 7,348,643**	**56**	**$ 9,840,561**

Comments: In 2011, approximately 60% of Ontario housing starts were condominiums. The increase in the high density condominium housing market contributed to the 2011 results.

This program has been redesigned for 2012 to focus on the Integrated Design Process. However, in 2012 and future years, Enbridge will continue to provide incentives for applications processed in 2011 through DAP and NBCP.

2.4 Industrial

Description: EGD aims to provide a complete solution to the Industrial customer's energy needs by providing assistance in three areas:

- to identify and prioritize opportunities,
- to conserve and reduce energy use, and
- to implement projects that will capture savings and improve energy efficiency.

Enbridge's program is founded on the concept that for ANY ENERGY related project, the Company has services and enabling resources to support customers at every major milestone in the development and implementation of energy efficiency solutions.

EGD's programs are designed to counter (1) technical barriers to EE adoption and (2) financial barriers related to the awareness, business justification and implementation of EE measures.

Enabling activities such as workshops are designed to educate customers and business partners on energy matters so that they are aware of the value that energy efficiency and energy conservation can bring to their businesses. These activities support energy efficiency adoption and energy conservation.

Highlights: The year 2011 showed signs of recovery due to the slight improvement to the economy however energy savings were slow to materialize. The sector lacks staff to implement projects and requires very high financial justification due to limited capital. In addition, manufacturing struggled with the high Canadian dollar and intense competition from alternative suppliers.

Enbridge was also operating in an environment where its 3 year plan had been extended by the Ontario Energy Board for an additional 2 years. As a consequence, budgets continued to be determined on a formulaic basis, a condition not particularly responsive to the altered business environment in which DSM was operating. This, paired with the approximate 25% decline in the industrial volumetric consumption over the past few years resulted in a shortfall in energy savings targets.

Enbridge continued the implementation incentive of $0.08 /m³ of natural gas saved to a maximum of $100,000 per project as seen in 2010. However, the further depressed cost for natural gas was a large barrier to implementing improvements as it lengthened the payback period thereby negatively impacting the economics of projects. Despite efforts, results decreased slightly.

The Industrial DSM program now faces the challenge posed by the emergence of other energy efficiency programs. Electric programs were slow to start but finally got off the ground in 2011 and are expected to become more established in 2012. Enbridge is currently providing the lowest level of incentives as compared to other

programs in the electricity market. This situation is increasingly a threat to the comprehensive approach to energy efficiency.

***Objectives**:* To capture energy savings in the Industrial sector through the delivery of custom energy solutions.

Metrics: Number of projects and per project savings.

Tracking Methodology: Monthly tracking as part of EGD's sales tracking software.

***Evaluation Activities**:* An internal review was conducted of project applications and savings calculations. In addition, a third party engineering review was conducted of a sample of projects from the Industrial sector. The engineering review is summarized in Section 3. Reported results include adjustments as recommended by the engineering review.

An assessment of Measure Life for Operational measures was initiated in 2011 based on an EAC recommendation. The assessment was completed in 2012 and results will be brought forward to the 2012 Technical Audit Committee for approval prior to filing a 2012 update.

Program Results:

Table 10: Industrial Program Results

Industrial	2007 Audited TRC		2008 Audited TRC		2009 Audited TRC Results		2010 Audited TRC Results		2011 Final TRC Results	
	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Agriculture	26	$ 3,028,137	29	$ 2,170,914	28	2,084,435	32	$ 2,014,476	15	$ 655,903
Industrial-All	121	$ 50,778,056	111	$ 59,179,956	92	68,899,977	91	$ 43,162,311	112	$ 27,514,500
Industrial Total	**147**	**$ 53,806,193**	**140**	**$ 61,350,871**	**120**	**70,984,411**	**123**	**$ 45,176,787**	**127**	**$ 28,170,403**

Note: Units in the table above refer to the number of projects completed.

Comments: The decline in avoided gas costs contributed to a much lower TRC/m^3 of gas savings than had been experienced in previous years.

Industrial program performance is at a plateau; process related projects remain the largest end use technology as a portion of the overall portfolio performance.

Interest in and need for metering, measurement and data based decision making initiatives is growing in terms of number of participants and use of data in developing the business case for energy efficiency projects.

2.5 Business Markets Lessons learned

Commercial lessons learned

- Analysis of previous years' programs can be extremely useful.
- Enbridge Energy Solutions Consultants (ESCs) have strong sales and technical skills. Buy in from the sales force can have a huge impact on results from individual offers.

Small Commercial lessons learned

- Multi targeted "push/pull" approach strategy marketed to both customers and trade partners in the Small Commercial sector continued to work well and allowed for more advertising and educational opportunities. In 2012, efforts will be focused on developing a more strategic approach with the Distributor Channel and working more closely with the trade Associations to leverage their credibility with their membership.

Multi-Residential lessons learned

- Enbridge business partners are integral to maintaining and growing this sector.
- The Multi-Residential sector continues to make up a significant portion of the overall Large Commercial business.

Large New Construction Lessons learned

- Targeting decision makers such as builders, owners and developers in 2012 will bring key players into the design of the building as a whole system as opposed to stand alone technologies.
- In new construction, incentives should be based on the building commissioning as well as construction to ensure that the building is operating at maximum energy efficiency potential.

Industrial Lessons learned

- The small industrial sector displays greater commonality with the small commercial sector than it does with large industrial. Without gas fired process loads, the gas consumption of small industrial customers is driven by heating and ventilation requirements. In terms of gas usage these small industrial customers are closer in profile to commercial customers than to large industrial customers with process load.
- Small industrial customers face a number of barriers to their adoption of energy efficient technologies. Two of the major barriers are financial and technical resources.
- Enbridge will have to adopt new approaches to the market in order to serve small industrial customers and offer programs that resonate with their business priorities.
- Customers appreciate the technical support that industrial Energy Solutions Consultants and Sales Managers provide.

2.6 Market Transformation, Awareness and Scorecard Programs

2.6.1 Drain Water Heat Recovery Program (DWHR)

Description: This program was first launched in the low rise Residential New Construction market in 2009. Program changes made in 2010 to focus and track units installed and incremental first time builders continued into 2011. The program offers a $400 incentive to the builder for every Drain Water Heat Recovery (DWHR) unit installed.

Objectives: The goal of the program is to transform the Residential New Construction market such that the installation of DWHR devices becomes standard practice in all new home construction. Three activities that will help attain the long term goal are to:

- educate builders and new home buyers about the technology,
- train builders and contractors to install DWHR units, and
- provide incentives to builders: $400 per DWHR unit installed.

Drain Water Heat Recovery technology is a simple technology but relatively new to builders in the Enbridge territory. With Enbridge promoting DWHR, awareness of the product amongst builders in the EGD territory should increase.

Tracking Methodology*:* Program results are tracked by number of units installed as reported by the builder participants and the number of builders enrolled as reported by the Channel Consultants and water heater rental providers.

Highlights: As 2011 was the second full year of operation, the program made significant traction in the market. Results exceeded the 150% target for incremental builders enrolled. The aggressive target for units installed, between 44% - 56% higher in each metric value level compared to 2010 targets, proved to be too aggressive as the program fell below the 50% target in this category.

Metrics & Program Results:

Table 11: Drain Water Heat Recovery Market Transformation Results

Drain Water Heat Recovery		**2011 Metric Value**			**Weight**	**2011 Metric Value Actual results**
Element	**Metrics**	50%	100%	150		
ULTIMATE OUTCOMES	a) Units Installed (new build) as percentage of 2011 housing starts (across all builders). Builder incentive of $400 per unit.	4800	5280	600	/80	2168
PROGRAM PERFORMANCE	b) 1st time new Builders enrolled (incremental)	20	25	30	/20	60

The Ultimate Outcomes metric, number of units installed as a percentage of 2011 housing starts, totaled 2,168 units. The less than favourable results in this metric were due to aggressive targets and to an increase in actual housing starts compared to the forecast. The 100% target of number of units installed metric was based on 22% percentage of actual housing starts (20% of housing starts at 50% and 25% of housing starts at 150%). When the forecast housing starts of 22,396 increased to actual starts of 23,999, the target increased from 4,927 units to 5,280 units. In comparison, the 2010 target at 100% was 2,722 units and 1,684 units were installed.

2.6.2 Low Income Energy Efficiency Awareness

Description: Enbridge sponsors two information support programs that aim to improve the energy efficiency knowledge and basic weatherization practices among low income Rate 1 homeowners and tenants through provision of information and simple energy savings tips from a trusted and confidential source. Program delivery includes media and outreach activities to promote energy efficient participation in programs such as the Enhanced TAPS program and the Low Income Weatherization program.

Enbridge also sponsors an information support program aimed to educate Low Income Stakeholders. Information is gathered and webinars are delivered in order to communicate findings to Low Income Stakeholders on items such as best program practices around the world and program elements that may be adaptable in Canada.

Information Support Sponsorships in 2011 for the Residential Market

- **GLOBE** - Community Champion Program GLOBE (Green Light on a Better Environment) is a subsidiary of SHSC (Social Housing Services Corporation), connecting social housing providers, municipal service managers, property managers and social housing tenants with tools and services to help them make smart choices about conservation, efficiency and green sustainable practices in the social housing sector.

  Objective: Community Champion Program objective is to provide an educational program for the purpose of engaging social housing staff and residents to work together on responsible and efficient energy use.

  Outcomes: Community Champion Training: Peel – Eleven residents and staff participated from 4 different housing providers; Peterborough – Sixteen residents and staff participated from 5 different housing providers

- **SPNO (Social Planning Network)** – SPNO is a coalition of social planning councils (SPC), community development councils (CDC), resource centers, and planning committees located in various communities throughout Ontario. For example, work includes providing outreach to Municipal Service Managers, housing providers/Board members and residents.

  Objective: To provide information sessions regarding Enbridge Low Income programs to front line case workers at various social service agencies within the two targeted Enbridge service areas of Niagara Region and Peterborough County.

  Outcomes: Three low income program sessions were coordinated and conducted in Peterborough and Niagara.

Information Support Sponsorship in 2011 for Low Income Stakeholders

- **Affordable Energy Canada -** Affordable Energy Canada is a project of Green Communities Canada, which takes a solutions-oriented approach to the problem of energy poverty in Canada through research, capacity building and collaboration.

  Objective: Produce a Community-Wide Retrofit Report examining international best practices in area-based retrofit approaches, identifying key program elements replicable in the Canadian context, as well as maintaining and expanding annual web seminar series provided to Low Income Stakeholders.

Outcomes:

- With Enbridge's support, a series of interviews were conducted and site visits were made of community wide retrofit programs throughout the United States and United Kingdom, learning first hand the challenges and strengths of these program models.
- A report was created for Enbridge and profiles three programs, Kirklee's Warm Zone in West Yorkshire, England, RE:NEW in London, England, and Clean Energy Works Portland, US. Each of these projects has completed at least a pilot delivery phase, and offers valuable lessons for the development of Canadian programming.
- Over the course of 2011, ten webinars were held highlighting Canadian and international best practices in the affordable retrofit sector. This series works to raise awareness about the impacts of energy poverty in our communities and to promote Canadian and international best practices in low income retrofit program design.

Tracking Methodology*:* Tracking of activities and spending.

2.6.3 Low Income Weatherization Scorecard

Description: In the September 24, 2010, Decision and Order of the Board (the "Decision"), regarding Enbridge's 2011 DSM Plan, EB-2010-0175, the Board stated its expectation for Enbridge to file an amendment in respect of the government's policy to increase conservation programs for low income customers and additional funding for such low income programs.

The scorecard below is the result of extensive discussion and review with a low income working group chosen by the Enbridge DSM Consultative. The working group was made of three intervenor members plus Enbridge and Union Gas representatives. The Board approved the amendment which encompasses program design, budget, performance metrics, and SSM.

Low income home owners and tenants qualify for the program if they pay their own natural gas bill, if they are living in low rise homes (up to six units), and if their income is within 135% of Statistics Canada Low Income Cut-Off (LICO), or if they are a beneficiary of selected social assistance programs.

Weatherization technologies may include attic insulation, wall insulation, basement insulation, blower-door guided air sealing, door and window weather-stripping, caulking, and switch and outlet gaskets and covers. A pilot to replace 75 furnaces was also included in the m^3 savings per household targets.

Objectives: The main objectives of the amended low income plan were to expand the reach of the weatherization program and provide greater energy savings to participants.

Tracking Methodology: Contractor reports summarize participant numbers and natural gas savings (m^3). The savings are calculated based on the results of the pre and post energy audits conducted by certified energy auditors on a custom basis.

Highlights: Program expansion was achieved by targeting new communities and by reducing the TRC screening threshold for eligible measures from 1.0 to .07 which allowed for delivery of more comprehensive and deeper measures. A total of 128 furnaces were replaced exceeding the target.

Metrics & Program Results:

Table 12: Weatherization Scorecard Results

Weatherization		**2011 Metric Value Levels**			**Weight**	**2011 Metric Value Actual results**
Element	**Metrics**	50%	100%	150%		
ULTIMATE OUTCOME	Weatherization Participants	400	500	575	/50	599
ULTIMATE OUTCOME	Total Natural Gas Savings (m3)	615,100	773,650	894,950	/50	824,773

3.0 Verification Studies

EGD undertakes verification studies in order to validate participant numbers and/or savings to be claimed in various program areas. In 2011, verification studies were completed for prescriptive measures and custom projects.

Prescriptive Measures

Residential Existing Homes

- TAPS – Regular and Low Income sectors encompassing all campaigns which include: door to door, bill insert, direct mail

Small Commercial – Existing

- Multi-Residential Showerheads
- Pre-Rinse Spray Valves

Verification studies of prescriptive measures consist of customer surveys and/or site inspections to verify installation and continued use of the energy saving devices.

Custom Commercial and Industrial Projects

The custom project portfolio was evaluated with sector specific verification studies. Custom projects cover opportunities where savings are linked to unique building specifications, uses and technologies. The evaluation research focuses on verifying the detailed project calculations and documentation for a sample of custom projects in the Commercial and Industrial sectors. Third party engineering firms are contracted to undertake the review and are given access to project application files.

3.1 TAPS Partners Program 2011 Follow-Up Studies

Enbridge Gas Distribution sponsors and delivers an energy conservation program called TAPS. In 2011, two program delivery methods were used, a direct install program and distribution kit for self-install program. Separate studies were conducted for the two delivery methods as described below.

3.1.1 TAPS Partners Program – Direct Install Follow-up Study

Background

The direct install program including both regular and low income existing houses had participating contractors visit customers' homes to install low-flow showerheads, provide kitchen and bathroom faucet aerators and provide compact fluorescent light bulbs (CFLs). A verification study was completed for the direct install program. Results of the study are discussed below and have been applied to savings calculations.

Objectives

This research study was designed to:

- determine if the customer received a home visit from a TAPS contractor,
- determine if the specified procedures were carried out,
- measure contractor results over time,
- compare results among contractors, and
- determine if the results differ from the information submitted by contractors.

Methodology

During 2011, four waves of telephone interviews were conducted. In total, 2,566 residential customer interviews were completed across seven contractors in the Enbridge Gas Distribution franchise area.

Customers were chosen for the follow-up research only if the respective contractor reports indicated that a) for showerhead questions, a showerhead was installed at the premise and b) for light bulb questions, that light bulbs were distributed to the premise. Further, this report reflects only those households that were not identified as low income in the data file.

The margin of error overall for 2011 is +/- 1.6 percentage points at the 90% confidence level.

Results

Verification of Visits

1.5% of customers contacted did not recall receiving a visit from a TAPS contractor. Individual contractor results were not significantly different. The remainder of the report pertains to the 2,566 customers interviewed who recalled receiving a visit from a TAPS contractor.

Overall Results

- 98.5 % of households received an energy-efficient showerhead, similar to the past five years. Contractors installed showerheads in 71.4% of households and householders installed 14.7% for a total (gross) installation rate of 86.1% for 2011. Net installations, after removals, was 83.1%.

- 90.1% of homes received aerators. 61.2% of homes installed kitchen aerators and 53.9% of homes installed bathroom aerators.

- 97.1% of homes received energy-efficient CFLs. 58.1 % of homes installed the CFLs and 96.6 % of those households who installed the bulbs used them to replace incandescents.

- Product removals were low: 3% for showerheads, 0.7% for kitchen aerators, 0.5. % for bathroom aerators and 0.7% for CFL light bulbs.

Table 13: Receipt of Installation of Products – Total Year

Receipt and Installation of Products			
	2009	**2010**	**2011**
Total Households	3,151	3,201	2,566
Showerheads			
- received	98%	98%	98.5%
- total (gross) installed	86%	85%	86.1%
- net installed	82%	82%	83.1%
- contractor installed	66%	65%	↑ 71.4%
Kitchen Aerators			
- total installed	64%	64%	↓ 61.2%
- contractor installed	36%	33%	35.3%
- removed	2%	1%	0.7%
Bathroom Aerators			
- total installed	50%	54%	53.9%
- contractor installed	29%	30%	↑ 34.1%
- removed	1%	*	0.5%
	2,572	3,201	2,564
CFL Light Bulbs			
- received	94%	97%	97.1%
- total installed	59%	58%	58.1%
- removed	1%	1%	0.7%

* Less than 0.5%

The reduction rates shown in the table above have been applied to the program savings calculation

3.1.2 TAPS Partner Program 2011 - Direct Mail and Bill Insert Follow Up Study

Background

The direct response program was introduced in 2010 and implemented again in 2011, using two methods to communicate to customers.

1. A bill insert was sent to approximately 36,952 targeted customers in February 2011. Customers completed the insert and mailed it to the EGD contractor who then shipped the kit. A total of 1,551 customers participated (4% participation rate).
2. A direct mail piece was sent to approximately 89,000 customers in September, 2011 which targeted customers who had not received the TAPS program previously. This offer included a bonus of 20 Air Miles. Customers went to the

EGD contractor's website, and completed and submitted a form on line. Over 8,300 kit requests were processed through this campaign (9% participation rate).

Products in the kits sent to customers contained 2 energy-efficient showerheads, 1 kitchen aerator, 2 bathroom aerators and 4 CFL light bulbs.

Objectives

This study targets Enbridge residential customers who requested packages of energy-saving products via either delivery method. The objectives of the TAPS Direct Response Verification research were to measure:

- installation rates of the products noted above and
- 'still-installed' rates (products not removed).

Methodology

Telephone interviews were conducted among residential customers who requested a kit of energy-efficient products in 2011. A total of 100 interviews were completed from the 9,865 customer records which included both distribution methods – bill insert and direct mail.

The margin of error overall for 2011 is +/- 7.4 percentage points at the 90% confidence level.

Results

- Showerheads - Total (gross) installations were 63.0% for 2011 year-end and net installations (after removals) was 61.0%.
- Aerators - 50% of homes installed kitchen aerators, 33.8% of homes installed bathroom aerators.
- CFLs - 51.6% installed the light bulbs.
- Product removals were low: 2% for showerheads, 2% for kitchen aerators, 0.5 % for bathroom aerators and 0.8% for CFL light bulbs.
- The reduction rates above have been applied to the savings calculation

3.2 TAPS Partners Program 2011 Low Income Study

Background

Enbridge Gas Distribution sponsors and promotes an energy conservation program called TAPS. Participating contractors visit customers' homes to install low-flow showerheads, kitchen and bathroom faucet aerators and provide energy-saving compact fluorescent light bulbs (CFLs), at no charge to customers. Contractors visiting low income households also install programmable thermostats at no charge to customers.

Research is carried out to verify customer participation and to improve future program delivery.

Objectives

This analysis was completed to better understand measure distribution, installation and product removal in low income households.

The objectives of the Low Income TAPS research are to:

- determine if the customer received a home visit from a TAPS contractor, and
- determine the proportion of customers who received, installed and/or removed each of the energy-efficient products noted above.

Methodology

Telephone interviews were conducted among 100 low income residential customers who received a home visit from a TAPS contractor during 2011. In 2011, four contractors participated in the Low Income TAPS program. Results for 2011 were not weighted. The margin of error for 2011 is +/-7.2 percentage points at the 90% confidence level.

Results

<u>Verification of Visits</u>

The chart below shows the proportion of households in 2011 who said they did not receive a visit from a TAPS contractor.

Table 14: Verification of Visits

Call Disposition and Verification of Visit for Total Interviews - Low Income TAPS			
	2009	**2010**	**2011**
Total households as per data file	1,589	283	419
Respondent did not receive TAPS visit	5%	1%	2.9%

The remainder of this report pertains to the 100 customers interviewed who recalled receiving a visit from a TAPS' contractor during 2011.

Summary of Product Receipt, Installation and Removal

- 74% of households said the contractor installed a programmable thermostat in 2011. This was an increase in comparison to 2010 (53%). Overall, 97% of households reported receiving aerators in 2011. The proportion of households reporting they had a kitchen aerator installed (80%) was higher than the reported installation of bathroom aerators (67%). 2% of households removed their kitchen aerators and 0% removed their bathroom aerators.
- 95% of households reported receiving energy-efficient CFLs. 59.0% of homes installed the CFLs and 96.9% of those households who installed the bulbs used them to replace incandescents.
- 1% of households removed the CFL light bulbs.
- 99% of households received energy-efficient showerheads and 81% had the showerheads installed. After removals, 80% of households had energy-efficient showerheads still installed in 2011.

Table 15: Receipt of Installation of Products

Receipt and Installation of Products				
	2008	**2009**	**2010**	**2011**
Base: Total households	18	144*	57	100
Programmable Thermostats				
- total installed	39%	69%	53%	↑ 74.0%
- installed (after removals)	33%	67%	53%	74.0%
- removed	6%	2%	0%	0.0%
Base: Total households	88	154	57	100
Kitchen and/or Bathroom Aerators				
- received	91%	66%	93%	97.0%
Kitchen Aerators				
- total installed	68%	45%	63%	↑ 80.0%
- contractor installed	41%	21%	25%	59.0%
- removed	1%	2%	4%	2.0%
Bathroom Aerators				
- total installed	55%	31%	53%	67.0%
- contractor installed	34%	16%	21%	↑ 52.0%
- removed	1%	1%	0%	0.0%
Base: Received CFLs as per contractor records	n/a	109	57	100
CFL Light Bulbs				
- received	n/a	93%	98%	95.0%
- total installed	n/a	62%	65%	59.0%
- removed	n/a	3%	0%	1.0%
Base: Received showerhead as per contractor records	88	101	55	100
Showerheads				
- received	89%	91%	95%	99.0%
- gross installed	77%	63%	80%	81.0%
- net installed	n/a	59%	76%	80.0%
- contractor installed	56%	42%	56%	65.0%

* Base lower as question revised part-way through Wave 1 2009

Source: Questions 1,3, 8a,8b,11, 15

The reduction rates shown in the table above have been applied to the savings calculation

3.3 Showerhead Verification among Rental Buildings Research Report

Background

The Multi-Residential Showerhead Program involves the replacement of conventional showerheads with low-flow showerheads in multi-residential buildings.

Enbridge Gas Distribution commissioned a third party to conduct research to verify the percentage of showerheads that have been installed and not removed in multi-residential units (within rental buildings only) that participated in the program during 2011.

Objectives

The objectives of this research are to sample a representative number of multi-residential units that have participated in the program and thereby to establish an estimate of showerheads that have been installed by the program and that remain installed.

Methodology

Statistical Approach

The 'two-stage random sampling' method was chosen to minimize the otherwise prohibitive cost of a simple random sampling methodology, which would require in-person visits to far more buildings. Under this approach, the initial step grouped certain smaller buildings (with lower numbers of units) into single clusters, and split larger buildings (with large numbers of units) into clusters with a similar number of units per cluster. Then, from the resulting population of clusters, 25 were randomly selected at the first stage of the two-stage random sampling process. Step-two generated random samples of approximately 20 installations (units/apartments) from each of the 25 clusters, for auditing. Only the units identified by Enbridge as having had the showerhead installed were included in sample selection.

A total of 493 inspections were conducted across 25 clusters (29 buildings). The results of this audit are accurate to within +/- 8.3%, 19 times of 20.

Physical Inspection Procedure

The property managers of the selected buildings were contacted, and dates and times were arranged for the inspection visits. The property manager was required to provide tenants with 24hrs notice of the inspection. On the day of each inspection, the inspector met the property manager at the building, and the property manager provided the inspector with access to each of the randomly selected units. The inspector recorded whether the showerhead installed had a 1.5 gpm marking on it. The inspector photographed the showerhead if the marking was not visible. Each showerhead record (or photo) was associated with a unit number, building number and address.

Upon completion of inspections, the data (including the photographs) were sent to Enbridge to re-confirm the low-flow showerheads identified by Ipsos.

Results

A total of 493 units were inspected across 29 of the 238 buildings. Inspections were conducted from March 7th to March 16th, 2012.

409 of the 493 units audited had showerheads with a 1.5 gpm marking on them. The percentage sample results for each building were applied to the total claimed for each building. The resulting weighted average for all buildings inspected is 84.5%, plus or minus 8.3%, accurate 19 out of 20 times.

Ipsos initially conducted this audit for Enbridge in 2011, looking to verify the low-flow showerhead installations from 2010. The audit in 2011 found that 85% of low-flow showerheads are still in place. Those results were very similar to the 84.5% reported this year (2012), indicating that the estimates are reliable, and that there was no significant change from 2011 to 2012, in terms of low-flow showerhead “keep” rates.

3.4 Verification Study of Commercial Custom Projects

Background

Each year, EGD commissions third party firms to undertake an engineering review of a random sample of the custom projects in the Commercial sector.

Purpose of the Study

The purpose of this study was to provide an objective opinion of the reasonableness of the natural gas, electricity and water savings claimed by the Commercial sector custom projects in 2011, through a review of a statistically representative sample of the projects.

EGD retained Building Innovation Inc. (BII) to conduct an engineering review of the savings for the 2011 Commercial sector custom projects which included Multi-Residential and Commercial Large New Construction projects.

Methodology

Using a sampling methodology developed for EGD and Union Gas by Summit Blue Consulting, Ipsos Reid randomly selected 26 Commercial projects to be reviewed by BII. The reviews involved site inspections with the clients to verify installations, utility savings results, project start-up and commissioning of measure, cost and purchase timing, and to discover any changes in building operation that would change the impact of savings, any unforeseen disturbances, and any savings measurements undertaken by the client. The savings calculations and methodology were reviewed and, where a more appropriate calculation was identified, the results of such a calculation were provided.

Results

Table 16 summarizes the variance between the claimed and revised savings as adjustment factors.

Table 16: 2011 Commercial Custom Projects Adjustment Factors

Gas Savings Factor	-2.6%
Electricity Savings Factor	-2.8%
Water Savings Factor	-1.0%

Results of the Engineering Review are shown below. Table 17 shows the claimed and revised savings for gas, electricity and water as recommended by BII.

Table 17: 2011 Commercial Sector Custom Project Verification Results

2011 Commercial Engineering Review Results	**Claimed**	**Recommended Revisions**
Commercial Projects Sampled	26	11
Gross Natural Gas Savings	6,886,322 m^3	6,707,460 m^3
Gross Electricity Savings	9,075,313 kWh	8,821,728 kWh
Gross Water Savings	32,897 m^3	32,570 m^3

3.5 Verification Study of Industrial Custom Projects

Background

Each year, EGD commissions third party firms to undertake an engineering review of a random sample of the custom projects in the Industrial sector.

Purpose of the Study

The purpose of this evaluation was to provide an objective opinion of the reasonableness of the savings natural gas, electricity and water savings claimed by the Industrial sector custom projects in 2011 through a review of a statistically representative sample of the projects.

Byron J. Landry & Associates Inc. was retained by Enbridge to conduct an engineering review of the savings for the 2011 Industrial custom projects.

Methodology

Using a sampling methodology developed for EGD and Union Gas by Summit Blue Consulting, Ipsos Reid randomly selected 15 Industrial projects to be reviewed by Byron J. Landry & Associates Inc. The reviews involved site inspections with the clients to verify installations, utility savings results, project start-up and commissioning of measure, cost and purchase timing, and to discover any changes in plant production that would change the impact of savings, any unforeseen disturbances, and any savings measurements undertaken by the client. The savings calculations and methodology were reviewed and, where a more appropriate calculation was identified, the results of such a calculation were provided.

Results

Table 18 summarizes the variance between the claimed and revised savings as adjustment factors.

Table 18: 2011 Industrial Custom Project Adjustment Factors

Gas Savings Factor	-0.7%
Electricity Savings Factor	0%
Water Savings Factor	-9.3%

Results of the Engineering Review are shown below. Table 19 shows the claimed and revised savings for gas, electricity and water as recommended by BII.

Table 19: 2011 Industrial Sector Custom Project Verification Results

2011 Industrial Engineering Review Results	Claimed	Recommended Revisions
Industrial Projects Sampled	15	3
Gross Natural Gas Savings	12,713,620 m^3	12,621,330 m^3
Gross Electricity Savings	4,030,813kWh	4,030,813 kWh
Gross Water Savings	106,024 m^3	96,140 m^3

3.6 Verification Study of Pre-Rinse Spray Valves

Background

During 2011, Enbridge Gas Distribution (Enbridge) promoted and implemented a Pre-Rinse Spray Valve Program (PRSV) to the Food Service sector. Contractors installed either a 0.64 or 0.65 GPM PRSV in participating establishments.

For the 2011 program year, 1,508 rebate forms were received and processed representing a total of 2,520 installed PRSVs.

Objectives

The objective of this research was to determine the installation and persistence level of PRSVs installed during 2011 in a sample of food service establishments within the Enbridge franchise territory. The estimate needed to be accurate to within +/-10% 9 out of 10 times. Enbridge contracted with Ipsos-Reid (Ipsos) to conduct the research.

Methodology

In order to meet statistical accuracy requirements, 65 food service establishment locations were randomly selected from the total list of participants (1,508 establishments). Each of the PRSVs installed at the selected location was inspected. The results are accurate as per the required level of statistical accuracy (+-10%, 9 times out of 10).

To further elaborate on the sampling methodology, 65 establishment locations was the amount required in order to obtain a representative sample from a population of 1,508 locations. Within each location, a census of the PRSVs was conducted, as every PRSV at that location was inspected. Due to the fact that every PRSV within the establishment was inspected, only the number of locations needed to be taken into account for the sample design.

Approach & Procedure

The on-site inspections were conducted by RIS Christie – a company that Ipsos has worked with in the past. Ipsos was responsible for overseeing all areas of the project.

The methodology for the physical inspections was designed to take into account anticipated field challenges. While only 65 locations were required to be audited, 260 (65 x 4) locations were randomly selected, foreseeing that certain locations may be inaccessible. The vendor then grouped the 260 locations into clusters of four,

based on proximity to one-another (i.e. all four locations within a cluster were closest to each other geographically). This was a way of ensuring that additional options were available in case access into a given establishment was not granted. If the auditor was not successful in getting into one of the four locations, he/she had three more possible locations to choose from.

The requirements for the inspection itself were as follows. Auditors were equipped with a short questionnaire/checklist, a digital camera and the original PRSV installation contract form signed by the establishment representative. The auditors were required to complete the checklist, indicating the following information:

1. The number of PRSVs that were supposed to have been installed as per the signed contract form.
2. The number of correct PRSVs (.64 or .65) that were still in use at the establishment.
3. The number of PRSVs that were removed.
4. The number of PRSVs that were not installed (but supposed to have been installed).

Also, for each PRSV that was still in use, the auditor was required to take a photograph of the actual valve, to prove that the correct valve was still in place. Where possible, the auditors were required to capture the GPM marking on the valve.

In cases where the PRSV was not in use, the auditors were required to take a picture of the sink/dishwashing area, to demonstrate that the correct valve was not in place.

The results and photographs were then reviewed and verified by both Ipsos and Enbridge, for final tabulation.

All forms and photographs, along with a spreadsheet summarizing the counts and analysis of data, were provided to Enbridge.

Results

Of the 99 PRSV's that were supposed to be in use within the 66 audited establishments, 33 (33.3% of total) were confirmed to be still in use. That is, 33 spray valves within the 66 locations were confirmed to be either 0.64 or 0.65 GPM. Inferring the 33.3% sample proportion onto the total "population" of 2,520 units across all 1,508 establishments, using a confidence level of 90%, the true proportion of low-flow PRSV's is between 23.3% and 43.3%.

- Percentage of low-flow PRSV's still in use = 33.3%
- Statistical inference = 33.3% plus or minus 10%, accurate 9 out of 10 times.

4.0 Natural Gas Savings

Gas savings estimates are a function of inputs such as participation numbers, free-ridership assumptions, base case assumptions and calculated or deemed savings that result from implemented projects & measures.

Table 20: Natural Gas Savings

2011 DSM Program	Net Annual Gas Savings	
EXISTING HOMES		
Water Conservation		
TAPS Partners Program - Showerheads over 2.5	4,427,064	
TAPS Partners Program - 2.1 - 2.5	1,255,085	
TAPS Partners Program - Kitchen Aerators	1,364,846	
TAPS Partners Program - Bathroom Aerators	314,458	
TAPS Partners - 13W CFLs (4 bulbs)	-	
TAPS ESK Showerheads 2.1 - 2.5	222,007	
ESK Kitchen Aerator	75,085	
ESK Bathroom Aerator	27,372	
TAPS ESK CFL 13w (4 bulbs)	-	
Total Existing Homes		**7,685,917**
RESIDENTIAL NEW CONSTRUCTION		
NC Energy Star Houses	1,167,239	
Total Residential New Construction		**1,167,239**
LOW INCOME		
LI TAPS Partners Program - Showerheads 2.5+	35,723	
LI TAPS Partners Program - Showerheads 2.0 - 2.5	7,171	
TAPS Low Income - 13W CFLs (2)	-	
TAPS Low Income - 23W CFLs (2)	-	
LI TAPS Partners Program - Kitchen Aerators	15,057	
LI TAPS Partners Program - Bathroom Aerators	3,374	
LI Prog Thermostats	23,374	
Total Low Income		**84,700**
TOTAL RESIDENTIAL		**8,937,855**

2011 DSM Program	Net Annual Gas Savings	
COMMERCIAL PRESCRIPTIVE		
Air Doors (Double)	63,912	
Air Curtains 8x8	28,747	
Air Curtains 8x10	8,984	
Air Curtains 10x10	39,150	
Condensing Boiler	158,215	
Condensing Boiler	11,363	
Demand Control Kitchen Ventilation (0 - 4999 CFM)	182,438	
Demand Control Kitchen Ventilation (5000 - 9999 CFM	480,115	
Demand Control Kitchen Ventilation (10000 - 15000 C	233,711	
Energy Recovery Ventilators (ERV)	247,545	
Ozone Laundry	806,880	
Small Commercial General	-	
SC High Efficiency Boiler over 300 MBH (Space)	729,491	
SC High Efficiency Boiler over 300 MBH (Water)	41,892	
SC High Efficiency Boiler under 300 MBH (Space)	24,357	
SC High Efficiency Boiler under 300 MBH (Water)	5,467	
Heat Recovery Ventilator (HRV)	707,134	
Infrared Heaters	1,346,155	
Pre-Rinse Spray Nozzle (0.64 GPM) (Full Service)	762,692	
Pre-Rinse Spray Nozzle (0.64 GPM) (Limited)	63,668	
Pre-Rinse Spray Nozzle (0.64 GPM) (Other)	19,484	
Energy Star Dishwashers Under High temp	24,030	
Energy Star Fryers	135,158	
Energy Star Stationary Rack - HT	24,265	
Energy Star Stationary Rack - LT	115,722	
ES Rack Conveyor - Multi	62,257	
ES Rack conveyor - Single	20,906	
High Efficiency Under-Fired Broilers	1,342	
Tankless Water Heaters	12,225	
Total Small Commercial		**6,357,308**
LARGE COMMERCIAL		
Hotels/Motels	1,273,182	
Offices	4,315,041	
Retail	186,230	
Warehouses	1,112,311	
Other Commercial	4,845,916	
Hospitals	2,723,752	
Long Term Health Care	76,043	
Government	733,445	
School	2,188,123	
College/University	514,396	
Total Large Commercial		**17,968,440**

MULTI RESIDENTIAL		
Multi-Residential Private	14,665,444	
Multi-Residential Non-Profit	5,939,008	
Multi-Residential Water Conservation		
Front Load Washer	41,909	
MR Showerheads Rental	1,324,089	
Multi-Res Showerheads Condo	20,861	
Total Multi-Residential		**21,991,311**
LARGE NEW CONSTRUCTION	3,706,499	**3,706,499**
INDUSTRIAL		
Industrial	17,119,029	
Agriculture	524,455	
Total Industrial		**17,643,484**
TOTAL BUSINESS MARKETS		**67,667,042**
TOTAL GAS SAVINGS (Bus. Markets & Residential)		**76,604,897**
Low Income Weatherization Scorecard Program		**824,773**
		77,429,670

5.0 LRAM Statement

Table 21 illustrates the LRAM volumetric variance by rate class and the amounts that will need to be returned to or collected from ratepayers. In total, $55,273 needs to be returned to ratepayers.

2011 Post-Audit LRAM Calculation

based on 55,774,692 FE m3 built into rates

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Distribution Margin	$	
Rate 1	6,988,269	4,500,606	(2,487,663)	~~5.5061~~	~~$ (136,974)~~	69%
Rate 6	13,764,114	17,963,563	4,199,448	~~3.3689~~	~~$ 141,475~~	-117%
~~Rate 100~~	~~0~~	~~0~~	~~0~~		~~$ -~~	~~0%~~
Rate 110	1,995,809	981,436	(1,014,373)	1.6252	$ (16,486)	28%
Rate 115	1,270,060	838,229	(431,831)	0.9911	$ (4,280)	12%
Rate 135	0	179,013	179,013	1.4002	$ 2,507	-5%
Rate 145	1,863,650	732,914	(1,130,736)	1.8106	$ (20,473)	31%
Rate 170	4,329,389	1,415,262	(2,914,127)	0.5676	$ (16,541)	81%
Totals	**30,211,292**	**26,611,023**	**-3,600,269**		~~**$ (50,773)**~~	
			Amount to be returned to Ratepayers		**$ (55,273)**	

Note: The variance for Rates 1 and 6 is managed through the Average Use True Up Variance Account (AUTUVA).

6.0 TRC Statement and SSM

Background

The Total Resource Cost (TRC) test is a cost-effectiveness test that values the energy savings resulting from DSM programs for society. The benefits are measured on the basis of discounted avoided gas, electricity, and water costs over the period for which the measure is in place. Costs include utility fixed costs associated with program delivery and customers' incremental equipment costs. The TRC is expressed as a net amount; when benefits exceed costs, a program is cost-effective. When the SSM was first approved, the Ontario Energy Board determined that it should be based on the TRC test results.

The SSM provides for an incentive to the Company for DSM activities. The Ontario Energy Board Decision in the Natural Gas DSM Generic Issues Proceeding stipulated a change to the SSM calculation for resource acquisition programs for the multi-year plan period 2007 through 2009[2].

With the OEB Decision to extend the multi-year plan for a second year to encompass 2011, the TRC target and SSM calculation were adjusted as described below.

Adjusted TRC Target and SSM calculation

The Decision in the DSM Generic Proceeding provides that the DSM target is calculated "by averaging the Utility's actual audited TRC results over the previous three years and applying to this figure an escalation factor equal to 1.5 times the amount by which the utility's budget is increased."

As a part of the 2011 DSM Plan submission (EB-2010-0175) the DSM budget formula was not changed from EB-2006-0021. However, there was an adjustment in the budget allocation between Resource Acquisition and Market Transformation programs. Therefore, the TRC target and SSM calculations were adjusted accordingly while retaining the maximum SSM allowable through EB-2006-0021 formulas. The charts below from the EB-2010-0175 submission illustrate the target calculation.

2 EB-2006-0021, Decision with Reasons, Ontario Energy Board, August, 2006, page 27-30

Settlement 2011 TRC and SSM 100% Target Calculation

This scenario assumes reduction of 2011 TRC equivalent of LI weatherization O&M

CURRENT

Operating Budget and TRC

		RA	MT	OH	
O&M (Baseline for 2011)	$26,708,068	$19,030,001.00	$ 1,600,000.00	$ 6,078,067.00	
O&M excldg LI Weatherization	$26,708,068	$ 17,752,201.00	$ 1,600,000.00	$ 6,078,067.00	
TRC (Baseline for 2011)	$148,020,982	$ 154,099,049.32	$ -	$ (6,078,067.00)	**O&M related to LI weatherization $1,277,800**
TRC excluding LI Weatherization		$ 153,494,067.32			**TRC related to LI weatherization $604,982**
	TRC per RA O&M	**$ 8.65**	**after LI-W adjustment**	$ 6,078,067.00	

SSM

	SSM - 2010	Prescribed O&M $	Consultative Offer April 20 O&M $
RA	$ 4,750,000	$ 17,752,201.00	$ 16,863,876.00
MT	$ 500,000	$ 1,600,000.00	$ 3,766,125.00
SSM Base	$ 5,250,000	$ 19,352,201.00	$ 20,630,001.00

Settlement Calculation

Operating Budget and TRC

	Settlement Summary	MT Breakdown	
A) Total O&M	$ 26,708,068.00	$ 1,536,125.00	Low Income Weatherization (Original)
B) MT O&M (settled value)	$ 3,766,125.00	$ 2,230,000.00	DWHR
C) Overheads	$ 6,078,067.00	$ 3,766,125.00	Total MT before Amended Low Income Weatherization
D) RA O&M (A-B-C)	$ 16,863,876.00	$ 1,366,375.00	Amended Low Income Weatherization
		$ 5,132,500.00	
E) TRC per RA O&M (from above)	$ 8.65		
F) Resulting TRC Gross value	$ 145,813,182.15		
G) Resulting TRC target (net of OH)	**$ 139,735,115.15**		

SSM

	SSM -2010	Consultative Last Counter 100% SSM Split	Consultative Last Counter 100% MT Split	Consultative Last Counter MT Split
RA	$ 4,750,000	4,000,000.00	650,000.00	DWHR
MT	$ 500,000	900,000.00	250,000.00	LI Weatherization
SSM Base	$ 5,250,000	4,900,000.00	900,000.00	Total

Settlement 2011 SSM Payment vs Target Calculation

% of pivot	2010 RA SSM Payouts	Revised MT SSM Payouts	Revised Total Available SSM	Revised Increment Payments	Revised
25%	***$200,000***			**$800**	For achievement of between 0 and up to 25.0% of the annual target, the SSM payout shall equal $800 for each 1/10 of 1% of target achieved.
50%	***$600,000***			**$1,600**	For achievement of greater than 25.0% up to 50% of the annual target, the SSM payout shall equal $200,000 plus $1,600 for each 1/10 of 1% of target achieved.
75%	***$2,000,000***			**$5,600**	For achievement of greater than 50.0% up to 75.0% of the annual target, the SSM payout shall equal $600,000-plus $5,600 or each 1/10 of 1% of target achieved above 50.0%, and
100%	***$4,000,000***	$900,000	$4,900,000	**$8,000**	For achievement of greater than 75.0% of the annual target, the SSM payout shall equal $2,000,000 plus $8,000 for each 1/10 of 1% of target achieved above 75.0% to a maximum of the SSM annual cap.
125%	***$6,000,000***	$900,000	$6,900,000		Up to 125% of the annual target, a total payout of $6,000,000.
over 125% (Note2)	***$8,100,000***	$900,000	$9,000,000		In excess of 125% of the annual target, a total that is capped at no more than $8,100,000 for 2007. The parties agree that the annual 'cap' of $8.1 million will increase annually by the Ontario CPI as determined in October of the preceding year.

Notes:

1. Proposed 2011 Resource Acquisition SSM payouts are set based on settled 100% of Target SSM value

2. 2010 over 125% Resource Acquisition SSM cap will be adjusted for October, 2010 CPI value. This is as per the 2006 Generic Hearing decision

Cap + CPI Calculation

	$8,100,000
1.73%	$8,240,130
1.05%	$8,326,651
1.82%	$8,478,196

The Enbridge 2011 target as per the Settlement Agreement formula is presented in Table 21 below, together with the preliminary target developed using the original formula.

The 2011 target calculation has been reviewed and approved by the auditor, Nexant.

Table 21: 2011 TRC Target Calculations

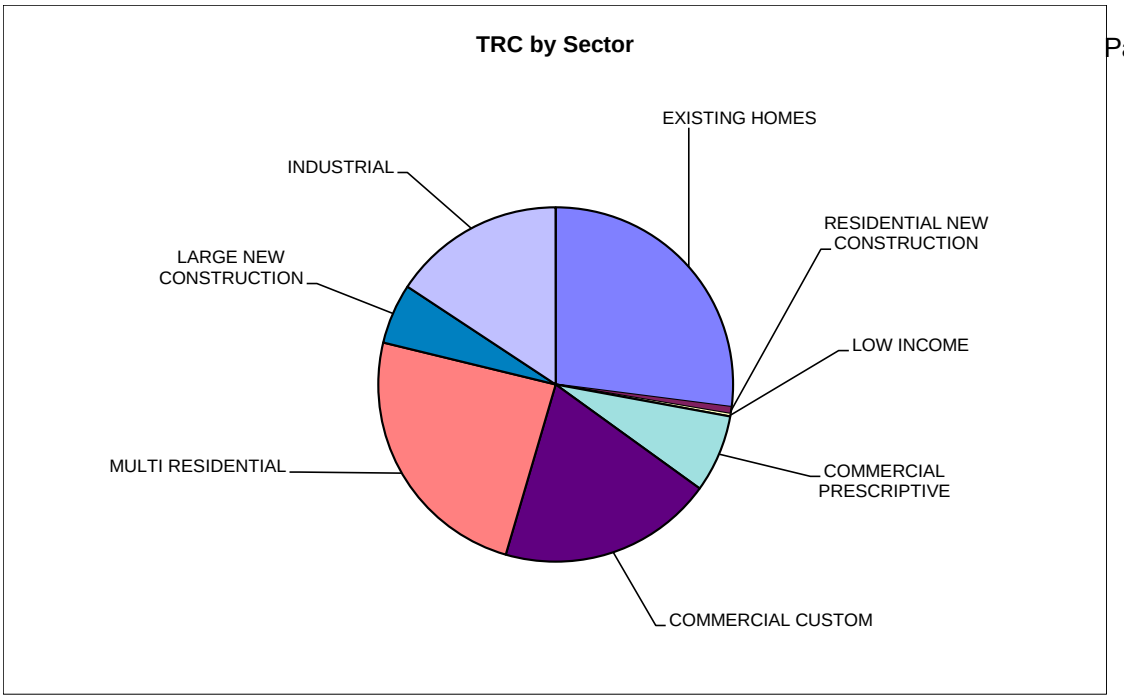
Actual Audit 2008 SSM TRC Results	Actual 2008 TRC results for LRAM with Final 2011 avoided costs	Actual Audit 2009 SSM TRC Results	Actual 2009 TRC results for LRAM with Final 2011 avoided costs	2010 SSM TRC Audit at Jun 29 2011	Audit 2010 LRAM TRC Results at Dec 13 2011 with Final 2011 avoided costs	Preliminary 2011 Target	2011 TRC Target per settlement
A	B	C	D	E	F	=(B+D+F)/3 * 1.075%	
$182,706,679	$146,216,779	$215,833,455	$130,533,176	$184,593,043	$136,331,856	$148,020,982	$139,735,115

6.1 TRC Results for Resource Acquisition Programs

6.1.1 TRC Results

Table 22: 2011 TRC Results by Sector

	TRC	% of Total
EXISTING HOMES	$ 48,461,257	27%
RESIDENTIAL NEW CONSTRUCTION	$ 1,125,396	1%
LOW INCOME	$ 423,000	0%
COMMERCIAL PRESCRIPTIVE	$ 12,666,641	7%
COMMERCIAL CUSTOM	$ 35,107,055	20%
MULTI RESIDENTIAL	$ 43,502,690	24%
LARGE NEW CONSTRUCTION	$ 9,840,561	5%
INDUSTRIAL	$ 28,170,403	16%
Total	**$ 179,297,002**	**100%**
Prog. Dev. & Market Research	$ (124,960)	
Overheads	$ (5,988,693)	
Net Total	**$ 173,183,348**	



6.1.2 SSM for Resource Acquisition Programs

The table below provides a summary of the 2011 SSM for all DSM resource acquisition programs using the SSM calculation based on the formula detailed above which was completed in consultation with the intervenors and approved by the Board in the 2011 Plan.

Table 23: 2011 SSM Resource Acquisition Programs

2011 YTD Actual TRC	**$173,183,348**		
TRC Target	**$139,735,115**		
% of Target	**% x Target**	**SSM payouts**	**SSM**
25%	34,933,779	200,000	$ -
50%	69,867,558	600,000	$ -
75%	104,801,336	2,000,000	$ -
100%	139,735,115	4,000,000	$ -
125%	174,668,894	6,000,000	$ 5,914,950.76
over 125%		9,111,263	$ -

6.2 SSM for Drain Water Heat Recovery System Market Transformation Program and Low Income Weatherization Scorecard Program

6.2.1 Drain Water Heat Recovery System (DWHRS)

Background

Enbridge launched the Drain Water Heat Recovery program in the low rise Residential New Construction market in 2009. Program changes made in 2010 to track units installed and incremental first time builders were continued into 2011.

DWHRS Scorecard

Table 24: SSM DWHRS Market Transformation Program

Drain Water Heat Recovery		2011 Metric Value Levels			Weight	2011 Metric Value Actual results	SSM Achievable at 100%	SSM Achieved
Element	**Metrics**	50%	100%	150%				
ULTIMATE OUTCOMES	a) Units Installed (new build) as percentage of 2010 housing starts (across all builders). Builder incentive of $400 per unit.	4800	5280	6000	/80	2168	$520,000	$117,438
PROGRAM PERFORMANCE	b) 1st time new Builders enrolled (incremental)	20	25	30	/20	60	$130,000	$195,000
							Total	**$312,438**

DWHRS Results

Two key metrics were measured: units installed and 1st time builders enrolled. The first time builders enrolled totaled 60 builders, exceeding the 150% target. The SSM achievable for this metric at 150% is $195,000. The other key metric, number of units installed as a percentage of 2011 housing starts, totaled 2168 units which results in an SSM of $117,438 for this metric.

The total SSM achieved for this market transformation program is $312,438.

6.2.2 Weatherization Scorecard Program

Background

The Ontario Energy Board stated its expectation for Enbridge to file an amendment to the Low Income Plan in respect of the government's policy to increase conservation programs and additional funding for low income programs. In accordance with the Board's request, Enbridge filed a Low Income amendment to the 2011 DSM plan. The amendment was accepted and the scorecard elements, performance metrics, and SSM formula were approved by the Board. Program results can be found in Table 25 below.

Weatherization Scorecard

Table 25: SSM Weatherization Scorecard Program

Weatherization		2011 Metric Value Levels			Weight	2011 Metric Value Actual	SSM Achievable at 100%	SSM Achieved
Element	Metrics	50%	100%	150%				
ULTIMATE OUTCOMES	Weatherization Participants	400	500	575	/50	599	$200,000	$ 300,000
ULTIMATE OUTCOMES	Total Natural Gas Savings (m3)	615100	773650	894950	/50	824,773	$200,000	$ 242,146
							Total	**$ 542,146**

Weatherization Results

Two key metrics were measured. Weatherization participants totaled 599 exceeding the 150% target. The SSM achievable for this metric at 150% is $300,000. The other key metric, natural gas savings (m3) totaled 824,773 m3 which results in an SSM of $242,146 for this metric.

The total SSM achieved for this scorecard program is $542,146

7.0 DSMVA Statement

The purpose of the DSM Variance Account (DSMVA) is outlined in the EB-2006-0021 in Decision with Reasons, page 30. The Decision states that "If spending is less than what was built into rates, ratepayers shall be reimbursed. If more is spent than was built into rates, the utility shall be reimbursed up to a maximum of 15% of its DSM budget for the year. All additional funding must be utilized on incremental program expenses only (i.e. cannot be used for additional utility overheads). There should be no limit on the amount of under spending from budget that should be returned to ratepayers."

The Enbridge 2011 DSM Plan (EB-2010-0175 filed 2010-05-28) established the Enbridge 2011 DSM budget at $26,708,068.

In the Board's Decision of September 24, 2010, regarding Enbridge's 2011 DSM Plan, (EB-2010-0175), the Board stated its expectation for Enbridge to file an amendment in respect of the government's policy to increase conservation programs for low income customers and provide additional funding for low income programs.

On November 11, 2011 Enbridge filed an amended Low Income Weatherization plan. The amended plan requested approval for an incremental budget amount of $1,366,375, to be allocated to the Low Income Weatherization program. This amount was incremental to the existing Board-approved 2011 DSM budget of $26,708,068 (EB-2010-0175, Exhibit B, Tab 1, Schedule 3).

On December 20, 2010, the Board issued its EB-2010-0175 Decision and found that Enbridge's proposed low income amendment to its 2011 DSM plan is generally consistent with the approved DSM framework established in the Generic DSM Proceeding. The Board therefore approved Enbridge's low income amendment to its 2011 DSM plan. This resulted in a total Board approved budget for 2011 of $28,074,443.

An initial approved budget of $26,708,067 was built into rates. Total program spending was $27,243,872, resulting in a variance of $535,805 to be recovered from ratepayers.

The 2011 DSMVA of $535,805 as aforementioned is shown on Table 26.

Table 26: DSMVA

	2011 Budget OEB Approved and built into Rates	2011 Additional Low Income Budget Amount OEB Approved NOT built into Rates	Total OEB Approved Budget	2011 Actual
Mass Markets				
Residential				
Total	**$ 5,204,216**		**$ 5,204,216**	**$ 4,530,332**
Market Transformation				
Residential				
Total	**$ 2,230,000**		**$ 2,230,000**	**$ 1,851,730**
Low Income				
Original OEB Approved Budget			$ 1,536,125	
Additional funding*			$ 1,366,375	
Total	**$ 1,536,125**	**$ 1,366,375**	**$ 2,902,500**	**$ 2,659,179**
Program Dev & Mkt Research				**$ 124,960**
Small Commercial				
Total	**$ 1,660,920**		**$ 1,660,920**	**$ 1,213,489**
Business Markets				
Large Commercial				
Total	**$ 5,073,400**		**$ 5,073,400**	**$ 8,047,550**
Industrial				
Total	**$ 4,925,339**		**$ 4,925,339**	**$ 2,827,939**
Overheads	**$ 6,078,067**		**$ 6,078,067**	**$ 5,988,693**
Total	**$ 26,708,067**		**$ 28,074,442**	**$ 27,243,872**
Recoverable from Ratepayers				**$ 535,805**

8.0 Status Updates for 2010 Auditor and EAC Recommendations

Auditor Recommendations

1. Complete an evaluation study to investigate showerhead "bag testing" accuracy to determine existing stock (baseline) showerhead flow rates.

Enbridge Response**:** EGD will discuss this with the 2011 EAC in its review of evaluation research priorities.

EAC Response**:** The EAC endorses this response.

Status Update**:** This research was reviewed with the EAC however was not a research priority. In 2012 EGD no longer completes residential bag tests as the program design has been changed from contractor delivery to self install kit.

In 2012 EGD will discuss with the EAC if and when bag tests should re-commence and the intervals required between testing.

2. For prescriptive measures, include in the tracking databases and spreadsheets the definition of a participation unit (i.e. household, device or device group)

Enbridge Response: EGD agrees to define participant units in the tracking databases, spreadsheets and tables in the Annual report.

EAC Response: The EAC endorses this response.

Status Update: EGD is in the process of capturing definitions of all units used in databases, and spreadsheets and in tables in the 2011 Annual report.

3. Create a uniform, consistent calculation format for calculation of reduction factors based on Verification Reports for residential programs

Enbridge Response: EGD agrees to implement the calculation format proposed by Nexant to consistently track residential reduction factors for TAPS and ESK. An example of the format is shown below.

2010 Reduction Factor Summary								
Quarter	Q1	Q2	Q3	Q4	Full Year			
Program	Reduction Factor	Reduction Factor	Reduction Factor	Reduction Factor	Total Participants	Total Adjusted Participants	Final Reduction Factor	ssm values
Participant SH2.6+	40.56%	37.34%	38.91%	37.32%	98,683	61,126	38.06%	38.06%
Participant SH2.0-2.5	40.56%	37.34%	38.91%	37.32%	53,721	33,181	38.24%	38.24%
Aerators(K)	39.61%	32.38%	38.62%	37.63%	153,148	97,268	36.49%	36.49%
Aerators(B)	50.50%	45.00%	45.00%	45.55%	153,110	83,251	45.63%	45.63%
CFL 13 w (4 bulbs)	19.76%	13.82%	14.51%	14.16%	153,172	130,729	14.65%	11.41%

Quarter	Q1						
Input Source	*Verification Survey Results*				*Calculated*	*From Mass Market Reports*	*Calculated*
Program	% Materials Distributed	% Materials Installed	% Material Remaining after Removal	% Showers taken on Enbridge Showerhead or #CFLs Replacing Incandescents/	Reduction Factor	Participants	Adjusted Participants
Participant SH2.6+	100%	86%	96%	72%	40.56%	8,035	4,776
Participant SH2.0-2.5	100%	86%	96%	72%	40.56%	5,175	3,076
Aerators(K)	100%	61%	99%	100%	39.61%	13,213	7,979
Aerators(B)	100%	50%	99%	100%	50.50%	13,200	6,534
CFL 13 w (4 bulbs)	88%	100%	98%	93%	19.76%	13,193	10,586

Note: Q1 reduction factor calculated by 1-(100%*86%*96%*72%) and participation number * reduction factor = adjusted participant number

Reduction factors from each month carried up into year summary chart and final reduction factor is calculated by taking 1-(adjusted participants/total participants)

EAC Response: The EAC endorses this response.

Status Update: EGD implemented the calculation format proposed by Nexant for 2011 residential TAPS and ESK program results

4. Remove unused fields in TRC/SSM spreadsheet (which is used to calculate final impacts for the Annual Report)

Enbridge Response: EGD has requested a list of specific fields from Nexant and will agree to hide fields that have proven not to be valuable for past auditors or for explanation of EGD results.

EAC Response: The EAC endorses this response.

Status Update: EGD did not receive a list of fields from Nexant however the Company will review the TRC spreadsheet to clear any field that may not be deemed as valuable for the auditor.

5. Change the manner (i.e. format) that adjustment factors are incorporated in the TRC/SSM spreadsheet for ease of use

Enbridge Response: EGD will label adjustment factors within the TRC/SSM spreadsheet for ease of use for future auditors.

EAC Response: The EAC endorses this response.

Status Update: Adjustment factors within the TRC/SSM spreadsheet have been labeled for 2011.

6. Complete a Custom Projects Attribution Study

Enbridge Response: EGD will discuss this with the 2011 EAC in review of evaluation research priorities.

EAC Response: The EAC endorses this response.

Status Update: EGD has discussed this with the 2011 EAC and it has been deemed as a priority research item. The Company expects to begin the study in 2012 in consultation with the Technical Evaluation Committee.

7. Specify that contractors completing Engineering Reviews provide statement of advancement vs. replacement issue in final report

Enbridge Response: EGD will incorporate this recommendation into the RFPs for future Engineering Reviews under scope of work.

EAC Response: The EAC endorses this response.

Status Update: Enbridge has requested that Engineering Review firms provide this statement as part of the 2011 report.

EGD will incorporate this requirement in the 2012 RFP.

8. Complete a pre-rinse spray valve verification study

Enbridge Response: As per agreement with the 2010 EAC, EGD is proceeding with spot checks and if warranted, a verification study will be considered. EGD will discuss this item further with the 2011 EAC when reviewing evaluation priorities.

EAC Response: The EAC endorses this response.

Status Update: EGD discussed this with the EAC and a verification study of 2011 results was completed in 2012.

9. Consider making efforts to track custom project applications resulting from industrial support programs

Enbridge Response: EGD agrees to investigate the feasibility of tracking custom project applications resulting from industrial support programs.

EAC Response: The EAC endorses this response.

Status Update: Enbridge has investigated the feasibility of tracking custom project applications resulting from industrial support programs. The outcome is that Enbridge is putting measures in place to track the implementation rates of our facility energy audits.

10. Require that contractors use significant digits within each Verification Report for Residential Programs

Enbridge Response: EGD will request that the verification contractors present their report results using 1/10th of a percent. .

EAC Response: The EAC endorses this response.

Status Update: EGD has requested that final year end verification report results for 2011 are taken to the 1/10th of a percent.

11. Require that contractors calculate the final reduction factors in each Verification Report for residential programs

Enbridge Response: See recommendation #3 – EGD will calculate final reduction factors using format proposed by Nexant.

EAC Response: The EAC endorses this response.

Status Update: EGD calculated final reduction factors in 2011 using the format proposed by Nexant. Numbers used within the format are taken directly from the contractor's verification reports.

12. Determine a responsible party for calculation of precision levels for adjustment factors resulting from Commercial & Industrial Custom Engineering Reviews.

Enbridge Response: The sampling methodology for Custom Engineering Reviews was developed in consultation with both EGD and Union's EACs. EGD will initiate discussions with Union and with the EACs to:

- Revisit level of precision after initial sample taken
- Determine where in process this should be done and by when in order to meet deadlines
- Where precision is less than target, determine whether to revisit and if so, how

EAC Response: The EAC endorses this response.

Status Update: Precision levels will be reviewed by the sampling contractor when the results of the engineering review of the initial sample are available.

If the initial sample does not meet the precision target, Enbridge will discuss alternative approaches with the Technical Evaluation Committee (TEC).

13. Include a focus on validating participation numbers and key project level data entered in the TRC/SSM spreadsheet in future audits. Key metrics should be validated upstream in the tracking process.

Enbridge Response: The 2010 Audit Terms of Reference and years prior included auditing for validation of participant numbers.

EGD will consider this recommendation as a candidate for priority audit review in future audits.

EAC Response: The EAC endorses this response.

Status Update: This recommendation will be flagged during discussions with the auditor and the EAC regarding the Audit Workplan.

14. A) Require that future Engineering Reviews include a more detailed review and discussion of industrial project costs. B) In addition, Enbridge should consider tracking additional program metrics which may provide more information to explain the benefit-cost ratios such as savings per participant and number of projects implemented as a percentage of the projects recommended by Enbridge.

Enbridge Response: A) Project Costs – EGD will incorporate this recommendation into the RFP's in future Engineering Reviews under scope of work. B) EGD will estimate the cost and benefits and bring the analysis forward to the 2011 EAC for discussion.

EAC Response: The EAC endorses this response.

Status Update: A) The 2012 RFP will include a requirement for more detailed review and discussion of industrial project costs. B) Enbridge will discuss this recommendation with the 2012 TEC (Technical Evaluation Committee).

15. Consider allocating more program budget to custom project verification in order to increase precision levels to 90/10

Enbridge Response: EGD will consider this recommendation when allocating budget on evaluation priorities and will also discuss with Union and the TEC. Also refer to audit recommendation #12.

EAC Response: The EAC endorses this response.

Status Update: Please refer to audit recommendation #12 for status update.

16. Require that the consultants in future years completing the residential verification work to analyse the effects of using the results of verification surveys on participants outside of the sampled population on the confidence and precision levels. In addition, the consultants should make adjustments required to the sampling strategy in order to ensure that the target 90/10 confidence and precision level is achieved.

Enbridge Response: EGD will continue to ensure that 90/10 level of confidence is reached and will have the consultants document in the reports the effect of un-sampled population on the validity of results.

EAC Response: The EAC endorses this response.

Status Update: After investigation, it was found that the population falling outside of the sample size in 2010 was due to counting participants before we had valid data to be able to include them in the survey for verification. In 2011, Enbridge did not accept participants into the population unless they included valid data in order to contact the participants for verification.

Therefore, there was no need to have the consultants report on the effect of un-sampled population.

17. Improve the steam trap research in future iterations of the work by providing additional details regarding the types of steam traps studied. In addition, include in the report an analysis of the statistical significance of the results.

Enbridge Response: As feasible, EGD will collect information regarding the types of steam traps studied. In addition, EGD will included, in future RFP's, that an analysis of the statistical significance of the results be documented.

EAC Response: The EAC endorses this response.

Status Update: After investigation, it was determined that it is not feasible at this time for Enbridge to be collecting additional details regarding the types of steam traps studied.

Enbridge will include in future RFPs that an analysis of the statistical significance of the result be documented.

Appendix A: Summary Overviews of 2011 DSM Program

This section of the report provides a summary of the 2011 DSM Program results presented by program category and by technology. Separate tables are presented for custom programs and prescriptive programs.

Note: Tables 29 – 34 are based on pre-audit results and are suitable for illustrative purposes only.

Table 29: Summary Overview by Program Category: Prescriptive Programs

Program Category	Sum of Net TRC Benefits	Sum of Net annual gas savings	Sum of Net kWh	Sum of Net Water Savings m3	Sum of Participants / Units	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total incentive payments
Low Income	422,179	85,362	163,107	19,023	5,003	10	57,798	54,203
Multi-Residential Water Conservation	5,845,837	1,386,859	141,847	327,039	26,125	10	504,349	317,311
Residential New Construction	1,125,396	1,167,239	1,662,570	0	2,205	13	3,669,120	147,300
Schools	1,562,527	736,416	0	0	38	25	340,373	71,000
Small Commercial	12,666,641	6,357,308	3,542,058	242,758	4,571	16	5,258,260	936,063
Water Conservation	48,867,106	7,754,910	17,554,129	2,376,342	615,874	10	2,644,673	4,155,010

Table 30: Summary Overview by Program Category: Custom Programs

Program Category	Sum of Net TRC Benefits	Sum of Net annual gas savings	Sum of Net kWh	Sum of Net Water Savings m3	Sum of Participants / Units	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total incentive payments
Agriculture	652,597	520,228	-3,256	0	15	12	183,733	70,275
College/University	1,664,200	513,507	1,064,259	11,701	13	18	497,345	62,291
Government/Municipalities	1,469,874	731,511	1,553,673	5,954	31	13	471,620	82,382
Hospitals	4,400,043	2,715,999	1,259,265	1,026	31	12	1,676,444	305,363
Hotel/Motel	5,209,769	1,269,335	3,454,101	24,015	10	22	949,980	149,020
Industrial	28,008,352	16,962,619	3,194,674	68,614	112	14	5,793,109	1,773,771
Large New Construction	10,187,820	3,701,445	6,632,186	0	56	25	6,416,323	493,471
Long Term Health Care	230,153	75,810	111,380	0	3	18	47,811	12,258
Multi-Res Non-Profit	10,318,762	5,906,555	1,477,904	0	146	18	3,382,916	1,128,163
Multi-Res Private	27,058,067	14,626,758	4,405,754	8,218	320	18	7,915,120	2,609,422
Office	9,909,186	4,302,370	3,146,642	3,768	55	16	2,196,538	574,731
Other Commercial	7,124,476	4,844,643	1,368,825	24,340	32	22	4,812,707	555,293
Retail	351,302	185,658	244,999	0	11	16	278,353	26,542
Schools	2,151,585	1,447,562	1,104,495	0	149	11	914,827	180,044
Warehouses	1,472,423	1,109,136	-18,204	0	20	16	819,286	134,439

Table 31: Summary Overview by Technology: Prescriptive Programs

Technology	Sum of Net TRC Benefits	Sum of Net Annual Gas savings m^3	Sum of Net kWh	Sum of Net Water savings m3	Sum of Participants/ Units	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total incentive payments
Aerator	10,346,138	1,811,801	0	612,462	315,778	10	217,892	0
Air Curtain	75,088	76,881	-27,181	0	7	15	58,473	0
Air Doors	61,619	63,912	42,761	0	44	15	104,500	12,200
Boiler - Hydronic High Efficiency	1,562,527	736,416	0	0	38	25	340,373	71,000
CFL	9,762,898	0	17,693,421	0	153,857	8	0	0
Condensing Boiler	237,269	169,578	0	0	59	25	198,226	25,000
Energy Star	1,138,093	1,167,239	1,662,570	0	2,205	25	3,669,120	147,300
Energy Star Broiler	1,385	1,342	10	0	1	12	1,016	0
Energy Star Dishwasher	152,080	24,030	112,620	3,384	50	10	-390	0
Energy Star Fryer	114,395	135,158	2,122	0	156	12	128,294	0
Energy Star Rack Conveyor	732,946	83,164	358,758	11,712	36	20	27,374	0
Energy Star Stationary Rack	869,413	139,986	256,926	19,703	221	15	-61,880	0
ERV	303,711	247,545	0	0	31	14	180,764	70,400
Front Load washer	236,379	41,909	141,847	20,819	398	11	214,920	32,250
HRV	824,361	707,134	0	0	46	14	559,584	-250
Infrared	2,442,018	1,346,155	330,329	0	1,028	20	1,053,394	48,650
Kitchen Ventilation	2,602,993	896,264	2,411,870	0	97	15	1,254,000	65,500
Ozone Laundry	1,417,262	806,880	53,845	42,223	65	15	831,892	0
Pre-Rinse Spray Nozzle	1,569,220	845,845	0	165,736	2,529	5	379,350	383,470
Showerhead	34,750,595	7,350,047	0	2,089,122	176,367	9	2,732,778	4,494,274
Small Commercial General	-277,426	0	0	0	0	0	0	327,843
Small Commercial High Eff Boiler	1,427,954	801,208	0	0	120	25	631,140	0
Tankless	112,355	12,225	0	0	81	18	-87,477	3,250
Thermostat - Programmable	26,416	23,374	23,815	0	602	15	41,230	0

CFL: Compact Fluorescent Light bulb

Table 32: Summary Overview by Technology: Custom Programs

Technology	Sum of Net TRC Benefits	Sum of Net Annual Gas savings m^3	Sum of Net kWh	Sum of Net Water savings m3	Sum of Participants/ Units	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total incentive payments
Air Curtain	21,299	11,340	4,062	0	1	15	5,203	1,323
Air Handling Unit	2,310,195	688,521	1,369,292	0	6	15	136,228	109,126
Boiler - Hydronic Condensing - Advanceme	377,561	739,571	23,869	0	15	10	841,798	137,104
Boiler - Hydronic Condensing - Replaceme	8,778,939	4,949,255	0	0	94	25	3,808,495	1,109,616
Boiler - Hydronic High Efficiency	15,398,514	6,265,594	6,632,186	0	128	25	7,781,071	824,021
Boiler - Hydronic High Efficiency - Adva	1,438,538	1,879,535	0	0	17	11	1,682,330	245,455
Boiler - Hydronic High Efficiency - Repl	11,431,997	5,221,837	0	0	89	25	1,969,171	870,577
Boiler - Steam - Advancement	212,057	20,727	297,142	3,144	1	8	12,500	3,316
Boiler - Steam - Replacement	611,663	274,522	61,320	0	2	25	124,025	30,624
Building Envelope	150,671	69,622	0	0	1	25	14,574	11,218
Burner	161,351	121,852	0	0	2	15	78,172	19,110
Condensing Economizer	600,263	455,882	0	0	2	15	262,021	106,863
Controls	14,783,701	7,172,152	6,354,823	10,595	150	15	5,141,260	936,011
Destratification	862,047	799,480	-111,737	0	22	15	649,725	104,541
Direct Contact Water Heater - Advancemen	19,854	25,092	0	175	1	10	18,999	4,043
Drain Water Heat Recovery	1,149,269	556,488	-14,199	17,343	7	25	516,608	28,708
Economizer	5,232,397	4,630,324	733,117	24,340	5	15	5,043,303	556,264
ERV/HRV	114,085	197,809	21,072	0	4	14	290,100	25,493
Furnace	444,244	390,846	0	0	4	18	360,204	62,976
Greenhouse Curtains	218,797	384,349	0	0	9	10	341,611	52,002
Heat Recovery	4,782,940	2,439,455	58,058	20,610	14	16	989,135	297,137
Industrial Equipment	14,237,002	6,914,064	796,062	34,699	22	20	2,188,242	636,704
Infrared	120,139	92,466	3,178	0	4	20	95,290	12,159
Insulation	228,998	186,547	0	0	5	15	119,875	29,918
Insulation/Caulking/Sealing	84,049	157,047	0	0	70	15	235,580	20,423
Linkageless Control	266,812	171,028	33,451	0	4	15	81,233	27,557
Make Up Air Unit	128,402	74,887	0	0	1	15	24,012	13,658
Operational Improvements	3,448,413	3,223,923	1,885,907	7,603	111	5	205,260	402,631
Oven	21,769	23,224	0	0	1	15	21,663	3,742
Ozone Laundry	188,497	65,957	-8,749	10,127	1	15	96,800	0
Pipe Insulation	59,083	67,422	0	0	4	15	66,621	9,345
Reflective Panel	421,503	348,440	0	0	17	15	287,657	35,274
Roof Top Unit	24,274	21,397	0	0	2	15	15,742	3,448
Showerheads	146,335	36,760	0	8,218	3	10	13,356	4,510
Steam Trap	3,392,711	4,281,277	0	3,289	41	5	264,420	168,783
Thermostat - Programmable	10,056	4,984	0	0	1	15	88	582
VFD	17,075,390	5,019,394	11,098,126	963	135	15	2,510,735	1,036,825
Waste Water Reduction	251,656	77,037	0	6,530	1	15	2,500	0

ERV: Energy Recovery Ventilation
HRV: Heat Recovery Ventilation
VFD: Variable Frequency Drive

Table 33: Natural Gas Savings per $1 of Incremental Cost and $1 of Incentive Payments by Technology

Technology	Sum of Net annual gas savings	Sum of Total Net Incremental costs	Gas Savings/m³ per $1 of Incremental costs	Sum of Total incentive payments	Gas Savings/m³ per $1 of Incentive Payments
Aerator	1,811,801	217,892	8.32	0	N/A
Air Curtain	88,220	63,676	1.39	1,323	66.68
Air Doors	63,912	104,500	0.61	12,200	5.24
Air Handling Unit	688,521	136,228	5.05	109,126	6.31
Boiler - Hydronic Condensing - Advanceme	739,571	841,798	0.88	137,104	5.39
Boiler - Hydronic Condensing - Replaceme	4,949,255	3,808,495	1.30	1,109,616	4.46
Boiler - Hydronic High Efficiency	7,002,009	8,121,444	0.86	895,021	7.82
Boiler - Hydronic High Efficiency - Adva	1,879,535	1,682,330	1.12	245,455	7.66
Boiler - Hydronic High Efficiency - Repl	5,221,837	1,969,171	2.65	870,577	6.00
Boiler - Steam - Advancement	20,727	12,500	1.66	3,316	6.25
Boiler - Steam - Replacement	274,522	124,025	2.21	30,624	8.96
Building Envelope	69,622	14,574	4.78	11,218	6.21
Burner	121,852	78,172	1.56	19,110	6.38
Condensing Boiler	169,578	198,226	0.86	25,000	6.78
Condensing Economizer	455,882	262,021	1.74	106,863	4.27
Controls	7,172,152	5,141,260	1.40	936,011	7.66
Destratification	799,480	649,725	1.23	104,541	7.65
Direct Contact Water Heater - Advancemen	25,092	18,999	1.32	4,043	6.21
Drain Water Heat Recovery	556,488	516,608	1.08	28,708	19.38
Economizer	4,630,324	5,043,303	0.92	556,264	8.32
Energy Star	1,167,239	3,669,120	0.32	147,300	7.92
Energy Star Broiler	1,342	1,016	1.32	0	N/A
Energy Star Dishwasher	24,030	-390	-61.62	0	N/A
Energy Star Fryer	135,158	128,294	1.05	0	N/A
Energy Star Rack Conveyor	83,164	27,374	3.04	0	N/A
Energy Star Stationary Rack	139,986	-61,880	-2.26	0	N/A
ERV	247,545	180,764	1.37	70,400	3.52
ERV/HRV	197,809	290,100	0.68	25,493	7.76
Front Load washer	41,909	214,920	0.20	32,250	1.30
Furnace	390,846	360,204	1.09	62,976	6.21
Greenhouse Curtains	384,349	341,611	1.13	52,002	7.39
Heat Recovery	2,439,455	989,135	2.47	297,137	8.21
HRV	707,134	559,584	1.26	0	N/A
Industrial Equipment	7,767,094	2,248,748	3.45	704,059	11.03
Infrared	1,438,621	1,148,684	1.25	60,809	23.66
Insulation	186,547	119,875	1.56	29,918	6.24
Insulation/Caulking/Sealing	157,047	235,580	0.67	20,423	7.69
Kitchen Ventilation	896,264	1,254,000	0.71	65,500	13.68
Linkageless Control	171,028	81,233	2.11	27,557	6.21
Make Up Air Unit	74,887	24,012	3.12	13,658	5.48
Operational Improvements	3,223,923	205,260	15.71	402,631	8.01
Oven	23,224	21,663	1.07	3,742	6.21
Ozone Laundry	872,838	928,692	0.94	0	N/A
Pipe Insulation	67,422	66,621	1.01	9,345	7.21
Pre-Rinse Spray Nozzle	845,845	379,350	2.23	383,470	2.21
Reflective Panel	348,440	287,657	1.21	35,274	9.88
Roof Top Unit	21,397	15,742	1.36	3,448	6.21
Showerhead	7,350,047	2,732,778	2.69	4,494,274	1.64
Showerheads	36,760	13,356	2.75	4,510	8.15
Small Commercial General	0	0	0.00	327,843	N/A
Small Commercial High Eff Boiler	801,208	631,140	1.27	0	N/A
Steam Trap	4,281,277	264,420	16.19	168,783	25.37
Tankless	12,225	-87,477	-0.14	3,250	3.76
Thermostat - Programmable	28,358	41,318	0.69	582	48.73
VFD	5,019,394	2,510,735	2.00	1,036,825	4.84
Waste Water Reduction	77,037	2,500	30.81	0	N/A

Notes

1. Small Commercial costs for Energy star broiler, dishwasher, fryer, rack conveyor, stationary rack, HRV,

ozone laundry, high efficiency boiler rolled into Small commercial general

Table 34: Natural Gas Savings per $1 of Incremental Cost and $1 of Incentive Payments by Program

Program Category	Sum of Net Gas savings	Sum of Total Net Incremental costs	Gas Savings/m³ per $1 of Incremental Cost	Sum of Total Incentive payments	Gas Savings/m³ per $1 of Incentive Payments
Agriculture	520,228	183,733	2.83	70,275	7.40
College/University	513,507	497,345	1.03	62,291	8.24
Government/Municipalities	731,511	471,620	1.55	82,382	8.88
Hospitals	2,715,999	1,676,444	1.62	305,363	8.89
Hotel/Motel	1,269,335	949,980	1.34	149,020	8.52
Industrial	16,962,619	5,793,109	2.93	1,773,771	9.56
Large New Construction	3,701,445	6,416,323	0.58	493,471	7.50
Long Term Health Care	75,810	47,811	1.59	12,258	6.18
Low Income	85,362	57,798	1.48	54,203	1.57
Multi-Res Non-Profit	5,906,555	3,382,916	1.75	1,128,163	5.24
Multi-Res Private	14,626,758	7,915,120	1.85	2,609,422	5.61
Multi-Residential Water Conservation	1,386,859	504,349	2.75	317,311	4.37
Office	4,302,370	2,196,538	1.96	574,731	7.49
Other Commercial	4,844,643	4,812,707	1.01	555,293	8.72
Residential New Construction	1,167,239	3,669,120	0.32	147,300	7.92
Retail	185,658	278,353	0.67	26,542	6.99
Schools	2,183,978	1,255,200	1.74	251,044	8.70
Small Commercial	6,357,308	5,258,260	1.21	936,063	6.79
Warehouses	1,109,136	819,286	1.35	134,439	8.25
Water Conservation	7,754,910	2,644,673	2.93	4,155,010	1.87

Appendix B: Approved 2011 Assumptions

2011 Free Ridership for New Measures

The following Free Ridership values for new measures were developed with complete consensus with the Enbridge EAC.

Table 27: Measure Life Assumptions

2011 Free Ridership for New Measures			
Measure	**Sector**	**Building Segment**	**Value**
Air Door (Shipping & Receiving)	Commercial and Industrial	New and Existing	5%
Condensing Make-up Air	Commercial	New and Existing	5%
Condensing Boiler (Under 300 MBH)	Commercial	New and Existing	5%
High Efficiency Boiler (Under 300 MBH)	Commercial	New and Existing	5%

Table 28: Resource savings Assumptions EB-2011-0254

	Enbridge Gas Distribution										
	UPDATED DSM Input Assumptions for 2011 Program Year										
		Indicates Updated Assumption, Reviewed and Accepted by the EAC									
		Indicates New measure, Reviewed and Accepted by the EAC									
				Resource Savings Assumptions							
Item #	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost	Free Ridership		Reference
				m3	kWh	L	Years	$	%		
	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)	(k)		
	RESIDENTIAL NEW CONSTRUCTION										
1	CFL (13W) (8 bulbs)	60W Incandescent	n/a	-	360	-	8	$0.00	24%		
2	Energy Star Home (version 3)	Home built to OBC 2006	weather	1,018	1,450	0	25	$3,200.00	48%		Updated Assumption. Free Ridership consistent with 2009 Audit.
3	Energy Star Home (version 4)	Home built to OBC 2006 as of Mar 31, 2009	weather	881	734	0	25	$4,275.00	48%		Updated Assumption. Free Ridership consistent with 2009 Audit.
4	Faucet Aerator - 1.0 GPM (Kitchen, installed)	Ontario Building Code 2006 (2.2 GPM)	base	32	-	10,631	10	$1.00	31%		
5	Faucet Aerator - 1.0 GPM (Bathroom, installed)	Ontario Building Code 2006 (2.2 GPM)	base	10	-	3,435	10	$0.55	31%		
6	Faucet Aerator - 1.5 GPM (Kitchen, installed)	Average Existing Stock, 2.5 GPM	base	23	-	7,797	10	$1.65	31%		
7	Faucet Aerator - 1.5 GPM (Bathroom, installed) (3 aerators)	Average Existing Stock, 2.2 GPM	base	18	-	6,012	10	$2.72	31%		
8	Low-Flow Showerhead - 1.5 GPM (Per household)	Average Existing Stock, 2.5 GPM	base	43	-	11,596	10	$12.50	10%		Updated Assumption
9	Low-Flow Showerhead - 1.25 GPM (Per household)	Average Existing Stock, 2.5 GPM	base	53	-	17,187	10	$4.26	10%		Updated Assumption
10	Low-Flow Showerhead - 1.25 & 1.50 GPM (Per household)	Average Existing Stock, 2.5 GPM	base	48	-	14,391	10	$16.76	10%		Updated Assumption
11	High Efficiency Fireplace with Pilotless Ignition - Freestanding = Minimum 70% EnerGuide Rating	Freestanding fireplace = 65% median efficiency	weather	110	(31)	-	20	$135.00	17%		
12	High Efficiency Fireplace with Pilotless Ignition - Insert = Minimum 60% EnerGuide Rating	Insert = 55% median efficiency	weather	109	(31)	-	20	$135.00	17%		
13	High Efficiency Fireplace with Pilotless Ignition - Zero Clearance >= 40 kBtu.h =Minimum 60% EnerGuide Rating	Zero Clearance >= 40kBtu/h median efficiency	weather	122	(31)	-	20	$135.00	17%		
14	High Efficiency Fireplace with Pilotless Ignition - Zero Clearance < 40 kBtu.h =Minimum 70% EnerGuide Rating	Zero Clearance <40kBtu/h median efficiency	weather	108	(31)	-	20	$135.00	17%		
15	Programmable Thermostat	Standard Thermostat	weather	53	54	-	15	$53.22	10%		
16	Tankless Water Heater	Storage Tank Water Heater	base	130	-	-	18	$750.00	2%		

	RESIDENTIAL EXISTING HOMES										
17	Faucet Aerator - 1.0 GPM (Kitchen, installed)	Average Existing Stock, 2.5 GPM	base	35	-	11,694	10	1.00	31%		
18	Faucet Aerator - 1.0 GPM (Bathroom, installed)	Average Existing Stock, 2.2 GPM	base	10	-	3,435	10	.55	31%		
19	Faucet Aerator - 1.5 GPM (Kitchen, distributed)	Average Existing Stock, 2.5 GPM	base	23	-	7,797	10	$1	31%		
20	Faucet Aerator - 1.5 GPM (Bathroom, distributed)	Average Existing Stock, 2.2 GPM	base	6	-	2,004	10	$1	31%		
21	Low-Flow Showerhead - 1.25 GPM (Distributed)	2.0 -2.5 GPM Showerhead (2.45 GPM)	base	50	-	16,631	10	$4.26	10%		Updated Assumption
22	Low-Flow Showerhead - 1.25 GPM (Distributed)	2.6 + GPM Showerhead (3.07 GPM)	base	82	-	23,374	10	$4.26	10%		Updated Assumption
23	Low-Flow Showerhead - 1.25 GPM (Installed)	2.0 -2.5 GPM Showerhead (2.45 GPM)	base	50	-	16,631	10	$19.00	10%		Updated Assumption
24	Low-Flow Showerhead - 1.25 GPM (Installed)	2.6 + GPM Showerhead (3.07 GPM)	base	82	-	23,374	10	$19.00	10%		Updated Assumption
25	High Efficiency Condensing Furnace AFUE 96	High-Efficiency Furnace AFUE 90	weather	129	-	-	18	$1,767.00			
26	High Efficiency Fireplace with Pilotless Ignition - Freestanding = Minimum 70% EnerGuide Rating	Freestanding fireplace = 65% median efficiency	weather	110	(31)	-	20	$135.00	17%		
27	High Efficiency Fireplace with Pilotless Ignition - Insert = Minimum 60% EnerGuide Rating	Insert = 55% median efficiency	weather	109	(31)	-	20	$135.00	17%		
28	High Efficiency Fireplace with Pilotless Ignition - Zero Clearance >= 40 kBtu.h =Minimum 60% EnerGuide Rating	Zero Clearance >= 40kBtu/h median efficiency	weather	122	(31)	-	20	$135.00	17%		
29	High Efficiency Fireplace with Pilotless Ignition - Zero Clearance < 40 kBtu.h =Minimum 70% EnerGuide Rating	Zero Clearance <40kBtu/h median efficiency	weather	108	(31)	-	20	$135.00	17%		
30	Pipe Insulation	Water Heater w/o pipe insulation	base	18	-	-	10	$2/$4	4%		
31	Programmable Thermostat	Standard Thermostat	weather	53	54	-	15	$50	43%		
32	Reflector Panels	Radiant heat w/o reflector panels	weather	143.0	-	-	18	$238.00	0%		
33	Solar Pool Heater	Natural Gas Pool Heater	base	1,116	(57)	-	20	$1,450.00	10%		
34	Tankless Water Heater	Storage Tank Water Heater	base	130	-	-	18	$750.00	2%		
	RESIDENTIAL LOW INCOME										
35	Faucet Aerator - 1.0 GPM (Kitchen, installed)	Average Existing Stock (2.5 gpm)	base	35	-	11,694	10	1.00	1%		
36	Faucet Aerator - 1.0 GPM (Bathroom, installed)	Average Existing Stock (2.2 gpm)	base	10	-	3,435	10	.55	1%		
37	Faucet Aerator - 1.5 GPM (Kitchen, installed)	Average Existing Stock (2.5 gpm)	base	23	-	7,797	10	$0.94	1%		
38	Faucet Aerator - 1.5 GPM (Bathroom, installed)	Average Existing Stock (2.2 gpm)	base	6	-	2,004	10	$0.46	1%		
39	Low-Flow Showerhead - 1.25 GPM (Installed)	2.0 -2.5 GPM Showerhead (2.45 GPM)	base	50	-	16,631	10	$18.71	5%		Updated Assumption
40	Low-Flow Showerhead - 1.25 GPM (Installed)	2.6 + GPM Showerhead (3.07 GPM)	base	82	-	23,374	10	$18.71	5%		Updated Assumption
41	CFL (13W) (2 bulbs)	60 W Incandescent	n/a	0	90	-	8	$0.00	5%		
42	CFL (23W) (2 bulbs)	75 W Incandescent	n/a	0	100	-	8	$0.00	5%		
43	Programmable Thermostat	Standard Thermostat	weather	53	54	-	15	$69.18	1%		

	COMMERCIAL NEW BUILDING CONSTRUCTION										
44	* Air Curtains (Shipping and Receiving Doors) 8 x8	No air curtain	weather	7,565	(5,380)	-	15	$8,242.00	5%		New Measure
45	* Air Curtains (Shipping and Receiving Doors) 8 X10	No air curtain	weather	9,457	(5,220)	-	15	$8,242.00	5%		New Measure
46	* Air Curtains (Shipping and Receiving Doors) 10 X10	No air curtain	weather	20,605	(936)	-	15	$10,170.00	5%		New Measure
47	CEE Qualified Energy Efficient Washers	Conventional top loading washers.	base	117	396	58,121	11	$600.00	10%		
48	Condensing Boiler - Space (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	weather	.0108 m3/(Btu/hr)	-	-	25	<100 MBH = $1,475, 100-199 MBH = $2,414, 200-299 MBH = $3,227	5%		New Measure
49	Condensing Boiler - DHW (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	base	<100 MBH = .03579, 100-199 MBH = .02196, 200-299 MBH = .01643 m3/(Btu/hr)	-	-	25	<100 MBH = $1,475, 100-199 MBH = $2,414, 200-299 MBH = $3,227	5%		New Measure
50	Condensing Gas Water Heater 100 gals	Storage Tank Water Heater	base	332	-	-	13	$2,230.00	5%		
51	Condensing Gas Water Heater 500 gals	Storage Tank Water Heater	base	873	-	-	13	$2,230.00	5%		
52	Condensing Gas Water Heater 1000 gals	Storage Tank Water Heater	base	1,551	-	-	13	$2,230.00	5%		
53	Condensing Make Up Air Unit - MR and LTC	Conventional MUA with constant speed drive	weather	.84 m3/cfm - 2.92 m3/cfm	(0-1.48) kwh/cfm	-	15	$870 + (.66 - 1.02) per cfm	5%		New Measure
54	Condensing Make Up Air Unit - Retail and Comm	Conventional MUA with constant speed drive	weather	.41 m3/cfm - 2.07 m3/cfm	(0- .48) kwh/cfm	-	15	$870 + (.66 - 1.02) per cfm	5%		New Measure
55	Condensing Unit Heater	% Sales Weighted Average model - Equivalent in efficiency to a power-vented or separated combustion unit heater (78% Annually Efficient)	weather	.00631 m3 / (BTU/H)	(.00186) kWh / (BTU/H)	-	18	$.0129 / (BTU/H)	0%		
56	Demand Control Kitchen Ventilation (0 - 4999 CFM)	Ventilation without DCKV	weather	4,801	13,521	-	15	$10,000.00	5%		
57	Demand Control Kitchen Ventilation (5000 - 9999 CFM)	Ventilation without DCKV	weather	11,486	30,901	-	15	$15,000.00	5%		
58	Demand Control Kitchen Ventilation (10000 - 15000 CFM)	Ventilation without DCKV	weather	18,924	49,102	-	15	$20,000.00	5%		
59	Destratification Fans	No destratification fans	weather	0.5 m3/ft^2	(-)0.0034/ft^2	-	15	$7,021.00	10%		
60	Drain Water Heat Recovery (DWHR) - Commercial Laundry	No water pre-heating	base	50,451	-	-	25	$37,210.85	5%		New Measure. As approved by Union Gas EAC
61	Drain Water Heat Recovery (DWHR) - Food Services, Dishwashing	No water pre-heating	base	8,167	-	-	25	$1,770.00	5%		New Measure. As approved by Union Gas EAC
62	Drain Water Heat Recovery (DWHR) - Hospital Dishwashing	No water pre-heating	base	6,335	-	-	25	$1,770.00	5%		New Measure. As approved by Union Gas EAC
63	Drain Water Heat Recovery (DWHR) - Hospital Laundry	No water pre-heating	base	45,468	-	-	25	$37,210.85	5%		New Measure. As approved by Union Gas EAC
64	Drain Water Heat Recovery (DWHR) - Nursing Home, Dishwashing	No water pre-heating	base	4,549	-	-	25	$1,770.00	5%		New Measure. As approved by Union Gas EAC
65	Drain Water Heat Recovery (DWHR) - Recreation Facility/Arena, Showering	No water pre-heating	base	17,209	-	-	25	$14,820.00	5%		New Measure. As approved by Union Gas EAC

66	Energy Recovery Ventilators (ERV) - Multi-Family, Health Care, Nursing Home	Ventilation without ERV	weather	5.77 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
67	Energy Recovery Ventilators (ERV) - Hotel, Restaurant, Retail	Ventilation without ERV	weather	3.21 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
68	Energy Recovery Ventilators (ERV) - Office, Warehouse, School	Ventilation without ERV	weather	2.05 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
69	Energy Star Dishwasher - Rack conveyor, multi (tank) - High Temperature	Non- Energy Star Dishwasher	base	3,708	15,822	522,192	20	$288.00	27%		
70	Energy Star Dishwasher - Rack conveyor, single (tank) - High Temperature	Non- Energy Star Dishwasher	base	2,203	9,811	310,271	20	$2,375.00	27%		
71	Energy Star Dishwasher - Stationary Rack (Door type or single rack) - High Temperature	Non- Energy Star Dishwasher	base	619	3,553	87,119	15	($350.00)	20%		
72	Energy Star Dishwasher - Stationary Rack (Door type or single rack) - Low Temperature	Non- Energy Star Dishwasher	base	841	855	118,369	15	($350.00)	20%		
73	Energy Star Dishwasher - Undercounter - High Temperature	Non- Energy Star Dishwasher	base	801	3,754	112,795	10	($13.00)	40%		
74	Energy Star Dishwasher - Undercounter - Low Temperature	Non- Energy Star Dishwasher	base	326	559	45,891	10	($13.00)	40%		
75	Energy Star Convection Oven (Full Size)	Standard Efficiency Convection Oven	base	847	1	-	12	$875.00	20%		New Measure. As approved by Union Gas EAC
76	Energy Star Fryers	Standard Efficiency Fryer	base	1,083	17	-	12	$1,028.00	20%		Updated Assumption. As approved by Union Gas EAC
77	Energy Star Steam Cookers	Standard Efficiency Steam Cooker	base	3,224	162	42,812	10	$2,000.00	20%		New Measure. As approved by Union Gas EAC
78	Energy Star Under Fired Broilers	Standard Efficiency Broiler	base	1,677	12	-	12	$1,270.00	20%		New Measure. As approved by Union Gas EAC
79	Heat Recovery Ventilators (HRV) - Multi-Family, Health Care, Nursing Home	Ventilation without HRV	weather	4.28 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
80	Heat Recovery Ventilators (HRV) - Hotel, Restaurant, Retail	Ventilation without HRV	weather	2.38 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
81	Heat Recovery Ventilators (HRV) - Office, Warehouse, School	Ventilation without HRV	weather	1.52 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
82	High Efficiency Boilers - Space (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	weather	.00665 m3/(Btu/hr)	-	-	25	<100 MBH = $1,238, 100-199 MBH = $1,544, 200-299 MBH = $1,388	5%		New Measure
83	High Efficiency Boilers - DHW (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	base	<100 MBH = .02430, 100-199 MBH = .01491, 200-299 MBH = .01115 m3/(Btu/hr)	-	-	25	<100 MBH = $1,238, 100-199 MBH = $1,544, 200-299 MBH = $1,388	5%		New Measure
84	Infrared Heaters (< 50,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	16	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
85	Infrared Heaters (50,000 - 165,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	409	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
86	Infrared Heaters (>165,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	873	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
87	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.5 GPM	base	36	-	11,587	10	$12.50	10%		New Measure
88	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	2.5 GPM	base	29	-	7,818	10	$12.50	10%		New Measure

89	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Washer extractor - 60 lbs	base	.0328 m3 / (lbs/yr)	.00219 kWh / (lbs/yr)	2.01 L / (lbs/yr)	15	$10,970.00	8%		
90	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Washer extractor - 500 lbs	base	.0328 m3 / (lbs/yr)	.00219 kWh / (lbs/yr)	2.01 L / (lbs/yr)	15	$30,270.00	8%		
91	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Tunnel Washer - 120 lbs	base	.0240 m3 / (lbs/yr)	.00152 kWh / (lbs/yr)	1.22 L / (lbs/yr)	15	$49,667.00	8%		
92	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Tunnel Washer - 500 lbs	base	.0240 m3 / (lbs/yr)	.00152 kWh / (lbs/yr)	1.22 L / (lbs/yr)	15	$160,065.00	8%		
93	Prescriptive Higher Efficiency Boiler - DWH (300-1500 MBH, 83-84% Efficient)	DWH Boiler (80% Combustion Efficiency)	base	1,075-4,317	-	-	25	$3900 -$5900	10/12/20 %		
94	Prescriptive Higher Efficiency Boiler - DWH (300-1500 MBH, 85-88% Efficient)	DWH Boiler (80% Combustion Efficiency)	base	1,766-7,095	-	-	25	$4500-$7400	10/12/20 %		
95	Prescriptive Higher Efficiency Boiler - Space (300-2000 MBH, 83-84% Efficient)	Space Heating Boiler (80% Combustion Efficiency)	weather	2,105-16,452	-	-	25	$3900-$4950	10/12/20 %		
96	Prescriptive Higher Efficiency Boiler - Space (300-2000 MBH, 85-88% Efficient)	Space Heating Boiler (80% Combustion Efficiency)	weather	3,125-24,431	-	-	25	$4500-$7050	10/12/20 %		
97	Pre-Rinse Spray Nozzle (0.64 GPM) (Full Service)	standard pre-rinse spray nozzle (3.0 GPM)	base	1,286	-	252,000	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
98	Pre-Rinse Spray Nozzle (0.64 GPM) (Limited)	standard pre-rinse spray nozzle (3.0 GPM)	base	339	-	66,400	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
99	Pre-Rinse Spray Nozzle 0.64 GPM) (Other)	standard pre-rinse spray nozzle (3.0 GPM)	base	318	-	62,200	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
100	Rooftop Unit (2 stage roof top unit)	Single stage rooftop unit	weather	255	-	-	15	$375.00	5%		
101	Tankless Water Heater 100 USG/day, 84% thermal efficiency	Conventional Storage Tank Water Heater, 80% thermal efficiency	base	154	-	-	18	-$1,102.00	2%		
	COMMERCIAL EXISTING BUILDINGS										
102	Air Curtains (Double Door)	No air curtain	weather	1,529	1,023	-	15	$2,500.00	5%		
103	* Air Curtains (Shipping and Receiving Doors) 8 x 8	No air curtain	weather	7,565	(5,380)	-	15	$8,242.00	5%		New Measure
104	* Air Curtains (Shipping and Receiving Doors) 8 X 10	No air curtain	weather	9,457	(5,220)	-	15	$8,242.00	5%		New Measure
105	* Air Curtains (Shipping and Receiving Doors) 10 X 10	No air curtain	weather	20,605	(936)	-	15	$10,170.00	5%		New Measure
106	Air Curtains (Single Door)	No air curtain	weather	667	172	-	15	$1,650.00	5%		
107	CEE Qualified Energy Efficient Washers	Conventional top loading washers.	base	117	396	58,121	11	$600.00	10%		
108	Condensing Boiler - DHW (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	base	<100 MBH = .03579, 100-199 MBH = .02196, 200-299 MBH = .01643 m3/(Btu/hr)	-	-	25	<100 MBH = $1,475, 100-199 MBH = $2,414, 200-299 MBH = $3,228	5%		New Measure
109	Condensing Boiler - Space (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	weather	.0108 m3/(Btu/hr)	-	-	25	<100 MBH = $2,045, 100-199 MBH = $2,984, 200-299 MBH = $3,797	5%		New Measure

110	Condensing Gas Water Heater 100 gals 95% thermal efficiency	Storage Tank Water Heater	base	332	-	-	13	$2,230.00	5%		
111	Condensing Gas Water Heater 500 gals 95% thermal efficiency	Storage Tank Water Heater	base	873	-	-	13	$2,230.00	5%		
112	Condensing Gas Water Heater 1000 gals 95% thermal efficiency	Storage Tank Water Heater	base	1,551	-	-	13	$2,230.00	5%		
113	Condensing Make Up Air Unit - MR and LTC	Conventional MUA with constant speed drive	weather	.84 m3/cfm - 2.92 m3/cfm	(0-1.48) kwh/cfm	-	15	$870 + (.66 - 1.02) per cfm	5%		New Measure
114	Condensing Make Up Air Unit - Retail and Comm	Conventional MUA with constant speed drive	weather	.41 m3/cfm - 2.07 m3/cfm	(0- .48) kwh/cfm	-	15	$870 + (.66 - 1.02) per cfm	5%		New Measure
115	Condensing Unit Heater	% Sales Weighted Average model - Equivalent in efficiency to a power-vented or separated combustion unit heater (78% Annually Efficient)	weather	.00631 m3 / (BTU/H)	(.00186) kWh / (BTU/H)	-	18	$.0129 / (BTU/H)	0%		
116	Demand Control Kitchen Ventilation (0 - 4999 CFM)	Ventilation without DCKV	weather	4,801	13,521	-	15	$10,000.00	5%		
117	Demand Control Kitchen Ventilation (5000 - 9999 CFM)	Ventilation without DCKV	weather	11,486	30,901	-	15	$15,000.00	5%		
118	Demand Control Kitchen Ventilation (10000 - 15000 CFM)	Ventilation without DCKV	weather	18,924	49,102	-	15	$20,000.00	5%		
119	Destratification Fans	No destratification fans	weather	0.5 m3/ft^2	(-)0.0034 / ft^2	-	15	$7,021.00	10%		
120	Drain Water Heat Recovery (DWHR) - Commercial Laundry	No water pre-heating	base	50,451	-	-	25	$40,810.85	5%		New Measure. As approved by Union Gas EAC
121	Drain Water Heat Recovery (DWHR) - Food Services, Dishwashing	No water pre-heating	base	8,167	-	-	25	$3,250.00	5%		New Measure. As approved by Union Gas EAC
122	Drain Water Heat Recovery (DWHR) - Hospital Dishwashing	No water pre-heating	base	6,335	-	-	25	$2,710.00	5%		New Measure. As approved by Union Gas EAC
123	Drain Water Heat Recovery (DWHR) - Hospital Laundry	No water pre-heating	base	45,468	-	-	25	$40,810.85	5%		New Measure. As approved by Union Gas EAC
124	Drain Water Heat Recovery (DWHR) - Nursing Home, Dishwashing	No water pre-heating	base	4,549	-	-	25	$2,710.00	5%		New Measure. As approved by Union Gas EAC
125	Drain Water Heat Recovery (DWHR) - Recreation Facility/Arena, Showering	No water pre-heating	base	17,209	-	-	25	$20,020.00	5%		New Measure. As approved by Union Gas EAC
126	Energy Recovery Ventilators (ERV) - Multi-Family, Health Care, Nursing Home	Ventilation without ERV	weather	6.12 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
127	Energy Recovery Ventilators (ERV) - Hotel, Restaurant, Retail	Ventilation without ERV	weather	3.40 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
128	Energy Recovery Ventilators (ERV) - Office, Warehouse, School	Ventilation without ERV	weather	2.17 m3 / CFM	-	-	14	$3.18/CFM	5%		Updated Assumption. As approved by Union Gas EAC
129	Energy Star Dishwasher - Rack conveyor, multi (tank) - High Temperature	Non- Energy Star Dishwasher	base	3,708	15,822	522,192	20	$288.00	27%		
130	Energy Star Dishwasher - Rack conveyor, single (tank) - High Temperature	Non- Energy Star Dishwasher	base	2,203	9,811	310,271	20	$2,375.00	27%		
131	Energy Star Dishwasher - Stationary Rack (Door type or single rack) - High Temperature	Non- Energy Star Dishwasher	base	619	3,553	87,119	15	($350.00)	20%		
132	Energy Star Dishwasher - Stationary Rack (Door type or single rack) - Low Temperature	Non- Energy Star Dishwasher	base	841	855	118,369	15	($350.00)	20%		
133	Energy Star Dishwasher - Undercounter - High Temperature	Non- Energy Star Dishwasher	base	801	3,754	112,795	10	($13.00)	40%		
134	Energy Star Dishwasher - Undercounter - Low Temperature	Non- Energy Star Dishwasher	base	326	559	45,891	10	($13.00)	40%		

135	Energy Star Convection Oven (Full Size)	Standard Efficiency Convection Oven	base	847	1	-	12	$875.00	20%		New Measure. As approved by Union Gas EAC
136	Energy Star Fryers	Standard Efficiency Fryer	base	1,083	17	-	12	$1,028.00	20%		Updated Assumption. As approved by Union Gas EAC
137	Energy Star Steam Cookers	Standard Efficiency Steam Cooker	base	3,224	162	42,812	10	$2,000.00	20%		New Measure. As approved by Union Gas EAC
138	Energy Star Under Fired Broilers	Standard Efficiency Broiler	base	1,677	12	-	12	$1,270.00	20%		New Measure. As approved by Union Gas EAC
139	Enhanced Furnace (continuous)	Standard PSC motor	weather	-2.7 m3/kBtu/h	22.7kWh/kBtu/h	-	15	$960.00	10%		
140	Enhanced Furnace (Non-continuous)	Standard PSC motor	weather	-0.4 m3/kBtu/h	4.8 kWh/kBtu/h		15	$960.00	10%		
141	Faucet Aerator (bathroom, installed, 1.0 GPM)	Average existing stock	base	7	-	2,371	10	$1.50	10%		
142	Faucet Aerator (bathroom, installed, 1.5 GPM)	Average existing stock	base	4	-	1,382	10	$2	10%		
143	Faucet Aerator (kitchen, installed, 1.0 GPM)	Average existing stock	base	24	-	8,072	10	$2	10%		
144	Faucet Aerator (kitchen, installed, 1.5 GPM)	Average existing stock	base	16	-	5,377	10	$2	10%		
145	Heat Recovery Ventilators (HRV) - Multi-Family, Health Care, Nursing Home	Ventilation without HRV	weather	4.70 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
146	Heat Recovery Ventilators (HRV) - Hotel, Restaurant, Retail	Ventilation without HRV	weather	2.61 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
147	Heat Recovery Ventilators (HRV) - Office, Warehouse, School	Ventilation without HRV	weather	1.67 m3 / CFM	-	-	14	$3.61/CFM	5%		Updated Assumption. As approved by Union Gas EAC
148	High Efficiency Boilers - Space (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	weather	.00665 m3/(Btu/hr)	-	-	25	<100 MBH = $1,808, 100-199 MBH = $2,114, 200-299 MBH = $1,958	5%		New Measure
149	High Efficiency Boilers - DHW (Under 300 MBH, 90% or greater AFUE)	Non-condensing Boiler, 80% AFUE	base	<100 MBH = .02430, 100-199 MBH = .01491, 200-299 MBH = .01115 m3/(Btu/hr)	-	-	25	<100 MBH = $1,808, 100-199 MBH = $2,114, 200-299 MBH = $1,958	5%		New Measure
150	High Efficiency Condensing Furnace (AFUE 96)	High Efficiency Furnace (AFUE 90)	weather	1.7/kBtu/hr	-	-	18	8.4/kBtu/hr	17.5%		
151	Infrared Heaters (< 50,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	16	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
152	Infrared Heaters (50,000 - 165,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	409	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
153	Infrared Heaters (>165,000 BTUH)	Regular Unit Heater	weather	0.015 m3/BTUH	873	-	20	$0.0122 BTUH/hr	33%		Updated Assumption
154	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.0 -2.5 GPM showerhead (2.25 GPM)	base	48	-	9,088	10	$17	10%		
155	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.6 + GPM showerhead and above (3.0GPM)	base	84	-	14,333	10	$12.50	10%		
156	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	2.0 -2.5 GPM showerhead (2.25 GPM)	base	21	-	5,931	10	$12.50	10%		Updated Assumption
157	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	2.6 -3.0 GPM GPM showerhead (2.80 GPM)	base	40	-	10,036	10	$12.50	10%		Updated Assumption
158	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	3.1 - 3.5 GPM showerhead (3.30 GPM)	base	58	-	13,621	10	$12.50	10%		Updated Assumption
159	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	3.6 GPM and above (3.6 GPM)	base	69	-	15,705	10	$12.50	10%		Updated Assumption

160	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Washer extractor - 60 lbs	base	.0328 m3 / (lbs/yr)	.00219 kWh / (lbs/yr)	2.01 L / (lbs/yr)	15	$10,970.00	8%		
161	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Washer extractor - 500 lbs	base	.0328 m3 / (lbs/yr)	.00219 kWh / (lbs/yr)	2.01 L / (lbs/yr)	15	$30,270.00	8%		
162	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Tunnel Washer - 120 lbs	base	.0240 m3 / (lbs/yr)	.00152 kWh / (lbs/yr)	1.22 L / (lbs/yr)	15	$49,667.00	8%		
163	Ozone Laundry - Commercial Laundry Washing Equipment with Ozone	Commercial Laundry Washing Equipment without Ozone - Tunnel Washer - 500 lbs	base	.0240 m3 / (lbs/yr)	.00152 kWh / (lbs/yr)	1.22 L / (lbs/yr)	15	$160,065.00	8%		
164	Pre-Rinse Spray Nozzle - 0.64 GPM (Full Service)	Standard Pre-Rinse Spray Nozzle (3.0 GPM)	base	1,286	-	252,000	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
165	Pre-Rinse Spray Nozzle - 0.64 GPM (Limited)	Standard Pre-Rinse Spray Nozzle (3.0 GPM)	base	339	-	66,400	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
166	Pre-Rinse Spray Nozzle - 0.64 GPM (Other)	Standard Pre-Rinse Spray Nozzle (3.0 GPM)	base	318	-	62,200	5	$150	0%		Updated Assumption. Consistent with 2010 Update Incremental Cost
167	Pre-Rinse Spray Nozzle - 0.64 GPM (Full Service)	Standard Pre-Rinse Spray Nozzle (1.6 GPM)	base	457	-	97,292	5	$150	0%		
168	Pre-Rinse Spray Nozzle - 0.64 GPM (Limited)	Standard Pre-Rinse Spray Nozzle (1.6 GPM)	base	90	-	19,197	5	$150	0%		
169	Pre-Rinse Spray Nozzle - 0.64 GPM (Other)	Standard Pre-Rinse Spray Nozzle (1.6 GPM)	base	109	-	23,166	5	$150	0%		
170	Prescriptive Higher Efficiency Boiler - DWH (300-1500 MBH, 83-84% Efficient)	DWH Boiler (80% Combustion Efficiency)	base	1,075-4,317	-	-	25	$3900 -$5900	10/12/20 %		
171	Prescriptive Higher Efficiency Boiler - DWH (300-1500 MBH, 85-88% Efficient)	DWH Boiler (80% Combustion Efficiency)	base	1,766-7,095	-	-	25	$4500-$7400	10/12/20 %		
172	Prescriptive Higher Efficiency Boiler - Space (300-2000 MBH, 83-84% Efficient)	Space Heating Boiler (80% Combustion Efficiency)	weather	2,105-16,452	-	-	25	$3900-$4950	10/12/20 %		
173	Prescriptive Higher Efficiency Boiler - Space (300-2000 MBH, 85-88% Efficient)	Space Heating Boiler (80% Combustion Efficiency)	weather	3,125-24,431	-	-	25	$4500-$7050	10/12/20 %		
174	Prescriptive School Boilers (Elementary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%.	weather	10,830	-	-	25	$8,646.00	12%		
175	Prescriptive School Boilers (Secondary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%.	weather	43,859	-	-	25	$14,470.00	12%		
176	Programmable Thermostats (Educational - School)	Standard thermostat	weather	65	8		15	$110	20%		Updated Assumption
177	Programmable Thermostats (Food Service - Restaurant/Tavern)	Standard thermostat	weather	69	77	-	15	$110	20%		Updated Assumption
178	Programmable Thermostats (Hotel/Motel)	Standard thermostat	weather	10	11	-	-	$110	20%		Updated Assumption
179	Programmable Thermostats (Large Hotel)	Standard thermostat	weather	10	14	-	-	$110	20%		Updated Assumption
180	Programmable Thermostats (Small Office)	Standard thermostat	weather	39	43	-	-	$110	20%		Updated Assumption
181	Programmable Thermostats (Recreation - Small Fitness / Spa)	Standard thermostat	weather	35	87	-	15	$110	20%		Updated Assumption
182	Programmable Thermostats (Retail - Mall)	Standard thermostat	weather	14	19	-	15	$110	20%		Updated Assumption
183	Programmable Thermostats (Retail - Strip Mall)	Standard thermostat	weather	11	19	-	15	$110	20%		Updated Assumption
184	Programmable Thermostats (Retail - Food)	Standard thermostat	weather	22	16	-	15	$110	20%		Updated Assumption
185	Programmable Thermostats (Educational - University/College)	Standard thermostat	weather	58	57	-	-	$110	20%		Updated Assumption
186	Programmable Thermostats (Warehouse / Wholesale)	Standard thermostat	weather	132	9	-	15	$110	20%		Updated Assumption
187	Programmable Thermostats - Multi Family	Standard thermostat	weather	15	13	-	15	$80	20%		Updated Assumption
188	Rooftop Unit	Standard Rooftop Unit	weather	255	-	-	15	$375.00	5%		
189	Tankless Water Heater 100 USG/day, 84% thermal efficiency	Conventional Storage Tank Water Heater, 80% thermal efficiency	base	154	-	-	18	-$1,102.00	2%		

	COMMERCIAL/INDUSTRIAL CUSTOM PROJECTS										
190	Custom Projects			Actual	Actual	Actual	Actual	Actual			
191	Agriculture								40%		
192	Industrial								50%		
193	Commercial								12%		
194	Multi-Residential								20%		
195	New construction								26%		
	OTHER MEASURES										
196	CFL (13W)	60W Incandescent	n/a	0	45	0	8	$0.00	24%		
197	CFL (23W)	75W Incandescent	n/a	0	49.7	0	8	$0.00	24%		
	* Approved for New/Existing Industrial										

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June 29, 2012

VIA RESS and COURIER

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: Natural Gas Reporting & Record Keeping Requirements - Enbridge Gas Distribution 2011 DSM Audit Report

The Ontario Energy Board's (the "Board") Reporting and Record Keeping Requirements for Gas Utilities requires under rule 2.1.12 that annually, by the last day of the sixth month after financial year end, the Utilities file an audited report of the actual results compared to the Board approved Demand Side Management ("DSM") plan with explanations of variances.

Under this rule, Enbridge Gas Distribution Inc. ("Enbridge") is required to file a fiscal 2011 DSM Plan Audit Report by June 30, 2012.

Enbridge has completed the 2011 DSM Plan Audit Report and attaches the results in accordance with the filing requirement as noted.

Should you have any questions related to this, please do not hesitate to call.

Sincerely,

[Original Signed]

Kevin Culbert
Manager, Regulatory Accounting

Attach.

Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results

Final Report

energy & resource solutions

120 Water Street, Suite 350

North Andover, MA 01845

(978) 521-2550

June 27, 2012

Contents

Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results Final Report

EXECUTIVE SUMMARY

This report presents the findings of the third-party independent audit of the Enbridge Gas Distribution's (Enbridge) savings and payment mechanism claims for their energy efficiency program performance during the calendar year ending December 31, 2011.

Objectives

The audit's primary objective is to review the Enbridge calculations for total resource cost (TRC), shared savings mechanism (SSM), lost revenue adjustment mechanism (LRAM), and demand side management variance account (DSMVA) and to express an independent opinion on claims to these amounts. When the Enbridge-reported amounts differ from what the auditor believes to be correct, the auditor has calculated alternative values. The audit has the secondary objective of recommending methodological changes to the program administration, verification and audit processes for the future.

Methodology

The auditors began the assessment by conducting preliminary reviews of Enbridge's program verification and technology research reports and general program information, then drafting a work plan, meeting with Enbridge program managers and key technical evaluation support staff, and receiving detailed walk-throughs of major analytical tools by Enbridge administrators.

The core of the large commercial and industrial (C/I) custom project verification process followed. It included intensive desk review of a subsample of twelve projects that were part of the verification samples, followed by telephone discussions with study and/or verification authors. [1] Analysts audited the TAPS program reports for validity and comprehensiveness of analysis to ensure they reflected the Ontario Energy Board's (OEB's) guidance and incorporated the most recent recommendations and performed a limited review of the Enbridge Updated DSM Measures List, then reviewed the TRC master workbook for correct inputs and calculations, reviewed the three sets of calculations required to compute SSM, the LRAM, and reconciliation of the DSMVA, and compared the workbook results with those in Enbridge's Annual Report for proper representation. This audit's scope did not include review of programs or program elements for which Enbridge did not produce reports in 2011 or in 2012 regarding 2011 program performance.

[1] Enbridge project savings are developed and then reviewed and revised at several levels. In a typical custom project the applicant or their vendor develops initial savings estimates. Enbridge then assigns a review engineer to determine if savings is reasonable and if necessary develop an alternate estimate. The final approved savings estimate constitutes the claimed savings estimate. After year end, Enbridge hires a verification firm to evaluate a sample of the project estimates and develop an overall verification adjustment factor. The final step in the process is this audit, whereby auditors review a subsample of the verified custom projects and the verification methodology.

Lastly, methodological recommendations were considered, both for individual verification activities and for the appropriateness of the scope of the 2011 research and program reports overall in the context of research reports completed in years prior to 2011.

Findings

The auditors made five sets of adjustments that affect the TRC calculations or the payment mechanism results. Table ES-1 summarizes the individual changes made that affected the calculated net annual m^3 of gas savings and the TRC. Table ES-2 summarizes the impact of these changes on the resource acquisition, market transformation, and low income weatherization programs.

Table ES-1. Summary of Adjustments by Program Type

Description of Adjustment	Original Value	Audit Value	NET Annual m3 Gas Savings Adjustment	TRC Adjustment for SSM ($)	Audit Report Ref. Page(s)
Audit Adjustments to Results of Custom Commercial and Industrial Resource Acquisition Program					
Custom industrial and agricultural adjustment factors updated to account for sample weights and edits to one industrial project.	Industrial & Agriculture: gas -0.7% elec 0.0% water -9.0%	Industrial & Agriculture: gas 2.01% elec 0.00% water -11.14%	479,162	$817,738	10 through 12 and Appendix B
Custom commercial and multifamily adjustment factors updated to account for sample weights and edits to two commercial projects.	Commercial and Multifamily Residential: gas -2.6% elec 2.8% water -1.0%	Commercial and Multifamily Residential: gas -3.57% elec -5.95% water -12.37%	-383,675	-$1,761,656	10 through 12 and Appendix B
Custom Resource Acquisition Program Totals	N/A	N/A	95,487	-$943,918	N/A
Audit Adjustments to Results of Residential and Low Income (LI) Resource Acquisition Programs					
Correction of Reduction Rates for TAPS programs for Existing Homes	7,754,910 m3 gas 17,554,129 kWh 2,376,342 m3 water	7,685,917 m3 gas 17,488,170 kWh 2,355,547 m3 water	-68,994	-$405,849	16 through 19
Correction of Reduction Rates for TAPS programs for Low Income	85,362 m3 gas 163,107 kWh 19,023 m3 water	84,700 m3 gas 171,579 kWh 18,799 m3 water	-662	$822	16 through 19
Residential and Low Income Resource Acquisition Program Totals	7,840,272 m3 gas 17,717,236 kWh 2,395,364 m3 water	7,770,616 m3 gas 17,659,749 kWh 2,374,347 m3 water	-69,655	-$405,027	N/A
Audit Adjustments to Market Transformation (MT) Program Results					
Correction to drain water heat recovery (DWHR) participant counts	4,052 installed units	2,168 installed units	See Table ES-2	See Table ES-2	21 & 22
Totals	4,052 installed units	2,168 installed units	N/A	N/A	N/A

Table ES-2. Summary of Adjustments to Net Annual Gas m3, TRC, and SSM

Description of Adjustment	NET Annual m3 Gas Savings Adjustment	TRC Adjustment for SSM ($)	SSM Adjustment ($)
Resource Acquisition Programs	25,831	-$1,348,946	-$77,229
DWHR Market Transformation Scorecard Program	Not applicable	Not applicable	-$102,054
Low Income Weatherization Scorecard Program	0	$0	$0
Totals	**N/A**	**-$1,348,946**	**-$179,283**

Overall, the adjustments were minor relative to the overall magnitude of savings and payments. The procedures used are reflective of a mature process. No single adjustment to the results exceeds 0.55% percent of the total portfolio TRC and the net resulting adjustment to the total TRC is a decrease of 0.80%. The nature of the adjustments generally can be characterized as technical corrections to erroneous calculations, as opposed to being modifications of inflated assumptions or other biasing factors. Overall, auditors found Enbridge's efforts to be diligent and reflective of a balanced effort to estimate actual savings.

The audit includes one significant qualifying statement. One of the most important elements of this audit was a review of savings verification efforts contracted by Enbridge to independent firms. While a portion of those savings verification efforts involved spot observation of equipment operating characteristics, others did not and none included logging of pre- or post-installation equipment performance over time. This approach to verification limits their scope to detection of errors and fraud and determination of the "reasonableness" of savings *predictions*. It does not enable validation of savings actually achieved. Thus, while the audit finds Enbridge's savings estimates to be reasonable and unbiased, it cannot fully validate the savings achieved.

Savings Verification Statement

We have audited Enbridge's Annual Report, TRC savings, SSM, LRAM, and DSMVA for the calendar year ending December 31, 2011. The Annual Report and the calculations of TRC, SSM, 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 (OEB) in its Decision with Reasons dated August 6, 2006 in EB-2006-0021. 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 herein 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 forth by the OEB that are applicable to the 2011 DSM programs of Enbridge:

- TRC savings – $171,770,167
- SSM amount recoverable – $6,688,629
- LRAM amount recoverable – -$54,905 (to be paid to the ratepayers)
- DSMVA amount recoverable – $535,804

For comparison, the draft values previously reported by Enbridge for 2011[2] were:

- TRC savings – $173,119,113
- SSM amount recoverable – $6,867,911
- LRAM amount recoverable – -$55,619 (to be paid to the ratepayers)
- DSMVA amount recoverable – $535,804

Recommendations

In addition to quantifying the savings and recoverable amounts, auditors identified nine opportunities for Enbridge to enhance program operation and verification procedures going forward. The auditors consider Recommendation 1 the most significant. The recommendations are briefly summarized below and addressed in more detail in the body of the report.

1. Change the custom verification protocols to include more intensive investigation of projects, including post-retrofit equipment performance measurement over time.
2. Collect custom project analysis files in native format (e.g. Excel workbooks) rather than just hard copy or PDF format, to aid later evaluation.
3. Add post-verification steps to the custom commercial and industrial sampling protocol that instruct the engineering verification contractor to provide the project-specific results to the sample design contractor, and for the sample design contractor then to calculate the overall weighted average adjustment factor that includes consideration of the sample expansion weights.
4. The custom engineering verification contractor should provide the project-specific results to the sample design contractor, and the latter firm should then calculate the final actual error ratio and report this value.
5. Collect more detailed final project cost information such as invoices, payment requisitions, or summary information from participants' in-house tracking or accounting systems.
6. Use data collected over the last few years to extrapolate the likely proportions of high- and medium-flow showerheads replaced instead of continuously bag testing.

[2] All values from *Demand Side Management 2011 Draft DSM Annual Report*, Enbridge Gas Distribution Inc., DSM Research and Evaluation, April, 2012 (SSM amounts combined for resource acquisition and scorecard programs) except LRAM, which is from 2011 FE-PE_Actual vs Budget_LRAM_Audit_Step 4_May 15.xlsx, provided to ERS from Corrie Morton, Enbridge DSM Research and Evaluation, May 22, 2012.

7. For pre-rinse spray valves, either re-analyze existing data or collect new data in the next round of evaluation to test whether retention rates vary by facility type (full service, limited duty, and other) and use different values if the difference is material.
8. Provide the residential verification firm with the spreadsheets and guidance required to report adjustment factors rather than just providing the calculation inputs. This will improve reporting consistency.
9. Future audit scope should include review of a sample of participant records to verify the participant counts and tracking procedures for programs such as the DWHR programs in which participant counts are based on the number of units installed by contractors or other parties that are not directly supervised and tracked by Enbridge staff.
10. Prioritize and complete free ridership research in 2012 for completion prior to next year's verification analysis.
11. Consider incorporating spillover research with the free ridership decision-making data collection for selected Enbridge programs.
12. The scope of future audits should include selective random depth tracing of Enbridge data processing from the TRC calculator inputs back to raw field data.

1. INTRODUCTION AND OBJECTIVES

Enbridge operates a series of demand side management (DSM) programs to encourage customers to use less natural gas and, in some cases, less electricity and water. The company receives a combination of direct cost recovery and performance incentive payments for DSM program delivery. OEB and the Consultative group's evaluation audit committee (EAC) require independent third-party review of Enbridge's Annual Report and supporting calculations to ensure that savings claims and performance-based payment calculations are correct.

1.1. Objectives

The primary objective of this audit is to review the Enbridge claims for TRC, SSM, LRAM, and DSMVA for the calendar year ending December 31, 2011 and to express an independent opinion on these amounts. Enbridge contracted with ERS to perform the audit. If the Enbridge-reported amounts differed from what ERS believed to be correct, ERS presented alternative values for the EAC to consider. As noted in the OEB DSM Framework, the audit has the secondary objective of recommending forward-looking evaluation work for consideration. The audit report authors have interpreted this objective to also include recommending methodological changes to the verification and audit processes.

This audit was conducted in accordance with the rules and principles set forth by the OEB in its Decision with Reasons dated August 6, 2006 in EB-2006-0021.

1.2. Methodology

The methodology followed by auditors is detailed in Appendix A: *Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results, Final Work Plan* and briefly summarized here.

Enbridge delivered the first program files to ERS for review on March 26, 2012. The information included both verification and technology research reports and general program information to help the auditors understand Enbridge's programs. The lead auditors began participation in weekly EAC conference calls, evaluating the methods and requesting and receiving additional files. After an orientation period auditors drafted the Work Plan on April 19 and met with Enbridge staff in Toronto on April 24 and 25. Enbridge arranged meetings between the auditors and all principal program managers and Enbridge's key technical evaluation support staff. The review process included detailed walk-throughs of major analytical tools used by the Enbridge senior staff responsible for savings estimation and related calculations. Tools reviewed included both the commercial e-tools and industrial e-tools and the TRC workbook. Examination of Enbridge's DSM analysis, reporting, and tracking system (DARTS) was not in scope. The auditors also met with the EAC and identified additional topics for investigation. Appendix A includes a list of the documentation provided for auditing.

This audit's scope did not include review of programs or program elements for which Enbridge did not produce reports in 2011 or in 2012 regarding 2011 program performance. Specifically, there was no auditing of the updated DSM measures list, DARTS, e-tools' formulae[3], the performance

[3] DARTS is Enbridge's program tracking database. E-tools is Enbridge's in-house savings estimation tool that standardizes inputs and calculations for complex measures.

characterization of residential thermostats, or the boiler and steam trap reports concluded in 2011 but which the prior auditor reviewed. Review of Enbridge's substantiation sheets was selective. Auditing of the low-income weatherization program was limited to a review of the Scorecard. Auditing of the small commercial offerings was limited to review of the pre-rinse spray valve measure research report and the TRC calculator. A comprehensive review of the DSM measure list and substantiation sheets was not performed.

The core of the large commercial and industrial (C/I) custom project verification process was intensive desk review of a subsample of twelve projects that were part of the verification samples, followed by telephone discussions with study and/or verification authors when questions arose. The audit subsample accounted for 68% of the verification sample's total annual natural gas savings. The reviews focused on appropriate baselines, cost estimates, energy savings calculations, and measure life reasonableness. If the auditor believed a different savings estimate was more appropriate for a reviewed project in the subsample, analysts adjusted the inputs for the TRC analysis.

Enbridge and its contractors completed program reports on the three residential TAPS programs (regular, low income, and direct mail/bill insert) and completed two research reports on specific commercial measures. Analysts audited the reports for validity and comprehensiveness of analysis to ensure they reflected OEB guidance and incorporated the most recent recommendations.

The auditors performed a limited review of the Enbridge Updated DSM Measures List (savings basis) submitted to the OEB by examining selected substantiation sheets. This list is the basis for a significant portion of the prescriptive savings.

After reviewing the 2011 individual components, the auditors reviewed the TRC master workbook for correct inputs and calculations, the three sets of calculations required to compute SSM, the LRAM, and reconciliation of the DSM variance account (DSMVA), and reviewed the results transfer for proper representation of results in Enbridge's Annual Report.

Lastly, methodological recommendations were considered, both for individual verification activities and for the appropriateness of the scope of the 2011 research and program reports overall in the context of research reports completed in years prior to 2011.

Audit activities continued through mid-May, with the product being this draft report due May 25.

1.3. Report Layout

The balance of this audit report has four major sections. The first section reports on the audited findings related to Enbridge's three program research reports completed in 2011. The second section reports on the same for Enbridge's three financial compensation mechanisms. The third presents the recommendations. Lastly, the appendices contain the previously submitted audit work plan, an example audit review checklist, presentation of detailed findings associated with one of the audit's adjustment factor calculations, and a flow diagram for the TRC workbook.

2. PROGRAM AND TECHNOLOGY AUDIT

Section 2 presents the program and technology audit findings.

2.1. Commercial, Multi-Residential, & Industrial Custom Incentive Verification

Enbridge's custom projects contributed over 85% of the portfolio's annual natural gas filed savings in 2011. To verify the filed savings values, Enbridge contracted with a statistics firm to execute the sample design as described in the protocol[4] then contracted with engineering firms to investigate the sampled projects. The samples included fifteen industrial and agricultural projects and twenty-six commercial and multi-residential projects.

The audit team selected a subsample of twelve projects from the verification samples to audit. The selection process assigned separate strata for industrial, agricultural, commercial/multi-residential retrofit, and commercial/multi-residential new construction, and made census selections of projects exceeding one million m3 reported savings. While statistically structured, the selection was not intended to be an optimized design. Rather it was designed to ensure representation of each customer type and to include projects both with and without water savings, both with large and small reported savings, and with a broad distribution of energy efficiency technologies. The audit subsample accounts for 68% of the verification sample's total annual natural gas savings.

The audit's project-specific scope included review of inputs and outputs that could affect the TRC calculation, principally measure annual savings (natural gas, electricity, and water), measure cost, and measure life. The project-specific reviews also included checks for the accuracy of each project's baseline definition. After determining the adjustments appropriate for each project in the subsample, the auditors calculated an overall subsample-based weighted average adjustment factor to the energy savings. As is detailed below, auditors made one adjustment on measure life. It is not appropriate to calculate an extrapolated adjustment factor for the life parameter, as the sample design was based on annual energy savings rather than life or lifetime energy savings, so auditors adjusted the measure life for the individual audited project alone.

This section reports on project-specific findings and then on findings related to the aggregated results and process. Auditors found two types of two types of corrections that need to be applied to the Company's custom C&I project savings estimates.

- The first adjustment is a correction to the engineering estimates of savings provided by the verification engineers based on audit engineering review of a subsample of verified projects. Section 2.1.1 and Appendix B describe the engineering adjustments made to individual projects. Section 2.1.2 and Table 2-2 aggregate the effects of the auditor engineering findings into a set of adjustment factors.

[4] Proposed Sampling Method for Custom Projects, memorandum from Gay Cook, Summit Blue, to Judith Ramsay, Enbridge Gas Distribution et al, October 31, 2008 provides the core procedure. Sample Selection for 2008 Custom Projects – Wave I, memorandum from Gay Cook, Summit Blue, to Judith Ramsay, Enbridge Gas Distribution et al, December 19, 2008, demonstrates the application adds consideration for measures that save water to the method.

- The second adjustment is a statistical correction to the way the verification firm developed the aggregate savings adjustment factor from the individual project reviews. Section 2.1.3 and Table 2-3 present the set of adjustment factors needed due to this change.

These two adjustments are independent of one another. The realization rates associated with the two adjustment factors must be multiplied together to compute the combined overall audited realization rates and adjustment factors. The combined effects of these two corrections are presented in Section 2.1.4 and Table 2-4 in that section.

2.1.1 Custom Project-Specific Findings

The auditors concluded that the natural gas savings should be adjusted for two of the twelve projects. The results of the review for those projects with different audited results are shown in Table 2-1 below.

Table 2-1. Custom Projects with Audited Estimates that Differ from Verification Estimates

Project #	Verification Savings	Auditor Savings	Reason for Auditor Change
NP.085.11	3,279 m3/yr of NG $9,246 installed cost 15-year measure life	21,858 m3/yr of NG $9,246 installed cost 15 years on insulation measure 5 years on other measures	The auditor found that metered data supports the savings claim; additional data on installed measures supports savings order of magnitude. Audit updates to measure life to account for shorter life (5 years) of operational improvement measures and longer life of insulation measures (15 years).
NC.011.11	189,372 m3/yr of NG 73,220 kWh/yr $281,000 installed (incremental) cost 25 year measure life	189,372 m3/yr of NG 67,829 kWh/yr $281,000 installed (incremental) cost 25 year measure life	The auditor found that in the 2011 evaluation, it was noted that the base case insulation levels were too low and gas use associated with heating was adjusted accordingly. The evaluator did not adjust space cooling energy (kWh) to account for the improved base case insulation levels. The auditor revised the kWh savings to reflect the increased cooling performance of the base case due to increased insulation levels
ALL.034.11	1,438,419 m3/yr of NG $1,536,684 installed cost 15-year measure life	1,557,340 m3/yr of NG $1,536,684 installed cost 15-year measure life	The auditor found that Enbridge's initial claimed savings were based on more rigorous analysis than the verification savings; auditors adopted EGD's savings estimate rather than the evaluation firm's estimate.

The auditors prepared a checklist template to use as a review tool and completed it for each project. Appendix B includes one-paragraph summaries of the audit review findings for each reviewed custom project and one example of a completed project checklist.

2.1.2 Custom Project-Specific Engineering Adjustment

After weighting the audit-subsample results according to stratum expansion weights, the additional adjustment factors are as shown in Table 2-2. In this report a positive adjustment factor indicates that the auditors found the savings to be greater than was verified. For example, an auditor adjustment factor of 1% means that audited savings are 101% of the previously reported savings.

Conversely a negative adjustment factor indicates savings should be reduced. The realization rates associated with these subsample adjustments should be multiplied with the realization rates associated with the verification studies to determine the combined realization rate and adjustment factor.[5] The net effect of the increase in the adjustment factor was to increase the total portfolio TRC by 0.81%.

Table 2-2. Audited Custom Subsample Engineering Review-Based Adjustment Factors

Verification Report	Natural Gas Adjustment Factor	Electric Energy Adjustment Factor	Water Adjustment Factor
Industrial & agriculture	0.90%	0%	0%
Commercial & multi-residential	1.61%	-0.44%	0%

2.1.3 Custom Statistical Weighting Adjustment

Aggregate results weighting. The custom program verification studies calculate the overall adjustment factor by computing the weighted average factor for the sample projects, with the weighting based on energy savings. The weighted average also should account for the differing expansion weights associated with each project. For example, the sample design protocols dictate that 3 of the 6 largest commercial renovation projects be verified and that 7 of the 160 remaining smaller projects be verified. The final weighted average adjustment factor should account for the fact that the 3 largest projects' adjustment factors each effectively represent 2 projects (6/3) in the population, whereas each of the 7 other sampled projects effectively represent about 23 projects (160/7).

Appendix C details the corrected calculations in tabular format for natural gas. The same procedure applies for electricity and water savings. The change in the adjustment factor after accounting for this adjustment is as shown in Table 2-3. The net effect of correcting the aggregate results calculation is that the custom industrial adjustment factor and associated custom industrial and agricultural program TRC increases by 1.92% and the custom commercial adjustment factor and associated custom commercial program TRC decreases by 3.27%.

[5] Total adjustment factor = Total realization rate (RR) – 100%. RR = Audit realization rate (RRa) × Verification realization rate (RRv). RRa = Audited subsample weighted savings / Verified subsample weighted savings = 100% - Audit adjustment factor. RRv = Verified sample weighted savings / Filed sample weighted savings = 100% - Verification adjustment factor.

Table 2-3. Custom Sample Statistical Review-Based Adjustment Factors

Verification Report	Natural Gas Adjustment Factor	Electric Energy Adjustment Factor	Water Adjustment Factor
Industrial & agriculture			
Verification report	-0.7%	0.0%	-9.0%
Audited	1.1%	0.0%	-11.1%
Net difference	1.8%	0.0%	-2.1%
Commercial & multi-residential			
Verification report	-2.6%	-2.8%	-1.0%
Audited	-5.1%	-5.5%	-12.4%
Net difference	-2.5%	-2.7%	-11.4%

2.1.4 Custom Combined Overall Audited Adjustment Factors

Enbridge's claimed savings associated with each project in the population must be multiplied by the audited realization rates associated with both the Subsample Engineering Review-Based Adjustment Factors in Table 2-2 and the Sample Statistical Review-Based Adjustment Factors in Table 2-3.[6] Table 2-4 summarizes the final combined adjustment factors.

Table 2-4. Audited Custom Combined Adjustment Factor

Verification Report	Gas Adjustment Factor	Electric Adjustment Factor	Water Adjustment Factor
Industrial & agriculture	2.01%	0.0%	-11.14%
Commercial & multi-residential	-3.57%	-5.95%	-12.37%

2.1.5 Custom Other Findings

Auditors made other observations during custom program review that do not affect the quantitative results.**Final statistical results.** Each year's custom program verification sample designs have a goal of 10% relative precision at 90% confidence. Sample sizes are calculated to meet this goal based on the assumption of a 0.5 error ratio. After verification activity completion, the verification studies neither report the actual relative precision compared to the 10% target nor report the actual error ratio, which could be used in the next year's design. This leaves the reader uninformed regarding the verification's statistical precision performance relative to the goals. Given the low variance that occurred in the past several years' custom verifications, it also is driving samples to be unnecessarily high. Table 2-5 provides this information based on auditor calculations.

[6] Combined Adjustment Factor in Table 2-4 = $RR_{combined} - 1$. $RR_{combined} = RR_{subsample} * RR_{sample}$. RRsubsample = Table 2-2 Adjustment Factor -1. RRsample = Table 2-3 Adjustment Factor – 1. For example, for Industrial & Agriculture natural gas, the combined adjustment factor in Table 2-4 = $(1+AF_{Tbl\ 2\text{-}2})*(1+ AF_{Tbl\ 2\text{-}3}) -1 = (1+0.0090)*(1+0.011) -1 = 0.0201$.

Table 2-5. Auditor Calculation of Verification Study Savings Correlation with Enbridge File Savings

Custom Verification Report	Relative Precision at 90% Confidence	Error Ratio
Industrial & agriculture	3.4%	0.05
Commercial & multi-residential	7.0%	0.19

Note that the statistics above are based on the verification study data as presented and do not reflect the auditor adjustments described earlier in this section.

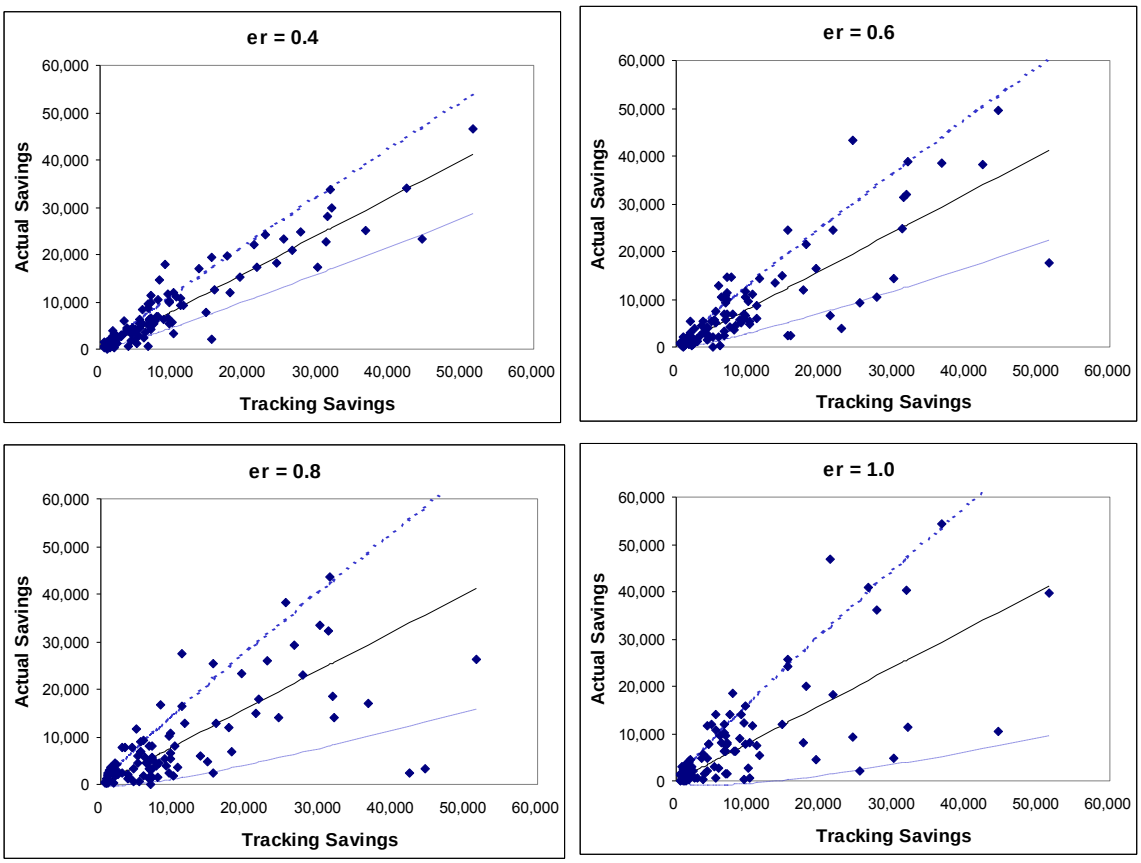
Level of rigor for measurement and verification (M&V). Desk review of project files supported by site inspections and spot measurement but without extended measurement over time is a limited form of verification.[7] Such verification will find errors or fraud and will affirm the "reasonableness" of savings predictions, but without M&V cannot truly validate savings that are actually occurring. The industrial custom project verification engineers found no need to adjust twelve out of the fifteen reviewed projects. Those that were adjusted were done so by less than 10%. No water savings estimates were adjusted and only one electric estimate was adjusted. For commercial projects the trend was similar. Seventeen of twenty-six were left unadjusted for natural gas savings. This is a small amount of correction given the advantages that hindsight estimation of savings offers.

Figure 2-1, from *The California Evaluation Framework*[8] (the Framework), illustrates different variances between reported and evaluated savings for four generic programs. As the charts show, a larger error ratio indicates less correlation between the two estimates.

[7] The typical measurement periods for equipment that operates independently of seasons is two to four weeks. If weather, seasonal production, or other cyclic variables materially affect loading, the measurement period may need to extend to several months.

[8] *The California Evaluation Framework,* by the TecMarket Works team for the California Public Utilities Commission and the Project Advisory Group, June 2004.

Figure 2-1. Error Ratio as a Measure of Correlation between Tracking and Evaluated Savings



The Framework states that "if the tracking system is expected to provide quite accurate estimates of the actual savings of most sample projects in the evaluation study then the error ratio is likely to be relatively small, e.g., near 0.4. This might be the case for example, if the program provides . . . fairly detailed analysis of each project." If poor estimates are expected the error ratio is likely to be closer to 1.0. The standard protocol Enbridge requires uses a 0.5 error ratio for the sample design.

It is generally considered that predicting savings for natural gas projects is harder than for electric projects due to difficulties in pre-retrofit metering. This leads one to expect error ratios to be larger. Table 2-6 shows the evaluated error ratios for a number of evaluated C/I natural gas programs.[9] All were based on or mostly based on post-retrofit metering.

Table 2-6. Error Ratios for Non-Enbridge Natural Gas Efficiency Programs

Portfolio or Program Type	Error Ratio for the Realization Rate Estimate ($\hat{er}$)	Error Ratio for the Realization Rate Estimate Excluding Outliers* ($\hat{er}$)
Commercial/industrial new & retrofit	1.08	0.92

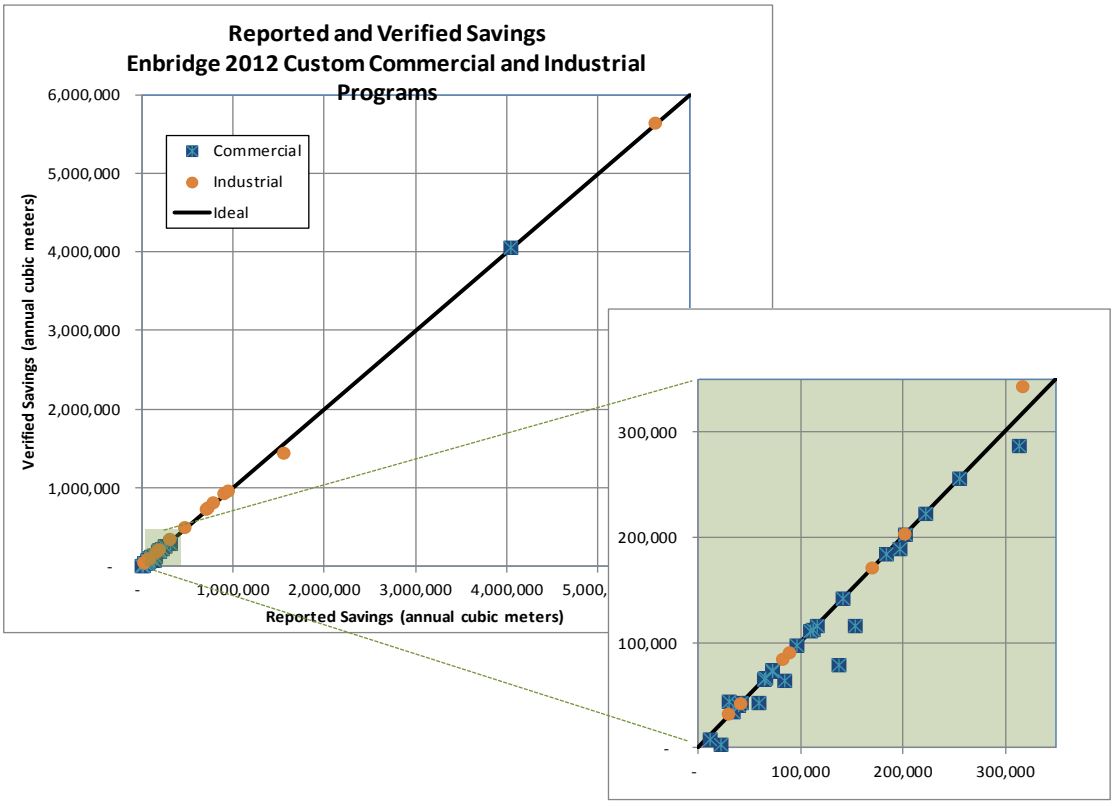
[9] *How to Design a Gas Program Impact Evaluation*, Jonathan B. Maxwell, Energy & Resource Solutions (ERS), College Station, TX, Kathryn Parlin, West Hill Energy & Computing, Chelsea, VT, AESP National Conference, January 2011.

Residential single family new construction	1.14	1.14
Multifamily retrofit	1.08	1.08
Commercial retrofit (major)	1.94	1.51
Commercial standard performance	1.14	1.14
Commercial/industrial bid program	0.30	0.30
Commercial retrocommissioning – Utility A	3.20	1.00
Commercial retrocommissioning – Utility B	1.26	1.19
Commercial retrocommissioning – Utility C	2.06	2.06
Industrial – fabrication	0.30	0.30
Agricultural & food processing	1.40	0.62
Non-res prescriptive pipe insulation measure	0.29	0.29

*Outliers were defined as projects with realization rates greater than 10 or less than 0.

With this background information, consider Enbridge's verification results, as shown in Figure 2-2.

Figure 2-2. Enbridge Custom Project Correlation between Tracking and Verification Savings Estimates



Enbridge's reported and verified results have unusually high correlation. The auditor-calculated error ratio for the combination of C/I projects is **0.14**. While it is possible that the reported estimates are excellent, it is likely that much of the explanation for the high correlation is that the

level of scrutiny the verification engineering firm could afford to apply to each review was simply not enough to discover substantive issues and also provide defensibly better estimates. Specifically, the verification activities do not fund independent evaluation of savings with logged data. (This audit, in turn, repeated this same weakness of the verification).

There are likely two forces driving the limited amount of discovered variance: budget restraints and calendar constraints. When the verification (and audit) cycle must be completed in just a couple of months after the program period end, it is impossible to engage in useful metering over time. The result is a pair of activities that enables discovery of computational errors and theoretical flaws but not of variations in true equipment performance compared to expectations.

2.2. Residential TAPS Program

The TAPS program is comprised of three separate programs for the delivery of energy efficient products to residential customers. These include the Partners Program, where participating contractors visit households to deliver and install products, a Low Income Partners Program with a slightly different set of products, and a Direct Mail/Bill Insert Program where kits are mailed to participants for self-installation. There was also a fourth program targeted to new homes and delivered through participating building contractors under the name of Energy Savings Kits (ESK). Enbridge did not claim ESK savings in 2011 to compensate for premature savings claims associated with equipment that was distributed but not installed in 2010.

Each of the programs provided low-flow showerheads, kitchen and bathroom aerators, and CFL lamps to participants. The low income program also provided programmable thermostats. Similar offerings were made to the multi-residential sector.

A third-party evaluator completed site visits for the multi-residential showerhead program and phone surveys for the other programs to verify installation rates, determine the percentage of products that remained installed, and collect other data necessary to accurately report savings and evaluate program effectiveness.

A summary report prepared for each program was reviewed as part of this audit. In general the approach taken to the collection and reporting of data was deemed to be appropriate and the reported results were valid, within the limits of precision stated in each report.

Inconsistencies in the reports and/or suggestions for modification to the verification approach are listed below.

1. For products like CFL lamps and showerheads, where there can be multiple units installed per household, there appeared to be inconsistencies in the reporting of the number of products installed per household. The reported percentage values when multiplied by the reported sample sizes frequently did not result in whole number values, suggesting, that either the percentage referred to a different sample size, or the calculation was in error (i.e., if the sample was 100 and it was reported that 10.4% of the homes in the sample installed two units, that implies that 10.4 respondents reported that they installed two units.)

   Greater clarity with regard to exactly what the 10.4% represents (i.e., percentage of total sample, percentage of sample minus "don't recall" responses, percentage of sample that installed some lamps) would help to ensure that the reported values are interpreted and utilized correctly in the reporting of program savings by the utility.

Savings for most of the products provided in these programs are calculated per household rather than per unit, and even for bathroom aerators and CFL lamps where the lamps installed per household data is used, the magnitude of any errors introduced by this inconsistency are expected to be very small.

2. The treatment of the "don't recall" responses to the survey questions was inconsistent. Typically participants with this response were eliminated from the survey and the reported sample size was reduced. We believe this approach is the correct one but it was not always followed. One example of an exception can be found in the report for the Direct Response Program (Section 5.2 showerheads). In this case there was a single "don't recall" response that was not removed from the sample and was included in the overall percentage reported as installing at least one showerhead. The resulting inaccuracy in the reported percentage installed was carried through to the Enbridge determination of a reduction factor and the ultimate savings reported for the program. Once again, because the number of "don't recall" responses is small, (1 out of 100 in this case), the impact on reported program savings is minimal, but consistent handling of the data should be stressed for future evaluations.
3. The report for the Partners Program provides very good comparison data between the various participating contractors and between various years the program has operated, which is useful information for the program managers and planners. Information related to overall installation rates was not provided for this program with the same level of detail that exists for the other smaller programs, making the derivation of the percentage installation rates less transparent. An example of this is in the verification report, which indicates that 90.1% of participants "received kitchen and/or bathroom aerators," but does not differentiate between the two, forcing Enbridge to assume the same installation rate for both products, reducing the precision of the resulting reported savings.

2.2.1 TAPS Savings Calculation Audit

Enbridge used the percentage installed, percentage removed after installation, and other inputs from the verification reports related to utilization rates to calculate reduction factors for each measure type in each program. These reduction factors were then used along with free ridership factors and defined per unit savings to predict natural gas, water, and electric savings resulting from each measure.

The Enbridge approach to determining reduction factors is essentially sound and followed prior audit recommendations, but the slight errors in execution and inconsistencies in the percentage installed and removed values provided in the survey result summary reports and discussed in the sections above were carried forward in these calculations.

The most consistent error results from the method used to arrive at a term labeled *percentage material remaining after removal*. This term is intended to represent the percentage of the installed units that remained installed. The reduction factor is determined by subtracting the product of the percentage *distributed,* percentage *installed*, and *percentage remaining after removal* terms from 100%.

Enbridge incorrectly derives the *percentage material remaining after removal* term by subtracting the percentage removed values taken from the verification reports from 100%. For example the survey results report for the TAP Kit Direct Response program reports that for a sample of ninety-eight kitchen aerators, 50% (or forty-nine units) were installed and 2% (or 2 units) were "installed but later removed." Enbridge calculates the *percentage remaining after removal* as:

$$100\% - 2\% = 98\%$$

Because the percentage removed values provided in the verification reports actually represent a percentage of the total sample rather than a percentage of the units that were initially installed, the percentage of material remaining value calculated by Enbridge is slightly in error here and for several other measures for which units that were removed after installation were reported as a percentage of the total sample. The correct value for the *percentage remaining after removal* as it is used to calculate the reduction factor should be calculated as:

$$(49\ Units\ installed - 2\ Units\ later\ removed) / 49\ Units\ installed = 95.9\%$$

Because the number of units removed after installation is small, the resulting error in reported savings is also relatively small.

In other cases, the percentage values used by Enbridge in the reduction factor calculation do not exactly match those provided in the survey reports. One example of this is the calculation of a reduction rate for CFL lamps supplied under the Low Income Partners Program; the Enbridge calculation is based on 90% of the materials being distributed, while the evaluation report for the program show this value as 95%. These errors are relatively few and could be associated with the use of quarterly survey values by Enbridge as opposed to the numbers taken directly from the summary annual verification report.

Table 2-7 provides a comparison of the reduction factors used by Enbridge in the TRC report and the validated reduction factors derived from evaluation survey report data that included the *percentage distributed, percentage installed, and percentage remaining after removal.*

Table 2-7. TRC Reduction Factors

Program /Measure Description	Correction Reason (1 = Incorrect calculation of *% remaining after removal term*; 2 = % values inconsistent with verification survey reports)	Reduction Factor from Enbridge 2011 Annual Report	Auditor Revised Reduction Factor
TAPS Partners – Showerheads >2.5 gpm	1	36.53%	37.19%
TAPS Partners – Showerheads 2.1 – 2.5 gpm	1	36.68%	37.19%
TAPS Partners – Kitchen aerator	1	39.22%	39.53%
TAPS Partners – Bathroom aerator	1	46.19%	46.59%
TAPS Partners – CFL 13 W (four lamps)	1	16.63%	16.97%
TAPS ESK Showerheads 2.1 – 2.5	2	49.68%	49.99%
TAPS ESK Kitchen aerator	1	51.00%	52.04%
TAPS ESK Bathroom aerator	1,2	66.54%	66.49%
TAPS ESK CFL 13W (four lamps)	No change	1.00%	1.00%
TAPS Partners LI – Showerheads >2.5 gpm	1, 2	29.43%	29.45%
TAPS Partners LI – Showerheads 2.1 – 2.5 gpm	1, 2	29.43%	29.45%
TAPS Partners LI – Kitchen aerator	1, 2	21.6%	24.34%
TAPS Partners LI - Bathroom aerator	2	33.00%	35.01%
TAPS Partners LI – CFL 13 W (two lamps)	1, 2	13.68%	8.43%
TAPS Partners LI – CFL 26 W (two lamps)	1, 2	13.68%	8.43%
TAPS Partners LI - Thermostats	No change	26.00%	26.00%

The changes in the validated reduction rates are relatively small, about 0.80% of the total TRC for the residential programs and 0.23% of the portfolio TRC, but in almost all cases the validated reduction rates are higher than the values used in the TRC calculations, making the cumulative impact more significant. The cumulative impact of these changes on overall savings reported in the TRC spreadsheet is shown in the Table 2-8.

Table 2-8. Cumulative Impact of Reduction Rate Changes

Program Group	Natural Gas Savings Impact (m^3/yr)	Electric Savings Impact (kWh/yr)	Water Savings Impact (m^3/yr)	Net TRC Benefits ($)
Total existing homes	-68,994	-65,959	-20,795	-$405,849
Total low income	-662	8,472	-223	$822
Combined	-69,655	-57,487	-21,018	-$405,027

It should be noted that no savings related to the new construction component of the TAPS program are reported for 2011. The explanation for this is that savings reported for this program in 2010 included some kits that were distributed to builders in 2010, but not installed in new homes until 2011. In an effort to ensure savings were not double counted, it was decided that the savings from this program would not be reported for 2011. It is likely that some kits distributed to participating builders during 2011 were actually installed in the same year, producing some level of savings that is not reflected in the TRC calculations.

2.2.2 Observations on Bag Test Protocols

For the Partners, Low Income Partners, and Multifamily Residential programs, Enbridge differentiated savings attributable to showerheads depending upon the flow rate of the pre-existing showerheads. Savings of 50 m^3 per participant for pre-existing showerheads with flow rates between 2.1 and 2.5 gpm, and 82 m^3 per participant for pre-existing showerheads with flow rates greater than 2.5 gpm were assigned.

The percentage of overall participants in each of the two categories is reportedly based upon data resulting from "bag tests" conducted and reported by the installing contractors to document the actual pre-existing flow rates. The breakdown of participants listed on the TRC spreadsheet suggests that 68.25% of participants receiving showerheads under the Partners Program had baseline showerheads with flows greater than 2.5 gpm; the corresponding percentage for participants under the Low Income Partners program was 81.9%. Since there were no on-site contractors to conduct bag tests and report results for the ESK Direct Response program, all showerhead savings for this program were calculated assuming the lower 50 m^3 per participant value.

Savings reported for showerheads under the Multifamily residential program used a per unit savings value of 69 m^3, suggesting that bag-test results for this program predicted that 59.4% of the participants had pre-existing showerheads with flow greater than 2.5 gpm.

Enbridge should be recognized for implementing the bag-test procedure and for documenting and reporting actual baseline flow rates. This level of documentation of baseline conditions is well beyond that typically expected for this type of measure.

2.2.3 Compact Fluorescent Lamp Assumptions

There are two assumptions related to the compact fluorescent lamps (CFLs) that may be generous with respect to electric energy savings. First, it is assumed that all lamps eventually are installed and used and, in particular, that never-installed lamps are in storage and eventually will be installed and accrue savings. The auditors understand that this interpretation was agreed upon previously and that Enbridge is following approved guidance from the OEB. For homes that report already having installed one or more lamps, this is reasonable. For some of the homes that have not installed any of the program CFLs it is likely that they were disposed of without installation due to lack of accommodating fixtures, dissatisfaction with light quality, breakage while in storage, and other similar reasons, and no savings should be associated with them.

Second, Canadian energy efficiency regulations are likely to drive standard practice lighting to technologies more efficient than the current substantiation sheet's baseline of incandescent lamps

within 3 years. Several years after that, CFLs are likely to be the baseline technology.[10] For this reason using an 8-year measure life for CFLs installed in 2011 likely overstates lifetime savings. As with the prior observation, auditors understand that this interpretation was agreed upon previously, and that Enbridge is following approved guidance from the OEB. No adjustment has been made to the calculations.

2.2.4 TAPS Summary

In summary, the auditor believes that the verification surveys were well constructed and generally provide sufficient information to accurately report implementation rates. Methodologies and practices employed by Enbridge in reporting savings based on these values are acceptable and produce results that are within the anticipated range of accuracy and precision.

2.3. Technology Research Reports

Enbridge completed two technology research reports in 2011: one on multi-residential showerheads and one on commercial kitchen pre-rinse spray valves.

2.3.1 Multi-Residential Showerheads

Enbridge provided high efficiency showerheads to 25,233 participants in multi-residential residential buildings during 2011. A verification study consisting of site visits to 493 household in twenty-nine representative buildings was conducted by the study contractor.

The study concluded that 84.5% of the showerheads distributed under the program are still in place. This result was very consistent with the 85.0% remaining result determined in a similar survey for 2010 installation. Enbridge used this value to calculate a reduction factor of 15.5% and predict overall program savings in the TRC spreadsheet.

The auditors examined the calculations and the data collection method as described. The evaluation process and the reported savings are deemed to be reasonable and appropriate.

2.3.2 Pre-Rinse Spray Valves

During the 2011 program year, Enbridge processed 1,508 incentive applications representing 2,520 energy efficient pre-rinse spray valves. A consulting firm was contracted to conduct an evaluation of this program with a goal of determining how many of the spray valves receiving incentives remained in place.

Sixty-five of the 1,508 food service establishments that received incentives were randomly selected for site visits. The site visits revealed that thirty-three of the ninety-nine spray valves that received incentives were still in operation. This represents 33.3% that were installed and remain in use. Additional survey data indicates that 31.3% of the valves represented by the sample were never installed, and 25.3% were initially installed and later removed for various reasons.

[10] See, for example, Table 2-4 of *Northeast Residential Lighting Strategy,* by Energy Futures Group et al, presented by Northeast Energy Efficiency Partnerships, March 2012.

Enbridge used the reported 33.3% remain-in-place value to calculate a reduction factor of 66.7%. The TRC spreadsheet differentiates savings associated with the spray valves based on anticipated utilization, with unit savings values of 1286 m^3 for full service valves, 339 m^3 for limited duty valves, and 318 m^3 for others. The 66.7% reduction factor was applied to all three categories of valves. Additional observation during the verification survey might have allowed for the determination of the percentage remaining in service for each utilization type, leading to a more accurate projection of overall program savings. If this program is to be continued, this modification to the evaluation effort is recommended.

2.4. Drain Water Heat Recovery Market Transformation Scorecard

Enbridge's Drain Water Heat Recovery (DWHR) Program is a market transformation effort targeted at the low rise residential new construction market. The program was originally launched in 2009, changes were made in 2010 to track the number of units installed, and incremental first-time builders were continued in 2011. The DWHR Program utilizes a scorecard approach to benchmark the program's performance. Key metrics included in the program scorecard are the number of units installed as a percentage of housing starts and the incremental first-time new builders enrolled in the program. Table 2-9 summarizes the DWHR market transformation program scorecard, including the 2011 outcomes and the resulting SSM attributable to the program.

Table 2-9. DWHR Market Transformation Scorecard from Enbridge's 2011 Annual Report

Drain Water Heat Recovery		2011 Metric Value Levels			Weight	2011 Metric Value Actual Results	SSM Achievable at 100%	SSM Achieved
Element	Metrics	50%	100%	150%				
Ultimate outcomes	Units installed (new buildings) as percentage of housing starts (across all builders)	4,800	5,280	6,000	/80	4,052	$520,000	$219,492
Program performance	First-time new builders enrolled (incremental)	20	25	30	/20	60	$130,000	$195,000
Total								**$414,492**

The auditors noted that the ultimate outcomes metric (the number of DWHR units installed) in 2011 fell below the 50% target, while the program performance metric (first-time new builders enrolled), exceeded the 150% target. Enbridge attributed the lower-than-anticipated number of DWHR installations to higher-than-forecasted housing starts in 2011 and overly aggressive installation targets compared to 2010. Enbridge established their targets based on a forecast of 22,396 housing starts in 2011; the actual number of housing starts in 2011 was 23,999. Additionally, Enbridge noted that the higher metric targets (44% – 56% higher than 2010) were too aggressive for this relatively young program. Further, in reviewing its internal procedures, Enbridge noted a discrepancy in the number of units installed vs. the number shipped. According to research done internally by Enbridge, the 4,052 DWHR units that had previously been claimed by

Enbridge in their 2011 annual report included approximately 334 units that were shipped in 2011 but installed in 2012, approximately 867 units that were shipped in 2011 and have yet to be installed, and approximately 771 units that were carried over from the 2011 program tracker and shipped in 2012. This discrepancy resulted in a significant reduction in the number of drain water heat recovery unit installations attributable to Enbridge's programs in 2011, down from 4,052 units to 2,168 units. The updated SSM calculation is shown in Table 2-10.

Table 2-10. DWHR Market Transformation Scorecard from 2011 Audit

Drain Water Heat Recovery		2011 Metric Value Levels			Weight	2011 Metric Value Actual Results	SSM Achievable at 100%	SSM Achieved
Element	Metrics	50%	100%	150%				
Ultimate outcomes	Units installed (new buildings) as percentage of housing starts (across all builders)	4,800	5,280	6,000	/80	2,168	$520,000	$117,438
Program performance	First-time new builders enrolled (incremental)	20	25	30	/20	60	$130,000	$195,000
Total								**$312,438**

There was no verification report for the DWHR market transformation program. Should a verification effort similar to the one implemented for the TAPs residential program have been implemented, it is possible that the error noted above would have been caught in the audit process. Under the current audit process, a review of the participant count and tracking procedures was not performed for this program. The auditors recommend that in future audits, a sample of participant records be reviewed to verify the participant counts and tracking procedures for programs such as the DWHR market transformation programs. Such action would be prudent for any program in which participant counts are based on the number of units installed by contractors or other parties that are not directly supervised and tracked by Enbridge staff. The auditors examined the scorecard calculations as described. The participant counts were reported by Enbridge and review of the participant tracking was not in the scope of the audit. Given the updated participant counts provided by Enbridge, the auditor believes that the reported SSM is reasonable and appropriate.

2.5. Low Income Weatherization Program Scorecard

Enbridge implemented a low-income weatherization program during the 2011 program year. The goals of this program were to reduce energy consumption through an improved building envelope. The program's target market was low-income customers. Table 2-11 summarizes the low-income weatherization program scorecard, including the 2011 outcomes and the resulting SSM attributable to the program.

Table 2-11. Low-Income Weatherization Program Scorecard

Low-Income Weatherization		2011 Metric Value Levels			Weight	2011 Metric Value Actual Results	SSM Achievable at 100%	SSM Achieved
Element	Metrics	50%	100%	150%				
Ultimate outcomes	Weatherization participants	400	500	575	/50	599	$200,000	$300,000
Program performance	Total natural gas savings (m3)	615,100	773,650	894,950	/50	824,773	$200,000	$242,146
Total								**$572,146**

Enbridge met or exceeded its 2011 targets for the low-income weatherization program. Enbridge attributed the success of this program to expanded program penetration into new communities and to more comprehensive program delivery as a result of the lower TRC threshold (reduced from 1 to 0.7 for this program).

The auditor reviewed the results reported by Enbridge for the 2011 low-income weatherization program and found the actual 2011 results and resulting SSM to be accurate.

3. CALCULATIONS AUDIT

The auditors reviewed the three calculation mechanisms in detail. In summary, no errors were found and all calculations produced the intended results.

3.1. Shared Savings Mechanism Calculations

The auditor reviewed the SSM and TRC calculation methods applied in the 2011 Annual Report[11] and found the calculations to be accurate and in accordance with OEB guidelines. The final TRC values were updated by auditors to reflect the changes they made in their review of the 2011 program results. The final TRC values are shown in Table 3-1.

Table 3-1. Enbridge Annual Report and Audited TRC Values

Shared Savings Mechanism, by Program Area	2011 Draft Annual Report TRC ($)	Audit Adjusted TRC ($)	Difference in TRC = Audited TRC - 2011 Annual Report TRC ($)
Existing Homes	$48,867,106	$48,461,257	-$405,849
Residential New Construction	$1,125,396	$1,125,396	$0
Low Income	$422,179	$423,000	$822
Total Residential	**$50,414,681**	**$50,009,653**	**-$405,027**
Commercial Prescriptive	$12,666,641	$12,666,641	$0
Commercial Custom	$35,042,436	$34,312,086	-$730,350
Multi Residential	$43,377,882	$42,760,257	-$617,626
Large New Construction	$9,835,906	$9,422,226	-$413,680
Industrial	$27,895,220	$28,712,958	$817,738
Total Business Markets	**$128,818,086**	**$127,874,167**	**-$943,918**
NPDC	-$124,960	-$124,960	$0
Overheads	-$5,988,693	-$5,988,693	$0
Total All Programs	**$173,119,113**	**$171,770,167**	**-$1,348,946**

[11] Appendix D illustrates the flow of data within the TRC workbook.

The audited TRC result was entered into the SSM calculation, and the resulting resource acquisition (RA) program SSM values were updated. The Drain Water Heat Recovery (DWHR) Market Transformation (MT) program scorecard and the Low Income (LI) Weatherization program scorecards were reviewed, and the adjusted SSM values from these programs were entered into the final SSM calculation. The audited RA, MT, and LI weatherization program SSM results are shown in Table 3-2.

Table 3-2. Draft Report and Audited RA, MT, and LI Weatherization Program Shared Savings Mechanism Results

Shared Savings Mechanism	2011 Draft Annual Report Value ($)	Audit Adjusted Value ($)	Difference = Audited SSM - 2011 Annual Report SSM ($)
2011 Resource Acquisition SSM	$5,911,273	$5,834,044	-$77,229
2011 Market Transformation Scorecard SSM	$414,492	$312,438	-$102,054
2011 Low Income Scorecard SSM	$542,146	$542,146	$0
Total	**$6,867,911**	**$6,688,629**	**-$179,283**

The audited SSM was 2.6% less than the value reported in Enbridge's 2011 Annual Report. The primary reason for this deviation was the error in the tracking of the installed DWHR units.

The auditors reviewed the TRC and SSM calculations and found the methods applied to calculate these values were accurate and in accordance with OEB guidelines. Applying the reviewed TRC and SSM calculation methods, the TRC and SSM values were updated to reflect the adjustments to the resource acquisition and market transformation program results discussed previously in this report. The resulting audited SSM is $6,688,629.

3.2. Demand Side Management Variance Account

The DSMVA provides Ontario's utilities with operational flexibility. This account may be used to rebate unused funds to customers at the end of the program year. Similarly, the variance account provides for the recovery from ratepayers any additional costs incurred for program implementation, subject to a 15% budget cap. The variance account is essentially a true-up mechanism that has the effect of motivating utilities to pursue efficiency investments, even if their actions cause the program to exceed approved budgets, subject to a cap.

Enbridge's original 2011 Annual Plan, filed on May 28, 2010 established a 2011 DSM budget of $26,708,068; this was the budget built into rates. As per the OEB's September 24, 2010 request, Enbridge filed an amended Low Income Weatherization Plan on November 11, 2011 that proposed an additional $1,366,375 for low income programs. Enbridge's Low Income Weatherization Plan amendment was approved by the Board on December 20, 2010. The total 2011 Board-approved program budget was $28,074,443. The initial $26,708,068 budget was built into rates; the additional $1,366,375 was not.

Enbridge's total 2011 spending was $27,243,872. Of this, $26,708,068 was built into rates, resulting in a variance of $535,804, as demonstrated in Table 3-3. The auditors reviewed Enbridge's 2011

Annual Plan, with updates[12], which included the $26,708,068 budget that was built into rates and the $1,366,375 budget that was approved in the Amended Low Income Weatherization Plan, but was not built into Enbridge's 2011 rates. The review did not include auditing of Enbridge spending documentation. This is a financial auditor's responsibility. Auditors assumed the spending to be correct. fThe auditors also reviewed the calculation of the 2011 DSMVA and discussed the reported spending with Enbridge staff to verify the accuracy of the DSMVA calculation and ensure consistency between the spending reported in the DSMVA calculation and the 2011 TRC calculation. The auditors' review of the 2011 spending calculation showed that although Enbridge underspent the budget that agreed upon with the Board in Enbridge's amended 2011 Annual Plan, Enbridge was entitled to collect money from the ratepayers via the DSMVA to recover the $535,804 of spending that was not built into the 2011 rates.

Table 3-3. Enbridge Draft Report and Audited DSMVA

DSMVA	2011 Annual Report Value ($)	Audit Adjusted Value ($)
Total 2011 DSM Budget as per 2011 Annual Plan, with updates	**$28,074,443**	**$28,074,443**
Additional 2011 DSM Budget, not included in rates, as per amendment to 2011 Annual Plan, approved by OEB on December 20, 2010	$1,366,375	$1,366,375
Portion of Budget from 2011 Annual Plan included in rates, submitted to OEB on May 28, 2010	**$26,708,068**	**$26,708,068**
Total 2011 Enbridge DSM Program Spending	$27,243,872	$27,243,872
2011 DSMVA	**$535,804**	**$535,804**

The auditors reviewed the DSMVA calculation in the draft of the 2011 Draft Annual Report and found that the calculation and inputs are accurate. The DSMVA recoverable from ratepayers to Enbridge is $535,804.

3.3. Lost Revenue Adjustment Mechanism

The LRAM serves as a self-correcting balancing account to ensure the interests of stockholders and ratepayers are equally protected. Specifically, the adjustment mechanism is intended to compensate Enbridge for distribution margins lost as a result of greater-than-anticipated efficiency performance. Similarly, the LRAM may also be used to compensate ratepayers when the utility does not meet its volumetric DSM savings estimates. Enbridge collects DSM and other expenses through a tariff. Ratepayers fund the expenses over time based on a pre-determined rate, in dollars per m^3 of gas

[12] Enbridge's 2011 Annual Plan is detailed in Ontario Energy Board filing EB-2010-0175. This filing includes the original 2011 Annual Plan, which details the budget that was built into rates, and the Amended Low Income Weatherization Plan.

sales. If sales exceed forecasted amounts due to DSM program underperformance, the consequence will be excessive ratepayer collection through the tariff. The LRAM calculation tracks any such deviation for ratepayer reimbursement.[13]

Rate adjustments for rates 1 and 6 are not included in the 2011 LRAM. An average use true-up variance account (AUTUVA) mechanism is used in the place of LRAM for these two rates. The auditors did not review the AUTUVA; this mechanism was approved by the Board in previous rate case proceedings and was not revisited here. Enbridge's 2011 LRAM, less rates 1 and 6, is shown in Table 3-4. Negative LRAM values in the final column of this table indicate payment that is due to the ratepayer; positive values indicate LRAM that is due to Enbridge.

Table 3-4. LRAM Reported in Enbridge's 2011 Annual Report

LRAM	Budget Net Partially Effective (m^3/yr)	Actual Net Partially Effective (m^3/yr)	Volume Variance (m^3/yr)	Distribution Margin (Cents/m^3/yr)	2011 LRAM ($)
Rate 110	1,995,809	973,689	-1,022,121	1.63	-$16,612
Rate 115	1,270,060	835,294	-434,767	0.99	-$4,309
Rate 135	0	178,224	178,224	1.40	-$2,495
Rate 145	1,863,650	730,207	-1,133,443	1.81	-$20,522
Rate 170	4,329,389	1,392,187	-2,937,203	0.57	-$16,671
2011 LRAM	**9,458,908**	**4,109,601**	**-5,349,310**	**1.04**	**-$55,619**

The auditors verified that the methodologies and assumptions used to calculate the actual LRAM sales volume, net of installed efficiency measures (i.e., ex post), are consistent with the methodologies and assumptions used to calculate the year's LRAM budget sales volume (i.e., ex ante). The auditors also ensured that the net volumetric sales are appropriately allocated to each respective customer class. The auditors verified that the distribution margin and m^3 savings included in the budgeted net partially effective LRAM calculations were the same values that were applied to establish the 2011 rates. The audited LRAM is shown in Table 3-5.

[13] "The LRAM amount is determined by calculating the difference between actual and forecast natural gas savings by customer class and monetizing those natural gas savings using the natural gas utility's Board-approved variable distribution charge appropriate to the rate class. . . . The natural gas utilities should calculate the first year impact of DSM programs on a monthly basis, based on the volumetric impact of the measures implemented in that month, multiplied by the distribution rate for each of the rate classes in which the volumetric variance occurs in. This approach will help ensure that LRAM amounts closely reflect the actual timing of the implementation of the DSM measures." From *Demand Side Management (DSM) Guidelines for Natural Gas Distributors*, EB-2008-0346, June 30, 2011, p. 33.

Table 3-5. Audited LRAM Results

LRAM	Budget Net Partially Effective (m3/yr)	Actual Net Partially Effective (m3/yr)	Volume Variance (m3/yr)	Distribution Margin (Cents/m3/yr)	2011 LRAM ($)
Rate 110	1,995,809	995,813	-999,996	1.63	-$16,252
Rate 115	1,270,060	845,723	-424,337	0.99	-$4,206
Rate 135	0	182,436	182,436	1.40	$2,554
Rate 145	1,863,650	726,920	-1,136,730	1.81	-$20,582
Rate 170	4,329,389	1,436,536	-2,892,854	0.57	-$16,420
2011 LRAM	**9,458,909**	**4,187,428**	**-5,271,481**	**$1.04**	**-$54,905**

Enbridge is recalculating the LRAM results using the "long form" method. The long form results may deviate slightly (expected to be less than $500) from the above. Enbridge will update the LRAM results if necessary in the audit summary report.

4. FINDINGS AND RECOMMENDATIONS

ERS has audited Enbridge's 2011 and 2012 reports associated with their 2011 program reporting and performance. In aggregate, the audit uncovered few elements requiring adjustment. Those adjustments collectively were small relative to Enbridge's total savings, TRC, and payment mechanism results as reported in their May 2012 Annual Report. ERS recalculated all results with audited adjustments.

We have audited Enbridge's Annual Report, TRC savings, SSM, LRAM and DSMVA for the calendar year ending December 31, 2011. The Annual Report and the calculations of TRC, SSM, 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 OEB in its Decision with Reasons dated August 6, 2006 in EB-2006-0021. Details of the steps taken in this audit process are set forth in the audit work plan provided in Appendix A, and this opinion is subject to the details and explanations herein 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 forth by the OEB that are applicable to the 2011 DSM programs of Enbridge:

- TRC savings – $171,770,167
- SSM amount recoverable – $6,688,629
- LRAM amount recoverable – -$54,905
- DSMVA amount recoverable – $535,804

For comparison, the draft values previously reported by Enbridge for 2011[14] were:

- TRC savings – $173,119,113
- SSM amount recoverable – $6,867,911
- LRAM amount recoverable – -$55,619
- DSMVA amount recoverable – $535,804

In addition to quantifying the savings and recoverable amounts, auditors identified opportunities for Enbridge to enhance program operation and verification procedures in the future.

4.1. Custom

1. **Finding.** The Enbridge independent review protocols of verification without post-retrofit measurement of equipment performance over time limits the scope of reviews to detection of

[14] All values from *Demand Side Management 2011 Draft DSM Annual Report*, Enbridge Gas Distribution Inc., DSM Research and Evaluation, April, 2012 (SSM amounts combined for resource acquisition and scorecard programs) except LRAM, which is from 2011 FE-PE_Actual vs Budget_LRAM_Audit_Step 4_May 15.xlsx, provided to ERS from Corrie Morton, Enbridge DSM Research and Evaluation, May 22, 2012.

errors, fraud, and determination of "reasonableness" of savings predictions, but cannot truly validate savings.

Recommendation. Change the verification cycle to enable more intensive investigation of projects. This can be done through one or a combination of the following approaches to evaluation:

a. Increase evaluation funding as a percentage of total program funds each year. We do not know Enbridge's current level of investment in verification and auditing. In North America typical energy efficiency program evaluation spending is 2% to 5% of program funding. California briefly was as high as 8%.

b. Decrease the number of sites verified per cycle and increase the engineering rigor for each project verified. One way to do this and maintain 90/10 is to group multiple programs into a single population frame and verify the performance for them in aggregate. Grouping could be of multiple Enbridge programs (e.g., commercial and industrial custom) or of multiple administrator programs in a jurisdiction (e.g., Union and Enbridge custom programs) or both.

c. Increase funding per verification without increasing total annual funding by conducting the more rigorous exercise on a bi-annual basis instead of conducting a less rigorous exercise each year.

d. Change the evaluation cycle to allow 6 to 9 months of post-retrofit evaluation. Can be done by either allowing later restatement of past savings or by applying the verification findings prospectively to the next rather than the prior year.

2. **Finding**. Enbridge does not collect custom project analysis data in its MS Excel workbook or other native format. This limits the ability of the verification and audit contractors to efficiently and effectively review prior work.

   Recommendation. Collect analysis files in native format rather than just hard copy to aid later evaluation. If this is impractical to require for all 1,000+ projects completed per year, establish criteria based on incentive value, project complexity, technology, and/or other factors to systematically do so for a subset of them. For example, analysis should be provided in native format for all applications that exceed $100,000 incentive value and are not based on e-tools calculated savings. Alternatively, require that applicants make such data available promptly upon request as part of the application terms.

3. **Finding**. The custom program verification studies calculate the overall adjustment factor by computing the weighted average factor for the sample projects, with the weighting based on energy savings. The weighted average also should account for the differing expansion weights associated with each project.

   Recommendation. Add post-verification steps to the sampling protocol that instruct the engineering verification contractor to provide the project-specific results to the sample design contractor, and for the design firm then to calculate the overall weighted average adjustment factor for use in the TRC calculator.

4. **Finding**. The verification studies do not report the actual error ratio, which could be used in the next year's design.

Recommendation. The engineering verification contractor should provide the project-specific results to the sample design contractor, and the latter firm should then calculate the final actual error ratio when they provide the final actual relative precision and report these values. Then, in the subsequent year's design, the prior year's actual error ratio can be considered.

Exception. If the verification method was to materially change (see the next recommendation), then using 0.5 for the first verification based on the new method would be better than using the prior actual error ratio.

5. **Finding:** Final project cost was not well documented. Though some form of final project documentation existed in each case, it was often informal consisting of an email from the participant to EGD or a quote (issued before the project, as opposed to an invoice) without final cost reconciliation.

   Recommendation: Collect more detailed final project cost information. These documents might include invoices, payment requisitions, or summary information from participants' in-house tracking or accounting systems.

4.2. Prescriptive

1. **Finding.** For the Partners, Low Income Partners, and Multi-Residential programs, Enbridge differentiated savings attributed to showerheads depending upon the flow rate of the pre-existing showerheads. The percentage of overall participants in each of two flow rate categories is based on documented pre-installation bag test data reported by the installing contractors. Multi-Residential Program showerhead reported savings implies that 59.4% of the participants had pre-existing showerheads with flow greater than 2.5 gpm.

   Recommendation. Unless Enbridge perceives more market volatility than auditors expect, it is probably not necessary to conduct bag tests continuously. Use the data obtained from prior bag tests to calculate weighted average unit savings values for residential program showerheads. Re-test periodically but not continuously to assess market penetration.

2. **Finding.** For pre-rinse spray valves Enbridge used the same overall reported 33.3% remain-in-place value for all three foodservice facility types (full service, limited duty, and other). It is likely that the retention rate varies by facility type.

   Recommendation. If this offering continues, either reanalyze existing data or collect new data in the next round of evaluation to test whether retention rates vary by facility type and use different values if the difference is material.

3. **Finding.** The residential verification reports were inconsistent in their presentation of the percentage of units distributed, percentage of units installed, and percentage of units remaining after removal. These inconsistencies led to errors in the calculation of residential program adjustment factors.

   Recommendation. Implement consistency in the values reported in the residential verification reports. Providing the verification firms with the spreadsheets and guidance required to report adjustment factors directly rather than just the inputs to the calculation will enable greater consistency in reporting the residential verification report results.

4.3. Market Transformation

1. **Finding.** In reviewing its internal procedures, Enbridge noted a discrepancy in the number of DWHR units installed vs. shipped. This discrepancy resulted in a decrease in the SSM for this market transformation program. There was no verification report for the DWHR market transformation program. Should a verification effort similar to the one implemented for the TAPs residential program have been implemented, it is possible that the error noted above would have been caught in the audit process. Under the current audit process, a review of the participant count and tracking procedures was not performed for this program.

   Recommendation. The auditors recommend that in future audits, a sample of participant records be reviewed to verify the participant counts and tracking procedures for programs such as the DWHR market transformation programs. Such action would be prudent for any program in which participant counts are based on the number of units installed by contractors or other parties that are not directly supervised and tracked by Enbridge staff.

4.4. General

1. **Finding.** The free-ridership estimates are quite dated. The prior audit report recommended new research to update these estimates. This is not critical for low income programs, which typically have low free ridership, but is important for the custom programs. For example, auditors noted that participants installed a significant number of the custom projects prior to the submitting incentive applications. This could mean that customers decided to implement projects before seeking incentives. Enbridge reports that is common for them to be engaged with customers long before receiving an application, and of course the expectation of incentives can influence decision-making well before paper trails demonstrate linkage. Nonetheless, this could be an indicator of free ridership. This is a subject that will be discussed by the newly formed Technical Evaluation Committee (TEC).

   Recommendation. Prioritize and complete free ridership research in 2012 for completion prior to next year's analysis.

2. **Finding.** Spillover is not considered in the TRC reports. While it is possible that this factor is small, it been found to be material in some jurisdictions.

   Recommendation. Consider incorporating spillover research with the free ridership decision-making data collection. Absent comprehensive study, targeted inquiry regarding spillover by residential contractors and large C/I participants and suppliers are more likely than with other entities.

3. **Finding.** This audit did not include "depth" investigation of any data transfer protocols or DARTS processing. During the audit Enbridge discovered substantive tracking errors related to residential drain water heat recovery installation rates that the audit did not and would never have uncovered without Enbridge direction.

   Recommendation. The scope of future audits should include selective random depth tracing of Enbridge data processing from the TRC calculator inputs back to raw field data, to make it possible to discover such errors. Also, Enbridge development and updating of detailed process flow diagrams could aid both the utility and the auditor.

Appendix A:

Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results, Final Work Plan

Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results

Final Work Plan

energy & resource solutions

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Contents

Work Plan for Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results

Introduction and Objectives

Enbridge Gas Distribution (Enbridge) operates a series of demand side management (DSM) programs to encourage customers to use less natural gas and, in some cases, less electricity and water. The company receives a combination of direct cost recovery and performance-based payments associated with program delivery. The Ontario Energy Board (OEB) and the consultative group's Evaluation and Audit Committee require independent third party review of Enbridge's annual report and supporting calculations to ensure that savings claims and performance-based payment calculations are correct.

The primary objective of this audit is to review the Enbridge Gas Distribution calculations for Total Resource Cost (TRC) savings, the Shared Savings Mechanism (SSM), the Lost Revenue Adjustment Mechanism (LRAM) and the Demand Side Management Variance Account (DSMVA) for the calendar year ended December 31, 2011 and to express an independent opinion on these amounts. Enbridge has contracted with Energy & Resource Solutions (ERS) to be the auditor. If the Enbridge-reported amounts differ from what ERS believes to be correct, ERS will present alternative values. As noted in the OEB DSM Framework, the auditor has a secondary role to recommend any forward-looking evaluation work for consideration.

This audit will be conducted in accordance with the rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated August 6, 2006 in EB-2006-0021.

ERS will perform the audit according to seven tasks as described in this work plan.

Task 1: Kick-Off

The audit started with Enbridge delivering the first of multiple sets of program files to ERS on March 26. ERS joined the Evaluation and Audit Committee (EAC) for their weekly teleconference calls starting on April 4. The EAC and ERS are using a portion of the time in this regular teleconference to help ERS gain familiarity with Enbridge's programs and historical context.

ERS will meet in person with Enbridge staff at their offices on April 24th and 25th, 2012 to review information and materials collected to date, solicit additional input, identify key issues, and discuss any uncertainties that may affect the audit. Specifically, ERS will interview evaluation and program administration staff to learn:

- How the programs work
- Topics that the program administrators would like ERS to investigate
- Database, workbook and E-Tools orientation
- Lessons learned from prior audits

ERS will meet with the EAC regarding:

- EAC and other stakeholder comments to the annual DSM report
- Other background information the EAC feels the auditor should know.

ERS then will:

- Present this work plan, and refine it with EAC members
- Discuss early findings and topics being investigated
- Present questions for further investigation

The conclusion of in-person meetings will signify the end of the kick-off phase of the audit.

Task 2: Review Program-Related Material and Documentation

ERS will gather information during Task 1 Kick-Off and will continue to assemble documentation throughout the first month of the audit as part of Task 2. ERS already has received or anticipates receiving and reviewing at least the following material:

- ❑ Year-end custom commercial and industrial program reports
  - o 2011 Custom Commercial Year End Report
  - o 2011 Custom Industrial Year End Report
  - o 2011 Custom Commercial and Industrial population records
  - o 2011 Sampling workbooks completed to select projects for the program review
  - o 2008 Sampling methodology guidance documents
- ❑ Year-end residential program reports
  - o 2011 Regular TAPS Year End Report
  - o 2011 Low Income TAPS Year End Report
  - o 2011 TAPS Kit Direct Response Research Report
  - o 2011 TAPS Reduction Factors Spreadsheet
- ❑ Research reports
  - o Showerhead Verification Research for Multi-Residential Rental Market

- Pre-Rinse Spray Valve (PRSV) Verification Research

- ❑ TRC documents, records, screening tools, and calculations
  - 2011 TRC Results SSM Workbook
  - 2011 TRC plan
  - LRAM calculations workbook
- ❑ Enbridge's DSM Annual Report for 2011, including comments of the EAC and other stakeholders
- ❑ OEB orders and approved technical reference manuals and Enbridge filed plans
  - OEB 2008-0346: Demand Side Management Guidelines for Natural Gas Utilities
  - OEB Decision Framework
  - OEB 2006-0021: DSM Handbook
  - EGDI DSM Plan
  - EGDI Low Income DSM Plan
  - EGDI Updated DSM Measures List (savings basis)
- ❑ Prior audit reports and recommendations
  - 2010 Audit Report
  - 2009 Audit Report
- ❑ Data tracking records and documents such as completed prescriptive forms and back-up documentation.

While not a direct subject of the audit, ERS also will review the prior year high efficiency boiler and steam trap research reports. 2011 research and verification activities do not address the prescriptive (small) commercial program except for the pre-rinse spray valve measure research report. Low income weatherization program review is not in scope.

Task 2 is primarily a survey and data collection exercise. ERS will review the orders and plans for policy purposes, and will read the pre-2011 reports for context. In-depth review of the 2011 program and research reports is part of Tasks 3 and 4.

The document collection and review process started April 1 and will continue through May 14.

Task 3: Review Custom Project Files and Engineering Records

Enbridge contributed funding for 141 custom industrial projects and 960 custom commercial projects in 2011. Each project required engineering analysis to develop unique savings estimates.

The verification process included intensive review of a sample of the projects. Enbridge hired an analytical firm to execute a standardized sample design procedure and select projects

for verification. The contractor selected 15 industrial projects and 26 commercial projects. [1] Enbridge then hired two engineering firms to independently verify savings associated with the sampled projects and develop representative custom commercial and custom industrial savings realization rates for Enbridge to apply to all custom projects in Total Resource Cost (TRC) calculations. The verification procedure included review of applicant calculations and a site visit to inspect the installed equipment and interview participants.

ERS selected a sub-sample of 12 projects from the verification samples to audit. The selection process assigned separate strata for industrial, agricultural, commercial/multi-residential retrofit, and commercial/multi-residential new construction, and made census selections of projects exceeding one million m^3 reported savings. While statistically structured, the selection was not intended to be an optimized design. It does ensure representation of each customer type and includes projects both with and without water savings, both with large and small reported savings, and with a broad distribution of energy efficiency technologies. The audit subsample accounts for 68% of the verification sample's total annual natural gas savings.

ERS will review a sufficient number of projects to be able to either confidently conclude that the verification-based realization rates are reasonable and unbiased, or to develop an audit-based alternate realization rate. ERS has requested and received information associated with twelve projects. After preliminarily reviewing all twelve projects and intensively reviewing nominally four of them, ERS will report to the EAC on the findings to date and estimate the total number of reviews necessary to make one of the two conclusions.[2] . The review will consist of:

1. **File review** – Our team will perform a thorough review of the project files and third-party reviews. ERS will utilize a checklist to allowing systematic determination of whether or not key project elements have been reported and are well documented. It will include checks for validity of baseline characterization, weather normalization, and operating hours, among other technical parameters. Any data, assumptions, or calculations considered less than reliable will be recorded for follow-up.
2. **Third-party reviewer interviews** – When project file reviews raise accuracy or reliability questions that document review alone cannot resolve, the lead audit

[1] The custom commercial category includes both commercial and multi-residential facilities, and both retrofit and new construction projects. The custom industrial category includes both industrial and agricultural projects.

[2] The final count may be greater or lesser than the nominal count of twelve budgeted. Due to the limitations inherent in desk review-based review, the audit-based realization rate, if necessary, will have a relatively high and unknown degree of measurement uncertainty.

engineer will engage the project reviewer and discuss the process utilized to calculate savings. The results of these discussions will be reported.

3. **Project site visits** – Site visits will not generally be in scope. If there are extenuating circumstances where ERS feels a site visit is necessary to resolve discrepancies ERS will consult with the EAC and if budget and schedule allow, make such arrangements.

ERS will quantitatively review the projects to:

- Determine if projects were categorized appropriately when distinguishing between "advancement" and "replacement" measures or projects;
- Review incremental cost estimates;
- Assess or independently calculate energy and water impact; and
- Review measure life for reasonableness.

If ERS believes a different savings estimate is more appropriate for a reviewed project in the sub-sample, analysts will adjust the inputs for the TRC analysis at least for that project and as a statistically representative correction to the sub-sample, sample, or population as appropriate.

After individual project reviews are completed, the auditors will assess whether or not the M&V contractors' method of aggregating results complies with industry accepted protocols, and will identify any areas of concern with respect to Enbridge's TRC calculations and assumptions for custom projects. Where appropriate, ERS will recommend improvements to Enbridge's reporting processes.

Task 4: Review Prescriptive and Quasi-Prescriptive Program Reports and Research Reports

Enbridge and its contractors completed program reports on the three residential TAPS programs (regular, low income, and direct mail) and completed two research reports on specific measures. ERS will audit the reports for validity, comprehensiveness of analysis, to ensure they reflect OEB guidance and incorporate the most recent recommendations. ERS will trace the results including the reduction factors from these reports to the master TRC workbook.

ERS will review the EGDI Updated DSM Measures List (savings basis) submitted to the OEB that is the basis for a significant portion of the prescriptive savings, but the review will not be intensive, as this document already has been reviewed by multiple parties including those independent of Enbridge. Our examination of the accepted substantiation sheets and Enbridge's measure database will be improved with interviews with program managers and

implementation staff both during the scheduled in-person meetings and afterwards via telephone.

As noted above, 2011 research and verification activities do not address the prescriptive (small) commercial program savings beyond the pre-rinse spray valve measure research report and the updated measures list. In 2009 and 2010 research reports have examined two other major sets of measures: high efficiency boilers and steam trap leak reduction measures. ERS will consider the appropriateness of the scope of the 2011 research and program reports in the context of research reports completed in recent years prior to 2011.

If errors are found for which ERS can recalculate savings directly, the engineer will do so as part of the audit. If errors are found that require Enbridge or contractor involvement, ERS will provide information on the requested change to Enbridge for recalculation.

ERS will note future opportunities to improve the impact estimates and areas of interest for later evaluation research.

Task 5: Data Tracking and TRC System Review

The results produced in the documents audited in Tasks 3 and 4 are inputs to the TRC master workbook. ERS will audit the 2011 TRC calculation workbook to determine if

1. The TRC workbook received the correct data inputs from the annual program and research reports,
2. The TRC calculations are correct and comply with OEB guidelines and other relevant guidance documents, and
3. The results are properly reflected in Enbridge's annual report.

ERS's TRC review will focus on the parameters that affect the TRC including measure unit savings from the substantiation sheets, program gross savings, evaluated measure retention, measure life, free ridership, and data transcription errors.

During the ERS in-person visit ERS will review the data management protocols that lead to the data generated for the TRC workbook inputs via in-person interviews. ERS will also learn how personnel process exceptions and whether such exceptions represent a significant proportion of claimed energy savings or project costs. In-depth examination of DSM Analysis, Reporting, and Tracking System (DARTS) and other similar tools is not in scope.

If auditors discover inaccuracies, data entry errors or untenable assumptions, he or she will highlight these discrepancies and then recalculate the net impacts of our recommended adjustments on the TRC savings value. If the auditor cannot perform the recalculation alone with confidence, ERS will work with Enbridge to do so.

Having completed the above-noted reviews, our team will provide an opinion regarding the accuracy and defensibility of the data supplied to and calculations executed by the TRC calculator.

Task 6: Performance-Based Account Review

The three subsections below describe how ERS will audit the three sets of calculations required to compute shared savings, the lost revenue adjustment, and reconciliation of the DSM variance account.

Shared Savings Mechanism (SSM)

Shared Savings Mechanism calculations are incorporated into the master TRC workbook. ERS will verify that the shared savings calculation for the 2011 program year is consistent with OEB-approved methodologies and that variables affecting claimed TRC savings values, and thus the SSM, reflect reasonable assumptions. Should auditors discover any deviations from OEB-approved or industry-accepted methodologies, ERS will recommend appropriate revisions and recalculate the SSM based on adjusted TRC savings values. Also, ERS will make any relevant recommendation to Enbridge's processes so that future SSM adjustments would be unnecessary.

Lost Revenue Adjustment Mechanism (LRAM)

Under this subtask, ERS's objectives are two-fold:

First and primarily, ERS will determine whether the methodologies and assumptions used to calculate the actual LRAM savings volume, net of installed efficiency measures, (i.e., ex post) are consistent with the methodologies and assumptions used to calculate the year's LRAM savings volume (i.e., ex ante). ERS will ensure that the net volumetric savings are appropriately allocated to each respective customer class. The results will determine whether Enbridge has under- or over-collected lost revenues based on the difference, if any, between forecasted sales volume and actual sales volume.

Second, ERS will point out opportunities discovered in the course of the audit that will result in value-added enhancements to the assumptions Enbridge operates under for further study in subsequent program evaluations.

Demand Side Management Variance Account (DSMVA)

ERS will examine the procedures and processes resulting in the collection of funds into the DSMVA and determine if these procedures and processes are correct by determining if:

1. The documented budgeted funding reflects that approved in the 2011 DSM plan, plus any relevant subsequent modifications, specifically the December 20, 2010 OEB approval of added funding;
2. The documented actual expenditures reflect the amounts generated by the financial accounting system cost outputs and are in the TRC workbook; and
3. The DSMVA calculations are correct and reflect the most current OEB guidelines.

If errors or inconsistency are uncovered, ERS will recommend modification of the DSMVA calculation and note the impact, if any, that such a modification has on the Enbridge's request to clear this account.

Task 7: Issue Draft and Final Reports

Upon completion of Tasks 1 through 6, ERS will be able either to render the independent opinion that the TRC, SRM, LRAM, and DSMVA calculations and results are correct and reasonable as submitted in Enbridge's annual report, or to provide independently developed alternative calculations of the same. The final report will include the following statements:

> *We have audited the Annual Report, Total Resource Cost (TRC) savings, Shared Savings Mechanism (SSM), Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ended December 31, 2011. The Annual Report, and the calculations of TRC, SSM, 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 its Decision with Reasons dated August 6, 2006 in EB-2006-0021. 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 accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2011 DSM programs of Enbridge Gas Distribution:*
>
> *TRC Savings - $xxx,xxx,xxx*
> *SSM Amount Recoverable - $x,xxx,xxx*
> *LRAM Amount Recoverable - $x,xxx,xxx*

DSMVA Amount Recoverable - $xxx,xxx

In the course of conducting the activities necessary to make the audit statement, reviewers are likely to find opportunities for Enbridge to change procedures or calculations to improve the program estimation of savings, and possibly to enhance program delivery. The final report will include a list of such recommendations.

Draft reports of our findings, opinions, and recommendations will be circulated to stakeholders for consideration and comment on May 25. Subsequent to our review meeting with the EAC on June 7, ERS will issue a final report by June 20, 2012 incorporating the input of the EAC.

The draft report will be formally presented by key ERS team members at a meeting with Enbridge and its stakeholders. ERS expects that this comprehensive review process will identify points needing clarification or correction. Assuming agreements have been reached with respect to any corrections and clarification, a second report will be drafted and submitted to stakeholders for review and comment.

Once draft audit reports have been fully reviewed, a final audit report will be submitted. The final report will provide an accurate and defensible independent opinion as to the reasonableness and accuracy of Enbridge's claims regarding the SSM, LRAM, and DSMVA. Enbridge will be able to confidently use the audit as evidence to clear the relevant DSM accounts.

Schedule

Key tasks and proposed completion dates are provided in Table 1-1, below.

Work Plan for Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results

Table 1-1 Key Task Schedule

Activity Description	Associated Task	April	May	June
Progress meetings w/EAC - conference calls	1	Weekly		
Program material review	2	4/1 to 5/14		
Custom sub-sample data request	3	4/10		
Custom project engineering reviews	3	4/12 to 5/14		
Draft work plan submission	1	4/19		
Work plan review with EAC	1	4/20		
Enbridge program orientation for auditors (in-person)	1	4/24		
Enbridge data systems orientation (in-person)	1	4/24 - 4/25		
Auditor presents preliminary findings/exploration topics	1	4/25		
Finalize work plan	1		5/2	
Data tracking and TRC system review	5	4/12 - 5/21		
Performance-based account review	6	4/12 - 5/21		
Review non-custom program reports	4	4/26 - 5/16		
Review measure research reports and updated measure list	4	4/26 - 5/16		
Draft audit report with findings and recommendations #1	7		5/25	
Review meeting w/EAC	7			6/7
Draft audit report #2	7			6/13
Review meeting w/EAC	7			6/20
Final report submitted	7			6/28

Appendix B:

CUSTOM PROJECT REVIEW SUMMARIES

AND

EXAMPLE
SITE-SPECIFIC CUSTOM PROJECT AUDIT CHECKLIST

NC.011.11. This was a new construction project at an 8,743 m^2 facility for medical patients and their families. The project was modeled using EE4 software and was signed and stamped by a professional engineer. A detailed narrative describing the modeling approach was included in the project file along with some of the output sheets from the EE4 software. The scope of the verification effort did not allow for parallel modeling as a method for confirming savings. The savings were reviewed on a system-by-system basis with the information provided in order to determine if the order of magnitude of savings was reasonable given the stated measures and inputs. The 2011 evaluator noted that the base-case insulation levels did meet MNECB but did not meet OBC 2006, which was the mandatory baseline for this project. The evaluator lowered the gas savings estimate due to the increased insulation requirements of the OBC 2006 baseline. The revision was also reviewed and found to be reasonable. The evaluator did not, however, consider the impact on space cooling from the increased base-case insulation. The same base-case improvement factor used to revise base-case gas use was applied to base-case electrical use for cooling to determine the final kWh savings. The auditors agree with the 2011 verification savings as the final gas savings and the auditor has adjusted the kWh savings downward. The filed costs and measure life were found to be reasonable.

NC.007.11. This was a new construction project consisting of 24,581 m^2 of student housing. The project was modeled using EE4 software. A narrative describing the modeling approach was included in the project file along with some of the output sheets from the EE4 software. The scope of the verification effort did not allow for parallel modeling as a method for confirming savings. The savings were reviewed on a system-by-system basis with the information provided in order to determine if the order of magnitude of savings was reasonable given the stated measures and inputs. The claimed savings for the project has been split between Enbridge and OPA. There are both electrical and gas savings associated with this project, with gas savings accounting for approximately 60% of the total and electric savings accounting for 40%. The allocation of gas and electric savings between Enbridge and OPA was made in a fashion that Enbridge reports does not allow double counting.[1] The audit accepts the 2011 evaluator savings, which are unadjusted from the original filed amount, as a reasonable estimate of savings and also found the filed costs and measure life reasonable.

If the project savings had been allocated according to the 2012 policy, which assigns all gas savings to the gas utility and all electric savings to the electric utility, then the Enbridge TRC for this project would decrease from $437,445 to $152,730.

[1] Ontario Energy Board Decision with Reasons, August 25, 2006, addresses allocation of savings resulting from projects in which both Enbridge and OPA have a role. It states that all savings associated with programs for which a single utility initiated the partnership or program or for which a single entity entirely funded or implemented it is to be considered to have "centrality" and the central utility must be assigned all savings. If centrality is not demonstrated, a program may be considered a partnership. A partnership program is conceived and delivered by both utility companies. For partnership programs, allocation of savings is to be gas savings to the gas utility and electric savings to the electric utility. Enbridge contends that this project's savings is not provided under either a centrality or partnership program. Enbridge and OPA contractually agreed to an alternate savings allocation basis. Auditors do not express an opinion on this interpretation of allocation with respect to Board policy. This distinction is irrelevant to future operations as new Board policy dictates that all program savings be allocated as described in this note for partnership programs.

NP.085.11. The application for this project listed one measure: the installation of insulation on a make-up air unit; no additional information was provided on the nature of the baseline insulation, the proposed insulation, or the operational details of the unit. Extensive pre- and post-install daily gas use data was provided. The metered data demonstrated annual gas savings of 21,858 m^3. The 2011 evaluator reviewed the findings and noted that the level of savings suggested by the metering could not be achieved through the addition of insulation to a make-up air unit alone. The auditors reviewed the theoretical savings that could be reasonably achieved through MAU insulation and agreed conceptually with the evaluators that the demonstrated level of savings could not be achieved through this single measure alone.

Discussions with Enbridge staff revealed that this project should have been categorized as an Ongoing Improvements project through Enbridge's Run It Right program. Enbridge was also able to obtain additional information on the measures implemented at the site. In addition to MAU insulation, improvements were made to dampers, fans, and burners, and boiler setpoints were adjusted. The pre- and post-install metered data was analyzed by both by Yorkland Controls and Enbridge, and the two savings figures were within 4% of one another. While the single insulation measure described in the file and reviewed by the verification firm could not save the filed amount, the overall project was more comprehensive than described and the filed amount is a fair reflection of the project savings. The auditors changed the savings back to the filed amount.

The TRC workbook currently uses a 15-year measure life for all costs and savings associated with this project. Per EGD, the project is to be removed from the C/I capital projects portfolio and placed into the ongoing improvements Run It Right portfolio. A revised TRC was prepared by EGD using the Yorkland Controls' savings, the full project cost, and a 5-year measure life. The audit accepts Yorkland Controls' savings value as a reasonable reflection of savings and also finds the filed costs reasonable. The audit splits the project into two measures in the TRC workbook. One measure is insulation for the make-up air unit, at the originally estimated savings, cost, and 15-year measure life. The second is all other measures, at the originally estimated savings and cost, and a 5-year measure life. The result was an increase in project TRC from -$2,546 to $9,640.

MULTI-PRIV.322.11. This project consisted of the replacement of the existing lead boilers and the addition of a variable frequency drive (VFD) to an existing air handling unit (AHU) to allow for setback of ventilation rates. The savings analysis was conducted with Enbridge's e-tools software. The proposed savings were reviewed with the information provided in order to determine if the order of magnitude of savings was reasonable given the stated measures and inputs. The audit accepts the 2011 evaluator savings, which are unadjusted from the original filed amount, as a reasonable estimate of savings and also found the filed costs and measure life reasonable.

MULTI-PRIV.192.11. This project consisted of the replacement of the existing boilers serving hydronic heating elements throughout the building. The savings analysis was conducted with Enbridge's e-tools software. The proposed savings were reviewed with the information provided in order to determine if the order of magnitude of savings was reasonable given the stated measures and inputs. Two project costs are listed in the provided email correspondence: $52,000 and $55,000. This project was reviewed with consideration to incremental cost, however, not total project cost. The incremental cost in both cases was listed as $20,000. Enbridge should consider revising the TRC to reflect the revised project cost of $55,000, although this will not affect the output of the TRC, as the TRC is based on the correct incremental cost of $20,000. The audit

accepts the 2011 evaluator savings, which are unadjusted from the original filed amount, as a reasonable estimate of savings and also found the filed costs and measure life reasonable.

OTHER.059.11[2]. This project consisted of the replacement and installation of conventional and condensing boiler economizers. Enbridge engineering staff conducted extensive on-site testing of the existing boilers and developed the savings estimate based on these values and detailed spreadsheet analysis. The evaluator's spot observations of economizer exit temperatures found that they were close to the values used in the calculations, an indicator of reasonable savings estimation. The evaluator also noted that the kWh savings associated with VFDs on draft fans needed to be revised as the base case assumed the presence of draft fans that did not exist. Enbridge's analysis represents a significant engineering effort. The audit accepts the 2011 evaluator savings, which were adjusted downward 11% from the original filed amount, as a reasonable estimate of savings and also found the filed costs and measure life reasonable.

AGR.003.11. This project proposed the installation of a horizontal energy curtain over a portion of the greenhouse facility. This curtain will reduce heat loss during nighttime hours. The analysis presented made use an energy model that considered weather data and enclosure performance characteristics. This analysis was supported by a second energy model that was run by the 2011 evaluator. The auditor reviewed the inputs to the models and performed Internet research to verify the enclosure improvements associated with the energy curtain. The audit accepts the 2011 evaluator savings, which are unadjusted from the original filed amount, as a reasonable estimate of savings and also found the filed costs and measure life reasonable.

ALL.015.11. This project included the removal of an existing make-up air unit (MAU) and the installation of eleven unit heaters with thermostats. Removing the MAUs, which draw in 100% outside air, and replacing them with new unit heaters that do not draw in any outside air, reduces the building heating load. The savings were generated through e-tools and account for the ventilation savings associated with the removal of the MAU. The magnitude of the savings was confirmed by the evaluator, who generated an independent analysis of the energy use associated with the decommissioned MAU. It was noted that all the savings have come from the removal of the MAU, with no additional gas use attributed to the new unit heaters. Enbridge engineering staff explained that this was because there was no increase to the heating load due to the removal of the MAU, and the new heaters were installed as a precaution. The same savings should result if the building's heating needs are met by increased use of pre-existing recirculating unit heaters instead of the new heaters because, absent differences in system combustion efficiency, it is the reduction in outside air that drives the savings. The evaluator agreed with this conclusion. The applicant stated that they would not remove the existing MAU without the installation of the new unit heaters. The 2011 evaluator savings are unchanged from the claimed amount and accepted as the final savings.

ALL.046.11. This facility conditions a large amount of outside air that is used in the spray booths. This project reduced the amount of outside air needing to be conditioned by recirculating a portion of the airstream. Significant on-site testing was conducted and is the basis for the savings analysis.

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[2] The project application reviewed by the auditor is dated January 12, 2012. The same document notes that the project was completed December 16, 2011. A second Enbridge document, "Energy Efficiency Custom Project Documentation", is dated January 12, 2011 supporting the project as part of 2011 portfolio, though no final invoices were included for review.

The 2011 evaluator confirmed through a site visit that the proposed system was operating as intended. The 2011 evaluator savings are accepted as the final savings.

ALL.034.11. This project proposed the installation of condensing economizers for boilers 1, 2, and 3; the condensing economizers are used to preheat three heat sinks in the facility. Enbridge engineering staff conducted extensive on-site testing and made use of detailed spreadsheet analysis to generate the savings. The 2011 evaluators reviewed the analysis and accepted the approach. During the site visit the 2011 evaluators noted that two issues with existing equipment prevented the facility from capturing and utilizing the anticipated quantities of heat. First, cold air is infiltrating the stack. The lower stack temperature reduces the economizer effectiveness. Less heat can be recovered from the stack than designed. Second, an existing condensate pump had insufficient head to push through the new economizers.

The evaluator noted that that applicant was in the process of troubleshooting and remediating the equipment issues and that the evaluated savings would assume that these deficiencies would be repaired. The evaluator then went on to propose savings based on a simple one-line calculation: multiplying the summer and winter condition heat recovery data from the economizer manufacturer (expressed in Btu/hr) by the summer and winter condition run hours from e-tools. This approach is less rigorous then the original savings calculated by e-tools. The auditor followed up on the status of the two repairs in June and the participant, through Enbridge, indicated that the condensate pump was replaced and that part of the system now is reportedly working as designed. Regarding the undesirable infiltration, plant personnel are scheduled to inspect for this in their July shutdown and will attempt to remedy the issue. More importantly, site staff report that the facility already recovers more heat than can be used. Enbridge reports, and auditors verified, that the e-tools modeled heat load reflects this condition as well, that the load is indeed less than the heat exchanger's design capacity could provide, so this remedy will not affect savings. Accepting that the site will repair the outstanding infiltration issue, the verified savings should be those proposed by Enbridge as they represent a more rigorous analysis. The audited savings are revised to the original Enbridge savings, for a net increase of 12% compared to the verification savings.

ALL.113.11. This project consisted of the expansion and improvement of an evaporation line by adding two additional effects to an existing single effect evaporator. The analysis presented is based on production data, engineering data provided by the manufacturer, and reviews performed by Enbridge staff. The 2011 evaluator reviewed the calculations and accepted the savings. The evaluator's site visit confirmed the installation and noted that the plant had experienced a reduction in energy intensity since implementing the project. The energy intensity values compare site-wide gas use to total production and do not specifically measure the evaporation process contained in this application. Therefore the reduction in measured energy intensity cannot be used to revise savings associated with this measure, but does indicate a general downward trend in energy use. The 2011 evaluator savings are accepted as the final savings.

ALL.041.11. This project proposed replacing existing spray guns with more efficient trigger-actuated spray guns. Additionally a portion of the water used in the spray process will now be recycled, reducing the amount of make-up water that needs to be heated for the process. The evaluator conducted spot verification measurement of key parameters. The typical variability of spray gun flow rates limits the value of spot metering, but the spot correlation is at least reassuring. The analysis is based on straightforward engineering calculations, making use of flow and temperature data as measured and provided by the applicant. The 2011 evaluator reviewed the

general approach and was able to revise slightly the savings estimates based on data collected by the site post install and passed on to the evaluator during their site visit. The 2011 evaluator savings are accepted as the final savings.

Auditor Summary of Enbridge Application Internal Review

Project :	

This section summarizes the information contained in the application documents provided to the Auditor by Enbridge and the Enbridge Internal Reviewers Final Savings

Project File Review Checklist

Project :	
Project Name:	
Reviewer:	Nick Collins
Date:	9-May-12
Application Date:	23-Aug-11
Invoice Date:	None included, email indicates boilers on site before 9/9/11

Brief Project Description

This project proposes the replacement of existing boilers serving hydronic heating elements throughout a multifamily building.

Are there scope revisions?

No

Applicant Savings	Natural Gas	98,814	m^3	annual
	Electricity	-	kWh	annual
	Water	-	m^3	annual

Is the calculation method clear/supported?

The source of the savings value on the application cover sheet (98,814 m^3) is not clear.

The source of EGDs final savings value is clear and supported.

Are key variables identified with clear explanation of their source?

The key variables in EGDs analysis are clear and supported.

EGD Reviewer/Final Savings	Natural Gas	65,799	m^3	annual
	Electricity	-	kWh	annual
	Water	-	m^3	annual

Are the savings revisions clearly explained?

The method and variables used in determining the final EGD savings figure are clear and supported.

			% change
Change in Savings	(33,015)	m^3	-33.41%
	-	kWh	N/A
	-	m^3	N/A

Auditor Review of Evaluation Findings

Project :		

This section summarizes the Auditor's review of the Evaluation Firm's findings for this project.

Evaluation File Review Checklist

Did the Evaluator revise EGDs savings?

No

Is the evaluators method clear/supported?

Yes. The evaluator reviewed the supplied ETools output and conducted a site visit to verify installation as per the application. The evaluator also prepared a spreadsheet performing basic checks on the sum of the savings and comparing the energy use to benchmarks.

Are key variables identified with clear explanation of their source?

N/A

EGD Reviewer/Final	Natural Gas	65,799	m^3	annual
	Electricity	-	kWh	annual
	Water	-	m^3	annual
2011 Evaluator Final	Natural Gas	65,799	m^3	annual
	Electricity	-	kWh	annual
	Water	-	m^3	annual
				% change
Change in Savings	Natural Gas	0	m^3	N/A
	Electricity	0	kWh	N/A
	Water	0	m^3	N/A

Applicant Project Cost	N.P.

Is the proposed cost clear/supported?

The project cost is for material only and is supported by email correspondence. More recent email correspondence indicates a project cost of $55,000. The incremental cost of $20,000 is based on email correspondence from the contractor quoting the proposed and a standard efficiency option with equivalent capacity. The incremental cost as run in the TRC is $20,000.

Are invoices provided for final project cost?

No

EGD Reviewer proposed cost	$52,000.00

Are proposed cost revisions clearly explained?

Email correspondence supports the proposed project and incremental costs

Are Final Invoices supplied?

No

Is the TRC cost re-run with final installed cost?

The TRC is run with an earlier price of $52,000. Later correspondence indicates a cost of $55,000. Either way an incremental cost of $20,000 is proposed and is used in the TRC.

TRC Cost per provided docs

$	120,019.00

*note TRC at $52,000 project cost, $20,000 incremental

Audit Review Summary

Project :	0	

This section summarizes the recommendations of the Auditor, including any recommended changes to the reported natural gas, electricity, water, and cost impacts for the project.

Audit Review Summary

If no changes to verified results are needed and there is confidence the estimates are reasonable, indicate ("X") and stop. X

Describe why changes are needed or why the auditor lacks confidence in results.

If unable to provide alternate estimate, explain what data would be needed to do so.

Verification Final Savings	Natural Gas	65,799	m^3	annual
	Electricity	-	kWh	annual
	Water	-	m^3	annual
Audit Savings	Natural Gas	65,799	m^3	annual
	Electricity	-	kWh	annual
	Water	0	m^3	annual
				% change
Change in Savings	Natural Gas	-	m^3	N/A
	Electricity	0	kWh	N/A
	Water	0	m^3	N/A

Applicant Project Cost	$55,000	
Audit Revised Cost	$55,000	
		% change
Change in Cost	$0	0.00%
Verified Project Life (years)	25	
Audit Revised Life	25	
		% change
Change in Life	0	0.00%

Appendix C: Aggregate Custom Adjustment Factor Calculations

Table C-1: Custom Sample Design Strata and Weights

Description, N, and n columns from IPSOS email sent 5/21/12.

Stratum	Description	Stratum ID	Total # of Projects (N)	Sample Size (n)	Expansion Weight (N/n)
Industrial Stratum 1	Top Electric Projects	I1	6	5	1.2
Industrial Stratum 2	Top Gas Projects	I2	5	3	1.7
Industrial Stratum 3	Remaining Electricity Projects	I3	14	4	3.5
Industrial Stratum 4	Remaining Gas Projects	I4	63	3	21.0
Commercial Stratum 1	Top Electric Building Renovation	C1	6	3	2.0
Commercial Stratum 2	Building Renovation	C2	160	7	22.9
Commercial Stratum 3	Top Electric Multi-Family	C3	5	3	1.7
Commercial Stratum 4	Multi-Family	C4	428	6	71.3
Commercial Stratum 5	Top Electric New Construction	C5	5	3	1.7
Commercial Stratum 6	New Construction	C6	21	4	5.3

Table C-2: Industrial & Agricultural Results and Adjustment Factors

All data but expansion weight and last row from verification report

Project	Stratum	Expansion Weight	EGD File Savings (m3)	Adjusted Gas Savings (m3)	Adjustment
(a)	(b)	(c)	(d)	(e)	(f)
ALL.015.11	I3	3.5	202,497	202,497	0.0%
ALL.017.11	I2	1.7	794,115	794,115	0.0%
ALL.041.11	I4	21.0	317,068	342,567	8.0%
ALL.028.11	I3	3.5	82,740	82,740	0.0%
ALL.008.11	I1	1.2	479,482	479,482	0.0%
ALL.094.11	I1	1.2	712,617	712,617	0.0%
ALL.045.11	I3	3.5	729,094	729,094	0.0%
ALL.118.11	I4	21.0	170,449	170,449	0.0%
ALL.113.11	I1	1.2	5,633,693	5,633,693	0.0%
ALL.070.11	I1	1.2	913,963	913,963	0.0%
ALL.034.11	I2	1.7	1,557,340	1,438,419	-7.6%
ALL.033.11	I3	3.5	30,319	31,451	3.7%
ALL.046.11	I2	1.7	959,061	959,061	0.0%
ALL.098.11	I1	1.2	41,454	41,454	0.0%
AGR.003.11	I4	21.0	89,728	89,728	0.0%
Total Adjustment without Expansion Weights (1 - Σ col (e) / Σ col (d))					-0.7%
Total Adjustment with Exp. Weights (1 - Σ (col (c)*col (e)) / Σ (col (c)*col (d)))					1.1%

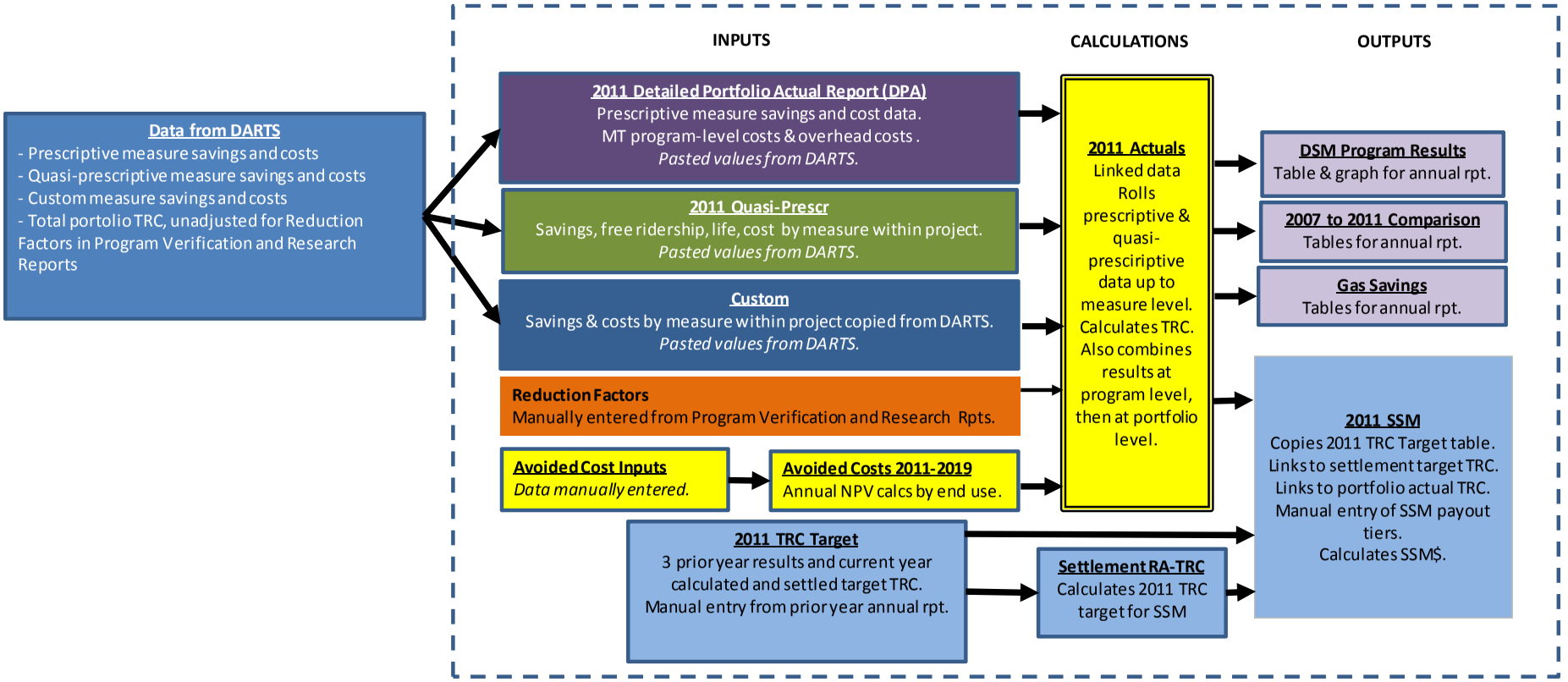
Table C-3: Commercial and Multi-Residential Results and Adjustment Factors

All data but expansion weight and last row from verification report

Project	Stratum	Expansion Weight	EGD File Savings (m3)	Adjusted Gas Savings (m3)	Adjustment
(a)	(b)	(c)	(d)	(e)	(f)
HOS.016	C2	22.9	183,910	183,910	0.0%
NC.013	C6	5.3	111,786	111,786	0.0%
OTHER.044	C2	22.9	10,707	8,030	-25.0%
MULTI-PRIV.192	C4	71.3	65,799	65,799	0.0%
NC.010	C5	1.7	115,909	115,909	0.0%
NC.011	C6	5.3	196,508	189,372	-3.6%
MULTI-PRIV.188	C3	1.7	110,414	110,414	0.0%
MULTI-PRIV.149	C4	71.3	29,877	43,623	46.0%
MULTI-PRIV.108	C4	71.3	71,642	71,642	0.0%
OFF.026	C2	22.9	96,981	96,981	0.0%
SCH.052	C2	22.9	153,684	115,392	-24.9%
MUN.010	C2	22.9	84,998	63,084	-25.8%
NC.007	C6	5.3	72,873	72,873	0.0%
HOS.028	C2	22.9	58,570	42,338	-27.7%
OFF.013	C1	2.0	138,148	78,146	-43.4%
NC.032	C6	5.3	64,702	64,702	0.0%
NC.027	C5	1.7	201,524	201,524	0.0%
WHS.012	C2	22.9	34,264	34,264	0.0%
MULTI-PRIV.066	C4	71.3	41,857	41,857	0.0%
MULTI-NP.140	C4	71.3	39,561	39,561	0.0%
MULTI-NP.085	C4	71.3	21,858	3,279	-85.0%
MULTI-PRIV.321	C3	1.7	313,548	285,772	-8.9%
MULTI-PRIV.322	C3	1.7	255,274	255,274	0.0%
OTHER.059	C1	2.0	4,047,647	4,047,647	0.0%
UNIV.002	C1	2.0	222,418	222,418	0.0%
NC.034	C5	1.7	141,863	141,863	0.0%
Total Adjustment without Expansion Weights (1 - Σ col (e) / Σ col (d))					-2.6%
Total Adjustment with Exp. Weights (1 - Σ (col (c)*col (e)) / Σ (col (c)*col (d)))					-5.1%

Appendix D:

TRC AND SSM WORKBOOK COMPUTATIONAL FLOW DIAGRAM



ENBRIDGE GAS DISTRIBUTION

2011 DSM AUDIT SUMMARY REPORT

APRIL 2, 2013

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ENBRIDGE GAS DISTRIBUTION'S 2011 DSM EAC AUDIT SUMMARY REPORT

1. INTRODUCTION

In accordance with Ontario Energy Board (the Board) requirements, an independent audit was conducted of the Enbridge 2011 DSM program results as reported in the Company's 2011 DSM Draft Annual Report.

This document provides a summary of:

- the process followed to audit the 2011 DSM Draft Annual Report;
- Enbridge Gas Distribution Inc.'s (EGD) responses to the Auditor's recommendations;
- Evaluation and Audit Committee (EAC) responses to the Auditor's recommendations and EGD responses;
- additional recommendations and issues raised by the Evaluation and Audit Committee (EAC) and EGD responses; and
- impact of Audit results on the 2011 DSM savings, associated Shared Savings incentive (SSM), Lost Revenue Adjustment (LRAM) claims

The EAC has endorsed the 2011 Audit and Enbridge's post-audit SSM, LRAM, and DSMVA claims as presented in this report.

As stated in the Board's Decision in the Generic Proceeding (EB-2006-0021):

"The auditor will be retained by the utility who determines the scope of the audit. It will be the role of the auditor to:

- Provide an opinion on the DSMVA, SSM and LRAM amounts proposed and any amendment thereto
- Verify the financial results in the Evaluation Report to the extent necessary to give that opinion
- Review the reasonableness of any input assumptions material to the provision of that opinion
- Recommend any forward looking evaluation work to be considered

The auditor shall be expected to take such actions by way of investigation, verification or otherwise as are necessary for the auditor to form their opinion.

The auditor, although hired by the utility, must be independent and must ultimately serve to protect the interests of stakeholders."[1]

This document is organized in the following sections:

1. Introduction
2. Audit Process
3. TRC Results and SSM Calculations
4. LRAM

In each of Sections 3 and 4, the recommendations of the auditor are presented first, including EGD and EAC responses on the recommendation, followed by additional advice from the EAC which was not part of the auditor's recommendations.

2.0 AUDIT PROCESS

2.1 SELECTION OF 2011 EVALUATION AND AUDIT COMMITTEE

The 2011 Evaluation and Audit Committee (EAC) was comprised of three representatives elected from the DSM Consultative and one representative from the utility. The 2011 EAC representatives are:

- Jay Shepherd – counsel to School Energy Coalition (SEC)
- Chris Neme – Energy Futures Group (EFG) consultant to Green Energy Coalition (GEC)
- Judy Simon –Elenchus Research Associates consultant to Low Income Energy Network (LIEN)
- Judith Ramsay – Enbridge Gas Distribution

2.2 TERMS OF REFERENCE AND SELECTION OF AUDITOR

The EAC participated in development of the Auditor Terms of Reference, the competitive bidding process and the selection of the 2011 DSM Auditor. The EAC and Enbridge agreed to select Energy Resource Solutions Inc. (ERS) as the auditor of the 2011Draft Annual Report.

[1] EBO 2006-0021, Decision with Reasons, Issue 9.3, page 17.

The 2011 Audit Terms of Reference described the overall objective of the audit as well as required tasks and deliverables. A copy of the Terms of Reference can be found in Appendix A.

2.3 PROJECT START UP AND WORK PLAN

The Draft 2011 Annual Report was circulated to the 2011 EAC, ERS and the Consultative Members on April 13, 2012.

All members of the EAC provided comments on the 2011 Draft Annual Report. Informed by these comments and their work reviewing Enbridge's 2011 DSM Annual Report, the auditor submitted a Final Work Plan found in Appendix B.

2.4 INFORMATION EXCHANGE

Enbridge has adopted an open Audit process for information sharing with the EAC which includes the option of attending weekly meetings with the Auditors. In addition, on completing a confidentiality agreement, EAC members receive all information provided to the Auditor. During the audit at least one non-utility member of the EAC participated in the weekly meetings.

At the outset of the audit, Enbridge provided the auditor with background materials related to the 2011 DSM activities. In addition, Enbridge arranged for the auditor to make a site visit to the Enbridge offices in order to examine the program tracking system, interview the staff who operate the system and meet the contractors responsible for the independent third party engineering review of custom projects. Enbridge also provided additional materials to the auditor throughout the course of the audit including those listed below.

- Year-end custom commercial and industrial program reports
  - 2011 Custom Commercial Year End Report
  - 2011 Custom Industrial Year End Report
  - 2011 Custom Commercial and Industrial population records
  - 2011 Sampling workbooks completed to select projects for the program review
  - 2008 Sampling methodology guidance documents
- Year-end residential program reports
  - 2011 Regular TAPS Year End Report
  - 2011 Low Income TAPS Year End Report
  - 2011 TAPS Kit Direct Response Research Report

- 2011 TAPS Reduction Factors Spreadsheet

- ❑ Research reports
  - Showerhead Verification Research for Multi-Residential Rental Market
  - Pre-Rinse Spray Valve (PRSV) Verification Research
- ❑ TRC documents, records, screening tools, and calculations
  - 2011 TRC Results SSM Workbook
  - 2011 TRC plan
  - LRAM calculations workbook
- ❑ Enbridge's DSM Annual Report for 2011, including comments of the EAC and other stakeholders
- ❑ OEB orders and approved technical reference manuals and Enbridge filed plans
  - OEB 2008-0346: Demand Side Management Guidelines for Natural Gas Utilities
  - OEB Decision Framework
  - OEB 2006-0021: DSM Handbook
  - EGDI DSM Plan
  - EGDI Low Income DSM Plan
  - EGDI Updated DSM Measures List (savings basis)
- ❑ Prior audit reports and recommendations
  - 2010 Audit Report
  - 2009 Audit Report
- ❑ Data tracking records and documents such as completed prescriptive forms and back-up documentation.

2.5 2011 AUDIT SCOPE OF WORK AND APPROACH TO AUDIT

The audit's primary objective is to review the Enbridge calculations for total resource cost (TRC) net benefits, shared savings mechanism (SSM), lost revenue adjustment mechanism (LRAM), and demand side management variance account (DSMVA) and to express an independent opinion on claims to these amounts. When the Enbridge-reported amounts differ from what the auditor believes to be correct, the auditor has calculated alternative values. The audit has the secondary objective of recommending methodological changes to the program administration, verification and audit processes for the future.

The audit review of the large commercial and industrial (C/I) custom project verification process included intensive desk review of a subsample of twelve C/I

custom projects that were part of the verification samples. This was followed by telephone discussions with study and/or verification authors as needed. [2]

The audit's project-specific scope included review of inputs and outputs that could affect the TRC calculation, principally measure annual savings (natural gas, electricity, and water), measure cost, and measure life. The project-specific reviews also included checks for the accuracy of each project's baseline definition. After determining the adjustments appropriate for each project in the subsample, the auditors recalculated the adjustment factor to apply to all custom projects, using a weighted average accounting for the differing expansion weight of each project in the sample.

Analysts audited the TAPS program reports for validity and comprehensiveness of analysis to ensure they reflected the Ontario Energy Board's (OEB's) guidance and incorporated the most recent recommendations and performed a limited review of the Enbridge Updated DSM Measures List.

The auditor then reviewed the TRC master workbook for correct inputs and calculations, reviewed the three sets of calculations required to compute SSM, the LRAM, and reconciliation of the DSMVA, and compared the workbook results with those in Enbridge's Annual Report for proper representation.

In addition to a review of individual programs, the auditor made recommendations regarding methods used for program processes and individual verification studies. The auditor also commented on the scope of the 2011 verification and evaluation research initiatives and made recommendations regarding future evaluation research.

This audit's scope did not include review of programs or program elements for which Enbridge did not produce reports in 2011 or in 2012 regarding 2011 program performance. Specifically, the audit did not address the updated DSM measures list, DARTS, E-tools' formulae[3], the performance characterization of residential thermostats, or the Boiler and Steam Trap Study reports concluded in 2011 but which the prior auditor reviewed. Review of Enbridge's substantiation sheets (which document saings calculations for prescriptive measures) was selective. Auditing of the low-income weatherization program was limited to a

[2] Enbridge project savings are developed and then reviewed and revised at several levels. In a typical custom project the applicant or their vendor develops initial savings estimates. Enbridge then assigns a review engineer to determine if savings is reasonable and if necessary develop an alternate estimate. The final approved savings estimate constitutes the claimed savings estimate. After year end, Enbridge hires a verification firm to evaluate a sample of the project estimates and develop an overall verification adjustment factor. The final step in the process is this audit, whereby auditors review a subsample of the verified custom projects and the verification methodology.

[3] DARTS is Enbridge's program tracking database. E-tools is Enbridge's in-house savings estimation tool that standardizes calculations for complex measures.

review of the Scorecard. Auditing of the small commercial offerings was limited to review of the pre-rinse spray valve measure research report and the TRC calculator.

2.6 2011 AUDIT REPORTS

A first draft of the ERS 2011 Draft Audit Report was circulated to the EAC on May 26, 2012, with a second draft on June 14, 2012 and a third on June 27, 2012. The Final Audit Report was circulated to the EAC and filed with the Board pursuant to the Regulatory Reporting Requirements on June 29, 2012.

2.7 2011 RECOMMENDED TRC, SSM, LRAM AND DSMVA

Table 1: TRC, SSM, LRAM and DSMVA Recommendations

	2011 Draft DSM Annual Report	Final Audit Report	Post Audit Results
TRC Savings	$173,119,113	$171,770,167	$173,183,348
SSM Amount Recoverable (Resource Acquisition)	$5,911,273	$5,834,044	$5,914,951
SSM Amount Recoverable (Market Transformation)	$956,638	$854,584	$854,584
LRAM (Reimbursable to Ratepayers)	$(55,619)	$(54,905)	($55,273)
DSMVA (Recoverable from Ratepayers)	$535,804	$535,804	$535,805

Note: Values that are reimbursable to ratepayers are shown as negative values and values that are payable to the Company are shown as positive values.

The EAC supports the foregoing calculations.

The following Table 2 from the Audit Report [4] is a summary of the adjustments recommended by the auditor.

The auditors made five sets of adjustments that affect the TRC calculations or the payment mechanism results. Table 2 summarizes the individual changes made that affected the calculated net annual m^3 of gas savings and the TRC. Table 2a summarizes the impact of these changes on the resource acquisition, market transformation, and low income weatherization programs.

Table 2: Summary of Adjustments by Program Type in Final Audit Report

Description of Adjustment	Original Value	Audit Value	NET Annual m3 Gas Savings Adjustment	TRC Adjustment for SSM ($)	Audit Report Ref. Page(s)
Audit Adjustments to Results of Custom Commercial and Industrial Resource Acquisition Program					
Custom industrial and agricultural adjustment factors updated to account for sample weights and edits to one industrial project.	Industrial & Agriculture: gas -0.7% elec 0.0% water -9.0%	Industrial & Agriculture: gas 2.01% elec 0.00% water -11.14%	479,162	$817,738	10 through 12 and Appendix B
Custom commercial and multifamily adjustment factors updated to account for sample weights and edits to two commercial projects.	Commercial and Multifamily Residential: gas -2.6% elec 2.8% water -1.0%	Commercial and Multifamily Residential: gas -3.57% elec -5.95% water -12.37%	-383,675	-$1,761,656	10 through 12 and Appendix B
Custom Resource Acquisition Program Totals	N/A	N/A	95,487	-$943,918	N/A
Audit Adjustments to Results of Residential and Low Income (LI) Resource Acquisition Programs					
Correction of Reduction Rates for TAPS programs for Existing Homes	7,754,910 m3 gas 17,554,129 kWh 2,376,342 m3 water	7,685,917 m3 gas 17,488,170 kWh 2,355,547 m3 water	-68,994	-$405,849	16 through 19
Correction of Reduction Rates for TAPS programs for Low Income	85,362 m3 gas 163,107 kWh 19,023 m3 water	84,700 m3 gas 171,579 kWh 18,799 m3 water	-662	$822	16 through 19
Residential and Low Income Resource Acquisition Program Totals	7,840,272 m3 gas 17,717,236 kWh 2,395,364 m3 water	7,770,616 m3 gas 17,659,749 kWh 2,374,347 m3 water	-69,655	-$405,027	N/A
Audit Adjustments to Market Transformation (MT) Program Results					

[4] Independent Audit of 2011 DSM Program Results, ERS, June 28, 2012, pg 2-3

Correction to drain water heat recovery (DWHR) participant counts	4,052 installed units	2,168 installed units	See Table ES-2	See Table ES-2	21 & 22
Totals	4,052 installed units	2,168 installed units	N/A	N/A	N/A

Table 2a. Summary of Adjustments to Net Annual Gas m3, TRC, and SSM in Final Audit Report

Description of Adjustment	NET Annual m3 Gas Savings Adjustment	TRC Adjustment for SSM ($)	SSM Adjustment ($)
Resource Acquisition Programs	25,831	-$1,348,946	-$77,229
DWHR Market Transformation Scorecard Program	Not applicable	Not applicable	-$102,054
Low Income Weatherization Scorecard Program	0	$0	$0
Totals	**25,831**	**-$1,348,946**	**-$179,283**

The EAC reviewed the auditor adjustments to the commercial and industrial sector custom project results. The Audit Report recommended two types of adjustments:

a) changes to results of three projects in the sample from the Custom Project Review

b) a change in how the overall adjustment factors resulting from the Custom Project Review were calculated prior to their application to the total population of commercial and industrial projects.

The EAC accepted the Audit Report recommendation (a.) and referred recommendation (b.) to the Technical Evaluation Committee for discussion and possible application to the 2012 program results. This is consistent with the treatment of the same issue in the 2011 Union Gas DSM Audit.

EGD then revised the TRC results for custom projects to reflect the EAC recommendations. EGD revised the results for the three projects and retained the original method for calculating the resulting adjustment factors to apply to all the custom projects in the commercial and industrial sectors.

At the request of the EAC, the auditor reviewed EGD's revised TRC calculations and confirmed that the calculations were consistent with the EAC recommendations and were done correctly. The Audit Report and EAC recommended TRC results are shown in the table below.

Table 2b. Changes from Final Audit Report to EAC Adjusted Values

TRC results	Final Audit Report	2011 EAC Adjusted Value	Change from Final Audit Report
EXISTING HOMES	$48,461,257	$48,461,257	$0
RESIDENTIAL NEW CONSTRUCTION	$1,125,396	$1,125,396	$0
LOW INCOME	$423,000	$423,000	$0
Total Residential	**$50,009,653**	**$50,009,653**	**$0**
COMMERCIAL PRESCRIPTIVE	$12,666,641	$12,666,641	$0
COMMERCIAL CUSTOM	$34,312,086	$35,107,055	$794,969
MULTI RESIDENTIAL	$42,760,257	$43,502,690	$742,433
LARGE NEW CONSTRUCTION	$9,422,226	$9,840,561	$418,335
INDUSTRIAL	$28,712,958	$28,170,403	($542,556)
Total Business Markets	**$127,874,167**	**$129,287,349**	**$1,413,182**
NPDC	-$124,960	-$124,960	$0
Overheads	-$5,988,693	-$5,988,693	$0
TOTAL ALL PROGRAMS	**$171,770,167**	**$173,183,348**	**$1,413,182**

Table 2c. Effect of EAC Adjustments on Final Audit Report SSM

SSM	Final Audit Report	2011 EAC Adjusted Value	Change from Final Audit Report
2011 Resource Acquisition SSM	$5,834,044	$5,914,951	$80,907
2011 Market Transformation Scorecard SSM	$312,438	$312,438	$0
2011 Low Income Scorecard SSM	$542,146	$542,146	$0
Total	**$6,688,628**	**$6,769,535**	**$80,907**

3. TRC Results and SSM Calculations

3.1 Auditor Recommendations

The auditor made the following recommendations that may affect SSM and LRAM for application in the current year and/or future years:

Custom

1. **Finding.** The Enbridge independent review protocols of verification without post-retrofit measurement of equipment performance over time limits the scope of reviews to detection of errors, fraud, and determination of "reasonableness" of savings predictions, but cannot truly validate savings.

Recommendation. Change the verification cycle to enable more intensive investigation of projects. This can be done through one or a combination of the following approaches to evaluation:

a. Increase evaluation funding as a percentage of total program funds each year. We do not know Enbridge's current level of investment in verification and auditing. In North America typical energy efficiency program evaluation spending is 2% to 5% of program funding. California briefly was as high as 8%.

b. Decrease the number of sites verified per cycle and increase the engineering rigor for each project verified. One way to do this and maintain 90/10 is to group multiple programs into a single population frame and verify the performance for them in aggregate. Grouping could be of multiple Enbridge programs (e.g., commercial and industrial custom) or of multiple administrator programs in a jurisdiction (e.g., Union and Enbridge custom programs) or both.

c. Increase funding per verification without increasing total annual funding by conducting the more rigorous exercise on a bi-annual basis instead of conducting a less rigorous exercise each year.

d. Change the evaluation cycle to allow 6 to 9 months of post-retrofit evaluation. Can be done by either allowing later restatement of past savings or by applying the verification findings prospectively to the next rather than the prior year.

Enbridge Response:

Enbridge has referred this recommendation to the Technical Evaluation Committee (TEC) .

EAC Response:

The EAC endorses this response.

2. **Finding**. Enbridge does not collect custom project analysis data in its MS Excel workbook or other native format. This limits the ability of the verification and audit contractors to efficiently and effectively review prior work.

Recommendation. Collect analysis files in native format rather than just hard copy to aid later evaluation. If this is impractical to require for all 1,000+ projects completed per year, establish criteria based on incentive value, project complexity, technology, and/or other factors to systematically do so for a subset of them. For example, analysis should be provided in native format for all applications that exceed $100,000 incentive value and

are not based on e-tools calculated savings. Alternatively, require that applicants make such data available promptly upon request as part of the application terms.

Enbridge Response:

Parties involved in custom project analysis, whether the Enbridge customer, the customer's engineering firm, Enbridge staff, or the custom project verification contractors have developed their own analysis tools, most of which are proprietary. Recognizing this, Enbridge has, for some years, required customers and their engineering firms to provide all inputs used in their analysis with the project application so that the Enbridge staff and the verification contractor may replicate the analysis using their tools. Where custom project analysis files are readily available in native format, Enbridge will request that they be included in the project file.

EAC Response:

The EAC endorses this response.

3. **Finding**. The custom program verification studies calculate the overall adjustment factor by computing the weighted average factor for the sample projects, with the weighting based on energy savings. The weighted average also should account for the differing expansion weights associated with each project.

   Recommendation. Add post-verification steps to the sampling protocol that instruct the engineering verification contractor to provide the project-specific results to the sample design contractor, and for the design firm then to calculate the overall weighted average adjustment factor for use in the TRC calculator.

Enbridge Response:

In the Final Audit Report, the auditor calculated the results for 2011 custom projects using a weighted average accounting for the differing expansion weights associated with each project in the sample of projects reviewed. Similar to the approach taken with this recommendation in the audit of the Union Gas 2011 DSM results, Enbridge will adjust results for 2011 individual custom projects as recommended by the auditor and recalculate the overall adjustment factor using the current method of a weighted average based on energy savings of the projects in the sample. This will result in revised

values for TRC results, SSM and LRAM compared to the Final Audit Report.

Enbridge will refer this recommendation to use a weighted average based on differing expansion weights to the Technical Evaluation Committee (TEC) regarding its application to future custom project verification studies.

EAC Response:

The EAC endorses this response.

4. **Finding**. The verification studies do not report the actual error ratio, which could be used in the next year's design.

   Recommendation. The engineering verification contractor should provide the project-specific results to the sample design contractor, and the latter firm should then calculate the final actual error ratio when they provide the final actual relative precision and report these values. Then, in the subsequent year's design, the prior year's actual error ratio can be considered.

   Exception. If the verification method was to materially change (see the next recommendation), then using 0.5 for the first verification based on the new method would be better than using the prior actual error ratio.

Enbridge Response:

Enbridge will refer this recommendation to the Technical Evaluation Committee (TEC) for review.

EAC Response:

The EAC endorses this response.

5. **Finding:** Final project cost was not well documented. Although some form of final project documentation existed in each case, it was often informal consisting of an email from the participant to EGD or a quote (issued before the project, as opposed to an invoice) without final cost reconciliation.

   Recommendation: Collect more detailed final project cost information. These documents might include invoices, payment requisitions, or summary information from participants' in-house tracking or accounting systems.

Enbridge Response:

Enbridge will review procedures for collecting cost data in the context of the new DSM Guidlelines and discuss the recommendation with future audit committees.

EAC Response:

The EAC endorses this response.

PRESCRIPTIVE

1. **Finding.** For the TAPS Partners, Low Income TAPS Partners, and Multi-Residential programs, Enbridge differentiated savings attributed to showerheads depending upon the flow rate of the pre-existing showerheads. The percentage of overall participants in each of two flow rate categories is based on documented pre-installation bag test data reported by the installing contractors. Multi-Residential Program showerhead reported savings implies that 59.4% of the participants had pre-existing showerheads with flow greater than 2.5 gpm.

   Recommendation. Unless Enbridge perceives more market volatility than auditors expect, it is probably not necessary to conduct bag tests continuously. Use the data obtained from prior bag tests to calculate weighted average unit savings values for residential program showerheads. Re-test periodically but not continuously to assess market penetration.

   Enbridge Response:

   Enbridge will no longer be completing bag tests in the Residential market as the program delivery is now a self-install.

   Enbridge will consider conducting bag tests in the Multi-Residential market during the 2012 fall campaign.

   EAC Response:

   The EAC endorses this response.

2. **Finding.** For pre-rinse spray valves Enbridge used the same overall reported 33.3% remain-in-place value for all three foodservice facility types (full service, limited duty, and other). It is likely that the retention rate varies by facility type.

   Recommendation. If this offering continues, either reanalyze existing data or collect new data in the next round of evaluation to test whether retention rates vary by facility type and use different values if the difference is material.

   Enbridge Response:

   Enbridge has discontinued the Pre-Rinse Spray Valve campaign.

   EAC Response:

   The EAC endorses this response.

3. **Finding.** The residential verification reports were inconsistent in their presentation of the percentage of units distributed, percentage of units installed, and percentage of units remaining after removal. These inconsistencies led to errors in the calculation of residential program adjustment factors.

   Recommendation. Implement consistency in the values reported in the residential verification reports. Providing the verification firms with the spreadsheets and guidance required to report adjustment factors directly rather than just the inputs to the calculation will enable greater consistency in reporting the residential verification report results.

   Enbridge Response:

   Enbridge will work with the verification firms to ensure that results are presented consistently and that adjustment factors can be pulled directly from the reports.

   EAC Response:

   The EAC endorses this response.

MARKET TRANSFORMATION

1. **Finding.** In reviewing its internal procedures, Enbridge noted a discrepancy in the number of DWHR units installed vs. shipped. This discrepancy resulted in a decrease in the SSM for this market transformation program. There was no verification report for the DWHR market transformation program. Should a verification effort similar to the one implemented for the TAPs residential program have been implemented, it is possible that the error noted above would have been caught in the audit process. Under the current audit process, a review of the participant count and tracking procedures was not performed for this program.

   Recommendation. The auditors recommend that in future audits, a sample of participant records be reviewed to verify the participant counts and tracking procedures for programs such as the DWHR market transformation programs. Such action would be prudent for any program in which participant counts are based on the number of units installed by contractors or other parties that are not directly supervised and tracked by Enbridge staff.

   Enbridge Response:

   Enbridge will implement this recommendation with the agreement of the 2012 Audit Committee.

   EAC Response:

   The EAC endorses this response.

GENERAL

1. **Finding.** The free-ridership estimates are quite dated. The prior audit report recommended new research to update these estimates. This is not critical for low income programs, which typically have low free ridership, but is important for the custom programs. For example, auditors noted that participants installed a significant number of the custom projects prior to the submitting incentive applications. This could mean that customers decided to implement projects before seeking incentives. Enbridge reports that is common for them to be engaged with customers long before receiving an application, and of course the expectation of incentives can influence decision-making well before paper trails demonstrate linkage. Nonetheless,

this could be an indicator of free ridership. This is a subject that will be discussed by the newly formed Technical Evaluation Committee (TEC).

Recommendation. Prioritize and complete free ridership research in 2012 for completion prior to next year's analysis.

Enbridge Response:

Enbridge has brought this recommendation to the Technical Evaluation Committee (TEC) for review.

EAC Response:

The EAC endorses this response.

2. **Finding.** Spillover is not considered in the TRC reports. While it is possible that this factor is small, it been found to be material in some jurisdictions.

   Recommendation. Consider incorporating spillover research with the free ridership decision-making data collection. Absent comprehensive study, targeted inquiry regarding spillover by residential contractors and large C/I participants and suppliers are more likely than with other entities.

Enbridge Response:

Enbridge will refer this recommendation to the Technical Evaluation Committee (TEC).

EAC Response:

The EAC endorses this response.

3. **Finding.** This audit did not include "depth" investigation of any data transfer protocols or DARTS processing. During the audit Enbridge discovered substantive tracking errors related to residential drain water heat recovery installation rates that the audit did not and would never have uncovered without Enbridge direction.

   Recommendation. The scope of future audits should include selective random depth tracing of Enbridge data processing from the TRC calculator inputs back to raw field data, to make it possible to discover such errors.

Also, Enbridge development and updating of detailed process flow diagrams could aid both the utility and the auditor.

Enbridge Response:

Enbridge will bring forward this recommendation to the 2012 Audit Committee and is currently completing process flow diagrams for all Market Transformation programs.

EAC Response:

The EAC endorses this response.

3.2 EAC RECOMMENDATIONS & COMMENTS

During the Audit, an issue of attribution arose involving the High Performance New Construction ("HPNC") program, being delivered by Enbridge under contract to the Ontario Power Authority. Enbridge advised that, under its contract with OPA, which is a confidential document and could not be released in full to the EAC, the attribution of both gas and electricity savings was to be pro rata to the total project energy savings based on a common measurement. If gas was 80% of the total energy savings, then 80% of the project energy savings would be borne by gas ratepayers, and 20% of the project savings would be accounted for in the OPA program.

The issue is explained in more detail on page 15 of the Appendix to the Final Audit Report.

Intervenor members of the EAC were concerned that OPA should not be in a position to make unilateral decisions about whether gas ratepayers or electricity ratepayers should bear the utility performance incentive costs associated with a joint program. They were also concerned that no attribution determination should be based on a contract that the intervenors cannot review because it is confidential.

In 2011, the effect of changing to 100% gas savings attributed to gas ratepayers, and 0% electricity, for all HPNC projects would be a small increase in SSM in 2011. However, in 2012 the effect would be a decrease in Enbridge's incentive.

There was disagreement amongst the committee members as to whether the Board's policies in 2011 favour one or the other attribution method, or are silent on the issue.

Under the new framework for natural gas DSM programs jointly delivered with rate-regulated electricity distributors, savings in this situation would be attributed all gas to Enbridge, and all electricity to the electricity distributor.

However, legacy projects from the OPA HPNC program which are recorded in 2012 will be treated in the same manner as the 2011 projects.

Because the impact in 2011 was de minimis, no adjustment was made.

Enbridge Response:

Enbridge endorses the EAC recommendation regarding treatment of results from the 2011 and 2012 HPNC projects.

3.4 TRC RESULTS

The following table presents a comparison of the Net Gas Savings and TRC found in the Draft Annual Report versus the Final EAC Adjustments made after the Final Audit Report. The auditor has reviewed the Adjusted TRC spreadsheet and agrees with the calculation.

Table 3: Net Gas Savings and TRC Values from Draft Annual Report to Final Adjusted Results as agreed by the EAC

	Draft Annual Report		Final Adjustments as agreed with the EAC after the Final Audit Report	
Program	**Net Gas Savings (m^3)**	**TRC $**	**Net Gas Savings (m^3)**	**TRC$**
EXISTING HOMES	7,754,910	$48,867,106	7,685,917	$48,461,257
RESIDENTIAL NEW CONSTRUCTION	1,167,239	$1,125,396	1,167,239	$1,125,396
LOW INCOME	85,362	$422,179	84,700	$423,000
Total Residential	**9,007,511**	**$50,414,681**	**8,937,855**	**$50,009,653**
COMMERCIAL PRESCRIPTIVE	6,357,308	$12,666,641	6,357,308	$12,666,641
COMMERCIAL CUSTOM	17,931,947	$35,042,436	17,968,440	$35,107,055
MULTI RESIDENTIAL	21,920,173	$43,377,882	21,991,311	$43,502,690
LARGE NEW CONSTRUCTION	3,701,445	$9,835,906	3,706,499	$9,840,561
INDUSTRIAL	17,482,847	$27,895,220	17,643,484	$28,170,403
Total Business Markets	**67,393,719**	**$128,818,086**	**$67,667,042**	**$129,287,349**
NPDC		($124,960)		($124,960)
Overheads		($5,988,693)		($5,988,693)
TOTAL ALL PROGRAMS	**76,401,230**	**$173,119,113**	**76,604,897**	**$173,183,348**

3.5 SSM CALCULATION

As seen in table 2a above, the Auditor's Final Audit Report states that the Audit results produce a total SSM reduction of $ 179,283 from the original SSM found in the Enbridge Draft Annual Report. However, with the EAC adjustments, the auditor reviewed the SSM calculation and agrees with the final SSM of $6,769,534 based on the EAC adjustments agreed upon.

Table 4: Auditor Recommended SSM

	2011 Draft Annual Report	Final Post Audit Adjusted Value
2011 Actual TRC	$173,119,113	$173,183,348
2011 TRC Target	$139,735,115	$139,735,115
Percent of Target	123.89%	123.94%
Base Target	100%	100%
Percent over 100%	23.89%	23.94%
SSM at 100% of Target	$4,000,000	$4,000,000
SSM over 100% of Target	$1,911,273	$1,914,951
Program Total	$5,911,273	$5,914,951
Market Transformation	$414,492	$312,438
Low Income	$542,146	$542,146
Total SSM	$6,867,911	$6,769,535

EAC Response:

The EAC supports the foregoing SSM calculations.

4.0 LRAM

4.1 AUDITOR RECOMMENDATIONS

The following are recommendations made by the auditor that affect 2011 LRAM:

All recommendations have been implemented by Enbridge and used in the calculation of 2011 LRAM.

4.2 LRAM RESULTS

LRAM

In preparing rates for a given year the forecast DSM volumes are taken into account. The Lost Revenue Adjustment Mechanism was established to account for the revenue impact of any variance between the forecast DSM volumes and post audit DSM volumes for the program year. LRAM only addresses the variance in DSM volumes.

The auditors recommended ($54,905) for the 2011 LRAM as the amount to be returned to ratepayers. Enbridge has recalculated the LRAM to reflect EAC post-audit recommendation which resulted in the 2011 LRAM of ($55,273).

Table 5 illustrates the LRAM by rate class and the variance that will need to be reimbursed to (negative number) or collected from (positive number) rate payers. In total, ($55,273) needs to be returned to rate payers.

Table 5: LRAM Calculation to Net Gas Savings

2011 Post-Audit LRAM Calculation						
	based on	55,774,692	FE m3 built into rates			
Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Distribution Margin	$	
Rate 1	6,988,269	4,500,606	(2,487,663)	~~5.5061~~	~~$ (136,974)~~	69%
Rate 6	13,764,114	17,963,563	4,199,448	~~3.3689~~	~~$ 141,475~~	-117%
~~Rate 100~~	~~0~~	~~0~~	~~0~~		~~$ ——~~	~~0%~~
Rate 110	1,995,809	981,436	(1,014,373)	1.6252	$ (16,486)	28%
Rate 115	1,270,060	838,229	(431,831)	0.9911	$ (4,280)	12%
Rate 135	0	179,013	179,013	1.4002	$ 2,507	-5%
Rate 145	1,863,650	732,914	(1,130,736)	1.8106	$ (20,473)	31%
Rate 170	4,329,389	1,415,262	(2,914,127)	0.5676	$ (16,541)	81%
Totals	**30,211,292**	**26,611,023**	**-3,600,269**		~~**$ (50,773)**~~	
			Amount to be returned to Ratepayers		**$ (55,273)**	

Rate 1 and Rate 6 are not included in the LRAM amount for clearance above as these rate classes are covered under AUTUVA, Average Use True-Up Variance Account.

AUTUVA

DSM is one of several factors contributing to declining average use in Rate 1 and Rate 6. The purpose of the 2011 AUTUVA is to record ("true-up") the revenue impact, exclusive of gas costs, of the difference between the forecast of average use per customer, for general service rate classes (Rate 1 and Rate 6), embedded in the volume forecast that underpins Rates 1 and 6 and the actual weather normalized average use experienced during the year. The calculation of the volume variance between forecast average use and actual normalized average use will exclude the volumetric impact of Demand Side Management programs in that year.

The Company's rates for Rate 1 and Rate 6 are based on budgeted average volumes per customer. At the end of each year the actual average volumes are calculated from the total metered usage which includes the impact of any DSM activities. During year-end if either the audited DSM volume information or an updated estimate is not available, the budget DSM volume information which is the best available estimate of the actual DSM volume information will be utilized in the AUTUVA calculation. If it turns out that the current year actual audited DSM volumes are different from the budget when this information is not available for current year AUTUVA calculation, the LRAM calculation is only required for other rate classes.

EAC Response:

The EAC supports the foregoing LRAM calculations.

APPENDIX A

Terms of Reference: Audit of 2011 DSM Program Results

Enbridge

Terms of Reference:

INDEPENDENT AUDIT OF 2011 DSM PROGRAM RESULTS

BACKGROUND

Since 1995, Enbridge Gas Distribution ("Enbridge") has been delivering Demand-Side Management (DSM) programs to its customer markets. Each year since then, Enbridge has been successful in achieving significant natural gas savings through its program portfolio. (See the attached DSM Factsheet for an overview of the Enbridge DSM programs.) Enbridge delivers its DSM programs in accordance with the rules and procedures defined by the Ontario Energy Board ("OEB").

The OEB DSM procedures include three financial mechanisms: the Demand Side Management Variance Account (DSMVA), the Lost Revenue Adjustment Mechanism (LRAM), and the Shared Savings Mechanism (SSM).

The DSM budget is set at the beginning of the year. "The DSMVA (DSM Variance Account) shall be used to "true up" the variance between the spending estimate built into rates for the year and the actual spending in that year. If spending is more than what was built into rates, the utility shall be reimbursed up to a maximum of 15% of its DSM budget for the year. All additional funding must be utilized on incremental program expenses only (i.e., cannot be used for additional utility overheads)." [5]

As described in the Board's Decision that first established the LRAM, "LRAM is a mechanism to adjust for margins the utility loses if its DSM Program is more successful in the period after rates are set than was planned in setting the rates."[6] The continuance of the LRAM was confirmed in the Board's Decision in the Generic Proceeding.[7]

[5] EBO 2006-0021, Decision with Reasons, Issue 6.1, 6.2 and 6.3, page 30
[6] EBRO 495, Decision, Pg 100, item 4.2
[7] EBO 2006-0021, Decision with Reasons, Issue 4.1, page 39

The SSM provides the Company a share of the DSM results. In the Generic Proceeding the Board approved a proposal whereby the amount of the SSM is determined by a formula based on a percentage of the actual net benefits.[8] The net benefits are calculated using the "Total Resource Cost Test", developed by the California Energy Commission and the California Public Utilities Commission.[9]

Enbridge maintains systems to monitor and track DSM results. In addition, the Company commissions independent evaluations of selected DSM programs. The DSM Annual Report is the Company's documentation of program results, evaluation research, and calculation of the DSMVA, LRAM, and SSM amounts.

OBJECTIVE

The objective of the audit is to provide an independent opinion as to the reasonableness of the Company's claims regarding DSMVA, LRAM & SSM. The Company intends to use the audit as evidence to clear the relevant DSM accounts at the OEB.

The auditor should include in their final report or subsequent memo an independent professional opinion in the following form, with or without qualifications:

"We have audited the Annual Report, Total Resource Cost (TRC) savings, Shared Savings Mechanism (SSM), Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ended December 31, 2011. The Annual Report, and the calculations of TRC, SSM, 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 its Decision with Reasons dated August 6, 2006 in EB-2006-0021. 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 accurate in all material respects, and following the rules and principles set down by the

[8] EBO 2006-0021, Decision with Reasons, Issue 5.2, page 27-30
[9] "Standard Practice Manual. Economic Analysis of Demand-Side Management Programs." California Energy Commission and California Public Utilities Commission, 1987.

Ontario Energy Board that are applicable to the 2011 DSM programs of Enbridge Gas Distribution:

TRC Savings	*-*	*$xxx,xxx,xxx*
SSM Amount Recoverable	*-*	*$x,xxx,xxx*
LRAM Amount Recoverable	*-*	*$x,xxx,xxx*
DSMVA Amount Recoverable	*-*	*$xxx,xxx"*

SCOPE AND REQUIREMENTS

As stated in the Decision from the Generic Proceeding,

> "The parties agree that a third party audit of the Evaluation Report is required. The auditor will be retained by the utility who determines the scope of the audit.
>
> It will be the role of the auditor to:
>
> - Provide an opinion on the DSMVA, SSM and LRAM amounts proposed and any amendment thereto
> - Verify the financial results in the Evaluation Report to the extent necessary to give that opinion
> - Review the reasonableness of input assumptions.
> - Recommend any forward looking evaluation work to be considered
>
> The auditor shall be expected to take such actions by way of investigation, verification or otherwise as are necessary for the auditor to form their opinion. The auditor, although hired by the utility, must be independent and must ultimately serve to protect the interests of stakeholders."[10]

The Auditor selected for this task will be expected to exercise his/her expert judgment to determine the elements of the audit, and to set the approach and process that will be followed in the audit in order to meet the regulatory requirements as stated above.

The deliverable will be written reports outlining the principles of the audit, the methodology followed, and the findings and recommendations of the audit, including an opinion in the form set forth above.

The following list of audit activities is suggested. It represents the minimum set of tasks the auditor will be expected to carry out. The Auditor is encouraged to

[10] EBO 2006-0021, Decision with Reasons, Issue 9.3, page 17

propose other tasks that it believes would be helpful in reaching the ultimate goal of assessing the accuracy of Enbridge's DSMVA, LRAM, and SSM calculations.

Audit Activities

- Consider and respond to stakeholder comments on Enbridge's Annual DSM Report for 2011, including those of the Evaluation Audit Committee (EAC).
- Review Enbridge's 2011 procedures for tracking program participants and determine whether they lead to accurate counts, particularly for programs that do not provide customer rebates.
- Determine whether Enbridge's reported values for participation, costs, measure lives and savings (gas, electricity and water) are appropriate for calculation of TRC, LRAM and SSM. This shall include assessing: (1) whether values are adequately documented by program records, evaluation studies and other relevant data; (2) where applicable, whether assumptions regarding measure costs, savings and lives are in line with Board approved values for calculation of the SSM; and (3) the reasonableness of costs, measure lives and savings for the calculation of LRAM and SSM. Where appropriate, the auditor shall recommend alternative costs, measure lives and savings values to be used for LRAM purposes. For measure assumptions that were not previously approved by the Board, the auditor is expected to propose alternatives to those put forward by EGD if it deems the EGD values less accurate. Consideration should be made to measures that are considered advancements rather than replacements to ensure costs, measure lives and savings are treated appropriately. As part of such consideration of advancement measures the auditor shall assess both whether cost, savings and measures lives are estimated in line with models developed in the last 2 years and whether such models are reasonable.
- Determine that all other assumptions are consistent with those approved in the forecast or that they properly reflect accepted recommendations from previous audits or new program designs.
- Review and verify the accuracy of all calculations leading up to the proposed TRC, DSMVA, LRAM, and SSM amounts.
- Verify that the methodology and assumptions used to calculate the "actual" LRAM volume savings are consistent with the methodology and assumptions used to calculate the LRAM budget volume savings and identify and quantify any inconsistencies.
- Verify that the calculations are consistent with the OEB-approved prescribed methodology.
- Verify the calculation of the Market Transformation incentive. As part of such efforts, the auditor should provide an opinion on the accuracy of EGD's reporting of performance against program metrics and the

reasonableness of EGD's interpretation of program metric results. The auditor shall also provide an opinion as to the usefulness of Enbridge's market transformation metrics as indicators of success in market transformation and, where applicable, propose alternatives that may be better indicators to use in the future.

- In accordance with OEB direction, Enbridge has retained independent third party engineering consultants to undertake a detailed review of the savings estimates for Industrial and Commercial custom projects. The auditor should review the final reports from these consultants and provide an opinion as to the quality of their review and the consultant's adherence to the terms of reference. The auditor should also provide an opinion on the reliability and reasonableness of the error ratio (and/or realization rate) when applied to a larger population of custom projects.
- Review other studies conducted in support of the DSM Annual Report.
- Identify any assumptions underlying Enbridge's DSM program design strategy, and TRC calculations, that should be modified prospectively, based on the auditor's experience, the results of the audit, and knowledge of other studies or data. Propose the amounts of those modified assumptions.
- Identify opportunities to enhance the assumptions used to calculate the SSM and LRAM that should be addressed in future evaluation work.
- Work with the EAC and Enbridge to resolve any relevant issues prior to completion of the audit.
- Work with firms contracted to review custom projects and provide guidance to these firms and Enbridge to ensure the final reports from these firms meet the needs of the audit.
- Review methodology and calculation used to calculate 2011 TRC target. Ensure methodology used is in line with Board approved guidelines and decisions.
- Any other matters considered by the auditor to be relevant to an assessment of Enbridge's DSMVA, LRAM and SSM claims.

Audit Resources

To assist the Auditor in conducting the audit, all relevant Company documentation will be made available to the Auditor for review. The Company is committed to providing the necessary data and tools the Auditor deems reasonably necessary in order to meet the ultimate goal of the audit. The list below provides examples of the resources that can be made available to the Auditor, but the list should not be considered as necessarily complete or exhaustive:

- Access to the Company's program tracking system and documentation of program participants;
- Access to the Company's cost-effectiveness screening spreadsheet tool;
- Access to all regulatory decisions and agreements which outline the requirements for DSM evaluation and the independent audit;
- Access to all regulatory decisions and guidelines that outline the DSMVA, LRAM and SSM calculations and procedures;
- Access to comments provided by DSM Consultative members on the 2011 DSM Annual Report;
- Access to all relevant evaluation and market research conducted by the Company relating to or informing the results for 2011 including a third party engineering review of a sample of custom projects in business markets, and including any research carried out after 2011, whether final or in draft form;
- Access to all previous audit reports;
- Enbridge's DSM and Program Evaluation department staff time; and
- Communication as required by the Auditor with the EAC.

REPORTING STRUCTURE

The Auditor will be under contract with Enbridge. Pursuant to the requirements established by the Board, a group of stakeholder representatives has been selected by the interveners to act in an advisory role to the auditor and Enbridge during this process. This group is defined as the "EAC" below.

Decision Issue 9.4, page 17 and 18

"…the EAC (Evaluation Audit Committee) will continue to have an advisory role in …

- Selection of the independent auditor to audit the Evaluation Report and determine the scope of the audit. The EAC will ensure that all comments on the Evaluation Report from the Consultative are reviewed by the auditor.
- The EAC will be responsible for meeting the reporting guidelines of the Board (found at Section 2.1.12 of the Natural Gas Reporting & Record Keeping Requirements Rule for Gas Utilities). The EAC will provide a final report within 10 weeks from the later of, the receipt of the Evaluation Report and supporting evaluation studies from the Utility, or the hiring of the auditor. Recommendations of the EAC with respect to DSMVA, LRAM

> and SSM clearances shall be included in the EAC's final report. The EAC shall not consider any further information subsequent to the Board's filing deadline each year."

The EAC consists of a Company representative and three stakeholders elected from the DSM Consultative Group. The DSM Consultative Group is a multi-stakeholder body which meets from time to time to discuss and review the Company's DSM activities.

In keeping with the guidelines above, the auditor will be selected by the Company in consultation with the EAC.

The EAC will also help to ensure that the process enables the Company to file the completed audit and recommended DSMVA, LRAM and SSM claims by June 30th as required by the OEB Directive.

The start-up meeting with the Auditor will be held with all members of the EAC to ensure a consistent understanding among all parties of the scope and expectations of the independent audit. Additional meetings between all Committee members and the Auditor will be arranged for group discussion and progress reporting. Meetings will be held at Enbridge offices or through conference calls as appropriate.

The Company may review preliminary drafts of the Audit Report to resolve matters of clarification, prior to review by the EAC. If any member of the EAC seeks to review drafts of the Audit Report from time to time, the auditor, subject to approval by the Company, will be required to provide those drafts to the EAC. In keeping with the independence of the auditor, neither the Company nor any members of the EAC will seek to influence the Audit Report in any way, other than by providing factual information and asking questions to clarify the intent of the report. The independent auditor will present their Draft Report to the Company and the Committee for review and possible revisions before it is finalized.

SCHEDULE

Following the Board Directive of December 2004, the independent audit of DSM results is to be completed and a recommendation filed with the Board by the last day of the sixth month after the financial year end.

Due to the importance to meet these Board imposed deadlines, the Auditor will be contractually bound to meet the deadlines outlined in their proposal. If due to the Auditor's negligence, the Auditor has not provided Enbridge with the deliverables, Enbridge may, in its sole discretion and after consulting with the EAC, deduct 10% of the amount payable to the Auditor for each week beyond

the deliverable dates specified herein that the Auditor has not provided Enbridge with the deliverables.

The schedule below meets this requirement.

RFP issued	Monday, February13, 2012
Proposals due	Monday, February 27, 2012
Contract awarded	Wednesday, February 29, 2012
Contract signed	Wednesday, March 14, 2012
Auditor Review of Custom Project Engineering Reviews	Monday, April 2, 2012
Auditor Meeting At Enbridge Offices	Wednesday, April 4, 2012
2011 DSM Annual Report circulated	Friday, April 20, 2012
Comments on DSM Annual Report from EAC and Consultative	Friday, April 27, 2012
Draft Work Plan	Tuesday May 1, 2012
Meeting with EAC to review scope and work plan	Wednesday May 2, 2012
Final Detailed Work Plan	Friday, May 4, 2012
Progress meetings with EAC	Weekly
Draft Audit Report #1 submitted	Friday, May 25, 2012
Review Meeting with EAC	Wednesday, June 6, 2012
Review Meeting with EAC	Thursday, June 07, 2012
Draft Audit Report #2 submitted	Friday, June 11, 2012
Review Meeting with EAC	Wednesday, June 20, 2012
Final Audit Report submitted	Friday, June 29, 2012

CRITERIA

Proposals will be evaluated on the following criteria:

- Experience and qualifications of the firm: direct experience in evaluation or audit of utility DSM programs,
- Methodology proposed,
- Demonstrated understanding of Enbridge rules and requirements,
- Proposed schedule and ability to meet timelines, and
- Price proposal.

PROPOSAL REQUIREMENTS

2011 EAC members are: Chris Neme from Energy Futures Group representing Green Energy Coalition, Jay Shepherd representing School Energy Coalition and Judy Simon from Elenchus representing Low Income Energy Network.

Please disclose any potential conflicts of interest.

The proposal should include the following elements:

- A description of the methodology and approach to be used in the audit,
- A list of proposed tasks,
- Suitable information for Enbridge to determine the qualifications of individuals and their roles in the project,
- Confirmation that the proponent will be able to meet the Enbridge contractor insurance and WSIB requirements as described in the attachment, and
- Confirmation of ability to meet timelines or specific reasons why a deviation from the schedule is required.

The cost proposal should include:

- Breakout of costs by task and roles,
- Assumptions regarding the number of meetings at the Enbridge offices and the associated costs, and
- Hourly rates for additional related work such as appearing as an expert witness at the OEB.

Proposals are due no later than 1:00 PM on February 27, 2012. Proposals may be submitted in hard copy or via email.

Questions of clarification should be directed to Corrie Morton at the coordinates indicated below. Responses to questions of clarification will be circulated to all respondents.

All correspondence should be sent to the attention of:

Corrie Morton, DSM Research and Evaluation
Phone: 416-495-6467 Email: corrie.morton@enbridge.com

Attachment #1: DSM Fact sheet (sent separate file to Auditor)

Attachment #2

Enbridge contract requirements regarding Insurance and WSIB

Insurance

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

(a) worker's compensation insurance as required under applicable laws;

(b) commercial general liability insurance having a minimum inclusive coverage limit, including personal injury and property damage, of at least Two Million Dollars ($2,000,000). Enbridge must be added as an additional named insured in the insurance policy, which should be extended to cover contractual liability, products/completed operations liability, owners'/ contractors' protective liability and must also contain a cross liability clause;

(c) automobile liability insurance on all vehicles used in connection with this Agreement and such insurance shall have a limit of at least Two Million Dollars ($2,000,000) in respect of bodily injury (including passenger hazard) and property damage inclusive of any one accident;

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

(e) professional liability or errors and omissions insurance and such insurance shall have a limit of at least Two Million Dollars ($2,000,000); and

(f) such other insurance as Enbridge may in its discretion determine to be necessary.

WSIB

The Consultant agrees to comply with the Occupational Health and Safety Act (Ontario) and the Workplace Safety and Insurance Act (Ontario) and with all other prevailing federal, provincial and municipal laws and regulations or any other laws or regulations in force in any jurisdiction where the consulting services are performed (the "Laws") and which are applicable to the Consultant, its subcontractors and the consulting services provided hereunder, and the Consultant shall familiarize itself and procure all required permits and licenses and pay all charges and fees necessary or incidental to the due and lawful prosecution of this Agreement and shall indemnify and save harmless Enbridge, its directors, officers, agents and employees thereof against any claim or liability from or based on the violation of any Laws, whether by the Consultant, its officers, employees, subcontractors, representatives or agents

APPENDIX B

Audit Final Work Plan

Independent Audit of Enbridge Gas Distribution 2011 DSM Program Results

Final Work Plan

energy & resource solutions

120 Water Street, Suite 350
North Andover, MA 01845
(978) 521-2550
May 20, 2012

INTRODUCTION AND OBJECTIVES

Enbridge Gas Distribution (Enbridge) operates a series of demand side management (DSM) programs to encourage customers to use less natural gas and, in some cases, less electricity and water. The company receives a combination of direct cost recovery and performance-based payments associated with program delivery. The Ontario Energy Board (OEB) and the consultative group's Evaluation and Audit Committee require independent third party review of Enbridge's annual report and supporting calculations to ensure that savings claims and performance-based payment calculations are correct. The primary objective of this audit is to review the Enbridge Gas Distribution calculations for Total Resource Cost (TRC) savings, the Shared Savings Mechanism (SSM), the Lost Revenue Adjustment Mechanism (LRAM) and the Demand Side Management Variance Account (DSMVA) for the calendar year ended December 31, 2011 and to express an independent opinion on these amounts. Enbridge has contracted with Energy & Resource Solutions (ERS) to be the auditor. If the Enbridge-reported amounts differ from what ERS believes to be correct, ERS will present alternative values. As noted in the OEB DSM Framework, the auditor has a secondary role to recommend any forward-looking evaluation work for consideration.

This audit will be conducted in accordance with the rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated August 6, 2006 in EB-2006-0021.

ERS will perform the audit according to seven tasks as described in this work plan.

TASK 1: KICK-OFF

The audit started with Enbridge delivering the first of multiple sets of program files to ERS on March 26. ERS joined the Evaluation and Audit Committee (EAC) for their weekly teleconference calls starting on April 4. The EAC and ERS are using a portion of the time in this regular teleconference to help ERS gain familiarity with Enbridge's programs and historical context.

ERS will meet in person with Enbridge staff at their offices on April 24th and 25th, 2012 to review information and materials collected to date, solicit additional input, identify key issues, and discuss any uncertainties that may affect the audit. Specifically, ERS will interview evaluation and program administration staff to learn:

- How the programs work
- Topics that the program administrators would like ERS to investigate
- Database, workbook and E-Tools orientation

- Lessons learned from prior audits

ERS will meet with the EAC regarding:

- EAC and other stakeholder comments to the annual DSM report
- Other background information the EAC feels the auditor should know.

ERS then will:

- Present this work plan, and refine it with EAC members
- Discuss early findings and topics being investigated
- Present questions for further investigation

The conclusion of in-person meetings will signify the end of the kick-off phase of the audit.

TASK 2: REVIEW PROGRAM-RELATED MATERIAL AND DOCUMENTATION

ERS will gather information during Task 1 Kick-Off and will continue to assemble documentation throughout the first month of the audit as part of Task 2. ERS already has received or anticipates receiving and reviewing at least the following material:

- ❑ Year-end custom commercial and industrial program reports
  - o 2011 Custom Commercial Year End Report
  - o 2011 Custom Industrial Year End Report
  - o 2011 Custom Commercial and Industrial population records
  - o 2011 Sampling workbooks completed to select projects for the program review
  - o 2008 Sampling methodology guidance documents
- ❑ Year-end residential program reports
  - o 2011 Regular TAPS Year End Report
  - o 2011 Low Income TAPS Year End Report
  - o 2011 TAPS Kit Direct Response Research Report
  - o 2011 TAPS Reduction Factors Spreadsheet
- ❑ Research reports
  - o Showerhead Verification Research for Multi-Residential Rental Market
  - o Pre-Rinse Spray Valve (PRSV) Verification Research
- ❑ TRC documents, records, screening tools, and calculations
  - o 2011 TRC Results SSM Workbook
  - o 2011 TRC plan
  - o LRAM calculations workbook
- ❑ Enbridge's DSM Annual Report for 2011, including comments of the EAC and other stakeholders
- ❑ OEB orders and approved technical reference manuals and Enbridge filed plans
  - o OEB 2008-0346: Demand Side Management Guidelines for Natural Gas Utilities
  - o OEB Decision Framework
  - o OEB 2006-0021: DSM Handbook

- EGDI DSM Plan
- EGDI Low Income DSM Plan
- EGDI Updated DSM Measures List (savings basis)

- ❑ Prior audit reports and recommendations
  - 2010 Audit Report
  - 2009 Audit Report
- ❑ Data tracking records and documents such as completed prescriptive forms and back-up documentation.

While not a direct subject of the audit, ERS also will review the prior year high efficiency boiler and steam trap research reports. 2011 research and verification activities do not address the prescriptive (small) commercial program except for the pre-rinse spray valve measure research report. Low income weatherization program review is not in scope.

Task 2 is primarily a survey and data collection exercise. ERS will review the orders and plans for policy purposes, and will read the pre-2011 reports for context. In-depth review of the 2011 program and research reports is part of Tasks 3 and 4.

The document collection and review process started April 1 and will continue through May 14.

TASK 3: REVIEW CUSTOM PROJECT FILES AND ENGINEERING RECORDS

Enbridge contributed funding for 141 custom industrial projects and 960 custom commercial projects in 2011. Each project required engineering analysis to develop unique savings estimates.

The verification process included intensive review of a sample of the projects. Enbridge hired an analytical firm to execute a standardized sample design procedure and select projects for verification. The contractor selected 15 industrial projects and 26 commercial projects. [11] Enbridge then hired two engineering firms to independently verify savings associated with the sampled projects and develop representative custom commercial and custom industrial savings realization rates for Enbridge to apply to all custom projects in Total Resource Cost (TRC) calculations. The verification procedure included review of applicant calculations and a site visit to inspect the installed equipment and interview participants.

ERS selected a sub-sample of 12 projects from the verification samples to audit. The selection process assigned separate strata for industrial, agricultural, commercial/multi-residential retrofit, and commercial/multi-residential new construction, and made census selections of projects exceeding one million m^3 reported savings. While statistically structured, the selection was not intended to be an optimized design. It does ensure representation of each customer type and includes projects both with and without water savings, both with large and small

[11] The custom commercial category includes both commercial and multi-residential facilities, and both retrofit and new construction projects. The custom industrial category includes both industrial and agricultural projects.

reported savings, and with a broad distribution of energy efficiency technologies. The audit subsample accounts for 68% of the verification sample's total annual natural gas savings.

ERS will review a sufficient number of projects to be able to either confidently conclude that the verification-based realization rates are reasonable and unbiased, or to develop an audit-based alternate realization rate. ERS has requested and received information associated with twelve projects. After preliminarily reviewing all twelve projects and intensively reviewing nominally four of them, ERS will report to the EAC on the findings to date and estimate the total number of reviews necessary to make one of the two conclusions.[12] . The review will consist of:

1. **File review** – Our team will perform a thorough review of the project files and third-party reviews. ERS will utilize a checklist to allowing systematic determination of whether or not key project elements have been reported and are well documented. It will include checks for validity of baseline characterization, weather normalization, and operating hours, among other technical parameters. Any data, assumptions, or calculations considered less than reliable will be recorded for follow-up.
2. **Third-party reviewer interviews** – When project file reviews raise accuracy or reliability questions that document review alone cannot resolve, the lead audit engineer will engage the project reviewer and discuss the process utilized to calculate savings. The results of these discussions will be reported.
3. **Project site visits** – Site visits will not generally be in scope. If there are extenuating circumstances where ERS feels a site visit is necessary to resolve discrepancies ERS will consult with the EAC and if budget and schedule allow, make such arrangements.

ERS will quantitatively review the projects to:

- Determine if projects were categorized appropriately when distinguishing between "advancement" and "replacement" measures or projects;
- Review incremental cost estimates;
- Assess or independently calculate energy and water impact; and
- Review measure life for reasonableness.

If ERS believes a different savings estimate is more appropriate for a reviewed project in the sub-sample, analysts will adjust the inputs for the TRC analysis at least for that project and as a statistically representative correction to the sub-sample, sample, or population as appropriate.

After individual project reviews are completed, the auditors will assess whether or not the M&V contractors' method of aggregating results complies with industry accepted protocols, and will identify any areas of concern with respect to Enbridge's TRC calculations and assumptions for custom projects. Where

[12] The final count may be greater or lesser than the nominal count of twelve budgeted. Due to the limitations inherent in desk review-based review, the audit-based realization rate, if necessary, will have a relatively high and unknown degree of measurement uncertainty.

appropriate, ERS will recommend improvements to Enbridge's reporting processes.

TASK 4: REVIEW PRESCRIPTIVE AND QUASI-PRESCRIPTIVE PROGRAM REPORTS AND RESEARCH REPORTS

Enbridge and its contractors completed program reports on the three residential TAPS programs (regular, low income, and direct mail) and completed two research reports on specific measures. ERS will audit the reports for validity, comprehensiveness of analysis, to ensure they reflect OEB guidance and incorporate the most recent recommendations. ERS will trace the results including the reduction factors from these reports to the master TRC workbook. ERS will review the EGDI Updated DSM Measures List (savings basis) submitted to the OEB that is the basis for a significant portion of the prescriptive savings, but the review will not be intensive, as this document already has been reviewed by multiple parties including those independent of Enbridge. Our examination of the accepted substantiation sheets and Enbridge's measure database will be improved with interviews with program managers and implementation staff both during the scheduled in-person meetings and afterwards via telephone.

As noted above, 2011 research and verification activities do not address the prescriptive (small) commercial program savings beyond the pre-rinse spray valve measure research report and the updated measures list. In 2009 and 2010 research reports have examined two other major sets of measures: high efficiency boilers and steam trap leak reduction measures. ERS will consider the appropriateness of the scope of the 2011 research and program reports in the context of research reports completed in recent years prior to 2011.

If errors are found for which ERS can recalculate savings directly, the engineer will do so as part of the audit. If errors are found that require Enbridge or contractor involvement, ERS will provide information on the requested change to Enbridge for recalculation.

ERS will note future opportunities to improve the impact estimates and areas of interest for later evaluation research.

TASK 5: DATA TRACKING AND TRC SYSTEM REVIEW

The results produced in the documents audited in Tasks 3 and 4 are inputs to the TRC master workbook. ERS will audit the 2011 TRC calculation workbook to determine if

1. The TRC workbook received the correct data inputs from the annual program and research reports,
2. The TRC calculations are correct and comply with OEB guidelines and other relevant guidance documents, and
3. The results are properly reflected in Enbridge's annual report.

ERS's TRC review will focus on the parameters that affect the TRC including measure unit savings from the substantiation sheets, program gross savings, evaluated measure retention, measure life, free ridership, and data transcription errors.

During the ERS in-person visit ERS will review the data management protocols that lead to the data generated for the TRC workbook inputs via in-person interviews. ERS will also learn how personnel process exceptions and whether such exceptions represent a significant proportion of claimed energy savings or project costs. In-depth examination of DSM Analysis, Reporting, and Tracking System (DARTS) and other similar tools is not in scope.

If auditors discover inaccuracies, data entry errors or untenable assumptions, he or she will highlight these discrepancies and then recalculate the net impacts of our recommended adjustments on the TRC savings value. If the auditor cannot perform the recalculation alone with confidence, ERS will work with Enbridge to do so.

Having completed the above-noted reviews, our team will provide an opinion regarding the accuracy and defensibility of the data supplied to and calculations executed by the TRC calculator.

TASK 6: PERFORMANCE-BASED ACCOUNT REVIEW

The three subsections below describe how ERS will audit the three sets of calculations required to compute shared savings, the lost revenue adjustment, and reconciliation of the DSM variance account.

Shared Savings Mechanism (SSM)

Shared Savings Mechanism calculations are incorporated into the master TRC workbook. ERS will verify that the shared savings calculation for the 2011 program year is consistent with OEB-approved methodologies and that variables affecting claimed TRC savings values, and thus the SSM, reflect reasonable assumptions. Should auditors discover any deviations from OEB-approved or industry-accepted methodologies, ERS will recommend appropriate revisions and recalculate the SSM based on adjusted TRC savings values. Also, ERS will make any relevant recommendation to Enbridge's processes so that future SSM adjustments would be unnecessary.

Lost Revenue Adjustment Mechanism (LRAM)

Under this subtask, ERS's objectives are two-fold:

First and primarily, ERS will determine whether the methodologies and assumptions used to calculate the actual LRAM savings volume, net of installed efficiency measures, (i.e., ex post) are consistent with the methodologies and assumptions used to calculate the year's LRAM savings volume (i.e., ex ante). ERS will ensure that the net volumetric savings are appropriately allocated to each respective customer class. The results will determine whether Enbridge has under- or over-collected lost revenues based on the difference, if any, between forecasted sales volume and actual sales volume.

Second, ERS will point out opportunities discovered in the course of the audit that will result in value-added enhancements to the assumptions Enbridge operates under for further study in subsequent program evaluations.

Demand Side Management Variance Account (DSMVA)

ERS will examine the procedures and processes resulting in the collection of funds into the DSMVA and determine if these procedures and processes are correct by determining if:

1. The documented budgeted funding reflects that approved in the 2011 DSM plan, plus any relevant subsequent modifications, specifically the December 20, 2010 OEB approval of added funding;
2. The documented actual expenditures reflect the amounts generated by the financial accounting system cost outputs and are in the TRC workbook; and
3. The DSMVA calculations are correct and reflect the most current OEB guidelines.

If errors or inconsistency are uncovered, ERS will recommend modification of the DSMVA calculation and note the impact, if any, that such a modification has on the Enbridge's request to clear this account.

TASK 7: ISSUE DRAFT AND FINAL REPORTS

Upon completion of Tasks 1 through 6, ERS will be able either to render the independent opinion that the TRC, SRM, LRAM, and DSMVA calculations and results are correct and reasonable as submitted in Enbridge's annual report, or to provide independently developed alternative calculations of the same. The final report will include the following statements:

> *We have audited the Annual Report, Total Resource Cost (TRC) savings, Shared Savings Mechanism (SSM), Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ended December 31, 2011. The Annual Report, and the calculations of TRC, SSM, 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 its Decision with Reasons dated August 6, 2006 in EB-2006-0021. 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 accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2011 DSM programs of Enbridge Gas Distribution:*
>
> *TRC Savings - $xxx,xxx,xxx*
> *SSM Amount Recoverable - $x,xxx,xxx*
> *LRAM Amount Recoverable - $x,xxx,xxx*

DSMVA Amount Recoverable - $xxx,xxx

In the course of conducting the activities necessary to make the audit statement, reviewers are likely to find opportunities for Enbridge to change procedures or calculations to improve the program estimation of savings, and possibly to enhance program delivery. The final report will include a list of such recommendations. Draft reports of our findings, opinions, and recommendations will be circulated to stakeholders for consideration and comment on May 25. Subsequent to our review meeting with the EAC on June 7, ERS will issue a final report by June 20, 2012 incorporating the input of the EAC.

The draft report will be formally presented by key ERS team members at a meeting with Enbridge and its stakeholders. ERS expects that this comprehensive review process will identify points needing clarification or correction. Assuming agreements have been reached with respect to any corrections and clarification, a second report will be drafted and submitted to stakeholders for review and comment.

Once draft audit reports have been fully reviewed, a final audit report will be submitted. The final report will provide an accurate and defensible independent opinion as to the reasonableness and accuracy of Enbridge's claims regarding the SSM, LRAM, and DSMVA. Enbridge will be able to confidently use the audit as evidence to clear the relevant DSM accounts.

SCHEDULE

Key tasks and proposed completion dates are provided in Table 1-1, below.

Table 1-1 Key Task Schedule

Activity Description	Associated Task	April	May	June
Progress meetings w/EAC - conference calls	1	Weekly		
Program material review	2	4/1 to 5/14		
Custom sub-sample data request	3	4/10		
Custom project engineering reviews	3	4/12 to 5/14		
Draft work plan submission	1	4/19		
Work plan review with EAC	1	4/20		
Enbridge program orientation for auditors (in-person)	1	4/24		
Enbridge data systems orientation (in-person)	1	4/24 - 4/25		
Auditor presents preliminary findings/exploration topics	1	4/25		
Finalize work plan	1		5/2	
Data tracking and TRC system review	5	4/12 - 5/21		
Performance-based account review	6	4/12 - 5/21		
Review non-custom program reports	4	4/26 - 5/16		
Review measure research reports and updated measure list	4	4/26 - 5/16		
Draft audit report with findings and recommendations #1	7		5/25	
Review meeting w/EAC	7			6/7
Draft audit report #2	7			6/13
Review meeting w/EAC	7			6/20
Final report submitted	7			6/28

ALLOCATION TO DSM VARIANCE ACCOUNTS

1. The chart below illustrates the allocation to rate classes of the DSM Variance Accounts.
2.

2011 Rate Allocation by DSM Variance Account

Rate Class	SSM	Market Transformation	LRAM	DSMVA	TOTAL
Rate 1	$1,659,703	$854,584	~~($136,974)~~	$1,406,875	$3,921,162
Rate 6	$3,304,676		~~$141,475~~	$1,894,971	$5,199,647
Rate 100	$17,677				$17,677
Rate 110	$180,014		($16,486)	($765,568)	($602,040)
Rate 115	$84,927		($4,280)	($948,415)	($867,768)
Rate 135	$45,681		$2,507	$73,546	$121,734
Rate 145	$109,710		($20,473)	($1,044,168)	($954,931)
Rate 170	$512,563		($16,541)	($81,436)	$414,586
	$5,914,951	$854,584	($55,273)	$535,805	$7,250,067

3. The chart below provides the estimated impact of the Clearance of the DSM Variance Accounts on a typical customer's bill in each of the rate classes affected.

Estimated Impact of DSM Clearance on a Typical Customer

	Annual Volume for Typical Customer (m^3)	Annual Bill for Typical Customer ($)	DSM Amount for Recovery** ($)	Estimated % of Annual Bill
Rate 1 - Heating & Water Heating	3,064	1,075	3	0.3%
Rate 6 - Commercial, Heating & Other Uses	22,606	6,743	27	0.4%
Rate 100 - Industrial, small size	339,188	87,912	1,524	1.7%
Rate 110 - Industrial, small size, 50% LF	598,568	138,479	(539)	-0.4%
Rate 110 - Industrial, avg. size, 75% LF	9,976,120	2,146,814	(8,983)	-0.4%
Rate 115 - Industrial, small size, 80% LF	4,471,609	946,515	(7,082)	-0.8%
Rate 135 - Industrial, Seasonal firm	598,567	122,577	1,155	0.9%
Rate 145 - Commercial, avg. size	598,568	132,136	(3,285)	-2.5%
Rate 170 - Industrial, avg. size, 75% LF	9,976,120	1,924,903	8,525	0.4%
* Annual bills based on July 1, 2013 rates.				
** DSM amounts for Recovery do not include interest amounts that will apply at the time of clearing.				