500 Consumers Road
North York, Ontario M2J 1P8
PO Box 650
Scarborough ON M1K 5E3

Bonnie Jean Adams
Regulatory Coordinator
Telephone: (416) 495-5499
Fax: (416) 495-6072
Email: EGDRegulatoryProceedings@enbridge.com

Wednesday, October 7, 2009

VIA COURIER

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

Re: Enbridge Gas Distribution Inc. ("Enbridge")
EB-2009-0341 DSM Variance Accounts

Further to Enbridge Gas Distribution's letter of October 2, 2009, please find enclosed two paper copies of the following corrected exhibit:

- Exhibit A, Tab 1, Schedule 3

The corrected evidence has 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.

Sincerely,

Bonnie Jean Adams
Regulatory Coordinator

cc: Mr. D. O'Leary, Aird & Berlis (via email and courier)

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	2008 DSM Draft Annual Report
	2	1	Final Report: Independent Audit of 2008 DSM Program Results
	3	1	2008 Rate Allocation by Account
	4	1	2008 DSM EAC Audit Summary Report
	5	1	Letter from School Energy Board and Response from Enbridge
	6	1	2009 Avoided Costs

EB-2009-0341

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998,* S.O. 1998, c. 15, Sched. 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, as at July 1, 2010.

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)	$5,607,522
SSM Amount Recoverable (Market Transformation)	$195,700
LRAM (Recoverable from Ratepayers)	$37,291
DSMVA Amount (Repayable to ratepayers)	$73,340
Total Amount Recoverable	$5,767,173

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, as at July 1, 2010. 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: October 2, 2009, at Toronto, Ontario.

ENBRIDGE GAS DISTRIBUTION INC.

Per: Norm Ryckman
Director, Regulatory Affairs

500 Consumers Road
North York, Ontario M2J 1P8
PO Box 650
Scarborough ON M1K 5E3

Bonnie Jean Adams
Regulatory Coordinator
Telephone: (416) 495-5499
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Wednesday, October 7, 2009

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Board Secretary
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2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Re: Enbridge Gas Distribution Inc. ("Enbridge")
EB-2009-0341 DSM Variance Accounts

Further to Enbridge Gas Distribution's letter of October 2, 2009, please find enclosed two paper copies of the following corrected exhibit:

- Exhibit A, Tab 1, Schedule 3

The corrected evidence has 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.

Sincerely,

Bonnie Jean Adams
Regulatory Coordinator

cc: Mr. D. O'Leary, Aird & Berlis (via email and courier)

("Generic Proceeding"). The methodologies used by the Company to determine the amounts recorded in each of the 2008 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 years 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 2008 consisting of representatives from the Industrial Gas Users Association (IGUA), Green Energy Coalition (GEC) and the School Energy Coalition (SEC). SEC had to withdraw from the EAC in mid June due to other work commitments but supported the continuation of GEC and IGUA.

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 the results of which were provided to the Auditor.

7. Consistent with the Decision at Issue 9.1, the Company prepared an evaluation report for 2008 titled *F2008 DSM Draft Annual Report* (the "Annual Report") which summarizes 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 Annual Report. The Annual Report also includes calculations for

the 2008 SSM and DSMVA. A copy of the Annual Report can be found at Exhibit B, Tab 1, Schedule 1.

8. The Annual Report was circulated for comment to the DSM Consultative and EAC on April 15, 2009.

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. The recommendation by the EAC to select the Cadmus Group Energy Services Division (Cadmus) as the Auditor was accepted by the Company.

10. Although SEC supports the clearance of the accounts in this proceeding, they asked that a letter be included with this filing. The SEC letter and Enbridge's response can be found at Exhibit B, Tab 5, Schedule 1.

11. The Company consulted the EAC on the Audit Work Plan and the reports prepared by Cadmus. The EAC subsequently made recommendations respecting the clearance of the DSM variance accounts which were ultimately accepted by the Company.

12. The Auditor verified the calculations underlying the proposed SSM, LRAM and DSMVA amounts. The Audit Report can be found at Exhibit B, Tab 2, Schedule 1.

13. 2009 Avoided Costs were developed by the Company following Board decisions and approved guidelines and can be found at Exhibit B, Tab 6, Schedule 1.

2008 Demand Side Management Variance Account

14. The amount recorded in this account, being a credit to ratepayers of $73,340, is set out and confirmed in the Annual Report found at Exhibit B, Tab 1, Schedule 1, pg 84 and in the Auditor's final report found at Exhibit B, Tab 4, Schedule 1, pg 3.

Lost Revenue Adjustment Mechanism Variance Account

15. An LRAM value was not determined at the time of the Annual Report. The amount recorded in this account of $37,291, being recoverable from ratepayers is set out in the Auditor's final report found at Exhibit B, Tab 4, Schedule 1, pg 3.

2007 Shared Savings Mechanism Deferral Account

16. The Decision provided for the method of calculating the SSM. This included an SSM cap of $8.72 million. The Annual Report found at Exhibit B, Tab 1, Schedule 1, pg 83 calculated an SSM of $5,551,802 for Resource Acquisition programs. In addition, the Annual Report included an incentive claim of $450,000 with respect to Market Transformation programs found at Exhibit B, Tab 1, Schedule 1, pg 80. The Auditor made a recommendation in respect of agriculture custom project realization rates which the Company and the EAC accepted. This resulted in a SSM of $5,607,522 for resource acquisition programs.

Recommendations of the Evaluation Audit Committee

17. Following its review of the Annual Report and the Audit Report, the EAC made the following recommendations regarding the 2008 DSMVA, SSM and LRAM:

    a. The EAC recommended accepting the Company's DSMVA calculation of $73,340 being a credit to ratepayers. The Company notes that this is consistent with the Auditor's recommendation.

b. The EAC recommended accepting the Auditor's recommended Resource Acquisition SSM of $5,607,522. The Company has accepted this recommendation.
c. The EAC recommended a Market Transformation SSM of $195,700. The Company has accepted this recommendation.
d. The EAC recommended accepting the Auditor's recommended LRAM of $37,291 being recoverable from ratepayers. The Company has accepted this recommendation.

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

	2008 Draft DSM Annual Report	Final Audit Report	Post Audit Results
TRC Savings	$181,769,031	$182,706,679	$182,706,679
SSM Amount Recoverable (Resource Acquisition)	$5,551,802	$5,607,522	$5,607,522
SSM Amount Recoverable (Market Transformation)	$450,000	$318,825	$195,700
LRAM (Recoverable from Ratepayers)	N/A	$37,291	$37,291
DSMVA Amount (Repayable to Ratepayers)	$73,340	$73,340	$73,340

19. During the audit, the Auditor verified the calculations underlying the Company's claims regarding the DSMVA, SSM and LRAM amounts. Subsequent to the EAC's recommendations, the Company recalculated the Market Transformation SSM. All other amounts remain as recommended by the Auditor.

Proposal for Clearance

20. The net amount which the Company proposes for clearance through to rates is $5,767,173. The Company respectfully requests that these amounts be included in rates, effective July 1, 2010. It should be noted that the proposed July 1st clearance date is consistent with the Board's approval of the Company's incentive regulation plan (EB-2007-0615), which provides for the annual clearance of deferral and variance accounts on July 1st of each year.

21. The allocation methodology applied by the Company was approved by the Decision. 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 can be found at Exhibit B, Tab 3, Schedule 1.

Benefits to Ratepayers

22. The Company's DSM activities in 2008 generated an estimated natural gas savings of 77.3 million m^3. Net TRC during this period totaled approximately $182.7 million.

ENBRIDGE GAS DISTRIBUTION INC.

DEMAND SIDE MANAGEMENT

F2008 DSM DRAFT ANNUAL REPORT

PREPARED BY:

Enbridge Gas Distribution Inc.,
DSM Research and Evaluation
April 15, 2009

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1.0 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 Board) 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 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. 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 2008 DSM programs and activities were delivered in alignment with this framework.

The 2008 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.

1 EBRO 495, Decision, Page 100

1.1 Report Overview

This report presents the results of the Company's DSM program activity for 2008. The Company's DSM portfolio of programs in 2008 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 participants 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 2008 are presented in Appendix A. 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 2008 SSM claim and its 2008 DSMVA claim and LRAM claim. The Report is structured as follows:

Section 1	Introduction
Section 2	Description of Programs
Section 3	Participation Levels
Section 4	Natural Gas Savings
Section 5	DSM Research
Section 6	LRAM Statement
Section 7	SSM and TRC Statement
Section 8	DSMVA Statement
Section 9	Comments

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 2008 Resource Acquisition Programs

Results for 2008 Programs are shown below.

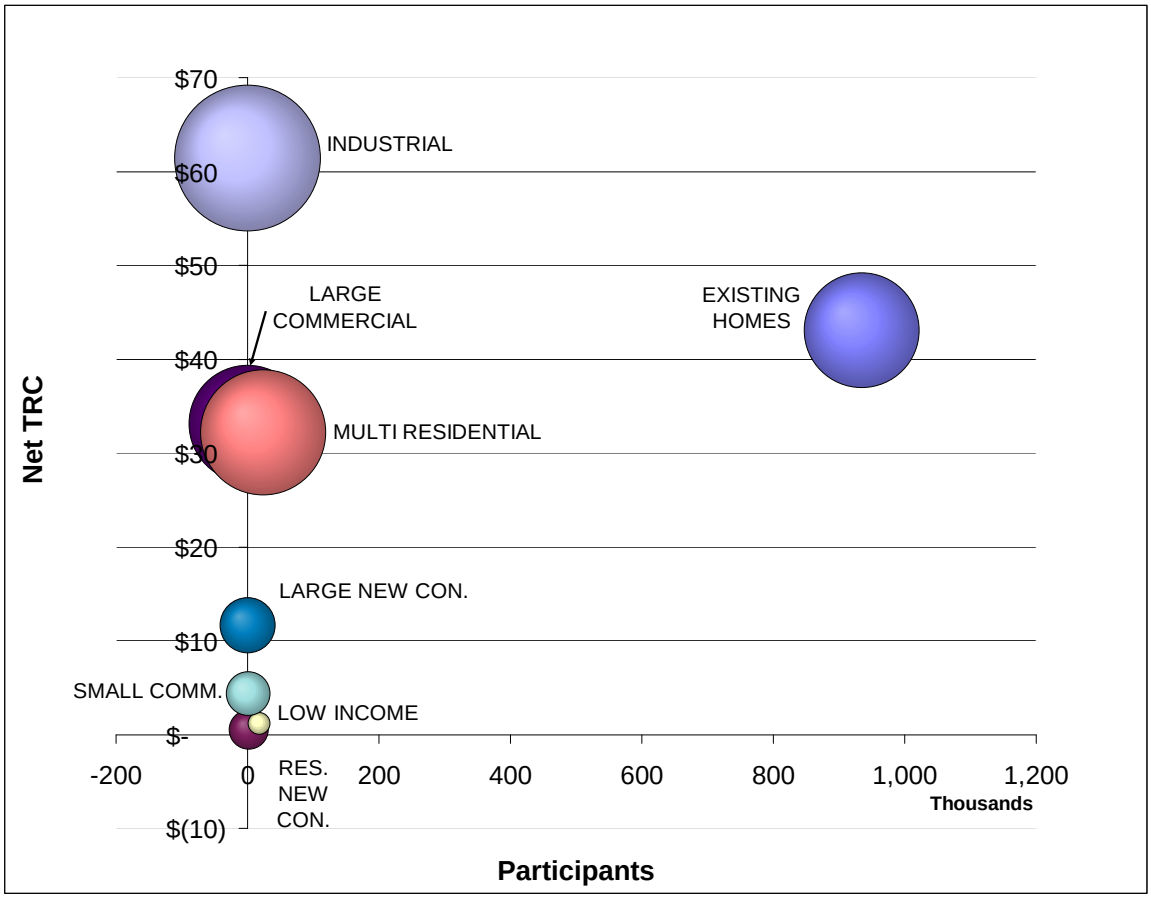
Table 1: 2008 DSM Program Results[2]

Program Area	Participants	Gas Savings	DSM Fixed and Variable Costs	Net TRC Results
EXISTING HOMES	934,150	14,857,208	8,281,218	$ 43,113,761
RESIDENTIAL NEW CONSTRUCTION	1,768	1,709,833	320,693	$ 498,507
LOW INCOME	17,317	584,712	996,085	$ 1,184,153
Total Residential	**953,235**	**17,151,753**	**9,597,995**	**$ 44,796,421**
SMALL COMMERCIAL	1,040	2,229,460	477,251	$ 4,346,038
LARGE COMMERCIAL	219	15,390,429	1,688,426	$ 33,112,388
MULTI RESIDENTIAL	23,737	17,654,343	2,181,397	$ 32,232,293
LARGE NEW CONSTRUCTION	59	3,485,097	570,519	$ 11,654,781
INDUSTRIAL	140	23,871,775	2,197,990	$ 61,411,882
Total Business Markets	**25,195**	**62,631,104**	**7,115,582**	**$ 142,757,382**
Market Transformation Programs			528,311	
Prog. Dev. & Market Research			685,777	$ (685,777)
Overheads			5,098,995	$ (5,098,995)
TOTAL ALL PROGRAMS	**978,430**	**79,782,857**	**23,026,660**	**$ 181,769,031**

Note: Approximately 1096 measures were implemented in 2008 across all customers.

2 A participant is defined as 1 customer X 1 measure. 1 customer may take several measures.

Figure 1: 2008 DSM Program Results



Notes:

- Net TRC in Millions
- Volume of the spheres represents relative gas savings.

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

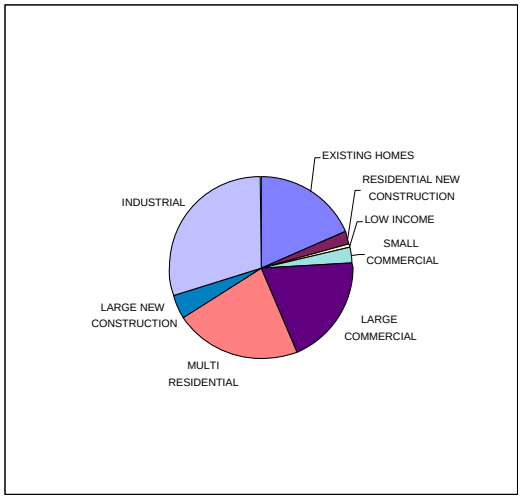


Figure 3: Participation by Sector

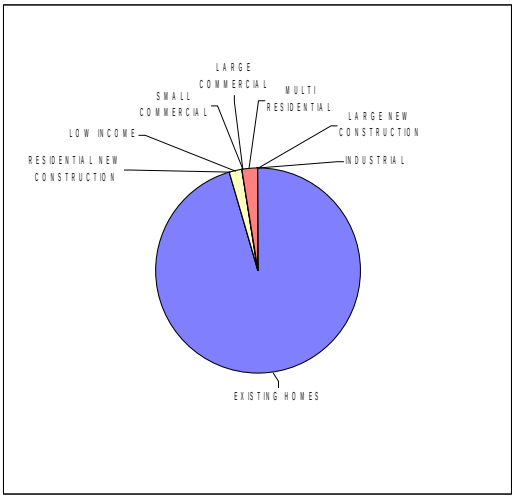
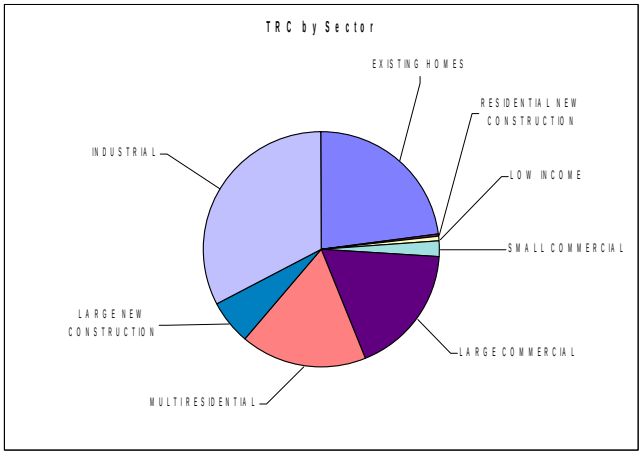


Figure 4: TRC by Sector



As can be seen from the figures & table above, the Industrial and Commercial sectors continue to be strong contributors to gas savings & TRC results. Although their participation numbers are relatively small when compared to the residential sectors, there continues to be significant success. The residential sectors, although they have not returned the same amount of gas savings or TRC as compared to industrial and commercial, their participation levels have been excellent. Large participation levels foster a greater awareness of energy efficiency programs and promote energy savings behavior beyond the DSM programs offered by EGD.

2.0 Description of Programs

This section provides an overview of all programs including the targeted customer class or group (sectors), the objectives of the program, and the activities associated with the program. Experience has taught us that the best approach to delivering programs is to have program managers focused on specific market sectors. Program managers develop an in-depth knowledge of contacts and partners in each market sector and the delivery mechanisms best suited to each sector. This section also reports on program performance as recorded through participants and net TRC benefits.

This section provides descriptions of resource acquisition programs in the following sectors:

- Residential Existing Homes
- Residential New Construction
- Low Income
- Commercial
- Industrial

It also includes descriptions of EGD's

- Market Transformation Programs

2.1 Residential Existing Homes

2.1.1 Water Conservation

Description: The program offers no-charge installation of a variety of water and energy savings measures. The program relies on 9 contractors (TAPS Partners) for delivery and reporting. Participating contractors visit customers' homes to install showerheads, water pipe wrap and faucet aerators (delivered, not installed)

Objectives: To capture energy savings related to hot water use

Metrics: Number of installations per measure and number of bag tests

Tracking Methodology: Monthly reports from the contractors

Evaluation Activities: In 2008, four waves of telephone interviews were conducted to verify installations. In total, 3,195 residential customer interviews were completed across 9 contractors in the EGD franchise area.

Program Results:

Table 2: Water Conservation Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Water Conservation	TAPS Bag Test	125,573	0	218,601	0
	TAPS Partners - Bathroom Aerator			170,949	1,346,180
	TAPS Partners - Kitchen Aerator			170,949	6,618,072
	TAPS Partners Program over 2.5 gpm	70,912	50,608,233	120,115	18,941,332
	TAPS Pipe Wrap	63,076	2,019,251	161,137	4,923,676
	TAPS Showerheads 2.0 gpm	348	86,106	371	26,555
	TAPS Showerheads 2.1 - 2.5 gpm	20,860	6,985,369	50,463	5,232,555
Water Conservation Total		**280,769**	**59,698,959**	**892,585**	**37,088,371**

Note: Participants in the table above represent number of devices not number of households visited.

Comments on Results:

Table 3: Water Conservation 2007 - 2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Water Conservation	TAPS Bag Test	93,028	74%		
	TAPS Partners - Bathroom Aerator			1,346,180	
	TAPS Partners - Kitchen Aerator			6,618,072	
	TAPS Partners Program over 2.5 gpm	49,203	69%	-31,666,901	-63%
	TAPS Pipe Wrap	98,061	155%	2,904,425	144%
	TAPS Showerheads 2.0 gpm	23	7%	-59,551	-69%
	TAPS Showerheads 2.1 - 2.5 gpm	29,603	142%	-1,752,814	-25%
Water Conservation Total		**611,816**	**218%**	**-22,610,588**	**-38%**

Note: In 2007, aerator participation numbers and TRC where included in showerhead results.

In 2008 a study was conducted to update savings values for low-flow showerheads, faucet aerators and programmable thermostats. Savings included natural gas, water & electricity. The results of this study were applied in 2008.

Overall participation numbers increased by 218% and overall TRC decreased by 38%. Increases in participation numbers were seen in all areas of the water conservation program. The discrepancy between participation increase and TRC decrease is a result of applying updated savings estimates in 2008. Participation is a better indicator of success in 2008. Participation numbers are independent of assumption changes whereas 2008 TRC is a function of both participation numbers and updated assumptions.

2.1.2 Residential Equipment Replacement

Description: The Equipment Replacement program focuses on replacing (or upgrading) heating and related systems and technologies. It offers incentives for furnace replacements, programmable thermostats, and heat reflecting Novitherm panels.

Objectives*:* To capture energy savings by upgrading to high efficiency heating systems (90% or greater AFUE for a forced air furnace, 85% or greater AFUE for a boiler) or through the installation of heat saving or heat retention equipment.

Metrics*:* Number of installations per measure

***Tracking Methodology*:** All measures were tracked as rebates were processed. Furnace replacements were concurrently tracked using contractor submitted correspondence & reports. For the thermostat program, customers were only considered as participants if they replaced a manual thermostat with a programmable thermostat.

Evaluation Activities: Please refer to section 5.2 Novitherm Heat Reflectors Verification Study. The objectives of this study were to determine installation rates and if other actions such as turning down thermostats were taken as a result of installing Novitherm Heat Reflectors.

Program Results:

Table 4: Equipment Replacement Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Equipment Replacement	Furnace Replacement	17,828	4,056,839	23,658	2,396,464
	Enhanced Furnace Replacement kWh	3,026	334,830	0	0
	Home Rewards - Energuide for Houses	2,592	2,361,719	0	0
	Thermostats	16,704	9,426,398	13,725	3,132,610
	Novitherm	1,757	169,848	4,182	496,316
	Energy Star Front Load Axis Washer	64	-539	0	0
Equipment Replacement Total		**41,971**	**16,349,094**	**41,565**	**6,025,390**

Comments on Results:

Table 5: Equipment Replacement 2007 – 2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Equipment Replacement	Furnace Replacement	5,830	33%	-1,660,375	-41%
	Enhanced Furnace Replacement kWh	-3,026	-100%	-334,830	-100%
	Home Rewards - Energuide for Houses	-2,592	-100%	-2,361,719	-100%
	Thermostats	-2,979	-18%	-6,293,788	-67%
	Novitherm	2,425	138%	326,468	192%
	Energy Star Front Load Axis Washer	-64	-100%	539	-100%
Equipment Replacement Total		**-406**	**-1%**	**-10,323,705**	**-63%**

Increases in participation rates were seen in furnace replacements and Novitherm panel installations. All other program areas had reduced participation numbers. TRC declined in all areas except in the Novitherm program.

In the Furnace program, while participation numbers increased, TRC decreased. This decrease was largely a result of an increase in free ridership value assumptions applied in 2008 to this program.

In the Thermostats program, the percentage decrease in participation was smaller than the percentage decrease in TRC. This was a result of updates to the free ridership assumption in 2008.

In the Novitherm program, the percentage increase in participation was lower than the percentage increase in TRC. This was a result of program start-up costs incurred in 2007. Examples of start up costs include the development of a mailing list and a program kick-off mail out to potential participants.

2.2 Residential New Construction

***Description**:* Recognizing that the market currently supports two predominant residential building labels, EGD offered two initiatives in the New Home Program portfolio in 2008 supporting the two labels. The EnerGuide for New Houses label indicates the energy performance of the home. If homes have an EnerGuide label, it is believed the buyer will be more aware of energy consumption and will opt for more energy efficient features. EGD offered an incentive of $100 to builders for each EnerGuide labeled home to relieve any of the required administrative burdens of labeling. Similarly the EnergyStar for new homes program also encourages builders to consider building envelope and other energy efficiency improvements by offering $100 to builders for each EnergyStar labeled house. To obtain an Energy star label the house must meet a required level of energy efficiency as measured through the EnerGuide system. It is expected that the market will continue a transition towards the EnergyStar standard in the future.

***Objectives**:* To promote energy efficiency in building practices in residential new construction by encouraging participation in the EnerGuide or EnergyStar for New Houses initiatives.

***Metrics**:* Number of new homes that achieve either the EnerGuide or EnergyStar label and receive an EGD incentive.

Tracking Methodology: Program results were compiled based on a review of builder reports and supporting documentation.

***Evaluation Activities**:* Internal review of participant submissions.

Program Results

Table 6: Residential New Construction Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Res New Construction	EnerGuide for New Houses	227	195,135	0	-94,452
	EnergyStar for New Houses	864	578,020	1,768	592,959
Res New Construction Total		**1,091**	**773,155**	**1,768**	**498,507**

***Comments on Results**:*

Table 7: Residential New Construction 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Res New Construction	EnerGuide for New Houses	-227	-100%	-289,588	-148%
	EnergyStar for New Houses	904	105%	14,940	3%
Res New Construction Total		**677**	**62%**	**-274,648**	**-36%**

The energy savings demonstrated through homes which were simply rated through the EnerGuide label process were not sufficient to provide positive TRC results for the program. As a result, the EnerGuide program was cancelled in November 2008. Any commitments to participants of this program prior to this decision were honored to maintain good customer/company relationships. Although the program had participants in 2008, none are being claimed in this report and a negative TRC is reported. The negative TRC was largely a result of the costs associated with this initiative.

Participation in the EnergyStar program more than doubled from 2007 to 2008. This was a result of a decrease in incremental costs for this measure in 2008 and increased education & awareness activities.

2.3 Low Income

Description: The Low Income portfolio offers two programs aimed at reducing water and energy use. The Enhanced TAPS program includes a programmable thermostat in the standard TAPS offering and uses the TAPS network of approved contractors for delivery in low income neighborhoods and reporting. The Weatherization program focuses on improving the homes' thermal envelope characteristics through ceiling and wall insulation as well as caulking and air sealing through designated delivery agents. The Low Income programs are directed to customers in low rise residential homes of 6 units or less. The program was expanded into the Ottawa area in 2008.

Objectives*:* To ensure that low income customers have improved access to energy efficiency programs that are targeted to their specific needs.

Metrics: Number of installations and/or participants per measure.

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

Evaluation Activities: In 2008, four waves of telephone interviews were conducted to verify installations in the TAPS program. These surveys included interviews with over 3000 participants.

Program Results:

Table 8: Low Income Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Low Income	Low Income Bag Test	7,033	0	3,420	0
	Low Income Kitchen Aerator			2,838	164,500
	Low Income Bathroom Aerators			2,838	33,594
	Low Income Pipe Wrap	2,718	88,687	2,510	77,765
	Low Income Showerheads 2.0	6	1,569	1	70
	Low Income Showerheads 2.1	1,265	446,817	436	45,614
	Low Income Thermostats	4,007	2,435,369	2,665	274,732
	Low Income Weatherization	61	76,299	208	218,273
	Low-Income Showerheads	2,838	2,174,088	2,401	369,605
Low Income Total		**17,928**	**5,222,829**	**17,317**	**1,184,153**

Notes:
In 2007, aerator participation numbers and TRC were included in showerhead results.
No TRC is reported against bag test as it is a 'test', not a measure that if implemented results in energy savings.

Comments on Results:

Table 9: Low Income 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Low Income	Low Income Bag Test	-3,613	-51%		
	Low Income Kitchen Aerator	2,838		164,500	
	Low Income Bathroom Aerators	2,838		33,594	
	Low Income Pipe Wrap	-208	-8%	-10,922	-12%
	Low Income Showerheads 2.0	-5	-83%	-1,499	-96%
	Low Income Showerheads 2.1	-829	-66%	-401,203	-90%
	Low Income Thermostats	-1,342	-33%	-2,160,637	-89%
	Low Income Weatherization	147	241%	141,975	186%
	Low-Income Showerheads	-437	-15%	-1,804,483	-83%
Low Income Total		**-611**	**-3%**	**-4,038,676**	**-77%**

Weatherization program results increased in 2008 as a result of leveraging the excellent relationship between the local delivery agent and Ottawa Community Housing (OCH).

Participation in other measures saw a decline as a result of market constraints regarding qualified installers.

2.4 Commercial

2.4.1 Large Commercial

Description: The Large Commercial program portfolio offers customers in the target segments a comprehensive suite of potential technologies and measures using incentives for both third party energy audits and equipment retrofits. Measures include boiler retrofits, improvements to HVAC systems, building automation systems, building envelope improvements and steam trap replacement. Delivery channels include performance and HVAC contractors, consulting engineers and designers and energy management firms. Strong relationships with customers and business partners help them enable energy efficiency solutions and participate in the Company's programs. Programs are also promoted through strong representation at numerous key industry tradeshows, speaker engagements, event sponsorships, the company's website, print material such as case studies and magazine articles, direct mail, and some print advertising. Memberships to trade associations, subscriptions to institutional public tender services and media monitoring provide timely market intelligence. The Company supports strategic, sector specific, initiatives such as the Toronto Region Conservation Authority's Greening Healthcare Program, Sustainable Schools Program and Mayor's Megawatt Challenge. In addition, the Company also invests in developing long term industry capacity by supporting workshops annually such as the Monitoring & Targeting Workshops for institutional customers. EGD has been a key ally in the support and formation of a Canadian Re-commissioning Association Chapter. This year witnessed a rising interest for monitoring and targeting related activities. EGD is working closely with these customers for onsite training, onsite assistance and providing meter upgrades where appropriate.

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.

Program Results:

Table 10: Large Commercial Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Large Commercial	Hospitals	8	5,222,073	30	9,063,845
	Hotel/Motel	6	1,275,414	11	3,839,063
	Long Term Care	3	94,921	3	164,475
	Municipalities	15	6,108,253	13	1,971,811
	Offices	14	1,986,198	28	4,125,824
	Other Commercial Sectors	24	911,621	15	2,356,829
	Retail	6	515,694	4	80,716
	Schools	46	2,627,321	96	6,584,609
	Universities	14	1,383,333	9	4,195,146
	Warehouses	5	627,730	10	730,070
Large Commercial Total		**141**	**20,752,558**	**219**	**33,112,388**

Comments on Results:

Table 11: Large Commercial 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Large Commercial	Hospitals	22	275%	3,841,772	74%
	Hotel/Motel	5	83%	2,563,649	201%
	Long Term Care	0	0%	69,554	73%
	Municipalities	-2	-13%	-4,136,442	-68%
	Offices	14	100%	2,139,626	108%
	Other Commercial Sectors	-9	-38%	1,445,208	159%
	Retail	-2	-33%	-434,978	-84%
	Schools	50	109%	3,957,288	151%
	Universities	-5	-36%	2,811,813	203%
	Warehouses	5	100%	102,340	16%
Large Commercial Total		**78**	**55%**	**12,359,830**	**60%**

Energy savings initiatives and activities in the large commercial sector are all related to custom projects. Each custom project has its own baseline, time-line, implemented activities, equipment installations, retrofits, monitoring, evaluation etc. As such, it is not possible to identify common threads in all cases that explain variations between changes to participation and changes to TRC between 2007 & 2008. Custom projects are different from each other and from year to year. However, some differences are noteworthy. Free ridership values were lower in the commercial and Multi-residential sector and higher in the Industrial sector due to the application of free ridership research results. The Company has increased its sales and marketing efforts in some traditionally under represented sectors such as hotels and offices. As well, sponsorship and relationships developed as a result of the Greening Healthcare initiative has contributed to ongoing success in this sector. The Prescriptive School Program has simplified program participation. In the municipal sector, ventilation related projects made a larger contribution in 2007 than in 2008.

2.4.2 Small Commercial

Description: The Small Commercial program in 2008 provided incentives for measures including controls for ventilation, pre-rinse spray valves for commercial kitchens, higher efficiency roof-top units, tankless water heaters, and programmable thermostats. The prescriptive savings assumptions for these programs were approved in the Natural Gas DSM Generic Issues Proceeding, Phase II and Phase III and in the 2008 update to program assumptions (EB-2008-0384). The kitchen ventilation, rooftop units, and tankless water heater efforts were new initiatives by EGD for this sector. The delivery of the program primarily relied on external business partners, channel consultants and manufacturers.

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

Metrics: Number of units installed.

Tracking Methodology: Monthly tracking reports provided by business partners and by tracking processes rebates.

Program Results:

Table 12: Small Commercial Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Small Commercial	Demand Control Kitchen Ventilation	21	646,879	15	448,615
	Pre-Rinse Spray Valve	290	1,106,662	627	3,215,331
	Rooftop Units	21	35,462	157	412,466
	Small Commercial Hi Eff Furnace - Custom	101	59,771	109	79,444
	Tankless Water Heaters	67	6,049	11	2,642
	Thermostats	141	260,702	111	183,419
	Air Doors			10	9,840
	Small Commercial General			0	-1,458
	Small Commercial Restaurants			-	-4,263
Small Commercial Total		**641**	**2,115,525**	**1,040**	**4,346,038**

Comments on Results:

Table 13: Small Commercial 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Small Commercial	Demand Control Kitchen Ventilation	-6	-29%	-198,264	-31%
	Pre-Rinse Spray Valve	337	116%	2,108,670	191%
	Rooftop Units	136	648%	377,004	1063%
	Small Commercial Hi Eff Furnace - Cus	8	8%	19,673	33%
	Tankless Water Heaters	-56	-84%	-3,407	-56%
	Thermostats	-30	-21%	-77,282	-30%
	Air Doors	10		9,840	
	Small Commercial General	0		-1,458	
	Small Commercial Restaurants	0		-4,263	
Small Commercial Total		**399**	**62%**	**2,230,513**	**105%**

The air door program was pilot tested in 2007 and all pilot sites were treated as custom projects. In 2008, the air doors program became a prescriptive program.

In 2008, NRCAN pulled its program contribution for small commercial tankless water heaters. As a result the total incentive amount decreased by 1/3 and participation numbers also decreased from 2007 to 2008. This program is being revised in 2009 with the intent to return to 2007 participation levels.

With the addition of the new prescriptive technologies (Demand Control Kitchen Ventilation, Rooftop Units, and Tankless Water Heaters) in 2008, the TRC Net Benefits doubled compared to 2007 TRC Net Benefits. The realignment with our business partners, manufacturers, associations, and channel consultants contributed to a very successful year.

2.4.3 Multi-Residential

Description: The Multi-residential program in 2008 provided a combination of prescriptive and custom incentives across a broad spectrum of potential technologies and measures. The program relied on multiple contacts to the marketplace, both public and private and included new initiatives aimed at re-commissioning and commercial front load washers in communal laundry rooms.

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. An additional survey was conducted to verify the number of showerhead installations.

Program Results:

Table 14: Multi-Residential Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Multi-Residential	Multi-Residential Non-Profit	7	619,182	20	1,377,550
	Multi-Residential Private	273	27,289,152	235	24,816,178
	Multi-Residential Recommissioning	1	-6,635	0	-5,009
	Showerheads/Aerators	26,678	11,894,381	22,312	5,037,352
	Front Load Washers	1,471	1,206,261	1,170	1,006,222
Multi-Residential Total		**28,430**	**41,002,341**	**23,737**	**32,232,293**

Note: Approximately 499 Measures were implemented across 255 buildings in the Multi-Residential DSM program.

Comments on Results:

Table 15: Multi-Residential 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Multi-Residential	Multi-Residential Non-Profit	13	186%	758,368	122%
	Multi-Residential Private	-38	-14%	-2,472,974	-9%
	Multi-Residential Recommissioning	-1	-100%	1,626	-25%
	Showerheads/Aerators	-4,366	-16%	-6,857,029	-58%
	Front Load Washers	-301	-20%	-200,039	-17%
Multi-Residential Total		**-4,693**	**-17%**	**-8,770,048**	**-21%**

Savings claims on a per participant basis declined significantly in 2008 versus previous years. As well, a review of the Showerhead Program in late 2008 identified areas for improving program tracking in 2009.

2.4.4 Large New Construction

Description: The New Construction program encourages the design and construction of large new buildings to higher levels of energy efficiency and environmental performance than required in the Model National Energy Code for Buildings (the basis for the energy requirements in the Ontario Building Code). The New Construction program provides two incentives – Design Assistance Program (DAP) directed towards the design phase of a building and the New Building Construction Program targeting actual implementation of more efficient options.

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 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.

Program Results:

Table 16: Large New Construction Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Large New Construction	NBCP	56	5,360,755	59	11,654,781
Large New Construction Total		**56**	**5,360,755**	**59**	**11,654,781**

Comments on Results:

Table 17: large New Construction 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Large New Construction	NBCP	3	5%	6,294,026	117%
Large New Construction Total		**3**	**5%**	**6,294,026**	**117%**

2008 saw the largest number of participants to date in this sector. This is reflective of the strong participation in and recognition of the value of the DAP phase of design. The large new construction sector consists solely of custom projects. Each custom project has its own baseline, time-line, implemented activities, equipment installations, retrofits, monitoring, evaluation etc. As in the

large commercial sector, it is not possible to identify common threads that explain variations between changes to participation and changes to TRC from between 2007 & 2008 -- all custom projects are different.

2.5 Industrial

Description: Energy audits are the primary vehicle for identifying opportunities in this sector. The Company makes the initial determination to assess the appropriate scale of the audit and also subsidizes the cost of the audit. The Energy Savings Consultant (ESC) then assists the customer to develop an implementation plan based on the audit results. Incentives for implementation are available for eligible projects up to a maximum of $30,000 per project. As in the past, the Company delivered the industrial programs under the sub-program designations: Steam Saver, HVAC, Heat Recovery and Process Efficiency.

Objectives*:* To capture energy savings in the Industrial segment 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 commercial sector.

Program Results:

Table 18: Industrial Program Results

		2007 Audited TRC Results (SSM)		2008 Pre-Audited TRC Results	
		Participants	TRC Net Benefits	Participants	TRC Net Benefits
Industrial	Agriculture	26	3,028,137	29	2,231,926
	Industrial-All	121	50,778,056	111	59,179,956
Industrial Total		**147**	**53,806,193**	**140**	**61,411,882**

Comments on Results:

Table 19: Industrial 2007-2008 Comparison

		Participants Delta		TRC Delta	
		(2008-2007)	Δ / 2007	(2008-2007)	Δ / 2007
Industrial	Agriculture	3	12%	-796,211	-26%
	Industrial-All	-10	-8%	8,401,900	17%
Industrial Total		**-7**	**-5%**	**7,605,689**	**14%**

Measures in the industrial sector are all custom projects. Each custom project has its own baseline, time-line, implemented activities, equipment installations, retrofits, monitoring, evaluation etc. As such, it is not possible to identify common threads that explain variations between changes to participation and changes to TRC from between 2007 & 2008 -- all custom projects are different.

2.6 Market Transformation Programs

2.6.1 EnerGuide for Natural Gas Fireplaces

***Description**:* To increase the awareness and influence of the EnerGuide Label for natural gas fireplaces through in-store point-of-purchase communication material.

Objectives:

a) Increase customer awareness of the EnerGuide label.
b) Increase influence of the EnerGuide label on the purchase decision.
c) Increase EnerGuide point of purchase (POP) promotional material in fireplace retail stores.

Metrics & Program Results:

Table 20: EnerGuide for Natural Gas Fireplaces MT Program Metrics

Element	Metric	2008 Metric (100%)	Weight
Market Effects	Percentage point increase in customer awareness of the EnerGuide label.	+10% pts/yr.	35%
	Percentage point increase in influence the EnerGuide label on purchase decision.	+10% pts./yr	35%
Program Performance	Percent increase in stores with EnerGuide POP promotional material	50% increase in # of stores	30%

Tracking Methodology: Fireplace purchaser surveys and store tracking.

Evaluation Activities: Key evaluation activities were fireplace purchaser surveys to measure the first two metrics in the table above.

Program Results:

Table 21: EnerGuide for Natural Gas Fireplaces MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight
EnerGuide for Fireplaces	$ 80,000	$ 109,092	POP materials in stores	47% increase	50% increase	30%
			Percentage point increase in awareness of label	19 percentage point increase	10 percentage point increase	35%
			Percentage point increase in label infuence to purchase	39 percentage point increase	10 percentage point increase	35%

Comments on Results:

In the 2007 DSM Draft Annual Report, it was noted that 114 stores had EnerGuide POP material. In 2008, 168 stores were provided with EnerGuide POP material. This is an increase of 54 stores, or a 47 percent increase from 2007 to 2008.

The metrics regarding awareness and influence of the EnerGuide label on fireplace sales were verified via a survey of fireplace purchasers. The results from this survey show that the awareness of the EnerGuide label for natural gas fireplaces increased from 61% in 2007 to 80% in 2008 – a 19 percentage point increase. 74% of the respondents to the same study in 2008 indicated that the EnerGuide rating on their fireplace had an influence on which natural gas fireplace they purchased, representing a 39 percentage point increase over the 2007 value of 35%.

2.6.2 Home Performance Contractor Market Transformation Program

Description: To improve residential building envelope performance through the training & education of residential market renovation and general contractors in the EGD franchise territory. This program aims to increase the frequency of weatherization measures included in home renovation and upgrade projects in the residential sector by providing contractor training on the benefits of weatherization & weatherization installation techniques.

Objectives:

a. Increase frequency of weatherization measures implemented by renovation contractors.
b. To increase the number of individuals in the home renovation/contracting business participating in workshops specific to this program.
c. Conduct workshops specific to this market transformation program for contractors.

Metrics & Program Results:

Table 22: Home Performance Contractor MT Program Metrics

Element	Metric	2008 Metric (100%)	Weight
Ultimate Outcome	Increase in frequency of at least three weatherization measures	1.0 increase in average score of at least 3 measures	60%
Market Effects	Contractor Engagement	60 individuals from renovation & contracting business participating in workshops	20%
Program Performance	Contractor Training Workshops	6 workshops per year	20%

Tracking Methodology

The number of workshops held and the number of participants at each workshop were tracked. Using data from the workshops and a post-workshop follow-up survey, the increase in weatherization measures among workshop participants was calculated.

Evaluation Activities

Workshop participants were surveyed at the beginning of the workshop regarding how often they included weatherization measures in renovation projects. They were surveyed again some months after the workshop to determine if their practices had since changed.

Program Results:

Table 23: Home Performance Contractor MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight
Home Contractor Performance	$ 90,000	$ 129,023	Contractor training workshop	15	6	20%
			Increase in frequency of at least 3 weatherization measures	0.37 increase in average score of at least 3	1.0 increase in average score of at least 3 measures	60%
			Contractor engagement (participation in workshop)	242	60	20%

Comments on Results:

In 2008, a larger audience was targeted than in 2007. The audience was expanded to include 'influencers' such as sales teams. In prior years, more focus was given to groups such as sub-contractors who install air sealing technology but who may have less influence on the customer.

The research summary contained in Section 5.8 reports on the results of different sub-sets of workshop participants, which is useful information for program planning and design. However, for the 2008 scorecard results on the "frequency of measures" metric above, the results are calculated on the basis of the "all Contractors and Advisors" group, as this is the group that responded to the full set of eight weatherization metrics as filed in EB-2006-0021 (Exhibit B, Tab 1, Schedule 1).

The top three weatherization measure increases resulted in an average increase of 0.37, falling short of the 1.0 target.

2.6.3 Boiler Market Transformation Program

***Description**:* The intent of this program was to increase sales of higher efficiency hydronic boilers in space heating and domestic hot water applications where conventional atmospheric boilers would typically be used. This program focused on hydronic boilers in sizes 300,000 Btu and greater and promoted both sealed combustion boilers labeled as high-efficiency boilers (84% - 89% combustion efficiency/non-condensing) and condensing boilers (90% + combustion efficiency).

Objectives:

a. 5 percentage point increase in market share of sales of high efficiency boilers in 2008 over the base line established in 2007.
b. 5 percentage point increase in market share of sales of condensing boilers in 2008 over the base line established in 2007.
c. Increase contractor, engineer & customer awareness and knowledge. The 100% targets for this metric is a 20 percentage point increase in awareness and knowledge.
d. Establish a data tracking system for sales of hydronic boilers in sizes 300,000 Btu and greater in Ontario by efficiency levels. Part of this metric is the establishment of the baseline share of sales by combustion efficiencies. For 2007 the 100% target for this metric was the development, launch and implementation of the data tracking system. For 2008 and 2009, the targets were to maintain and support this new tracking system.
e. The development of effective sales tools such as case studies, testimonials and a user-friendly NPV/life cycle calculator. These tools were to be developed for manufacturers, contractors and engineers. These tools have been developed in 2007 and were to be maintained & supported in 2008.
f. Deliver training events to contractors, engineers and customers. This metric includes such items as workshops, seminars, a product knowledge day, etc.
g. Influence engineers, contractors & customers to attend training events.
h. Attend trade shows and promote high efficiency hydronic boilers.

Metrics & Results:

Table 24: Boiler MT Program Metrics

Element	Metric	2008 Metric (100%)	Weight
Ultimate Outcome	Percentage point increase of high efficiency boilers sales	5 percentage point increase	15%
	Percentage point increase of condensing boiler sales	5 percentage point increase	25%
Market Effects	Contractor, Engineer & Customer Awareness	20 percentage point increase	30%
Program Performance	Boiler Statistical Reporting Structure	Continuous tracking	5%
	Benefit/Cost Sales Tools	Maintain & enhance	5%
	Training Events	3	5%
	Training Participants	60	10%
	Trade Shows	3	5%

Tracking Methodology:
Training events, participants and Trade Show participation were tracked.

Evaluation Activities*:* Workshop participants were surveyed to determine their awareness of boiler technology and efficiency. See section 5, Measures Evaluation Research

Program Results:

Table 25: Boiler MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight
Boiler Market Transformation	$ 250,000	$ 34,525	% point increase of high efficiency boilers sales	(in progress)	5 percentage point increase	15%
			% point increase of condensing boiler sales	(in progress)	5 percentage point increase	25%
			Contractor, engineer, & customer awareness	24 percentage point increase	20 percentage point increase	30%
			Boiler statistical reporting structure	Structure developed and maintained	Continuous tracking	5%
			Benefit/Cost Sales Tools	Maintained	Maintain & enhance	5%
			Training Events	2	3	5%
			Training Participants	110	60	10%
			Trade Shows	3	3	5%

Comments on Results:

The original Boiler Market Transformation plan filed in EB-2006-0021 Exhibit B, Tab 1, Schedule 1 was to establish a statistical reporting structure for high efficiency and condensing boilers in 2007, and to maintain it in subsequent years and use it to measure changes in boiler sales in 2008 and 2009. EGD was not successful in 2007 in establishing that structure due to hesitancy on the part of boiler manufacturers in sharing competitive sales data, and also because regional or provincial sales data by efficiency is not recorded by any central body or organization.

In 2008, as a result of EGD's continued efforts to establish a reasonable proxy for regional sales data by efficiency, plus continued reassurances to key boiler market players that we are only interested in aggregate data, we have identified a market indicator based on national sales data from the Canadian Institute of Plumbing and Heating, and key provincial indicators which enable an allocation of those national sales figures to Ontario.

[Note: final reporting on boiler market share is pending execution of a confidentiality agreement with the Canadian Institute of Plumbing and Heating. Results for the two market share metrics above should be available in early May, 2009].

2.6.4 Business Partner Market Transformation Program

Description: The purpose of this program was to increase awareness and facilitate market adoption of emerging and newly commercialized natural gas technologies in Business Markets by the HVAC, engineering and design community. Emerging technologies were considered to be either newly commercialized technologies, or technologies that were available and accepted outside of the franchise area or province, but had not yet been widely adopted within the franchise area or province. This activity was also intended to identify barriers to specifying emerging technologies.

Objectives: Increase the adoption and incorporation rate of newly commercialized natural gas technologies into process designs over current baseline.

Identify and target top market players and early adopters. The focus of this activity is to identify top engineering firms and early adopters through market analysis and surveys and then increase their participation in awareness building activities. The metric for this activity in 2008 was to keep this base current to reflect changes within the community, as new early adopters emerge, or change occurs.

Conduct training workshops, seminars and product knowledge days. The audience for these training events was consulting engineers and contractors. The objective was to increase awareness and knowledge of emerging technologies amongst the HVAC, engineering and design community.

Metrics & Program Results:

Table 26: Business Partner MT Program Metrics

Element	Metric	2008 Metric (100%)	Weight
Ultimate Outcome	Percentage point increase in design incorporation plans	5 percentage point increase	25%
Market Effects	Identify & target top market players/early adopters	Continuous tracking	5%
	Consulting Engineers / Energy Mgmt Awareness	20 percentage point increase	20%
	Manufacturer, Distributor & Contractor Awareness	20 percentage point increase	20%
Program Performance	Training Events	4	10%
	Training Participants	40	10%
	Technical guides and case studies	4	10%

Tracking Methodology: Training events held, participant attendance and the number of technical guides produced were tracked.

Evaluation Activities: Workshop participants were surveyed regarding their awareness of emerging energy efficiency technologies and their behavior in incorporating the technologies in design plans. See Section 5, Measures Evaluation Research

Program Results:

Table 27: Business Partner MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight
Business Partners	$ 200,000	$ 135,439	a) Percentage point increase in Design Incorporation Plans	5 percentage point increase	5 percentage point increase	25%
			b) Identify & Target Top Market Players / Early Adopters	continuous tracking	continuous tracking	5%
			c) Consulting Engineers / Energy Mgmt Awareness	47 percentage point increase	20 percentage point increase	20%
			d) Manufacturer / Distributor / Contractor Awareness	44 percentage point increase	20 percentage point increase	20%
			e) Training Events	6	4	10%
			f) Training Participants	137	40	10%
			g) Technical Guides and Case Studies	2	4	10%

Comments on Results:

In late 2007, top market players and early adopters were identified by researching relevant association memberships (such as Consulting Engineers of Ontario and Mechanical Contractors Association of Ontario), as well as the EGD business partner database. For the 2008 program, 248 companies (66 engineering firms and 182 contractors) had been identified and contacted as representing the top HVAC design and installation firms. This base of contacts gradually expanded throughout the year.

Six training workshops covering three under-marketed energy-saving measures were conducted during 2008. A precise measure of frequency of design incorporation plans pre- and post-workshop would have been extremely difficult to acquire, as it would have required attendees to review historical project files and tablulate frequencies, and provide this information to EGD; an unlikely scenario. However, EGD was able to establish a directional impact of the workshops in terms of how many attendees are now promoting/recommending these technologies who were not doing so before, or were doing so infrequently before. The data indicate that at least 50 percent of the respondents have

increased their rate of recommendation of the Air Doors technology, and at least 26 percent have increased their rate of recommendation of the Demand Controlled Ventilation technology.

While these results do not provide a precise measure of the increase in frequency of design incorporation, they do directionally suggest a result that is much higher than five percentage points, especially given that on average, one-quarter (average of 34% for Air Doors and 18% for Demand Controlled Ventilation) of attendees had never recommended these technologies before and now they do (at least a 100% increase in frequency).

Due to the measurement challenges noted above, but in consideration of the directional evidence, EGD is claiming a conservative result of 5 percentage points for this frequency metric.

In terms of technology awareness, 137 business partner representatives experienced a 45.5 percentage point increase (average of 44 and 47 percentage points) in awareness of the new technologies, as determined by pre- and post-seminar test results (see section 5.12 for details).

2.6.5 Low Income Market Transformation

Description: This program improves energy efficiency knowledge among low income Rate 1 home owners and tenants through the distribution of energy savings kits through existing low income organizations and agencies (e.g. food banks). The program also includes media and outreach activities to promote use of the energy saving kits as well as participation in the Enhanced TAPS program and the Low Income Weatherization program. Activities completed in 2008 include the following:

a.) energy saving kits
- Distribution of Green Boxes (energy kits with Enhanced TAPS applications) through the Food Banks.

b.) media events and placements
- Media events in Toronto and Ottawa were conducted
- Transit Ads in Peel and Durham regions Aug. - Sept. '08
- "On the Go" magazine ad - September '08

c.) outreach activities
- Winter Warmth - Enhanced TAPS applications have been available through this program.
- Mailing to Winter Warmth United Way agencies
- MP and MPP Mailing
- Package to Association of Older Adults of Ontario
- Chinese Seniors Association newsletter article and advertising
- Presentation at a local United Way agencies meeting
- EGD pensioners newsletter article
- Two "Pipeline" newsletter articles
- Program design and consultation with VECC and LIEN
- Poster Session at Time For Action conference - September '08 (also lunch sponsor and delegates)

Objectives:
- To provide energy management tips and simple measures that are implemented by the customer such as reducing air leakage around windows, doors, switch plates and outlet gaskets and saving electricity with compact fluorescent lights through the distribution of energy saving kits.
- To offer customers the opportunity to take advantage of the Enhanced TAPS program and the Low Income weatherization program via completed application forms included in the kits.
- To utilize the Enhanced TAPS installation visits to survey customers to determine implementation of measures in energy savings kits.
- To promote distribution of the kits and participation in the EGD low income programs through media and outreach activities.

Tracking Methodology: Tracking of Spending & Completed Activities

3.0 Participation Levels

Table 28: Participation Levels

Program Area	2007 Participants	2008 Participants	% Increase
EXISTING HOMES	322,740	934,150	189%
RESIDENTIAL NEW CONSTRUCTION	1,091	1,768	62%
LOW INCOME	17,928	17,317	-3%
SMALL COMMERCIAL	641	1,040	62%
LARGE COMMERCIAL	141	219	55%
MULTI RESIDENTIAL	28,430	23,737	-17%
LARGE NEW CONSTRUCTION	56	59	5%
INDUSTRIAL	147	140	-5%
Total	**371,174**	**978,430**	**164%**

Participation levels in 2008 were 164% higher than those of 2007. The largest contributors to this growth are found in the existing homes, residential new construction and small commercial sectors. The success of the Small Commercial sector is particularly noteworthy. Traditional approaches used to grow participation levels in residential (large number of customers with relatively small gas demands) and Industrial (low number of customers with large gas demand) is not optimal for penetrating the small commercial sector. This sector is filled with small business owners or small establishments that may not require a one-on-one visit from an energy savings consultant but also do not respond well to more partner based programs as found in the residential sector. The following activities served the small commercial sector well in 2008 and will be continued and enhanced in 2009:

- Contractors were hired specifically to work with restaurants to distribute high efficiency pre-rinse spray valves. These contractors contacted restaurants 'door-to-door' and aided EGD to mitigate any language or cultural barriers. In 2008, contractors were hired for the Toronto and Barrie areas. For 2009, contractors are being considered for the Niagara and Peterborough areas.
- In 2008, EGDs relationships with manufacturers and distributors that support small commercial customers were strengthened with one-on-one visits and direct correspondence. Manufacturers and distributors were educated on the conservation programs & rebates EGD has to offer and in turn this knowledge was shared with their customers.
- In 2008 EGD exercised its existing relationships with organizations such as Ontario Restaurant Hotel & Motel Association (ORHMA), Heating Refrigeration & Air Conditioning Institute (HRAI) and Energy Efficiency Contractors Network (EECN). EGD spoke at various meetings and educated the members of these organizations on the conservation programs and rebates offered by EGD. The members of these organizations were then able to share this knowledge with their customers or peers in the small commercial sector.

4.0 Natural Gas Savings

Gas savings estimates are a function of inputs such as participation numbers, free-ridership assumptions, base case assumptions and assumed savings that result from implemented projects & measures. Of interest is the contrast between gas savings and participation levels. 2008 saw an increase in participation levels of 164% and a decline in calculated gas savings of 13%. This observation can be interpreted in many ways. The 2008 approved assumptions include new values for free ridership and measure savings based on research completed in 2008. Lower savings assumptions for showerheads, aerators and thermostats together with higher free ridership rates for some programs such as industrial custom projects contributed to the decline in gas savings.

Table 29: Natural Gas Savings Residential

2008 DSM Program	Net Annual Gas Savings	
EXISTING HOMES		
Water Conservation		
TAPS Partners Program - Showerheads over 2.5	5,804,787	
TAPS Partners Program - 2.1 - 2.5	1,642,043	
TAPS Partners Program - EQ 2.0	8,682	
TAPS Partners Program - Kitchen Aerators	1,659,570	
TAPS Partners Program - Bathroom Aerators	365,449	
TAPS Partners Program - Pipe wrap	2,092,909	
Equipment Replacement		
Furnace Replacements	1,639,499	
Thermostats	1,189,134	
Novitherm	455,135	
Total Existing Homes		**14,857,208**
RESIDENTIAL NEW CONSTRUCTION		
EnergyStar for New Houses	1,709,833	**1,709,833**
LOW INCOME		
LI TAPS Partners Program - Showerheads 2.5+	114,653	
LI TAPS Partners Program - Showerheads 2.1 - 2.5	14,390	
LI TAPS Partners Program - Showerheads 2.0	23	
LI TAPS Partners Program - Pipe wrap	33,119	
LI TAPS Partners Program - Kitchen Aerators	41,191	
LI TAPS Partners Program - Bathroom Aerators	9,086	
LI Prog Thermostats	134,505	
LI Weatherization program	237,744	
Total Low Income		**584,712**
TOTAL RESIDENTIAL		**17,151,753**

Table 30: Natural Gas Savings Business

2008 DSM Program	Net Annual Gas Savings	
SMALL COMMERCIAL		
Air Doors	20,121	
Restaurants - CKV	3,477	
Restaurants - CKV2	62,282	
Restaurants - CKV3	31,094	
Furnace Replacements	45,246	
Restaurants - PRSV	1,822,093	
Rooftop Units	190,166	
Tankless Water Heaters	8,894	
Programmable thermostats	46,087	
Total Small Commercial		**2,229,460**
LARGE COMMERCIAL		
Hotel/Motel	1,653,078	
Office	2,465,398	
Retail	99,339	
Warehouses	392,751	
Other Commercial	1,339,999	
Hospitals	3,692,195	
Long Term Health Care	197,765	
Government	931,904	
School	2,831,646	
College/University	1,786,354	
Total Large Commercial		**15,390,429**
MULTI RESIDENTIAL		
Multi-Residential Private	14,913,577	
Multi-Residential Non-Profit	906,424	
Multi-Residential Water Conservation		
Showerheads - Rental	1,036,416	
Showerheads - Condo	437,800	
Front Load washers	360,126	
Total Multi-Residential		**17,654,343**
LARGE NEW CONSTRUCTION	3,485,097	**3,485,097**
INDUSTRIAL		
Industrial	22,223,016	
Agriculture	1,648,758	
Total Industrial		**23,871,775**
TOTAL BUSINESS MARKETS		**62,631,104**

5.0 DSM Research

Every year, EGD undertakes a number of research efforts in support of the various programming areas. These studies evaluate the performance of specific market transformation efforts, custom projects, and prescriptive programs such as the TAPs Partners Program.

Annual evaluations of the TAPS Partners Program are undertaken by the Company to verify results and the overall effectiveness of the program. A similar study was undertaken to verify installations of Novitherm heat reflective panels. Research studies were also undertaken to evaluate the results of market transformation programs.

The custom project portfolio was evaluated with sector specific 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 projects in the Business Markets. Third party engineering firms are contracted to undertake the review and are given access to project application files.

In addition, the Company undertakes forward-looking research to update assumptions used in existing programs, to develop assumptions for new prescriptive programs or measures and to assess DSM market potential. This section describes the purpose, methodology, and results of the program evaluations and research undertaken.

5.1 TAPS Program Verification Study

Background

EGD sponsors and promotes the TAPS program aimed at reducing water usage in the residential sector. Research in support of the program is used to validate customer participation and to improve the program in the future.

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.
- Determine if the results differ from the information submitted by contractors.

Methodology

During 2008, four waves of telephone interviews were conducted. In total, 3,195 residential customer interviews were completed across 9 contractors in the EGD Gas Distribution franchise area.

The pipe wrap program was discontinued November 28 and contractor visits after this date did not include pipe wrap. Therefore, pipe wrap results are based on visits up to and including November 28, 2008 (n=2,976). The base for showerheads, aerators and programmable thermostats is 3,195.

Showerhead Results

Overall, contractors distributed showerheads to 98% of households. Results were consistent across all contractors and versus 2007 and 2006. Contractors installed showerheads in 69% of homes, up from 65% reported in 2007. The overall contractor installation rate was 70% (ratio of showerheads installed to showerheads received), also up from 2007 (66%), which follows from the increase in contractor-installed showerheads.

Table 31: Showerhead Installations

Showerhead Installations						
	Contractor Installed	Installed Myself	Someone else	Total Installed	Not Installed	Not stated
Total 2008	69%	14%	3%	86%	14%	0%
Total 2007	65%	17%	3%	85%	14%	1%

Source: Q3. **Base:** all customers

On average, contractors did not offer to install showerheads in 7% of homes receiving showerheads in 2008, consistent with 2007 and 2006 results. The reasons given most often for non-installation of the showerheads were:

- *Preferred to install it myself*
- *Wasn't a convenient time*
- *Contractor just left them/dropped them off*
- *Did not want the contractor to install*

61% of customer visits resulted in the installation of one showerhead, down from 2007 (67%) and 2006 (65%), but similar to 2005 (61%). There was an increase in the proportion of visits that resulted in the installation of two showerheads (24%) versus 2007 (19%) and 2006 (21%). In total, for every 100 households visited, 130 showerheads were distributed (123 in 2007; 126 in 2006) and 114 were installed (107 in 2007; 108 in 2006).

Table 32: Showerheads Distributed & Installed

Number of Showerheads:	% of Households		
	Received	Installed*	Removed
0	2%	13%	n/a
1	67%	61%	4%
2	29%	24%	0%
3 or more	2%	1%	0%
Not stated	0%	0%	0%
Total products per 100 households	130	**114**	**5**
Total products per 100 received	100	**88**	**3**

* Installed by contractor, customer, or someone else
Source: Q2a, Q2b, Q11c

Pipe Wrap Results

Contractors distributed foam pipe insulation (pipe wrap) to 93% of households, the third consecutive year of increases (89% in 2007; 87% in 2006; 83% in 2006). Contractors installed pipe wrap in 62% of homes visited, returning to levels seen in 2006 (57% in 2007; 62% in 2006; 69% in 2005). The overall contractor installation rate (ratio of pipe wrap installed to pipe wrap received) was 67% for the year, up versus 2007. The main reasons for the contractor not installing the pipe wrap continued to be:

- *Preferred to install it myself*
- *Wasn't a convenient time*
- *Did not want contractor to install it*
- *Contractor/rep did not offer*
- *Contractor just left them / dropped them off / handed them to me*
- *Did not want contractor / rep to enter my home*

Aerators Results

Contractors distributed faucet aerators to 90% of households and results were consistent across most contractors. Contractors installed aerators in 47% of

households, up from 44% in 2007. This is not a required service. In total, 79% of household visits resulted in the installation of aerators, up from 72% in 2007 and in line with 2006 (80%). Beginning with the first wave of 2008, customers were asked about the installation of aerators in the kitchen and the bathroom(s) separately. Overall, more households had aerators installed in the kitchen than the bathroom 68% versus 54%.

Table 33: Aerators Received & Installed

Aerators: % of Households Receiving and Installing							
	Received	Total Installed	Contractor Installed	Installed Myself	Someone else	Not Installed	Not stated
Total:	90%	79%	47%	26%	6	21%	0%

Source: Q7a,b. **Base:** all customers

Note: The total installation rate for aerators (79%) represents the percentage of households that have at least one aerator installed. A household may have an aerator installed in just the kitchen or just the bathroom, or could have aerators installed in both rooms. If aerators are installed in both a kitchen and a bathroom, only one aerator is counted for that household for the purpose of this survey question.

Programmable Thermostats Results

In total, 35% of households were offered programmable thermostats, down from the previous two years (41% 2007, 40% 2006). In 2008, 2% of households purchased a programmable thermostat, down slightly from 2007 (4%) but similar to 2006 (2%). The proportion of households who said they already had one was similar to 2007 (24% versus 25%). There was a decrease in the proportion of households who said they didn't want one – 9% in 2008 versus 12% in 2007.

Table 34: Offer to Purchase & Install Programmable Thermostats

Offer to purchase and install a Programmable Thermostat?				
	Yes, Purchased	Yes, but already have one	Yes, but didn't want one	Total 'Yes'
Total 2008	2%	24%	9%	35%
Total 2007	4%	25%	12%	41%

Source: Q11

Aerators, Pipe Wrap and Thermostat Removal

About 2% of households removed their kitchen aerator and less than 1% removed their bathroom aerator. Reasons for removing the aerators included the following:

- *No pressure/not enough water coming out*
- *It was leaking*
- *Preferred the old one*
- *Didn't like them*

Table 35: Removal Rates

Device:	% of Households			
	Received	Installed*	Non-installs**	Removed
Kitchen Aerator	na	68%	32%	1.8%
Bathroom Aerator(s)	na	54%	46%	0.7%
PipeWrap	93%	82%	18%	0.3%
Programmable Thermostat ***	2%	1%	99%	0.0%

* Installed by contractor, customer or someone else

** Total households minus installed by contractor, customer or someone else

*** Installed and non-installs based on Waves 3 and 4 only

Source: Q7a-b, Q8a-b, Q11, Q11c. **Base:** all customers

Note: The installed rates for kitchen & bathroom aerators can not be directly compared to the installation rates presented in Table 34. In Table 34, the installation rate (78%) for aerators was based on at least one aerator being installed in a household. In the above table installation rates are calculated for each room, not by household.

Satisfaction Results

95% of participants said they were very satisfied (65%) or somewhat satisfied (30%), similar to previous years - 96% in 2007; 95% in 2006 and 96% in 2005. All contractors met the requirement for 90% customer satisfaction. Overall, the quality of the TAPS representatives appeared to be satisfactory. Customers rated the contractors as being professional (92%), knowledgeable (90%) and friendly (98%). "Professional" and "friendly" ratings were similar to 2007, while "knowledgeable" ratings softened versus 2007 (92%).

Table 36: Satisfaction Rates

Was the representative who visited you … ? (% of 'Yes' responses)			
	Professional	Knowledgeable	Friendly
Total 2008	**92%**	**90%**	**98%**
Total 2007	93%	92%	98%

Source: Q13.

5.2 Novitherm Heat Reflectors Verification Study

Summary
The Novitherm TM residential DSM program was designed to help EGD customers conserve energy. Customers with a natural gas boiler using radiators or convector systems applied to receive heat reflectors to install behind their radiators. Customers were later surveyed to determine if they had received and installed the panels.

Just over three quarters of program participants surveyed had installed the panels at the time of interviewing (77%). Among those who had not yet installed the panels, the majority planned to do so in the next six months or so. It is projected that 97% of survey respondents will have installed the heat reflector panels. The number of panels received matches well with the number of panels installed. This indicates a low wastage of panels.

The majority of respondents did not turn down either the thermostat (58%) or the boiler temperature (89%) after the panels were installed. 86% of participants said they were satisfied, 76% said they where 'very satisfied' or 'satisfied' and 10% said 'somewhat satisfied'. Only 5% said they were dissatisfied.

Background & Objectives
The Novitherm™ residential DSM program was launched in April 2007 and continued through December 2008. The program was designed for homes within the EGD franchise that are heated with a natural gas boiler using radiators or convector systems. Through direct mail campaigns, the 2007 program ended with a total of 2,312 participants. In January 2008, a direct mail campaign of 25,000 was launched. Participation as of February 2008 was 1,185. Various campaigns followed during the rest of 2008. Total participation in 2008 was 4,182.

Follow-up research was conducted among 200 of the program participants. The research objectives were to determine the following:

- installation rates of Novitherm™ heat panels among program participants, and
- Whether other actions were taken as a result of installing the NovithermTM panels such as turning down the thermostat or adjusting the temperature on the boiler.

Methodology
Telephone interviews were conducted among a random sample of the Novitherm™ DSM program participants. 200 participants were interviewed during the second half of April 2008.

Results

Findings of the research show that 76% of participants had installed Novitherm reflectors when the survey was undertaken.

Table 37: Novatherm Panel Installation Rates

Total Installation of Reflectors	
	Total (n=200)
Installed	77%
Reflectors removed	-1%
	76%
Plan to install	21%
Total installation *	**97%**

* Assumes all respondents who said they will install the reflectors in the future do install the reflectors.

5.3 Multi-Residential Showerhead Program Verification Study

Summary

EGD commissioned a multi-residential showerhead study to determine the proportion of low-flow showerheads provided that were eventually installed in participating multi-residential buildings and that were not later removed. EGD contracted, GfK Research Dynamics to conduct an audit among a sample of participating buildings.

Based on the audit conducted, 68 per cent of the dwellings have converted to the low-flow showerhead provided by EGD.

During the research process, it was found that in some condominium buildings, contractors did not install the low-flow showerheads but the property manager sent out notices to residents informing them that they could pick up their showerheads for installation. This has likely resulted in a lower than expected installation rate for 2008. As processes are being changed in 2009 to correct this problem, the installation / non-removal rate quoted in this study should not be applied beyond 2008.

Background & Purpose

One of EGD's DSM programs involves the replacement of conventional showerheads with low-flow showerheads in multi-residential buildings. These showerheads were distributed through contractors, who in turn, were responsible for delivering and installing the showerheads.

EGD commissioned GfK Research Dynamics (GfK RD) to conduct an audit among a sample of participating Condominium and apartment buildings. This audit provided EGD with information on the proportion of low flow showerheads that are currently installed in participating multi-residential units. With this information, EGD can determine how many of the distributed showerheads were eventually installed in dwellings and not removed.

Sample

All multi-residential buildings from 2008 were invited to participate in the audit. A list of 27 buildings that agreed to participate in the audit program was provided to GfK RD by EGD. The majority of the buildings were located within the Greater Toronto Area, while two buildings were located in St. Catharine's, Ontario. The breakdown of the buildings is as follows:

Table 38: Multi-Residential Showerhead Audit Study, Building Breakdown

	Number of Participating Buildings	Number of Showerheads	Number of Buildings Agreeing to Audit	Number of Showerheads in the Subject Buildings	Number of Buildings Audited	Number of Showerhead Audited
Condominiums	30	7,359	9	2,995	8	356
Apartments	133	13,418	18	1,759	18	225
Contractor:						
1 of 3	N/A		17	1,455	17	194
2 of 3	N/A		7	2,347	6	243
3 of 3	N/A		3	952	3	144
TOTAL	**163**	**20,777**	**27**	**4,754**	**26**	**581**

Methodology

GfK RD conducted the audit with property managers of the 27 buildings. Dwellings within the building were selected at random. GfK RD conducted these audits from November 18th through until December 3, 2008, and gained access to 26 of the buildings within this time frame.

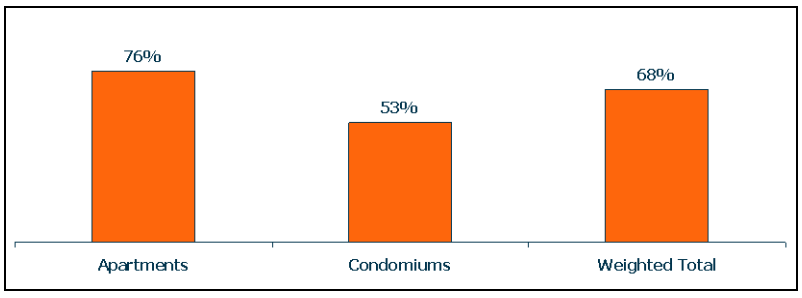
Sampling Plan

Initially, the number of floors and dwellings per floor was noted by the auditor. Based on this count, every 'nth' dwelling was selected, ensuring that at least one dwelling on every floor was audited. In cases where a dwelling had more than one shower, then all showerheads within the dwelling were audited. In cases where the occupant of the dwelling was not home at the time of the audit, and entry was not possible by the property manager, the next closest unit was selected. In order to determine if the correct showerhead was installed, EGD provided GfK RD with a showerhead for the auditor to bring with them to compare with the current showerhead installed. A total of 581 showerheads were audited across the 26 buildings.

Results

Based on the weighting structure, the proportion of dwellings with showerheads that have been converted and not removed is as follows:

Figure 5: Multi-residential Shower Head Audit Results



5.4 Sampling Methodology for Verification Studies of 2008 Commercial and Industrial Sector Custom Projects

Background

As part of the annual evaluation and DSM audit process, EGD commissions third party firms to undertake an engineering review of a sample of the custom projects in the Commercial and Industrial sectors. The purpose of the engineering review of custom projects is to:

- Meet Ontario Energy Board guidelines from the Generic Hearing Decision[3] re: third party or internal audit for custom projects. "A special assessment program must be implemented for custom projects. … The assessment will focus on verifying the equipment installation and estimates of savings and equipment cost."4
- Provide an independent, objective opinion of the reasonableness of the energy savings and equipment costs claimed by the custom projects through a review of a statistically representative sample of the projects.

Purpose of the Study

EGD jointly with Union Gas requested Summit Blue to update the sampling method for the annual engineering review of custom DSM projects with large commercial and industrial (C&I) customers. The objective was to revise the method to address issues encountered as part of the 2007 project reviews and comments from the independent auditors for both EGD and Union Gas 2007 results. These issues included the following:

1. Overall, adjust the strata sizes to meet practical challenges in field applications, e.g., census samples for the largest projects.
2. Develop an approach that considers the significance of water and electricity savings.
3. Revise the sampling method to:
   a. Accommodate the recommendation to schedule two sample assessment periods per year in order to move towards more "real time evaluation," and
   b. Allow for more cost-effective evaluations to be conducted.

3 EB-2006-0021, Decision with Reasons, Ontario Energy Board, page 44-46

4 Total Resource Cost Guide, September 25, 2005, page 19

Methodology
The study included a review of verification protocols developed by a number of organizations as well as industry practice as demonstrated in program evaluation.

Results
The approach presented addressed the issues listed above and took into account practical issues related to the time needed to perform verifications of Custom C&I projects as well as the high cost of verifying these projects. This resulted in a need to balance select sample design factors while still providing the confidence in estimated TRC benefits needed by the Ontario Energy Board (OEB) and the Evaluation and Audit Sub Committee (EAC).

The study resulted in a sample design for annual reviews of custom projects suitable for EGD to apply in 2008. The target precision for the sample design is 90 percent confidence plus/minus 15 percent precision for both gas, electric and water TRC estimates. This is within the range of precision for Monitoring and Verification studies which generally use 90/20 to 80/20 levels of confidence and precision for commercial and industrial program-wide estimates.

5.5 Verification Study of Commercial Custom Projects

Background

As part of the annual evaluation and DSM audit process, EGD commissions third party firms to undertake an engineering review of a sample of the custom projects in the Commercial and Industrial sectors.

Purpose of the Study

EGD retained Building Innovation Inc. (BII) to conduct an engineering review of the savings for the 2008 Commercial Sector custom projects (including Multi-residential and Commercial New Construction). The purpose of the study was to provide an objective opinion of the reasonableness of the savings (natural gas, and induced electricity and water savings) claimed by the Commercial Sector custom projects in 2008, through a review of a statistically representative sample of the projects.

Methodology

Using a sampling methodology developed for EGD and Union Gas by Summit Blue, BII reviewed 22 Commercial sector custom projects. The approach to this study was three tiered: Document review, Telephone Interviews, and Calculation Reviews. BII conducted a review of documentation related to each selected project. The information within the Energy Efficiency Application (EEP) file was reviewed in detail, including the assumptions, calculation methodology, and data used to support the savings estimates. In the case of missing, incomplete, or ambiguous information, BII worked with EGD to obtain the appropriate data. Where clarification was required, BII interviewed EGD staff to gain a better understanding of project details. Telephone interviews with project contacts were then undertaken to clarify project scope and timing and to confirm certain assumptions used in savings calculations. Using information gleaned from the first two steps of the study, BII evaluated the assumptions used in calculating the savings.

Results

22 projects were sampled and reviewed. Gas savings calculations were adjusted in 12 projects. The net result of these adjustments was a 1.6% decline in gas savings (50,690 m^3/yr.), an 8% decline in electricity savings (240,753kWh/yr.) and a 38% (5219 liter/yr.) decline in water savings.

Table 39: Commercial Sector Custom Project Verification Results

Commercial Projects Sampled	22
Sampled Projects with Calculation Discrepancies	12
Natural Gas Savings of all Sampled Projects	3,117,508 m^3/yr
Revised Natural Gas Savings	3,066,818 m^3/yr
Electricity Savings of all Sampled Projects	3,012,781 kWh/yr
Revised Electricity Savings	2,772,028 kWh/yr
Gross Water Savings of all Sampled Projects	13,685 l/yr.
Revised Gross Water Savings	18,904 l/yr.

5.6 Verification Study of Industrial Custom Projects

Background

As part of the annual evaluation and DSM audit process, EGD commissions third party firms to undertake an engineering review of a sample of the custom projects in the Commercial and Industrial sectors.

Purpose of the Study

EGD retained Genivar Ontario Inc. (Genivar) to conduct an engineering review of the savings for the 2008 Industrial custom projects. The purpose of this evaluation was to provide an objective opinion of the reasonableness of the savings (natural gas, and induced electricity and water savings) claimed by the industrial sector custom projects in 2008 through a review of a statistically representative sample of the projects.[5]

Methodology

Using a sampling process developed for EGD and Union Gas by Summit Blue, Genivar Ontario Inc. reviewed 15 industrial projects and 3 agricultural custom projects. The reviews involved site inspections with the clients, verification of installations, utility savings results, project start-up and commissioning of measure, cost and purchase timing, any changes in plant production that would change the impact of savings, any unforeseen disturbances, any savings measurements undertaken by client, review savings calculations and methodology, provide a 3rd party engineering review of the sample of projects and, where a more appropriate calculation is identified, provide the results of such a calculation.

Results

As a result of the site investigation, all projects were confirmed as being implemented by the client with general conformance to the scenario depicted in the files. Each file included supporting documentation in the form of either manufacturer's quotations or billings which justify the incurred cost of the project. Overall, analysis applied to each project was based on good engineering practices. Of the 18 projects reviewed, Genivar made adjustments to the gas savings calculations for 9 projects (8 resulted in an increase in gas savings and 1 in a decrease), based on information garnered through the site visits, additional information from clients, and calculation reviews. The result of these changes was a 2% increase in gas savings (304,199 m^3/yr.). Electricity savings were decreased for 3 projects. The result of these changes resulted in an electricity saving reduction of 5% (977,585 kWh/yr.). Water savings were increased for 1 project. The result of this change was a 3% increase in water savings (2,106 liters/yr.).

5 IBID

Table 40: Industrial Sector Custom Project Verification Results

Industrial Projects Sampled	18
Sampled Projects with Calculation Discrepancies	12
Natural Gas Savings of all Sampled Projects	16,201,888 m^3/yr
Revised Natural Gas Savings	16,506,087 m^3/yr
Electricity Savings of all Sampled Projects	20,108,589 kWh/yr
Revised Electricity Savings	19,131,004 kWh/yr
Gross Water Savings of all Sampled Projects	63,245 l/yr.
Revised Gross Water Savings	65,350 l/yr.

5.7 EnerGuide for Natural Gas Fireplaces, Awareness Survey of the EnerGuide Label

Background & Objectives

EGD launched an in-store program in 2007 to increase awareness of the EnerGuide label for natural gas fireplaces through point of purchase communication material and sales associate training. Research was conducted by EGD with the following objectives:

- Measure the change in awareness of the EnerGuide label for natural gas fireplaces following the in-store point of purchase campaign.
- Determine if an EnerGuide label had an influence on which natural gas fireplace was purchased.

This report was prepared by the EGD Research & Business Intelligence group and presents the findings from the first and second year post program follow-up since EGDs point-of-purchase promotional material campaign was launched. This report includes the research findings from 2006 and 2007 that were reported by GfK Research Dynamics in previous years.

Methodology

Survey Qualifications: Survey respondents had to be an EGD residential customer and have purchased a natural gas fireplace in 2006 (Baseline), 2007 (First year post follow-up) or 2008 (Second year post follow-up). Data Collection for 2006 Purchasers: A notice was printed on customers' EGD bill for the June 2007 cycle month inviting them to respond to the survey, if they had purchased a natural gas fireplace in 2006. They were directed to a website to complete the questionnaire. The survey was open from June 7 to July 27, 2007 and 485 qualified customers completed the online survey.

Data Collection for 2007 Purchasers: Customers were contacted from a list of customers who entered an in-store promotion to receive an on-bill credit. They were invited to respond to a telephone survey. The survey was conducted from January 14 to February 6, 2008. 105 respondents to the survey qualified by indicating they had purchased a natural gas fireplace in 2007 and were EGD customers.

Data Collection 2008 Purchasers: Customers completed an in-store EGD awareness and influence survey at point of fireplace purchase. Respondents were offered a financial incentive of $50 to complete the survey. Surveys were completed by customers between July 1, 2008 and January 9, 2009. A total of 357 customers completed the survey.

Results

The results show that the awareness of the EnerGuide label for natural gas fireplaces increased from 61% in 2007 to 80% in 2008. In 2008, 74% of all respondents indicated that the EnerGuide rating on their fireplace had an influence on which natural gas fireplace they purchased. This is up from 35% in 2007.

5.8 Home Performance Contractor Market Transformation Program

Background

In 2007 EGD launched the Home Performance Contractor Market Program designed "to improve residential building envelope performance through the training and education of residential market renovation and general contractors in the EGD franchise territory. This program aims to increase the frequency of weatherization measures included in home renovation and upgrade projects in the residential sector through industry-delivered workshops."

In the first half of 2008, two sets of workshops were held. One set was among contractors and advisors – eight workshops were held and 120 pre-course surveys were completed. The other set was among building inspectors – two workshops were held and 28 pre-course surveys were completed. During all workshops, participants were advised that there would be a follow-up survey conducted later in the year. A representative of the research department audited the administration of the survey at a workshop during the Spring sessions. The follow-up survey was conducted in the Fall of 2008. The wording of the questions was tailored for each segment; therefore, the results for contractors/ advisors and building inspectors are reported separately.

Methodology

At the beginning of each workshop, participants were asked to complete a survey, which established baseline measurements. As noted above, 120 contractor advisors completed the survey. The results of this survey were issued in August 2008.

In November/December 2008, a follow-up, identical survey was administered to help determine if there were changes in the implementation of the weatherization measures. Respondents who completed the pre-survey were sent an email invitation asking them to complete the follow-up survey online. Respondents also had the options of phoning in their answers or faxing the completed questionnaire. After one month, respondents who had not responded were phoned to see if they would participate.

Results of the surveys were compared. Respondents have been "matched" based on the following:

- Having answered at least one question in both surveys.
- If a respondent wrote in 'not stated' or 'not applicable' from either survey for a question, they have been removed for that question.
- Also, if a respondent completed the non-measurement questions but none of the measurement questions, they have been removed from the results.

As a result of the matching, the base sizes for each question may have differed.

Of the 120 potential contractor and advisor respondents from the baseline survey, a total of 72 could be matched based on the foregoing criteria, for a 60% completion rate.

Metrics

The program's success is based on the increase in frequency of weatherization measures implemented by the participating contractors. Specifically the 100% target for this metric is an average increase of at least 1.0 (i.e. one response level on a five-point scale), in at least three weatherization measures, relative to the baseline survey.

Five Point Scale:

1. Never
2. Sometimes
3. Often
4. Almost always
5. Always

Results, Contractor Owners and Advisors

The results presented in Table 42 are based on the results from a survey written for and answered by contractor owners and advisors, not employees.

Table 41: Contractor Owner and Advisor Results

	Average Rating out of 5		
	Baseline	Follow-Up	Change
Comprehensive air sealing as a separate service / business?	2.6	3.2	0.6
Creating a continuous air barrier with multiple products when building new (home or addition)?	3.4	3.9	0.5
Measures to meet the ventilation and combustion air supply needs of a house when quoting a major renovation contract?	3.1	3.7	0.6
A heat loss / heat gain calculation when quoting a major renovation?	2.6	3.1	0.5
A blower door test to assess home performance before, during or after a job?	2.6	3.2	0.6

Results, All Contractors & Advisors

The results in table 43 are based on the results of a survey written for and answered by all respondents.

Table 42: All Contractors & Advisors

	Average Rating out of 5		
	Baseline	Follow-Up	Change
Comprehensive air sealing of the attic floor with 2 part component foam	2.4	2.8	0.3
Comprehensive air sealing of the attic floor with 1 component foam, caulking	2.4	2.8	0.4
Some air sealing of the attic floor with 1 component foam, caulking	2.4	2.8	0.4
Air sealing baseboards, window / door trim, electrical outlets / switches	3.4	3.4	0.0
Air sealing and insulating basement sill plate and joint header area	3.6	3.8	0.2
Weatherstripping existing doors	3.4	3.5	0.1
Weatherstripping existing windows	3.0	3.2	0.2
Insulating garage ceilings, cantilevers etc. with 2 component foam	2.7	2.9	0.2

The average increase in score for the top three weatherization measures was 0.37.

5.9 Boiler Market Transformation Program 2008: Contractor, Engineer & Customer Awareness Research

Summary

A survey was administered to the participants of the High Efficiency and Condensing Boiler workshops at the Property Management Exposition & Conferences (PM Expo) held in Toronto on April 10 and October 9, 2008. This survey was designed to measure the increase in awareness and knowledge at the end of the workshops compared to results taken at the beginning of the workshops. Results showed that there was a 25 percentage point increase in average test results.

Background

The purpose of the Boiler Market Transformation Program is to increase sales of higher efficiency hydronic boilers in space heating and domestic hot water applications where conventional atmospheric boilers would typically be used.

This program focuses on hydronic boilers in sizes 300,000 BTU and greater. This program promotes both sealed combustion boilers labeled as high-efficiency boilers (84% - 89% combustion efficiency/non-condensing) and condensing boilers (90% + combustion efficiency).

Scope of Research

The scope of this research is focused on assessing the Market Effect of the change in awareness among participants in the training events implemented through the program.

Methodology

A survey was administered to the participants of the High Efficiency and Condensing Boiler workshops at the PM Expo Conferences held in Toronto on April 10 and October 9, 2008. At the beginning of the workshop the instructor passed out a questionnaire that tested participants' knowledge and awareness of high efficiency and condensing boilers. At the end of the workshop, the instructor asked the participants to answer the survey again as a measure to assess the change in knowledge and awareness among participants as a result of the workshop. The results were tabulated and analyzed by the Research & Business Intelligence unit of EGD Gas Distribution.

Below are the questions asked via the survey.

Q1. According to research, what criterion is most commonly used by managers when deciding whether to spend capital funds on projects? (select one answer)

(a) First cost, (b) Net present value (NPV) and internal rate of return (IRR), (c) Simple payback, (d) Discounted payback

Q2. You could be leaving money on the table if you use one of the following methods when deciding to spend capital funds on projects: (select one answer) (a) Simple payback, (b) First cost, (c) Net present value (NPV), (d) Discounted payback.

Q3. Condensing boilers operate at 90% combustion efficiency or above when: (select one answer) (a) The return water temperature is below 120ºF, (b) The return water temperature is between 130 and 150ºF, (c) The return water temperature is over 180ºF, (d) Efficiency is same for all operating ranges

Q4. Select the applications that are best suited for condensing boilers: (select as many as apply) (a) Direct-fired domestic hot water, (b) Baseboard convectors, (c) Make-up air heating, (d) Pool heating, (e) Snow melting

Results

As can be seen below, average test scores increased from 44% at the start of the workshop to 68% at the end of the workshop – a 25 percentage point increase (percentage point increase based on raw numbers)

Table 43: Awareness and Knowledge Results

Question No.	% Correct before the workshop	% Correct after the workshop	% Point Change
Question 1	29%	87%	58%
Question 2	51%	31%	-20%
Question 3	46%	74%	27%
Question 4	49%	82%	33%
Average Q1-4	44%	68%	25%

Workshop attendees also rated their understanding of high efficiency and condensing boiler basics at the start of the workshop and at the end of the workshop. Results showed that respondents rated their understanding at a level of 4.0 out of 10 at the beginning of the course and at 6.5 out of 10 at the end of the workshop, a substantial increase overall.

5.10 Business Partner Market Transformation Program: Percentage Increase in Design Incorporation Plans

Background & Objectives

In 2007,103 engineering consultants and mechanical contractors participated in a survey which identified their implementation practices for five under-marketed HVAC technologies - natural gas fired desiccant dehumidification, natural gas fired humidification, ceiling-mounted de-stratification fans, air doors/air barriers/air curtains and demand control ventilation. This 2007 survey established the baseline level of industry practice against which the 2008 market transformation results were to be measured.

In early 2008, the 103 firms who participated in the 2007 baseline survey were invited to attend a series of breakfast seminars where two new and emerging energy efficiency products were promoted - Air Doors, and Demand Controlled Ventilation (DCV) technologies. The seminars were held on January 31 (Toronto), February 21 (St. Catharines) and April 3, 2008 (Ottawa). Thirty-four of these firms sent 84 delegates to the Technology Awareness seminars.

The original objective was to measure, at the end of 2008, an increase in the recommendation/ implementation of under-marketed technologies by those who had completed the 2007 baseline survey and had attended the seminars. Unfortunately, less than half of seminar attendees (34) were 2007 baseline survey participants. Rather than compare results to the 2007 baseline survey, a different methodology was implemented.

Methodology

In December 2008, telephone interviews of seminar attendees were conducted from a central, supervised facility, using CATI (Computer Assisted Telephone Interviewing). The target group included the 34 individuals who had completed the 2007 baseline survey plus an additional 25 firms, for a total of 79 potential respondents (44 Consulting Engineers, 35 HVAC Contractors). A total of 62 respondents participated in the survey (78%, 33 consulting engineers, 29 HVAC Contractors).

Follow-up interviews were conducted on respondents who said that they were actively recommending Air Doors and/or DCV technologies since attending the seminars. This was to determine a) how many had not recommended the technologies *prior* to attending the seminars, and b) if they had recommended the technologies prior to the seminars, had they increased their frequency of recommending. 48 respondents qualified for the follow-up interviews and 45 interviews were completed (three respondents could not be reached).

Results:

Air Doors: Overall, two-thirds of respondents said they have recommended air doors to a client since participating in the workshops (66%). As a result of attending the seminars, 34% are new adopters/promoters of the technology, and 16% are recommending air doors more frequently than before attending the seminars.

Demand Controlled Ventilation: Half the respondents said they have recommended DCV since participating in the workshops (50%). As a result of attending the seminars, 18% are new adopters/promoters of the technology, and 8% are recommending DCV more frequently than they had been before they attended the seminars.

Among those who have not yet recommended the technologies, the main reason was because a suitable project opportunity had not yet presented itself.

The 2008 Market Transformation program successfully increased the incorporation of air doors and DCV technologies in the design activities of EGD's business partners by at least 5 percentage points and the 100% metric value was achieved.

Table 44: Recommending the Technologies

	Air Doors	Demand Controlled Ventilation
	Total	**Total**
Total sample	(n=62)	(n=62)
Recommended since attending seminar	**66%**	**50%**
Recommend now who did not recommend before attending the seminars	34%	18%
Recommended before attending the seminars but now recommend more frequently	16%	8%
Likely to recommend in next 12 to 18 months	26%	35%

5.11 Business Partner Market Transformation Program: Technology Awareness

Summary

During 2008, EGD organized six technology awareness workshops to educate engineers and contractors about existing, proven, but under-marketed energy-saving space conditioning technologies that they could be promoting and implementing for their clients.

Workshops held on January 31, February 21 and April 3 covered Air Doors and Demand Controlled Ventilation (DCV) technologies. Seminars held on September 30, October 10 and November 12 featured De-stratification Fans.

A questionnaire was designed to measure the increase in awareness and knowledge at the end of the workshops compared to results taken at the beginning of the sessions.

In all, 137 business partner representatives participated in the breakfast seminars. Results showed that there was a 155% percent increase in average test results, substantially above the 30% increase required to meet the 150% metric level.

Scope of the Research

EGD's Research & Business Intelligence unit was asked to assess the increase in awareness and knowledge of emerging technologies relative to initial survey results. The parties surveyed included consulting engineers, energy management firms and contractors.

Methodology

A survey was administered to the participants of six workshops conducted throughout 2008. At the beginning of each workshop the instructor passed out a questionnaire that tested participants' knowledge and awareness of emerging technologies. At the end of the workshop, the instructor asked the participants to answer the survey again as a measure to assess the change in knowledge and awareness among participants as a result of the workshop. The results were tabulated and analyzed by the Research & Business Intelligence unit of EGD.

Results

As can be seen below, average test scores increased from 29% at the start of the workshop to 75% at the end of the workshop – a 46 percentage point increase (47 percentage points for engineers and 44 percentage points for contractors).

Table 45: Awareness & Knowledge Results

All Date	No.	% Pre Correct	% Post Correct	% Point Change
31-Jan	31	31%	92%	60%
21-Feb	18	28%	78%	50%
3-Apr	19	36%	71%	36%
30-Sep	14	25%	79%	54%
10-Oct	25	28%	61%	33%
12-Nov	11	25%	57%	32%
Total / Average	118	29%	75%	46%

It is interesting to note that average test scores among all contractors were quite similar to the average scores among all Engineers.

Table 46: Results by Contractors & Engineers

Contractors Date	No.	% Pre Correct	% Post Correct	% Point Change
31-Jan	12	31%	92%	60%
21-Feb	13	31%	73%	42%
3-Apr	7	18%	46%	29%
30-Sep	10	28%	75%	48%
10-Oct	12	31%	69%	38%
12-Nov	4	31%	69%	38%
Total / Average	58	29%	73%	44%

Engineers Date	No.	% Pre Correct	% Post Correct	% Point Change
31-Jan	19	32%	92%	61%
21-Feb	5	20%	90%	70%
3-Apr	12	46%	85%	40%
30-Sep	4	19%	88%	69%
10-Oct	13	25%	54%	29%
12-Nov	7	21%	50%	29%
Total / Average	60	30%	77%	47%

5.12 Examining the Impact of Low Flow Showerheads on Water Heater Consumption

Background & Objectives

The purpose of this study was to derive an estimate of the change in water heating energy consumption pre- and post-installation of low flow showerheads. The research involved monitoring customers' water heaters with Load Research AMR equipment and collecting end use data. This data was cleaned, modeled and used in conjunction with relevant participation survey data to produce an estimate of savings. This method obviated the need for any assumed behavioral inputs by observing the impact of actual behavioral changes in the field through measured consumption, and by controlling for several variables of interest, both qualitative and quantitative.

Methodology

Data was analyzed for 69 households pre and post installation of low-flow showerheads. Data records began on August 31 2007 until December 31 2008 date. Showerheads were installed between 13 August 2008 and 18 October 2008. A simple paired t-test (before-after installation) was used to test for the magnitude and statistical significance of installation effect on consumption. Longitudinal mixed models were used to explore relationships between inputs and low flow showerhead installation on consumption.

Results

A plot of seasonally adjusted consumption (SAC) by time since shower installation shows that consumption is generally lower after installation (red) than before installation (blue). Surprisingly, immediately after installation (close to time 0) there appears to be an initial increase in consumption. But note the decreasing trend in consumption post-installation through time (red).

Figure 6: Low Flow Showerheads, Seasonally Adjusted Consumption

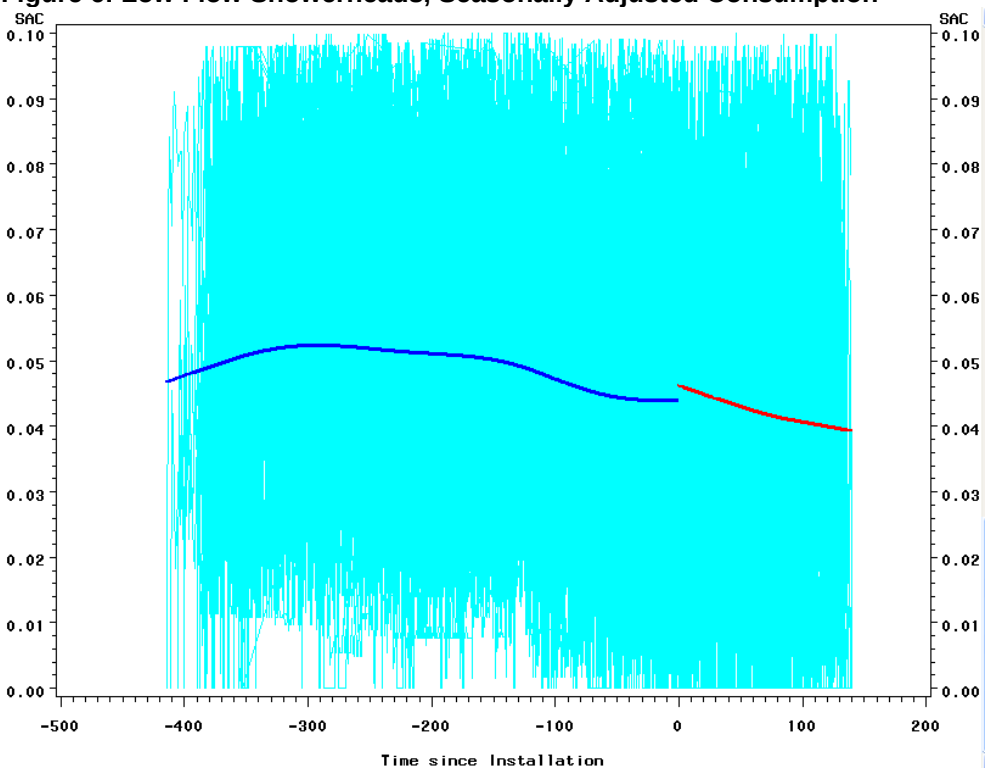


Table 47: Before-After Test on Seasonally Adjusted Data

ALL DATA (Paired t-test)

Average hourly difference m^3/hour	Average daily difference m^3/day	Average annual difference m^3/year
0.0102	0.2448	89.352
Lower 95% Confidence Bound		
0.0065	0.156	56.94
Upper 95% Confidence Bound		
0.0138	0.3312	120.888

Longitudinal Mixed Model: Accounting for Pre-Installation Flow

We added information on pre-existing showerheads to estimate savings due to low-flow installation by previous showerhead flow-rates. Three buckets were originally proposed. However, the lowest flow bucket (2.0 gpm or less) had too few observations and are rare in the population of households. Further, EGD will not be installing low-flow shower heads in homes with existing low flow heads (less than 2.0 gpm). Therefore two buckets were used instead: 2.0 to 2.5 gpm heads and greater than 2.5 gpm.

There were statistically significant effects of flow category of pre-existing showerheads on consumption. The following prediction table shows that savings in consumption is greater for the 2.5 + gpm group of houses than in the 2.0-2.5 gpm group.

Table 48: Low Flow Showerheads Savings Model, Pre-existing 2-2.5 gpm

	Average m^3 / hr.	Average Daily m^3 / day	Average Annual m^3 / yr.	Lower Confidence Interval m^3 / hr.	Upper Confidence Interval m^3 / hr.
Low Flow - No	.0517	1.240	452.5	.0446	0.0587
Low Flow - Yes	.0442	1.060	387.0	.0370	.0513
Savings		0.180	65.5		

Note: Predictions derived by comparing low-flow to normal shower heads at the mean value of all other attributes, for homes with pre-existing showerheads of 2.0-2.5 gpm.

Table 49: Low Flow Showerheads Savings Model, Pre-existing 2.5+ gpm

	Average m^3 / hr.	Average Daily m^3 / day	Average Annual m^3 / yr.	Lower Confidence Interval m^3 / hr.	Upper Confidence Interval m^3 / hr.
Low Flow - No	.0660	1.583	577.8	0.0589	0.0730
Low Flow - Yes	.0528	1.266	462.2	0.0456	0.0599
Savings		0.317	115.6		

Note: Predictions derived by comparing low-flow to normal shower heads at the mean value of all other attributes, for homes with pre-existing showerheads with flow rates of 2.5 gpm or higher.

5.13 Natural Gas Energy Efficiency Potential: Update 2008

Background

Following the decision in the DSM Generic proceedings held in 2006, EGD committed to creating an updated Market Potential Study for input in the next DSM Plan. A Natural Gas Efficiency Potential Study was previously completed for EGD in 2006. This current study employs similar methodology, sector definitions, facility archetypes and geographical coverage as in the previous study but addresses the period 2007 – 2017. Marbek Resource Consultants were commissioned through an RFP process and the start-up meeting held in June 2008. Work commenced on this study in the summer of 2008 and continued through March 2009.

Purpose of the study

This study will form the basis for identifying potential energy savings measures for EGD's next multi-year plan. It estimates the achievable and economic potential for DSM measures across all applicable technologies, markets and sectors in EGD's service area. It provides perspective for the present level of DSM results, future DSM programming, and DSM performance over the long term.

Methodology

This study was conducted within an iterative process that involved a number of well defined steps.

Step 1: Develop Base Year Calibration using Actual EGD Sales Data
Step 2: Develop Reference case
Step 3: Assess DSM Technologies
Step 4: Estimate Economic Natural Gas Savings
Step 5: Conduct Sensitivity Analysis
Sept 6: Estimate Achievable Natural Gas Savings Potential

Comment on Results

Final study results were not available at the time of this report. The Achievable results for the Residential, Commercial and Industrial sectors will be presented within four different DSM Budget scenarios: Financially Unconstrained, $20 Million, $40 Million and $60 Million.

5.14 Residential Measure Free Ridership and Inside Spillover Study

Background

In 2006, the Ontario Energy Board (OEB) convened a Generic Proceeding on the subject of natural gas demand-side management (DSM). Through the Proceeding, the OEB approved the EGD and Union Gas DSM plans for the three-year period 2007 through 2009, including assumptions for measure savings and free ridership. Items identified as priorities for evaluation research included a free ridership study on low-flow showerheads, aerators, programmable thermostats and high-efficiency furnaces. EGD undertook the research jointly with Union Gas. The work was to provide a robust set of estimates that can be used with confidence until the next program update. Following a RFP process, Summit Blue was engaged to conduct a market research study during the winter of 2007-2008 to ascertain the level of free-ridership and inside spillover related to each of the above mentioned measures.

Methodology

The study included the following research tasks:

- Development of a project work plan and an associated analysis plan detailing the study's methodology;
- A review of literature focused on attribution knowledge pertaining to the measures in the project scope, including development of natural gas furnace shipment data to help estimate high-efficiency free ridership;
- Telephone surveys of five program/measure groups of customers: EGD TAPS, Union Gas Energy Saving Kits, Thermostat Coupons, Union Gas Furnace and EGD Furnace program participants;
- Telephone surveys of furnace contractors; and
- An analysis and scoring of the customer survey contractor interviews, and furnace shipment data, to produce the free ridership and inside spillover estimates.

Results

The table below present overall results of the research for the four measures and associated programs. High-efficiency furnaces had a net free ridership (net-free-ridership = net-to-gross = free ridership minus inside spillover) over 50%. Showerheads have almost no net free ridership for EGD TAPS and a negative net free ridership for Union ESK, owing to a combination of low unadjusted free ridership (~36%), the adjustment effect of program-unique technology not available in stores (reduces the unadjusted level by 72%), and a substantial level of inside spillover (19%). Please refer to the final report for a more detailed explanation of study methodology & results.

Table 50: Measure/Program Type Free ridership Estimates

	Free Rider Score	Component Score	Low Range Uncertainty	High Range Uncertainty	+/- Sampling Error
Aerators					
TAPS On-site	31%	*NA*	28%	34%	9%
ESK Event	33%	*NA*	30%	36%	9%
Furnaces					
Enbridge	65%		49%	77%	
Customer Survey		*53%*	*47%*	*59%*	*12%*
Furnace Contractor Survey		*62%*	*52%*	*72%*	*16%*
Market Data		*74%*	*50%*	*90%*	*NA*
Union	68%		52%	80%	
Furnace Contractor Survey		*60%*	*54%*	*66%*	*10%*
Market Data		*74%*	*50%*	*90%*	*NA*
Low-flow Showerheads					
TAPS On-site	10%	*NA*	9%	11%	8%
ESK Event	10%	*NA*	10%	11%	8%
Programmable Thermostats					
General Customer	43%		39%	48%	
Customer Survey		*39%*	*35%*	*43%*	*10%*
Furnace Contractor Survey		*60%*	*53%*	*67%*	*11%*
Enbridge Furnace Customer	46%	*NA*	40%	52%	12%

5.15 Resource Savings Values in Selected Residential DSM Prescriptive Programs

Background & Overview

In the decision of the 2006 Generic Proceeding on Natural Gas DSM, the OEB indicated that the utilities should conduct forward-looking evaluation research to update measure assumptions. Following a RFP process, Summit Blue was engaged to conduct the research. This research was undertaken jointly with Union Gas in an effort to update savings values for low-flow showerheads, faucet aerators and programmable thermostats.

Methodology

Summit Blue used the followed steps to conduct their study:

- Reviewed existing research and literature to determine the savings values used by other jurisdictions.
- Provided specific questions that were included in the survey conducted for the Free Ridership study[1] to further validate the results and gain a better understanding of the customers' usage of the measures being studied.
- Reviewed the values used by EGD and Union Gas. Identified the variables that impact savings from each measure. Using the information gathered from the literature review, determined the additional research required to calculate the potential resource savings values for each residential DSM prescriptive measure.
- Prepared an initial estimate of values with associated confidence estimates.
- Validated the resource savings identified in the literature review with the responses to the questions posed in the survey and all relevant data findings.
- Conducted a review of the available utility analysis & data and considered the various delivery mechanisms to validate the resource savings values calculated in the previous step.
- Incorporated any results obtained from the Residential Free Ridership and Inside Spillover Study in the calculations
- Reviewed the available literature on measure life.

Results

Please refer to the final report dated June 4th, 2008 for a detailed explanation of method, results & recommendations. Below are summary tables found in the executive summary of the final report.

Table 51: Estimated Savings from Efficient Showerheads

Showerheads	*Gallons per Minute (gpm)*		Recommended Annual Savings		No Throttling		No Throttling or Temperature Change		No Throttling or Temp./Length Change	
	Existing	*Replaced*	gas (m^3)	water (litres)	Gas (m^3)	Water (l)	Gas (m^3)	Water (l)	Gas (m^3)	Water (l)
Per Household Enbridge TAPS and Low Income Union Gas install and Low Income	2.0	1.25	33	8,900	47	12,512	51	12,512	55	13,550
	2.1 - 2.5 (2.41)	1.25	47	12,400	74	19,087	78	19,087	84	20,674
	2.6 + (3.06)	1.25	68	17,500	114	28,903	117	28,903	128	31,375
	2.0	1.50	15	4,600	29	8,228	33	8,228	37	9,033
	2.1 - 2.5 (2.41)	1.50	29	8,100	59	15,486	60	15,486	66	16,218
	2.6 + (3.06)	1.50	50	13,300	95	24,478	100	24,478	110	27,041
Per Showerhead (ESK)		2.00	4	2,200	11	3,918	16	3,918	18	4,456
		1.50	22	6,400	45	12,634	49	12,634	54	13,367
		1.25	40	10,700	65	16,907	67	16,907	72	17,822

Table 52: Estimates of Savings Values for Efficient Faucet Aerators

Location	Replacement (gpm)	Recommended Annual Savings (per aerator)	
		gas (m3)	water (litres)
Kitchen	2.0	11	3,900
	1.5	22	7,800
Bathroom	2.0	2	600
	1.5	6	2,000

Table 53: Estimates of Savings for Programmable Thermostats

	Recommended Annual Savings
Natural Gas	152 m^3
Electricity	26 kWh

5.16 Custom Projects Attribution Study

Background & Overview

This research was undertaken to measure free ridership and spillover for custom project programs. The study was conducted in accordance with the outcome of the 2006 Generic Proceeding on Natural Gas DSM. In this proceeding, the OEB identified the study of free ridership in custom project programs as a priority item. Following an RFP process, Summit Blue was engaged to conduct the research.

Methodology

The following research tasks where completed during the winter of 2007-2008:

- Development of a project analysis plan and the study's methodology.
- A study of methods used in the past to estimate free ridership and spillover in nonresidential programs.
- On site and telephone interviews with participants and participating trade allies.
- Telephone interviews with customers who had a program supported energy audit but had not implemented any measures through the program.
- Telephone surveys with non-participants to find and quantify non-participant spillover.
- An analysis and scoring of the data to produce free-ridership & spillover estimates.

Results

Please refer to the final report dated October 27, 2008 for a detailed explanation of method, results & recommendations.

Table 54: Custom Project Attribution Study Net-To-Gross

Utility	Sector	Free Ridership	Participant Inside + Outside Spillover	Audit-Only Spillover %	Net-to-Gross Ratio
EGD	Agriculture	40%			
EGD	Commercial Retrofit	12%			
EGD	Industrial	50%			
EGD	Multifamily	20%			
EGD	New Construction	26%			
EGD	Total	41%	10%	11%	79%
Union	Agriculture	0%			
Union	Commercial Retrofit	59%			
Union	Industrial	56%			
Union	Multifamily	42%			
Union	New Construction	33%			
Union	Total	54%	10%	0%	56%
Total	Agriculture	18%			
Total	Commercial Retrofit	27%			
Total	Industrial	53%			
Total	Multifamily	26%			
Total	New Construction	28%			
Total	Total	48%	10%	5%	67%

Free Ridership Assumptions (See Figure 2.1 for the interpretation of these assumptions):

Weight of Participant Reported Importance [F] in [K] compared to the planning [H] and influence [G] scores	Triple weight
Weight of Project-based estimate [14] in [20] compared to the measure-specific scores [9]	Triple Weight
Weight of Program Influence Score [L] compared to the Project-Based score [21]	Equal Weight

Definitions

- Free Ridership: Free riders are customers who received an incentive through a DSM program, yet would have installed the same efficiency measure on their own even if the program had not been offered.
- Spillover: Energy savings that are due to a DSM program but not counted in program records.
- Net-to-Gross Ratio: 1 - free ridership ratio + spillover ratio.

5.17 Measure Life for Retro-Commissioning and Continuous Commissioning Projects

Background & Overview

This study was commissioned by EGD to establish acceptable measure life for operational improvements in Commercial premises for its DSM programs. The intent was to gain an understanding of industry best practice on similar commissioning programs, establish measure life and establish persistence of savings for various operational improvements, intended for:

- Retro-commissioning (RCx, a systematic process of ensuring the building systems, such as HVAC and lighting, are being operated according to the building needs), or re-commissioning, with measure implementations without active monitoring.
- Continuous commissioning (CCx, an "on-going process" to resolve operating problems, improve comfort, and continually optimize energy use for existing buildings) with active monitoring

While the focus of the report was on natural gas savings, the corresponding electrical savings were also identified.

Methodology

A detailed review of five studies was completed. All of the 5 studies attempted to quantify the savings persistency in retro-commissioning. Thirty two (32) articles were reviewed. The primary research included Portland Energy Conservation Inc.'s (PECI) National Conference on Building Commissioning (NCBC), California Energy Commission's Public Interest Energy Research (PIER) Program, and the International Energy Program Evaluation Conference.

Conclusions

This study found that the measure life for retro-commissioning varies building by building and measure by measure, with significant impact from the operating staff and preventative maintenance procedures. There is insufficient substantiated data to assign a measure life to individual measures. RCx & CCx programs should be based on comprehensive programs with a number of measures so that the savings and payback period can be blended. In the case of RCx, it appears the optimal cycle would be to retro-commission after 5 years. Energy savings are still generated after this period, however the reduction in savings would warrant carrying out retro-commissioning again. There is no doubt that RCx and CCx programs save energy. It is expected that most projects will yield an average savings in the 5% to 20% range, depending on the building type, building size and implemented measures. The costs for retro-commissioning vary dramatically, again depending on the size, function and complexity of the facility as well as the measures implemented. Taking inflation into account the studies indicate that a median cost of $0.33 per sq.ft., in 2009 Canadian dollars, could be expected.

5.18 Prescriptive Destratification Fan Program

Background & Overview

EGD wishes to implement a prescriptive destratification fan program for the commercial sector. To date, within the EGD franchise area, the commercial sector has been eligible for incentives only under its custom programs. Custom programs require significant supporting documentation to meet regulatory requirements. In many cases it is difficult for the customer to estimate base case costs and incremental costs. This has typically led to delays in application processing times and significant ongoing communication between the utility and the customer. A prescriptive program will simplify the application and incentive process and should address this barrier.

The proposed program will offer a fixed incentive for the installation of large diameter Destratification fans. The intended program goals, destratification equipment and commercial applications are as follows:

- **Goal:** To improve energy efficiency of the facility by installing a destratification fan at the ceiling level to mix hot and cold air Energy efficiency results from the reduction of surface temperatures both inside of the ceiling and the tops of walls.
- **Target Market:** Warehousing, Manufacturing, Industrial, and retail buildings with ceiling heights between 20ft and 40ft.
- **End-use Addressed:** Space conditioning
- **Measure:** Installation of destratification fan on ceiling heights of between 20ft and 40ft.
- **Program Elements:** Fan diameter (20ft to 24ft). Weighted average ceiling height of 30ft.

Methodology

An analysis of energy savings due to destratification fans was completed at a commercial manufacturing and warehousing facility in the Greater Toronto Area during the winter of 2008. The results of this analysis were used to verify calculations within the EGD Commercial ETools Destratification Savings Calculator V1.07. The comparison resulted in a natural gas savings difference within 1%. The ETools Calculator was used to determine the typical energy savings on a per fan basis using the information learned from the on-site analysis.

Conclusions

Measure assumptions provided from the analysis for a prescriptive destratification fan program are presented below:

Table 55: Destratification Fan Program Measure Assumptions

Resource Savings (per participant)	
• Natural Gas	7,020 m3/yr
• Electricity (Incremental)	(123) kWh/yr
Equipment Life	25 years
Incremental Costs (per participant)	
• Equipment	$6,200
• Installation	$1,800

5.19 Prescriptive Commercial Boiler Program

Background & Overview

In an effort to simplify the administration of DSM programs for commercial businesses, a prescriptive boiler program for the commercial sector was developed. To date the commercial sector has been eligible for incentives only through the completion of custom projects. A prescriptive program will simplify the application and incentive process and should allow more customers to participate in a boiler program.

This study followed the following steps in determining the costs and savings of using higher efficiency boiler equipment in the commercial sector.

- Analysis - This step determined the consumption of an average small commercial business using EGD's customer database.
- Boiler Plant Hourly Input -- This step calculated the size of the boiler required to provide heat and hot water for a typical facility using ASHRAE accepted principles and EGD's E-Tools calculator.
- Average Boiler MSRP – This step determined the Manufacturer's Suggested Retail Price based on the utilities' boiler databases for boilers.
- Savings Analysis -- This step determined all incremental costs and savings versus a base case of 80 to 82% and calculated the TRC benefits based on the estimated savings and incremental costs.

The report detailed the analysis and savings for both seasonal (i.e., space heating) and non-seasonal (i.e., domestic hot water) hot water boilers.

Methodology

An iterative approach was used to determine the annual savings in the commercial sector. The following steps were taken:

a. The Rate 6 accounts were subdivided into bins of annual gas use. This provided the annual average gas use, number of accounts, seasonal, non-seasonal and total gas use.
b. The seasonal portion of the annual gas use was normalized to 30 year weather data. This normalized gas use was correlated to a seasonal boiler size required for gas consumption.
c. Categories of boiler sizes were selected to provide a suitable range of boilers available within the sector.
d. The Rate 6 accounts were subdivided using the normalized average seasonal gas use for the respective categories of boilers selected. This provided the annual average gas use, number of accounts, and total gas use per seasonal boiler size category.
e. Seasonal annual gas use normalization of the boiler size category accounts was completed.
f. Annual seasonal efficiency of the boiler size categories for each of the combustion efficiency ranges was determined.

g. Costs for boilers of different size were compiled.
h. A TRC analysis was completed for each of the boiler size categories.
i. A similar approached was used for the non-seasonal gas use with the exception of normalizing the data.

TRC Analysis – Seasonal Boiler

The tables below show the TRC savings analysis of the respective combustion efficiency ranges. This includes the MSRP, incremental cost, gas use and savings, as well as the net TRC benefit. The TRC analysis is based on a 'Boiler Replacement' measure using a free-ridership of 10% and measure life of 25yrs.

Table 55: Seasonal Boiler TRC (by Size & Efficiency)

TRC ($)

	Seasonal Boiler Size (MBH IP)				
	300	600	1,000	1,500	2,000
Base (80-82%)	$ -	$ -	$ -	$ -	$ -
(83-84%)	$ 2,721	$ 6,602	$ 14,977	$ 28,889	$ 44,241
(85-88%)	$ 5,200	$ 12,152	$ 22,863	$ 44,123	$ 65,968
(89+%)	$ 3,305	$ 9,402	$ 19,477	$ 41,558	$ 65,061

Table 56: Non-Seasonal Boiler TRC (by Size & Efficiency)

TRC ($)

	Non-Seasonal Boiler Size (MBH IP)				
	300	600	1,000	1,500	2,000
Base (80-82%)	$ -	$ -	$ -	$ -	$ -
(83-84%)	$ 1,532	$ 2,347	$ 2,622	$ 6,353	$ -
(85-88%)	$ 1,177	$ 2,489	$ 5,988	$ 14,340	$ -
(89+%)	$ (1,492)	$ (191)	$ 1,241	$ 6,821	$ -

6.0 LRAM Statement

An LRAM statement was not available at the time this report was published. An addendum to this document will be published that includes an LRAM statement.

7.0 SSM and TRC Statement

7.1 SSM for Market Transformation Programs

Table 57: SSM Market Transformation Programs

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight	Applied Weight	SSM at 100% of Target	2008 SSM
EnerGuide for Fireplaces	$ 80,000	$ 109,092	POP materials in stores	47% increase	50% increase	30%	28%	$100,000	$ 231,200
			Percentage point increase in awareness of label	19 percentage point increase	10 percentage point increase	35%	67%		
			Percentage point increase in label infuence to purchase	39 percentage point increase	10 percentage point increase	35%	137%		

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight	Applied Weight	SSM at 100% of Target	2008 SSM
Home Contractor Performance	$ 90,000	$ 129,023	Contractor training workshop	15	6	20%	50%	$ 100,000	$ 152,867
			Increase in frequency of at least 3 weatherization measures	0.37 increase in average score of at least 3	1.0 increase in average score of at least 3 measures	60%	22%		
			Contractor engagement (participation in workshop)	242	60	20%	81%		

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight	Applied Weight	SSM at 100% of Target	2008 SSM
Boiler Market Transformation	$ 250,000	$ 34,525	% point increase of high efficiency boilers sales	(in progress)	5 percentage point increase	15%	0%	$ 200,000	$145,333 (incomplete, pending final results on market share metrics)
			% point increase of condensing boiler sales	(in progress)	5 percentage point increase	25%	0%		
			Contractor, engineer, & customer awareness	24 percentage point increase	20 percentage point increase	30%	36%		
			Boiler statistical reporting structure	Structure developed and maintained	Continuous tracking	5%	5%		
			Benefit/Cost Sales Tools	Maintained	Maintain & enhance	5%	5%		
			Training Events	2	3	5%	3%		
			Training Participants	110	60	10%	18%		
			Trade Shows	3	3	5%	5%		

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight	Applied Weight	SSM at 100% of Target	2008 SSM
Business Partners	$ 200,000	$ 135,439	a) Percentage point increase in Design Incorporation Plans	5 percentage point increase	5 percentage point increase	25%	25%	$ 50,000	$ 87,625
			b) Identify & Target Top Market Players / Early Adopters	continuous tracking	continuous tracking	5%	5%		
			c) Consulting Engineers / Energy Mgmt Awareness	47 percentage point increase	20 percentage point increase	20%	47%		
			d) Manufacturer / Distributor / Contractor Awareness	44 percentage point increase	20 percentage point increase	20%	44%		
			e) Training Events	6	4	10%	15%		
			f) Training Participants	137	40	10%	34%		
			g) Technical Guides and Case Studies	2	4	10%	5%		

	SSM at 100% of Target	2008 SSM
2008 SSM Market Transformation Programs	$ 450,000	$ 450,000

As can be seen from the table above, each program has its own SSM incentive structure. A SSM incentive dollar amount is specified for each program and a weight is assigned to each of a the program metrics. An applied weight for each

metric is calculated by taking the actual achieved, dividing it by the target and then taking the resulting ratio and multiplying it by the weighted SSM incentive. The example below illustrates this logic.

Table 58: Example SSM Calculation for MT Program

	Total Budget ($)	Actual ($)	Program Metrics	2008 Actual	2008 Target	Weight	Applied Weight	SSM Incentive	2008 SSM
Home Contractor Performance	$ 90,000	$ 129,023	Contractor training workshop	15	6	20%	50%	$ 100,000	$ 152,867
			Increase in frequency of at least 3 weatherization measures	0.37 increase in average score of at least 3	1.0 increase in average score of at least 3 measures	60%	22%		
			Contractor engagement (participation in workshop)	242	60	20%	81%		

2008 SSM = [(15/6 *20%) + (0.37/1 * 60%) + (242/60 * 20%)] * $100,000 = $152,867

7.2 SSM & TRC for Resource Acquisition Programs

7.2.1 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 the customers' incremental equipment cost. 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 OEB Decision in the Natural Gas DSM Generic Issues Proceeding stipulated a change to the TRC target calculation for the multi-year plan period 2007 through 2009[6] . For EGD, the 2008 TRC target was set by taking the average of the 2007 TRC target ($150,000,000) and the actual 2007 audited TRC value as approved by the Board ($163,072,713) and increasing it by 1.5 times the budget escalation factor of 5%. This calculation resulted in a 2008 TRC target of $168,276,583 ($150,000,000 + $163,072,713) x (1/2) x (1 + {1.5x 5%}).

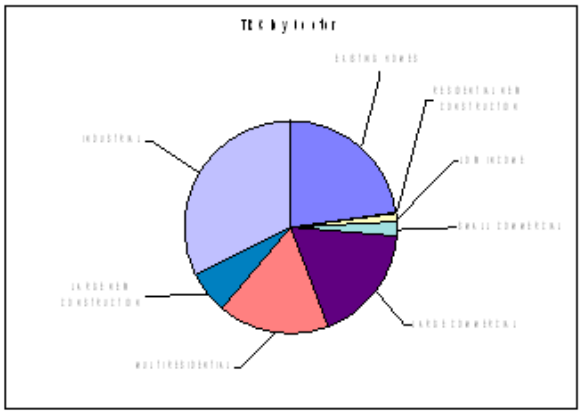
6 EB-2006-0021, Decision with Reasons, Ontario Energy Board, August, 2006, page 25

7.2.2 TRC Results

Table 59: 2008 TRC Results by Sector

EXISTING HOMES	$ 42,913,038
RESIDENTIAL NEW CONSTRUCTION	$ 498,507
LOW INCOME	$ 2,026,817
SMALL COMMERCIAL	$ 4,346,038
LARGE COMMERCIAL	$ 33,112,388
MULTI RESIDENTIAL	$ 32,232,293
LARGE NEW CONSTRUCTION	$ 11,654,781
INDUSTRIAL	$ 61,263,488
Total	**$188,047,350**

Figure 7: 2008 TRC Results by Sector



7.2.3 SSM Claim by Sector

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 the multi-year plan period 2007 through 2009[7].

The SSM for 2008 is structured as follows:

- "For achievement of between 0 and up to 25.0% of the annual target, the SSM payout shall equal $900 for each 1/10 of 1% of target achieved.
- For achievement of greater than 25.0% up to 50% of the annual target, the SSM payout shall equal $225,000 plus $1,800 for each 1/10 of 1% of target achieved.
- For achievement of greater than 50.0% up to 75.0% of the annual target, the SSM payout shall equal $675,000 plus $6,300 for each 1/10 of 1% of target achieved above 50.0%, and
- For achievement of greater than 75.0% of the annual target, the SSM payout shall equal $2,250,000 plus $10,000 for each 1/10 of 1% of target achieved above 75.0% to a maximum of the SSM annual cap."[8]

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

8 Ibid, page 29

- The annual 'cap' of $8.5 million will increase annually by the Ontario CPI as determined in October of the preceding year (i.e., the 2008 cap will increase based on CPI as determined at October of 2007).

CPI rose 2.6% in the 12 months to October 2008[9]. This sets the SSM cap for 2008 at $8.721 million ($8.5million x [1+2.6%]). In accordance with the SSM formula as described, the 2008 SSM calculation is shown in Table 65. The portfolio TRC outcome results in EGD achieving the SSM of $5,551,802 for resource acquisition programs.

The table below provides a summary of the 2008 SSM for all DSM programs other than market transformation programs.

Table 60: 2008 SSM Resource Acquisition Programs

2008 Actual TRC	$	181,769,031
2008 TRC Target		168,276,583

% of Target	% x Target	SSM payouts	SSM
25%	42,069,146	225,000	-
50%	84,138,292	675,000	-
75%	126,207,437	2,250,000	-
100%	168,276,583	4,750,000	-
125%	210,345,729	7,250,000	**5,551,802**
Cap SSM		8,721,000	-

9 Statistics Canada, Consumer Price Index, The Daily, Friday November 21, 2008

8.0 DSMVA Statement

As part of its EB-2006-0021 Decision, the Board agreed 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."

Program spending was less than anticipated in 2008 with a resulting reimbursement to ratepayers of $73,340. This represents a 0.3% variance from the Board-approved budget. The calculation is detailed in Table 63.

Table 61: DSMVA

	2008 Budget	2008 Actual
Residential Markets		
Fixed	681,225	555,469
Variable	6,977,226	9,045,955
Total	7,658,451	9,601,424
Business Markets		
Fixed	2,668,673	1,601,038
Variable	5,534,093	5,514,544
Total	8,202,766	7,115,582
Other		
Market Transformation	950,000	524,883
Program Dev. & Market Research	920,000	685,776
Overhead	5,368,783	5,098,995
Total	7,238,783	6,309,654
Total DSM		
Fixed	10,588,681	8,466,161
Variable	12,511,319	14,560,499
Total	23,100,000	23,026,660
DSM Costs Covered in Rates		23,100,000
DSMVA Adjustment to Ratepayers		**73,340**
Variance from OEB Approved Budget		**0.3%**

9.0 Comments

9.1 Program Changes

Market Transformation: The following Market Transformation programs were not renewed in 2009:

- Business Partners – As a result of challenges encountered in the design of this program and its metrics, as identified in the 2007 DSM Audit (released in June 2008), EGD will be discontinuing this program for 2009. Although the workshops provided by this program were very favorably received, the objective of introducing a large community of HVAC contractors and engineers to emerging technologies and influencing them to specify these technologies with increasing frequency is likely beyond the scope of this program's budget and timeline. EGD will continue to communicate with its HVAC business partners on new and emerging technologies through case studies, workshops/training where appropriate and web-based communications.
- Boiler – As a result of challenges encountered in the design of this program and its metrics, as identified in the 2007 DSM Audit (released in June 2008), EGD will be discontinuing this program for 2009. Acquisition of representative data on sales of these boilers in our franchise area, to fulfill the "ultimate outcomes" metrics, has proven to be particularly challenging, as manufacturers are not prepared to share competitive sales data on a regional level.
- EnergyStar™ front load washers -- Consumers now have a large selection of washers to choose from with the EnergyStar™ label. Research conducted late in 2007 indicated that over 80% of clothes washers on display in a sample of retailers were already ENERGY STAR qualified. The remaining models, according to retailer feedback, were offered to fill the need for a lower-priced model for the more cost-conscious consumer. As a result of this research finding, this program was deemed unnecessary for 2008 and 2009, and therefore cancelled.

Commercial: A prescriptive school program was launched in 2008. This program was based on numerous custom projects conducted with school boards in the past and created to alleviate some of the administrative burden associated with the custom project process. This is of benefit to both the Company and the school boards.

Industrial: The current portfolio of programs is delivering effective results and as such, no Industrial programs were withdrawn in 2008. However, Industrial programs are continuously being fine-tuned. For example, in 2008 a study was completed to investigate steam savings that result from the replacement of faulty steam traps. This and a revised life expectancy for steam traps rejuvenated interest in this aspect of the Steam Saver program. Incentives for energy

assessments were increased to a $10,000 maximum to facilitate customers identifying DSM opportunities and obtaining the information they needed to make informed energy decisions. Metering & Tracking (M&T) programs were extended to smaller customers and an incentive was added to support sub-metering.

Residential: The following Residential program or program elements were not renewed in 2009:

- EnerGuide for new homes. A study was conducted to estimate the savings when comparing a home built to the most recent building code and one built to the EnerGuide standard. The savings did not allow for a positive TRC and it was decided to end the program. Builders who participated in the program were allowed to claim the incentive ($100) until Dec. 31, 2008.
- The installation of pipe wrap was removed from the Low Income program. The incremental costs to address quality control issues surrounding the installation of pipe wrap, did not deliver a sufficient contribution to TRC to warrant the continuation of the pipe wrap measure.

The following Residential programs or program elements were added in 2008:

- A Novitherm reflective panel program was launched in 2008. These panels are placed behind radiators used for space heating in residential homes. Their reflective qualities and shape contribute to space heating energy savings.

Industrial: The current portfolio of programs is delivering effective results and as such, no Industrial programs were withdrawn in 2008. However, Industrial programs are continuously being fine-tuned. For example, in 2008 a study was completed to investigate steam savings that result from the replacement of faulty steam traps. This and a revised life expectancy for steam traps rejuvenated interest in this aspect of the Steam Saver program. Incentives for energy assessments were increased to a $10,000 maximum to facilitate customers identifying DSM opportunities and obtaining the information they needed to make informed energy decisions. Metering & Tracking (M&T) programs were extended to smaller customers and an incentive was added to support sub-metering.

9.2 Market Place & Economy

In 2008, we experienced an economic downturn. The consequences of this downturn had their greatest effect on our customers in the latter half of 2008. By the 4th quarter of 2008 many industrial projects had been completed or were substantially completed. As a result, Industrial gas savings claims for 2008 were not greatly affected by the economic downturn. However, the downturn will have a significant effect on 2009 energy savings projects. For example, the fate of

General Motors and Chrysler, two of EGDs largest industrial gas users, is uncertain. The impact on their suppliers is also uncertain. This is a major concern as the destinies of many of our industrial customers are strongly tied to the automotive industry. Other companies such as Honda introduced reduced operating times in response to declining sales. A few major plant closings occurred in 2008 that will impact potential future projects that EGD had been cultivating. Declining business and reduced operating hours are prevalent amongst many industrial companies as they resort to "survival mode" operation pending determination of how the economy responds. On a more positive note some companies are utilizing this lull in business to implement changes and improvements that were postponed or foregone when more robust business precluded their planned/scheduled shutdowns.

9.3 Success of our DSM Programs

Industrial programs have enjoyed a high degree of success as they have consistently exceeded the targets in the current 3 year plan under which DSM is operating. This success is in largely a result of EGDs unique position as a utility with a sales force that interacts directly with customers to provide technical assistance. These business-to-business relationships have built credibility for the energy recommendations EGD provides resulting in the adoption and implementation of successful energy efficiency and conservation measures. Industrial programs employ the following three pronged approach:

- Provide incentives to assist customers identify energy efficiency and conservation opportunities and to obtain the information to set energy priorities.
- Provide incentives to assist customers to partially defray or offset implementation costs.
- Provide technical support to assist in informed energy decision making, locating needed resources, and supporting implementation of projects.

Compared to Industrial, Residential programs have struggled as, for example, building code legislated changes have impacted on some programs.

9.4 Future Activities

Market Transformation: In 2009 a Drain Water Heat Recovery Market Transformation program will be launched. EGD will learn from the success of the Drain Water Heat Recovery program currently being managed by Union Gas and launch a similar program for EGDs customers.

Residential: The following modifications are expected for Residential Sectors in 2009:

- EGD has initiated a project with the OEB and Union Gas that will develop a preferred approach to achieving the EnergyStar label for new homes. In recognition of the recent release of EnergyStar version 4 and Ontario Building Code 2006 updates for January 1, 2009, a new approach to meeting EnergyStar version 4 requirements needs to be developed in order to ensure positive TRC values from an EnergyStar based program.
- 2009 will be the last year for the High Efficiency Furnace program. With a free ridership level in the 90% range, incentive dollars for this program will be better spent on other DSM programs.
- It is planned to replace pipe wrap with Compact Florescent Lights (CFLs) in the Low Income program.
- A Solar Pool heating program is being investigated. Based on recent research, it appears a Solar Pool heating DSM program could provide positive TRC results and would be welcomed by the market.

Industrial: The following modifications are anticipated for Industrial programs:

- Expanding the current network of business partners
- Building sales & energy savings consulting capacity to provide DSM services with an emphasis on metering & targeting
- More focus on Heating and Ventilating programs
- Enhancing incentives
- Introducing an Industrial 'E-tools' to standardize calculations for Boiler, Process and Heating/Ventilating. This will serve to enhance support provided by our Sales team to our customers.

The following activities are anticipated for Industrial programs:

- EGD is investigating the possibility of acquiring additional funds to support metering & targeting projects where specific TRC is not directly attached to the funding as is currently the case with most DSM funding.
- It is anticipated that EGD will be providing programs responding to increased involvement in renewable energy sources.
- EGD perceives a role to be played in services addressing the impending but as yet to be determined environmental regulations that will impact many of the large industrial customers.

Appendix A: Approved 2008 Assumptions

Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Resource Savings Assumptions			Equipment Life	Incremental Cost		Free Ridership		Notes	Reference
			Natural Gas	Electricity	Water		Customer Installed	Contractor Installed				
			m3	kWh	L	Years			%			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)		(k)	
RESIDENTIAL NEW CONSTRUCTION												
1. Tankless Water Heater	Storage Tank Water Heater	base	237	-	-	20	-	$694	2%		Enbridge	updated
2. Energy Star Home	Home built to OBC 2006	weather	1,018	1,450	-	25	-	$4,701	5%		Union and Enbridge - Values to be used for recording completions under current OBC.	updated
RESIDENTIAL EXISTING HOMES												
1a. Enhanced Furnace (ECM only)	Mid-Efficiency Furnace	weather	(65)	730	-	18	-	$550	15%		Union and Enbridge	EB-2006-0021 Phase II
1b. Enhanced Furnace (Furnace only) & High Efficiency Furnace*	Mid-Efficiency Furnace	weather	385	-	-	18	-	$650	82%		Union and Enbridge - 65% is the 2007 FR rate. 2008 is 82% and 2009 is 90%.	updated
2. Faucet Aerator (kitchen, distributed, 1.5 GPM)*	Average existing stock	base	22	-	7,800	10	$2	-	33% / 31%		Union & Enbridge - Savings per aerato	updated
3. Faucet Aerator (bathroom, distributed, 1.5 GPM)*	Average existing stock	base	6	-	2,000	10	$1	-	33% / 31%		Union & Enbridge - Savings per aerato	updated
4. Low-Flow Showerhead (Per unit, distributed, 1.5 GPM)*	Average existing stock	base	22	-	6,400	10	$4	-	10%		Union	updated
5. Low-Flow Showerhead (Per unit, distributed, 1.25 GPM)*	Average existing stock	base	40	-	10,700	10	$4	-	10%		Union	updated
6a. Low-Flow Showerhead (Per household, installed, 1.25 GPM replacing 2.0 GPM)*	2.0 GPM showerhead	base	33	-	8,900	10	-	$15	10%		Union & Enbridge	updated
6b. Low-Flow Showerhead (Per household, installed, 1.25 GPM replacing 2.1-2.5 GPM)*	2.1 -2.5 GPM showerhead	base	47	-	12,400	10	-	$15	10%		Union & Enbridge	updated
6c. Low-Flow Showerhead (Per household, installed, 1.25 GPM replacing 2.6 + GPM)*	2.6 + GPM showerhead	base	68	-	17,500	10	-	$15	10%		Union & Enbridge	updated
7. Pipe Insulation	Water Heater w/o pipe insulation	base	17	-	-	15	$1	$4	4%		Union & Enbridge	EB-2006-0021 Phase II
8. Programmable Thermostat*	Standard Thermostat	weather	152	26	-	15	$50		43%		Union & Enbridge	updated
9. Tankless Water Heater	Storage Tank Water Heater	base	237	-	-	20	-	$694	2%		Enbridge	updated
10. Reflector Panels	Radiant heat w/o reflector panels	weather	143	-	-	18	-	$213	0%		Enbridge	Enbridge 2007-2009 DSM Plan, updated
LOW INCOME												
1. Faucet Aerator (kitchen, distributed, 1.5 GPM)	Average existing stock	base	22	-	7,800	10	$2	-	1%		Union & Enbridge - Savings per aerato	updated
2. Faucet Aerator (bathroom, distributed, 1.5 GPM)	Average existing stock	base	6	-	2,000	10	$1	-	1%		Union & Enbridge - Savings per aerato	updated
3a. Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.0 GPM showerhead	base	33	-	8,900	10	-	$15	1% / 5%		Union & Enbridge	updated
3b. Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.1 -2.5 GPM showerhead	base	47	-	12,400	10	-	$15	1% / 5%		Union & Enbridge	updated
3c. Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.6 + GPM showerhead	base	68	-	17,500	10	-	$15	1% / 5%		Union & Enbridge	updated
4. Pipe Insulation	Water Heater w/o pipe insulation	base	17	-	-	15	-	$4	1%		Union & Enbridge	EB-2006-0021 Phase II
5. Programmable Thermostat	Standard Thermostat	weather	152	26	-	15	-	$50	1%		Union & Enbridge	updated
6. Weatherization	Existing home sample	weather	1,143	165	-	23	-	$2,600	0%		Union & Enbridge	Enbridge 2007-2009 DSM Plan, updated

Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas m3	Electricity kWh	Water L	Equipment Life Years	Incremental Cost		Free Ridership %	Notes	Reference
							Customer Installed	Contractor Installed			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	
COMMERCIAL NEW BUILDING CONSTRUCTION											
1. Condensing Gas Water Heater	Storage Tank Water Heater	base	1,412	-	-	15	-	$4,200	5%	Food services application	EB-2006-0021 Phase II
2. Rooftop Unit	Standard Rooftop Unit	weather	1,275	-	-	20	-	$1,250	5%	Union	EB-2006-0021 Phase II
3. Tankless Water Heater	Storage Tank Water Heater	base	825	-	-	20	-	$2,200	2%	Food services application	EB-2006-0021 Phase II
4a. Infrared Heaters (0 - 49,999 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	312	-	20	-	$15.40/10^3 BTUH	33%	Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
4b. Infrared Heaters (49,9099 - 164,999 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	624	-	20	-	$15.40/10^3 BTUH	33%	Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
4c. Infrared Heaters (>165,000 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	936	-	20	-	$15.40/10^3 BTUH	33%	Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
5a. Demand Control Kitchen Ventilation (0 - 4999 CFM)	Ventilation without DCKV	weather	3,660	7,229	-	20	-	$5,000	5%	Union & Enbridge - Updated for new OBC	updated
5b. Demand Control Kitchen Ventilation (5000 - 9999 CFM)	Ventilation without DCKV	weather	5,960	22,855	-	20	-	$10,000	5%	Union & Enbridge - Updated for new OBC	updated
5c. Demand Control Kitchen Ventilation (10000 - 15000 CFM)	Ventilation without DCKV	weather	10,910	40,334	-	20	-	$15,000	5%	Union & Enbridge - Updated for new OBC	updated
6. Energy Recovery Ventilators (ERV)	Ventilation without ERV	weather	3.14 m3/CFM	-	-	15	-	$2.50/CFM	5%	Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
7. Heat Recovery Ventilators (HRV)	Ventilation without HRV	weather	2.92 m3/CFM	-	-	15	-	$3.40/CFM	5%	Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
8. Condensing Boilers	Non-condensing Boiler (76% estimated seasonal efficiency)	base	0.0119 m3/BTUH	-	-	25	-	$15.40/10^3 BTUH	5%	Union For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
9. Destratification Fans	No destratification fans	weather	6,205	-511	-	15	-	$7,021	10%	Union	Substantiation Documents provided
COMMERCIAL EXISTING BUILDINGS											
1. Condensing Gas Water Heater	Storage Tank Water Heater	base	1,412	-	-	15	-	$4,200	5%	Food services application	EB-2006-0021 Phase II
2a. Faucet Aerator	Average Existing Stock	base	14	-	6,520	10	$2	-	10%	Enbridge program - Savings per aerato	EB-2006-0021 Phase II
2b. Faucet Aerator (kitchen, distributed, 1.5 GPM)*	Average existing stock	base	22	-	7,800	10	$2	-	10%	Union program - Savings per aerator	updated
2c. Faucet Aerator (bathroom, distributed, 1.5 GPM)*	Average existing stock	base	6	-	2,000	10	$1	-	10%	Union program - Savings per aerator	updated
3. High Efficiency Furnace	Mid-Efficiency Furnace	weather	5.1 per 1000 BTUH furnace capacity	-	-	18	-	$650	17.50%	Union - Based on 75,000 BTUH residential application. Scalable m3 from residential base	EB-2006-0021 Phase II
4. Low-Flow Showerhead (Contractor installed per multi-res. Household).	Average Existing Stock	base	115	-	30,966	10	-	15	10%	Enbridge - Recommended Evaluation Priority	EB-2006-0021 Phase II
4. Low-Flow Showerhead (Per unit, distributed, 1.5 GPM)*	Average existing stock	base	22	-	6,400	10	$4	-	10%	Union	updated
5. Low-Flow Showerhead (Per unit, distributed, 1.25 GPM)*	Average existing stock	base	40	-	10,700	10	$4	-	10%	Union	updated
6 a. Pre-Rinse Spray Nozzle (1.6 GPM)	Average Existing Stock	base	2,434	-	432,800	5	-	$100	5%	Enbridge - Food services application, r	EB-2006-0021 Phase II
6b. Pre-Rinse Spray Nozzle (1.24 GPM)	Average Existing Stock	base	3,059	-	544,145	5	-	$100	5%	Union & Enbridge - Based on same approved inputs as 1.6 GPM unit to determine appropriate savings	Union 2007 Evaluation Report

Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas m3	Electricity kWh	Water L	Equipment Life Years	Incremental Cost		Free Ridership %		Notes	Reference
							Customer Installed	Contractor Installed				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)		(k)	
7. Programmable Thermostats	Standard Thermostat	weather	519	921	0	15	-	$50	20%		Union & Enbridge - Per building.	updated
8. Rooftop Unit	Standard Rooftop Unit	weather	1,275	-	-	20	-	$1,250	5%		Union & Enbridge	EB-2006-0021 Phase II
9. Tankless Water Heater	Storage Tank Water Heater	base	825	-	-	20	-	$2,200	2%		Enbridge - Food services application	EB-2006-0021 Phase II
10a. Enhanced Furnace - up to 299 mbtu/h (ECM only)	Mid-Efficiency Furnace	weather	-0.87 per 1000 BTUH	9.7 per 1000 BTUH	-	18	-	$550	10%		Union & Enbridge - Based on 75,000 BTUH residential application	EB-2006-0021 Phase II
10b. Enhanced Furnace - up to 299 mbtu/h (furnace only)	Mid-Efficiency Furnace	weather	5.1 per 1000 BTUH	-	-	18	-	$650	30%		Union & Enbridge - Based on 75,000 BTUH residential application	EB-2006-0021 Phase II
11. Heat Recovery Ventilator (HRV)	Ventilation without HRV	weather	2.92 m3/CFM	-	-	15	-	$3.40/CFM	5%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
12. Energy Recovery Ventilator (ERV)	Ventilation without ERV	weather	3.14 m3/CFM	-	-	15	-	$2.50/CFM	5%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
13. Condensing Boilers	Non-condensing Boiler (76% estimated seasonal efficiency)	base	0.0119 m3/BTUH	-	-	25	-	$15.40/$10^3$ BTUH	5%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
14a. Infrared Heaters (0 - 49,999 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	312	-	20	-	$15.40/$10^3$ BTUH	33%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
14b. Infrared Heaters (49,9099 - 164,999 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	624	-	20	-	$15.40/$10^3$ BTUH	33%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
14c. Infrared Heaters (>165,000 BTUH)	Unit Heater	weather	0.0102 m3/BTUH	936	-	20	-	$15.40/$10^3$ BTUH	33%		Union - For use with Union Gas Quasi Tool, Updated for new OBC	Union 2007-2009 DSM Plan
15a. Demand Control Kitchen Ventilation (0 - 4999 CFM)	Ventilation without DCKV	weather	3,660	7,319	-	20	-	$5,000	5%		Union & Enbridge	Union 2007-2009 DSM Plan
15b. Demand Control Kitchen Ventilation (5000 - 9999 CFM)	Ventilation without DCKV	weather	9,535	23,180	-	20	-	$10,000	5%		Union & Enbridge	Union 2007-2009 DSM Plan
15c. Demand Control Kitchen Ventilation (10000 - 15000 CFM)	Ventilation without DCKV	weather	17,455	40,929	-	20	-	$15,000	5%		Union & Enbridge	Union 2007-2009 DSM Plan
16a. Air Curtains (Single Door)		weather	2,118	172	-	15	-	$1,650	5%		Enbridge	Enbridge 2007-2009 DSM Plan - updated
16b. Air Curtains (Double Door)		weather	4,508	1,023	-	15		$2,500	5%		Enbridge	Enbridge 2007-2009 DSM Plan - updated
17. Destratification Fans	No destratification fans	weather	6,205	-511	-	15	-	$7,021	10%		Union - Minimum ceiling height 25'	Substantiation Documents provided
18. Energy Efficient Washers	Conventional top loading washers.	base	342	306	90,790	10		$450	10%		Enbridge	Enbridge 2007-2009 DSM Plan
19a. Prescriptive Schools (Elementary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%.	base	10,830	-	-	25		$8,646	100% (net to gross)		Enbridge: net to gross value is consistent with EGD Commercial sector	Substantiation Documents provided
19b. Prescriptive Schools (Secondary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%.	base	43,859	-	-	25		$14,470	100% (net to gross)		Enbridge: net to gross value is consistent with EGD Commercial sector	Substantiation Documents provided

Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas m3	Electricity kWh	Water L	Equipment Life Years	Incremental Cost		Free Ridership %		Notes	Reference
							Customer Installed	Contractor Installed				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)		(k)	
COMMERCIAL/INDUSTRIAL CUSTOM PROJECTS												
1. Custom Projects			Actual	Actual	Actual	Actual	-	Actual	By sector from S.B. Report (dated Oct., 2008)			
Union Gas									**Free Ridership**			
Agriculture*									0%		Union	updated: Summit Blue Custom Projects Attribution Study
Industrial*									Results from SB Dec'08 Study		Union	
Commercial*									59%		Union	updated: Summit Blue Custom Projects Attribution Study
Multi-Residential*									42%		Union	updated: Summit Blue Custom Projects Attribution Study
New construction*									33%		Union	updated: Summit Blue Custom Projects Attribution Study
Enbridge Gas									**Free Ridership**			
Agriculture									40%		Enbridge	updated: Summit Blue Custom Projects Attribution Study
Industrial									50%		Enbridge	updated: Summit Blue Custom Projects Attribution Study
Commercial									12%		Enbridge	updated: Summit Blue Custom Projects Attribution Study
Multi-Residential									20%		Enbridge	updated: Summit Blue Custom Projects Attribution Study
New construction									26%		Enbridge	updated: Summit Blue Custom Projects Attribution Study
OTHER MEASURES									Free Ridership			
1. CFL (13W)	60W Incandescent	n/a	0	45	0	8	$1.75		24%		Enbridge	Substantiation documents provided
2. CFL (23W)	75W Incandescent	n/a	0	49.7	0	8	$2.00		24%		Enbridge	Substantiation documents provided

Indicates no input assumption update.
New measure

THE CADMUS GROUP, INC.

Report

Independent Audit of 2008 DSM Program Results

Prepared for:

Marco Spinelli, DSM Research and Evaluation
Enbridge Gas Distribution

The Cadmus Group, Inc.
Energy Services
720 SW Washington Street, Suite 400
Portland, OR 97205
503-228-2992

Revised

July 9, 2009

THE CADMUS GROUP, INC.

Prepared by:
Brian Hedman
Ben Bronfman, Ph.D.

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Introduction and Overview

The Cadmus Group (Cadmus) was retained by Enbridge Gas Distribution (Enbridge), in consultation with the Enbridge Audit Committee (EAC), to conduct an audit of the Enbridge 2008 DSM Annual Report. Cadmus staff reviewed calculations and assumptions, background material and supporting documentation, and internal Enbridge processes and procedures.

Cadmus' Approach to the Scope of Work

Our approach to the scope of work addresses five concerns:

- Are the inputs to the savings financial calculations based on assumptions approved by the Ontario Energy Board (OEB)? Are they gathered and documented in a reliable manner? Are they consistent with the best available current information?
- Are market effects adequately tracked and attributable? Are baseline data collected and available?
- Are the economic and financial calculations accurate and based on agreed-upon rules, protocols, and procedures? If not, where are the differences and to what can the deviations be attributed?
- Are the SSM, DSMVA, and LRAM calculations accurate and consistent with methodology and assumptions approved by the OEB? If not, where are they different?
- Are savings, free-ridership, and measure life assumptions consistent with the best available current information?

Cadmus Approach to the Audit

The Cadmus approach to this audit involved the following general activities:

- Review of documents including memos, reports, filings and third-party assessments. (A list of documents reviewed is included in Appendix A.)
- Review and verification of EAC recommendations and Enbridge responses from the 2007 audit (included as Appendix B).
- In-person and telephone discussions with Enbridge staff.
- Meetings with Enbridge and EAC.
- "Live" Internet meetings and presentations of tracking databases and spreadsheet calculations.
- Detailed, in-person "walkthroughs" of program participation processes and quality assurances procedures.
- Follow-on telephone discussions with Enbridge staff, report, and with the authors of , reports, and other documents, as document authors, where necessary.

Key Meetings and Discussions

The Cadmus team met with Enbridge staff and the Evaluation and Audit Committee (EAC) on February 24 and 25, 2009, to review the scope of work, collect initial documents, and gain an overview of the Enbridge DSM programs, data collection methodologies and systems, and the audit function.

Subsequent to that meeting, Cadmus and Enbridge staff conducted weekly or bi-weekly status-update phone calls, and they communicated via e-mail on a regular basis. Cadmus submitted more than 30 requests for information and clarification to Enbridge during the course of the audit, and Enbridge was diligent in providing timely response to the requests. (A list of questions submitted and Enbridge's responses are included as Appendix B.)

Our review of Enbridge program processes, data tracking, and oversight activities identified several areas reflective of industry best practices, among which are:

- The development of a free-ridership methodology for commercial and industrial custom measures
- The development and continual improvement of the E-Tools custom project screening tool, and
- Program QA/QC procedures, especially with regards to third-party implementation of residential direct install programs

On March 3 and 4, 2009, Enbridge hosted discussions between Cadmus and the commercial and industrial engineering review firms BII and Genivar to discuss the draft custom project reviews.

On May 5, 2009, Cadmus staff again met with Enbridge staff and the EAC in Toronto to review the final work plan. Following that meeting, bi-weekly conference calls with Enbridge staff and the EAC were conducted to discuss audit issues as they arose during report preparation.

The Cadmus team reviewed all programs included in the Total Resource Cost (TRC) calculation. The review was tiered according to the total claimed savings by the program and any issues identified in past audits. We compared the prescriptive savings with weather-adjusted savings for like measures in other jurisdictions.

Based on this initial review, we identified the following programs and measures for more in-depth analysis:

- Showerheads
- Pre-rinse spray nozzles
- Custom engineering studies
- Prescriptive boiler savings

Findings and Opinion

For the calendar year ended December 31, 2008, Cadmus has audited the following:

- Demand-Side Management (DSM) Annual Report
- TRC (Total Resource Cost) savings
- Shared Savings Mechanism (SSM)
- Lost Revenue Adjustment Mechanism (LRAM)
- Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution

The DSM Annual Report and the calculations of TRC, SSM, LRAM, and DSMVA are the responsibility of Enbridge's management. Our responsibility is to provide 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. We followed directions given to us by the Evaluation and Audit Committee of Enbridge Gas Distribution with respect to the scope, depth, and focus of our audit. The audit included examining evidence (on a test basis) that supported the amounts and disclosures in the DSM Annual Report as well as the calculations used to determine the numbers proposed for TRC, SSM, LRAM, and DSMVA. The audit also included assessing assumptions used and methods of recording and measuring information. 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 described there.

In our opinion, and subject to the qualifications set forth above, the following figures are calculated (1) using reasonable assumptions, based on data gathered and recorded via methods that are reasonable and accurate in all material respects, and (2) following rules and principles established by the OEB and applicable to the 2008 DSM programs of Enbridge Gas Distribution:

TRC Savings	$182,706,679
SSM Amount Recoverable (Resource Acquisition)	$5,607,522
SSM Amount Recoverable (Market Transformation)	$318,825
LRAM (Recoverable from Ratepayer)	$37,291
DSMVA Amount Recoverable	$(73,340)

Table 1, on the following page, lists the individual program changes reflected in the final SSM, LRAM, and DSMVA amounts. SSM savings were adjusted only by the incorporation of the agricultural realization rate into the overall commercial realization rate, as noted in the custom commercial and industrial program discussion below.

Table 1. Adjusted TRC and LRAM Savings

Program Area	Participants	Gas Savings (m3)	DSM Fixed and Variable Costs	Net TRC Results	Adjusted Net Gas Savings (for LRAM)	Adjusted Net TRC Results (for SSM)
Existing Homes	934,150	14,857,208	8,281,218	$43,113,761	13,551,951	$43,113,761
Residential New Construction	1,768	1,709,833	320,693	$498,507	1,709,833	$498,507
Low Income	17,317	584,712	996,085	$1,184,153	499,055	$1,184,153
Total Residential	**953,235**	**17,151,753**	**9,597,996**	**$44,796,421**	**15,760,840**	**$44,796,421**
Small Commercial	1,040	2,229,460	477,251	$4,346,038	825,073	$4,346,038
Large Commercial	219	15,390,429	1,688,426	$33,112,388	15,613,113	$33,559,011
Multi-Residential	23,737	17,654,343	2,181,397	$32,232,293	17,678,287	$32,771,114
Large New Construction	59	3,485,097	570,519	$11,654,781	3,529,074	$11,667,996
Industrial	140	23,871,775	2,197,990	$61,411,882	23,846,594	$61,350,871
Total Business Markets	**25,195**	**62,631,104**	**7,115,583**	**$142,757,382**	**61,492,141**	**$143,695,030**
Market Transformation Programs			528,311			
Program Development and Market Research			685,777	($685,777)		($685,777)
Overheads			5,098,995	($5,098,995)		($5,098,995)
Total All Programs	**978,430**	**79,782,857**	**23,026,662**	**$181,769,031**	**77,252,981**	**$182,706,679**

Table 2 lists the individual measure assumptions that were incorporated in the adjusted LRAM gas savings.

Table 2. LRAM Savings Adjustments

LRAM Savings Changes	2008 Draft Annual Report		Adjusted per Audit		Comment
Measure	Savings per Unit (m3)	Free-ridership	Savings per Unit (m3)	Free-ridership	
EXISTING RESIDENTIAL					
TAPS Partners Program - Kitchen Aerators	22	31%	23	31%	Navigant Report
TAPS Partners Program - Pipe wrap	17	4%	18	4%	Navigant Report
Furnace Replacements	385	82%	385	90%	Navigant Report
Thermostats ($15)	152	43%	53	43%	Navigant Report
RESIDENTIAL NEW CONSTRUCTION					
EnergyStar for New Houses	1,018	5%	1,018	5%	Navigant Report
LOW INCOME					
LI TAPS Partners Program - Pipe wrap	17	1%	18	1%	Navigant Report
LI TAPS Partners Program - Kitchen Aerators	22	1%	23	1%	Navigant Report
LI Prog Thermostats	152	1%	53	1%	Navigant Report
LI Weatherization program	1,143	0%	1,134	0%	Navigant Report
SMALL COMMERCIAL					
Air Doors	2,118	5%	667	5%	Navigant Report
Restaurants - CKV	3,660	5%	4,801	5%	Navigant Report
Restaurants - CKV2	5,960	5%	11,486	5%	Navigant Report
Restaurants - CKV3	10,910	5%	18,924	5%	Navigant Report
Restaurants - PRSV	3,059	5%	886	5%	Navigant Report - Large Restaurant
Rooftop Units	1,275	5%	255	5%	Navigant Report
Tankless Water Heaters	825	2%	154	2%	Navigant Report
Programmable thermostats	519	20%	310	20%	Navigant Report - Average

Table 3 illustrates the calculation of the SSM amount. The Market Transformation SSM in the original calculation is capped at the $450,000.

Table 3. SSM Calculation

	Original	Adjusted for Audit
2008 Actual TRC	$181,769,031	$182,706,679
2008 TRC Target	$168,276,583	$168,276,584
Percent of Actual	1.08	1.09
Base Target	75%	75%
Percent over 75%	33.02%	33.58%
$ per 1/10 of 1 %	10,000.00	10,000.00
SSM @ 75%	$2,250,000	$2,250,000
$ @ 10,000 per 1/10 of 1 % over 75%	$3,301,802	$3,357,522
Total Program Related	$5,551,802	$5,607,522
Market Transformation	$450,000	$318,825
Total SSM	**$6,001,802**	**$5,926,347**
Market Transformation Detail		
Energuide	$231,200	$231,200
Home Contactor	$152,867	
Boiler Market	$145,333	
Buisness Partners	$87,625	$87,625
Total	$617,025	$318,825

Review of Shared Savings Mechanism (SSM) Calculations

Cadmus reviewed the SSM from two perspectives. The first was whether calculations in the Total Resource Cost (TRC) spreadsheet were correct. (That is, we checked for any mechanical errors in the spreadsheet.) The second was whether inputs to the TRC spreadsheet were accurate and reasonable. Discussion of the inputs follows in individual program sections below.

TRC Spreadsheet Calculations

Cadmus reviewed the individual cells to assure the mathematical formulations were correct:

- Gross savings were a product of participation and unit savings.
- Net savings for prescriptive measures were a product of gross savings, free-ridership, and reduction factors for deemed-savings measures.
- Net savings for customer projects were a product of gross savings, the realization rate determined by the commercial and industrial studies, and the free-ridership rate:
    - Net savings for projects selected as part of the commercial and industrial samples were calculated as the product of savings determined by the respective study and the free-ridership rate.
    - Net savings for prescriptive school projects were calculated as the product of the prescriptive savings estimate and the free-ridership rate.
- Total benefits were the net present value of the product of net savings and the appropriate avoided cost value, based on the project's characteristics:
    - Gas, electricity and water.
    - Measure life.
    - Dominant end use (water heat, space heat, combined or industrial).
- Net incremental costs were calculated as the product of the number of participants, the per-unit incremental costs, and the free-ridership rate
- Net TRC benefits were calculated as the difference between the avoided costs and the sum of net participant costs and direct program costs. Direct program costs include:
    - Incentive payments for the cancelled EnerGuide for New Houses program.
    - Costs associated with market transformation programs.
    - Costs associated with program development and market research.

Review of DSMVA Calculations

The draft DSM Annual Report for 2008 compares budgeted 2008 DSM expenditures with expenditures that actually incurred. Cadmus reviewed the OEB-approved three-year plan and confirmed the budgeted expenditures used in the DSMVA calculations match the plan. We also confirmed the 2008 actual expenditures in the DSMVA calculation matched the total DSM O&M included in the TRC worksheet. Our review did not include an audit of Enbridge's accounting records that form the basis of the DSM O&M amounts in the TRC worksheet.

Review of LRAM

Cadmus reviewed the LRAM spreadsheet provided by Enbridge. The review included a Web-conference, during which Enbridge staff walked the Cadmus team through the calculations. We find the LRAM spreadsheet accurately calculates the LRAM adjustment. On April 16, 2009, Navigant Consulting presented a comprehensive recommendation for measure savings to the OEB. With the exception of showerhead estimates (discussed below), we recommend adopting these savings for calculating the LRAM, as they represent the most current available savings estimates. This adjustment decreases the m^3 saved to 77,252,981 for LRAM. Table 4 illustrates the final LRAM adjustment amount.

Table 4: LRAM Calculation

2008 Audit Report LRAM Calculation						
	based on	56,244,500	FE m3 built into rates			
Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin	$	
Rate 1	8,246,394	6,950,851	1,295,544	~~7.6921~~	~~$ 99,654~~	-59%
Rate 6	7,148,028	9,559,194	(2,411,166)	~~4.0023~~	~~$ (96,501)~~	109%
Rate 100	5,703,303	7,408,034	(1,704,731)	2.9427	$ (50,165)	77%
Rate 110	2,019,518	1,040,042	979,475	1.6537	$ 16,197	-44%
Rate 115	1,285,148	2,167,715	(882,567)	1.0185	$ (8,989)	40%
Rate 145	1,780,944	1,580,389	200,556	1.9481	$ 3,907	-9%
Rate 170	4,282,436	3,968,053	314,383	0.5595	$ 1,759	-14%
Totals	**30,465,771**	**32,674,277**	**-2,208,507**		**~~$ (34,137)~~**	
					$ (37,291)	

TRC Inputs

Prescriptive Savings Programs

In the residential sector we reviewed the following programs:

- TAPS
- Residential Equipment Replacement
- Residential New Construction
- Low Income

Our review consisted of a measure-by-measure comparison of the deemed values with savings assumptions used in other jurisdictions, most notably from Iowa (where Cadmus completed a statewide DSM potential study and program design effort in 2008) and, to a lesser extent, the California Database for Energy Efficient Resources (DEER). The savings for weather-dependent measures were adjusted to reflect the difference in heating degree days between Iowa and Ontario. Except where noted below, we found the savings, free-ridership, reduction factors, and measure lives to be consistent with both OEB-approved assumptions and the assumptions employed in other jurisdictions.

Showerhead

While the showerhead savings values were within the range of those used in other jurisdictions, this measure was the source of some debate in the last audit. Ultimately, Enbridge updated the savings to those determined by Summit Blue in its report titled "Resource Savings Values in Selected Residential DSM Programs" (dated June 4, 2008). Subsequent to completion of that report, Enbridge commissioned a study conducted by the SAS Institute of Canada, which found savings to be higher than those in the Summit Blue study. However, the SAS report notes:

> *For a more accurate extrapolation of yearly consumption, the SAS team recommends this analysis be redone after one year post-installation data are available. Further, control households with no low-flow showerhead installation should be included.*

We concur with the SAS recommendation, in particular the absence of a control group substantially increases the uncertainty of the findings. Using a larger sample size, longer post-installation data, and a control group would yield a more accurate estimate. In the interim, we recommend continued use of the Summit Blue estimates for the 2008 and 2009 SSM and LRAM calculations. We recommend that an updated study be performed before the 2010 program and that the resulting savings estimates be filed for approval with the OEB

We confirmed the participants reported in the DSM Annual Report represent households rather than showerheads installed. Savings assumptions in the TRC calculation are correct on a per-household basis.

Novitherm

The Novitherm savings estimation suffers from the same deficiencies noted by the SAS Institute in its estimation of showerhead savings. Notably, the study would benefit from a full year of post-installation data and a control group that did not have Novitherm panels installed. The use of a control group is necessary to account for exogenous impacts, such as economic changes. We

recommend a more comprehensive evaluation of this technology. Pending further evaluation, the OEB-approved savings estimate should continue to be used for SSM and LRAM calculations

EnergyGuide for New Houses

This program was rendered impotent in 2008 due to changes in the Ontario furnace standards. Enbridge did not include the program in its 2008 filing for program assumptions before the OEB; however, the OEB did not act on that application until December of 2008. As a result, the program continued to see participation through October of 2008. The consequence of the OEB ruling is that Enbridge did not have an approved program for 2008. For the 2008 Annual Report , Enbridge has excluded all savings and participant costs from the TRC, SSM and LRAM calculations; however, the program costs it incurred are included.

ENERGY STAR® for New Houses

The savings estimates for ENERGY STAR® for New Houses are comparable to those employed in other jurisdictions; however, we believe the free-ridership value is unrealistic. Typically, ENERGY STAR® residential new construction programs consist of two incentives:

- First, there is an incentive paid to the builder that covers the cost of certifying the home, and this certification incentive is typically about $400.
- Second, some portion of the incremental cost associated with meeting ENERGY STAR® savings criteria is provided as an incentive, and this incentive, which varies with the measures installed, may be several thousand dollars.

The program currently offers a $100 incentive to builders who have their homes certified as meeting the ENERGY STAR® standard. Enbridge has indicated it costs builders between $300 and $600 to have the homes certified. Because the certification cost is significantly higher than the incentive provided and no incentive is offered for the incremental cost of meeting ENERGY STAR® specifications, it is unlikely the incentive is a motivating factor. Enbridge has supported the ENERGY STAR® program since its inception through workshops and other promotional activities. Although this support has likely impacted the market beyond the program participation and $100 incentive, direct attribution of savings is difficult to determine.

For the 2008 program year, in the absence of specific research on free-ridership, the savings and attribution have been unchanged from the OEB-approved values; however, it is highly likely that the free-ridership under the current program design is significantly higher than the 5 percent approved by the OEB.

We recommend that Enbridge undertake a detailed free-ridership analysis and process evaluation of the program. The analysis should incorporate participating and non-participating builders and home buyers to determine the motivation behind building and purchasing ENERGY STAR® homes. Alternate program designs should be considered, including those providing incentives to cover a portion of the incremental cost of building to ENERGY STAR® specification and the certification process.

Prescriptive measures were installed in the following commercial programs:

- Small Commercial
- Multi-Residential

- Schools

Except where noted below, we found the savings, free-ridership, reduction factors, and measure lives to be consistent with OEB-approved assumptions and common industry practices.

Prescriptive Boilers in Schools

The savings for the prescriptive boiler program are based upon two reports by Agviro. These reports were reviewed as part of the previous (2007) audit, and Cadmus engineering staff reviewed them again for the 2008 audit. Results were based upon billing data analysis and modeling using E-Tools. No substantive flaws in the analysis were identified in either review.

However, we note that the demonstrated ease of use of E-tools for the custom commercial program suggests that a custom approach for this sector may be viable and would increase the confidence in the savings assumptions. We also note that the underlying reason for the Agviro report (published in 2007) was that "custom programs require significant supporting documentation to meet regulatory requirement (sic). In many cases it is difficult for the customer to estimate base case costs and incremental costs."[1] Enbridge's own statistics show a substantial number of schools involved in some custom projects (see Table 5), and the 2008 statistics appear to indicate that the burden of participation in custom projects is moot.

Table 5. School Participation in Enbridge Programs

	2007	2008
All Projects	46	96
Boiler Projects	45	57
Prescriptive Boiler Projects	29	48

We recommend accepting the 2008 claims for this program. However, we also recommend initiating a parallel custom savings calculation for schools and revisiting the program design in 2010, in the light of these additional data.

Custom Savings Programs

Custom savings program verification was undertaken by BII for commercial programs and by Genivar for industrial programs. These studies and the supporting documentation were reviewed by Cadmus engineering and audit staff. Both studies employed Summit Blue's recommended methodology for sampling.

We note that free-ridership factors were agreed upon, based on the 2008 study conducted by Summit Blue Consulting. A review of the study and a discussion with the authors confirmed the free-rider ratios were savings-weighted numbers based on surveys of 2007 program participants. It is entirely possible—even likely—the 2008 cohort is sufficiently different from the 2007 cohort that the ratios are no longer applicable and, thus, should be applied to individual projects with caution. Yet, in the absence of a new study, we accept the 2007 numbers for the 2008 participant group.

[1] Agviro Inc, Secondary Schools Prescriptive Savings Analysis, November 23, 2007, p. 1

The realization rate for agriculture custom projects was incorporated into the industrial program realization rate in the draft Annual Report. The sampling protocol developed by Summit Blue as a result of the 2007 audit incorporated the agriculture sample realization rates with the commercial projects. We recommend removing the agriculture realization rates from the industrial program and incorporating them in the commercial program to be consistent with the sampling protocol. This recommendation affects both the SSM and LRAM calculations.

Custom Commercial Programs

For commercial custom programs, the BII study did the following:

- examined 22 projects
- focused on verifying the input assumptions to E-Tools
- employed engineering reviews
- Conducted follow-one telephone conversations with customers

Adjustments were made to gas savings as well as to electric and water savings. BII reviewed Enbridge files, developed and included file review forms, replicated calculations (where necessary), and documented reasons for recommended changes to savings.

The study and supporting documentation were reviewed by audit engineering staff and found to be reasonable and consistent with standard industry practices. Some calculations were again replicated by staff, and no discrepancies were found.

While it is standard practice to use telephone verification for prescriptive and small custom projects, on-site verification is usually required for large and/or complex projects. We note that the sampling strategy accepted by Enbridge[2] involves dropping small projects from the sample frame and sampling from the largest stratum of projects. Verification site visits would increase the validity of the verification—although it may not change the results—and bring the verification effort up to industry best practices. We also note that water savings were adjusted by 38 percent because the verification contractor identified water savings that were not included in the initial Enbridge project savings estimate. From a statistical perspective, projecting the adjustment to the population of custom commercial projects is correct. However, it might also suggest a systematic under-reporting of water savings. . We encourage Enbridge to explore this issue for future program reporting.

The measure lives for the Large New Construction projects are currently listed as 25 years, and this measure life is approved for shell and boiler measures, which make up the majority of the savings. (However, other commercial measures have measure lives ranging from 10 to 20 years.) While we did not review the project files for commercial projects, it would be typical for such projects to have a very high percentage of savings resulting from the 25-year measures. Consequently, the impact of reducing the savings life by 5 to 15 years for a small fraction of the total savings will have a negligible impact on the overall SSM calculation. Nonetheless, we recommend that a weighted measure life be calculated for projects that have measures other than shell and boilers, based on the savings contribution of each technology for future TRC and SSM calculations.

We accept the realization rates determined by the BII study.

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[2] Memorandum, **Sample Selection for 2008 Custom Projects,** Summit Blue Consulting, December 19, 2008.

Custom Industrial Programs

A verification study was commissioned by Enbridge for industrial programs. The study, produced by Genivar, examined 15 industrial and 3 agricultural sites and included document reviews, site visits, verification of input assumptions, and examination of operating conditions. The terms of reference requires the consultant to ". . . review the input assumptions and replicate the engineering algorithms to verify that the savings and costs were correctly calculated."

Cadmus staff reviewed the Genivar report and determined that the report lacked descriptions of the verified engineering algorithms, baseline conditions, and equipment installed, which would allow for an adequate audit. Cadmus then discussed the report with Genivar staff members, who confirmed that they had relied on Enbridge's files to confirm the engineering savings estimates and that no additional back-up was available.

Enbridge provided Cadmus the detailed projects files, including input assumptions, detailed project descriptions, E-Tools screen shots, equipment descriptions, equipment invoices, savings calculations, measure costs, and incentives. Cadmus engineering staff then independently reviewed a sample of input assumptions and calculations and compared them to the Genivar conclusions. No differences or exceptions were noted.

We conclude that the savings estimates and adjustments made by Genivar are reasonable and consistent with current practice in the industry. The study and supporting documentation were reviewed by Cadmus staff and, together they provide a reasonable review, consistent with current industry practices. We accept the realization rates determined by the Genivar study. However, we recommend that, going forward, more systematic documentation and back-up be provided as part of the verification report.

Market Transformation Programs

A critical component of measurement of market transformation programs is the establishment of meaningful metrics that indicate a program is on a logical trajectory to transform the market, coupled with defensible market indicators (including equipment sales and surveys of current practice). The 2007 audit recommended a more systematic review of current indicators and the development of program logic models to develop performance metrics. Additionally, a recommendation was made to base claims on whether changes in current metrics were statistically significant. However, (1) no logic models were developed, (2) nor were any new indicators or metrics, (3) nor were any measures of statistical significance reported for assessing changes in current indicators.

We are also concerned with the weighting of the metrics and the treatment of metrics that exceed goals. For example, the Business Partners program includes a metric of targeting early adopters and top market players, but it assigns only a 5-percent weight to the metric. This metric is implicitly tied to a program theory based on diffusion of innovation, but does not appear to be appropriately weighted. On the other hand—as noted in the 2007 audit—program activities (such as number of workshops) are given substantial weight even though they may not be indicators of market transformation program effects.

Finally, the approved weighting structure allows for less-relevant metric performance to be exceeded and disproportionally contribute to SSM claims.

Consider the metrics, performance, and contribution to SSM of the Home Performance Contractor Market Transformation Program (Table 6).

Table 6. Metric reports, Weights and Performance

Metric	2008 Reported	2008 Target	Weight	Metric Performance	SSM
Contractor Training (events)	15	6	20%	250%	$50,000
Increase in Weatherization Frequency	.37	1	60%	37%	$22,200
Number of Participating Contractors	242	60	20%	403%	$80,667

Exceeding the number of workshops offered and the number of workshop attendees results in these two metrics contributing 85% toward the SSM, even though the metrics themselves might be inappropriate as market transformation progress indicators. For these reasons, the Market Transformation portfolio claims for 2008 suffer from the same shortcomings as the 2007 portfolio.

EnerGuide for Natural Fireplaces

Enbridge conducted a study of 357 purchasers of gas fireplaces. Results showed a substantial increase in awareness from previous surveys (80 percent of respondents up from 61 percent). Additionally, 74 percent of customers indicated that the label had an influence on their purchase decision. While the numbers are not tests of statistical significance, on face, the numbers appear to validate the SSM claim.

The method for gathering information from purchasers changed from the 2007 to the 2008 report. In 2007, customers were contacted by telephone at some time after the purchase had been made. In 2008, customers were intercepted in the store and offered a $50 inventive to participate in the survey.

There are essentially two major issues that could impact comparison survey results over time:

- changes in the survey instrument itself
- changes in the administration of the survey

Cadmus has confirmed that the wording of the questions for the metric has not changed. The issue for the audit is whether the survey implementation methodologies could have impacted the results.

Unfortunately, there is no clear answer. Intercept surveys are used in evaluation research because they provide immediate feedback when purchase decisions are fresh in consumers' minds. As such, they are very appropriate for a point-of purchase program such as EnerGuide for Natural Gas Fireplaces. Telephone surveys, while more common, have the disadvantage of introducing non-response bias (the incentive provided customers in the intercept situation are targeted at decreasing this bias), as well as giving customers more time to think about the decision and perhaps overestimate the program effect by rationalizing decisions already made. Or customers may have forgotten the reasons for making the original decision, and so they offer what they think is a socially acceptable response.

What we do know, however, is that a consistent approach to tracking and survey implementation produces the most reliable results over the long run. We recommend that Enbridge continue the current approach for this program, and we propose no changes to the 2008 claims.

Home Performance Contractor Market Transformation

Enbridge conducted surveys with attendees of a workshop for contractor and then conducted follow-up surveys some months later. Based upon self-reports from participants who responded to both initial and follow-up surveys (72 sets), Enbridge reported an increase of 0.37 (out of a 5-point scale) in the frequency of the top three weatherization measures.

While some progress may be attributable the survey participants, this study has several flaws, amongst which are:

- lack of clarity as to how this program and these changes would affect the market
- lack of comparable baseline data from nonparticipating contractors
- lack of measures of statistical significance in the metric change

For these reasons, we do not support the SSM claim for this program.

Boiler Market Transformation Program

This program appears to be unchanged from the 2007 program, for which the previous auditor recommended no SSM payments. The relationship of the metrics to market transformation has not been clarified, nor has the relative weighting of the metrics. The survey of workshop participants immediately before and immediately after the workshop is not a reasonable indicator of retention of information and future action. Changes in levels of awareness were reported by percentages, but no indication of the number of participants was included in either the annual report or the Enbridge presentation of results.

For these reasons we recommend, again, that the SSM claim for this program be rejected.

Business Partner Market Transformation

This program shows substantial improvement, as it now includes follow-up surveys to verify post-workshop behavior and an implicit program theory (as indicated by the inclusion of a metric entitled "identify and target top market players/early adopters" as part of the approved metrics). Enbridge identified 248 "top HVAC design and installation firms" for the 2008 program, in addition to those identified in 2007.

Enbridge conducted follow-up surveys with 2007 workshop participants, focusing on air-doors and DCV. Surveys included information on measure recommendations since the seminars. Participant behavior was broken out by respondents who had never recommended the measures before the seminars and respondents who had recommended them previously but were now recommending them more frequently.

Results showed what appeared to be a significant increase in new recommendations for these two measures in both groups (although no statistical measures of significance were presented).

Additional workshops were held in 2008 with another set of business partner representatives. Once again, immediate pre- and immediate post-workshop surveys were implemented. We question the usefulness of these surveys by themselves, but recognize their value for future evaluations.

Because of the improvement in program and evaluation design and in the development of linkages to program and market transformation theory, we support the SSM claim for this program.

Recommendations

Based on the audit, we offer the following recommendations for Enbridge:

Change the measure life assumption for steam traps to six years for LRAM until better data are available. The six-year measure life, which is the most recent update to the California DEER database, is a number weighted for high-, medium-, and low-pressure applications. Current Enbridge documentation supporting an increase in steam trap measure life from three to 13 years is based on analysis of four sites, and it uses a straight line projection rather than the industry-standard logistic curve for survival functions. Enbridge could calculate a utility-specific steam trap Effective Useful Life (EUL) estimate by simply (1) gathering data on the age of replaced steam traps on the next 100-150 replacements, as part of the current custom programs, and (2) applying a conventional statistical package to the data (for example, SAS PROC LIFETEST). We encourage Enbridge to undertake this activity. This recommendation affects the SSM in future years.

Update the SAS shower head load study pursuant to the recommendations included as part of the report. These recommendations include (1) performing re-analysis after one-year post-installation data are available, and (2) employing a comparative household sample with no installation (to control for trends).

Conduct a comprehensive evaluation of the Novitherm program. As noted in the Novitherm review, savings estimates suffer from similar shortcomings as those identified in the showerhead study. We recommend analysis using a full year of post-installation gas usage, as well as the inclusion of a control group.

Remove the agriculture custom project realization rates from the industrial program and incorporate them into the commercial program results. This recommendation would make the reporting consistent with the sampling protocol.

Include systematic documentation and back-up for industrial program verification report. Because the report did not include sufficient documentation for audit review, our auditors had to request project files from Enbridge to examine baseline conditions etc. These data should have been included in the report.

Implement a process to ensure consistent survey implementation approaches over time for Market Transformation programs. This is important because Market Transformation progress can only be understood over time. Where survey approaches change, an assessment of construct validity should be provided.

Revise ENERGY STAR® program. We recommend Enbridge undertake a detailed free-ridership analysis and process evaluation of the program. The analysis should incorporate both participant and nonparticipant builders and home-buyers to determine the motivation behind building and purchasing ENERGY STAR® homes. Alternate program designs should be considered, including providing incentives to cover a portion of the incremental cost of building to ENERGY STAR® specification and the certification process.

Document the decision rules for categorizing individual replacements versus advancements for custom projects. A total of 485 custom boiler installations were reported for 2008. Approximately 67 percent (327) were categorized as "advancement," while 158 (33 percent) were characterized as "replacements." Enbridge staff informed the auditor that that the categorization

was made as a result of discussions with the customer; however, there was no specific documentation provided for each decision.

The characterization is important because the TRC savings for the advancement case is based upon the difference between the existing equipment and the new equipment for the period representing the remaining useful life of the original equipment. At the end of the useful life estimate for the old equipment, the remaining savings are calculated as the difference between the new equipment and current practice or code. For the replacement scenario, all of the savings are the difference between the new equipment and a current practice or code baseline.

Current practice in the industry is that *only* a decision to install new equipment before the end of the assumed measure life that is *attributable to utility intervention* should be categorized as advancement. Any independent decision by a customer to install new equipment should be categorized as a replacement, regardless of equipment age. Specifically:

1. If a boiler is replaced beyond its effective useful life (if a boiler is older than 25 years), it should be categorized a replacement.
2. If a boiler burns out or is inoperable, regardless of its age, it should be categorized as a replacement.
3. If a customer had already decided to replace a boiler, regardless of age or condition, it should be a replacement.
4. Installing new equipment is should be characterized as advancement only when there is evidence that the utility program convinced the customer to replace an operating boiler before the end of its effective useful life.

Enbridge's approach, which bases the determination of advancement versus replacement on discussions about the project with the customer, is consistent with current industry standards, but the documentation for the decision is not. We recommend that Enbridge (1) develop formal rules for determining when a custom installation is to be characterized as an advancement or a replacement, and (2) require documentation when the decision is made to characterize a project as advancement. Ideally, this documentation would involve recording customer responses to a specific question or questions.

Evaluation and verification studies in support of annual reports need more time and should be planned and initiated earlier. Final reports were only available in April or May, and one author noted that all site visits and file reviews were performed in one month. This may account for the fact that baseline conditions were not well documented in the industrial verification report and that copies of the project files were supplied to the auditors independently by Enbridge for review.

Conduct site verification visits for commercial custom project verification studies. It is standard practice in evaluation to conduct some telephone verifications usually for simple or small projects. However, for larger custom projects, verification site visits are the standard. Site visits were implemented for the industrial sample, but not for the commercial sample. We recommend that future custom commercial verification studies require site visits.

Conduct annual free-rider surveys for custom project participants. The free-rider adjustments currently used by Enbridge custom commercial projects are based on a survey of 2007 participants. More importantly, the free-rider estimates are savings-weighted averages applied to the 2008 cohort. If the mix of measures, project verified savings, business type, and decision-maker vary from year to year, so will the free-rider estimate. Enbridge has an accepted methodology and approach for

calculating free-ridership ratios, so replication of these ratios for the 40 or 50 participants should not be a burden. Survey information could be gathered by telephone or in conjunction with verification site visits. This recommendation will affect both SSM and LRAM in future years.

Stratify savings calculations for pre-rinse spray nozzles. The savings for this technology is highly dependent on the nature of the commercial operation. CEE notes that small restaurants spray rinse approximately one hour per day; medium-sized restaurants spray rinse 1.5-2 hours per day; and large cafeteria operations spray rinse 3 to 4 hours per day.[3] The prescriptive savings for this measure is based on assumed usage of 3.75 hours per day. The daily usage was determined by a study conducted in 2003, weighted by the number of restaurants surveyed. We recommend that savings be stratified by the nature of the commercial operation in which they are installed. This approach is incorporated in the Navigant study that was adopted by the OEB for use in 2010. Alternatively, the weighted average should be updated on an annual basis based on the actual participation in the program year. This recommendation will affect both SSM and LRAM in future years.

Reconsider the Prescriptive Schools Program design after additional data collection activities. The details required to conduct energy savings calculations in E-Tools do not appear to add burden on participants or staff. The tool has proven easy to use, elegant, and flexible. Once a history of school boiler project savings has been accumulated (using the prescriptive savings algorithm), the program design might be reconsidered. This recommendation may affect both SSM and LRAM in future years.

New construction measure life estimates should be savings-weighted. Currently, measure life for new construction is based on the life of the longest-lived measure. In keeping with industry current practice, this should be changed to calculate overall measure life by weighting individual component annual savings measure lives in proportion to lifetime savings. This recommendation will affect both SSM and LRAM in future years.

Develop logic models and market progress indicators for market transformation programs. This recommendation was made in the 2007 report, but has not been implemented. Consequently, it was not possible to recommend even partial SSM return for several market transformation programs, because linkages to market transformation were not established. It should be noted that the Business Partner Market Transformation Program has shown significant improvement in demonstrating an implicit model and theory. More formal program logic and metrics are still required. Future SSM returns should not be considered without these products. This recommendation will affect SSM in future years.

Develop a comprehensive third-party evaluation strategy and schedule. Program evaluations seem to be *ad hoc* and lack an overall strategy and framework. While some Enbridge administrative and support activities are exemplary and represent industry best practices (for example the QA/QC on the TAPS program), the *ad hoc* nature of the evaluation activities produces a wide range of products (some of which are, indeed, excellent). Programs do not necessarily need to be evaluated every year, but they do need an overall strategy and plan for each program cycle, including both process and impact evaluations. Third-party evaluation avoids the appearance of a conflict of interest. The reports should also be publically available for review, and future free-ridership and savings should be based on the evaluated results. Best practices in program evaluation have budgets

[3] http://www.cee1.org/com/com-kit/prv-guides.pdf

in the range of 3 to 6 percent of program expenditures. A comprehensive evaluation program for Enbridge could require a budget of $1,000,000 per year. This recommendation will affect both SSM and LRAM in future years.

Document program process flows and QA/QC procedures. Program process flows and QA/QC procedures were described in great detail, and they reflect some industry best practices; however, no back-up documentation was available. Enbridge would be well-served to develop these flows to facilitate future audits as well as to provide both internal management oversight and input to process improvement.

Review Commercial Custom Program water savings protocols. The verification report for this program found water savings for projects where no water savings were identified by Enbridge. A review of the program protocols and models related to water savings is warranted. This recommendation will affect both SSM and LRAM in future years.

EAC Comments and Recommendations

During the course of the audit analysis—and as a result of a review of the Draft Annual Report and the Draft Audit Report—the EAC offered the following comments and recommendations:

Provide a linkage between historical and current audit. We have included the Auditor, EAC and Enbridge comments and recommendations from the 2007 audit in Appendix B. This appendix also indicates the disposition of each recommendation. During the course of the current audit, we have verified the disposition of these recommendations and have noted the recommendation as appropriate in the preceding program discussion.

Include a summary table with original and audited savings, SSM and LRAM values. A summary table has been added to the introduction.

Describe rational for accepting 25-year measure lives for certain custom commercial projects. We added language describing the rational for accepting 25-year measure lives for certain custom commercial projects that include shell measures, boilers, and other measures.

Clarify program specific recommendations impacts on SSM and LRAM. We added language to indicate whether adjustments recommended by the audit affect the SSM, LRAM, or both.

Verify that the costs for all delivered measures are included in the TRC calculation, whether installed or not. We verified that (1) the TRC costs are based on all delivered measures and (2) savings are based on only those measures for which installation has been verified through program surveys or other verification methods.

Compare number of projects with negative TRCs between 2007 and 2008 program years. Each of 2007 and 2008 program years had approximately 1,000 commercial and industrial custom projects. Of the commercial and industrial custom projects, 147 projects had negative TRCs in 2007 while 76 projects had negative TRCs in 2008 (all of which were included in the TRC calculation). The decline in negative TRCs is indicative of increased pre-screening by Enbridge staff.

Apply best available information for LRAM calculation. We have assumed the Navigant study recently adopted by the OEB to be the basis for the LRAM savings calculation (with the exception of showerhead savings). Navigant adopted the results from a recent study conducted by SAS that we believe to be fundamentally flawed, as discussed above. Until a study is conducted that overcomes the flaws noted by SAS in its analysis, we do not believe the higher level of savings is warranted

The linkage between market transformation metrics and market outcomes is not clear. We agree with this general statement. As indicated above, we find that two of the market transformation program linkages are so vague as not to warrant any SSM payment. In all cases, the market transformation tracking metrics should be revisited to establish a clear linkage with market outcomes.

Individual market transformation metric performance should be capped at 150% of target. We agree that a cap on individual metric performance is important to preserve the weighting of each metric. However this is a policy issue that must ultimately be determined by Enbridge, interested parties, and the OEB.

Clarify "participant" for the Novitherm program. The Novitherm savings and participation is based on an average participating household.

SAS showerhead study suffers from serious flaws. As we noted in the body of this report, the SAS Institute indicated that the showerhead study it conducted suffers from two serious deficiencies: (1) the study period should be longer, and (2), the participant group needs to have a non-participating control group. We agree that the study is flawed and recommend that the currently approved showerhead saving values be used until a more robust study can be conducted.

Appendix A: Documents Reviewed

OEB Documents

Decision in Docket EB-2006-0021 (August 2006)
DSM Handbook – EB-2006-0021 (April 2006)
Enbridge 2008 DSM Variance Clearance Application in – EB-2008-0271 (August 2008)
Decision Phase III EB-2006-0021 - January 2007
Market Transformation Revision – February 2007
2008 Approved Assumptions EB-2008-0384 (January 2009)
Draft DSM Guidelines - EB-2008-0346 (January 2009)
2010 Approved Assumptions – EB-2008-0346 (April 2009)
- Navigant Report
- GEC comments on Navigant Report

2007 Annual Report and Audit

2007 Audit Comments

2008 DSM Draft Annual Report

2008 Draft Annual Report Comments received from GEC

Research Studies

Energy Efficient Boiler Systems Market Place – Agviro
Comparison of ENERGY STAR and Ontario Building Code - Bowser Report
Custom Projects Attribution – Summit Blue
Residential Attribution – Summit Blue
Residential Measure Savings – Summit Blue

Verification Studies

Industrial project sample – Genivar
Commercial project sample – BII
2008 Boiler Market Transformation – Enbridge
2008 Business Partner Market Transformation – Enbridge
2008 Energuide for Natural Gas Fireplaces – Enbridge
2008 Home Performance Contractor Baseline Study – Enbridge
2008 Home Performance Contractor Followup Survey – Enbridge
2008 MultiRes Showerhead – GFK
2008 Novitherm Study – Enbridge
Impact of low-flow showerheads – SAS
GEC comments on SAS low-flow showerhead study
2008 TAPS survey – Quadra Research

Custom Project Sampling Methodology

Report on the Process of the Evaluation and Audit Committee of Enbridge Gas Distribution for the 2007 Year

Appendix B: 2007 Audit Recommendations

Status Report: 2007 Audit Recommendations

Prepared for the 2008 Audit

April, 2009

Introduction

This report follows the Audit Summary Report from the 2007 audit. For each audit recommendation a status update re: 2008 has been added.

A. Auditor Recommendations

ECONorthwest obtained the SSM calculations from Enbridge and then replicated and checked for the following:

- Accuracy with the final savings totals shown in the Annual Report
- Consistency with the agreed upon assumptions for calculation parameters (e.g., free ridership, per unit savings, savings adjustments)

This resulted in one recommended correction to the Novitherm free rider rate as noted below.

1. Recommendation:

Adjust the Res. **Novitherm free rider** rate from 1% to zero (value approved by OEB).

Enbridge Response:

Enbridge recalculated the program results to correct this clerical error.

2008 Status: This correction was included with Enbridge's 2008 Assumption Update which was subsequently approved by the Ontario Energy Board (the Board). This

Resolved

The balance of this section records the Auditor's recommendations re: adjustments to TRC Results based on application of evaluation study findings.

2. Recommendation:

Reduce the Res. **Novitherm installation** adjustment from 85% to 76% based on the rate of completed installations as determined from the Enbridge Novitherm installation survey.

Enbridge Response:

Enbridge recalculated the program results as recommended to discount participants who indicated that they would install the panels within the next six months and to only count those participants who had actually installed the panels.

2008 Status: Enbridge followed this methodology in calculating the installation rate for 2008 participants.

Implemented

3. **Recommendation:**

Adjust the **low income TAPS installations** using the same installation adjustment factors used for the other residential programs.

Enbridge Response:

Enbridge recalculated the program results for 2007 to apply the general TAPS installation rate to low income participants. The number of low income participants in 2007 was too small to ascertain a separate installation rate through the follow-up survey. As participation in the Low Income TAPS program increases, Enbridge will consider administering a separate Follow-up survey to this group of participants.

2008 Status: In 2008 Enbridge conducted a follow-up survey of low income participants and applied a separate installation rate.

Implemented

4. **Recommendation:**

Reduce the total **custom commercial gas savings values** by 2.3 percent and the **Custom industrial gas savings value**s by 3.6 percent based on the findings from the evaluation studies.

Enbridge Response:

See item #5 below

5. **Recommendation:**

Subsequent to the Final Audit Report (July 23, 2008), a memorandum was distributed to the 2007 EAC with a recommendation that the results of an **additional detailed custom file review** be applied to all custom projects.

Enbridge Response:

Enbridge proposed by way of compromise an overall blended reduction factor for gas savings in the Commercial and Industrial sectors to include results of the auditor's custom project review as well as the engineering review (5.3% for Commercial and 5.5% for Industrial). This method would help maintain the statistical significance used in selecting the original sample. The EAC agreed to this on the basis, as recommended by the Auditor, that this is a transitional solution for 2007 only, and that improvements in the process for 2008 should be implemented. In the auditor memo of July 23rd, the auditor agreed that this approach would yield an appropriate adjustment factor for 2007, subject to its comments about future applicability of the compromise approach. Enbridge subsequently worked with the auditor to adjust the Commercial and Industrial gas savings accordingly.

2008 Status: This recommendation is specific to 2007 and not applicable to 2008 results.

Not Applicable

6. **Recommendation:**

Use the **prescriptive schools boiler savings values** from the Agviro reports for 2007 only for those sites that are considered to be part of the prescriptive schools program.

Enbridge Response:

Enbridge included the prescriptive boiler savings for selected elementary and secondary school projects in the 2007 DSM Annual Report results.

2008 Status: In 2008, Enbridge continued to apply prescriptive boiler savings only to those projects that are part of the prescriptive schools program.

Implemented

7. Recommendation:

Reduce the SSM incentive amounts for the market transformation programs to $178,151.

Enbridge Response:

The Company pointed out that the Ontario Energy Board may assign SSM incentives for milestones in market transformation programs beyond market effects. "The Board remains satisfied that market outcomes should not be the exclusive metric for shareholder incentives."[4] Enbridge expressed concern that where the Company has met the performance of an approved metric, the SSM should apply. Changes to market transformation SSM metrics should only apply going forward. To expedite resolution of the 2007 results, Enbridge recalculated the Market Transformation SSM calculation for 2007 as recommended.

Enbridge acknowledged the Board's "… expectation that continuous improvement can be achieved within the new long term collaborative framework."[5] Further to the auditor's report, Enbridge intends to work to improve evaluation methods for the market transformation programs in consultation with the EAC. Further, Enbridge will investigate the application of the program theory and logic model approach to at least one market transformation program for 2009 and submit any resulting proposed change in program metrics to the Board for approval.

2008 Status: Enbridge has consulted with the EAC re: market transformation programs, investigated the program theory and logic model approach and submitted revised 2009 program metrics to the Board for approval. Enbridge is continuing to investigate the program theory and logic model approach for application to market transformation programs in 2010 and beyond.

In Progress

B. EAC Recommendations

8. Recommendation:

Adjustments re: **non-installs resulting from the TAPS Follow-up Survey** should be reflected only in the savings of those participants. There should be no change to the incremental costs.

Enbridge Response:

Enbridge reviewed the treatment of the non-install adjustment for TAPS showerheads, TAPS aerators and Novitherm panels and revised the TRC calculation where necessary to ensure that all incremental costs remain in the TRC calculation for programs with non-install adjustments.

2008 Status: This recommendation was implemented in the calculation of 2008 TRC results.

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[4] EB2006-0021,Ontario Energy Board, Decision and Order Phase III, page 5.

[5] EB2006-0021, Ontario Energy Board, Decision and Order, Enbridge Gas Distribution Inc. – Market Transformation Incentive Metrics, page 4.

Implemented

9. Recommendation:

Calculation of savings for custom projects in **Large New Construction** should reflect the introduction of the new Building Code effective April, 2007.

Enbridge Response:

Enbridge reviewed the documentation for all Large New Construction projects included in the 2007 Annual Report and determined that there was one project where the building permit was issued after April 2007. Enbridge adjusted the savings claim for this one project.

2008 Status: In 2008 Enbridge continued to monitor the date of building permit issue and adjust project savings as necessary.

Implemented

10. Recommendation:

The wording in the Board Decision from the Generic Proceeding is ambiguous re: treatment of **negative projects** in results. Negative projects should be either entirely on the books OR entirely off the books. If removed, the project spending should be removed entirely from the DSM budget and DSMVA. Alternatively, the negative projects may be left entirely in the TRC calculation.

Enbridge Response:

In the Annual Report, Enbridge interpreted the Board's Decision to mean that all aspects of the project should be removed from the TRC calculation except for the incentive costs which should be treated as direct cost with a negative impact on the TRC. Following the EAC's recommendation, Enbridge included all aspects of the negative projects in the TRC calculation, budget and DSMVA.

2008 Status: This recommendation was implemented in the calculation of 2008 TRC results.

Implemented

IV LRAM

A. Auditor Recommendations

11. Recommendation :

ECONorthwest recommended that the adjustments based on changes in water temperature and throttling be omitted from the **savings estimates for low flow showerheads** outlined in the Summit Blue Savings Values for Residential Prescriptive Programs Study.

ECONorthwest recommended the following savings values for showerheads: $51m^3$, $78m^3$ and 117 m^3 for replacement of showerheads at 2, at 2.1 to 2.5 and over 2.6 gallons per minute flow rate. The EAC recommended applying the Summit Blue recommendation instead EcoNorthwest recommendation.

Enbridge Response:

The Company is willing to accept the application of Summit Blue recommended Deemed Savings study results for 2007 LRAM. Enbridge recalculated the showerhead savings accordingly.

The Company's agreement is based on the understanding that these adjustments for 2007 LRAM (with the exception of the item discussed in Recommendation #15 below) are used for setting the 2008 target and for tracking 2008 actual results. Given that we are half way through 2008, this will enable Enbridge to finalize the 2008 target and make 2008 decisions based on this information. Any changes to these values in 2008 will be used for 2008 LRAM purposes only and will not affect the 2008 target or actual.

2008 Status: Enbridge included the Summit Blue recommended savings values in the 2008 Assumption Update which was subsequently approved by the Board.

Implemented (EAC recommendation**)**

12. Recommendation:

ECONorthwest recommended that the Summit Blue estimates for **programmable thermostats and aerators** be adopted until a study can be conducted by Enbridge to develop savings estimates that are tailored to its own customers.

Enbridge Response:

The Company is willing to accept the application of Summit Blue recommended Deemed Savings study results for 2007 LRAM. Enbridge recalculated the volumetric savings for programmable thermostats and aerators using the Deemed Savings as recommended by Summit Blue and the auditor.

See Recommendation #11 re: application of these adjustments to the 2008 target and tracking of actual results.

2008 Status: Enbridge included the Summit Blue recommended savings values in the 2008 Assumption Update which was subsequently approved by the Board. Enbridge has not pursued a new study for thermostats and aerators.

Implemented (for 2008)

13. Recommendation:

ECONorthwest recommended that the **free ridership rates from the Summit Blue Free Ridership Study** not be used for the 2007 (or future) programs. Until a different free ridership estimate can be completed, ECONorthwest recommended that the previous free ridership values be used for these measures.

Enbridge Response:

In Enbridge's view the study was developed by a firm with acknowledged expertise in the field of free ridership and spillover, the study results are reasonable and the net to gross ratio should be applied. The EAC expressed several concerns with using the spillover results and recommended that only the free rider values from the study be applied to the 2007 LRAM and that the spillover issue be referred to future policy discussion with the Consultative.

The Company is willing to accept the application of Summit Blue recommended free ridership rates (ie. excluding spillover) for 2007 LRAM settlement. Enbridge recalculated the savings for showerheads, aerators, programmable thermostats and furnaces using the free ridership values recommended in the Summit Blue study.

See Recommendation #11 re: application of these adjustments to 2008 target and tracking of actual results.

2008 Status: In the 2008 Assumption Update Enbridge submitted the Summit Blue free ridership values; these were subsequently approved by the Board.

Resolved

14. Recommendation:

Use a gross savings estimate of 28.3 therms for **multi-family clothes washer replacements**. This assumes a new, standard efficiency clothes washer as the baseline rather than the existing machine.

Enbridge Response:

Enbridge has concerns about assuming a new, standard efficiency clothes washer as the baseline since this assumes that the program is directed to capturing scheduled replacements rather than discretionary retrofits. For the 2007 LRAM Enbridge calculated the multi-residential washer savings using the recommended deemed savings. Enbridge has added this item to the list of 2008 research priorities.

2008 Status: Enbridge investigated savings for multi-residential clothes washers but did not have results available for the 2008 Assumption Update. The Board approved continued use of the original assumption of 342m^3 savings for 2008. Enbridge submitted a revised savings value in the 2009 Assumption Update.

Resolved

B. EAC Recommendations

15. Recommendation:

The EAC reviewed the Summit Blue Draft Report for Custom Project Free Ridership and Spillover. The EAC acknowledged that **spillover** was included in the study Terms of Reference and recommended that the net to gross values recommended by Summit Blue be applied to the 2007 LRAM but with no precedent value for use in 2008. The Committee further recommended that the issue of spillover for 2008, TRC and SSM purposes be referred to the Consultative for policy discussion.

Enbridge Response:

In Enbridge's view the study was developed by a firm with acknowledged expertise in the field of free ridership and spillover, the study results are reasonable and the net to gross ratio should be applied.

The Company accepts the application of the Summit Blue recommended net to gross values (including spillover) for 2007 LRAM. Enbridge recalculated custom project volumetric savings using the program-by-program values from the draft Summit Blue study.

Re: application of these adjustments to the 2008 target and tracking of actual results, the Company intends to continue discussion around the issue of spillover with the DSM Consultative at the policy level. Following this discussion, the Company may submit notice to the Board and the parties that the 2008 target is proposed to be adjusted to reflect a 2007 LRAM calculation including the spillover results for custom projects. If approved by the Board, the same net-to-gross value will be applied to 2008 actual results as used for the 2008 target. In the interim the 2008 target will be calculated without spillover included using the program-by-program values from the draft Summit Blue study.

2008 Status: In the 2008 Assumption Update**,** Enbridge submitted net to gross values (including spillover) for the custom projects. The Board Decision directed Enbridge to apply only the free rider rate to custom projects for 2008. The Company then circulated to all parties a revised Assumption Table reflecting the Board's Decision. In the 2009 Assumption Update Enbridge submitted spillover values for all measures where the information was available. It is expected that the Board will invite comments from intervenors on the 2009 Assumption Update.

In Progress

VI Future Research and Savings Calculations

A. Auditor Recommendations

ECONorthwest recommended that the following adjustments be made to future DSM claims (2008 onward).

16. Recommendation:

Adjust **showerhead and thermostat per unit savings** based on the Summit Blue studies using adjustment discussed in this audit report.

Enbridge Response:

Enbridge is undertaking a load research study of showerhead savings in consultation with the 2008 EAC. Enbridge will also discuss the application of the Summit Blue results for thermostats with the EAC.

2008 Status: In the 2008 Assumption Update Enbridge submitted the showerhead and thermostat savings as recommended by Summit Blue; these values were subsequently approved by the Board. Enbridge began load a load research study of showerhead savings in 2008 but the results were not available for the Update submission. Enbridge included the showerhead load research results in the 2009 Assumption Update which is currently before the Board. Enbridge has not as yet discussed the Summit Blue results for thermostats with the EAC.

In Progress

17. Recommendation:

Apply TAPS installation adjustments to **multi-residential showerhead and aerator installations** until a study can be conducted addressing the multi-family sector.

Enbridge Response:

Enbridge has begun work to design an appropriate non-install study for multi-residential showerheads and will consult with the 2008 EAC.

2008 Status: Enbridge completed a third party study of 2008 multi-residential showerhead installations and incorporated the findings in the 2008 TRC calculation.

Implemented

18. Recommendation:

Revise as needed the **prescriptive school savings values** based on new information on the base case conditions.

Enbridge Response:

Enbridge will review the Agviro Report and the auditor's comments with the 2008 EAC.

2008 Status: Enbridge has not yet reviewed the Agviro Report or the auditor's comments with the 2008 EAC. In their review of the 2010 Assumptions, the Board's consultant, (Navigant Consulting) endorsed the Enbridge savings values.

Follow-up needed

19. Recommendation:

For **Novitherm panels**, only use survey results for customers that have actually installed the panel to calculate the installation adjustment factor.

Enbridge Response:

This issue was addressed in the SSM recommendations. For 2008 forward, Enbridge agreed to exclude the responses of those participants who intend to install the panels within six months and only use responses from customers who actually installed the panels.

2008 Status: As indicated, in calculating 2008 results, Enbridge used only responses from customers who actually installed the panels.

Implemented

20. Recommendation:

All projects in the sample included natural gas savings. There were only a handful of **projects with electrical savings** reviewed by third party engineers and no projects were reviewed with **water savings**. Given the very small sample sizes, ECONorthwest indicated there was no basis for auditing or adjusting the electricity and water savings claims and that these samples must be increased in future years so that the kWh and water savings estimates can receive an adequate review.

Enbridge Response:

Sample used for review by the third party independent engineering firms met OEB requirements and was statistically significant. In conjunction with the EAC, Enbridge will review the sampling methodology for application to the 2008 custom project evaluation work.

2008 Status: Enbridge, together with Union Gas, worked with their respective EACs to develop a sampling methodology for 2008 which included electricity and water savings. This sampling methodology was then used to select the custom projects for the engineering review.

Implemented

EcoNorthwest made the following recommendations regarding future evaluation research.

21. Recommendation:

Conduct a new **residential free ridership study** with the survey questions and scoring methods thoroughly vetted prior to fielding the survey**.** This will allow for a study to be completed that provides results that can be applied to the savings estimates. EcoNorthwest also recommended a method that utilizes fewer questions with a less complicated weighting scheme. Having the survey questions and scoring method reviewed prior to fielding the survey will help ensure that the study produces results that can be used in the net savings calculations.

Enbridge Response:

Study was conducted by a qualified independent consultant. RFP and consultant selection was completed with input from EAC. Enbridge will discuss the application of the Summit Blue residential free ridership study results and any subsequent new residential free ridership study with the 2008 EAC.

2008 Status: Enbridge has not discussed the application of the Summit Blue residential free ridership study results with the EAC or initiated a new residential free ridership study.

Follow-up needed

22. Recommendation:

Develop **savings values for showerheads** using a sample of metered Enbridge customers. Meter tests for showers. Enbridge should conduct a study on low-flow showerheads that involves metering a randomly selected sample of participants before and after the new showerhead is installed. The sample should be large enough and cover enough housing types (single family and multi-family at a minimum) so that the results can be extrapolated to the population.

Enbridge Response:

Enbridge has begun work to develop such a study and has circulated a study proposal to the 2008 EAC for comment.

2008 Status: Enbridge initiated a showerhead load research study for single family homes in 2008. Following consultation with the EAC Enbridge engaged a third party firm to conduct the statistical analysis of the load research findings. Results were not available for the 2008 Assumption Update submission. The study was completed in 2009 and results included in the 2009 Assumption Update submission. In the 2009 Update Enbridge adapted the work of Summit Blue from the single family sector to develop savings estimates for the multi residential sector.

Implemented

23. Recommendation:

For future program years we strongly suggest that new metrics be established for **market transformation programs.** Create formal logic models and program theory documents for these programs. For the market transformation programs, it is important to develop program logic models and associated program theory to articulate what each program is attempting to achieve. These logic models will clearly show the program activities, the associated direct outputs, and how these outputs will result in short-term, mid-term, and long-term market outcomes. NYSERDA has done extensive work developing these models for their programs and these will serve as a good template for what is needed for the Enbridge market transformation programs.

Progress on the various market transformation metrics should also be calculated using confidence ranges (i.e., 90 percent confidence level with an error of +/-10%). Incentives should only be paid on those metrics that show improvement that is statistically significant.

Enbridge Response:

Enbridge will review the market transformation program evaluation methods and metrics for 2009 (see item #7 above) and the next Multi-year plan.

2008 Status: Enbridge has consulted with the EAC re: market transformation programs, investigated the program theory and logic model approach and submitted revised 2009 program metrics to the Board for approval. Enbridge is continuing to investigate the program theory and logic model approach for application to market transformation programs in 2010 and beyond.

In Progress

24. Recommendation:

Use the logic models and program theory to develop performance metrics for **market transformation programs**. Once the logic models and program theory have been developed, specific metrics should be developed that measure the various links between program activities, outputs, and outcomes. Progress on these metrics will then serve as the basis for all evaluation activities for these programs. As discussed previously, activities performed by the program should not be considered as metrics of market transformation (although these were the metrics set for the current programs).

Enbridge Response:

As above, Enbridge will review the market transformation program evaluation methods and metrics.

2008 Status: see above item #23

25. Recommendation:

Use larger samples for **engineering review**, covering the major equipment types and end uses. Future engineering reviews should utilize larger project samples so that statistically representative samples for the major measures and end uses within sectors are represented. This will allow the sample results to be extrapolated to the population with a greater degree of confidence.

Enbridge Response:

Enbridge will review this recommendation and discuss with the 2008 EAC.

2008 Status: Enbridge has not as yet discussed this recommendation with the EAC.

Follow-up needed

26. Recommendation:

Create separate samples to cover **projects with electricity and water savings.** A separate and larger sampling method and file review should be done for projects that involve electricity and water savings as these are savings amounts that can contribute to net benefits. The 2007 samples had only a few electricity projects and no water projects. Consequently, the savings calculations received very little review by the 3rd party engineers and no review by the auditor.

Enbridge Response:

Enbridge will review this recommendation and discuss with the 2008 EAC.

2008 Status: Enbridge, together with Union Gas, worked with their respective EACs to develop a sampling methodology for 2008 which included electricity and water savings. This sampling methodology was then used to select the custom projects for the engineering review.

Implemented

27. Recommendation:

More project detail needed in the **engineering review report.** For the projects reviewed by the 3rd party engineers, much more detail should be made available. This includes any engineering site or design reports, documentation of assumptions used to calculate savings, information on existing equipment, printouts from e tools, and any other information that is necessary for an auditor to see how savings are calculated.

Enbridge Response:

Enbridge will review this recommendation and discuss with the 2008 EAC with a view to more clearly defining the respective roles of the engineering review evaluation studies and the auditor.

2008 Status: Enbridge discussed requirements re: the engineering review reports with the 2008 auditor prior to the completion of the reports to ensure that all needed information would be available for the auditor's review.

In Progress

28. Recommendation:

Revise savings estimates for **clothes washers for multi-family units.** We recommend that savings be estimated based on a comparison with a new, standard efficiency model rather than the current practice of comparing the high efficiency model with the existing equipment. A placeholder savings value was recommended for 2007 until research into a new value can be completed.

Enbridge Response:

Enbridge has added this item to the list of 2008 research priorities. Research will be prioritized relative to the other items on the list.

2008 Status: Enbridge investigated savings for multi-residential clothes washers but did not have results available for the 2008 Assumption Update. The Board approved continued use of the original assumption of 342m^3 savings for 2008. Enbridge submitted a revised savings value in the 2009 Assumption Update.

Implemented

29. Recommendation:

Conduct research on effectiveness of **EnerGuide and ENERGY STAR new home** construction rebates. It seems unlikely that these rebates are having any affect on the new construction market. Research demonstrating the incremental benefits of these rebates on builder behavior should be conducted for future program years.

Enbridge Response:

Enbridge will discuss this recommendation on reviewing the list of research priorities with the 2008 EAC.

2008 Status: The EnerGuide for New Homes program was discontinued in 2008. Enbridge has not, as yet, discussed research re: the effectiveness of builder rebates with the EAC.

Follow-up needed

30. Recommendation:

Adopt recommendations provided in the 3rd party engineering review studies. Each of the engineering studies provided a list of recommendations for future evaluation work. The audit supports each of the recommendations made by the engineers regarding future evaluation activities and encourages Enbridge to adopt them as soon as possible.

Enbridge Response:

Enbridge will discuss the research recommendations from the Engineering Review studies with the 2008 EAC. Research priorities in each year have to be set in relation to a review of the full list.

2008 Status: Enbridge is systematically reviewing the recommendations from the 3rd party engineering review studies with the internal DSM engineering committee prior to discussing the recommendations with the EAC.

In Progress

B. EAC Recommendations

31. Recommendation:

Develop research to substantiate prescriptive savings of Novitherm panels in the residential sector for application to 2008 results.

Enbridge Response:

Enbridge has undertaken load research on Novitherm panel installations in the residential sector and will bring forward the study results to the 2008 EAC.

2008 Status: Enbridge circulated the study results to 2008 EAC members in the fall of 2008. The results were submitted in the 2008 Assumption Update and subsequently approved by the Board.

Resolved

32. Recommendation:

For Low Income Weatherization Program, develop approach to savings calculation and evaluation for 2008 following discussion with program manager re: program delivery.

Enbridge Response:

Enbridge will consider with input from the 2008 EAC regarding the 2008 savings calculation and evaluation.

2008 Status: Enbridge has not, as yet, discussed this issue with the EAC. In the 2009 Assumption Update Enbridge submitted revised prescriptive savings and incremental costs per participant based on two years of program results.

Follow-up needed

33. Recommendation:

For greater transparency, report TAPS showerhead and aerator savings separately.

Enbridge Response:

Enbridge will revise TAPS reporting method to separate showerhead and aerator results in 2008 DSM Annual Report.

2008 Status: This recommendation was implemented in 2008 tracking and is reflected in the 2008 Annual Report.

Implemented

34. Recommendation:

In 2008 Energy Star for New Homes, separate results into two groups. For homes where permits were issued under the old building code, apply the prescriptive savings values as approved for 2007. Bring forward new program assumptions for the savings values for Energy Star Homes constructed under the new code.

Enbridge Response:

Enbridge will bring forward new program assumptions for Energy Star Homes constructed under the new code.

2008 Status: In the 2008 Assumption Update, Enbridge submitted program assumptions to be used under the current Ontario Building Code and these were approved by the Board. In the 2009 Assumption Update, Enbridge submitted an additional set of program assumptions for Energy Star Homes constructed under the new code.

Implemented

35. Recommendation:

Put all program assumptions included in Phase III of the Generic Proceeding at the top of the priority list for review and research.

Enbridge Response:

Enbridge will review the 2008 evaluation research priorities with the 2008 EAC following completion of the 2007 audit. These items will be added to the list. Research priorities in each year have to be set in relation to a review of the full list.

2008 Status: Late in 2008 the Board announced the process for approval of assumptions for 2010 and beyond; this process addressed the above recommendation. The Board engaged a consultant (Navigant Consulting) to develop updated assumptions for all measures. This included all measures approved in Phase III of the Generic Proceeding.

Resolved

36. Recommendation:

The TAPS Follow-up Study should clearly indicate whether one or both aerators were installed.

Enbridge Response:

Enbridge will review the survey for the TAPS Follow-up Study and revise as appropriate to address this issue.

2008 Status: The TAPS Follow-up Study was revised in 2008 to capture more detailed information on the number of kitchen and bathroom aerators installed.

Implemented

37. Recommendation:

Enbridge should refer the issue of a change in Steam Trap Measure life to the 2008 EAC for review.

Enbridge Response:

Enbridge has circulated the background study on Steam Trap Measure life to the 2008 EAC for comment.

2008 Status: Enbridge received some comments from the EAC on the Steam Trap Measure life study. The updated measure life value was approved by the Board as part of the 2008 Assumption Update.

Resolved

38. Recommendation:

Bring the issue of spillover and net to gross calculation to the DSM Consultative for policy discussion.

Enbridge Response:

Enbridge will arrange for a discussion of spillover at the DSM Consultative.

2008 Status: Enbridge submitted net to gross values (including spillover) for custom projects in the 2008 Assumption Update. Enbridge's proposed updates were circulated to the Consultative by the Board for comment. Enbridge has not, as yet, included spillover as an agenda item at a Consultative meeting.

Follow-up needed

Appendix C: Questions and Responses

Date	Question	Response	Response Date
4/20/2009	Can you tell me where the backup for the Reduction Factor in the TRC/SSM spreadsheet is? I was expecting it to be in the verification reports but I'm not finding it (or not recognizing it). The reduction factor tab divides a net savings number by a gross savings adjusted for free-ridership number to derive the reduction factor, but I don't see where the net and gross savings numbers come from in the reduction factor tab.	The reduction factors in the reduction factor tab were calculated to ensure gas savings in the actuals tab match what is in DARTS. The reduction factors are calculated using raw data gathered from the TAPs surveys. The attached spreadsheet presents findings from the surveys and calculates the weighted average reduction factor for different measures.	4/21/2009
4/20/2009	I'm having trouble finding the source for the savings estimates and free-ridership for the multi-residential showerheads. Can you point me in the right direction?	The multi-residential showerhead program is a prescriptive program. For source information, you can look at the 2008 OEB approved assumptions. Within our submission are sub-documents that present our source and back-up data.	4/21/2009

Date	Question	Response	Response Date
4/20/2009	The Genivar report calculates separate adjustment factors for industrial and agricultural savings. Can you tell me why the industrial factor is being applied to the agricultural savings in the SSM/TRC spreadsheet?	When Summit Blue was asked to develop a sampling methodology, they saw HVAC technology in the agricultural projects and recommended agricultural projects be placed in the commercial sector sample design. Summit Blue then developed a sampling methodology for the commercial sector that included agricultural projects. Historically, agricultural projects have been included in the industrial sector because the organizations/companies that run agricultural operations, do so to produce agricultural products—producing product is an industrial endeavor. Summit Blue identified three agricultural projects that needed to be verified as part of their recommended sample for the commercial sector. As we have historically placed agricultural projects in the Industrial sector, we asked Genivar to verify the results of the three agricultural projects identified by Summit Blue. Once the verification work was completed by Genivar, a question was raised, where do we put the results of the verification study on the three agricultural projects? Due to time constraints, we did not put the results from the three agricultural projects back into the commercial sample. You may choose to explore this 'glitch' in your audit of our 2008 DSM results. Perhaps we need to put the verification results of the three agricultural projects back into the matrix of commercial projects to be true to the original sample design recommended by Summit Blue, and apply the resulting commercial adjustment factor to both commercial and agricultural projects. This would allow us to be true to the original sample design methodology recommended by Summit Blue.	4/21/2009
4/22/2009	I cannot find any backup for the deemed savings for the multifamily showerheads. I see that the rental deemed savings is listed on the OEB-approved summary sheet, but I have not found where that value comes from. I cannot find the value for the condo savings either on the summary sheet or in the backup sheets.	The 2008 savings assumptions were approved during the 2006 ADR Agreement (see attached document). Showerhead condo savings were adjusted to 94.3 m3 per suite, due to the 2008 GFK Study that determined there were 1.22 showerheads per suite in the Multi-Res.Condo sector. 115 m3 / 1.22 = 94.3 m3 30,966 L / 1.22 = 25,382 L	4/23/2009
4/22/2009	Also, it looks like you uploaded a PowerPoint presentation of the installation rates for Novitherm, but I don't see any savings calculations in the PowerPoint. Item 31 of the 2007 audit recommendations indicates that there was a 2008 study that concluded that the panels saved 4.1%. Do you have that study?	Savings study provided.	4/23/2009

Date	Question	Response	Response Date
4/22/2009	Marco, the 2007 audit recommendations document indicates that the showerhead study was completed this year (Item 22). Do you have that report (it looks like you have uploaded the project description, terms of reference and some interim analysis so far)?	Current study provided.	
4/23/2009	Can you provide documentation for your decision to use the sector-specific free-ridership estimates for C&I projects?	It was settled with the EAC to use sector-specific results. I have asked Judith Ramsay to provide meeting minutes that recorded the EAC recommending the use of sector specific results. Also, please note the OEB approved the use of sector-specific free-ride-ship results for 2008.	4/27/2009
5/4/2009	BII and Genivar Final Report	Delivered.	5/4/2009
5/4/2009	Overview of how participant data are tracked from the time of participation through to the production of the annual report and what kind of controls are in place to assure its accuracy.	Discussed at Enbridge offices.	5/5/2009
5/5/2009	How are homes designated as ENERGY STAR?	1. The builder registers addresses it wants to have ENERGY STAR labeled to a company called Enerquality. Enerquality is a service organization appointed by NRCAN. 2. The builder hires an evaluator to conduct the inspection/audit of the registered addresses to confirm the homes meet ENERGY STAR standards. 3. The evaluator sends its survey/inspection reports to both NRCAN and Enerquality. 4. Enerquality issues the ENERGY STAR label to home addresses that pass the evaluators inspection. 5. Enerquality sends Enbridge monthly summary reports of all addresses that received an ENERGY STAR label. 6. In 2008, Enbridge matched the invoice from the builders to the addresses in the monthly reports. Incentive amounts were paid only for addresses found on monthly reports from Enerquality. 7. Monthly reports from Enerquality are stored and used to track participation and paid-out incentive amounts.	5/6/2009

Date	Question	Response	Response Date
5/8/2009	Do you know how much it costs the builder to hire the evaluator?	This varies, depending on the volume of homes and which company they are using. The average cost ranges from $300–$600. We have considered this to be a marketing expense as a builder needs to do this in order for him to advertise the house as an ENERGY STAR home. It is possible to buy two different homes from two different builders that both meet ENERGY STAR guidelines, yet one has been labeled and one has not. Also, some contractors use the services of Certified Energy Evaluators (evaluator) to help them better design their homes. One example of a better design is an evaluator consulting on the design that requires less timber and meets ENERGY STAR requirements. In this case, the consulting efforts of the evaluator reduced the material cost of the home.	5/14/2009
5/8/2009	Regarding the report, can you tell me what the ESNH and EGNH column titles indicate? Also, what is the distinction between enrollments and labels?	ESNH indicates ENERGY STAR for New Homes, EGNH indicates EnerGuide for New Homes but now is called EnerGuide Rating System. Enrollments are the homes that have sighed up to become ENERGY STAR or EnerGuide, and Labels are the home has been finalized and received the ESNH Label.	5/14/2009
5/13/2009	How does EGD decide whether a boiler is a simple replacement or advancement? What criteria are used?	If the owner or operator of a building indicates a piece of equipment is scheduled for replacement or for removal, the EMC decides the project is a replacement. If the owner or operator of the building indicates the piece of equipment is functioning, and there is no plan to replace or remove it, the EMC decides the project is an advancement. Most building owners prefer to repair an existing boiler because a repair is tax deductible (it is an expense, not a capital investment), requires a lower cash outlay, and is relatively immediate compared to an equipment replacement.	5/20/2009
5/13/2009	How is the base case for an advancement presented? Is it the same for all advancements? Is it tailored to the specific site? How?		

Date	Question	Response	Response Date
5/13/2009	On another related topic: I was struck by what was said at the eTools demonstration regarding ease of use. It seems counter to the EGD position that the process is too complex for the schools sector. Can you explain?	Although eTools is quick to use once the user has been trained and run through a number of examples, this ease of use did not enter into the decision to develop a prescriptive schools boiler program. The primary purpose of the prescriptive schools program was to reduce the administration typically required for custom programs. When the program was being developed, it was observed many schools had similar gas consumption profiles and used boilers of similar efficiency. These similarities suggested the process could be streamlined. By taking advantage of the similarities, a prescriptive program was developed that streamlined the process for the schools and for Enbridge. Not only does this reduce the time required to run E-Tools, but it saves substantial time trying to obtain incremental costs on a case-by-case basis for boilers, which are typically not an individual line item when a school awards a large tender.	5/20/2009
5/15/2009	Are Novitherm values number of participants or number of panels?	Number of participants.	5/19/2009
5/15/2009	Are avoided costs approved by OEB?	Tab 9 of the OEB approved three-year plan outlines the methodology for establishing avoided costs. Enbridge has been following the approved methodology. Also, 2008 avoided costs where filed with the 2007 Audit Summary Report in the Application for Clearance of Accounts (Filed: 2008-08-14, EB-2008-0271, Exhibit B, Tab 5, Schedule 1, Page 19 of 21).	5/19/2009
5/15/2009	The note below Table 2 on page 7 of the Annual Report indicates that the term "participant" in Table 2 refers to the number of measures rather than the number of households. Can you confirm that this is the case?	In 2008 we assumed one device per household in our TRC calculations. Participants in Table 2 truly represent the number of households, and, because we assumed one device per household, participants also presents number of devices. [Cadmus note: Enbridge later provided the TAPS summary information that indicated that the number of installed showerheads was 1.27 per household which is consistent with the deemed savings estimate.]	5/20/2009
5/15/2009	The savings in the TRC calculator for the TAPS showerhead measures appears to be the "per household" savings as calculated by the Summit Blue report, for example 68 cubic meters for "showerheads over 2.5". Is that correct?	The savings in the TRC calculator for the TAPS showerhead measures appears to be the "per household" savings, as calculated by the Summit Blue report; for example, 68 cubic meters for "showerheads over 2.5." Is that correct?	5/20/2009

Date	Question	Response	Response Date
5/15/2009	The savings in the TRC calculator for TAPS showerhead measures is based on installing a 1.25 gpm showerhead. Can you confirm that all of the 2008 showerheads were 1.25 gpm?	Yes, this is correct. Keep in mind that in 2008, we assumed one device per household; so using per household savings is appropriate when estimating savings. [Cadmus note: Enbridge later provided the TAPS summary information that indicated that the number of installed showerheads was 1.27 per household which is consistent with the deemed savings estimate.]	
5/18/2009	Is 150% a cap on market transformation metrics?	No.	5/19/2009
5/18/2009	Are there program costs beyond the costs included in the TRC spreadsheet?	No. Regarding the Energuide for new homes program, if you look at the comments attached to cells AB25 & AC25 (highlighted in green) on tab Actuals of the TRC spreadsheet, you will find an explanation of how the incentive payments where handled.	5/19/2009
5/18/2009	It appears that the total incremental costs are calculated based on the gross number of participants, i.e. before the reduction factor is applied, so I believe that all measure costs whether installed or not have been included. Can you confirm this?	Confirmed. Please refer to Section 8 of the 2007 Audit Recommendation Status summary. Enbridge followed this recommendation in our 2008 programs and results.	5/19/2009
5/18/2009	2) Project S.BM.CM.HOS.016.08 is a steam trap replacement. Can you find out why 15 years was used as the measure life?	Please refer to the attached document (Custom Resource Acquisition Programs, Measure Life Assumptions October 31, 2008). Fifteen years was pulled from this chart under industrial heat recovery. (BKH-Note: BII report indicates pump trap replacement, BII detail indicates steam trap replacement.)	5/20/2009
5/18/2009	3) Project S.BM.CM.SCH.002.08 is also a replacement of boilers. Can you find out why 11 years was used as the measure life?	This project is an advancement. As in question #1, we use 11 years in advancement scenarios.	5/20/2009
5/18/2009	4) Projects S.BM.CM.SCH.007.08 through S.BM.CM.SCH.012.08 are also replacement of boilers. Can you find out why 25 years was used as the measure life and how these differ from the replacement of boiler projects where 11 years was used?	Twenty-five years was pulled from the approved list (see attached document); 25 years was pulled from the boiler line items found in the attached chart.	5/20/2009
5/18/2009	5) Project S.BM.CM.SCH.016.08 is also a replacement of boilers. Can you find out why 11 years was used as the measure life?	This is an advancement. Same as in question 1.	5/20/2009

Date	Question	Response	Response Date
5/18/2009	6) Project S.BM.CM.NC.034.08 is described as "High Efficiency Improvements." A 25 year measure life was used in the TRC spreadsheet. Can you confirm that these were shell improvements? Also, the project file indicates that the incentive was not paid because the customer did not agree to the terms of the EEP. Can you explain what this means and why the project is included in the TRC calculations?	Answer Part 1: Bell Creekbank was an Archetype Calculated project, where the savings were recalculated using the revised A.C. from BII. The project had a measure life of 25 years since it had both shell and HVAC improvements. Answer Part 2: These projects typically have two incentives: one as part of the Design Advisory Program, the second for installation/ implementation. A payment was made for the modeling included in the DAP program. In the agreement for the installation/implementation incentive, EGD asks for access into the building for 18 months. The customer did not agree to this condition, and, as a result, the contract was not signed. EGD was prepared to sign and pay out the incentive if the customer had agreed to all conditions in the contact.	5/27/2009
5/18/2009	7) Project S.BM.IND.ALL.052.08 is an upgrade of an electric furnace. I did not find an approved measure life for electric furnaces. Can you tell me the source of the 18 year measure life?	Please refer to the attached document; 18 years comes from Industrial Equipment, Furnaces (gas-fired). We assumed the same life for an electric furnace.	5/20/2009
5/18/2009	1) Project S.BM.CM.HOS.001.08 is a replacement of boilers. Can you find out why 11 years was used as the measure life?	This project is an advancement. Through previous audits and agreements with the EAC, we have reached agreement to use 11 years in advancement scenarios.	5/20/2009
5/20/2009	Does the EGD note the age of the existing boiler?	We do not collect the age of the boiler as that is not always available and not critical for savings calculations.	5/27/2009
5/27/2009	Project S.BM.CM.NC.038.08 also appears to have HVAC equipment. The measure life assumption for HVAC equipment appears to be 15 years. Do you know the proportion of savings attributable to the shell versus HVAC equipment for these projects? If it is typical that the new construction projects have a mix of HVAC and shell improvements, has the Company considered a weighted measure life?	Historically, for new construction custom projects, we have taken the measure life of shell improvements. We have looked into the application of different measure lives, such as a weighted approach, but have found it difficult to develop a methodology that is acceptable. The table below presents possible values for savings and incremental costs under different scenarios. Challenges with an average weighted approach include the following: 1. How do we best generate all these numbers? 2. How do we use these numbers to generate a weighted average measure life? Is the weighted average based on savings? Based on incremental cost?	5/27/2009

Date	Question	Response	Response Date
5/27/2009	I'm going under the assumption that the new construction projects consist of some combination of shell measures, HVAC, lighting, controls and other energy efficient technologies. Does Archetype model the building with and without these enhancements to create a total savings for the project? If so, does it calculate the savings by measure?	The Archetype calculator was developed because the federal government (NRCAN) was no longer supporting the EE4 calculator, which is the base calculator to determine the savings from base case to high-efficiency case. The EE4 calculator was generating a base case based on the 1998 MNECB (Model National Energy Code of Canada for Buildings); however, when the OBC (Ontario Building Code) was updated in 2006, the EE4 Calculator was not updated. Therefore, the Archetype calculator was developed to adjust the results of the EE4 calculator for the new updated OBC 2006 requirements. It does so in the following measure buckets: • Lighting • Auxiliary Equipment • Space Heating • Space Cooling • Heat Rejection • Pumps and Miscellaneous • Vent Fans • Water Heating • Refrigeration Savings for each bucket are generated. In 2009, Enbridge will no longer be using the Archetype calculator. Base cases will be developed based on the current OBC, not the EE4 calculator.	5/28/2009

2008 RATE ALLOCATION BY ACCOUNT

Allocation to DSM Variance Accounts

1. Below is a chart indicating the rate allocation to the DSM Variance Accounts.

2008 Rate Allocation by Account

Rate Class	SSM	Market Transformation	LRAM	DSMVA	TOTAL
Rate 1	$1,325,327	$46,253	$0	-$35,600	$1,335,980
Rate 6	$1,630,914	$56,918	$0	-$18,570	$1,669,262
Rate 100	$810,450	$28,284	$50,165	-$7,372	$881,528
Rate 110	$444,351	$15,508	-$16,197	-$1,904	$441,758
Rate 115	$542,455	$18,931	$8,989	-$3,640	$566,735
Rate 135	$0	$0	$0	-$243	-$243
Rate 145	$383,738	$13,392	-$3,907	-$1,633	$391,591
Rate 170	$470,287	$16,413	-$1,759	-$4,379	$480,561
Total	$5,607,522	$195,700	$37,291	-$73,340	$5,767,173

Estimated Impact of DSM Clearance on a Typical Customer

2. The chart below provides the estimated impact of DSM Clearance on a typical customer's bill.

	Annual Volume for Typical Customer (m3)	Annual Bill for Typical Customer ($)	DSM Amount for Recovery** ($)	Estimated % of Annual Bill
Rate 1	3,064	1,201	1	0.1%
Rate 6	22,606	7,649	9	0.1%
Rate 100	339,188	103,549	504	0.5%
Rate 110	9,976,121	2,650,071	6,633	0.2%
Rate 115	69,832,850	17,878,748	62,250	0.3%
Rate 145	339,188	93,740	547	0.6%
Rate 170	9,976,121	2,404,365	6,956	0.3%

* Annual bills based on July 1, 2009 rates.

** *DSM amounts for Recovery do not include interest amounts that will apply at the time* of clearing.

ENBRIDGE GAS DISTRIBUTION'S 2008 DSM EAC AUDIT SUMMARY REPORT

1. INTRODUCTION

In accordance with Ontario Energy Board (the Board) requirements, an independent audit was conducted of the Enbridge 2008 DSM program results as reported in the Company's 2008 DSM Draft Annual Report. This document provides a summary of the process followed to audit the 2008 DSM Draft Annual Report; a summary of Enbridge Gas Distribution Inc.'s responses to the Auditor's recommendations; issues from the Evaluation and Audit Committee (EAC) that are beyond the purview of the auditor; discussion with the Evaluation and Audit Committee (EAC); and a report on the corresponding impacts to the 2008 DSM savings and associated Shared Savings (SSM) and Lost Revenue Adjustment (LRAM) claims.

The EAC has endorsed the 2008 Audit and Enbridge's post-audit SSM claim as presented in this report. The only material issue that was unresolved involved a proposed post audit adjustment to market transformation (MT) SSM by the inclusion of a 150% of target cap on the individual metrics of MT programs. In the interest of avoiding ratepayer costs that would result from a Proceeding over this issue and to facilitate a full Settlement, Enbridge has agreed to apply a 150% cap on individual 2008 MT metrics. This applies only to 2008 and is contingent on a full Settlement. If a hearing process results due to lack of a full Settlement Agreement, Enbridge reserves the right to claim the full MT SSM.

The EAC endorses the calculations for Enbridge's post-audit LRAM claim**.**

As stated in the Board's Decision in the Generic Proceeding:
"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 into the following sections:

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

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

Of the 19 recommendations made by the auditor, Enbridge agreed to 14 of them, and will investigate 5 of them. Enbridge did not disagree with any recommendations made by the auditor.

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

2. AUDIT PROCESS

2.1 SELECTION OF 2008 EVALUATION AND AUDIT COMMITTEE

The Evaluation and Audit Committee (EAC) was comprised of three representatives elected from the DSM Consultative and one representative from the utility. The 2008 EAC representatives are:

- Ian Mondrow – Industrial Gas Users Association (IGUA)
- Chris Neme – Green Energy Coalition (GEC)
- Jay Shepherd – School Energy Coalition
- Judith Ramsay – Enbridge Gas Distribution

Note: In June 2009, Jay Shepherd removed himself from the 2008 EAC due to other work commitments. Up to this point in the audit process, Jay Shepherd had contributed to the development of the terms of reference, the auditor selection, the audit kick off meeting and the development of the work plan. The Consultative was notified and agreed that due to the advanced stage of the work, Chris Neme, Ian Mondrow and the Enbridge membership would finish the process.

2.2 TERMS OF REFERENCE AND SELECTION OF AUDITOR

The EAC participated in development of the Auditor Terms of Reference and the review of proponents' proposals. A recommendation to select The Cadmus Group Inc. (Cadmus) as the auditor of the 2008 Draft Annual Report was made by the EAC and accepted by the Company.

The 2008 Audit Terms of Reference described the overall objective of the audit as well as required tasks and deliverables and it was on this basis that the Auditor accepted the assignment. A copy of the Terms of Reference can be found in Appendix A.

2.3 PROJECT START UP AND WORKPLAN

The Draft 2008 Annual Report was circulated to the 2008 EAC, Cadmus and the Consultative on April 15, 2009. It was requested that comments be provided within the 30 days following April 15th.

GEC was the only organization to submit comments on the 2008 Draft Annual Report. Following a meeting with the EAC on May 5th, and the gathering of issues which the EAC requested the auditor to investigate, the auditor submitted

a Final Work Plan on May 12th, 2009. A copy of the Final Work Plan can be found in Appendix B.

2.4 INFORMATION EXCHANGE

At the outset of the audit, Enbridge provided the auditor with requested materials related to the 2008 DSM activities. In addition, at the outset of the audit, 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. A complete list of materials provided by Enbridge is included in the Audit Report.

2.5 2008 AUDIT SCOPE OF WORK AND APPROACH TO AUDIT

As described in their report, Cadmus' approach to the scope of work was as follows:

- Are the inputs to the savings and financial calculations based on assumptions approved by the Ontario Energy Board (OEB)? Are they gathered and documented in a reliable manner? Are they consistent with the best available current information?
- Are market effects adequately tracked and attributable? Are baseline data collected and available?
- Are the economic and financial calculations accurate and based on agreed-upon rules, protocols, and procedures? If not, where are the differences and to what can the deviations be attributed?
- Are the SSM, DSMVA, and LRAM calculations accurate and consistent with methodology and assumptions approved by the OEB? If not, where are they different?
- Are savings, free-ridership, and measure life assumptions consistent with the best available current information?

As described in their report, tasks undertaken by Cadmus during the audit included the following:

- Review of documents including memos, reports, filings and third-party assessments. Review and verification of EAC

recommendations and Enbridge responses from the 2007 audit.
- In-person and telephone discussions with Enbridge staff.
- Meetings with Enbridge and EAC.
- "Live" Internet meetings and presentations of tracking databases and spreadsheet calculations.
- Detailed, in-person "walkthroughs" of program participation processes and quality assurances procedures.
- Follow-on telephone discussions with Enbridge staff and with the authors of reports and other documents where necessary.

2.6 2008 AUDIT REPORTS

A first draft of the Cadmus 2008 Audit Report was circulated to the EAC on May 29, 2009. Following meetings with EAC and Company personnel on June 11, 12, 17 and 19, a second Draft Report was circulated to the EAC on June 20, 2009. Following an EAC meeting on June 24, 2009, the Final Audit Report was circulated on June 26, 2009, and filed with the Board pursuant to the Regulatory Reporting Requirements on June 30, 2009.

On July 7, 2009, Cadmus circulated an errata memo presenting LRAM values different then those found in the Final Audit Report. The memo is found in Appendix C to this Audit Summary Report.

2.7 2008 RECOMMENDED TRC, SSM, LRAM AND DSMVA

Table 1: Auditor TRC, SSM, LRAM and DSMVA Recommendations

	2008 Draft DSM Annual Report	Final Audit Report	Post Audit Results
TRC Savings	$181,769,031	$182,706,679	$182,706,679
SSM Amount Recoverable (Resource Acquisition)	$5,551,802	$5,607,522	$5,607,522
SSM Amount Recoverable (Market Transformation)	$450,000	$318,825	$195,700
LRAM (Recoverable from Ratepayers)	N/A	$37,291	$37,291
DSMVA Amount Recoverable	$73,340	$73,340	$73,340

The following is a summary of the adjustments recommended by the auditor that reflect the differences in the values found in Columns 2 and 3 of Table 1:

- Adjustment to SSM savings by the incorporation of the agricultural (custom projects) realization rate into the overall commercial (custom projects) realization rate. Please see section 3.1 for a complete description of this recommendation.
- Removal of SSM claims for Home Performance Contractor and Boiler Market Transformation Programs.

In Column 4, Post Audit Results, the SSM Amount Recoverable for MT programs is proposed to be to $195,700, subject to a full Settlement as described earlier in this document.

Table 5 presents a summary of all changes recommended by the auditor to reach the auditor recommended LRAM of 77,252,981 m^3. Changes were based on the Navigant report recently approved by the Board for 2010 program assumptions.

3. TRC RESULTS AND SSM CALCULATIONS

3.1 AUDITOR RECOMMENDATIONS

Cadmus obtained the SSM calculations from Enbridge and then replicated and checked for the following:

- Accuracy with the final savings totals shown in the Annual Report
- Consistency with the Board approved assumptions for calculation parameters (e.g., free ridership, per unit savings, savings adjustments)

This resulted in one recommendation to adjust SSM savings by the incorporation of the agricultural (custom projects) realization rate into the overall commercial (custom projects) realization rate.

Background on this recommendation:
When a sampling methodology was developed for custom projects, the sampling of agricultural custom projects was included in the sampling plan for commercial custom projects due to similarities in the technologies used by these 2 sectors. Historically, Enbridge has asked one engineering firm to verify and adjust if necessary the savings of agricultural and industrial custom projects. A second engineering firm has historically been asked to verify the savings of commercial custom projects. Enbridge followed this historic practice and then realized that asking one firm to generate a combined realization rate for both agricultural and industrial custom projects was in conflict with the sampling plan. To correct this, the sampled agricultural custom projects, verified and adjusted for savings by an outside engineering firm, were combined with the commercial custom projects to generate a realization rate for both commercial and agricultural custom projects. This approach was in alignment with the original sampling methodology and recommended by the auditor.

The auditor made the following recommendations that may affect SSM and LRAM for application in future years (i.e. next available opportunity):

1. Recommendation:
“Remove the agriculture custom project realization rates from the industrial program and incorporate them into the commercial program results. This recommendation would make the reporting consistent with the sampling protocol.”

Enbridge Response:
Enbridge is in agreement with this recommendation and recalculated the SSM accordingly.

EAC Response:
The EAC endorses this response.

2. Recommendation:
Revise ENERGY STAR® program. The auditor recommended the following: "We recommend Enbridge undertake a detailed free-ridership analysis and process evaluation of the program. The analysis should incorporate both participant and nonparticipant builders and home-buyers to determine the motivation behind building and purchasing ENERGY STAR® homes. Alternate program designs should be considered, including providing incentives to cover a portion of the incremental cost of building to ENERGY STAR® specification and the certification process."

Enbridge Response:
Enbridge intends to assess this recommendation in the context of a larger program review for the future. Enbridge is currently reviewing this program in light of the audit recommendations as well as upcoming changes to the Building Code and other industry developments that will affect the program in 2010 and beyond. Enbridge will discuss potential research relating to this program with the 2009 EAC.

EAC Response:
The EAC shared the auditor's concerns that adjusting a $100 builder incentive would neither address doubts regarding the influence of this incentive nor facilitate broader penetration of ENERGY STAR® standards. The EAC thus endorses Enbridge's response.

3. Recommendation:

The following recommendations were made by the auditor in their Final Report specific to the school prescriptive boiler program:

"We recommend accepting the 2008 claims for this program. However, we also recommend initiating a parallel custom savings calculation for schools and revisiting the program design in 2010, in the light of these additional data."

"Reconsider the Prescriptive Schools Program design after additional data collection activities. The details required to conduct energy savings calculations in E-Tools do not appear to add burden on participants or staff. The tool has proven easy to use, elegant, and flexible. Once a history of school boiler project savings has been accumulated (using the prescriptive savings algorithm), the program design might be reconsidered. This recommendation may affect both SSM and LRAM in future years."

Enbridge Response:
The Auditor recommends that a "parallel custom savings" be established for schools and that Enbridge should revisit the program's design in 2010.

Because the program uses a "replacement scenario" rather than an "advancement scenario", all input assumptions are made against a theoretical base case installation that doesn't take place. The program standardizes these input assumptions rather than leaving it to the discretion of the customer or individual user. Savings have been estimated using the very same E-Tools vehicle that the Auditor would have Enbridge use on a Custom basis. The Auditor has also concurred that Enbridge's sampling methodology is statistically valid.

Although the Auditor states that E-Tools is an easy tool to use, there are other administrative elements not addressed by the Auditor's recommendation. These elements include the administrative time required to search multiple data bases for obtaining customer consumption, verifying individual building consumption, eliminating data outliers with respect to estimated bills and inputting and running E-Tools. There would also be a significant increase in the evaluation process. Each project would once again need an internal engineering review of the project's calculations and assumptions.

The prescriptive approach is acceptable when the size of the market is large, there is uniformity amongst participants and it provides administrative efficiencies.

Enbridge intends to continue with the current program design. The auditor's recommendation implies a potential abandonment or market place reversal of using a prescriptive approach. This would materially impact the Company's efforts to develop other prescriptive program offerings for the smaller end of its Large Commercial sector. Reverting back to a custom approach would be regressive.

Enbridge DSM staff reported that the Prescriptive Schools Program has been identified by the school sector as a far more popular program design for this sector. Enbridge staff reported that there is a resistance, within this sector towards the increased administrative demands required for custom projects.

Stated simply, a reversion back to a more administratively demanding custom approach would alienate the schools from participating in any meaningful way. A significant barrier for schools is complex and large administration. A custom program will place additional administrative demands on the schools. From past experience, Enbridge recognizes that the schools are unlikely to allocate the time required to provide the back up information needed to support a custom project file and evaluation. For example, costs for performance improvements are often

found in a proposal accepted by the schools that encompasses much larger projects. Specific costs such as the cost for a new boiler are often blended within the price quote and difficult to disaggregate.

As an alternative, Enbridge will investigate updating the current program design. Areas of interest that will need to be investigated before any change is made to the program include the following:

- Baseline -- One fundamental question that will need to be answered is what is an appropriate baseline for the Prescriptive Schools program?
- Market Data – Review and analyze available market data to better understand the state of, and trends in, the market.
- Revised questionnaire to be answered by the schools following the installation of upgrades or boilers. These surveys will provide a more detailed understanding of the features (such as flue dampening and number of stages) installed with new boilers.
- Hybrid Approach – investigate a program in which some elements of the savings and TRC calculation are prescriptive and others are custom.

EAC Response:

As noted in Enbridge's response, prescriptive assumptions can be appropriate when the market is large; there is significant uniformity among participants with respect to projected savings, incremental costs and other key assumptions; and there are significant administrative efficiencies to be realized. The company has not made a compelling case that any of these three conditions apply to the schools measures.

Perhaps most importantly, the Company has provided no evidence to suggest that savings per school do not vary considerably. There are at least two major factors that could lead to significant variation. The first is the size of the heating load. The partial histogram of gas use by schools that is provided in the report used to support the Company's prescriptive schools assumptions suggests that there is non-trivial variation in gas use. The second is the features of the boilers actually installed in schools. The Company's prescriptive savings estimate for schools is based on a set of assumptions regarding key features of the installed boilers, including efficiency rating, number of heating stages, average jacket temperature, etc. No data on the variability of the features installed in school projects have been provided. During the audit process, the EAC asked Enbridge to provide data on the range of savings estimated for school boilers from a couple of years ago when savings from all school boilers were estimated on a custom basis. Such actual data would have shown the degree to which there is variability in savings. The EAC also requested data to demonstrate increased uptake under the prescriptive model than previously under the custom program model. However, the Company has not provided such data.

The Company makes several statements in its response about the barriers to participation that reverting to a custom approach may create. However, there is no evidence to support the Company's assertions. Indeed, as the auditor itself noted, the Company had as many custom projects as prescriptive projects with schools in 2008. In 2006, the last year that school boiler projects were treated as entirely custom, the Company had more school projects than in any other year.

While we are sure that schools – like all customers – prefer DSM approaches that lessen their administrative burden, we do not see the evidence that the burden under the custom program approach is excessive. Indeed, it should be possible to adopt an approach that generates much greater accuracy on savings estimates without putting any burden on schools. Specifically, Enbridge could require the school to identify the make and model number of the boiler installed, with the Company then able to identify the boiler features and do a custom savings calculation with E-tools.

4. Recommendation:
The auditor recommended the following: "[The aggregated] New construction measure life estimates should be savings-weighted. "

Enbridge Response:
Enbridge will investigate such an approach to determine if it is operationally feasible. At present we do not have an approved model that can calculate weighted measure life as described by the auditor nor do we have a complete understanding of the ramifications to program administration and customer interactions and requirements.

EAC Response:
The EAC accepts this response.

5. Recommendation:
Include systematic documentation and back-up for industrial program verification report. Because the report did not include sufficient documentation for audit review, our auditors had to request project files from Enbridge to examine baseline conditions etc. These data should have been included in the report.

Enbridge Response:
Enbridge agrees with this recommendation. The industrial verification report was written assuming the reader would have all project files available to them at the same time as when reading the verification report. Enbridge will work with the third party responsible for the industrial verification report to ensure that, in future years, the report itself includes sufficient documentation for the auditor's review. It is expected that a detailed review of a project will still require the project file.

EAC Response:
The EAC accepts this response.

6. Recommendation:
The auditor recommended the following: "Develop logic models and market progress indicators for market transformation programs."

Enbridge Response:
Enbridge agrees with this recommendation. Enbridge will begin work on logic models in 2009 and complete them as soon as practical. To the extent that the logic model work suggests changes in the design of Enbridge's market transformation programs, the Company will also pursue those changes as soon as possible.

In 2009 the following 3 market transformation programs are being delivered by Enbridge:

- EnerGuide for Natural Gas Fireplaces
- Home Performance Contractor Market Transformation
- Drain Water Heat Recovery

Some steps in line with the recommendation to develop market transformation logic models have been completed but finalized logic models are not yet available.

Because of the time line for development, regulatory filing and approval of program designs, it is possible that some program design changes may not go into effect until 2011. Those that can be put in place sooner, will be.

EAC Response:
The EAC accepts this response.

7. Recommendation:
The auditor recommended the following: "Implement a process to ensure consistent survey implementation approaches over time for Market Transformation programs. This is important because Market Transformation progress can only be understood over time. Where survey approaches change, an assessment of construct validity should be provided."

Enbridge Response:
Enbridge agrees with this recommendation with the understanding that programs may change over time and with such change, some adjustment to survey implementation approaches may be practically unavoidable.

EAC Response:
The EAC endorses this response.

8. Recommendation:
The auditor recommended the following: “Change the measure life assumption for steam traps to six years for LRAM until better data are available.”

Enbridge Response:
Enbridge has accepted prospective application of this recommendation. Following a review of the auditor’s sources that suggest a 6 year life, Enbridge concluded that the references found in those sources are qualitative in nature, limited in scope and that an enhanced statistical analysis would prove to be the best available information for customers found in Enbridge’s jurisdiction. Enbridge intends to enhance the current statistical analysis that recommends a 13 year measure life with additional customer sites and a greater number of steam traps in the sample. In addition, the approach to this analysis and key issues and questions that need to be addressed, including the concern expressed by the auditor about using “a straight line projection” from a few years of data “rather than the industry-standard logistic curve for survival functions”, will be looked at with the EAC. The process to be used for the analysis and the terms of reference for this work will be agreed upon by both the EAC and Enbridge. In the interim, a 13 year measure life as approved by the OEB for 2009 will be used for the 2009 SSM calculation.

EAC Response:
The EAC endorses this response.

9. Recommendation:
“Document the decision rules for categorizing individual replacements versus advancements for custom projects.”

Enbridge Response:
Enbridge agrees with this recommendation and will use the rules suggested by the auditor as a starting point to the development of Enbridge-specific decision rules. Enbridge intends to phase in this approach in 2009 and reach full implementation in 2010.

EAC Response:
The EAC endorses this response.

10. Recommendation:
“Evaluation and verification studies in support of annual reports need more time and should be planned and initiated earlier.”

Enbridge Response:
Enbridge agrees with this recommendation and has already taken steps to ensure that, where feasible, verification studies will be completed earlier in the year than for the 2007 and 2008 results.

EAC Response:
The EAC endorses this response.

11. Recommendation:
"Conduct site verification visits for commercial custom project verification studies."

Enbridge Response:
Enbridge will conduct sites visits for commercial custom projects in 2009 and use that experience to inform future commercial project verification efforts.

EAC Response:
The EAC endorses this response.

12. Recommendation:
"Conduct annual free-rider surveys for custom project participants."

Enbridge Response:
Enbridge agrees to investigate this recommendation. Discussions with the Auditor indicate that few if any jurisdictions have successfully implemented this theoretical best practice. Enbridge will investigate the practical effects of implementing this recommendation on programs and customers. Areas that will need to be investigated before adopting this recommendation include the following:

- Cost and Resource demands. In previous years, the costs required to conduct free ridership surveys were high and these studies also required Enbridge resources.
- Impact on other evaluations and study work. Conducting annual free-ridership surveys for custom project participants may have an impact on what can be done for other programs.
- Survey design and implementation strategy to ensure reasonable free ridership estimates are calculated.
- Pilot design and implementation of a free-ridership survey that can be administered to all industrial customers at the time a project is being verified for implementation.

EAC Response:
The EAC accepts this response.

13. Recommendation:
"Stratify savings calculations for pre-rinse spray nozzles."

Enbridge Response:
Enbridge is in agreement with this recommendation. The OEB approved assumptions for 2009 includes stratified savings for pre-rinse spray valves. Enbridge recommends using a study called Deemed Savings for (Low-Flow) Pre-Rinse Spray Nozzles (Jan 2009) recently commissioned by Union Gas as best available information for pre-rinse spray nozzles. This study stratifies the savings by the nature of the commercial operation as recommended by Cadmus and is referenced in our submission to the OEB for recommended 2009 and 2010 assumptions. The savings values as approved by the OEB in the Decision for 2010 Assumptions and the Board's decision re: Enbridge 2009 assumptions were based on this report.

EAC Response:
The EAC endorses this response.

14. Recommendation:
"Develop a comprehensive third-party evaluation strategy and schedule."

Enbridge Response:
Enbridge is in agreement with this recommendation. As part of the annual DSM cycle, Enbridge reviews the evaluation research priorities with the Evaluation Audit Committee following publication of the Audit Report. Enbridge has met with the 2009 EAC to begin this review for 2009.

EAC Response:
The EAC endorses this response.

15. Recommendation:
"Document program process flows and QA/QC procedures."

Enbridge Response:
Enbridge is in agreement with this recommendation. As noted by the auditor, Enbridge QA / QC procedures reflect some industry best practices but they are not well documented. Enbridge will begin documenting QA/QC procedures in 2009.

EAC Response:
The EAC endorses this response.

16. Recommendation:
"Review Commercial Custom Program water savings protocols as the verification report for the Commercial sector found water savings for projects where none were identified by Enbridge. "

Enbridge Response:
Enbridge is in agreement with this recommendation. Enbridge will begin this review in 2009.

EAC Response:
The EAC accepts this response.

3.2 EAC RECOMMENDATIONS

1. 150% Cap on Value of Individual Market Transformation Metrics
In its filing, the Company has suggested that it can earn bonus incentives for exceeding goals on individual market transformation metrics. The Company has assumed that the bonus is proportional to the margin by which it exceeded the goal, with no cap on the amount that can be earned for any one performance metric. Indeed its Draft 2008 Annual Report claimed more than 400% of the incentives set aside for one individual metric and over 200% for several others. The result is that metrics that were supposed to have limited weight when it comes to earning shareholder incentives dominate the Company's calculation of incentives for some market transformation programs. These dominant impacts can result in significant incentive payments even where the program underperforms on key transformation indicative metrics.

Our read of the Company's own filing several years ago on market transformation incentives (which the OEB adopted) suggests that the Company can earn extra incentives on individual performance metrics, but only up to the point where it achieves 150% of the goal for that metric. Thus, very high numbers relative to goals on metrics that are not meant to have great weight should be allowed to only partially offset short-falls on more important metrics. Specifically, in the Company's Market Transformation Incentive Update filed 2/26/07 (EB-2006-0021, Exhibit B, Tab 1, Schedule 1, p. 1), the Company says:

> *"The MT Shared Savings Mechanism (SSM) amount for any program results will be prorated on a linear basis between the scorecard levels for each program (i.e. 0%, 50%, target or 100% and 150%) indicated in the program scorecards."*

None of the filed scorecards in subsequent pages in the referenced Enbridge filing has a "level" higher than 150%.

It should also be noted that although the auditor did not pass judgment on our or the Company's competing interpretations of the rules on this issue (because it was outside of the auditor's purview), the auditor agreed that an approach that would allow for less important metrics to disproportionately contribute to SSM claims is problematic.

Enbridge Response:
In the interest of avoiding ratepayer costs that would result from a Proceeding over this issue and to facilitate a full Settlement, Enbridge ahs agreed to apply a 150% cap on individual 2008 MT metrics. This applies only to 2008 and is contingent on a full Settlement. If a hearing process results due to lack of a full Settlement Agreement, Enbridge reserves the right to claim the full MT SSM.

EAC Response:
The EAC endorses this response.

3.3 TRC RESULTS

The following table was taken from the auditor's Final Audit Report. It presents adjusted TRC.

Table 2: Auditor Recommended Adjusted TRC and LRAM

Program Area	Participants	Gas Savings (m3)	DSM Fixed and Variable Costs	Net TRC Results	Adjusted Net Gas Savings (for LRAM)	Adjusted Net TRC Results (for SSM)
Existing Homes	934,150	14,857,208	8,281,218	$43,113,761	13,551,951	$43,113,761
Residential New Construction	1,768	1,709,833	320,693	$498,507	1,709,833	$498,507
Low Income	17,317	584,712	996,085	$1,184,153	499,055	$1,184,153
Total Residential	**953,235**	**17,151,753**	**9,597,996**	**$44,796,421**	**15,760,840**	**$44,796,421**
Small Commercial	1,040	2,229,460	477,251	$4,346,038	825,073	$4,346,038
Large Commercial	219	15,390,429	1,688,426	$33,112,388	15,613,113	$33,559,011
Multi-Residential	23,737	17,654,343	2,181,397	$32,232,293	17,678,287	$32,771,114
Large New Construction	59	3,485,097	570,519	$11,654,781	3,529,074	$11,667,996
Industrial	140	23,871,775	2,197,990	$61,411,882	23,846,594	$61,350,871
Total Business Markets	**25,195**	**62,631,104**	**7,115,583**	**$142,757,382**	**61,492,141**	**$143,695,030**
Market Transformation Programs			528,311			
Program Development and Market Research			685,777	($685,777)		($685,777)
Overheads			5,098,995	($5,098,995)		($5,098,995)
Total All Programs	**978,430**	**79,782,857**	**23,026,662**	**$181,769,031**	**77,252,981**	**$182,706,679**

3.4 SSM CALCULATION

The following table was taken from the auditor's Final Audit Report. It presents the original SSM from the Enbridge Draft Annual Report and the SSM as adjusted based on the adjusted TRC results following the audit.

Table 3: Auditor Recommended SSM Calculation

	Original	Adjusted for Audit
2008 Actual TRC	$181,769,031	$182,706,679
2008 TRC Target	$168,276,583	$168,276,584
Percent of Actual	1.08	1.09
Base Target	75%	75%
Percent over 75%	33.02%	33.58%
$ per 1/10 of 1 %	10,000.00	10,000.00
SSM @ 75%	$2,250,000	$2,250,000
$ @ 10,000 per 1/10 of 1 % over 75%	$3,301,802	$3,357,522
Total Program Related	$5,551,802	$5,607,522
Market Transformation	$450,000	$318,825
Total SSM	**$6,001,802**	**$5,926,347**
Market Transformation Detail		
Energuide	$231,200	$231,200
Home Contactor	$152,867	
Boiler Market	$145,333	
Buisness Partners	$87,625	$87,625
Total	$617,025	$318,825

As discussed in the Introduction of this document, Enbridge is willing to adjust SSM claims for MT programs if it allows for the full settlement on the 2008 audit and 2008 clearing of accounts. With such an adjustment, the $318,825 noted in the table above for MT programs is reduced by $123,125 to $195, 700. That reduction is consistent with what would be achieved through the EAC's recommendation to cap incentives for individual metrics at 150% of their pre-assigned weight. This reduces overall SSM from $6,245,172 to $6,122,047

EAC Response:
The EAC supports the foregoing SSM calculations.

4. LRAM

4.1 AUDITOR RECOMMENDATIONS

17. Recommendation
"On April 16, 2009, Navigant Consulting presented a comprehensive recommendation for measure savings to the OEB. With the exception of showerhead estimates (discussed below), we recommend adopting these savings for calculating the LRAM, as they represent the most current available savings estimates."

This adjustment decreases the m3 saved to 77,252,981 for LRAM.

Enbridge Response:
Enbridge agrees with this recommendation and has updated the calculation of 2008 LRAM to reflect this recommendation.

EAC Response:
The EAC endorses this response.

18. Recommendation:
"Update the SAS shower head load study pursuant to the recommendations included as part of the report. These recommendations include (1) performing re-analysis after one-year post-installation data are available and (2) employing a comparative household sample with no installation (to control for trends)."

Enbridge Response:
Enbridge is in agreement with the recommendations made by Cadmus and will investigate how to address these recommendations. This research will be added to the master list of potential evaluation research for 2009 and 2010 for review with the EAC. The purpose of this research will be to develop savings estimates for both single family and multi-family dwellings.

EAC Response:
The EAC accepts this response.

19. Recommendation:
"Conduct a comprehensive evaluation of the Novitherm program. As noted in the Novitherm review, savings estimates suffer from similar shortcomings as those identified in the showerhead study. We recommend analysis using a full year of post-installation gas usage, as well as the inclusion of a control group."

Enbridge Response:
Enbridge will investigate how to address these recommendations using the in-house services of the load research group. This research will be added to the master list of potential evaluation research for 2009 and 2010 for review with the EAC.

EAC Response:
The EAC accepts this response.

4.2 EAC RECOMMENDATIONS

1. Free rider rate for Energy Star for New Homes Program. The auditor noted, that "it is highly likely that the free-ridership rate under the current program design is significantly higher than the 5 percent approved by the OEB". In the absence of specific research to develop an alternative number, and noting that the burden of proof should lie with the Company to support its assumption rather than with intervenors to support an alternative assumption, we suggest that a 95% free rider rate should be used for LRAM purposes for this program.

Enbridge Response:
Further study is required to bring forward 'best available information' that can be used to recommend an appropriate free-ridership value for this program. The auditor did not propose a specific change in free ridership assumption in the absence of a study to support a specific value. At present, without a new study and with Board approved values for free ridership, we recommend following the auditors recommendation to keep the current free-ridership value for the Energy Star program. Enbridge will discuss a free ridership study with the 2009 EAC. This study will be prioritized and addressed as with all other possible studies currently being reviewed between the 2009 EAC and Enbridge.

EAC Response:
While the EAC does not accept this response, it is also acknowledged that, under the current IRM framework, adopting the EAC's recommendation would have no impact on LRAM for the 2008 program year.

4.3 LRAM RESULTS

The table below presents a summary of all changes recommended by the auditor to reach the auditor recommended LRAM of 77,252,981 m^3.

Table 4: LRAM Savings Adjustments

LRAM Savings Changes	2008 Draft Annual Report		Adjusted per Audit		Comment
Measure	Savings per Unit (m3)	Free-ridership	Savings per Unit (m3)	Free-ridership	
EXISTING RESIDENTIAL					
TAPS Partners Program - Kitchen Aerators	22	31%	23	31%	Navigant Report
TAPS Partners Program - Pipe wrap	17	4%	18	4%	Navigant Report
Furnace Replacements	385	82%	385	90%	Navigant Report
Thermostats ($15)	152	43%	53	43%	Navigant Report
LOW INCOME					
LI TAPS Partners Program - Pipe wrap	17	1%	18	1%	Navigant Report
LI TAPS Partners Program - Kitchen Aerators	22	1%	23	1%	Navigant Report
LI Prog Thermostats	152	1%	53	1%	Navigant Report
LI Weatherization program	1,143	0%	1,134	0%	Navigant Report
SMALL COMMERCIAL					
Air Doors	2,118	5%	667	5%	Navigant Report
Restaurants - CKV	3,660	5%	4,801	5%	Navigant Report
Restaurants - CKV2	5,960	5%	11,486	5%	Navigant Report
Restaurants - CKV3	10,910	5%	18,924	5%	Navigant Report
Restaurants - PRSV	3,059	5%	886	5%	Navigant Report - Large Restaurant
Rooftop Units	1,275	5%	255	5%	Navigant Report
Tankless Water Heaters	825	2%	154	2%	Navigant Report
Programmable thermostats	519	20%	310	20%	Navigant Report - Average

Table 5: Auditor Recommended LRAM Calculation

Table 4: LRAM Calculation

2008 Audit Report LRAM Calculation

based on 56,244,500 FE m3 built into rates

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin	$
Rate 1	8,246,394	7,361,104	885,290	~~7.6921~~	~~$ 68,097~~
Rate 6	7,148,028	9,568,648	(2,420,620)	~~4.0023~~	~~$ (96,879)~~
Rate 100	5,703,303	7,408,034	(1,704,731)	2.9427	$ (50,165)
Rate 110	2,019,518	1,040,042	979,475	1.6537	$ 16,197
Rate 115	1,285,148	2,167,715	(882,567)	1.0185	$ (8,989)
Rate 145	1,780,944	1,580,389	200,556	1.9481	$ 3,907
Rate 170	4,282,436	3,968,053	314,383	0.5595	$ 1,759
Totals	30,465,771	33,093,985	-2,628,214		~~$ (66,073)~~
Total Excluding Rate 1 and Rate 6					$ (37,291)

Table 6: LRAM Results, Draft Annual Report to Post Audit Results

Enbridge Gas Distribution 2008 DSM LRAM Results

	Annual Report (LRAM)			Audit Report (LRAM)	
Program Areas	Net Annual Gas Savings	Net TRC Benefits		Net Annual Gas Savings	Net TRC Benefits
Existing Homes	14,857,208	$43,113,761		13,551,951	$40,250,885
Res. New Construction	1,709,833	$498,507		1,709,833	$498,507
Low Income	584,712	$1,184,153		499,055	$932,461
Total Residential	17,151,753	$44,796,421		15,760,840	$41,681,852
Small Commercial	2,229,460	$4,346,038		825,073	$2,421,061
Large Commercial	15,390,429	$33,112,388		15,613,113	$33,559,011
Multi-Residential	17,654,343	$32,232,293		17,678,287	$32,281,983
Large New Construction	3,485,097	$11,654,781		3,529,074	$11,667,996
Industrial	23,871,775	$61,411,882		23,846,594	$61,350,871
Total Business Markets	62,631,104	$142,757,382		61,492,141	$141,280,922
TOTAL RESIDENTIAL AND BUSINESS MARKETS	79,782,857	$187,553,803		77,252,981	$182,962,774
Portfolio Administration		($5,784,772)			($5,784,772)
TOTAL ALL PROGRAMS	79,782,857	$181,769,031		77,252,981	$177,178,002

Table 7: SSM and LRAM Tables: Residential

Program	SSM Case (Audit Report)		LRAM Case (Audit Report)	
	Net Annual Gas Savings	Net TRC Benefits	Net Annual Gas Savings	Net TRC Benefits
TAPS Partners Program - Showerheads over 2.5	5,804,787	$18,941,332	5,804,787	$18,941,332
TAPS Partners Program - 2.1 - 2.5	1,642,043	$5,232,555	1,642,043	$5,232,555
TAPS Partners Program - EQ 2.0	8,682	$26,555	8,682	$26,555
TAPS Partners Program - Kitchen Aerators	1,659,570	$6,618,072	1,735,005	$6,773,808
TAPS Partners Program - Bathroom Aerators	365,449	$1,346,180	365,449	$1,346,180
TAPS Partners Program - Pipe wrap	2,092,909	$4,923,676	2,216,022	$5,249,702
TAPS Partners Program - Bag test	0	$0	-	$0
Furnace Replacements	1,639,499	$2,396,464	910,833	$1,299,757
Thermostats ($15)	1,189,134	$3,132,610	414,632	$886,709
Novitherm	455,135	$496,316	454,500	$494,286
Total Existing Homes	**14,857,208**	**$43,113,761**	**13,551,951**	**$40,250,885**
EnerGuide for New Houses	0	($94,452)	-	($94,452)
EnergyStar for New Houses	1,709,833	$592,959	1,709,833	$592,959
EnergyStar for New Houses - Building Code	0	$0	-	$0
Total Residential New Construction	**1,709,833**	**$498,507**	**1,709,833**	**$498,507**
LI TAPS Partners Program - Showerheads 2.5+	114,653	$369,605	114,653	$369,605
LI TAPS Partners Program - Showerheads 2.1 - 2.5	14,390	$45,614	14,390	$45,614
LI TAPS Partners Program - Showerheads 2.0	23	$70	23	$70
LI TAPS Partners Program - Pipe wrap	33,119	$77,765	35,067	$82,925
LI TAPS Partners Program - Bag test	0	$0	-	$0
LI TAPS Partners Program - Kitchen Aerators	41,191	$164,500	43,064	$168,365
LI TAPS Partners Program - Bathroom Aerators	9,086	$33,594	9,086	$33,594
LI Prog Thermostats	134,505	$274,732	46,900	$20,694
LI Weatherization program	237,744	$218,273	235,872	$211,594
Total Low Income	**584,712**	**$1,184,153**	**499,055**	**$932,461**
TOTAL RESIDENTIAL	**17,151,753**	**$44,796,421**	**15,760,840**	**$41,681,852**

Table 8: SSM and LRAM Table: Commercial and Industrial

Note: At the bottom of Table 8 is found totals for the sum of all residential, commercial and industrial programs.

Program	SSM Case (Audit Report)		LRAM Case (Audit Report)	
	Net Annual Gas Savings	Net TRC Benefits	Net Annual Gas Savings	Net TRC Benefits
Small Commercial Boilers	0	$0	-	$0
Restaurants - CKV	3,477	($14,351)	4,561	($10,711)
Restaurants - CKV2	62,282	$304,913	120,029	$498,855
Restaurants - CKV3	31,094	$158,053	53,933	$234,761
Small Commercial General	0	($1,458)	-	($1,458)
Furnace Replacements	45,246	$79,444	45,246	$79,444
Restaurants - PRSV	1,822,093	$3,215,331	527,746	$1,642,958
Small Commercial Restaurants	0	($4,263)	-	($4,263)
Rooftop Units	190,166	$412,466	38,033	($98,472)
Tankless Water Heaters	8,894	$2,642	1,660	($19,523)
Programmable thermostats	46,087	$183,419	27,528	$129,601
TOTAL SMALL COMMERCIAL	**2,229,460**	**$4,346,038**	**825,073**	**$2,421,061**
Hotel/Motel	1,680,952	$3,901,189	1,680,952	$3,901,189
Office	2,507,991	$4,224,856	2,507,991	$4,224,856
Retail	101,055	$84,995	101,055	$84,995
Warehouses	399,536	$741,881	399,536	$741,881
Other Commercial	1,363,149	$2,416,894	1,363,149	$2,416,894
Hospitals	3,742,708	$9,192,867	3,742,708	$9,192,867
Long Term Health Care	201,182	$172,324	201,182	$172,324
Government	948,004	$1,997,712	948,004	$1,997,712
Schools	2,863,756	$6,638,753	2,863,756	$6,638,753
College/University	1,804,778	$4,187,542	1,804,778	$4,187,542
TOTAL LARGE COMMERCIAL	**15,613,113**	**$33,559,011**	**15,613,113**	**$33,559,011**
Multi-Res Private	15,158,787	$25,312,293	15,158,787	$25,312,293
Multi-Res Non-Profit	922,084	$1,420,257	922,084	$1,420,257
Multi - Residential ReCommissioning	0	($5,009)	0.00	($5,009)
Showerheads - Rental	1,036,416	$3,555,404	1,036,416	$3,555,404
Showerheads - Condo	437,800	$1,481,948	437,800	$1,481,948
Front Load Washers	360,126	$1,006,222	123,201	$517,090
TOTAL MULTI-RESIDENTIAL	**17,915,212**	**$32,771,114**	**17,678,287**	**$32,281,983**
TOTAL LARGE NEW CONSTRUCTION	**3,529,074**	**$11,667,996**	**3,529,074**	**$11,667,996**
Industrial	22,223,016	$59,179,956	22,223,016	$59,179,956
Agriculture	1,623,577	$2,170,914	1,623,577	$2,170,914
TOTAL INDUSTRIAL	**23,846,594**	**$61,350,871**	**23,846,594**	**$61,350,871**
TOTAL BUSINESS MARKETS	**63,133,453**	**$143,695,030**	**61,492,141**	**$141,280,922**
TOTAL MASS MARKETS AND BUSINESS MARKETS	**80,285,206**	**$188,491,451**	**77,252,981**	**$182,962,774**
TOTAL PORTFOLIO ADMINISTRATION		($5,784,772)		($5,784,772)
TOTAL	**80,285,206**	**$182,706,679**	**77,252,981**	**$177,178,002**

APPENDIX A

Terms of Reference: Independent Audit of 2008 DSM Program Results

Terms of reference

APPENDIX B

Final Work Plan

Final Work Plan

Independent Audit of 2008 DSM Program Results

Prepared for:

Marco Spinelli, DSM Research and Evaluation
Enbridge Gas Distribution

The Cadmus Group, Inc.
Energy Services
720 SW Washington Street, Suite 400
Portland, OR 97205
503-228-2992

May 8, 2009

TABLE OF CONTENTS

Methodology and Approach, and Work Plan

Our approach to the scope of work addresses five concerns:

- Are the inputs to the savings financial calculations based on approved assumptions? Are they gathered and documented in a reliable manner? We will identify any areas where these are lacking.
- Are market effects adequately tracked and attributable? Are baseline data collected and available?
- Are economic and financial calculations accurate, based upon agreed-upon rules, protocols, and procedures? If not, where are the differences, and to what can the deviations be attributed?
- Are the LRAM calculations consistent with methodology and assumptions used to calculate the LRAM budget volume savings? If not, where are they different?
- How can the calculations be improved? Where are the tracking and assumptions lacking, and where and how can better data be used, going forward? (These assumptions may include net-to-gross assumptions, including adjusted gross, freeridership and spillover, unit savings, measure life and incremental cost assumptions, program tracking, and, in some cases, program design.)

At the conclusion of our review, we will issue an assessment that describes the scope of our review, the methodology employed, and our findings as they relate to the accuracy of the calculations for the TRC savings and the SSM, LRAM, and DSMVA amounts recoverable. The RFP identifies 14 activities, which we have organized under the six tasks summarized in the following final work plan.

Task 1: Kick-Off Meeting

The Cadmus team will meet with Enbridge and interested parties to come to a shared understanding of the audit's goals and requirements. We will solicit input to identify key issues and uncertainties associated with the audit data and procedures, and we will use the opportunity to gather appropriate background information, including: hands-on demonstrations of appropriate forecasting models, tracking databases, financial calculations, and benefit cost analysis. (Experience has shown documentation of these systems is often difficult to interpret, and the direct-use approach is a very cost-effective way deal with this learning curve.) In addition to these goals, we will use the kick-off meeting to discuss:

- ***Project objectives***. We will confirm project expectations to be certain we fully understand Enbridge's and the stakeholders' goals and objectives; thus the direction of our analysis and allocation of resources will be appropriate.
- ***Proposed methodologies for achieving objectives***. We will review the audit principles and process we propose to use for this review. The approach will be adjusted as necessary to meet Enbridge's objectives.
- ***Schedule and deliverables***. This final work plan presents a detailed schedule for performing tasks and formatting deliverables. Cadmus is committed to meeting the schedule outlined below; the detailed schedule will show how we will achieve these objectives.

- ***Data Requirements***:
    - All relevant filings
    - Program marketing plan and materials
    - Program surveys
    - Participant databases

Task 2: Review of Background Materials

We will review background material to identify any apparent gaps in data or procedures which may have implications for the audit as well as any additional information that may be required. The background review will entail enhanced communication with the Enbridge project manager.

The background material will include but not be limited to:

- The Annual DSM report for 2008, including comments from stakeholders.
- Data or documents from Enbridge's DSM tracking system.
- 2008 TRC/SSM spreadsheet.
- Commercial and industrial sector reports and project files.
- Verification studies.
- 2008 OEB approved assumptions.
- Freeridership/spillover analysis.

Task 3: Discussion of the Revised Scope of work

Based on our review of the background materials, we have revised the work plan to provide more detail on the methods, approaches, and focus of the audit. We met with Enbridge staff and the EAC on May 5 to review the revised work plan and receive input. Our approach for this type of program review is based on an iterative, interactive, and consensus-building process. We use an *iterative* process that asks questions and requests documents/data, reviews materials, asks additional questions, requests additional materials, and so on, until we have a sound understanding of each issue. The *interactive* nature of this process helps all stakeholders develop confidence in the accuracy, validity, and reliability of our ultimate findings. At the work plan review meeting, we discussed:

- Completion of the review of OEB-approved assumptions:
    - Savings
    - Freeridership
    - Measure life
- Benchmarking savings assumptions.
- Review of the Measure Tracking System:
    - Data input forms
    - Internal controls
- Review of the reduction factor calculations.
- Verify TRC/SSM/LRAM calculations.

- 2008 Audit recommendations:
    - Verify incorporation of recommendations, as appropriate
- Complete review of available evaluations and verification reports.
- Assumptions, methodologies, and approaches.
- Compare program evaluations to industry best practices.
- Complete review of BII and Genivar reports:
    - Internal engineering review for completeness
    - Sampling strategy
- Market transformation metrics.

Our approach to the final scope of work addresses the following concerns:

- Are inputs to the savings financial calculations based on approved assumptions? Are they gathered and documented in a reliable manner? We will identify any areas where these issues are lacking, addressing the following questions.
    - How are measure lives determined for C&I projects?
    - Is early replacement appropriately considered?
    - What are the baseline assumptions for boiler replacements?
- Are market effects adequately tracked and attributable? Are baseline data collected and available?
- Are the economic and financial calculations accurate, based upon agreed-upon rules, protocols, and procedures? If not, where are the differences and what can the deviations be attributed to?
- Are the LRAM calculations consistent with methodology and assumptions used to calculate the LRAM budget volume savings? If not, where are they different?
- Are there gaps in data management and processes, and are participant activities properly tracked?
- Where are the tracking and assumptions lacking, and where and how can data be better used, going forward? (These assumptions may include net-to-gross assumptions, including adjusted gross, freeridership and spillover, unit savings, measure life and incremental cost assumptions, program tracking, and, in some cases, program design.)
- Has EGD followed through with its commitments, based on the recommendations made and accepted in the 2008 Audit of the 2007 programs?
- Have new studies and information been integrated into the 2008 Annual Report, including sampling strategies and freerider adjustments?
- Are there multiple-year, unresolved issues that can be finally be resolved?
- Are there information gaps that can be addressed through new activities going forward?

Additionally, the GEC identified five areas of concern regarding OEB's approved 2008 assumptions for Enbridge's DSM programs. We will research and address these concerns:

1) ***Energy Star Homes.*** GEC has raised concerns about Enbridge's use of a study conducted by Bowser Technical to base updated savings assumptions of ENERGY STAR home construction. GEC also raised concerns about the low freerider estimate. GEC noted the 2007 audit indicated the $100 incentive was unlikely to have a significant impact on the new construction market.

2) ***Air-Curtains.*** GEC stated prescriptive assumptions were not appropriate for this technology.

3) ***Prescriptive School Boilers.*** GEC raised concerns about the calculation of approved prescriptive savings for school boilers, based on GEC's estimation of the impact of moving from an 81.5% efficiency boiler to an 83.5% mid-efficiency boiler and to an 86.5% high-efficiency boiler.

4) ***Industrial Steam Trap Measure Life.*** GEC questioned the analysis that Enbridge used to support increasing the measure lives of industrial steam traps from 3 years to 13 years.

5) ***Low unsupported freeridership rates.*** GEC indicated Enbridge's freeridership rates were not supported by adequate research and documentation.

Task 4: Data Analysis/Audit Assumptions

We will determine whether the reported values for key assumptions are consistent with evaluation literature and our professional knowledge of other programs. We will review the source of these assumptions to ensure Enbridge is using values appropriate to market penetration and market maturity in the service territory, and that these are well documented and commensurate with program design objectives, including the following:

- ***Program planning assumptions***. Values used for participation, costs, energy savings, freeridership rates, spillover, market effects, measure lives, and other key assumptions will be assessed for accuracy and proper documentation. These values will be compared with Board-approved values, and any perceived inconsistencies will be investigated to determine if there were special circumstances in the Enbridge programs that led to variances from other programs. Particular attention will be placed on whether the methodologies and assumptions used to develop the savings and costs in the 2008 Annual DSM Report are consistent with methodologies and assumptions used to estimate budgeted savings
and costs.

- ***Program evaluation assumptions***. Verification and evaluation approaches will be examined and compared to best practices, including those recommended in the California protocols, IPMVP protocols, and others. Program baseline and net effects results will be examined. Third-party engineering reports will be reviewed, including the appropriateness of extrapolating the realization rate to the total population of custom projects. Appropriate identification and application of measure-effective useful lives will be reviewed, especially where the program encourages early replacement of working measures.

- ***Market transformation assumptions***. Market transformation programs rely on a separate set of assumptions than those of direct resource acquisition programs. Typically, estimating savings from market transformation programs requires identification of Key Performance Indicators, which are subsequently tracked over time. We will review EGD's market transformation metrics for reasonableness and suggest appropriate modifications or additions.
- ***Program tracking systems.*** We will review the program tracking systems to ensure accurate participation data are being collected. In particular, we will identify whether controls and internal audit procedures are in place and being followed. For programs not driven by rebates, we will review the participation estimating methodology.

Task 5: Data Analysis/Financial Calculations

Our assessment of the 2008 Evaluation Report will be based on a thorough review of the actual evaluation approach and the critical calculations. We will identify and assess any differences between the Board-approved assumptions and the evaluation and verification studies. These differences will be grouped by the following categories:

- ***Not Important.*** Any differences that do not materially impact program evaluation results.
- ***Moderately Important.*** Any differences that may affect the program evaluation results or cost-effectiveness, but which are not expected to change Enbridge's conclusions.
- ***Important.*** Any differences that will likely change the program evaluation results or cost-effectiveness to the extent that Enbridge will need to consider alternative approaches.

Cadmus will work with Enbridge to further refine these categories, if necessary. The major goal will be to highlight areas where differences might be relevant or significant, and ensure attention is focused on variables and calculations that make a difference.

Task 6: Draft and Final Report

Cadmus will prepare a draft and final report that will summarize this audit's findings. Included in our recommendations will be modifications to the assumptions and program design we believe will enhance Enbridge's program effectiveness on a prospective basis. We will recommend refinements to the savings estimation process that will increase the accuracy of the savings estimation used to develop the SSM and LRAM recoverable amounts.
The report, which will be revised and finalized to address Enbridge's and stakeholder's comments, will contain the following sections:

- Executive summary
- Background or introduction
- Methodology
- Findings
- Recommendations

- Appendices (including a bibliography and reference list, clean copies of interview guides and survey instruments, and documentation of any electronic databases)

Updated Schedule

The following chart illustrates the current project schedule as well as revisions from the original schedule.

	Original Dates	Updated April 1	Updated April 7	Updated April 20
RFP issued	Dec. 22	Completed	Completed	Completed
Proposals due	Jan. 19	Completed	Completed	Completed
Contract awarded	Feb. 04	Completed	Completed	Completed
Contract signed	Feb. 19		Completed	Completed
Auditor Meeting At Enbridge Offices: Introduction and Access to Background Information, Tracking Systems, Recording Systems and DSM Program Files	Feb. 19 and 20	Completed	Completed	Completed
TRC/SSM Spreadsheet to Cadmus	Mar. 13	March 27th	Updated Spreadsheet April 9	Completed
LRAM and SSM Spreadsheet to Cadmus	Mar. 13	April 6	Week of April 14	Completed
2008 DSM Annual Report circulated	Mar. 13	April 9	April 9	Completed (April 15)
Comments from EAC on DSM Annual Report Required for Work Plan			April 23	May 5
Comments on DSM Annual Report from Consultative	Mar. 23	April 17	May 9	May 15
Draft Work Plan	Mar. 25	April 22	April 27	April 27
Meeting with EAC to review scope and work plan	Mar. 30	April 28	April 29	May 5
Final Detailed Work Plan	Apr. 2	May 1	May 1	May 8
Progress meetings with EAC	Weekly	Weekly	Weekly	Weekly
Draft Audit Report submitted	May 29	May 29	May 29	May 29
Review Meeting with EAC	Jun. 1	Jun. 1	Jun. 1	Jun. 1
Final Audit Report submitted	Jun. 9	Jun. 9	Jun. 9	Jun. 9

APPENDIX C

Errata Memo from Cadmus

Date: **July 7, 2009**

To: **Marco Spinelli**

From: **Brian Hedman**
Ben Bronfman

Re: **Errata for Audit of 2008 DSM Annual Report**

Subsequent to the submission of the Independent Audit of 2008 DSM Program Results errors were discovered in the calculation of the savings for the LRAM calculation. The LRAM savings estimate is based on the best available information. The Audit referred to the 2010 savings estimates approved by the OEB as the best available information with the exception of low flow single family and low income showerheads for which the audit found that the study supporting the 2010 savings was flawed. The remaining prescriptive measure savings were intended to be based on the 2010 approved savings, however it was determined that two values were obtained from the 2009 Enbridge filing rather than the 2010 approved savings:

1) The free-ridership for commercial pre-rinse spray valves was set to 0%. The correct value should be 5%. This reduces the LRAM savings by 27,776 m^3.
2) The Residential Programmable Thermostat value was set to 146 m^3. The correct value should be 53 m^3. This reduces the LRAM savings by 809,858 m^3.

The corrected total savings for LRAM is 77,252,981.
The LRAM recovery amount is not affected as both of these corrections impact only Rates 1 and 6.

SHIBLEY RIGHTON LLP
Barristers and Solicitors

TORONTO OFFICE:
250 University Avenue, Suite 700, Toronto, Ontario, M5H 3E5
Main 416 214-5200 Toll free 1-877-214-5200
Facsimile 416 214-5400

WINDSOR OFFICE:
2510 Ouellette Avenue, Windsor, Ontario, N8X 1L4
Main 519 969-9844 Toll free 1-866-522-7988
Facsimile 519 969-8045

www.shibleyrighton.com

Please Reply to the TORONTO OFFICE

Jay Shepherd
Direct Line (416) 214-5224
Direct Fax (416) 214-5424
jay.shepherd@shibleyrighton.com

BY EMAIL

September 3, 2009
Our File No. 2040103

Enbridge Gas Distribution
500 Consumers Road
Toronto, Ontario
M4P 1E4

Attn: Trevor Maclean, Director, DSM

Dear Mr. Maclean:

Re: Clearance of Enbridge 2008 DSM Deferral and Variance Accounts

Further to the meeting of the Enbridge DSM Consultative yesterday, we are writing on behalf of our client the School Energy Coalition to advise our position with respect to the clearance of the 2008 DSM deferral and variance accounts.

We have no reason to doubt that the audit of your 2008 DSM Report was thorough and that the resulting numbers are reasonable and compliant with the Board's rules. Not only is Cadmus a good audit firm for this purpose, but Mr. Neme and Mr. Mondrow, the two members of the Evaluation and Audit Committee that participated throughout, are knowledgeable and careful.

We do have a concern, which we expressed to you again yesterday morning, that in the process of selecting the auditor for the 2008 results, Enbridge consciously decided not to include on the list of eligible bidders the 2007 auditors, EcoNorthwest, despite two members of the EAC recommending that they be included. This calls into question the integrity of the selection process, and therefore the independence of the audit.

There are many reasons why a consulting firm, having audited DSM results for one or more years, would not be invited to bid again, and some of those reasons are quite legitimate. For example, a firm can be selected to do the work based on their claims of competence, but be found to be lacking in material ways when they actually do an audit. Or, a firm may overbill for their work, or not produce results in a timely manner.

In this case, it was open to Enbridge to propose to the EAC the exclusion of EcoNorthwest from the bidder list, and give reasons for doing so. The EAC could have had a transparent and open discussion, and could have collectively decided either to exclude them, or to investigate further, or to include them.

What appears to have happened here is that Enbridge decided to exclude the most recent auditors from bidding, unilaterally and over the objections of EAC members. Given that EcoNorthwest, in the 2007 audit, exhibited a strong independence that allowed real breakthroughs in how the audit was conducted, an observer could conclude that they were being "punished" by Enbridge for their independence. If audit firms feel that being too independent of utility control can undermine the economic viability of their business (i.e. they are no longer invited to bid on jobs), the integrity of the DSM audit process is weakened.

We note that DSM auditing is moving more and more towards the financial audit paradigm. One aspect of that paradigm in financial auditing is that the incumbent auditor cannot be removed easily. The main purpose of this is to ensure that auditors are able to remain independent, as they are required to be, without jeopardizing their retainers. Financial audit results cannot be relied on by the shareholders and third parties if those people feel that the auditor was too concerned with pleasing management.

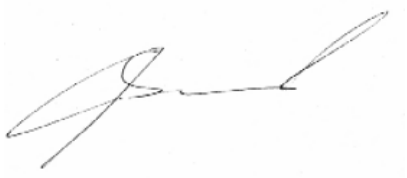
We also note that this particular incident is part of a more general question of whether the auditors should be chosen and supervised by Enbridge, with the EAC having merely an advisory role, or whether the EAC should participate actively in auditor selection, and in supervision of the audit, to ensure independence. It appears that there may remain some ambiguity over which model most assists the Board in managing the regulatory process.

During the Consultative meeting yesterday, Enbridge acknowledged that it was not appropriate to exclude EcoNorthwest without a full and open discussion with the EAC, and we understand that you have committed not to take such steps in the future. We appreciate the resolution of our concern on a going forward basis, although of course the lessons from this and previous audit processes will presumably inform the discussion over the next multi-year DSM plan to be considered by the Board.

Subject to expressing this concern, which we believe you have now satisfied, the School Energy Coalition accepts the amounts and clearance of the deferral and variance accounts for the 2008 year.

We would ask that this letter of concern be filed with your application for clearance, so that it is on the public record and can be considered by the Board.

Yours very truly,
SHIBLEY RIGHTON LLP



Jay Shepherd

cc: Bob Williams, SEC (email)
Wayne McNally, SEC (email)
Interested Parties (email)

Trevor MacLean
Director, Market Development
500 Consumers Road, North York, ON M2J 1P8
Direct: (416) 495-5427 Fax: (416) 495-8350
Email: trevor.maclean@enbridge.com

ENBRIDGE

September 16, 2009

Jay Shepherd
Shibley Righton LLP
250 University Avenue, Suite 700,
Toronto, Ontario, M5H 3E5

Dear Jay,

Re: Clearance of EGD DSM Deferral and Variance Accounts

Thank you for your letter dated September 3, 2009 and SEC's support for clearance of the 2008 DSM accounts. As presented to the Consultative on September 2nd, the audit process conducted was thorough, robust, and confirmed that EGD is conducting its operation in a manner that produces credible results in alignment with Board rules.

Nevertheless, your letter reiterated the concern you raised in the Consultative regarding the selection of this year's auditor; and more specifically, the absence of the previous year's auditor from the selection list. I listened carefully to the concerns expressed and am reminded of the phrase 'perception is reality'. While I believe we followed the letter of the rules within the Board approved process, we certainly did not do all that we could have done to outline our thought process and the reasons for our actions. Ergo, I am inclined to agree with you in so far as we could have done better in the spirit of consultation around this part of the process. Having spoken with my staff, I believe this was a case of good people simply missing the opportunity to clarify and resolve a concern early. It is my intention of ensuring this does not happen again by strengthening our internal review and communication processes; in short, I believe this is an opportunity for improvement and plan on treating it as such.

Also, you touched on the nature of the relationship between the Company and the EAC in your comments; alluding to the possibility of redefining that relationship in a future proceeding. Notwithstanding that I agree we should have handled the 2008 auditor selection better, I am not inclined to believe that there is anything fundamentally broken with the process or the nature of the relationship between the Company and the EAC. In any case, all I can say for now is that reasonable people can agree to disagree, and that might in fact be the case on this particular aspect of your comments.

Again, I thank SEC for your support in Clearance of Accounts for our 2008 DSM results and for your thoughtful consideration of all the issues addressed during the audit process. In particular, I appreciate your point of view on the selection of the auditor and you have my commitment to ensure such a situation is better handled in the future. As always, I look forward to working with SEC and all members of the Consultative to continuously improve our DSM program and to deliver the best possible results and value to our customers.

Sincerely,

Trevor MacLean

CC: Enbridge DSM Consultative Parties (via email)
Kirsten Walli, Board Secretary, Ontario Energy Board (via email)

1. 2009 AVOIDED COSTS

The purpose of this information is to update commodity costs for 2009, in accordance with the Board Decision in EB-2006-0021. The Board Decision stated: "The avoided costs will be submitted for review as part of the multi-year plan filing and should be in place for the duration of the plan. The commodity portion of the avoided costs will be updated annually".[1]

1.1 AVOIDED GAS COSTS

The commodity price forecast has been updated for the four load types: water heating, space heating, industrial process, and water and space heating combination as shown in Table 9. This has resulted in a higher unit avoided gas cost, in comparison with the forecast provided in EB-2006-2001. Forecast values beyond those shown for 2017 are adjusted for a nominal growth rate of 2%.

1.2 AVOIDED ELECTRICITY COSTS

Avoided electricity costs have been updated using the same methodology as for previous DSM plans. The avoided electricity costs are based on the wholesale price of electricity as reported in the Annual Report of the Independent Electricity System Operator ("IESO"). The avoided electricity costs of $0.0771/kWh represent the wholesale cost of electricity, i.e., the cost of the commodity price plus wholesale market services, transmission and debt retirement charges which are passed from the IESO to the Local Distribution Utilities. The values represent the l atest full year of data available from the IESO (January 2008 to December 2008). Forecast values are adjusted for the Consumer Price Index.

1.3 AVOIDED WATER COSTS

The avoided water costs are based on the wholesale cost of water which includes the cost of water and sewage treatment, but not the cost of water distribution and sewage collection.

A weighted average cost of 1.3417m^3 (or 1,000 liters) was developed by applying the number of customers in each region to the water costs in each region. For subsequent years the values are adjusted for the Consumer Price Index.

[1] EB-2006-0021. Decision With Reasons. Ontario Energy Board. August 25, 2006. Page 38.

Table 1: 2009 Avoided Cost Summary

2009 Avoided Costs Summary

Year		Water Heating		Space Heating		Space & Water Heating		Industrial	
		Avoided Costs	NPV	Avoided Costs	NPV	Avoided Costs	NPV	Avoided Costs	NPV
1	2009	$ 0.3009	$0.30	$ 0.3267	$0.33	$ 0.3221	$0.32	$ 0.3038	$0.30
2	2010	$ 0.3136	$0.59	$ 0.3416	$0.64	$ 0.3362	$0.63	$ 0.3178	$0.59
3	2011	$ 0.3354	$0.87	$ 0.3701	$0.95	$ 0.3639	$0.94	$ 0.3396	$0.88
4	2012	$ 0.3310	$1.12	$ 0.3618	$1.23	$ 0.3560	$1.21	$ 0.3351	$1.14
5	2013	$ 0.3552	$1.37	$ 0.3870	$1.50	$ 0.3811	$1.48	$ 0.3591	$1.39
6	2014	$ 0.3703	$1.61	$ 0.4084	$1.77	$ 0.4018	$1.74	$ 0.3745	$1.63
7	2015	$ 0.3829	$1.84	$ 0.4221	$2.02	$ 0.4150	$1.98	$ 0.3871	$1.86
8	2016	$ 0.3845	$2.05	$ 0.4238	$2.24	$ 0.4168	$2.21	$ 0.3887	$2.07
9	2017	$ 0.3602	$2.23	$ 0.3971	$2.44	$ 0.3904	$2.40	$ 0.3642	$2.25
10	2018	$ 0.3674	$2.39	$ 0.4050	$2.63	$ 0.3982	$2.58	$ 0.3714	$2.42
11	2019	$ 0.3747	$2.55	$ 0.4131	$2.80	$ 0.4062	$2.75	$ 0.3789	$2.58
12	2020	$ 0.3822	$2.70	$ 0.4214	$2.96	$ 0.4143	$2.91	$ 0.3865	$2.73
13	2021	$ 0.3899	$2.83	$ 0.4298	$3.11	$ 0.4226	$3.06	$ 0.3942	$2.87
14	2022	$ 0.3977	$2.96	$ 0.4384	$3.25	$ 0.4311	$3.20	$ 0.4021	$3.00
15	2023	$ 0.4056	$3.08	$ 0.4471	$3.38	$ 0.4397	$3.33	$ 0.4101	$3.12
16	2024	$ 0.4137	$3.19	$ 0.4561	$3.51	$ 0.4485	$3.45	$ 0.4183	$3.23
17	2025	$ 0.4220	$3.30	$ 0.4652	$3.62	$ 0.4575	$3.56	$ 0.4267	$3.33
18	2026	$ 0.4304	$3.39	$ 0.4745	$3.73	$ 0.4666	$3.67	$ 0.4352	$3.43
19	2027	$ 0.4390	$3.48	$ 0.4840	$3.83	$ 0.4759	$3.77	$ 0.4439	$3.52
20	2028	$ 0.4478	$3.57	$ 0.4937	$3.92	$ 0.4855	$3.86	$ 0.4528	$3.61
21	2029	$ 0.4568	$3.65	$ 0.5036	$4.01	$ 0.4952	$3.94	$ 0.4619	$3.69
22	2030	$ 0.4659	$3.72	$ 0.5136	$4.09	$ 0.5051	$4.02	$ 0.4711	$3.77
23	2031	$ 0.4752	$3.79	$ 0.5239	$4.17	$ 0.5152	$4.10	$ 0.4805	$3.84
24	2032	$ 0.4847	$3.86	$ 0.5344	$4.24	$ 0.5255	$4.17	$ 0.4901	$3.90
25	2033	$ 0.4944	$3.92	$ 0.5451	$4.31	$ 0.5360	$4.24	$ 0.4999	$3.96
26	2034	$ 0.5043	$3.97	$ 0.5560	$4.37	$ 0.5467	$4.30	$ 0.5099	$4.02
27	2035	$ 0.5144	$4.03	$ 0.5671	$4.43	$ 0.5576	$4.35	$ 0.5201	$4.07
28	2036	$ 0.5247	$4.08	$ 0.5784	$4.48	$ 0.5688	$4.41	$ 0.5305	$4.12
29	2037	$ 0.5352	$4.12	$ 0.5900	$4.53	$ 0.5802	$4.46	$ 0.5411	$4.17
30	2038	$ 0.5459	$4.17	$ 0.6018	$4.58	$ 0.5918	$4.50	$ 0.5520	$4.21

Discount Rate: 9.14%

Year		Ont. CPI	Electricity		Water	
			¢ / Kwh	NPV	Water Rates $ / 1000 litres	NPV
1	2009	1.05	$ 0.0771	$0.08	$ 1.3417	$1.34
2	2010	1.73	$ 0.0784	$0.15	$ 1.3649	$2.59
3	2011	1.84	$ 0.0799	$0.22	$ 1.3901	$3.76
4	2012	1.89	$ 0.0814	$0.28	$ 1.4164	$4.85
5	2013	1.92	$ 0.0830	$0.34	$ 1.4436	$5.87
6	2014	1.92	$ 0.0845	$0.39	$ 1.4713	$6.82
7	2015	1.90	$ 0.0862	$0.44	$ 1.4993	$7.70
8	2016	1.79	$ 0.0877	$0.49	$ 1.5262	$8.53
9	2017	1.89	$ 0.0894	$0.53	$ 1.5550	$9.30
10	2018	1.95	$ 0.0911	$0.58	$ 1.5854	$10.02
11	2019	2.00	$ 0.0929	$0.61	$ 1.6170	$10.70
12	2020	2.24	$ 0.0950	$0.65	$ 1.6533	$11.33
13	2021	2.11	$ 0.0970	$0.69	$ 1.6881	$11.92
14	2022	2.04	$ 0.0990	$0.72	$ 1.7225	$12.47
15	2023	2.05	$ 0.1010	$0.75	$ 1.7579	$12.99
16	2024	2.09	$ 0.1031	$0.77	$ 1.7946	$13.47
17	2025	2.13	$ 0.1053	$0.80	$ 1.8328	$13.93
18	2026	2.19	$ 0.1076	$0.82	$ 1.8729	$14.35
19	2027	2.32	$ 0.1101	$0.85	$ 1.9163	$14.75
20	2028	2.26	$ 0.1126	$0.87	$ 1.9596	$15.12
21	2029	2.31	$ 0.1152	$0.89	$ 2.0049	$15.47
22	2030	2.25	$ 0.1178	$0.91	$ 2.0501	$15.79
23	2031	2.00	$ 0.1202	$0.93	$ 2.0911	$16.10
24	2032	2.00	$ 0.1226	$0.94	$ 2.1329	$16.39
25	2033	2.00	$ 0.1250	$0.96	$ 2.1756	$16.65
26	2034	2.00	$ 0.1275	$0.97	$ 2.2191	$16.90
27	2035	2.00	$ 0.1301	$0.98	$ 2.2635	$17.13
28	2036	2.00	$ 0.1327	$1.00	$ 2.3087	$17.35
29	2037	2.00	$ 0.1353	$1.01	$ 2.3549	$17.55
30	2038	2.00	$ 0.1380	$1.02	$ 2.4020	$17.75

Discount Rate: 9.14%