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VIA RESS, EMAIL AND COURIER

January 12, 2011

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

Dear Ms. Walli:

Re: Enbridge Gas Distribution Inc. ("Enbridge")
Board No: EB-2010-0277 – Clearance of DSM Variance Accounts Application

Enbridge is filing an application with the Ontario Energy Board (the "Board") for an order or orders approving the balances and clearance of certain Demand Side Management Variance Accounts into rates, as at July 1st, 2011.

Enbridge has provided the results of the independent audit to the Evaluation Audit Committee and has provided the EAC Audit Summary Report ("Report") to the DSM Consultative. This Report received the endorsement of the DSM Consultative with the exception of two members who declined to comment. Based upon this, it is the belief of Enbridge that no member of the DSM Consultative is opposed to the Board approving the amounts set out in the application and clearing these amounts through to rates.

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

Please contact the undersigned if you have any questions.

Sincerely,

Lesley Austin
Regulatory Coordinator

cc: Dennis O'Leary, Aird & Berlis

A - ADMINISTRATIVE

EXHIBIT LIST

A - ADMINISTRATION

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

B – EVIDENCE

B	1	1	2009 DSM Annual Report
	2	1	Final Report: Independent Audit of 2009 DSM Program Results
	3	1	2009 DSM EAC Audit Summary Report
	4	1	2009 Rate Allocation by Account
	5	1	2010 Avoided Costs

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, 2011.

APPLICATION

1. Enbridge Gas Distribution Inc. ("Enbridge" 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 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 2009 DSM accounts, and the disposition of these balances:

SSM Amount Recoverable (Resource Acquisition)	$5,007,909
SSM Amount Recoverable (Market Transformation)	$356,303
LRAM (Owing to Ratepayers)	($45,722)
DSMVA Amount (Recoverable from ratepayers)	$1,165,061
Total Amount Recoverable	$6,483,551

3. Enbridge 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, 2011. 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. 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:	500 Consumers Road North York, ON M2J 1P8
Mailing Address:	P.O. Box 650 Scarborough, ON M1K 5E3
Telephone:	(416) 495-5499
Facsimile:	(416) 495-6072
Email:	EGDRegulatoryProceedings@enbridge.com

The Applicant's counsel:

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

Address: Brookfield Place, Box 754
Suite 1800, 181 Bay Street
Toronto, ON M4J 2T9

Telephone: (416) 865-4711
Facsimile: (416) 863-1515
Email: doleary@airdbelis.com

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

Dated: January 12, 2011, at Toronto, Ontario.

ENBRIDGE GAS DISTRIBUTION INC.

Norm Ryckman
Director, Regulatory Affairs

SUMMARY OF APPLICATION

1. Enbridge is applying to the OEB pursuant to Section 36 of the Ontario Energy Board Act, 1998, as amended for an Order or Orders approving the final balances in certain 2009 DSM Variance Accounts. The Company is also seeking the disposition of the balances in these accounts and the inclusion into rates, as at July 1, 2011. The accounts which are the subject of this Application and the balances recorded are as follows:

SSM Amount Recoverable (Resource Acquisition)	$5,007,909
SSM Amount Recoverable (Market Transformation)	$356,303
LRAM (Owing to Ratepayers)	($45,722)
DSMVA Amount (Recoverable from Ratepayers)	$1,165,061
Total Amount Recoverable	$6,483,551

2. The net impact of the three 2009 DSM accounts is $6,483,551. The Company seeks approval from the Board for clearance of this amount through to rates, as of July 1, 2011.

DSM Framework

3. The variance accounts which are the subject of this proceeding relate to DSM activities in 2009. This was the third year of operation of the DSM Framework approved by the Board by its Decision with Reasons ("Decision") dated

August 25, 2006, in the Natural Gas DSM Generic Issues proceeding (EB-2006-0021) ("Generic Proceeding"). The methodologies used by the Company to determine the amounts recorded in each of the 2009 DSMVA, LRAM and SSM were the subject of the Generic Proceeding and were approved by the Decision.

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

Summary of Facts and Events

5. The DSM Consultative elected an Evaluation and Audit Committee ("EAC") for 2009 consisting of representatives from the Industrial Gas Users Association ("IGUA"), Green Energy Coalition ("GEC") and Energy Probe ("EP").

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 2009 titled 2009 DSM Draft Annual Report (the "Annual Report") which summarized the savings achieved, the amounts spent and how the results were evaluated. The results of the independent review of custom projects were included in the Annual Report. The Annual Report also includes calculations for

the 2009 SSM and DSMVA. A copy of the Final Annual Report which reflects the post audit results is attached as Exhibit B, Tab 1, Schedule 1.

8. The Draft Annual Report was circulated for comment to the DSM Consultative and EAC on April 29, 2010.

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. 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.

11. The Auditor verified the calculations underlying the proposed SSM, LRAM and DSMVA amounts. The Audit Report is attached as Exhibit B, Tab 2, Schedule 1.

12. In addition, the Auditor reviewed the calculation of the 2010 TRC Target. The Auditor focused on a review of the overall methodology used and adherence to OEB decisions and approved guidelines. The Auditor's findings on this matter are found in their final report, attached as Exhibit B, Tab 2, Schedule 1, page 11, and in a subsequent memo, dated September 14, 2010 (Exhibit B, Tab 3, Schedule 1, Appendix F).

2009 Demand Side Management Variance Account

13. The amount recorded in this account, being recoverable from ratepayers of $1,165,061, is set out and confirmed in the Annual Report, at Exhibit B, Tab 1, Schedule 1, page 85, and in the Auditor's final report, at Exhibit B, Tab 2, Schedule 1, page 5.

Lost Revenue Adjustment Mechanism Variance Account

14. An LRAM value was not determined at the time of the Draft Annual Report. The amount recorded in this account of $45,722, owing to ratepayers is set out in the Auditor's final report, at Exhibit B, Tab 2, Schedule 1, page 5.

Shared Savings Mechanism Deferral Account

15. The Decision provided for the method of calculating the SSM. This included an SSM cap of $8.72 million. The Draft Annual Report calculated an SSM of $4,891,973 for Resource Acquisition programs. In addition, the Draft Annual Report included an incentive claim of $375,512 with respect to Market Transformation programs. The Auditor made recommendations with regard to the following measures that the Company and the EAC accepted:

    i) CFL installation rates

    ii) Showerhead water savings

    iii) Infrared heaters

    iv) Energy Recovery Units

    v) Prescriptive Schools Boilers

    vi) Controlled Kitchen Ventilation

Details behind these recommendations can be found on page 7 of the Audit Report, at Exhibit B, Tab 2, Schedule 1. This resulted in a SSM of $5,007,909 for Resource Acquisition programs.

In consideration of comments and recommendations made by the EAC and the Company with regard to how to interpret the 2006 Board Decision (EB-2006-0021) on the calculation of SSM for Market Transformation programs, the Auditor made recommendations on how to modify the SSM calculation for Market Transformation programs. Details behind this recommendation can be found on page 18 of the Audit Report and page 27 of the Audit Summary Report (Exhibit B, Tab 3, Schedule 1). This resulted in a SSM of $356,303 for Market Transformation programs. The Company and the EAC accepted this recommendation.

Recommendations of the Evaluation Audit Committee

16. Following its review of the Annual Report and the Audit Report, the EAC made the following recommendations regarding the 2009 DSMVA, SSM and LRAM:

    a. The EAC recommended accepting the Company's DSMVA calculation of $1,165,061 being recoverable from 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 $5,007,909. The Company has accepted this recommendation.
    c. The EAC recommended a Market Transformation SSM of $356,303. The Company has accepted this recommendation.

d. The EAC recommended accepting the Auditor's recommended LRAM of $45,722 being owing to ratepayers. The Company has accepted this recommendation.

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

	2009 Draft DSM Annual Report	Final Audit Report	Post Audit Results
TRC Savings	$213,394,074	$215,833,455	$215,833,455
SSM Amount Recoverable (Resource Acquisition)	$4,891,973	$5,007,909	$5,007,909
SSM Amount Recoverable (Market Transformation)	$375,512	$356,303	$356,303
LRAM (Owing to Ratepayers)	N/A	$45,722	$45,722
DSMVA Amount Recoverable	$1,165,061	$1,165,061	$1,165,061

18. 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.

Review by the DSM Consultative

19. Following the review by the Evaluation Audit Committee, the Company circulated the EAC Audit Summary Report to the DSM Consultative. The Report received the endorsement of the DSM Consultative with the exception of two members who declined to comment.

Proposal for Clearance

20. The net amount which the Company proposes for clearance through to rates is $6,483,551. The Company respectfully requests that these amounts be included in rates, effective July 1, 2011.

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 is attached at Exhibit B, Tab 4, Schedule 1.

Benefits to Ratepayers

22. The Company's DSM activities in 2009 generated an estimated natural gas savings of 71 million m^3. Net TRC (based on 'best available information') during this period totalled approximately $205.4 million.

B - EVIDENCE

ENBRIDGE GAS DISTRIBUTION INC.

DEMAND SIDE MANAGEMENT

2009 FINAL DSM ANNUAL REPORT

PREPARED BY:

Enbridge Gas Distribution Inc.,

DSM Research and Evaluation

September 20, 2010

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

The 2009 DSM Annual Report (the Report) provides a summary of the year's DSM program results together with the associated SSM, LRAM and DSMVA calculations. The Report is reviewed through an independent audit and the process culminates in the Company filing the SSM, LRAM and DSMVA claims with the Board.

The DSM Regulatory process involves several steps. In 2006, the Company's Multi-year DSM plan for 2007-2009 was approved by the Ontario Energy Board (OEB). The DSM Plan provided detail on the DSM programs and measures, the planned budget expenditure, natural gas savings, and the associated societal benefits (TRC results). The 2009 DSM programs and activities were delivered in alignment with this framework.

1 EBRO 495, Decision, Page 100

1.1 Report Overview

This report presents the results of the Company's DSM program activity for 2009. The Company's DSM portfolio of programs in 2009 included both resource acquisition programs and market transformation initiatives. The resource acquisition programs are of two types – prescriptive and custom programs. Results for prescriptive programs are calculated based on the number of units installed together with the deemed savings and related assumptions for specific DSM measures as approved by the Board in the DSM Plan. Board approved assumptions for 2009 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 2009 SSM claim and its 2009 DSMVA claim and LRAM claim. The Report is structured as follows:

Section 1	Introduction
Section 2	Description of Programs
Section 3	Verification and Research Studies
Section 4	Natural Gas Savings
Section 5	LRAM Statement
Section 6	SSM and TRC Statement
Section 7	DSMVA Statement
Section 8	Draft 2010 TRC Target
Appendix A	Summary Overviews of 2009 DSM Program
Appendix B	Approved 2009 Assumptions

1.2 DSM Program Results Summary

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

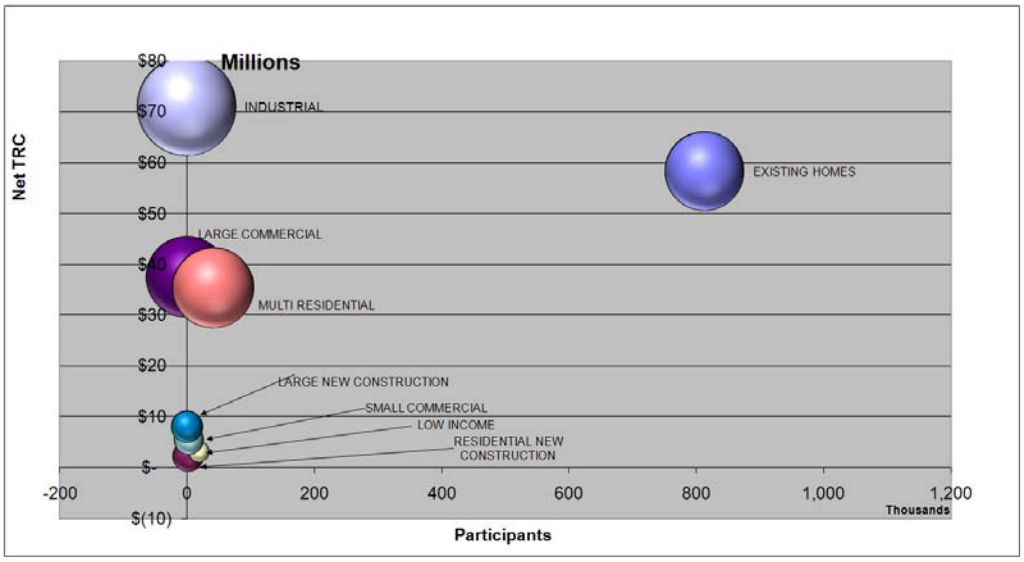
1.2.1 Results for 2009 Resource Acquisition Programs

Results for 2009 Programs are shown below.

Table 1: 2009 DSM Program Results

Program Area	Gas Savings	% of Total	DSM Fixed & Variable Costs	% of Total	Net TRC Results	% of Total
Existing Homes	14,084,047	19%	10,234,502	40%	58,286,208	27%
Residential New Construction	2,126,653	3%	241,527	1%	2,218,179	1%
Low Income	991,192	1%	1,512,339	6%	3,045,256	1%
Total Residential	**17,201,892**		**11,988,368**		**63,549,643**	
Small Commercial	2,029,469	3%	681,906	3%	5,413,335	3%
Large Commercial	15,377,676	21%	1,895,005	7%	37,456,208	17%
Multi Residential	15,094,725	20%	2,333,850	9%	35,265,374	16%
Large New Construction	2,287,063	3%	488,615	2%	7,906,422	4%
Industrial	22,330,732	30%	2,400,862	9%	70,984,411	33%
Total Business Markets	**57,119,665**		**7,800,239**		**157,025,752**	
Market Transformation Programs			889,516	3%		
Prog. Dev. & Market Research			226,716	1%	(226,716)	0%
Overheads			4,515,222	18%	(4,515,222)	-2%
TOTAL ALL PROGRAMS	**74,321,558**		**25,420,061**		**215,833,455**	

Figure 1: 2009 DSM Program Results



Notes:

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

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

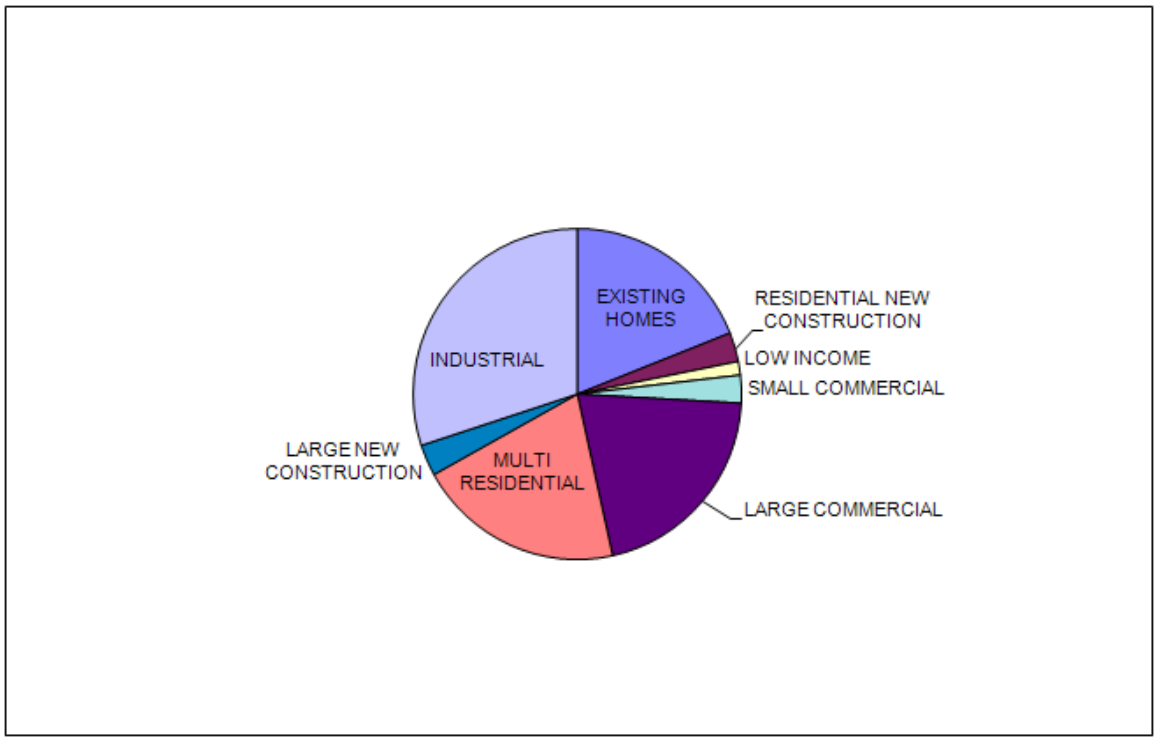
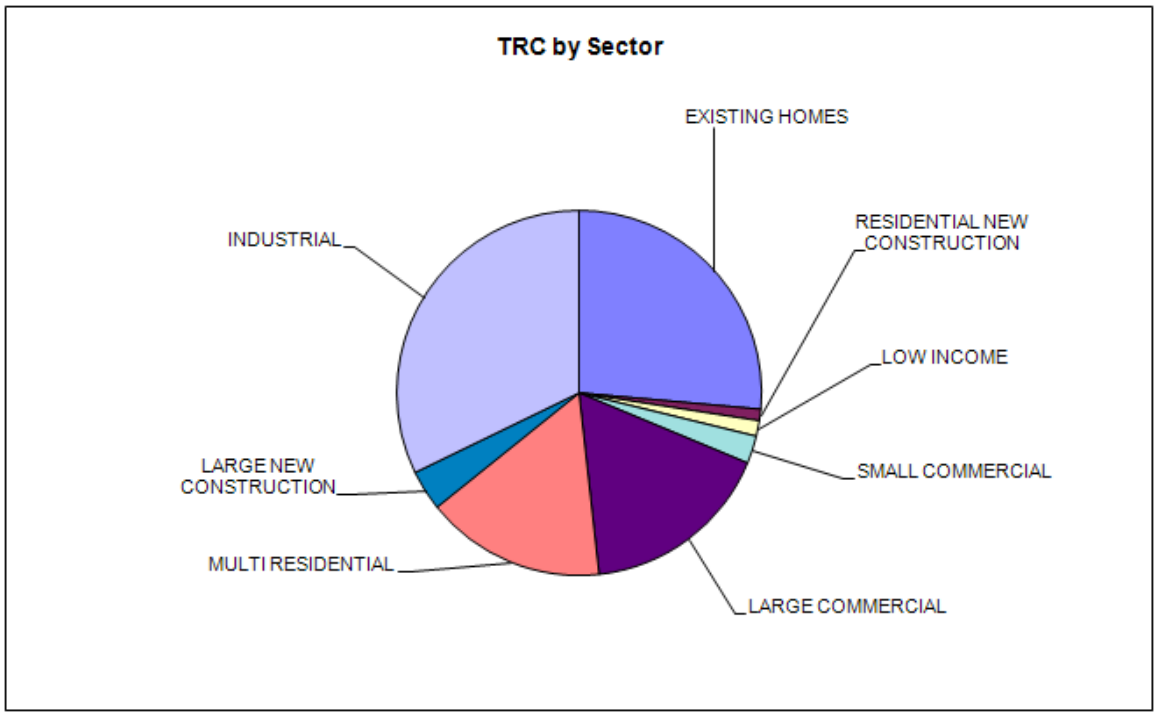


Figure 3: TRC by Sector



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.

Appendix A provides summary tables for the 2009 DSM Programs that present the following information:

- Net TRC Benefits
- Net Natural Gas Savings
- Net kWh Savings
- Water Savings (m^3)
- Number of Participants or Units Installed
- Average Measure Life
- Incremental Costs
- Total Incentive Payments

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

When looking at the 2009 DSM program summary tables, the following observations can be made:

- In custom programs, technologies and programs that generate the greatest TRC, also generate the greatest natural gas savings and require the greatest incremental costs and incentive payments.

- In prescriptive programs, there appears not to be a clear link between TRC, natural gas savings, incremental costs and incentive payments. Programs and technologies that require the greatest incremental cost or incentive payments do not necessarily generate the greatest TRC or natural gas savings.

- Technologies that generate the greatest ratio of natural gas savings per $1 spent of incremental cost include condensate recovery, aerators and use of meters for focused monitoring and adjustment of gas use.

- Technologies that generate the greatest ratio of natural gas savings per $1 spent of incentive payments include burner technology, industrial equipment and steam traps.

- Sectors that generate the greatest ratio of natural gas savings per $1 spent of incremental cost include hospitals, schools and industrial.

- Sectors that generate the greatest ratio of natural gas savings per $1 spent of incentive payments include industrial, universities and hospitals.

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 focus 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 in terms of number of participants or units installed and net TRC benefits.

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

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

The section also includes descriptions of EGD's Market Transformation Programs.

2.1 Residential

2.1.1 Residential Existing Homes

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, and provide faucet aerators and four compact fluorescent light bulbs for self-installation. The brochure for this program is presented in Figure 4.

Highlights: Compact fluorescent light bulbs were added to the program in 2009

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

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

Tracking Methodology: Monthly reports from the contractors

Evaluation Activities: Quarterly customer surveys are conducted of TAPS participants. These reports are summarized in Section 3 of this report.

Program Results:

Table 2: Water Conservation Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Water Conservation	Tankless					7,053	-2,178,367
	TAPS Partners - 13W CFLs (4 bulbs)					135,236	7,407,364
	TAPS Bag Test	125,573	0	218,601	0	180,344	0
	TAPS Partners - Bathroom Aerator			170,949	1,346,180	146,337	1,750,444
	TAPS Partners - Kitchen Aerator			170,949	6,618,072	146,537	8,671,259
	TAPS Partners Program over 2.5 gpm	70,912	50,608,233	120,115	18,941,332	95,393	25,981,316
	TAPS Pipe Wrap	63,076	2,019,251	161,137	4,923,676	0	0
	TAPS Showerheads 2.0 gpm	348	86,106	371	26,555	0	0
	TAPS Showerheads 2.1 - 2.5 gpm	20,860	6,985,369	50,463	5,232,555	51,409	8,042,756
Water Conservation Total		**280,769**	**59,698,959**	**892,585**	**37,088,371**	**762,309**	**49,674,772**

Note: the TAPS program results are tracked by number of units installed with the exception of CFLs which are tracked by household participants. The tankless water heater program is also tracked by household.

Table 3: Water Conservation 2008 - 2009 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Water Conservation	Tankless	7,053		-2,178,367	
	TAPS Partners - 13W CFLs (4 bulbs)	135,236		7,407,364	
	TAPS Bag Test	-38,257	-18%	0	
	TAPS Partners - Bathroom Aerator	-24,612	-14%	404,264	30%
	TAPS Partners - Kitchen Aerator	-24,412	-14%	2,053,186	31%
	TAPS Partners Program over 2.5 gpm	-24,722	-21%	7,039,984	37%
	TAPS Pipe Wrap	-161,137	-100%	-4,923,676	-100%
	TAPS Showerheads 2.0 gpm	-371	-100%	-26,555	-100%
	TAPS Showerheads 2.1 - 2.5 gpm	946	2%	2,810,201	54%
Water Conservation Total		**-130,276**	**-15%**	**12,586,401**	**34%**

Comments:

- Due to concerns related to installation, the pipe wrap was removed from the program in 2009.
- Participation for many of the measures decreased or increased a very small amount yet overall 2009 TRC results increased relative to 2008 values. The addition of CFLs is the cause of this result. CFLs contributed double the TRC benefits compared to that of pipe wrap.
- In 2009, two categories were used for shower heads. One category was for showerheads 2.5 gpm and over and the second category captured shower heads with outputs between 2.0 and 2.5 gpm.

Figure 4: TAPS Brochure

Thank you for participating in the TAPS program.

As a valued Enbridge Gas Distribution customer, we have completed the following energy-efficiency and water saving measures in your home (where possible):

Energy-Efficient Showerhead
How can this improve energy and water efficiency?
With the installation of an energy-efficient showerhead and two faucet aerators, you can save approximately 27,300 litres of water per year and approximately 96 m^3 of natural gas per year.

Kitchen and Bathroom Faucet Aerators
How can this improve energy and water efficiency?
By installing the aerators we left for you, you can reduce the faucet water flow rate up to 65%. While they reduce the amount of water used, they often make the flow more forceful and provide more effective wetting and rinsing.

Compact Fluorescent Light Bulbs (CFL)
How can this improve energy efficiency?
CFL bulbs provide as much light as regular incandescent bulbs, but use up to 75% less electricity. Their average life is 10,000 hours, with some types lasting as long as 15,000 hours.

How much can I save?

- If you heat your water with natural gas, and use an energy-efficient showerhead in conjunction with kitchen and bathroom faucet aerators, you can save up to $42 per year on your natural gas bill and up to $120 per year on your water and sewer bill.
- When you replace four bulbs in your home with the four free 13 watt compact fluorescent light bulbs, you could save up to $19 a year on your electricity bill. Compact fluorescent light bulbs contain a small amount of mercury and should be disposed of safely. Check with your municipal waste management program for the preferred methods of disposal. Many retailers of CFLs have also started recycling programs.

Did you know that it takes 13 mature trees about a year to remove 2 tonnes of CO_2? The installed energy-efficient showerhead and your self-installed kitchen and bathroom aerators could reduce your household CO_2 emissions by approximately 2 tonnes over a 10-year period! Not only will you save money from the TAPS measures, you will also help contribute to a cleaner environment.

If you have any questions about the products or service you received today, please contact us at

Company Name
Telephone Number
Website URL

Natural gas savings are based on average annual natural gas consumption of 653 m3 for water heating for a typical residential customer. The use of two faucet aerators in conjunction with an energy-efficient showerhead can save approximately 27,300 litres of water per year and approximately 96 m3 of natural gas per year. The use of 4 CFL bulbs can save approximately 180 kWh of electricity per year. Actual consumption levels and savings will vary based on household characteristics, lifestyle, natural gas and water prices. Natural gas rate is based on Enbridge Gas Distribution Inc.'s Rate 1 effective January 1, 2009. Water rate is based on the general water and sewer rate for North York, East York, Scarborough, Toronto and Etobicoke, effective January 1, 2009. Electricity rates are based on the Toronto Hydro residential rate effective November 1, 2008.

1-877-SAVE-GAS

This special TAPS program is a complimentary service provided by

ENBRIDGE

Enbridge TAPS 09 Regular Conservation Card

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 ($100.00 on bill rebate), programmable thermostats ($15 on bill rebate), and heat reflecting Novitherm panels (customer pays only $25 shipping fee). The programs were delivered through HVAC contractors and/or marketing efforts directly to customers.

Figure 5: Sample Programmable Thermostat & Energy Star Rebate Offer

Highlights: In September 2009 the furnace program was retired. On December 31, 2009 a new federal minimum energy performance standard for furnaces came into effect that required a minimum efficiency level of 90% AFUE (high efficiency). As a result it was decided that once the budget for this program was exhausted, it would be retired. The original plan for this program was to have it run until the end of November 2009. However, with the introduction of the Home Renovation Tax Credit from the government of Ontario, the program became oversubscribed and was retired earlier than anticipated. The Novitherm program was not actively marketed after March due to budget restraints. The Novitherm and Programmable Thermostat programs will not be offered in 2010 as budget has been allocated to more effective DSM programs.

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 of each measure

***Tracking Methodology*:** All measures were tracked as rebates were processed. For the thermostat program, customers were only counted as participants if they replaced a manual thermostat with a programmable thermostat.

Evaluation Activities: Customers were required to submit proof of purchase for the furnace and programmable thermostat programs. Participation in the Novitherm panel program declined in 2009. Following consultation with the EAC (Evaluation Audit Committee) it was decided to apply the adjustment factor from the 2008 customer survey to the 2009 program results.

Program Results:

Table 4: Equipment Replacement Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Equipment Replacement	Furnace Replacement	17,828	4,056,839	23,658	2,396,464	28,518	2,139,578
	Enhanced Furnace Replacement kWh	3,026	334,830	0	0	0	0
	Home Rewards - Energuide for Houses	2,592	2,361,719	0	0	0	0
	Thermostats	16,704	9,426,398	13,725	3,132,610	20,112	6,089,133
	Novitherm	1,757	169,848	4,182	496,316	2,315	382,725
	Energy Star Front Load Axis Washer	64	-539	0	0	0	0
Equipment Replacement Total		**41,971**	**16,349,094**	**41,565**	**6,025,390**	**50,945**	**8,611,436**

Table 5: Equipment Replacement 2007 – 2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Equipment Replacement	Furnace Replacement	4,860	21%	-256,886	-11%
	Enhanced Furnace Replacement kWh				
	Home Rewards - Energuide for Houses				
	Thermostats	6,387	47%	2,956,524	94%
	Novitherm	-1,867	-45%	-113,591	-23%
	Energy Star Front Load Axis Washer				
Equipment Replacement Total		**9,380**	**23%**	**2,586,047**	**43%**

Comments:

- Furnace program TRC declined due to an increase in free ridership from 2008 level of 48% to 90% in 2009.
- Programmable thermostat program TRC declined due to assumption changes for 2009. 2008 assumptions were 212 m^3 with 11% free ridership and 2009 assumptions were 146 m^3 with a 43% free ridership.
- Novitherm program participation declined as marketing activity was significantly reduced over previous year.

2.1.2 Residential New Construction

***Description**:* Recognizing that the market currently has one predominant residential building label, EGD offered initiatives in the New Home Program portfolio in 2009 supporting the EnergyStar label. The EnergyStar for New Homes (ESNH) program encourages builders to consider building envelope and other energy efficiency improvements by offering $100 to builders for each EnergyStar labelled house. To obtain an Energy star label the house must meet a required level of energy efficiency as measured through the EnerStar Version 3 system.

Figure 6: Residential New Construction Customer Information Publication

Highlights: EnerGuide for New Homes was not offered in 2009. The program was cancelled in November 2008. With the introduction of Version 3 of EnergyStar for New Homes, both incremental costs and gas savings increased for this program. The combination of updated incremental costs and gas savings no longer allowed for a program with positive TRC. As a result, the funds associated with this program were diverted to other programs and the EnerGuide for new homes program was cancelled.

***Objectives**:* To promote energy efficiency in building practices in residential new construction by encouraging participation in the EnergyStar for New Homes initiative.

***Metrics**:* Number of new homes that achieve the 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 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Res New Construction	EnerGuide for New Houses	227	195,135	0	-94,452	0	0
	EnergyStar for New Houses	864	578,020	1,768	592,959	2,199	2,218,179
Res New Construction Total		**1,091**	**773,155**	**1,768**	**498,507**	**2,199**	**2,218,179**

Table 7: Residential New Construction 2007-2008 Comparison

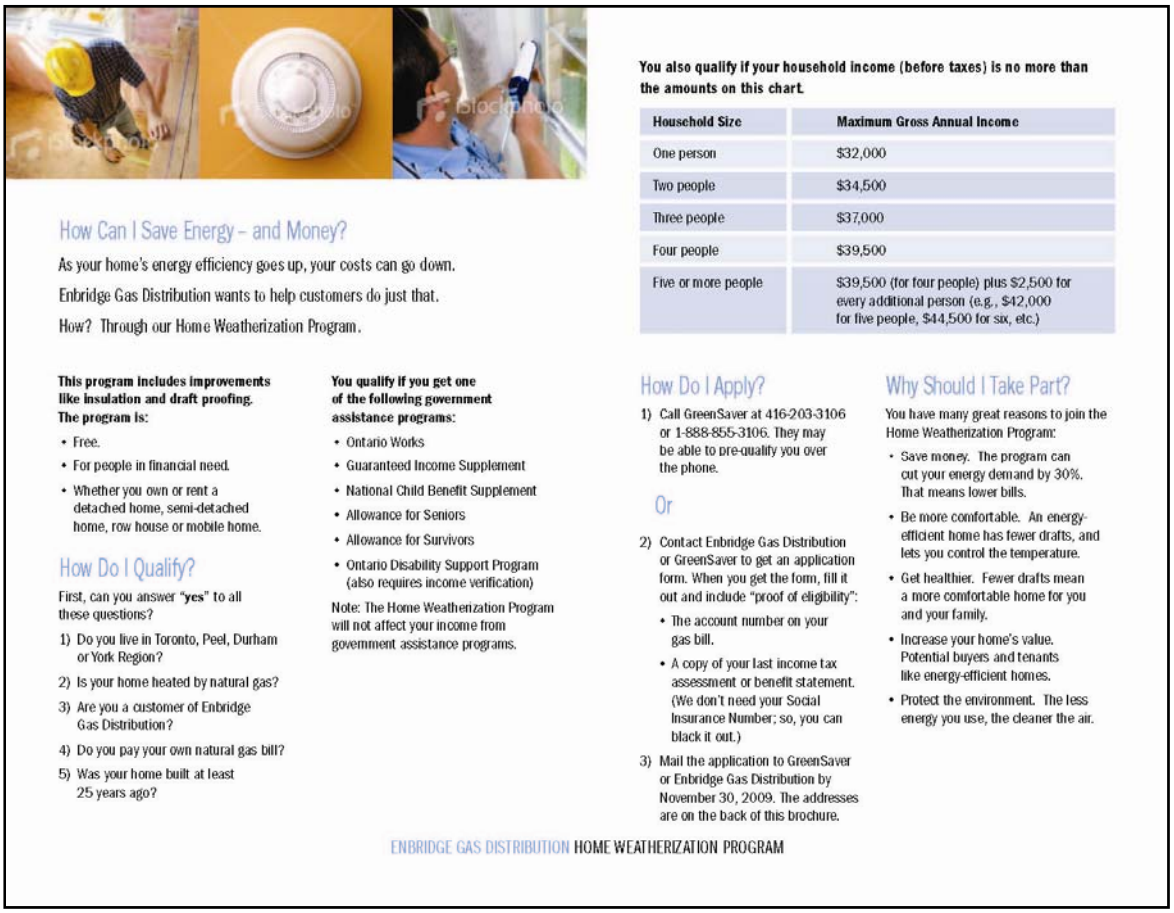
		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Res New Construction	EnerGuide for New Houses				
	EnergyStar for New Houses	431	24%	1,625,220	274%
Res New Construction Total		**431**	**24%**	**1,719,672**	**345%**

***Comments**:* With the introduction of Version 3 of EnergyStar for new homes (ESNH), both electrical and gas savings increased for this program. Gas savings moved from 818 to 1018 m^3 per year per home and electrical savings moved from 1000 to 1450 kWhr per year per home. It should be noted incremental costs also increased. As a result of Version 3 of ESNH, TRC increased in 2009 when compared to 2008.

2.1.3 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, basement and wall insulation as well as caulking and air sealing installed by designated delivery agents. The Low Income programs are directed to customers in low rise residential homes and buldings of 6 units or less. The program was expanded into the Niagara region in 2009. Both programs are provided free of charge to low income customers.

Figure 7: Home Weatherization Publication for EGD Customers



How Can I Save Energy – and Money?

As your home's energy efficiency goes up, your costs can go down.

Enbridge Gas Distribution wants to help customers do just that.

How? Through our Home Weatherization Program.

This program includes improvements like insulation and draft proofing. The program is:

- Free.
- For people in financial need.
- Whether you own or rent a detached home, semi-detached home, row house or mobile home.

How Do I Qualify?

First, can you answer **"yes"** to all these questions?

1) Do you live in Toronto, Peel, Durham or York Region?
2) Is your home heated by natural gas?
3) Are you a customer of Enbridge Gas Distribution?
4) Do you pay your own natural gas bill?
5) Was your home built at least 25 years ago?

You qualify if you get one of the following government assistance programs:

- Ontario Works
- Guaranteed Income Supplement
- National Child Benefit Supplement
- Allowance for Seniors
- Allowance for Survivors
- Ontario Disability Support Program (also requires income verification)

Note: The Home Weatherization Program will not affect your income from government assistance programs.

You also qualify if your household income (before taxes) is no more than the amounts on this chart.

Household Size	Maximum Gross Annual Income
One person	$32,000
Two people	$34,500
Three people	$37,000
Four people	$39,500
Five or more people	$39,500 (for four people) plus $2,500 for every additional person (e.g., $42,000 for five people, $44,500 for six, etc.)

How Do I Apply?

1) Call GreenSaver at 416-203-3106 or 1-888-855-3106. They may be able to pre-qualify you over the phone.

Or

2) Contact Enbridge Gas Distribution or GreenSaver to get an application form. When you get the form, fill it out and include "proof of eligibility":
   - The account number on your gas bill.
   - A copy of your last income tax assessment or benefit statement. (We don't need your Social Insurance Number; so, you can black it out.)
3) Mail the application to GreenSaver or Enbridge Gas Distribution by November 30, 2009. The addresses are on the back of this brochure.

Why Should I Take Part?

You have many great reasons to join the Home Weatherization Program:

- Save money. The program can cut your energy demand by 30%. That means lower bills.
- Be more comfortable. An energy-efficient home has fewer drafts, and lets you control the temperature.
- Get healthier. Fewer drafts mean a more comfortable home for you and your family.
- Increase your home's value. Potential buyers and tenants like energy-efficient homes.
- Protect the environment. The less energy you use, the cleaner the air.

ENBRIDGE GAS DISTRIBUTION HOME WEATHERIZATION PROGRAM

Highlights: In 2009 the distribution of 4 CFLs was added to the TAPS program. The weatherization program was expanded into the Niagara region with a new partner, Green Venture, a Green Communities Canada member, engaged to deliver the program.

Objectives*:* To ensure that low income customers have the opportunity to participate in energy efficiency programs that are targeted to their specific needs and that aid in reducing energy costs.

Metrics: Number of installations of each measure for the TAPS program and number of participants for the Weatherization program

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

Evaluation Activities: In 2009, four waves of telephone interviews were conducted to verify installations in the TAPS program.

Program Results:

Table 8: Low Income Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Low Income	TAPS Low Income - 13W CFLs					3,703	103,804
	TAPS Low Income - 23W CFLs					3,703	114,646
	Low Income Bag Test	7,033	0	3,420	0	1,764	0
	Low Income Kitchen Aerator			2,838	164,500	1,824	93,677
	Low Income Bathroom Aerator			2,838	33,594	1,824	15,418
	Low Income Pipe Wrap	2,718	88,687	2,510	77,765	0	0
	Low Income Showerheads 2.0	6	1,569	1	70	0	0
	Low Income Showerheads 2.1	1,265	446,817	436	45,614	22	2,949
	Low Income Thermostats	4,007	2,435,369	2,665	274,732	3,952	1,456,024
	Low Income Weatherization	61	76,299	208	218,273	361	724,840
	Low-Income Showerheads	2,838	2,174,088	2,401	369,605	1,704	533,898
Low Income Total		**17,928**	**5,222,829**	**17,317**	**1,184,153**	**18,857**	**3,045,256**

Note: The TAPS program results are tracked by number of units installed with the exception of CFLs which are tracked by household. The Weatherization program is also tracked by household participant.

Table 9: Low Income 2007-2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Low Income	TAPS Low Income - 13W CFLs	3,703		103,804	
	TAPS Low Income - 23W CFLs	3,703		114,646	
	Low Income Bag Test	-1,656	-48%	0	
	Low Income Kitchen Aerator	-1,014	-36%	-70,823	-43%
	Low Income Bathroom Aerator	-1,014	-36%	-18,176	-54%
	Low Income Pipe Wrap	-2,510	-100%	-77,765	-100%
	Low Income Showerheads 2.0	-1	-100%	-70	-100%
	Low Income Showerheads 2.1	-414	-95%	-42,664	-94%
	Low Income Thermostats	1,287	48%	1,181,292	430%
	Low Income Weatherization	153	74%	506,566	232%
	Low-Income Showerheads	-697	-29%	164,293	44%
Low Income Total		**1,540**	**9%**	**1,861,102**	**157%**

2.2 Commercial

2.2.1 Large Commercial

Description: The Large Commercial program portfolio offers customers in the target segments incentives for third party energy audits, equipment retrofits and operational improvements. Retrofit 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. The Company's Energy Solutions Consultants (ESCs) and their strong relationships with customers and business partners are key to enabling energy efficiency solutions and program success.

Focus groups held with commercial business partners revealed that the role of the ESC is highly valued. EGD is regarded as easy to work with and having streamlined administrative process. These features have contributed to Enbridge's success in the commercial/multifamily sectors.

Programs are 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. The third party review is summarized in Section 3. Program results as reported include adjustments recommended by the engineering review.

Program Results:

Table 10: Large Commercial Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Large Commercial	Hospitals	8	5,222,073	30	9,192,867	21	$11,062,072.26
	Hotel/Motel	6	1,275,414	11	3,901,189	7	$1,583,603.98
	Long Term Care	3	94,921	3	172,324	14	$1,333,817.30
	Municipalities	15	6,108,253	13	1,997,712	81	$6,641,941.28
	Offices	14	1,986,198	28	4,224,856	38	$4,288,541.66
	Other Commercial Sectors	24	911,621	15	2,416,894	14	$4,507,286.23
	Retail	6	515,694	4	84,995	16	$801,805.63
	Schools	46	2,627,321	96	6,638,753	110	$5,597,299.88
	Universities	14	1,383,333	9	4,187,542	7	$1,069,242.20
	Warehouses	5	627,730	10	741,881	10	$570,597.90
Large Commercial Total		**141**	**20,752,558**	**219**	**33,559,011**	**318**	**37,456,208**

Table 11: Large Commercial 2007-2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Large Commercial	Hospitals	-9	-30%	1,869,206	20%
	Hotel/Motel	-4	-36%	-2,317,585	-59%
	Long Term Care	11	367%	1,161,493	674%
	Municipalities	68	523%	4,644,230	232%
	Offices	10	36%	63,686	2%
	Other Commercial Sectors	-1	-7%	2,090,392	86%
	Retail	12	300%	716,811	843%
	Schools	14	15%	-1,041,453	-16%
	Universities	-2	-22%	-3,118,299	-74%
	Warehouses	0	0%	-171,283	-23%
Large Commercial Total		**99**	**45%**	**3,897,197**	**12%**

2.2.2 Small Commercial

Description: The Small Commercial program in 2009 provided incentives for measures including Demand Control Kitchen 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 2009 update to program assumptions. The delivery of the program primarily relied on external business partners, channel consultants and manufacturers.

Highlights: The Channel Consultants started to develop a more extensive business partner list for all of the products. This in turn increased the number of rebates submitted to EGD for each of our programs. The new programs were well received by our business partners and customers.

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.

Program Results:

Table 12: Small Commercial Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Small Commercial	Energy Recovery Ventilators (ERV)					37	612,258
	Heat Recovery Ventilator (HRV)					5	7,919
	Infrared Heaters					144	693,551
	Demand Control Kitchen Ventilation	21	646,879	15	448,615	9	108,415
	Kitchen Ventilation - Tier 2	0	0	11	304,913	18	802,274
	Kitchen Ventilation - Tier 3	0	0	3	158,053	2	153,256
	Pre-Rinse Spray Valve	290	1,106,662	627	3,215,331	1,961	2,557,104
	Rooftop Units	21	35,462	157	412,466	564	258,232
	Small Commercial Hi Eff Furnace - Custo	101	59,771	109	79,444	117	90,989
	Tankless Water Heaters	67	6,049	11	2,642	30	47,763
	Thermostats	141	260,702	111	183,419	334	123,851
	Air Doors			10	9,840	40	63,391
	Small Commercial General			0	-1,458	-	(46,028)
	Small Commercial Restaurants			-	-4,263	-	(59,637)
Small Commercial Total		**641**	**2,115,525**	**1,040**	**4,346,038**	**3,261**	**5,413,335**

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

Table 13: Small Commercial 2007-2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Small Commercial	Energy Recovery Ventilators (ERV)	37		612,258	
	Heat Recovery Ventilator (HRV)	5		7,919	
	Infrared Heaters	144		693,551	
	Demand Control Kitchen Ventilation	-6	-40%	-340,200	-76%
	Kitchen Ventilation - Tier 2	7	64%	497,361	163%
	Kitchen Ventilation - Tier 3	-1	-33%	-4,797	-3%
	Pre-Rinse Spray Valve	1,334	213%	-658,227	-20%
	Rooftop Units	407	259%	-154,235	-37%
	Small Commercial Hi Eff Furnace - Custom	8	7%	11,545	15%
	Tankless Water Heaters	19	173%	45,120	1708%
	Thermostats	223	201%	-59,569	-32%
	Air Doors	30	300%	53,551	544%
	Small Commercial General	0		-44,571	3057%
	Small Commercial Restaurants	0		-55,374	1299%
Small Commercial Total		**2,221**	**214%**	**1,067,298**	**25%**

2.2.3 Multi-Residential

Description: The Multi-residential sector in 2009 benefited from a combination of prescriptive and custom incentives across a broad spectrum of potential technologies and measures. Energy Solutions Consultants leveraged their contacts in the marketplace, both public and private to promote new initiatives aimed at re-commissioning and commercial front load washers in communal laundry rooms. The Company introduced new components to its Showerhead Program to improve program evaluation including tracking base case flow rates.

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 and a survey was conducted to verify the number of showerhead installations. These verification studies are summarized in Section 3. Program results as reported include adjustments from the verification studies.

Program Results:

Table 14: Multi-Residential Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Multi-Residential	Multi-Residential Non-Profit	7	619,182	20	1,420,257	11	$730,874.67
	Multi-Residential Private	273	27,289,152	235	25,312,293	257	$31,285,440.92
	Multi-Residential Recommissioning	1	-6,635	0	-5,009	0	($5,782.44)
	Showerheads/Aerators	26,678	11,894,381	22,312	5,037,352	40,332	$3,025,332.47
	Front Load Washers	1,471	1,206,261	1,170	1,006,222	453	$229,508.36
Multi-Residential Total		**28,430**	**41,002,341**	**23,737**	**32,771,114**	**41,053**	**35,265,374**

Note: Results for custom projects in the Multi-residential sector are tracked by participant or building. Units in the table above for Multi-Residential Non-Profit and Multi-Residential Private indicate the number of buildings. The prescriptive programs for low-flow showerheads and front load washers are tracked by number of units installed as shown in the table above. In 2009 low-flow showerheads and aerators were installed in a total of 15,957 suites in 770 buildings.

Table 15: Multi-Residential 2007-2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Multi-Residential	Multi-Residential Non-Profit	-9	-45%	-689,382	-49%
	Multi-Residential Private	22	9%	5,973,148	24%
	Multi-Residential Recommissioning			-773	15%
	Showerheads/Aerators	18,020	81%	-2,012,020	-40%
	Front Load Washers	-717	-61%	-776,713	-77%
Multi-Residential Total		**17,316**	**73%**	**2,494,260**	**8%**

Comments: In 2007 and 2008, participant numbers for showerheads/aerators was based on the number of showerheads installed. In 2009, participant counts included the number of showerheads and the number of aerators installed. This is the main driver behind the perceived difference in participant numbers for showerheads across the years 2008 and 2009.

2.2.4 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 Ontario Building Code 2006. The New Construction program has four components. The Design Assistance Program (DAP) is directed towards the design phase of a building while the New Building Construction (NBC) Program targets actual implementation of more efficient options with the energy savings being defined by energy modeling of the proposed building. Business Partner Implementation Support is designed to help support design decision-makers and encourage building owners to implement energy efficient design. The New Construction Program provides an incentive for energy savings that result from adding energy efficient natural gas equipment to a new building design; energy efficiency savings are defined by engineering calculations.

Highlights: In 2009 more incentive dollars for this program were added and the distribution of incentive dollars was shifted to have more dollars in the NBCP phase of the program. Some of the dollars associated with the DAP process where shifted to the Business Partner Implementation Support phase. It is believed that participants were more encouraged to implement energy savings changes into their large new construction projects when more incentive dollars are released in the NBCP phase. The economic conditions of 2009 pushed out many large new construction projects and as a result, a decline in participation numbers was observed. There are no changes planned for this program in 2010.

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 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Large New Construction	NBCP	56	5,360,755	59	11,667,996	21	7,906,422
Large New Construction Total		**56**	**5,360,755**	**59**	**11,667,996**	**21**	**7,906,422**

Note: Units in the table above indicate number of buildings.

Table 17: Large New Construction 2008-2009 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Large New Construction	NBCP	-38	-64%	-3,761,574	-32%
Large New Construction Total		**-38**	**-64%**	**-3,761,574**	**-32%**

2.3 Industrial

Description: Energy audits are the primary vehicle for identifying opportunities in this sector. The Company, in collaboration with the customer, makes the initial determination to assess the appropriate scale of the audit and also subsidizes the cost of the audit. The Energy Solutions 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 $100,000 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.

Focus groups held with Industrial customers revealed that the role of the ESC is highly valued by the industrial gas user. They are regarded as the primary source for relevant and credible energy efficiency information. Also EGD is regarded as easy to work with and as having streamlined administrative processes. These features have contributed to Enbridge's success in the industrial sector.

The increased cap on incentives from $30k to $100k in 2009 resulted in 6 projects incentivized at $100k for implementation. The increased incentives helped to sustain participation levels despite the economic down turn.

Participation in the on-site energy manager program increased with EGD subsidizing energy managers in four companies in 2009.

The Industrial DSM program now faces the challenge posed by the emergence of other energy efficiency programs. Enbridge is currently providing the lowest level of incentives as compared to other programs in the market, a situation that must be addressed to support comprehensive energy solutions for customers and effective capture of gas DSM savings.

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. The engineering review is summarized in Section 3. Reported results include adjustments as recommended by the engineering review.

Program Results:

Table 18: Industrial Program Results

		2007 Audited TRC Results (SSM)		2008 Audited TRC Results		2009 Audited TRC Results	
		Units	TRC Net Benefits	Units	TRC Net Benefits	Units	TRC Net Benefits
Industrial	Agriculture	26	3,028,137	29	2,170,914	28	$2,084,434.61
	Industrial-All	121	50,778,056	111	59,179,956	92	$68,899,976.72
Industrial Total		**147**	**53,806,193**	**140**	**61,350,871**	**120**	**70,984,411**

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

Table 19: Industrial 2007-2008 Comparison

		Units Delta		TRC Delta	
		(2009-2008)	Δ / 2008	(2009-2008)	Δ / 2008
Industrial	Agriculture	-1	-3%	-86,480	-4%
	Industrial-All	-19	-17%	9,720,021	16%
Industrial Total		**-20**	**-14%**	**9,633,541**	**16%**

Comments: One factor that impacted the results was the increased incentive cap which assisted in capturing projects at a period where capital was exceedingly tight. In addition the avoided gas costs remained high which contributed to a much higher TRC/m^3 of gas savings than had been experienced in previous years.

These factors are not likely to be repeated going forward.

Figure 8: Industrial Customer Incentives Brochure

ENBRIDGE

Financial Incentives for Industry

- ENERGY ASSESSMENTS
- PROJECT IMPLEMENTATION
- TECHNICAL SUPPORT

2009

How Enbridge Gas Distribution Can Help

Energy Assessments

- Boiler Plant Performance Test and Assessment – Enbridge pays ½ of the cost up to a maximum of $10,000.
- Process Heating Equipment Testing Assessment – Enbridge pays ½ of the cost up to a maximum of $10,000.
- Steam Trap Surveys – Enbridge pays ½ of the cost of up to a maximum of $10,000. There is a further condition applied. The maximum grant will be $10 per steam trap surveyed.
- Insulation Survey – Enbridge pays ½ of the cost up to a maximum of $10,000.
- Industrial Heating and Ventilation Assessment – Enbridge pays ½ of the cost up to a maximum of $10,000.
- Monitoring and Targeting Study – Enbridge pays ½ of the costs up to a maximum of $10,000.
- Process Integration Study – Enbridge Pays ½ the cost up to a maximum of $30,000.

Incentive amounts will be based on the following table:

Annual energy consumption (associated with the end use)	Maximum Grant
2,500,000 m^3 or greater	Up to $10,000
1,000,000 m^3 to 2,499,999 m^3	Up to $6,000
340,000 m^3 to 999,999 m^3	Up to $2,000

Enbridge incentive grants can be combined with incentives from other organizations. At a minimum the customer's financial contribution to the assessment must at least equal the Enbridge contribution.

Project Implementation

One time incentive grants are based on the number of energy efficiency measures implemented per project:

- One or more measures qualify for 5¢ per cubic metre of natural gas savings, up to a maximum amount of $100,000 per project.
- Three or more measures qualify for 10¢ per cubic metre of gas savings, up to a maximum amount of $30,000 per project.
- High efficiency condensing equipment such as boilers, condensing economizers, and direct contact heaters or heat exchangers are eligible for an incentive grant of 10¢ per cubic metre of gas savings, up to a maximum amount of $30,000 per project.

The simple financial payback must exceed one year and not exceed 5 years to be eligible for a grant.

An Enbridge Energy Solutions Consultant must approve each project and should be actively involved in the project from an early stage.

Linkageless Combustion Control For Boilers

- Enbridge pays an incentive of 15% of the installed cost up to a maximum of $3,000, where installed on boilers with a minimum annual consumption of 500,000 m^3 of natural gas.

Figure 9: Monitoring and Targeting Program Brochure

ENBRIDGE

KNOWLEDGE IS POWER

The way forward isn't always obvious, but with the right tools it's a lot easier to find the best path. In any organization, wise decisions are always based on a strong foundation of knowledge. Wouldn't it be nice to know your energy management system delivered the information you needed to make the right choices and initiate the actions necessary to achieve the greatest possible savings?

Do you know much you spend on energy?	*With energy costs on the rise, this is one variable cost you can actually control. Are you controlling your costs?*
Do you know where your energy is being used?	*Experience has taught us that what's obvious isn't necessarily what's true. Are you sure you're not wasting energy?*
Do you monitor and track your energy use?	*You can't manage what you can't measure. Are you ready to take control?*
Do you make decisions based on sound information?	*There are low-cost projects in every facility that can lead to greater energy efficiency. Are you sure you've picked all the low-hanging fruit?*
Do you know when and how to take corrective action?	*Maintenance, scheduling, and operations all have an effect on your energy footprint. Are you getting the maximum benefit from these activities?*
Do you know that you can count on us to help?	*We're here to help! Give us a call, and we'll help you find the way forward.*

Phone: 1-866-844-9994 Fax: 416-495-6047 Email: energyservices@enbridge.com Web: www.enbridgegas.com/industrial

DECISIONS based on knowledge

ACTIONS based on decisions

SAVINGS based on actions

2.4 Market Transformation Programs

2.4.1 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.

Tracking Methodology: Fireplace purchaser surveys and in-store tracking.

Evaluation Activities: Key evaluation activities were fireplace purchaser surveys to measure customer awareness and influence of the EnerGuide label and a mystery shopper initiative to verify results for the POP promotional material metrics.

Metrics & Program Results:

Table 20: EnerGuide for Natural Gas Fireplaces MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight
EnerGuide for Fireplaces	$ 80,000	$ 57,389	% Point increase in customer awareness of the EnerGuide label	80% in 2008, 81% in 2009	5 percentage points	35%	21%
			% point increase in the influence of the EnerGuide label on purchase decision	74% in 2008, 72% in 2009	5 percentage points	35%	0%
			Number of stores with EnerGuide POP promotional material	97	150 Stores	15%	7%
			Share of stores which received the EnerGuide POP material which still have it displayed at year end	82%	90%	15%	9%

***Comments**:* 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. In 2009, 97 stores received the EnerGuide POP material. It is thought that the reduction in the number of stores receiving the material is over the previous year is due to the number of stores that chose not to participate and those that were no longer in business.

In 2009, two studies were conducted to determine 2009 actual results for the program. A detailed description of these studies can be found in Section 3 of this report. Below are highlights of the findings found in these studies.

- 81% of the study respondents indicated they were aware of the EnerGuide rating on their natural gas fireplace.
- 72% of customers in 2009 indicated that the EnerGuide influenced their choice of natural gas fireplace purchased.
- 96% of customers are aware of the EnerGuide label that is applied to many appliances sold in Canada.
- 82% of stores had their Enbridge EnerGuide POP brochures on display at the time of the research audit.

2.4.2 Home Performance Contractor Market Transformation Program

Description: 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 by providing contractor training on the benefits of weatherization and weatherization installation techniques.

Objectives:

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

Highlights: The following changes were made in 2009 to the Home Performance Contractor MT program:

- The maximum SSM was increased from $100,000 to $125,000
- The measurement methodology for the ultimate outcome metric was changed from “x increase in frequency of at least three weatherization measures” to “Average increase in frequency scores of all weatherization measures of x.”
- The target number of training workshops to be held was increased from 6 per year to 8 per year.

Rationale for program changes: In 2007 and 2008, the Home Performance Contractor workshops were very favorably received by attendees due to creative promotional strategies and word-of-mouth referrals. At the outset of 2009 it was expected that interest in and demand for the workshops would increase. This would increase the need for budget dollars to support the additional workshops and measure the impacts.

In 2009 the Company began targeting ‘Influencers’ of the home performance air sealing measure by obtaining a listing from the Renovation Council and specifically offering this course to Owners and Sales staff.

Figure 10: Home Performance Market Transformation Program Customer Brochure

The methodology for measuring the "increase in frequency of at least three weatherization measures" metric was revised to eliminate a possible complication of measurement which could arise with the original methodology, that being the lack of a prescribed method for scoring when more than three measures experienced the reported increase in average score. In other words, the original methodology would have assigned the same score (100%) for a 1.0 increase in three weatherization measures, as it would for a 1.0 increase in eight weatherization measures, when clearly the second

outcome is significantly better. The new methodology assigns a score based on the average increase in frequency scores across all weatherization measures.

Updated Budget:

- 2009 Budget $90,000
- 2009 Target SSM $125,000

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 six months after the workshop they attended to determine if their practices had since changed.

Metrics & Program Results:

Table 21: Home Performance Contractor MT Program Results

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight
Home Performance Contractor	$ 90,000	$ 37,761	Average Increase in frequency scores of all weatherization measures	0.3	Average increase of 0.45	60%	0%
			Contractor engagement (participation in workshop)	63	60 individuals from renovation & contracting	20%	21%
			Contractor training workshop	4	8 workshops per year	20%	8%

2.4.3 Drain Water Heat Recovery Market Transformation

Description: This was a new program offered by Enbridge in 2009 for the low-rise residential new construction market, complementing the current program that Union Gas offered to builders in their franchise territory. Extensive consultation was held with Union Gas staff to ensure compatibility between the two utilities' programs, and consideration was given to simplify the builder's process and administration to streamline the program for builders that operate in both franchises. The key difference between the two utility programs is that Enbridge targeted its promotional activity to the key water heater rental service providers who, in turn, promoted the technology to the builder market. Union Gas targeted the builders directly.

Enbridge offered builder incentives of $400 per Drainwater Heat Recovery (DWHR) unit installed.

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

- Develop promotional materials
- Recruit and train rental service providers to attract and recruit builders and contractors
- Train builders and contractors to install DWHR units
- Provide incentives to builders: $400 per DWHR unit installed

Drain Water Heat Recovery technology is simple but relatively new to builders in the Enbridge territory. With Enbridge promoting DWHR, awareness of the product amongst builders should increase. Most water heaters in new homes are rental units installed by service providers on a contract basis with the builder. EGD has recruited the service providers who, in turn will educate builders on the benefits of this technology, enroll builders in the program, and encourage them to install DWHR units in their new construction homes.

Tracking Methodology: Tracking was completed by each Rental service provider. Units ordered and installed were tracked by the supplier and reconciled with Enbridge records.

Highlights: Although this program was started in September, EGD managed to achieve more than 50% (455 units) of our target for total units. With the collaboration of the rental providers, the program was delivered seamlessly with minimal costs.

Evaluation Activities: A third party was commissioned to conduct research and collect data regarding the following:

- Builder awareness of Enbridge's DWHRS program.
- Builder familiarity with Enbridge's DWHRS progam.
- Builder awareness of the builder incentive
- Perceptions of the builder incentive, and
- The level of builder/organization involvement with drain water heat recovery systems.

A more detailed description of this research and findings can be found in Section 3.8 of this report.

Metrics & Program Results:

Table 22: Drain Water Heat Recovery Market Transformation Results

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight
Drain Water Heat Recovery	$ 512,000	354,774	a) Builders Enrolled	24	12	10%	15%
			b) Units Installed	455	650	40%	28%
			c) Builder Knowledge (Answer 2 or more of Below noted key measurements correctly) 1. Knowledge of Program Incentives 2. How the Technology works. 3. Benefit of Technology	71%	50%	15%	23%
			d) Service Provider Promotion	100%	70%	20%	30%
			e) Builder Training Workshops	5	3	5%	8%
			f) Contractor / Sub Workshops	3	3	5%	5%
			g) Trade Show Promotion	3	3	5%	5%

a) Builders Enrolled: The number of builders enrolled in the program was tracked through the rental service providers. In 2009, 24 builders were enrolled. Target for 2009 was 12.

b) Units Installed: The target for 2009 was 650 units. 455 were installed.

c) Builder Knowledge: Non-enrolled builders were surveyed at the end of the year to establish their level of exposure and knowledge of the technology and

Enbridge's program. 71% of surveyed builders answered 2 or more of the questions noted in the matrix above correctly.

d) Service Provider Promotion: The following activities were conducted in 2009 for this metric:

i. Enbridge and Service providers conducted discussions with 75 builders on DWHR
ii. Each service provider kept their binder on Enbridge's DWHR program up to date.
iii. The Enbridge web site was kept up to date on the program
iv. 4 seminars promoting DWHR were conducted with the Home Buyers Association.
v. 6 Builders displayed a power pipe in one of their model homes

e) Builder Training Workshops: The number of workshops delivered to builders with at least 10 builders in attendance. In 2009, 5 training workshops were conducted. Target for 2009 was 3 workshops.

f) Contractor/Sub Workshops: The number of workshops delivered to contractors/sub-contractors with at least 10 contractors in attendance. In 2009, 3 workshops were conducted. Target for 2009 was 3 workshops.

g) Trade Shows/Builder Shows: The number of trade shows/builder shows with an Enbridge presence promoting Drain water Heat Recovery. In 2009, 3 trade shows had DWHR technology promoted by EGD. Target for 2009 was 3 trade shows.

2.4.4 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 2009 include the following:

- Sponsorship of Ontario Association of Food Banks Thought for Food gala
- Workshops with social agency personnel
- Ad in "On the Go" magazine - March Issue
- Sponsorship of TEA LITES energy kits

The budget for this program in 2009 was $170,000. The actual spend was $296,600.

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 Verification and Research Studies

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. 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.

3.1 TAPS Partners Program 2009 Follow-Up Study

Background

EGD sponsors and promotes an energy conservation program named TAPS. Participating contractors visit customers' homes to install energy-saving showerheads, provide energy-saving aerators for kitchen and bathroom faucets and provide energy-saving compact fluorescent light bulbs (CFLs). Research is used to measure customer participation and to improve program delivery 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 2009, four waves of telephone interviews were conducted. In total, 3,151 residential customer interviews were completed across eight contractors in the Enbridge Gas Distribution franchise area.

Customers were chosen for the follow-up research only if the respective contractor reports indicated that a) for showerhead questions, a showerhead was distributed to the premise and b) for light bulb questions, that light bulbs were distributed to the premise. Further, this report reflects only those households that were not identified as low income in the data file. At the beginning of 2009, new analyses were introduced for the installation of showerheads and aerators (total installation) and cannot be compared to previous years. The pipe wrap and programmable thermostat programs were discontinued for "Regular TAPS" households and the CFL light bulb program was introduced.

Results

<u>Verification of Visits</u>

1.59% of customers contacted did not recall receiving a visit from a TAPS contractor. Individual contractor results were not significantly different. The remainder of the report pertains to the 3,151 customers interviewed who recalled receiving a visit from a TAPS contractor.

Overall Results

- Customers were satisfied overall (95%). All contractors met the 90% satisfaction requirement.

- Most households received energy-efficient showerheads (98%), similar to the past four years. Total (gross) installations were 86% for 2009 year-end and net installations (after removals) was 82%. Contractors installed showerheads in 66% of households during 2009. The majority of contractors (78%) explained the water conservation / savings benefits of using an energy-efficient showerhead, similar to 2008 (79%), but still lower compared to 2007 (83%).

- 89% of homes received aerators, similar to 2008 (90%). 64% of homes installed kitchen aerators, a decrease versus 2008 (68%). 50% of homes installed bathroom aerators, also a decrease versus 2008 (54%).

- 94% of homes received energy-efficient compact fluorescent light bulbs and 59% installed the light bulbs.

- The majority of households said that their TAPS visit was a separate visit (77%), an increase versus 2008 (75%).

- The overall length of visit tended to be shorter in 2009. 42% of visits were 10 minutes or less, compared to 38% in 2008 and 35% in 2007.

- Product removals were low – 5% for showerheads, 2% for kitchen aerators, 1% for bathroom aerators and 1% for CFL light bulbs.

Table 23: Receipt of Products and Services per 100 Households

	Total
Total Households	3151
Showerheads	
- Received	98%
-Total (gross) installed	86%
-Net installed	82%
-contractor installed	66%
Kitchen and/or Bathroom Aerators	
-Received	89%
Kitchen Aerators	
-Total installed	64%
-Contractor installed	36%
-Removed	2%
Bathroom Aerators	
-Total installed	50%
-Contractor installed	29%
-Removed	1%
CFL Light Bulbs	
Reduced CFL's as per data 1e	2572
- Received	94%
-Total installed	59%
-Removed	1%

Margin of Error: Overall results +/- 2 percentage points
Source: Questions 1,3,8a,8b,11,15,19,21

3.2 TAPS Partners Program 2009 Low Income Analysis

Background

EGD's TAPS program promotes energy conservation. Participating contractors visit customers' homes to install a programmable thermostat, provide energy-efficient light bulbs (CFLs), provide energy-saving aerators for kitchen and bathroom faucets and install energy-saving showerheads. Research is used to measure customer participation and to improve programs in the future.

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

Objectives

This research study was designed to:

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

Methodology

Telephone interviews were conducted among 154 low income residential customers who received a home visit from a TAPS contractor during 2009. In 2009, three contractors participated in the Low Income TAPS program. Results for 2009 were not weighted. The margin of error for 2009 is +/- 7.5 percentage points at the 95% confidence level.

Results

<u>Verification of Visits</u>

The chart below shows the proportion of households in 2009 who said they did not receive a visit from a TAPS contractor.

Table 24: Verification of Visits

	2009
Total households as per data file	**1589**
Respondent did not receive TAPS visit	**5%**

Source: Contractor records and call disposition records

Summary of Product Receipt, Installation and Removal

- 69% of households said the contractor installed a programmable thermostat in 2009. 2% of households said they removed their programmable thermostat in 2009.
- Overall, 66% of households reported receiving aerators in 2009. The proportion of households reporting they had a kitchen aerator installed (45%) was higher than the reported installation of bathroom aerators (31%). 2% of households removed their kitchen aerators and 1% removed their bathroom aerators.
- 93% of households reported receiving energy-efficient CFL light bulbs and 62% had CFL light bulbs installed in 2009.
- 3% of households removed the CFL light bulbs.
- 91% of households received energy-efficient showerheads and 63% had the showerheads installed. After removals, 59% of households had energy-efficient showerheads still installed in 2009.

Summary of Customer Satisfaction and Contractor Visit

- Customer satisfaction scores fell below the 90% requirement for 2009 (87%)
- The majority of low income households said the contractor visit was a separate visit (67%). 18% of households said they received advance notice.

Table 25: Receipt of Products and Services per 100 Households

Receipt of Products and Services per 100 Households		
	2009	**2008**
Base: Total households *	144	18
Programmable Thermostats		
- total installed	69%	39%
- installed (after removals)	67%	33%
- removed	2%	6%
Base: Total households	154	88
Kitchen and/or Bathroom Aerators		
- received	66%	91%
Kitchen Aerators		
- total installed	45%	68%
- contractor installed	21%	41%
- removed	2%	1%
Bathroom Aerators		
- total installed	31%	55%
- contractor installed	16%	34%
- removed	1%	1%
Base: Received CFLs as per contractor records	109	n/a
CFL Light Bulbs		
- received	93%	n/a
- total installed	62%	n/a
- removed	3%	n/a
Base: Received showerhead as per contractor records	101	88
Showerheads		
- received	91%	89%
- gross installed	63%	77%
- net installed	59%	n/a
- contractor installed	42%	56%

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

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

3.3 Showerhead and Aerator Audit Study Multi-Residential Rental Buildings

Background

The Multi-Residential Showerhead & Aerator Program is a water conservation initiative that involves the replacement of conventional showerheads and aerators (kitchen & bathroom) with low-flow showerheads and aerators in multi-residential buildings. This program was offered to all multi-residential buildings (rental, condo, and co-op) within the Enbridge Gas Distribution Inc. franchise area.

Enbridge Gas Distribution Inc. commissioned a third party to conduct an on-site audit of a random sample of rental buildings that participated in the program during 2009. In 2009, 770 rental buildings representing 15,957 apartment units participated in the program.

The following measures were applicable for installation in a Multi-Residential rental unit:

- 1.0 & 1.5 GPM Basin Aerator (Tamper proof)
- 1.0 & 1.5 GPM Kitchen Aerator (Tamper proof)
- 1.5 & 2.0 GPM Showerhead (Tamperproof)

Objectives

This research study was designed to determine the install rate for each of the above measures.

Methodology

Overall, there were 770 buildings representing 15,957 apartment units that participated in the program. The random sample selected 29 buildings, representing 3,968 apartment units. The random sample selected 534 apartment units for an on-site visit to be conducted. Of these:

- 489 were audited for the showerhead
- 426 were audited for the kitchen aerator
- 375 were audited for the bathroom aerator

A detailed breakdown of building size and audits conducted for each measure is presented in the table below:

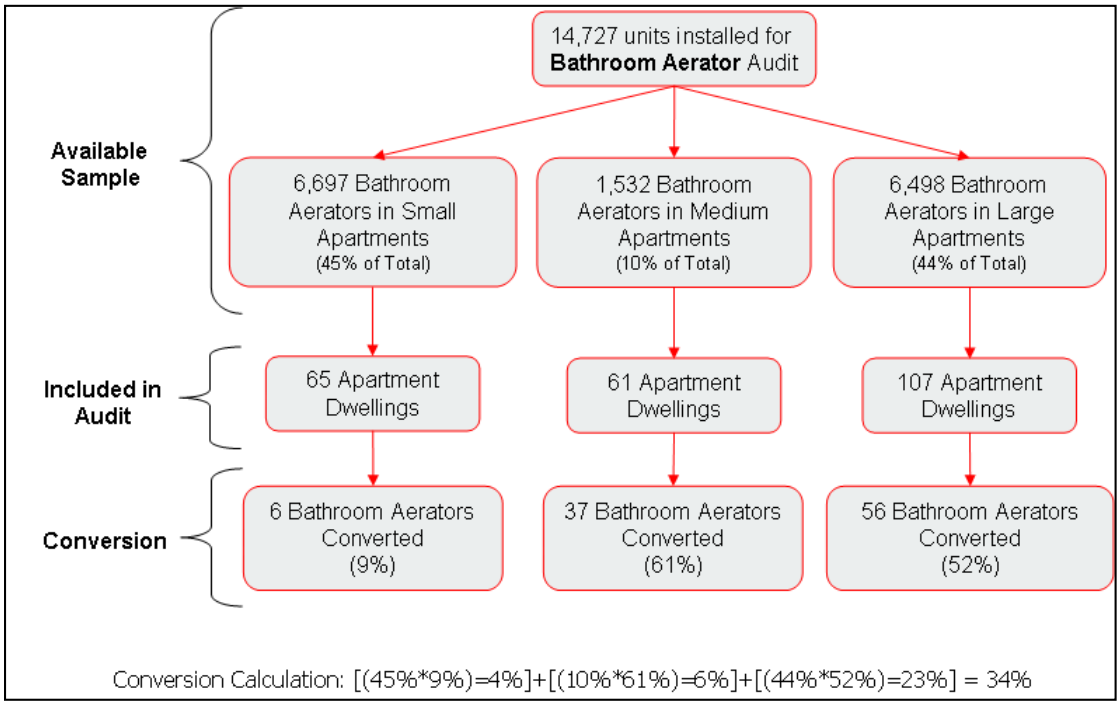
Table 26: Break Down of Building Size and Audits Conducted

Building Type	Showerhead	Kitchen	Bathroom
Small (<65 units)	153	128	102
Medium (65-200 units)	152	111	103
Large (More than 200 units)	184	187	170

Buildings were grouped according to their building size, as outlined in the above table. Installations were then weighted according to the number of devices ordered, by building size, as proxy for the number of installations that were possible across all buildings – not only the buildings that were audited.

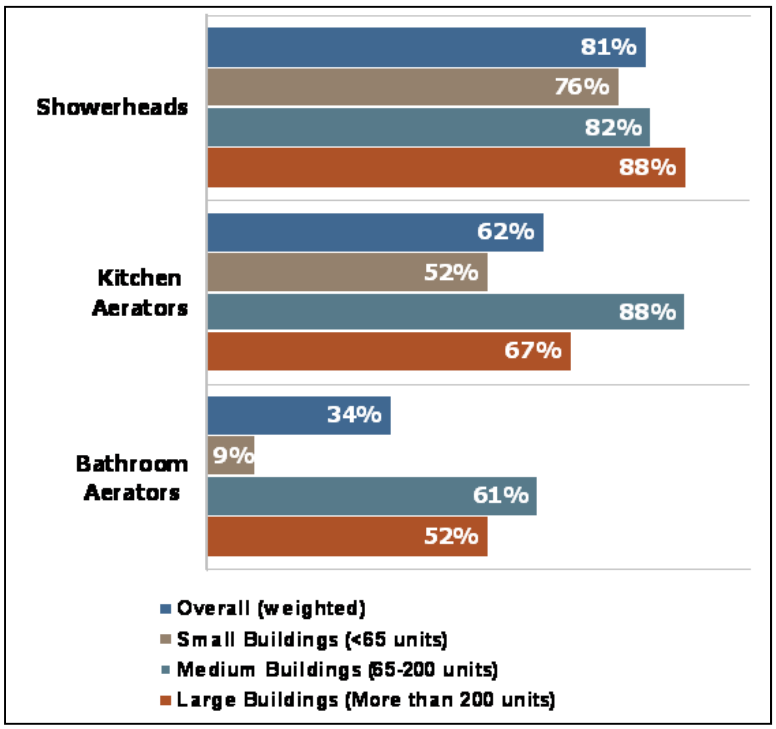
A weighting structure was used to calculate the installation rate according to the share of devices ordered by building size, versus the actual audits conducted. The figure below presents an example of the weighting structure implemented:

Figure 11: Example of Weighting Structure Implemented in Showerhead and Aerator Audit Study



Results : Results from this research are summarized in the table below.

Table 27: Summary of Install Rates



3.4 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. Commercial and Industrial Engineering Reviews were initiated 2-3 weeks earlier in 2009 than in 2008.

Purpose of the Study

EGD retained Building Innovation Inc. (BII) to conduct an engineering review of the savings for the 2009 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 2009, 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 23 Commercial sector custom projects. The approach to this study was three tiered: Document review, site visits, 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. Site visits were first conducted in 2009 as a result of a recommendation from the auditor of the 2008 DSM program. Site visits 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

Table 28: Commercial Customer Projects Adjustment Factors

Gas savings Factor	-3.2%
Electricity Savings Factor	-10.1%

The overall reduction factors for Commercial Sector custom projects were -3.2% for gas savings and -10.1% for electricity savings. The Industrial Sector water adjustment factor of +49.2% will be utilized since no commercial projects with water measures were selected for the random sample conducted by Summit Blue. This is a natural possibility when following the random sampling methodology recommended by Summit Blue.

Table 29: Commercial Sector Custom Project Verification Results

Commercial Projects Sampled	23
Sampled Projects with Calculation Discrepancies	7
Natural Gas Savings of all Sampled Projects	4,654,224 m^3
Revised Natural Gas Savings	4,503,382 m^3
Electricity Savings of all Sampled Projects	6,785,521 kWh
Revised Electricity Savings	6,098,037 kWh
Water Savings of all Sampled Projects	0
Revised Water Savings	0

3.5 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 2009 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 2009 through a review of a statistically representative sample of the projects.[2]

Methodology

Using a sampling process developed for EGD and Union Gas by Summit Blue, Genivar Ontario Inc. reviewed 20 industrial 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 third party engineering review of the sample of projects and, where a more appropriate calculation is identified, provide the results of such a calculation.

2 IBID

Results

Table 30: Industrial Custom Projects Adjustment Factors

Gas savings Factor	3.5%
Electricity Savings Factor	-4.8%
Water Savings Factor	49.2%

Table 31: Industrial Sector Custom Project Verification Results

Industrial Projects Sampled	20
Sampled Projects with Calculation Discrepancies	6
Natural Gas Savings of all Sampled Projects	25,067,756 m^3
Revised Natural Gas Savings	25,931,507 m^3
Electricity Savings of all Sampled Projects	6,962,297 kWh
Revised Electricity Savings	6,626,578 kWh
Gross Water Savings of all Sampled Projects	414,739 m^3
Revised Gross Water Savings	618,663 m^3

3.6 EnerGuide for Natural Gas Fireplaces

3.6.1 Program Performance Research 2009

Background

The EnerGuide for Natural Gas Fireplaces Market Transformation Program is part of the Enbridge Multi-year plan approved by the Ontario Energy Board for the years 2007 through 2009.

Purpose

The purpose of this research is to document program results and determine if the program performance meets the metric value required for the target DSM Market Transformation Program SSM (Shared Savings Mechanism) for 2009.

Objectives

- To determine the share of stores (retailers and HVAC), who received the Enbridge EnerGuide POP material (information pamphlet with $50 mail-in rebate coupon) earlier in the year, and still have it visibly displayed at year end.
- To compare results by region and EGD channel representative area.

Methodology

Research fieldwork was completed by an independent contractor through in-person “mystery shopper” field audits. The field auditor was not identified as a representative of Enbridge. Information collected included the following:

- Date
- Retailer/HVAC company name
- Retailer/HVAC company address
- Verification that Enbridge POP is on display (or available in-store)

Audits Completed

Of the list of 136 fireplace stores, 129 were included in the research. Seven locations were not included in the research for the following reasons:

- 2 addresses provided were duplicates
- 1 location was a home-based business and could not be audited (per channel rep notes)
- 1 location was an installation business and did not sell fireplaces (per 2008 audit findings)
- 1 location was a “locked” sales office, not a retail or HVAC store (per 2008 audit findings)
- 1 business was a service shop – house and barn – not a retail or HVAC store (per 2008 audit findings)
- 1 business was a residential address with no business sign out front (per 2008 audit findings)

Fieldwork Disposition

Of the 129 stores included in the research, all were audited in-person in 2009.

Ten locations were not included in the performance metric calculation for various reasons (business locations permanently closed, store not open the day of the audit, residential addresses, and a duplicate address).

Results

Overall, **82%** of stores still had their Enbridge EnerGuide POP brochure on display at the time of the research audit. Retail stores had a higher performance rating (88%) than HVAC businesses (72%). All three distributors/manufacturers participating in the program had the fireplace brochure on display.

Table 32: Percentage of Stores with POP Material on Display

Business Type	Yes		Audits Completed
	#	%	
Retailer	58	**88%**	66
HVAC	36	**72%**	50
Distributor / Manufacturer	3	**100%**	3
Total:	97	**82%**	119

Businesses new to the program this year scored slightly but not significantly higher (84%) than those who had participated the previous year (81%).

Retailer and HVAC engagement is higher compared to 2008, when the program performance came in at 63% overall and 68% for the audits conducted in person.

Table 33: Performance Results by Channel Rep Area:

Region	Channel Rep Area	Yes		Audits Completed
		#	%	
Toronto	Toronto	17	100%	17
Central East	Durham Region	12	100%	12
Niagara	Niagara Area	8	100%	8
Central West	Peel Region / Dufferin	13	87%	15
Central East	Kawarth Lakes / Peterborough	11	85%	13
Eastern	Ottawa Area	23	74%	31
Central North	Georgian Bay	8	73%	11
Central North	York Region	5	42%	12
	Total:	97	**82%**	119

3.6.2 2009 Awareness Survey of the EnerGuide Label

Background and Purpose

EGD's EnerGuide for natural Gas Fireplaces encourages customers to purchase natural gas fireplaces with the EnerGuide label and that are of higher efficiency relative to what is available in the market. EGD launched the 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 the EnerGuide label had an influence on which natural gas fireplace was purchased

This summary presents the findings from the first, second and third year post program follow-ups since EGD's point-of-purchase promotional material campaign was launched. This summary also includes the research findings from 2006 and 2007 that were reported in previous years.

Methodology

Survey Qualifications

To qualify for taking the survey, the respondent must have been an EGD residential customer, must have purchased a natural gas fireplace in 2006 (Baseline) or 2007, 2008 or 2009 for first year, second year, and third year post follow-up.

Data Collection – 2006 Purchases

A notice was printed on customers' Enbridge bill for the June 2007 cycle month inviting them to respond to the survey. If they had purchased a natural gas fireplace in 2006 and completed a questionnaire, they received a $15 honorarium. They were directed to a website to complete the questionnaire. The survey was open from June 7, 2007 to July 27, 2007. A total of 485 qualified customers completed the online survey.

Data Collection – 2007 Purchases

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 the telephone survey to receive a $15 honorarium. The survey was conducted from January 14, 2008 to February 6,

2008. A total of 105 respondents qualified by indicating they had purchased a natural gas fireplace in 2007 and were Enbridge customers.

Data Collection – 2008 & 2009 Purchases

Customers completed an in-store Enbridge rebate form as well as the questionnaire on the back of the rebate form. In 2008, survey forms were completed by customers between July 1, 2008 and January 9, 2009. A total of 357 customers completed the survey. In 2009, survey forms were completed by 489 customers between January and December 2009.

Results

Table 34: Awareness of EnerGuide Label on Appliances

Aware of the EnerGuide label on appliances?				
Year	2006	2007	2008	2009
Base	n=485	n=105	n=357	n=489
Yes	95%	88%	96%	96%
No	5%	12%	4%	4%

Awareness of the EnerGuide label has remained relatively consistent across all 4 years with a slight decline in 2007.

Table 35: Awareness of EnerGuide Label on Fireplace

Aware that fireplace you purchased had an EnerGuide rating…				
Year	2006	2007	2008	2009
Base	n=485	n=105	n=357	n=489
Yes	64%	61%	80%	81%
No	36%	39%	19%	19%
No Response	0%	0%	1%	0%

Awareness of the EnerGuide label on fireplaces increased from 64% to 81% in 2009. Relative to appliances, it appears customers are more aware of Energuide labels on appliances as a whole then on natural gas fireplaces.

Table 36: EnerGuide Influence on Purchase

EnerGuide Influence on Purchase…				
Year	2006	2007	2008	2009
Base	n=485	n=105	n=357	n=489
Yes	37%	35%	74%	72%
No	63%	65%	26%	28%

The majority of customers (72%) in 2009 indicated that the EnerGuide rating influenced their choice of Natural Gas Fireplace purchased. This does not represent a statistical change from 74% in 2008.

3.7 Home Performance Contractor Market Transformation Program: 2009

Background

In 2007 Enbridge 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 Enbridge 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 2009, a total of four workshops were held for contractors and advisors.

Table 37: Workshops Conducted and Questionnaires Received

Date	Location	# of Completed Surveys
June 15	Enbridge office, Scarborough	8
June 29	Enbridge office, Scarborough	21
June 17	Enbridge office, Ottawa	21
August 25	BILD, North York	13

A total of 63 completed questionnaires were received at the workshop; however, one respondent did not answer any of the metrics questions and was therefore removed from the analysis. A base of 62 was used for the baseline report.

Methodology

Baseline

At the beginning of each workshop, participants were asked to complete a survey, which established baseline measurements. As noted, 62 contractors and advisors completed the survey. The results of this survey were issued in October 2009.

Follow-Up

A follow-up, identical survey was administered to determine if there were changes in the implementation of the weatherization measures. Field work was conducted from January 20 to February 8, 2010.

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 two weeks, respondents who had not responded to the online survey were phoned to see if they would participate. In order to maximize the response rate, an honorarium of $50 was offered to both online and telephone respondents.

This analysis compared the results of the two surveys. In order to achieve an effective comparison of pre and post measures the following actions were taken.

- Respondents were “matched” based on answering at least one question in both surveys.
- If a respondent wrote in ‘not stated’ or ‘not applicable’ from either survey for a question, they were removed for that question.
- If a respondent completed the non-measurement questions but none of the measurement questions, they have been removed from the analysis of the average frequency measures.

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

Of the 62 potential contractor and advisor respondents from the baseline survey, a total of 49 respondents could be matched based on the foregoing criteria, for a 79% completion rate.

Results

Program Success Measures and Targets

The Home Performance Contractor Market Transformation program’s success is based on the increase in average frequency of weatherization measures implemented by the participating contractors. The 100% target is an increase in average frequency scores of all weatherization measures of 0.45.

Findings: Occupation

Table 38: Occupations of Participants

	Total
	49
Insulation	59%
Air Sealing	47%
HVAC	37%
Other	61%

Q3. Which of the following type(s) of work do you do?

Adds to more than 100%, multiple answers allowed

Almost six out of ten respondents were involved in insulation (59%). 47% were involved in air sealing, while 37% selected “HVAC”.

Table 39: Involvement in Air Sealing Measures

Involvement in Air Sealing Measures	
	Total
	49
I'm more involved in recommending air sealing measures	35%
I'm more involved in implementing air sealing measures	16%
I'm involved equally in recommending and implementing air sealing measures	43%
I'm not involved in either recommending or implementing air sealing measures	6%

Q4. Are you more involved in recommending air sealing measures or implementing air sealing measures?

Virtually all respondents were involved in air sealing measures – only 6% were not involved. 43% were involved equally in recommending and implementing air sealing measures, while another 35% were involved only in recommending air sealing measures.

Findings: Implementation of Services

Workshop participants were asked to rate the frequency with which they currently implement the eight services noted below. The base size for each service ranges from

n=45 to n=48, depending on the number of respondents who answered both the pre-course survey and the follow-up survey.

Services:

- Comprehensive air sealing of the attic floor with 2 component foam (n=46)
- Comprehensive air sealing of the attic floor with 1component foam, caulking and poly (n=46)
- Some air sealing of the attic floor with 1 component foam, caulking and poly (n=45)
- Air sealing baseboards, window / door trim, electrical outlets / switches (n=48)
- Air sealing and insulate basement sill plate and joint header area (n=47)
- Weather stripping existing doors (n=47)
- Weather stripping existing windows (n=46)
- Insulating garage ceilings, cantilevers, etc. with 2 component foam (n=48)

Based on the overall average of the eight weatherization measures, the 2009 program met the 50% target –an increase in average frequency scores of all weatherization measures of 0.3.

Table 40: Average Frequency Scores of all Weatherization Measures

	Average Rating Out of Five		
	Baseline	**Follow-Up**	**Change**
Comprehensive air sealing of the attic floor with 2 component foam	1.8	2.5	0.7
Comprehensive air sealing of the attic floor with 1 component foam, caulking and poly	2.2	2.7	0.5
Some air sealing of the attic floor with 1 component foam, caulking and poly	2.6	2.6	0.0
Air sealing baseboards, window / door trim, electrical outlets / switches	3.5	3.5	0.0
Air sealing and insulating basement sill plate and joint header area	3.8	4.0	0.2
Weatherstripping existing doors	3.6	3.9	0.3
Weatherstripping existing windows	3.1	3.5	0.4
Insulating garage ceilings, cantilevers, etc. with 2 component foam	2.5	2.8	0.3
Overall Average	**2.9**	**3.2**	**0.3**

Q5. Thinking of the contracts fulfilled since you took the Air Sealing and Insulation course, do you implement / recommend the following services?

Certification

The vast majority of program participants said it was a good idea to offer certification for air sealing courses (90%). Over half the respondents said certification should be mandatory (55%) and just over one third said it should be voluntary (35%).

Duration and Focus of Course

Most respondents said they preferred to have the air sealing and insulation course as a full-day course (84%). The vast majority of respondents said greater focus should be placed equally on the benefits and actual 'how to' of air sealing (90%).

3.8 Drain Water Heat Recovery System Market Transformation Program 2009 Builder Knowledge Research

Background

Enbridge's Drain Water Heat Recovery Program promotes drain water heat recovery technology in the low-rise residential new construction market. Research was conducted among builders not enrolled in the program to assess their level of exposure to and knowledge of the program.

Research Objectives:

Specific research objectives were to determine:

- awareness of Enbridge's DWHR program,
- familiarity with Enbridge's program,
- awareness of the builder incentive,
- perceptions of the builder incentive and
- the level of builder/organization involvement with drain water heat recovery systems.

Methodology

Enbridge provided contact information for 62 builders who, according to Enbridge records, were not currently enrolled in the PowerPipe Program in either the Enbridge Gas Distribution or Union Gas franchise territories. Telephone calls were made to these builders using Computer-Assisted Telephone Interviewing (CATI) from a central, supervised facility. Up to eight attempts were made to reach respondents before the record was abandoned. Calls were made from January 28 – February 4, 2010. To ensure data quality, respondents were re-screened on whether they were currently enrolled in the Program. A summary of the calls is provided in the table below:

Table 41: 2009 Builder Knowledge Research Call Summary

Total:	62
Could not reach after 8 attempts:	11
Duplicate phone number:	1
Refused:	6
Is enrolled in the Enbridge Power pipe program:	5
Sample available for research:	39

Results

Of the three key metrics measured (incentive, knowledge of how technology works and benefit of program), respondents were most aware of how the technology worked (79%) and the benefits of the program (82%). A total of 43% of respondents correctly identified the incentive being offered for the program.

Awareness of Power Pipe Program

- 67% of builders were aware of Enbridge's PowerPipe Program. These respondents were asked how they learned about the Program.
- 5% did not know. These respondents were not asked how they learned about the program but continued through the rest of the questionnaire.
- 28% had not heard of the program and these respondents were thanked for their time and the interview ended.

Source of Knowledge of Program

- 58% of respondents who were aware of the PowerPipe Program said they learned about the program through their hot water tank service provider.
- 27% learned about the program through print (magazines, newspapers)
- 23% learned about the program through a representative of Enbridge.
- The table below provides a summary of other mentions of the program.

Table 42: Source of Customer Knowledge about DWHR Market Transformation Program

Source of Knowledge	Total	
Base: Aware of the PowerPipe Program	26	
	#	%
Hot water tank service provider / Direct Energy	15	58%
Print (magazines, newspapers)	7	27%
Enbridge (rep/area manager)	6	23%
Trade show	3	12%
Contractor	1	4%
Home builders' association	1	4%
Manufacturer of drain water pipe	1	4%
Green building program	1	4%
The internet	0	0%

Q3. How did you learn about Enbridge's PowerPipe Program? Was it through …

Multiple answers accepted - adds to more than 100%

Key Measure 1: Knowledge of Program Incentives Offered

Just over four out of ten respondents knew the correct program incentive – a free PowerPipe for every home in which the program is implemented (43%).

A total of 46% of respondents did not know what the incentive was.

Key Measure 2: How the Technology Works

The majority of respondents knew how the technology worked. 79% selected "pre-heats fresh water using heat captured from drain water". Of the builders, 11% did not know how the technology worked.

Key Measure 3: Benefit of the PowerPipe Technology

The majority of respondents correctly identified the benefit of the PowerPipe technology. A total of 82% selected "it reduces the amount of natural gas required to heat hot water".

Meeting the Target for the Drain Water Heat Recovery System Market Transformation Program

In order to meet the 100% metric level, 50% of the respondents had to answer two or more of the above 3 key measurements correctly. This target was met, with 71% of respondents answering two or more metrics correctly (see table below).

Table 43: Respondents Success At Answering 3 Key Measures Correctly

	Total	
	28	
	#	
Answered 0 metrics correctly	5	18%
Answered 1 metric correctly	3	11%
Answered 2 or more metrics correctly	**20**	**71%**

Results were based on each respondent answering at least two questions correctly.

3.9 Analysis of Low Income Weatherization Program Results

Background

Enbridge has been delivering the Low Income Weatherization program since 2007. The initiative is a prescriptive program with assumptions reviewed by Navigant Consulting and included in their Board approved list of DSM program assumptions on April 16, 2009 (EB-2008-0346). The Board approved deemed savings and incremental costs associated with the weatherization retrofits are based on average results for 61 homes in the Low Income Weatherization program conducted in 2007. Both Union Gas and Enbridge currently deliver low income weatherization programs using the Navigant assumptions approved in EB-2008-0346. While the savings and incremental costs are deemed values, the program delivery includes the development of individual computer modeled savings results for each individual dwelling. Similarly, the actual costs of the weatherization measures are tracked for each dwelling.

Purpose of the Study

Enbridge Gas Distribution undertook an analysis of three years results from the Low Income Weatherization program in order to determine if the assumptions re: deemed savings and incremental costs should be updated.

Methodology

Using program tracking information submitted by the contractors, Enbridge analyzed the average savings per dwelling and average retrofit cost per dwelling for low income weatherization retrofits completed in 2007, 2008, and 2009.

Results

	2007	**2008**	**2009**	**Board Approved Assumptions (April 2009)**
Number of Homes	61	208	361	
Total average cost per retrofit	$2284	$2422	$2696	$2284
Total Average Savings m3	1143	1273	1637	1134
Total Average Savings kWh	165	300	195	165

Note: The average cost per retrofit includes the cost of the audit. The average savings per retrofit is based on a simple average of average results from three contractors. The average savings

was not weighted by the number of homes retrofitted by each contractor. The number of homes per contractor ranged from 29 to 300.

It should be noted that there was one contractor in 2007, two in 2008, and three in 2009. On examining the records from individual contractors it can be seen that, as contractors gain experience, the depth of retrofits undertaken increases year over year resulting in the trend toward increased savings and costs.

Recommendation

After consultation with the Enbridge Evaluation Audit Committee (EAC) and with Union Gas, Enbridge recommends that the Low Income Weatherization program move to a protocol whereby savings and incremental cost are based on the actual results for the program year. Other program assumptions such as free ridership and measure life would continue as prescriptive assumptions.

For 2009, in keeping with the Multi-year plan framework, Enbridge recommends that the actual results for 2009 be used for LRAM purposes while retaining the Board approved assumptions for the SSM calculation. For 2010, the actual results for the program year would be used for both LRAM and SSM purposes.

3.10 Analysis of Showerhead Flow Rates Residential Sector

Background

Enbridge Gas Distribution delivers a showerhead retrofit program in the residential sector, the TAPS program. Deemed savings for the showerhead measure are categorized in two groups: showerheads with a flow rate between 2.0 and 2.5 gpm and showerheads with a flow rate greater than 2.5 gpm. Prior to installing the new, low flow units, the Enbridge contractors test the existing showerheads in order to a.) ensure that they are not already low flow and b.) determine the flow rate for the purposes of calculating the deemed savings.

Purpose

The purpose of this analysis is to benchmark the flow rates of existing showerheads in the residential sector utilizing data from the TAPS program.

Methodology

Available flow rate information was separated into two categories, less than 2.5 gpm (low-bucket) and greater than 2.5 gpm (high-bucket), to be consistent with the bucket requirements. The table below provides a summary of the information used in this study.

Table 44: Available Flow Rate Information

2.0 gpm - 2.5 gpm		**2006**	**2007**	**2008**	**2009**
	Weighted Average	2.4195	2.4026	2.4596	2.4502
	Variance	0.90	2.36	1.20	1.30
	Standard Deviation	0.95	1.54	1.10	1.14
	Number of Observations	8868	38649	62908	60854

Above 2.5 gpm		**2006**	**2007**	**2008**	**2009**
	Weighted Average	3.0545	3.0957	3.1396	3.0674
	Variance	7.49	7.81	8.18	7.63
	Standard Deviation	2.74	2.79	2.86	2.76
	Number of Observations	54188	113580	158821	123338

A weighted average was calculated for each category. It was important to apply weights to the existing flow rates as they were not evenly distributed in the sample. Between 2006 and 2009, average flow rate for the low-bucket category fluctuated around 2.4gpm while the average for the high-bucket category fluctuated around 3.1gpm.

The next step in the analysis was to investigate whether the weighted averages are statistically significantly different from year to year. Of the available statistical procedures, a two-tailed independent population test for means was considered to be the most appropriate one for this study. Since the samples came from the same population, a pooled variance was calculated for each scenario as given below.

Table 45: Calculated Pool Variances

2.0 gpm - 2.5 gpm		**2006**	**2007**	**2008**	**2009**
	2006	x	1.630407	1.023144	1.022703
	2007	1.630407	x	1.890237	1.385064
	2008	1.023144	1.890237	x	1.118643
	2009	1.022703	1.385064	1.118643	x

Above 2.5 gpm		**2006**	**2007**	**2008**	**2009**
	2006	x	7.618152	7.770213	7.541625
	2007	7.618152	x	7.994175	7.72477
	2008	7.770213	7.994175	x	7.922761
	2009	7.541625	7.72477	7.922761	x

The calculated pool variances above are used in constructing test-statistics for each scenario. Tables given below provide calculated test-statistics for a two tailed test with a null hypothesis of “no difference between means”. A test of this type examines if the two means are “statistically identical” given the sample size and the variance. In this case the tests were performed to check the weighted average of one year against every other year.

Test-statistics give evidence that the null hypothesis could not be rejected at 5% level of significance in all cases except one. Due to an unusually high variance in the low-bucket category in 2007, the test statistic (2.322161) was slightly above the critical-t value resulting in the rejection of null hypothesis in the test between 2007 and 2009.

Table 46: Weighted Average, One Year vs. Other Years

2.0 gpm - 2.5 gpm		2006	2007	2008	2009
	2006	x	0.038662	-0.10509	-0.07822
	2007	0.038662	x	-0.10998	2.322161
	2008	-0.10509	-0.10998	x	-0.22762
	2009	-0.07822	2.322161	-0.22762	x

Above 2.5 gpm		2006	2007	2008	2009
	2006	x	-0.08307	-1.37829	-0.02514
	2007	-0.08307	x	-0.07943	0.052289
	2008	-0.1706	0.07943	x	0.127294
	2009	0.02514	0.052289	0.127294	x

Results

The purpose of this analysis was to investigate if the average flow rates of existing shower heads change from one year to the next. At first glace, it appeared that the weighted averages were consistent from 2006 to 2009, for both categories. A more rigorous statistical test provided evidence that the weighted averages are not statistically significantly different from one year to the next. There is enough evidence to conclude that from 2006 to 2009 the average flow rate for the low-bucket was 2.4gpm and the average flow rate for the high-bucket was 3.1gpm. Also, it is worth noting that historically about 72% of the observations fell in the high-bucket category and about 28% were in the low-bucket category (see below). Also, the number of showerheads that fall into the low-flow category (<2.0 gpm) is less than one percent of the total.

Table 47: Results

BUCKETS	2006		2007		2008		2009		TOTAL	
<2.0	379	0.59%	465	0.31%	480	0.22%	98	0.05%	1422	0.23%
2.0 - 2.5	8489	13.26%	38184	25.08%	62428	28.15%	60756	32.98%	169857	27.30%
>2.5	55128	86.14%	113584	74.61%	158837	71.63%	123341	66.96%	450890	72.47%
Total	63996	100.00%	152233	100.00%	221745	100.00%	184195	100.00%	622169	100.00%

Recommendation

Based on this analysis, EGD recommends that the bag test be discontinued and that the program showerhead deemed savings be assigned based on the bench marked flow rates as determined by this study.

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

Background & Objectives

In 2008, Enbridge undertook a load research study on the impact of low flow showerheads. The purpose of this study was to derive an estimate of the change in water heating natural gas 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 behavioural inputs by observing the impact of actual behavioural changes in the field through measured consumption, and by controlling for several variables of interest, both qualitative and quantitative.

A summary of the Showerhead Load Research study was included in the 2008 DSM Annual Report. On the recommendation of the DSM auditor who reviewed the 2008 DSM Annual Report, Enbridge undertook an extension to the original study.

Methodology

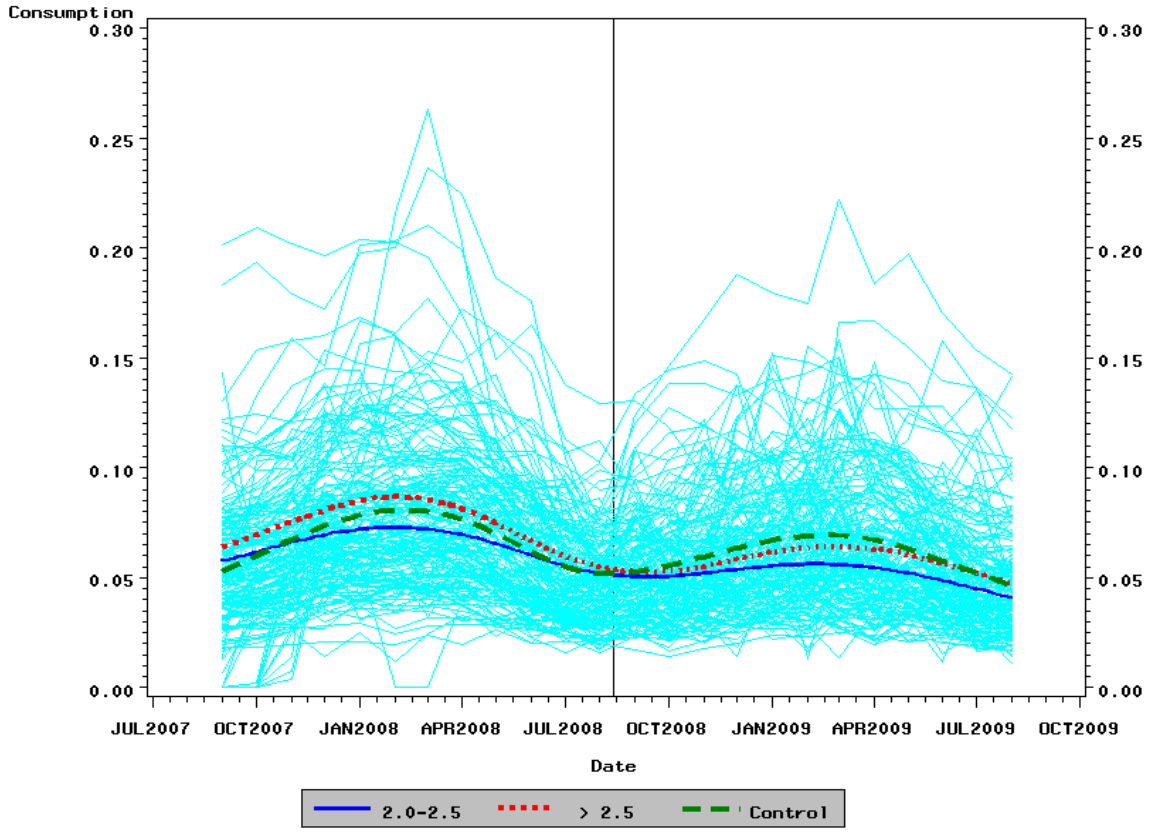
Data was analyzed for 69 households pre and post installation of low-flow showerheads. In the original study, data records began on August 31 2007 and continued to December 31 2008 date. Showerheads were installed between 13 August 2008 and 18 October 2008. The extended study included data for a year prior to and following installations. Following data cleaning, results from 54 homes pre and post installation were analyzed. In addition, data were gathered from a control group for the same period.

Longitudinal Mixed Models were chosen for the data analysis. The objectives of longitudinal data analysis are to examine and compare responses over time. The defining feature of a longitudinal data model is its ability to study changes over time within households and changes over time between groups. Longitudinal Mixed Models allow for a powerful exploration of the impacts of low-flow showerheads on EGD consumption data, while controlling for other sources of variation in the data, such as multiple household attributes. For this study, three types of longitudinal mixed models analysis were performed: a Before/After comparison of households receiving low-flow showerheads, a Treatment/Control comparison, and a more complex, Time Trend model to corroborate the findings.

Results

The chart below illustrates the study results as expressed in average hourly consumption / month for the control group and the two groups with replacement low-flow showerheads. The chart also illustrates that gas consumption even in control households is lower, on average, in the year after installation than it is in the year prior. (The point of installation of the low flow units is marked with the vertical black line.)

Figure 12: Average Hourly Consumption per Month



Annual savings estimated are approximately 45-46m3 for households that switched to a low-flow showerhead from a pre-existing showerhead with flow rates between 2.0 and 2.5 gpm, and 88m3 for households that switch from a pre-existing showerhead with flow-rates greater than 2.5 gpm. These savings estimates are smaller than those found in the 2008 study. The key difference being that the 2008 study lacked contemporaneous control households, making it difficult to adjust for time trends in consumption.

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.

Table 48: Natural Gas Savings

2009 DSM Program	Net Annual Gas Savings	
EXISTING HOMES		
Water Conservation		
Tankless Water Heating	898,552	
TAPS Partners Program - Showerheads over 2.5	6,373,957	
TAPS Partners Program - 2.1 - 2.5	1,951,674	
TAPS Partners Program - Kitchen Aerators	1,513,866	
TAPS Partners Program - Bathroom Aerators	322,740	
Equipment Replacement		
Furnace Replacements	1,097,943	
Thermostats	1,673,721	
Novitherm	251,594	
Total Existing Homes		**14,084,047**
RESIDENTIAL NEW CONSTRUCTION		
EnergyStar for New Houses	2,126,653	**2,126,653**
LOW INCOME		
LI TAPS Partners Program - Showerheads 2.5+	131,308	
LI TAPS Partners Program - Showerheads 2.1 - 2.5	732	
LI TAPS Partners Program - Kitchen Aerators	16,478	
LI TAPS Partners Program - Bathroom Aerators	3,002	
LI Prog Thermostats	430,299	
LI Weatherization program	409,374	
Total Low Income		**991,192**
TOTAL RESIDENTIAL		**17,201,892**

Natural Gas Savings (con't)

2009 DSM Program	Net Annual Gas Savings	
SMALL COMMERCIAL		
Air Doors (Single)	15,208	
Air Doors (Double)	23,241	
Demand Control Kitchen Ventilation (0 - 4999 CFM)	41,049	
Demand Control Kitchen Ventilation (5000 - 9999 CFM	196,411	
Demand Control Kitchen Ventilation (10000 - 15000 C	35,956	
Energy Recovery Ventilators (ERV)	209,830	
Furnace Replacements	41,536	
Heat Recovery Ventilator (HRV)	3,544	
Infrared Heaters	206,990	
Pre-Rinse Spray Nozzle	1,074,325	
Rooftop Units	136,629	
Tankless Water Heaters	4,528	
Programmable thermostats	40,225	
Total Small Commercial		**2,029,469**
LARGE COMMERCIAL		
Hotel/Motel	605,555	
Office	2,057,905	
Retail	381,609	
Warehouses	264,889	
Other Commercial	1,631,785	
Hospitals	4,526,318	
Long Term Health Care	531,088	
Government	3,158,996	
School	1,734,432	
College/University	485,098	
Total Large Commercial		**15,377,676**
MULTI RESIDENTIAL		
Multi-Residential Private	13,907,770	
Multi-Residential Non-Profit	374,632	
Multi-Residential Water Conservation		
Condo	83,868	
Rental	680,754	
Front Load washers	47,701	
Total Multi-Residential		**15,094,725**
LARGE NEW CONSTRUCTION	2,287,063	**2,287,063**
INDUSTRIAL		
Industrial	20,953,163	
Agriculture	1,377,570	
Total Industrial		**22,330,732**
TOTAL BUSINESS MARKETS		**57,119,665**
TOTAL GAS SAVINGS (Bus. Markets & Residential)		**74,321,558**

5.0 LRAM Statement

Table 49 illustrates the LRAM by rate class and the variance that will need to be reimbursed to (positive number) or collected from (negative number) rate payers. In total, $45,722 needs to be returned to rate payers.

Table 49: Final LRAM Calculation

2009 Audit Report LRAM Calculation

(based on 60,011037 FE m3 built into rates)

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin (cents/$m^{3)}$	$	
Rate 1	8,153,242	5,924,543	(2,228,700)	~~7.01~~	$	~~(156,220)~~ 24.3%
Rate 5	14,235,533	11,489,960	(2,745,573)	~~3.77~~	$	~~(103,438)~~ 30.0%
Rate 110	2,191,564	1,499,067	(692,497)	1.54	$	(10,643) 7.6%
Rate 115	1,394,632	1,032,480	(362,152)	0.97	$	(3,516) 4.0%
Rate 135	0	18,796	18,796	1.39	$	261 -0.2%
Rate 145	1,921,623	936,892	(984,731)	1.92	$	(18,878) 10.7%
Rate 170	4,609,385	2,441,975	(2,167,410)	0.60	$	(12,947) 23.7%
Totals	32,505,979	23,343,711	(9,162,268)		$	~~(305,380)~~
Total Excluding Rate 1 and Rate 6					$	**(45,722)**

Notes:

- The volume of 60,011,037 fully effective (FE) m3 was the assumption used in the 2009 LRAM budget.
- The EAC and Enbridge, following the application of best available information, have agreed on 2009 LRAM FE volumes of 69,856,861m3.
- Fully Effective volumes assume savings from implemented measures delivered savings for the entire year.
- Partially Effective volumes assume savings were realized in 2009 only for the period of time in 2009 in which a measure was implemented and delivering gas savings.

Gas savings for LRAM are shown in Table 50. Gas savings for LRAM are calculated using best available information and will differ from the gas savings recorded for SSM purposes.

Table 50: Gas Savings for LRAM

2009 DSM Program	Net Annual Gas Savings	
EXISTING HOMES		
Water Conservation		
Tankless Water Heating	898,552	
TAPS Partners Program - Showerheads over 2.5	4,835,416	
TAPS Partners Program - 2.1 - 2.5	1,360,258	
TAPS Partners Program - Kitchen Aerators	1,513,866	
TAPS Partners Program - Bathroom Aerators	322,740	
Equipment Replacement		
Furnace Replacements	1,097,943	
Thermostats	607,584	
Novitherm	251,594	
Total Existing Homes		**10,887,952**
RESIDENTIAL NEW CONSTRUCTION		
EnergyStar for New Houses	1,164,063	**1,164,063**
LOW INCOME		
LI TAPS Partners Program - Showerheads 2.5+	99,613	
LI TAPS Partners Program - Showerheads 2.1 - 2.5	510	
LI TAPS Partners Program - Kitchen Aerators	16,478	
LI TAPS Partners Program - Bathroom Aerators	3,002	
LI Prog Thermostats	156,204	
LI Weatherization program	409,374	
Total Low Income		**685,181**
TOTAL RESIDENTIAL		**12,737,196**

Gas Savings for LRAM (con't)

2009 DSM Program	Net Annual Gas Savings	
SMALL COMMERCIAL		
Air Doors (Single)	15,208	
Air Doors (Double)	23,241	
Demand Control Kitchen Ventilation (0 - 4999 CFM)	41,049	
Demand Control Kitchen Ventilation (5000 - 9999 CFM	196,411	
Demand Control Kitchen Ventilation (10000 - 15000 C	35,956	
Energy Recovery Ventilators (ERV)	209,830	
Furnace Replacements	41,536	
Heat Recovery Ventilator (HRV)	3,544	
Infrared Heaters	206,990	
Pre-Rinse Spray Nozzle	1,074,325	
Rooftop Units	136,629	
Tankless Water Heaters	4,528	
Programmable thermostats	40,225	
Total Small Commercial		**2,029,469**
LARGE COMMERCIAL		
Hotel/Motel	605,555	
Office	2,057,905	
Retail	381,609	
Warehouses	264,889	
Other Commercial	1,631,785	
Hospitals	4,526,318	
Long Term Health Care	531,088	
Government	3,158,996	
School	1,734,432	
College/University	485,098	
Total Large Commercial		**15,377,676**
MULTI RESIDENTIAL		
Multi-Residential Private	13,907,770	
Multi-Residential Non-Profit	374,632	
Multi-Residential Water Conservation		
Condo	83,868	
Rental	680,754	
Front Load washers	47,701	
Total Multi-Residential		**15,094,725**
LARGE NEW CONSTRUCTION	2,287,063	**2,287,063**
INDUSTRIAL		
Industrial	20,953,163	
Agriculture	1,377,570	
Total Industrial		**22,330,732**
TOTAL BUSINESS MARKETS		**57,119,665**
TOTAL GAS SAVINGS (Bus. Markets & Residential)		**69,856,861**

6.0 SSM and TRC Statement

The OEB Decision in the Natural Gas DSM Generic Issues Proceeding stipulated a change to the TRC target and SSM calculation for the multi-year plan period 2007 through 2009[3] . The target for 2009 was $210,406,868. The target calculation is presented in the table below.

Table 51: 2009 TRC Target

2007 TRC Target	Actual 2007 TRC results for LRAM (excluding spillover, on program by program basis and with 2009 avoided costs	Actual 2008 TRC results for LRAM (with 2009 Avoided Costs)*	2009 TRC Target
a	b	c	(a+b+c)/3*1.075%
$150,000,000	$210,228,256	$226,953,700	$210,406,868

* No PRSV Free Rider adjustment implemented

6.1 SSM & TRC for Resource Acquisition Programs

6.2.1 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 customers' incremental equipment costs. The TRC is expressed as a net amount; when benefits exceed costs, a program is cost-effective. When the SSM was first approved, the Ontario Energy Board determined that it should be based on the TRC test results.

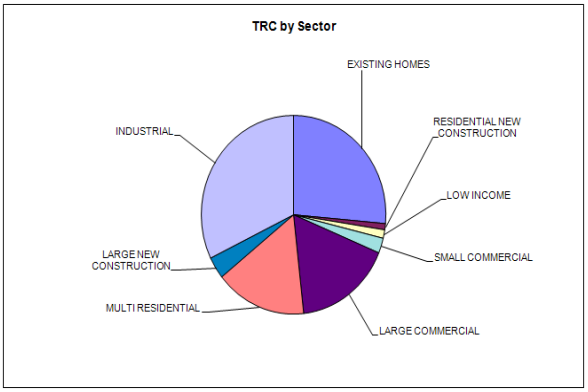
3 EB-2006-0021, Decision with Reasons, Ontario Energy Board, August, 2006, page 25

6.2.2 TRC Results

Table 52: 2009 TRC Results by Sector

	TRC	% of Total
EXISTING HOMES	$ 58,286,208	26%
RESIDENTIAL NEW CONSTRUCTION	$ 2,218,179	1%
LOW INCOME	$ 3,045,256	1%
SMALL COMMERCIAL	$ 5,413,335	2%
LARGE COMMERCIAL	$ 37,456,208	17%
MULTI RESIDENTIAL	$ 35,265,374	16%
LARGE NEW CONSTRUCTION	$ 7,906,422	4%
INDUSTRIAL	$ 70,984,411	32%
Total	**$ 220,575,394**	**100%**
Prog. Dev. & Market Research	$ (226,716)	
Overheads	$ (4,515,222)	
Net Total	**$ 215,833,455**	

Figure 13: 2009 TRC Results by Sector



6.2.3 SSM for Resource Acquisition Programs

The SSM provides for an incentive to the Company for DSM activities. The Ontario Energy Board Decision in the Natural Gas DSM Generic Issues Proceeding stipulated a change to the SSM calculation for resource acquisition programs for the multi-year plan period 2007 through 2009[4].

The SSM for 2009 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

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

- 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."[5]

- 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 2009 cap will increase based on CPI as determined at October of 2008).

The table below provides a summary of the 2009 SSM for all DSM resource acquisition programs.

Table 53: 2009 SSM Resource Acquisition Programs

2010 Actual TRC	$	215,833,455		
2010 TRC Target		210,406,868		
% of Target		% x Target	SSM payouts	SSM
25%		52,601,717	225,000	-
50%		105,203,434	675,000	-
75%		157,805,151	2,250,000	-
100%		210,406,868	4,750,000	-
125%		263,008,585	7,250,000	5,007,909

5 Ibid, page 29

6.2 SSM for Market Transformation Programs

Table 54: SSM Market Transformation Programs

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight	SSM at 100% of Target	2009 SSM
EnerGuide for Fireplaces	$ 80,000	$ 57,389	% Point increase in customer awareness of the EnerGuide label	80% in 2008, 81% in 2009	5 percentage points	35%	21%	$125,000	$ 37,500
			% point increase in the influence of the EnerGuide label on purchase decision	74% in 2008, 72% in 2009	5 percentage points	35%	0%		
			Number of stores with EnerGuide POP promotional material	97	150 Stores	15%	7%		
			Share of stores which received the EnerGuide POP material which still have it displayed at year end	82%	90%	15%	9%		

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight	SSM at 100% of Target	2009 SSM
Home Performance Contractor	$ 90,000	$ 37,761	Average Increase in frequency scores of all weatherization measures	0.3	Average increase of 0.45	60%	0%	$ 125,000	$ 36,303
			Contractor engagement (participation in workshop)	63	60 individuals from renovation & contracting	20%	21%		
			Contractor training workshop	4	8 workshops per year	20%	8%		

	Total Budget ($)	Actual ($)	Program Metrics	2009 Actual	2009 Target	Weight	Applied Weight	SSM at 100% of Target	2009 SSM
Drain Water Heat Recovery	$ 512,000	354,774	a) Builders Enrolled	24	12	10%	15%	$ 250,000	$ 282,500
			b) Units Installed	455	650	40%	28%		
			c) Builder Knowledge (Answer 2 or more of Below noted key measurements correctly) 1. Knowledge of Program Incentives 2. How the Technology works. 3. Benefit of Technology	71%	50%	15%	23%		
			d) Service Provider Promotion	100%	70%	20%	30%		
			e) Builder Training Workshops	5	3	5%	8%		
			f) Contractor / Sub Workshops	3	3	5%	5%		
			g) Trade Show Promotion	3	3	5%	5%		

Total	**$ 682,000**	**$ 449,924**	**2009 SSM Market Transformation Programs**	**$ 500,000**	**$ 356,303**

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 the program metrics.

7.0 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. All additional funding must be utilized on incremental program expenses only (i.e. cannot be used for additional utility overheads)."

Program spending was more than anticipated in 2009 with a resulting over spend of $1.17 million.

Table 55: DSMVA

	2009 Budget	2009 Actual
Residential Markets		
Variable	$ 7,526,520	$ 12,161,380
Fixed	$ 1,393,229	$ 1,353,972
Business Markets		
Variable	$ 5,510,587	$ 5,965,665
Fixed	$ 2,496,285	$ 1,152,667
Other		
Market Transformation	$ 700,000	$ 115,523
Program Development & Mkt Research	$ 720,000	$ 155,632
Overheads	$ 5,908,379	$ 4,515,222
Total DSM		
Variable	$ 13,037,107	$ 18,127,045
Fixed	$ 11,217,893	$ 7,293,016
Total DSM	$ 24,255,000	$ 25,420,061
DSMVA	$	(1,165,061)
RECOVERED IN RATES	$	24,255,000
DSM RECOVERABLE	$	1,165,061

8.0 Final 2010 TRC Target

The table below shows the TRC target for 2010. The values in the table have been developed with 2010 avoided costs and 2009 audited program results.

Table 56: 2010 TRC Target

Actual Audit 2007 TRC Results	Actual 2007 TRC results for LRAM with 2010 avoided costs	Actual Audit 2008 TRC Results	Actual 2008 TRC results for LRAM with 2010 avoided costs	Latest prepared 2009 TRC Results at Jun 16, 2010	Latest 2009 TRC results (col E) with Final 2010 avoided costs with LRAM changes	2010 Target
A	B	C	D	E	F	=(B+D+F)/3 * 1.075%
$199,798,420	$184,156,243	$182,706,679	$200,474,811	$215,833,455	$180,045,503	$202,342,433

Note:
2010 Target = [(184,156,243 + 200,474,811 + 180,045,503) / 3] x
[1 + (1.5 x 5%)]

Extension of the 3 Year DSM Framework

On April14, 2009, the Ontario Energy Board informed Enbridge that it would not be appropriate to consider developing a new multi-year DSM framework for implementation in 2010. The OEB made this decision based on the uncertainties surrounding the forthcoming Bill 150, An Act to enact the Green Energy Act, 2009, and to Build a Green Economy, to repeal the Energy Conservation Leadership Act, 2006, and the Energy Efficiency Act.

Following the Board's Directive, EGD filed an application with the OEB on June 1, 2009 seeking an order granting approval of its 2010 Natural Gas Demand Side Management ("DSM") plan. The Board assigned File No. EB-2009-0154 to this application. Following a written proceeding, EGD filed an updated DSM plan with the OEB on Aug. 12th, 2009. This DSM plan was approved by the OEB on September 30, 2009.

Appendix A: Summary Overviews of 2009 DSM Program

This section of the report provides a summary of the 2009 DSM Program results. This data is presented by program category and by technology. Separate tables are presented for custom programs and prescriptive programs.

Note: Tables 57 – 62 are based on pre-audited results suitable for illustrative purposes. The variance for pre and post audit for natural gas savings was less than 1/10th of 1%. The variance in net TRC benefits was approximately 1%.

Table 57: Summary Overview by Program Category: Custom Programs

Program Category	Sum of Net TRC Benefits	Sum of Net NG Savings	Sum of Net kWh Savings	Sum of Net Water Savings m3	Sum of Participants	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total Incentive Payments
Agriculture	2,097,502	1,379,244	79,168	-	27	12	1,522,888	145,134
Hospitals	11,357,982	4,601,591	(872,721)	14,867	21	13	1,547,110	408,741
Hotels/Motels	1,742,115	600,777	704,139	-	7	14	690,040	55,680
Industial	69,434,676	20,957,319	4,945,757	401,557	91	15	10,022,070	1,530,328
Large New Construction	7,817,965	2,259,823	4,071,691	-	21	25	5,648,692	234,104
Long Term Care	1,332,905	530,942	284,868	-	14	15	528,587	65,420
Multi - Residential Non Profit	746,021	374,632	91,456	-	11	12	356,782	51,803
Multi - Residential Private	31,549,445	13,905,099	4,498,725	-	258	13	13,118,008	1,971,528
Municipalities	6,431,650	3,125,914	2,517,036	709	81	16	5,814,339	335,844
Offices	4,342,146	2,067,193	1,301,900	-	38	13	2,806,157	259,595
Other Commercial	4,545,430	1,631,785	291,881	19,361	14	14	1,115,184	143,005
Retail	806,794	379,248	267,759	-	16	14	540,442	59,255
Schools	1,800,836	720,009	414,222	3,474	47	11	229,387	82,946
Universities	1,046,914	474,924	10,697	-	7	13	268,478	43,295
Warehouses	578,207	264,889	(26,652)	-	10	14	263,852	30,086

Table 58: Summary Overview by Program Category: Prescriptive Programs

Program Category	Sum of Net TRC Benefits	Sum of Net NG Savings	Sum of Net kWh Savings	Sum of Net Water Savings m3	Sum of Participants	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total Incentive Payments
Equipment Replacement	8,611,436	3,023,258	1,410,052	-	50,945	17	2,977,832	3,745,213
Low Income	3,021,893	991,192	946,325	26,145	18,857	12	1,129,251	1,294,555
Residential New Construction	2,218,179	2,126,653	3,029,123	-	2,199	25	9,820,624	226,000
Schools	3,646,976	975,098	-	-	63	25	551,086	109,200
Small Commercial	5,631,139	2,116,485	839,057	206,631	3,261	13	1,328,701	506,665
Multi-Residential Water Conservation	3,254,841	812,322	161,449	171,482	40,785	10	516,860	229,051
Water Conservation	47,239,806	11,060,789	18,315,282	1,886,460	762,309	11	7,896,352	6,194,257

Table 59: Summary Overview by Technology: Prescriptive Programs

Technology	Sum of Net TRC Benefits	Sum of Net NG Savings	Sum of Net kWh Savings	Sum of Net Water Savings m3	Sum of Participants	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total Incentive Payments
Aerator	1,386,820	306,141	-	69,600	28,833	10	44,103	-
Air Doors	63,391	38,448	19,471	-	40	15	75,620	15,000
Boiler	3,646,976	975,098	-	-	63	25	551,086	109,200
CFL	9,235,622	-	18,839,530	-	142,642	8	-	-
DCKV	1,063,945	273,415	737,305	-	29	15	380,000	39,000
EnergyStar	2,218,179	2,126,653	3,029,123	-	2,199	25	9,820,624	226,000
ERU	937,696	296,846	-	-	37	20	226,256	27,750
Front Load Washer	229,508	47,701	161,449	23,697	453	11	244,620	44,700
Furnace	2,230,567	1,139,479	-	-	28,635	18	1,916,411	2,952,096
Heat Recovery	7,919	3,544	-	-	5	20	5,976	750
Infrared	585,916	206,990	57,873	-	144	20	275,986	18,150
Novitherm	382,725	251,594	-	-	2,315	18	550,970	449,473
Pre-Rinse Spray Nozzle	2,557,104	1,074,325	-	206,631	1,961	5	104,204	123,130
PSTAT	7,669,008	2,144,244	1,796,971	-	24,398	15	872,545	361,230
Restaurant	(59,637)	-	-	-	-	-	-	-
Rooftop Unit	258,232	136,629	-	-	564	15	200,925	253,850
Showerhead	42,662,093	10,772,237	-	1,990,789	638,657	10	2,975,301	5,132,353
Small Commercial General	(46,028)	-	-	-	-	-	-	-
Tankless	(2,130,605)	903,080	-	-	7,083	18	5,151,556	1,578,988
Weatherization	724,840	409,374	59,565	-	361	23	824,524	973,272

CFL: Compact Fluorescent Light bulb
DCKV: Demand Control Kitchen Ventilation
PSTAT: Programmable Thermostat
Tankless: Tankless Water Heater

Table 60: Summary Overview by Technology: Custom Programs

Technology	Sum of Net TRC Benefits	Sum of Net NG Savings	Sum of Net kWh Savings	Sum of Net Water Savings m3	Sum of Participants	Average of Measure Life	Sum of Total Net Incremental costs	Sum of Total Incentive Payments
Air Cleaning/Filtration	36,953	14,376	-	-	-	15	7,840	2,778
Air Curtain	159,774	64,637	(12,439)	-	3	15	46,259	12,864
Air Handling Unit	1,012,446	509,693	1,043,645	-	2	15	1,490,554	59,835
BAS	50,534	22,289	-	-	1	15	18,128	2,617
Blowdown Heat Recovery	101,087	31,214	-	1,944	1	15	21,422	3,016
Boiler	32,808,395	16,032,533	4,138,178	2,128	241	14	20,549,314	2,178,707
Building Envelope	299,777	114,507	-	-	1	25	169,870	16,061
Burner	295,294	100,812	-	-	3	17	33,023	3,464
Combustion Control	552,291	203,433	-	-	1	15	81,556	39,610
Condensate Recovery	156,370	33,198	-	4,251	-	15	2,288	5,552
Controls	25,435,019	7,915,079	5,529,723	12,908	83	15	4,727,122	674,900
Destratification	401,257	224,945	(155,177)	-	7	15	212,451	35,513
Digester Gas Engine	347,515	124,015	80,877	-	1	15	99,262	9,985
Direct Contact Water Heater	81,782	49,945	-	-	1	10	39,135	9,438
Drain Water Heat Recovery	460,747	208,596	-	-	22	30	408,324	24,488
Dryer	521,126	190,506	13,084	-	1	15	82,210	30,000
Economizer	5,085,969	1,856,165	-	-	11	15	1,037,490	196,437
Efficient Motor/Fan/Pump	(4,253)	11,066	-	-	-	15	38,733	2,138
ERV/HRV	1,233,604	694,801	(208,467)	19,688	7	15	1,184,077	77,733
Evapourator	44,192	14,102	8,511	-	1	15	6,100	2,725
Furnace	17,919,547	5,290,729	1,655,432	-	7	18	1,603,774	229,956
Greenhouse Curtains	1,003,628	769,279	-	-	22	10	860,003	77,805
Greenhouse Double Poly	1,971	173,964	-	-	-	5	240,002	16,337
Heat Exchanger	117,852	41,772	-	692	2	15	21,284	7,940
Heat Recovery	2,601,135	799,051	44,604	39,354	7	15	433,058	85,820
Industrial Equipment	26,474,526	7,878,668	(97,690)	320,991	16	17	5,700,741	493,188
Infrared	55,826	85,825	-	-	2	10	159,870	10,188
Insulation	1,400,928	509,756	-	-	8	15	187,344	80,315
Insulation/Caulking/Sealing	4,058,126	1,037,945	1,408,012	-	4	15	503,545	122,222
Kitchen Ventilation	522,166	138,391	375,146	-	15	15	225,960	25,389
Linkageless Control	471,841	166,854	-	-	3	15	48,034	22,937
Make Up Air Unit	334,805	163,879	101,452	-	3	15	295,203	26,796
Natural Gas Meter	815,866	100,517	675,342	-	1	15	1,485	16,810
Pool Heating	20,143	5,557	48,592	382	1	15	38,213	652
Reflective Panel	2,023,290	880,101	-	-	47	15	953,392	112,437
Showerheads	58,589	10,440	-	3,474	-	10	1,242	-
Space Heating	2,534,949	1,969,610	399,508	-	38	5	557,244	217,573
Steam Trap	4,427,017	1,571,024	-	-	23	13	350,448	111,012
Thermal Oxidizer	847,004	256,471	-	17,158	1	15	175,000	24,780
VFD	10,497,460	2,791,940	3,504,838	-	41	15	1,398,390	315,134
Waste Water Reduction	306,262	85,769	-	16,998	1	15	181,802	16,574
Water	14,970	119,603	-	-	33	10	271,468	14,041
Water Heater	42,813	10,334	26,756	-	1	15	9,362	999

BAS: Building Automation System
ERV: Energy Recovery Ventilation
HRV: Heat Recovery Ventilation
VFD: Variable Frequency Drive

Table 61: NG Savings per $1 of Incremental Cost and $1 of Incentive Payments by Technology

Program Category	Sum of Net NG Savings	Sum of Total Net Incremental costs	NG Savings per $1 of Incremental Cost	Sum of Total Incentive Payments	NG Savings per $1 of Incentive Payments
Aerator	306,141	44,103	6.94		
Air Cleaning/Filtration	14,376	7,840	1.83	2,778	5.18
Air Curtain	64,637	46,259	1.40	12,864	5.02
Air Doors	38,448	75,620	0.51	15,000	2.56
Air Handling Unit	509,693	1,490,554	0.34	59,835	8.52
BAS	22,289	18,128	1.23	2,617	8.52
Blowdown Heat Recovery	31,214	21,422	1.46	3,016	10.35
Boiler	17,007,630	21,100,400	0.81	2,287,907	7.43
Building Envelope	114,507	169,870	0.67	16,061	7.13
Burner	100,812	33,023	3.05	3,464	**29.10**
CFL					
Combustion Control	203,433	81,556	2.49	39,610	5.14
Condensate Recovery	33,198	2,288	**14.51**	5,552	5.98
Controls	7,915,079	4,727,122	1.67	674,900	11.73
DCKV	273,415	380,000	0.72	39,000	7.01
Destratification	224,945	212,451	1.06	35,513	6.33
Digester Gas Engine	124,015	99,262	1.25	9,985	12.42
Direct Contact Water Heater	49,945	39,135	1.28	9,438	5.29
Drain Water Heat Recovery	208,596	408,324	0.51	24,488	8.52
Dryer	190,506	82,210	2.32	30,000	6.35
Economizer	1,856,165	1,037,490	1.79	196,437	9.45
Efficient Motor/Fan/Pump	11,066	38,733	0.29	2,138	5.18
EnergyStar	2,126,653	9,820,624	0.22	226,000	9.41
ERU	296,846	226,256	1.31	27,750	10.70
ERV/HRV	694,801	1,184,077	0.59	77,733	8.94
Evapourator	14,102	6,100	2.31	2,725	5.18
Front Load Washer	47,701	244,620	0.20	44,700	1.07
Furnace	6,430,208	3,520,185	1.83	3,182,052	2.02
Greenhouse Curtains	769,279	860,003	0.89	77,805	9.89
Greenhouse Double Poly	173,964	240,002	0.72	16,337	10.65
Heat Exchanger	41,772	21,284	1.96	7,940	5.26
Heat Recovery	802,594	439,034	1.83	86,570	9.27
Industrial Equipment	7,878,668	5,700,741	1.38	493,188	**15.97**
Infrared	292,814	435,857	0.67	28,338	10.33
Insulation	509,756	187,344	2.72	80,315	6.35
Insulation/Caulking/Sealing	1,037,945	503,545	2.06	122,222	8.49
Kitchen Ventilation	138,391	225,960	0.61	25,389	5.45
Linkageless Control	166,854	48,034	3.47	22,937	7.27
Make Up Air Unit	163,879	295,203	0.56	26,796	6.12
Natural Gas Meter	100,517	1,485	**67.69**	16,810	5.98
Novitherm	251,594	550,970	0.46	449,473	0.56
Pool Heating	5,557	38,213	**0.15**	652	8.52
Pre-Rinse Spray Nozzle	1,074,325	104,204	10.31	123,130	8.73
PSTAT	2,144,244	872,545	2.46	361,230	5.94
Reflective Panel	880,101	953,392	0.92	112,437	7.83
Restaurant	-	-		-	
Rooftop Unit	136,629	200,925	0.68	253,850	0.54
Showerhead	10,772,237	2,975,301	3.62	5,132,353	2.10
Showerheads	10,440	1,242	8.41		
Small Commercial General					
Space Heating	1,969,610	557,244	3.53	217,573	9.05
Steam Trap	1,571,024	350,448	4.48	111,012	14.15
Tankless	903,080	5,151,556	0.18	1,578,988	0.57
Thermal Oxidizer	256,471	175,000	1.47	24,780	10.35
VFD	2,791,940	1,398,390	2.00	315,134	8.86
Waste Water Reduction	85,769	181,802	0.47	16,574	5.17
Water	119,603	271,468	0.44	14,041	8.52
Water Heater	10,334	9,362	1.10	999	10.34
Weatherization	409,374	824,524	0.50	973,272	**0.42**

Table 62: NG Savings per $1 of Incremental Cost and $1 of Incentive Payments by Program

Program Category	Sum of Net NG Savings	Sum of Total Net Incremental costs	NG Savings per $1 of Incremental Cost	Sum of Total Incentive Payments	NG Savings per $1 of Incentive Payments
Agriculture	1,379,244	1,522,888	0.91	145,134	9.50
Equipment Replacement	3,023,258	2,977,832	1.02	3,745,213	0.81
Hospitals	4,601,591	1,547,110	**2.97**	408,741	11.26
Hotels/Motels	600,777	690,040	0.87	55,680	10.79
Industrial	20,957,319	10,022,070	2.09	1,530,328	**13.69**
LARGE NEW CONSTRUCTION	2,259,823	5,648,692	0.40	234,104	9.65
Long Term Care	530,942	528,587	1.00	65,420	8.12
Low Income	991,192	1,129,251	0.88	1,294,555	**0.77**
Multi - Residential Non Profit	374,632	356,782	1.05	51,803	7.23
Multi - Residential Private	13,905,099	13,118,008	1.06	1,971,528	7.05
Multi - Residential ReCommissioning	-	-		-	
Municipalities	3,125,914	5,814,339	0.54	335,844	9.31
Offices	2,067,193	2,806,157	0.74	259,595	7.96
Other Commercial	1,631,785	1,115,184	1.46	143,005	**11.41**
Residential New Construction	2,126,653	9,820,624	**0.22**	226,000	9.41
Retail	379,248	540,442	0.70	59,255	6.40
Schools	1,695,107	780,473	**2.17**	192,146	8.82
Small Commercial	2,116,485	1,328,701	1.59	506,665	4.18
Multi-Residential Water Conservation	812,322	516,860	1.57	229,051	3.55
Universities	474,924	268,478	1.77	43,295	10.97
Warehouses	264,889	263,852	1.00	30,086	8.80
Water Conservation	11,060,789	7,896,352	1.40	6,194,257	1.79

Appendix B: Approved 2009 Assumptions

Custom Resource Acquisition Technologies

Table 63: Measure Life Assumptions

March, 2009

	Commercial	Industrial	Multi-residential
Boiler Related			
Boilers – DHW	25[1]	n/a	25[1]
Boilers - Industrial Process	n/a	20	n/a
Boilers – Space Heating	25[1]	25[1]	25[1]
Combustion Tune-up	5	5	n/a
Controls	15	15	15
Steam pipe/tank insulation	n/a	15	n/a
Steam trap	13[3]	13[3]	n/a
Building Related			
Building envelope	25	25	25
Windows	25	25	25
Greenhouse curtains	na	10	na
Double Poly greenhouse	n/a	5	n/a
HVAC Related			
Dessicant cooling	15	n/a	n/a
Heat Recovery	15	15	n/a
Infra-red heaters	10	10	n/a
Make-up Air	15	15	15
Novitherm panels	15	n/a	15
Furnaces (gas-fired)	18[2]	n/a	18[2]
Re-Commissioning	**5[4]**	n/a	**5[4]**
Process Related			
Furnaces (gas-fired)	n/a	18[2]	n/a

Source:

RP-2002-0133 Settlement Proposal, Ex N1, Tab 1, Schedule 1, page 70.

Board approved in EB-2006-0021.

[1]updated in RP-2006-0001 – Source: ASHRAE

[2]new item - Source: ASHRAE updated in EB-2006-0021

[3]Source: Measure Life of Steam Traps Research Study, Enbridge Gas Distribution, November, 2007.

[4]Source: Measure Life For Retro-Commissioning And Continuous Commissioning Projects, Finn Projects, December, 2008.

Table 64: Resource Savings Assumptions

	2009 DSM Input Assumptions - Including Navigant Recommendations											
		indicates assumptions as per EB 2008-0346 Decision.										
		indicates program specific information for 2009										
		indicates measure not referenced in EB 2008-0346 but needed										
		indicates corrected value										
				Resource Savings Assumptions								
Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership		Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)		(l)
	RESIDENTIAL NEW CONSTRUCTION											
1	Tankless Water Heater	Storage Tank Water Heater	base	130	-	-	18	-	$750	2%		Savings, measure life and incremental costs as per EB 2008-0346 Decision
2a	Energy Star Home (version 3)	Home built to OBC 2006	weather	1,018	1,450	-	25	-	$4,701	5%		As approved in EB 2008-0384 and 0385.
2b	Energy Star Home (version 4)	Home built to OBC 2006 as of Jan 1, 2009	weather	881	734	-	25	-	$4,275	5%		
	RESIDENTIAL EXISTING HOMES											
3a	Enhanced Furnace (ECM only)	Mid-Efficiency Furnace	weather	-65	730	-	18	-	$550	15%		Not referenced in EB 2008-0346 Decision. Savings, measure life, incremental cost, and FR as per EB 2008-0384 and 0385. 2009 is the last year for this measure due to a change in standards.
3b	Enhanced Furnace (Furnace only) & High Efficiency Furnace	Mid-Efficiency Furnace	weather	385	-	-	18	-	$650	90%		Not referenced in EB 2008-0346 Decision. Savings, measure life, incremental cost, and FR as per EB 2008-0384 and 0385. 2009 is the last year for this measure due to a change in standards.
4	Faucet Aerator (kitchen, distributed, 1.5 GPM)	Average existing stock, 2.5 GPM	base	23	-	7,797	10	$1	-	31%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
5	Faucet Aerator (bathroom, distributed, 1.5 GPM)	Average existing stock, 2.2 GPM	base	6	-	2,004	10	$1	-	31%		Savings and measure life as per 2010 Board approved. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
6	Low-Flow Showerhead (Per unit, distributed, 1.5 GPM)	Average existing stock, 2.2 GPM	base	46	-	6,334	10	$4	-	10%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
7	Low-Flow Showerhead (Per unit, distributed, 1.25 GPM)	Average existing stock, 2.2 GPM	base	63	-	10,570	10	$4	-	10%		as above
8a	Low-Flow Showerhead (Per household, installed, 1.25 GPM replacing 2.0-2.5 GPM)	2.0 -2.5 GPM showerhead (2.25 GPM)	base	66	-	10,886	10	-	$19	10%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
8b	Low-Flow Showerhead (Per household, installed, 1.25 GPM replacing 2.6 + GPM)	2.6 + GPM showerhead (3.0 GPM)	base	116	-	17,168	10	-	$19	10%		as above
9	Pipe Insulation	Water Heater w/o pipe insulation	base	18	-	-	10	$1	$4	4%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
10	Programmable Thermostat	Standard Thermostat	weather	146	123	-	15	$50		43%		Measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
11	Tankless Water Heater	Storage Tank Water Heater	base	130	-	-	18	-	$750	2%		Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.
12	Reflector Panels	Radiant heat w/o reflector panels	weather	143	-	-	18	-	$238	0%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.

Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership	Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%	
13	Faucet Aerator (kitchen, distributed, 1.5 GPM)	Average existing stock, 2.5 GPM	base	23	-	7,797	10	$1	-	1%	Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
14	Faucet Aerator (bathroom, distributed, 1.5 GPM)	Average existing stock, 2.2 GPM	base	6	-	2,004	10	$1	-	1%	as above
15	Low-Flow Showerhead (Per unit, distributed, 1.5 GPM)	Average existing stock, 2.2 GPM	base	46	-	6,334	10	$4	-	5%	Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
16	Low-Flow Showerhead (Per unit, distributed, 1.25 GPM)	Average existing stock, 2.2 GPM	base	63	-	10,570	10	$4	-	5%	as above
17a	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.0 -2.5 GPM showerhead	base	66	-	10,886	10	-	$19	5%	Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
17b	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.6 + GPM showerhead	base	116	-	17,168	10	-	$19	5%	as above
18	Pipe Insulation	Water Heater w/o pipe insulation	base	18	-	-	10	-	$4	1%	Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
19	Programmable Thermostat	Standard Thermostat	weather	146	123	-	15	-	$69	1%	Measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.
20	Weatherization	Existing home sample	weather	1,134	165	-	23	-	$2,284	0%	Savings, measure life, and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385
	COMMERCIAL NEW BUILDING CONSTRUCTION										
21	Condensing Gas Water Heater (100 gal/day)	Storage Tank Water Heater	base	332	-	-	13	-	$2,230	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
22	Rooftop Unit	Standard Rooftop Unit	weather	255	-	-	15	-	$375	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
23	Tankless Water Heater 100 USG/day, 84% thermal efficiency	Storage Tank Water Heater 91 gal tank, 80% efficiency	base	154	-	-	18	-	-$1,102	2%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
24a	Infrared Heaters (0 - 75,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	245	-	20	-	$0.02	33%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
24b	Infrared Heaters (76,000 - 150,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	559	-	20	-	$0.02	33%	as above
24c	Infrared Heaters (>151,000 - 300,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	870	-	20	-	$0.02	33%	as above
25a	Demand Control Kitchen Ventilation (5000 CFM)	Ventilation without DCKV	weather	4,801	13,521	-	15	-	$10,000	5%	Not referenced in EB 2008-0346 Decision. Savings, measure life and incremental cost as per EB 2008-0346 Decision for Commercial Existing. FR as per EB 2008-0382 and 0385
25b	Demand Control Kitchen Ventilation (10,000 CFM)	Ventilation without DCKV	weather	11,486	30,901	-	15	-	$15,000	5%	as above
25c	Demand Control Kitchen Ventilation (15000 CFM)	Ventilation without DCKV	weather	18,924	49,102	-	15	-	$20,000	5%	as above
26	Energy Recovery Ventilators (ERV)	Ventilation without ERV	weather	1.75-4.89 / CFM	-	-	20	-	$3.00/CFM	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
27	Heat Recovery Ventilator (HRV)	Ventilation without HRV	weather	1.62-4.55 / CFM	-	-	20	-	$3.40/CFM	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
28	Condensing Boilers (90% estimated seasonal efficiency)	Non-condensing Boiler (76% estimated seasonal efficiency)	base	0.0104 m3/BTUH	-	-	25	-	$12.00/$10^3$ BTUH	5%	Not referenced in EB 2008-0346 Decision. Savings, measure life and incremental cost as per EB 2008-0346 Decision for Commercial Existing. FR as per EB 2008-0382 and 0385
29	Destratification Fans	No destratification fans	weather	0.56/ft^2	(-)0.0034/ft^2	-	15	-	$7,021	10%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
30a	Programmable Thermostats (savings vary per market segment)	Standard thermostat	weather	82-538	63-266	-	15	$110	-	20%	Not referenced in EB 2008-0346 Decision. Savings, measure life and incremental cost as per EB 2008-0346 Decision for Commercial Existing. FR as per EB 2008-0382 and 0385
31	Energy Efficient Fryers	Standard fryer	base	913		-	12	$2,648	-		Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385

Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership		Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%		
	COMMERCIAL EXISTING BUILDINGS											
32	Condensing Gas Water Heater (100 gal/day)	Storage Tank Water Heater	base	332	-	-	13	-	$2,230	5%		Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
33a	Faucet Aerator (kitchen, installed, 1.5 GPM)	Average existing stock	base	16	-	5,377	10	$2	-	10%		Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
33b	Faucet Aerator (kitchen, installed, 1.0 GPM)	Average existing stock	base	39	-	8,072	10	$2	-	10%		Not referenced in EB 2008-0346 Decision. Savings formula and measure life based on EB 2008-0346 Decision for 1.5GPM aerator adjusted for 1.0 GPM aerator. Measure life, incremental cost and FR as per EB 2008-0384 and 0385.
34a	Faucet Aerator (bathroom, installed, 1.5 GPM)	Average existing stock	base	4	-	1,382	10	$2	-	10%		Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
34b	Faucet Aerator (bathroom, installed, 1.0 GPM)	Average existing stock	base	11	-	2,371	10	$1.50	-	10%		Not referenced in EB 2008-0346 Decision. Savings formula and measure life based on EB 2008-0346 Decision for 1.5GPM aerator adjusted for 1.0 GPM aerator. Measure life, incremental cost and FR as per EB 2008-0384 and 0385.
35	High Efficiency Furnace	Mid-Efficiency Furnace	weather	5.1 per 1000 BTUH furnace capacity	-	-	18	-	$650	17.50%		Not referenced in EB 2008-0346 Decision. Savings, measure life, incremental cost and FR per EB 2008-0384 and 0385. This is the last year for this measure due to a change in furnace standards.
36	Low-Flow Showerhead (Per unit, distributed, 1.5 GPM)	Average existing stock	base	33	-	5,228	10	$4	-	10%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost to reflect utility purchase. FR as per EB 2008-0384 and 0385.
37	Low-Flow Showerhead (Per unit, distributed, 1.25 GPM)	Average existing stock	base	45	-	8,824	10	$4	-	10%		as above
38a	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.0 -2.5 GPM showerhead (2.25 GPM)	base	48	-	9,088	10	$17	-	10%		Savings and measure life as per EB 2008-0346 Decision. Incremental cost to reflect utility purchase. FR as per EB 2008-0384 and 0385.
38b	Low-Flow Showerhead (Per household, Installed, 1.25 GPM)	2.6 + GPM showerhead and above (3.0GPM)	base	84	-	14,333	10	$17	-	10%		as above
39a	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	2.0 -2.5 GPM showerhead (2.25 GPM)	base	28	-	5,197	10	$17	-	10%		Not referenced in EB 2008-0346. Savings formula and measure life based on EB 2008-0346 Decision showerhead at 1.25GPM. Incremental cost updated to reflect utility purchase and installation costs. FR as per EB 2008-0384 and 0385
39b	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	2.6 -3.0 GPM GPM showerhead (2.75 GPM)	base	55	-	9,490	10	$17	-	10%		as above
39c	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	3.1 - 3.5 GPM showerhead (3.25 GPM)	base	79	-	13,250	10	$17	-	10%		as above
39d	Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	3.6 GPM and above (3.6 GPM)	base	91	-	15,114	10	$17	-	10%		as above
40a	Low-Flow Showerhead (Per household, Installed, 2.0 GPM)	2.6 -3.0 GPM GPM showerhead (2.75 GPM)	base	4	-	1,727	10	$17	-	10%		Not referenced in EB 2008-0346 Decision. Savings formula and measure life based on EB 2008-0346 Decision showerhead at 1.25GPM. Incremental cost updated to reflect utility purchase and installation costs. FR as per EB 2008-0384 and 0385
40b	Low-Flow Showerhead (Per household, Installed, 2.0 GPM)	3.1 o 3.5 GPM (3.25 GPM)	base	28	-	5,487	10	$17	-	10%		as above
40c	Low-Flow Showerhead (Per household, Installed, 2.0 GPM)	3.6 GPM and above (3.6 GPM)	base	40	-	7,351	10	$17	-	10%		as above
41a	Pre-Rinse Spray Nozzle (1.24 GPM) (savings vary depending on market segment)	standard pre-rinse spray nozzle (3.0 GPM)	base	190-886	-	36,484 - 170,326	5	$60	-	12.4%		Savings, measure life and incremental cost as per EB 2008-0346 Decision. Free ridership adjusted as per Union Gas research with PA Consulting.

Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership	Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%	
42a	Pre-Rinse Spray Nozzle (0.64 GPM) (Full Service)	standard pre-rinse spray nozzle (3.0 GPM)	base	1,286	-	252,000	5	$88	-	0%	Not referenced in EB 2008-0346 Decision. Savings and free ridership as per Union Gas research with PA Consulting. Incremental cost as per Union Gas purchase price. Measure life as per EB 2008-0384 and 0385.
42b	Pre-Rinse Spray Nozzle (0.64 GPM) (Limited)	standard pre-rinse spray nozzle (3.0 GPM)	base	339	-	66,400	5	$88	-	0%	as above
42c	Pre-Rinse Spray Nozzle (0.64 GPM) (Other)	standard pre-rinse spray nozzle (3.0 GPM)	base	318	-	62,200	5	$88	-	0%	as above
43a	Programmable Thermostats (savings vary per market segment)	Standard thermostat	weather	82-538	63-266	-	15	$110	-	20%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
44	Rooftop Unit	Standard Rooftop Unit	weather	255	-	-	15	-	$375	5%	Not referenced in EB 2008-0346 Decision. Savings, measure life and incremental cost as per EB 2008-0346 Decision Commercial New Construction. FR as per EB 2008-0384 and 0385.
45	Tankless Water Heater 100 USG/day, 84% thermal efficiency	Storage Tank Water Heater 91 gal tank, 80% efficiency	base	154	-	-	18	-	-$1,102	2%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
46a	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%	Not referenced in EB 2008-0346 Decision. Savings, measure life and incremental cost per EB 2008-0384 and 0385. This is the last year for this measure due to a change in furnace standards.
46b	Enhanced Furnace - up to 299 mbtu/h (furnace only)	Mid-Efficiency Furnace	weather	5.1 per 1000 BTUH furnace capacity	-	-	18	-	$650	30%	as above
47	Heat Recovery Ventilator (HRV)	Ventilation without HRV	weather	1.62-4.55 / CFM	-	-	20	-	$3.40/CFM	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.
48	Energy Recovery Ventilators (ERV)	Ventilation without ERV	weather	1.84-5.14 / CFM	-	-	20	-	$3.00/CFM	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.
49	Condensing Boilers	Non-condensing Boiler (76% estimated seasonal efficiency)	base	0.0104 /Btu/hr	-	-	25	-	$12.00/ KBtu/hr	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
50a	Infrared Heaters (0 - 75,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	245	-	20	-	$0.02	33%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
50b	Infrared Heaters (76,000 - 150,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	559	-	20	-	$0.02	33%	as above
50c	Infrared Heaters (>151,000 - 300,000 BTUH)	Unit Heater	weather	0.015 /Btu/hr	870	-	20	-	$0.02	33%	as above
51a	Demand Control Kitchen Ventilation (0 - 4999 CFM)	Ventilation without DCKV	weather	4,801	13,521	-	15	-	$10,000	5%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
51b	Demand Control Kitchen Ventilation (5000 - 9999 CFM)	Ventilation without DCKV	weather	11,486	30,901	-	15	-	$15,000	5%	as above
51c	Demand Control Kitchen Ventilation (10000 - 15000 CFM)	Ventilation without DCKV	weather	18,924	49,102	-	15	-	$20,000	5%	as above
52a	Air Curtains (Single Door)		weather	667	172	-	15	-	$1,650	5%	Savings, measure life, incremental cos as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.
52b	Air Curtains (Double Door)		weather	1,529	1,023	-	15		$2,500	5%	as above
53	Destratification Fans	No destratification fans	weather	0.56/ft^2	(-)0.0034/ft^2	-	15	-	$7,021	10%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
54	CEE Qualified Energy Efficient Washers	Conventional top loading washers.	base	117	396	58,121	11	-	$600	10%	Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0382 and 0385
55a	Prescriptive School Boilers (Elementary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%	base	10,830	-	-	25	-	$8,646	12%	Savings, measure life and incremental costs as per EB 2008-0346 Decision. Free ridership as per Board Decision re: 2008 Update.
55b	Prescriptive School Boilers (Secondary)	Space Heating, Hydronic Boiler with Comb. Eff. Of 80%-82%	base	43,859	-	-	25	-	$14,470	12%	as above
56	Energy Efficient Fryers	Standard fryer	base	916	0	-	12	$2,648	-		As submitted with 2010 Assumptions.

Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership	Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%	
57a	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 300-1500 MBH 83-84% efficient	base	1,075-4,317	-	-	25	-	$3900-$5900	Enbridge: 10/12/20%	Not referenced in EB 2008-0346 Decision. FR for Small Commercial / Large Commercial / Multi-residential
57b	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 600 MBH 83-84% efficient	base	1,777	-	-	25	-	$5,800	Enbridge: 10/12/20% Union: 10/59/42%	as above
57c	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1000 MBH 83-84% efficient	base	3,136	-	-	25	-	$7,400	Enbridge: 10/12/20% Union: 10/59/42%	as above
57d	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1500 MBH 83-84% efficient	base	4,317	-	-	25	-	$5,900	Enbridge: 10/12/20% Union: 10/59/42%	as above
58a	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 300-1500 MBH 85-88% efficient	base	17,66-7,095	-	-	25	-	$4500-$7400	Enbridge: 10/12/20%	as above
58b	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 600 MBH 85-88% efficient	base	2,290	-	-	25	-	$6,000	Enbridge: 10/12/20% Union: 10/59/42%	as above
58c	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1000 MBH 85-88% efficient	base	5,155	-	-	25	-	$10,300	Enbridge: 10/12/20% Union: 10/59/42%	as above
58d	High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1500 MBH 85-88% efficient	base	7,095	-	-	25	-	$7,400	Enbridge: 10/12/20% Union: 10/59/42%	as above
59a	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 300-2000 MBH 83-84% efficient	weather	2,105-16,452	-	-	25	-	$3900-$4950	Enbridge: 10/12/20%	as above
59b	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 600 MBH 83-84% efficient	weather	3,994	-	-	25	-	$5,800	Enbridge: 10/12/20% Union: 10/59/42%	as above
59c	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1000 MBH 83-84% efficient	weather	7,310	-	-	25	-	$7,400	Enbridge: 10/12/20% Union: 10/59/42%	as above
59d	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1500 MBH 83-84% efficient	weather	11,554	-	-	25	-	$5,900	Enbridge: 10/12/20% Union: 10/59/42%	as above
59e	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 2000 MBH 83-84% efficient	weather	16,452	-	-	25	-	$4,950	Enbridge: 10/12/20% Union: 10/59/42%	as above
60a	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 300-2000 MBH 85-88% efficient	weather	3,125-24,431	-	-	25	-	$4500-$7050	Enbridge: 10/12/20%	as above
60b	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 600 MBH 85-88% efficient	weather	5,930	-	-	25	-	$6,000	Enbridge: 10/12/20% Union: 10/59/42%	as above
60c	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1000 MBH 85-88% efficient	weather	10,856	-	-	25	-	$10,300	Enbridge: 10/12/20% Union: 10/59/42%	as above
60d	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 1500 MBH 85-88% efficient	weather	17,157	-	-	25	-	$7,400	Enbridge: 10/12/20% Union: 10/59/42%	as above
60e	High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	higher efficiency boilers 2000 MBH 85-88% efficient	weather	24,431	-	-	25	-	$7,050	Enbridge: 10/12/20% Union: 10/59/42%	as above

Item	Efficient Equipment & Technologies	Base Equipment & Technologies	Load Type	Natural Gas	Electricity	Water	Equipment Life	Incremental Cost		Free Ridership		Reference
				m3	kWh	L	Years	Customer Installed	Contractor Installed	%		
	COMMERCIAL/INDUSTRIAL CUSTOM PROJECTS											
	Custom Projects			Actual	Actual	Actual	Actual	-	Actual	By sector from S.B. Report (dated Oct., 2008)		
64	Agriculture									40%		as per EB 2008-0384
65	Industrial									50%		as per EB 2008-0384
66	Commercial									12%		as per EB 2008-0384
67	Multi-Residential									20%		as per EB 2008-0384
68	New construction									26%		as per EB 2008-0384
	OTHER MEASURES									Free Ridership		
69	1. CFL (13W)	60W Incandescent	n/a	-	45	-	8	$0.00	-	24%		Not referenced in EB 2008-0346 Decision. Savings, Measure life and FR as per EB 2008-0384 and 0385.
70	2. CFL (23W)	75W Incandescent	n/a	-	49.7	-	8	$0.00	-	24%		as above
	See also attached Custom Resource Acqusition Technologies - Measure life assumptions											

THE CADMUS GROUP, INC.

Final Report

Independent Audit of 2009 DSM Program Results

Prepared for:

Marco Spinelli, DSM Research and Evaluation
Enbridge Gas Distribution

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June 28, 2010
Revised September 10, 2010 with corrected Tables 1 and 2

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 2009 DSM Annual Report. Cadmus staff reviewed calculations and assumptions, background material and supporting documentation, and internal Enbridge processes and procedures.

In general we find the 2009 Annual Report to be a significant improvement over the 2008 Annual Report, which we also audited. The 2009 report is better organized and contains much of the backup documentation that was absent in the 2008 report. We commend Enbridge on their continued improvement of the Annual Report.

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?

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 and 2008 audit (included as Appendix B).
- In-person and telephone discussions with Enbridge staff.
- Meetings with Enbridge and the EAC.
- Detailed, in-person "walkthroughs" of program participation processes and quality assurance procedures.
- Follow-on telephone discussions with Enbridge staff and report authors, as necessary.

Key Meetings and Discussions

The Cadmus team met with Enbridge staff and the EAC on January 26 and 27, 2010, 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 communicated via e-mail on a regular basis. Cadmus submitted numerous 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 C.)

Our review of Enbridge program processes, data tracking, and oversight activities identified several areas reflective of industry best practices, including recommending efficiency improvements to commercial and industrial customers that did not qualify for Enbridge incentives, but were in the customers' best interests.

On February 4 and 5, 2010, Enbridge hosted discussions between Cadmus and the commercial and industrial engineering review firms BII and Genivar to discuss the draft custom project reviews.

On April 15, 2010, Cadmus staff again met with Enbridge staff and the EAC to review the final work plan. Following that meeting, bi-weekly conference calls with Enbridge staff 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. We prioritized the review according to the total claimed savings by the program and any issues identified in past audits. We also compared the prescriptive savings with weather-adjusted savings for like measures in other jurisdictions.

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

- Showerheads
- Energy Star New Homes
- CFLs
- Thermostats
- Low Income Weatherization
- Tankless Water heaters
- Prescriptive Boilers in Schools
- Custom engineering studies
- Water realization rate extrapolation

Findings and Opinion

For the calendar year ended December 31, 2009, 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 for recording and documenting 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 2009 DSM programs of Enbridge Gas Distribution:

TRC Savings	$215,833,455
SSM Amount Recoverable (Resource Acquisition)	$5,007,909
SSM Amount Recoverable (Market Transformation)	$356,303
LRAM (Recoverable from Ratepayer)	$45,722
DSMVA Amount Recoverable	$1,165,061

Table 1, provides a summary of the draft filing and audited results.

Table 1. Adjusted TRC and LRAM Savings

	Draft Annual Report				Audit Adjusted	
Program Area	Participants	Gas Savings (m3)	DSM Fixed and Variable Costs	Net TRC Results	Adjusted Net Gas Savings (for SSM)	Adjusted Net TRC Results (for SSM)
Existing Homes	813,254	14,084,047	$10,234,502	$55,851,242	14,084,047	$58,286,208
Residential New Construction	2,199	2,126,653	$241,527	$2,218,179	2,126,653	$2,218,179
Low Income	18,857	991,192	$1,512,339	$3,021,894	991,192	$3,045,256
Total Residential	**834,310**	**17,201,892**	**$11,988,368**	**$61,091,315**	**17,201,892**	**$63,549,643**
Small Commercial	3,261	2,116,485	$681,906	$5,631,139	2,029,469	$5,413,335
Large Commercial	85	4,939,382	$662,774	$11,728,493	4,941,743	$11,751,835
MUSH	233	10,395,978	$1,232,232	$25,528,858	10,435,933	$25,704,373
Multi-Residential	41,053	15,094,725	$2,333,850	$35,265,374	15,094,725	$35,265,374
Large New Construction	21	2,287,063	$488,615	$7,906,422	2,287,063	$7,906,422
Industrial	120	22,330,732	$2,400,862	$70,984,411	22,330,732	$70,984,411
Total Business Markets	**44,773**	**57,164,364**	**$7,800,239**	**$157,044,697**	**57,119,665**	**$157,025,752**
Market Transformation Programs	0	0	$889,516	$0	-	$0
Program Development	0	0	$155,632	($155,632)	-	($155,632)
Market Research	0	0	$71,084	($71,084)	-	($71,084)
Overheads	0	0	$4,515,222	($4,515,222)	-	($4,515,222)
Total All Programs	**879,083**	**74,366,257**	**$25,420,061**	**$213,394,074**	**74,321,558**	**$215,833,455**

Table 2 presents the draft filing and the LRAM adjustments. These adjustments are based on best currently available information and are used to create the LRAM and the 2010 TRC target.

Table 2. Best Currently Available Information Adjusted Savings

	Draft Annual Report				Audit Adjusted	
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 2010 Target)
Existing Homes	813,254	14,084,047	$10,234,502	$55,851,242	10,887,952	48,988,731
Residential New Construction	2,199	2,126,653	$241,527	$2,218,179	2,126,653	$2,218,179
Low Income	18,857	991,192	$1,512,339	$3,021,894	685,181	$1,889,959
Total Residential	**834,310**	**17,201,892**	**$11,988,368**	**$61,091,315**	**13,699,786**	**$53,096,870**
Small Commercial	3,261	2,116,485	$681,906	$5,631,139	2,029,469	$5,413,335
Large Commercial	85	4,939,382	$662,774	$11,728,493	4,941,743	$11,751,835
MUSH	233	10,395,978	$1,232,232	$25,528,858	10,435,933	$25,704,373
Multi-Residential	41,053	15,094,725	$2,333,850	$35,265,374	15,094,725	$35,265,374
Large New Construction	21	2,287,063	$488,615	$7,906,422	2,287,063	$7,906,422
Industrial	120	22,330,732	$2,400,862	$70,984,411	22,330,732	$70,984,411
Total Business Markets	**44,773**	**57,164,364**	**$7,800,239**	**$157,044,697**	**57,119,665**	**$157,025,752**
Market Transformation Programs	0	0	$889,516	$0	-	$0
Program Development	0	0	$155,632	($155,632)	-	($155,632)
Market Research	0	0	$71,084	($71,084)	-	($71,084)
Overheads	0	0	$4,515,222	($4,515,222)	-	($4,515,222)
Total All Programs	**879,083**	**74,366,257**	**$25,420,061**	**$213,394,074**	**70,819,452**	**$205,380,682**

Table 3 lists specific adjustments made.

Table 3. SSM/LRAM Adjustment Detail

Adjustment	Original Value	Revised Value	SSM TRC Impact	LRAM m3 Impact	Source
CFL Installation Rate	4.0 CFLs per home	3.3 CFLs – TAPS, 3.4 CFLs – Low Income	-$1,609,809	0	TAPS Annual Report (see page 13)
Showerhead gas savings	116 m3 >2.5 gpm, 66 m3 2.1-2.5 gpm	88 m3 >2.5 gpm, 46 m3 2.1-2.5 gpm	$0	-2,161,874	SAS Showerhead study (see page 12)
Showerhead water savings	17.1 m3 >2.5 gpm, 10.89 m3 2.1-2.5 gpm	22.59 m3 >2.5 gpm, 14.33 m3 2.1-2.5 gpm	$4,068,136	0	Navigant report substantiation sheets adjusted for reduction factor (see page 12)
Residential Thermostats	146 m3 / 123 kWh	53 m3 / 54 kWh	$0	-1,340,231	Navigant report substantiation sheets (see page 13)
Infrared heaters	$2,860.56 / unit	$1,744.94 / unit	$107,635	0	Navigant report substantiation sheets (see page 13)
ERV project correction	135,593 m3	43,998 m3	-$325,438	-87,015	TRC spreadsheet correction (see page 14)
ERV cost correction	$3.4/cfm for November projects	$3.0/cfm for November projects	(embedded in ERV project correction)	0	TRC spreadsheet correction (see page 14)
Prescriptive School Boilers and Demand Controlled Kitchen Ventilation	Commercial realization rate applied	No realization rate applied	$198,858	42,316	TRC spreadsheet correction (see page 14)

Table 4 illustrates the calculation of the SSM amount.

Table 4. SSM Calculation

	Original	Adjusted for Audit
2009 Actual TRC	$213,483,107	$215,833,455
2009 TRC Target	$210,406,868	$210,406,868
Percent of Actual	101%	103%
Base Target	75%	75%
Percent over 75%	26.46%	27.58%
$ 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%	$2,646,204	$2,757,909
Total Program Related	$4,896,204	$5,007,909
Market Transformation	$375,512	$356,303
Total SSM	**$5,271,716**	**$5,364,212**
Market Transformation Detail		
Energuide	$8,750	$37,500
Home Contactor	$88,750	$36,303
Drain Water Heat Recovery	$278,012	$282,500
Total	$375,512	$356,303

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 in that:

- Gross savings were a product of participation and unit savings.
- Net savings for prescriptive measures were a function of gross savings, free-ridership, and verification survey reduction factors for deemed-savings measures.
- Net savings for custom projects were a function 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 function of savings determined by the respective study and the free-ridership rate.
    - Net savings for prescriptive school projects were calculated as the function 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 participant 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 incremental participant costs, direct program costs and costs associated with market transformation, program development and market research.

Review of DSMVA Calculations

The draft DSM Annual Report for 2009 compares budgeted 2009 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 2009 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 was based on a comparison of the methodology employed with that employed for the 2008 LRAM calculation and a reasonableness check of the distribution of monthly installations and distribution of partially effective savings, i.e. savings adjusted for the portion of the year that the measures were installed. We find the LRAM spreadsheet accurately calculates the LRAM adjustment.

Table 5: LRAM Calculation

2009 Audit Report LRAM Calculation

based on 60,011,037 FE m3 built into rates

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin (cents / m^3)	$	
Rate 1	8,153,242	6,459,826	1,693,416	~~7.01~~	~~$ 118,700~~	19.6%
Rate 6	14,235,533	11,489,960	2,745,573	~~3.77~~	~~$ 103,438~~	31.8%
Rate 110	2,191,564	1,499,067	692,497	1.54	$ 10,643	8.0%
Rate 115	1,394,632	1,032,480	362,152	0.97	$ 3,516	4.2%
Rate 135	0	18,796	(18,796)	1.39	$ (261)	-0.2%
Rate 145	1,921,623	936,892	984,731	1.92	$ 18,878	11.4%
Rate 170	4,609,385	2,441,975	2,167,410	0.60	$ 12,947	25.1%
Totals	32,505,979	23,878,994	8,626,985		~~$ 267,859~~	
Total Excluding Rate 1 and Rate 6					**$ 45,722**	

Review of 2010 Target

Cadmus reviewed the calculation of the 2010 TRC target. The determination of the 2010 TRC target relies on the LRAM adjusted TRC from the 2007, 2008 and 2009 programs. This TRC calculation reflects best available information for savings and incremental costs and reflects the Company's most recent avoided cost determination for natural gas, electricity and water. Table 5 presents the results of the calculation. We verified that the methodology employed adheres to the methodology outlined in the Ontario Energy Board's August 25, 2006 Decision with Reasons in docket EB-2006-0021.

Table 6: 2010 TRC Target

Actual 2007 TRC results for LRAM with 2010 avoided costs	Actual 2008 TRC results for LRAM with 2010 avoided costs	Latest 2009 TRC results (col E) with Final 2010 avoided costs with LRAM changes	2010 Target
A	B	C	=(A+B+C)/3 * 1.075%
$184,156,243	$200,474,811	$180,674,137	$202,567,693

TRC Inputs

Avoided Costs

Enbridge updated the avoided costs used for all programs in 2009. We reviewed the avoided cost methodology and found it to be consistent with the methodology used in the 2007 and 2008 Annual Report.

Prescriptive Savings Programs

In the residential sector we reviewed the following programs:

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

During the audit of the 2008 programs we conducted 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[1], and measure lives to be consistent with both OEB-approved assumptions and the assumptions employed in other jurisdictions.

Because of the comprehensive review conducted for the audit of the 2008 program and the acceptance of a Navigant report updating assumptions for each of the gas measures by the OEB we limited our review of savings for the audit of the 2009 program to a comparison of those used in the TRC calculations and the assumptions approved by the OEB for 2009. We found all values to be consistent with the approved values. Specific recommendations for each measure where indicated are listed below.

Showerhead

In the audit of the 2008 program we identified enhancements to the showerhead savings study that would provide more robust estimates. During 2009, Enbridge commissioned a revised study that incorporated a larger sample size, longer post-installation data, and a control group. This study addresses our concerns with the 2008 study. The 2009 showerhead savings LRAM values reflect the results of the revised study.

During a review of the TRC spreadsheet calculations Enbridge determined that an adjustment to account for the percentage of showers taken with Enbridge program showerheads was being inadvertently applied twice for water savings calculations. A reduction factor that incorporated the TAPS survey percentage of showers taken was being applied to the unit savings figure from the

[1] Enbridge calculates a reduction factor on a program specific basis based on participant surveys. The reduction factor adjusts savings for measure installation, usage and removal.

Navigant energy efficiency measure study. A review of the study indicated that Navigant had applied a 76% adjustment factor in determining the unit savings. Our audited water savings value has reversed the Navigant adjustment so that only the TAPS survey adjustment was applied.

ENERGY STAR® for New Houses

The 2008 Audit found the savings estimates for ENERGY STAR® for New Houses are comparable to those employed in other jurisdictions; however, we continue to believe the free-ridership value is unrealistic. In the 2008 Audit it was argued that the free rider rate could be 95% just as easily as 5%, given the level of incentive provided by EGD. A recent evaluation of a similar program with similar incentives in Arizona showed a free-ridership rate of 48%[2]. This may be a better estimate than either extreme. Enbridge has indicated that the program is being terminated or substantially revised based on negative TRC results under Version 4 of the ENERGY STAR® specifications.

CFL

In 2009 Enbridge added CFLs to the measures that are installed in the TAPS and Low Income TAPS programs. TRC is calculated on the assumption that 4 CFLs are distributed to each home. During 2009 Enbridge conducted a survey of TAPS participants and determined that 3.3 CFLs were received on average by participants in the TAPS program and 3.4 CFLs were received on average by participants in the TAPS Low Income program. We adjusted the TRC calculation to reflect the evaluated number of CFLs received.

Enbridge is also assuming zero incremental cost for CFLs based on a comparison of current CFL costs with the cost of incandescent bulbs required to last an equivalent lifetime. We concur with this assumption.

Thermostats

Enbridge has indicated that the reduction factor for low income thermostats declined from 66.5% in 2008 to 24.7% in 2009. The reduction is due to increased contractor installation of thermostats in 2009 as reported by the low income surveys. A survey wording change in 2009 clarified that contractors install the thermostats free of charge, resulting in a more accurate assessment.

Thermostat savings were approved by the OEB based on a draft finding by Navigant in decision EB 2008-0346. Navigant's final report filed in the same docket revised the natural gas savings from 146 m3 to 53 m3 and from 123 kWh to 54 kWh. LRAM calculations reflect the final values.

Low Income Weatherization

Low income weatherization savings per home remained constant between 2008 and 2009, however total TRC attributable to this measure increased significantly due to increased avoided costs and increased participation. Enbridge proposes to revise the annual savings estimates based on modeling of participant homes. The modeled homes in 2009 indicate a 44% increase in savings over the OEB approved deemed savings values. We recommend that an impact evaluation of the program be commissioned to verify that such an increase is warranted (recommendation 11, on p. 20). No adjustment to TRC was made.

[2] Cadmus, PowerWise Homes Program FY2009 Evaluation, conducted for Salt River Project, Pg 56. September 2009

Commercial Prescriptive Measures

In 2009 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.

Tankless Water Heaters

Commercial Tankless Water Heaters have a negative incremental cost. It is unusual that a more efficient option, in this case the tankless unit, is less expensive than the less efficient option, in this case a traditional storage water heater. The negative incremental cost is based on Navigant's comparison of a WaiWela PH28CIFS tankless water heater and installation kit at $2,080 and a Rheem G37-200 storage tank water heater at $3,182. Both the tankless and storage units are rated at 195-200 gallons per hour of 100 degree rise in water temperature. We have verified the unit operating characteristics and costs and find the comparison to be reasonable. No adjustment to TRC or LRAM was made.

Infrared Heaters

A review of the TRC spreadsheet indicated that the cost for infrared heaters was misstated due to a typographical error. We confirmed the error and adjusted the spreadsheet to reduce the cost from $0.02/kbtu/hr to the value approved by the OEB of $0.0112/kbtu/hr. This adjustment affects the TRC for both the SSM and the 2010 target.

Energy Recovery Ventilators

A review of the TRC spreadsheet indicated that the savings for one of the Energy Recovery Ventilator projects was overstated. The project's savings was adjusted from 135,593 m3 to 43,998 m3. Additionally, it was determined that the November cost calculation inadvertently used $3.4/cfm rather than the filed and approved $3.0/cfm. The costs were recalculated and updated. These adjustments affect the TRC and gas savings for both the SSM and the LRAM.

Prescriptive Boilers in Schools

The Prescriptive Boilers in Schools program was not included in the EGD draft Annual Report. The program was singled out for increased scrutiny in the 2008 Audit - together with a recommendation for further research - and is included in this Audit to indicate a continuing concern with the prescriptive criteria. The number of schools enrolled in EGD's program is documented in the draft Annual Report, as is the total number of boilers installed in the commercial offering, and we accept the aggregate findings. However, there are still some unanswered questions regarding the validity of boiler baseline assumptions. These questions affect not only the Prescriptive Boilers in Schools initiative, but all boiler replacements in the commercial portfolio.

Recently Union Gas commissioned a market study to examine current practice in boiler efficiency retrofits. The report found that current practice in boiler installation is averaging about 85 percent efficiency. This suggests that further work needs to be done in fine tuning EGD's baseline assumptions, given that some program boilers are less efficient than the current practice reported in the Union Gas study. We note that EGD's current baseline assumptions are also based on

systematic feedback from manufacturers and distributors, although the feedback appears to be anecdotal and undocumented. These contradictory findings strongly suggest the need for additional, systematic research into boiler current practice. We note that EGD in concurrence with the EAC is planning to undertake this additional research in the coming year, and commend this effort.

The TRC spreadsheet inadvertently applied the commercial realization rate to the prescriptive school boiler savings. We have adjusted the school boiler savings to 100% realization. This adjustment affects both the SSM and LRAM.

Demand Control Kitchen Ventilation

The TRC spreadsheet inadvertently applied the commercial realization rate to the prescriptive demand control kitchen ventilation savings. We have adjusted the savings to 100% realization. This adjustment affects both the SSM and LRAM.

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[3] recommended methodology for sampling.

As we did in the audit of the 2008 programs 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 2009 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.

EGD's incentive levels for their commercial and industrial programs averaged 14% of incremental cost in 2009. In general, there is an inverse relationship between free-ridership and incentive payment levels. As Enbridge's incentives are at the low end of comparable programs free-ridership is arguably higher than current estimates.

Yet, in the absence of a new study, we accept the 2007 numbers for the 2009 participant group. We note, in the disposition of 2008 recommendations (Recommendation 12), that EGD is actively pursuing a new study of free ridership directed at annual estimation of these ratios in a time frame appropriate for customer recollection of decision-making criteria. We strongly endorse this approach.

We also note that discussions with the Commercial Program manager revealed that EGD provides additional recommendations to proponents for measures and behaviors that are not eligible for incentives under current EGD programs. For example, compressed air systems efficiency improvements have been recommended, with anecdotal evidence suggesting the proponents either did not know about the opportunity or did not have the time or funding available to address the issue. We recommend that EGD consider claiming these savings, and work toward developing

[3] Summit Blue Consulting was acquired by Navigant Consulting in early 2010. The referenced studies were conducted by Summit Blue Consulting prior to the acquisition.

measurement and verification protocols and evaluation plans to substantiate the claims (see recommendation 2 on p. 18).

The issue of steam trap measure life is still an unresolved, open question. EGD is commended for developing terms of reference for an independent study of this issue.

Custom Commercial Programs

For commercial custom programs, the BII study:

- Examined 23 projects
- Reviewed the appropriate Project Application Files
- Conducted an independent review of the engineering calculations
- Resolved clarification issues with Enbridge and project staff
- Conducted on-site inspection of the selected projects (this activity was new to the 2009 sample)

Generally, the reviews focused on verification of calculation input assumptions, including operating hours, schedules, total gas usage, air flow and infiltration, weather characteristics and other assumptions based on reasonableness and current practice. Finally, the calculations themselves were checked for errors, and alternative calculations were provided as validity checks.

Cadmus engineering staff reviewed the Report, and the complete supporting files for 12 of the 23 projects. In general, we concluded that the project files contained most of the information normally employed to estimate energy savings but some still lacked details, including, for example, facility description (number of beds in a hospital, or number of dwelling units in an apartment building). These details would be important in benchmarking savings estimates, irrespective of whether the calculations themselves are correct. New construction project files contained the Enbridge New Construction Program Reports but did not contain the simulation calculations or the NRCan software input assumptions, architectural drawings and baseline vs. enhanced efficiency ratings and assumptions.

Cadmus made additional requests to EGD to resolve these issues. In some cases both the auditor and EGD agreed the additional data were deemed not critical to the audit review. In the remaining cases, the additional information was sufficient to resolve any outstanding questions.

The New Construction files do not contain the simulation input and output files, but rather contain the Program Reports, as noted above. EGD does not normally maintain these files. EGD did provide the auditor with the qualification requirements for modeling specialists for new construction and we agree that these requirements are indeed stringent. We recommend that the additional information be provided for future audits, recognizing that even with the additional information replication of the simulation runs are outside the scope of this audit.

BII made adjustments 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, including for new construction.

With the exceptions noted above, 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 few discrepancies were found.

We accept the realization rates determined by the BII study.

The commercial sample did not include any participants with water savings[4]. Consequently, Enbridge applied the industrial water savings realization rate for those commercial projects that had water savings based on recommendations from Summit Blue, the author of the sample design methodology. While this may be expedient, we are concerned that a realization rate developed for industrial processes may not be representative of a commercial application. The few commercial projects in the 2009 program with water savings minimizes the impact for 2009 and no adjustment was made to the TRC calculation, however we recommend that for future program years commercial sector specific realization rates be developed.

Custom Industrial Programs

A verification study was commissioned by Enbridge for industrial programs. The study, produced by Genivar, examined 18 industrial and 2 agricultural sites and included document reviews, site visits, verification of input assumptions, and examination of operating conditions.

Cadmus staff reviewed the draft and final Genivar reports. Cadmus discussed the draft report with Genivar staff members, and conducted a detailed review of the 6 projects included in the draft report, and a review of all the projects included in the final report. The detailed review included reviews of all the backup files and documentation used in the report summaries. Comments and suggestions were communicated to Genivar during the discussions.

The overall assessment by Cadmus senior engineering staff concluded that the analysis presented in the report was sound, well documented and appeared to conform to good engineering practice. No differences or exceptions were noted, although some of the additional detail communicated in the discussions would have enhanced the evaluation report. We note, however, that more detail was provided in the 2009 evaluation report than in the 2008 report, which substantially improved the review process.

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 together provide a reasonable review, consistent with current industry practices. We accept the realization rates determined by the Genivar study.

[4] The sampling plan does not specifically seek commercial water saving representation due to the relatively small occurrence.

Market Transformation Programs

Market Transformation metrics were established and agreed to for the current program cycle, and are applicable to the 2009 program results. The metrics still have the same underlying issues that have been noted in the 2007 and 2008 Audit reports: namely, that they are focused on program *activities* (things that the program does) rather than program *outcomes* (things that the program is supposed to accomplish). EGD in consultation with the EAC has is working to improve both the metrics and the weighting for new Market Transformation programs. This new approach is reflected in the Drain Water Heat Recovery System Market Transformation Program, as reviewed below. Notwithstanding the advances in Market Transformation metrics for new initiatives, , the underlying objective of this Audit is to assess whether the existing programs met their agreed-upon performance criteria for SSM claims.

We found a systematic calculation error resulting where EGD claimed '0' SSM accomplishments in cases where they should have claimed partial (pro-rated) accomplishments. Corrections were made in the SSM spreadsheet to reflect these additional claims.

EnerGuide for Natural Gas Fireplaces

The primary performance metric for the EnerGuide for Natural Gas Fireplaces Market Transformation Program is the presence or absence of EnerGuide Point of Purchase (POP) material on display at participating retailers. Enbridge conducted in-store audits of 129 retail establishments to ascertain whether the POP materials were on display. Overall, 82% of all stores had the material on display. These results met the program performance metric at the 50 percent level. Enbridge provided an overview of the process and results by type of retail establishment and by region within Ontario. In addition, Enbridge conducted a study of 489 purchasers of gas fireplaces. The content of the survey and the implementation method was the same as for the 2008 survey. Results showed a continued high awareness of the EnerGuide label at 81%, virtually the same at the 2008 cohort (80%). The influence of the EnerGuide label on purchase decisions was also consistent with the 2008 survey with 72% acknowledging influence (74% in 2008). The increase of 1% in customer awareness was 20% of the metric target and was the only one of approved metrics that contributed to the SSM claim.

We support the SSM claim for this program, as revised by the Audit, while noting that a 1% change in customer awareness does not appear to be a statistically significant difference.

Home Performance Contractor Market Transformation

The Home Performance Contractor Market Transformation Program seeks to increase the market penetration of weatherization activities in home renovations thorough the engagement of a range of residential market actors in training and workshops.

Workshop participants were surveyed at the beginning of the workshops about their current practice regarding weatherization measures. They were surveyed six months later to ascertain whether any their practices had changed. Survey respondents who answered both surveys reported an increase in the frequency of eight target measures implemented.

The 2008 Audit Report listed several reasons behind the recommendation not to support the SSM claim. These were:

- Lack of clarity as to how this program and these changes would affect the market (as opposed to just affecting the participants in the workshops),
- Lack of comparable baseline data from nonparticipating contractors (to ascertain what normal current practice is), and
- Lack of measures of statistical significance in the metric change

None of these issues were addressed in the Impact Evaluation Report or the Annual Report. EGD made a mid-year decision to cancel this program and, as such we cannot support the SSM claim.

Drain Water Heat Recovery System Market Transformation Program

The Drain Water Heat Recovery System Market Transformation Program is a new program initiated by Enbridge in 2009, and designed to complement the equivalent Union Gas program. Union Gas markets their program directly to builders, while Enbridge markets the Program to water heater rental service providers, who then promote the program to builders. While this technology is by no means new or experimental, knowledge of the measure is generally not widespread, and several utilities – including Black Hills Energy – include this measure in their "innovative" portfolio.

This program, the metrics and evaluation are well thought out and represent a good example of how market transformation programs can be successfully implemented and successfully evaluated. Among the strengths of this approach is a focus on true market transformation metrics (builder's behavior, nonparticipating builder knowledge, units installed) in addition to conventional program activities (outreach to providers, workshops held).

Additionally, EGD provided a draft logic model for this program, indicating to the auditor a significant advance in thinking about appropriate indicators for future market transformation programs. The short-term outcomes identified in the draft logic model are among the metrics used in calculating SSM.

It is important that questions in the survey of market actors produce unbiased results. Currently it is possible to criticize the survey as containing leading questions that bias results toward EGD preferred outcomes. We reviewed the questionnaire instrument to examine the face validity of the individual items. We note that for all of the questions the respondent is read a series of choices about the characteristics and benefits of the technology. A better design would be to ask about the technology without a prompt to ensure a non-biased answer. There is no evidence that there is actual bias in the response set, but the possibility exists that the answers were somehow compromised by the structure of the questions. We recommend that these surveys be reviewed in more depth going forward to eliminate this possibility.

Because of the balance between market transformation metrics and program activity metrics, we support the SSM claim for this program, as revised by the Audit.

Recommendations

Based upon the Audit of the 2009 programs, the Auditors make the following recommendations:

1. *EGD should collect the building simulation runs for the Commercial New Construction program.* Currently EGD documents the results of the simulation, but does not provide the inputs and interim results for review. While we feel that the results are reasonable, without the complete files the auditors cannot verify the assumptions. The auditors are not proposing to re-run the simulations.
2. *EGD should consider claiming savings for measures and operation changes recommended by staff, but not available for program incentives, if these measures are adopted and save energy.* Discussions with program staff indicated that efficiency improvements have been recommended in addition to program measures for commercial and industrial customers. These adoptions cannot be classified as "spillover", but rather they are direct effects of the program interaction with customers. While "spillover" is currently not counted, direct program effects legitimately could be. The process for claiming savings should include developing methodologies for documenting, monitoring and verification of the claims as well as independently evaluating the claims.
3. *EGD should provide the disposition of prior year recommendations as part of the draft Annual Report.* The disposition document was late and in draft form. Certainly an update would be reasonable as the Audit report is finalized, but an early disposition document would minimize surprises.
4. *EGD should begin implementing agreed-upon action items within a month of the final OEB close of proceedings*. While many of the recommendation were acted upon expeditiously, those involving commissioning of new studies lagged significantly. The effect of the lag means that results of new studies or activities may not be available until the end of 2010 or early 2011. In some cases the studies would have been useful to have for the 2009 Audit (the Steam Trap measure life review, for example).We understand that EGD staff is busy, and cannot control the regulatory process, but earlier attention to these action items agreed to would be helpful.
5. *EGD should work with their evaluators to refine the market transformation surveys of builders and market actors to eliminate "leading" questions that can bias responses*. Although we commend the approach to evaluating new market transformation programs (DWHR) and linking metrics to program logic models, care must be taken to ensure that questions and response categories lead to unbiased responses. This includes eliminating questions that steer respondents to response that EGD prefers. Since this is the first evaluation of the DWHR Program there is room for improvement.
6. *EGD should update the commercial and industrial sampling methodology if water savings becomes more prevalent*.
   The sampling methodology established in a memo from Summit Blue dated October 31, 2008 notes that water savings account for less than 1% of the TRC benefits. Consequently, sites with water savings are only evaluated if they happen to be part of the sample drawn for gas and electric savings. In the memo, Summit Blue notes that this may need to be revisited – "If TRC benefits from water savings increase substantially in the future, then this approach—that only verifies water savings if these savings happen to

occur in conjunction with sampled gas and electric savings within the joint-sample—might need to be modified".

7. *EGD should update the showerhead savings values based on the 2009 SAS study.*

   See discussion of showerhead values above.

8. *EGD should conduct a free-rider study for the ENERGY STAR® for New Houses if the program is continued.*

   See discussion of ENERGY STAR® for New Houses program above.

9. *EGD should adjust the CFL distribution rate based on the result of the participant surveys.*

   See discussion of TAPS and TAPS Low Income CFL distribution adjustment above.

10. *EGD should adopt the final Navigant thermostat savings assumptions for the 2009 LRAM and the 2010 savings estimate.*

    See discussion of thermostats above.

11. *EGD should conduct an impact evaluation of the low income program savings before adjusting the current OEB approved savings estimate.*

    See discussion of low income weatherization savings estimates above.

Appendix A: Documents Reviewed

OEB Documents

Decision in Docket EB-2006-0021 (August 2006)
DSM Handbook – EB-2006-0021 (April 2006)
Decision Phase III EB-2006-0021 - January 2007
Market Transformation Revision – February 2007
2009 Approved Assumptions EB-2008-0103
2010 Approved Assumptions – EB-2008-0346 (April 2009)
- Navigant Report
- GEC comments on Navigant Report

2008 Annual Report and Audit

2008 Audit Comments

2009 DSM Draft Annual Report

2009 Draft Annual Report Comments received from GEC

Research Studies

Custom Projects Attribution – Summit Blue

Verification Studies

Industrial project sample – Genivar
Commercial project sample – BII
C520100076 Multi-Res Rental Verification Report_Final
Drainwater Heat Recovery Program 2009 Builder Knowledge Report Final
Energuide for Natural Gas Fireplaces Program Performance Research 2009 report final
Fireplaces Awareness Research 2009 Report Final
Home Performance Contractor Market Transformation Program 2009 Final
TAPS_Low Income Yearend 2009 Final
TAPS_Year end report_2009 Final
Impact of low-flow showerheads Phase 2 – SAS

Custom Project Sampling Methodology

Appendix B: 2008 Audit Recommendations

Status Report: 2008 Audit Recommendations

Prepared for the 2009 Audit

May, 2010

DISPOSITION OF 2008 DSM AUDIT RECOMMENDATIONS

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status:

- Nov 17: OEB approved savings assumptions for 2009 & 2010 were published. The program is in flux due to the changing environment (green energy act, OBC code changes). Until program mangers decide on direction for this program, no free ridership study or process evaluation will be conducted.
- May 2010: The current version 4 of the Energy Star program generates negative TRC results and as a result will not be supported by EGD. Enbridge will honor and process all 2009 enrolments. Builders enrolled in the program have up to 2 years to build homes that meet version 3 of the energy star program. EGD will support current enrollments up to the end of 2011.
- With the program in its current state, a free ridership analysis or process evaluation is no longer warranted.

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.

Status as of May 2010:

- Addressing baseline with study to be conducted by SeeLine (an extension to a study previously completed in 2009.)
- The scope of work has been circulated.
- The purpose of this study is to develop a more accurate estimate of the market share of efficient boilers. This knowledge will help determine baseline boiler efficiency for replacement projects.
- **In process**

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.

Status as of May 2010:

- The 2008 auditor concluded that even with the implementation of this recommendation, the relative affect on TRC, SSM and LRAM would not be material.
- At present it cannot be determined if such a change would increase or decrease TRC.
- On individual custom new construction projects, it is Enbridge current practice to indicate savings and measure life for individual measures in a project, where that information is available.
- EGD does not believe the effort required to implement such a change in the program design is required at this time due to the minimal affect (+ve or -ve) on TRC, SSM or LRAM.

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- This recommendation has been accepted and continues to be a work in progress.
- MT programs (other than the DWHR program) that were active in 2009 will not have logic models developed for them as they were not continued in 2010.
- The logic model for the drain water heat recovery (DWHR) program has been developed.
- Logic models will be developed for market transformation programs as new programs are developed and implemented.
- This recommendation has been **implemented**.

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- The current OEB approved measure life for steam traps is 13 years
- EGD personnel have been engaged to develop an approach to enhance the current study.
- Terms of Reference are being prepared for a potential study
- **In process**

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.

Status as of May 2010:

The following decision rules (as recommended by Cadmus) are being considered for implementation.

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.

The rules have been distributed for comment. Target close date for this recommendation is end of May 2010.

- **In process**

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- A working committee has been formed to address this recommendation.
- The committee is composed of Peter, Walter, Judith, Rodney, Fai & Daniel
- The bidders list is complete.
- To avoid the risks associated with not knowing free ridership rates for 2010, EGD will apply 2009 free ridership rates to custom projects completed in 2010.
- Going forward, free ridership studies would be conducted each year. The free ridership rates developed in one year will be applied to custom projects in the following year.
- A study will be conducted in 2010 and the results will be applied to programs in 2011.
- EGD will discuss this approach with Cadmus. .

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- The EAC for 2010 has reviewed the evaluation priorities at the start of the year and will review them again in light of recommendations resulting from the audit of 2009 results
- This recommendation has been **implemented**

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.

Status as of May 2010:

- This recommendation has been partially implemented for new programs.
- The documentation of QA/QC procedures will be a requirement for new programs.
- Example: QA/QC procedures were documented for a potential condensing gas water heater program. Unfortunately the program did not provide positive TRC results and was not launched.
- **In process**

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- This recommendation has been **implemented**.

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.

Status as of May 2010:

- Discussed the extended research with EAC on Nov. 16th.
- No opposition to study as presented.
- Study results are included in the 2009 Annual Report.
- This recommendation has been **implemented**.

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.

Status as of May 2010:

- An evaluation of the Novitherm program is no longer required as this program is no longer supported by EGD.

20. 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.

Status as of May 2010:

- This recommendation has been **implemented**.

Appendix C: Questions and Responses

Date	Question	Response	Response Date
5/14/2020	1) Can you refresh my memory as to how the "net annual gas savings" and "net annual electric savings" columns are calculated? The values are hard coded in the spreadsheet.	"net annual gas savings" and "net annual electric savings" columns are calculated in DARTs using participant numbers, savings assumptions and reduction factors. Some reduction factors are updated quarterly. In order to have the 'correct' reduction factor in the 'actuals' tab, we had to calculate an equivalent reduction factor for programs that have quarterly surveys that provide quarterly reduction factors. The data in the chart was pulled directly from DARTs and the factors in the column named 'Reduction factor for Excel' were calculated. This allows the 'actuals' tab to calculate the correct net results. Unfortunately, that 'actuals' tab assumes one reduction factor for the year. Many of our programs have quarterly surveys that provide quarterly reduction factors. The process described above bridges the gap. This is the same process we followed last year.	5/17/2010
5/14/2020	2) Regarding EnergyStar for New Homes: the EnerQuality website indicates that version 3 technical specifications is for homes enrolled prior to March 31, 2009 and that version 4 applies thereafter. Does the 2009 Annual Report include only version 3 homes? How was the average savings employed in the report determined?	Yes, only version 3 homes are in the 2009 Annual Report. I'll upload the substantiation documents for the 2009 approved assumptions on the FTP site. Please see the attached file 'ENERGY STAR FOR NEW HOMES – sub docs for auditor/.doc' for a description of how average savings was determined.	5/17/2010, 5/18/2010

Date	Question	Response	Response Date
5/14/2020	3.) How were the number of measure installations for the TAPS program calculated? For example, the TAPS year-end report indicates that 98% of households received showerheads, 86% installed them and 4% removed them leaving 82% of the households that installed at least one. Does the number of showerheads in the TRC spreadsheet (146,802) represent the final installed number? a. Following on with this line of reasoning, if 146,802 is 82% of the total number of households, then the total number of households is 179,027. b. Assuming 179,027 is the total number of households, how was the number of CFL installations derived? The TAPS year-end report indicates that 59% of the households installed the CFLs. 59% of 179,027 is 105,625, however the TRC spreadsheet indicates that 135,236 households installed CFLs c. Again regarding the CFLs. The TAPS year-end report indicates that the average household installed 2.8 CFLs. Currently, the TRC spreadsheet assumes 4.0 CFLs per household. How do these two values relate to one another? d. Is there a spreadsheet that shows how each of the TAPS and low income measure number of installations was derived?	146,802 represents the number of participants before reduction factors are applied. Contractors provide excel files that are uploaded into the TAPS database. The records go through a 'scrubbing' process to ensure there are no duplicates or other problems with the data. A report is then provided which calculates how many of each device were delivered. It is this report that supplies us with the numbers provided on the summary sheet which feeds into DARTS/TRC. See the attached files 'DEC2009TAPS – FINAL –for auditor.xls' and 'ERIC Nov-Dec.xls' for details a) For the purpose of calculating energy savings, the number of households is tracked.For the purposes of billing, we track the number of showerheads installed and the number of households.. According to our back-up information there were a total of 146,900 households that received bag tests however only 146,802 showerheads qualified for a new showerhead. As some households receive more than one showerhead the total number of showerheads installed was 181,647. b) CFL's are counted on an individual basis as the other measures are. Not all households received CFL's for various reasons such as: the program didn't start at the beginning of the year, not all customers want CFL's etc. c) Industry standard assumes CFL's have a long shelf life. It is assumed that not all CFL's will be installed immediately upon delivery. However, it is assumed also that all CFL's handed out will be installed eventually. Enbridge has claimed saving for the delivery of 4 CLF's per participant in the TRC spreadsheet due to the assumption that all delivered CFL's will eventually be installed and result in energy savings. We understand that not all CFL's will be installed in the year they are delivered however, EGD should be TRC credited for the savings that will result regardless of the year in which the delivered CFL's start to be used. d) Yes – see attached files..	5/18/2010

Date	Question	Response	Response Date
5/14/2020	4) What is the rational for using the industrial water adjustment factor for commercial applications? It may be more appropriate to assume no adjustment or to use a average of the previous evaluation adjustments.	When applying the established sampling methodology to pull custom project files to be reviewed, the sampling methodology may pull more, less or no projects with water savings from commercial projects. When summit blue developed the sampling methodology, it was assumed projects would be pulled to establish water savings realization rates but it didn't matter if the projects were pulled from commercial or industrial projects. A side benefit of this decision is that the sampling size could be kept at a reasonable level. I believe you have the report from summit blue that recommended the sampling methodology. You may want to review the report or even call summit blue to get their perspective.	5/17/2010, 5/26/2010
5/14/2020	5) How were the average cost, gas and electric savings for the low income weatherization program calculated?	Discussed modeling tool during weekly status conference call.	5/18/2010
5/20/2010	CM.HOS.003.09 The project files had excellent usage data, incentive calculations, methodology but lacked information about the number of beds, the amount/type of insulation added to the pipe, (ASHRAE/Code), AHU specifications and associated calculations. 1. How much pipe insulation was installed (meters, feet) and what were the thermal characteristics of the pipe before and after the installation of the pipe insulation? 2. What is the HP and efficiency of the air handlers where scheduling changes to place? 3. What are the before and after operating hours? 4. What were the other control adjustments and what equipment was effected?	Files provided with responses and additional detail	5/26/2010

Date	Question	Response	Response Date
5/20/2010	CM.Multi-Priv.040.09 –The project files were fairly complete and provided details including the size of the boilers (base and enhanced capacities), boiler efficiencies; annual energy consumption, incentive calculations, E-Tools Worksheets and other project data. However, it still lacked detailed information about the window replacements and gas dryers. 1. The savings were established using the E-Tools program 2. What is the square footage of the facility and number of occupants? (this will assist in the analysis of space heating energy and water heating loads) 3. Additional measures were installed as part of larger project including windows, new domestic hot water risers, and new showerheads. The site also reported there were 5 new gas-fired dryers in the buildings laundry room. The new boiler was downsized as part of the window replacement. 4. What is the square footage and thermal characteristics of the pre and post case windows. 5. Additional information on each measure needs to be provided including a "base case" and "enhanced case" including efficiencies or other applicable data to provide a more accurate energy analysis.	Files provided with responses and additional detail	5/26/2010
5/20/2010	CM.Multi_Priv.082.09 –The project files were fairly complete and provided incentive calculations, consumption details, energy savings estimates, E-Tools Worksheets, EEM cost data and some specifics about the heat reflective materials. However, it lacked details about the space and water heating systems and details on residential building including square footage and occupancy level. 1. Need more details on residential buildings. 2. What is the occupancy level of residential apartment complex? 3. What are the operating hours and setpoints for the base and enhanced case measures? 4. Provide accurate square footage information.	Files provided with responses and additional detail	5/26/2010

Date	Question	Response	Response Date
5/20/2010	CM.MUN.044.09 –The project files were fairly complete and included incentive calculations, steam trap survey, EEM cost data but lacked information about the boilers and E-Tools Worksheets. 1. Provide more data on the building including square footage and operating hours. 2. If available, provide download steam metered data to obtain baseline consumption for the heating system or use typical EUI data to estimate the heating load based on the age of building and equipment efficiencies.	Files provided with responses and additional detail	5/26/2010

Date	Question	Response	Response Date
5/20/2010	CM.NC.001.09 –The project files were fairly complete and provided details on incentive calculations, end-use load estimates (Enbridge New Construction Program Report) and square footage data however it lacked data on building envelope (physical characteristics of building, heat load estimate), boiler types and efficiencies and additional information on the heat recovery system. Since this is a new construction project, the project files are their architectural plans, heating and cooling load estimates, baseline and enhanced efficiencies and operating conditions. 1. Need baseline building EUI for specific area. It appears the baseline was MNECM rather than ASHRAE 90.1. 2. What did the building envelope measures consists of and how will it effect energy savings? 3. What types of lighting controls were installed? 4. Need number of fixtures and operating hours of lighting control system. 5. What type of energy recovery system (ERS) was installed. 6. What is the typical savings associated with this type of ERS? 7. What types of space heating measures were installed? 8. What is the base and enhanced case efficiencies? 9. The final savings should be an interactive analysis. 10. A DOE2/eQuest or other hourly energy simulation model should be used to determine overall savings. A simulation was provided by a DAP model? However it was not sealed by professional engineer. 11. Staff reported higher actual usage (bills) than predicted energy usage (model). 12. Were heat pumps used in the analysis and does this effect fuel switching issues?	Files provided with responses and additional detail	5/26/2010

Date	Question	Response	Response Date
5/20/2010	CM.NC.004.09 –The project files provided details on incentive calculations, end-use load estimates (Enbridge New Construction Program Report), square footage data however it lacked data on building envelope including physical characteristics of building, HVAC base and enhanced case efficiencies and additional information on the heat recovery system. Since this is a new construction project, are there architectural plans, heating and cooling load estimates, baseline versus enhanced case efficiency ratings and operating conditions? 1. Need baseline building EUI for specific area (as approved by LEED, ASHRAE or other resources). 2. What is square footage of facility? 3. What did the building envelope measures consists of? 4. How would they affect energy savings? 5. What type of heat recovery system (HRS) was installed? 6. What are the typical savings associated with this type of HRS? 7. What types of high efficiency heating measures were installed? 8. What is the base and enhanced case efficiencies? 9. The final savings should be an interactive analysis. 10. A DOE2/eQuest or other hourly energy simulation model should be used to determine overall savings.	Files provided with responses and additional detail	5/26/2010

Date	Question	Response	Response Date
5/20/2010	CM.NC.006.09 –This project files provided details on incentive calculations, end-use load estimates (Enbridge New Construction Program Report), square footage data and details about the facility. Since this is a new construction project, are there architectural plans, heating and cooling load estimates, baseline and enhanced case efficiencies and operating conditions? 1. Need baseline building EUI for specific area (as approved by LEED, ASHRAE or other resources). 2. What did the building envelope measures consists of? 3. How with this affect energy savings? 4. What type of lighting measure was installed? 5. Need number of fixtures, operating hours, base and enhanced case wattages. 6. What type of heat recovery system (HRS) was installed? 7. What is the typical savings associated with this type of HRS? 8. What type of central heating plant efficiency measures were installed? 9. What are the base and enhanced case efficiencies? 10. What type of central cooling plant efficiency measures were installed? 11. What is the base and enhanced case efficiencies? 12. The final savings should be an interactive analysis. 13. A DOE2/eQuest or other hourly energy simulation model should be used to determine overall savings.	Files provided with responses and additional detail	5/26/2010
5/20/2010	1) The approved savings and incremental costs for Energy Recovery Ventilators, Furnace Replacements, Heat Recovery Ventilators and Infrared Heaters is based on the installed size of the unit, i.e. the approved savings and costs are on a Btu/hr or CFM basis. The TRC spreadsheet "Actuals" tab point to the "DPA - SC Custom (linked)" which has hard coded total values entered per project. Is there a backup spreadsheet that has the project detail that supports the hard coded totals?	There were 4 customers in the program in 2009. The savings for each customer was calculated by using the OEB approved savings per CFM and multiplying this factor by the CFM rating of the units installed. 2009 HRV calculations are found in the attached pdf file.	5/21/2010

Date	Question	Response	Response Date
5/20/2010	2) How were restaurants categorized into the three pre-rinse spray nozzle categories? Is there a backup spreadsheet that illustrates this?	Customers fill in a spray'n save program flyer (example in pdf file) or a tracking sheet is filled out by the customer or our partners. Data from the flyer and tracking sheet is used to categorize restaurants. The tracking spreadsheet can be provided if required	5/21/2010
5/20/2010	3) How were commercial programmable thermostats assigned to market segments? Is there a backup spreadsheet that illustrates this?	Customers filled in the back of a Programmable Thermostat Program flyer. The 1st section of the form on the back of the flyer asks the customer what business sector they are in. The tracking spread sheet can be provided if required	5/21/2010
5/21/2010	1) The TRC spreadsheet assumes 4 CFLs per household. The "Regular TAPS Partners Program Follow-up Study 2009 Year End" indicates that only 3.3 CFLs were distributed per household. I am proposing that we use 3.3 as the verified number. What are your thoughts?	Discussed during weekly status update conference calls and agreed to by EGD	n/a
5/21/2010	2) There is an inconsistency in the "Regular TAPS Partners Program Follow-up Study 2009 Year End" report. Slide 21 states that 1% of households removed their CFLs. Slide 22 indicates that 2% removed their CFLs. Can you confirm which is the correct figure?	Slide 21 states that 1% (33/2572) of households that were given CFLs as per contractor records removed one or more. Slide 22 states that 2% (33/1524) of households that installed CFLs removed one or more. If we want to determine a net install rate (based on all households that were given CFLs as per contractor records) after removal, then you should reduce your installation rate by 1%.	5/28/2010
5/21/2010	3) I'm also proposing we that we use 3.4 CFLs per home as the verified number for the low income TAPS program based on that year end report.	Discussed during weekly status update conference calls and agreed to by EGD	n/a

Date	Question	Response	Response Date
5/21/2010	4) Regarding extrapolation of the industrial water savings factor to the commercial sector, my interpretation of the Summit Blue sampling design is that commercial and industrial sectors are evaluated separately. Can you point me to the section that suggests a factor from one sector may be extrapolated to another or point me to an audited historical spreadsheet in which that was done? (In general, sampling design starts with the assumption that the characteristics of the population as a whole are represented by the sampled projects. This allows the extrapolation from the sample to the whole population. There are, of course, distinct differences between the commercial and industrial sectors such that it is less likely that a sample drawn from one sector would be representative of the population of the other sector.)	Please see the e-mail trail below between EGD and Navigant Consulting (formerly Summit Blue)EGD asked Navigant, "If there are no commercial water savings in this sample and in the Wave 1 sample, do the water results for the industrial sector apply to the commercial sector?" Navigant replied, "As for the water projects, I selected 5 water projects from the total population of water projects and none of the four commercial projects were selected. The results for this sample would be applied to all water projects, yes." With this information we are now in a position of who's opinion (Cadmus, GEC, EGD or Navigant) is more valid? I recommend the opinion of Navigant. They are unbiased. The sampling methodology and Summit Blue were approved by Enbridge and the EAC. If we only apply water realization rates to Industrial projects, we will have no realization rate to apply to commercial projects?	5/26/2010
5/21/2010	1) The 504 HRV project calculates to 10.276 m3/CFM which is outside the range of approved values. Can you tell me why?	The Market Development 2009 HRV Tracking Spreadsheet indicated incorrect calculated savings values. The savings values were corrected for the 2009 SSM Spreadsheet.	5/26/2010
5/21/2010	2) For ERV the 255 and 17 projects also calculate to m3/CFM greater than the range in the approved values. It is my understanding that the approved values are merely representative based on some generic assumptions. Please confirm and provide the calculations for these projects	The Market Development 2009 ERV Tracking Spreadsheet indicated incorrect calculated savings values. The savings values were corrected for the 2009 SSM Spreadsheet.	5/26/2010
5/21/2010	3) The total of the HRV savings in the attachment is 6,137 which is greater than the amount of 3,730 entered in the TRC spreadsheet. Do you know why?	The Market Development 2009 HRV Tracking Spreadsheet indicated incorrect calculated savings values. The savings values were corrected for the 2009 SSM Spreadsheet.	5/26/2010
5/21/2010	4) Similarly, the total of the ERV savings in the attachment is 315,338 which is greater than the amount of 312,469 entered in the TRC spreadsheet.	[response in 2 above]	5/26/2010
5/21/2010	5) I did not see an explanation of the calculation for infrared heaters.	Please find attached the Market Development 2009 tracking spreadsheet for infrared participants. I have checked to see if they were calculated correctly.	5/26/2010

Date	Question	Response	Response Date
5/21/2010	6) For completeness, if there is a summary spreadsheet for the pre-rinse spray nozzles and thermostats that shows the categorization please send it.		5/26/2010
5/24/1010	Regarding the avoided costs. 1) Natural gas avoided costs increased approximately 15% over the 2008 forecast. 2) Water prices increased approximately 70% over the 2008 forecast. Do you know the underlying reasons these increased? Are these avoided costs filed and approved by the OEB?	The 2009 avoided costs were calculated in the fall of 2008. The full impact of declining gas prices was not seen until the avoided costs for 2010 were calculated. The 2010 avoided costs for gas will show a decline compared to 2009. Water savings for 2008 for the city of Toronto were calculated at less than what they should have been. Our contact at The City of Toronto gave use water rates for only one 'block'. When the water rates for all 'blocks' were taken into account the water rate (avoided cost for water) increased. Avoided costs are not filed or approved by the OEB. However, the process by which avoided costs are calculated was approved in the EG-2006-0021 decision. Detailed calculations for the 2009 avoided costs are available if you wish to review them.	5/28/2010
5/26/2010	1) Regarding the thermostat reduction factor decrease from 66.5% in 2008 to 24.7% in 2009: I do not see any verification studies for thermostats. Your response indicates that we should have a study. Can you point me to the correct one for both 2008 and 2009 (or provide them if I do not already have them)?	I've uploaded to the FTP site the TAPs Low Income studies and a spreadsheet that calculates reduction factors. If you look at the spreadsheet you will see the following: • YTD 12 Month m3 results before reductions = 571, 222 • YTD Final 12 Month m3 results = 431,741 • A reduction factor can be calculated as follows: (571,222 – 431,741) / 571,222 = 24.4% • This number in not a perfect match to the 24.7% found in the TRC spreadsheet.	6/2/2010

Date	Question	Response	Response Date
5/26/2010	2) Regarding commercial tankless water heaters: I could not find any details for the 2008 incremental cost, however the incremental cost detail for the 2009 filing indicates that a commercial business may require 2-3 tankless systems to replace a single storage tank however the incremental cost compares a single system to a single tank. It seems more reasonable to assume 2 tankless systems to replace a single storage tank per the language in the backup. This would increase the incremental cost to $510 from the current -$1,570. Can you verify that a single tankless system is capable of replacing a storage tank?	• Please refer to the following report: Measures and Assumptions for Demand Side Management (DSM) Planning, presented to the OEB on April 16, 2009 by Navigant Consulting. • On page C-228 and C-229 of this report you will find the backup to our incremental cost of -ve $1,102. • In this document 3 scenarios are presented. Scenario A is the only scenario our DSM program supports. The incremental cost of -$1,102 = $2,080 (cost of 1 WaiWela PH28CIFS Tankless Water Heater) - $3,182 (cost of 1 Rheem G37-200 storage tank water heater). • The table of assumptions in the draft annual report notes an incremental cost of -$1,102 for base equipment described as a 91 gal tank. This is a typo. It should note a 37 gallon tank	6/2/2010
5/26/2010	3) Were the Energuide for Home Contractor Performance market transformation metrics those in Decision EB-2009-0103? That decision indicates that 5 workshops would result in a 50% score for the first metric. Consequently, the 4 workshops actual held would result in a score for that metric of 4/5 of 50%. Is that the correct interpretation?	Revised market transformation spreadsheet provided by EGD	6/1/2010
5/26/2010	4) Regarding industrial incremental costs. The Genivar report notes that the project files contain manufacturer's quotations or billings, which justify the incurred cost of the project. Can you verify tell me how the incremental cost reported in column "Y" (unit incremental cost) is derived from the manufacturer's quotations or billings? Specifically, is the total of the manufacturer's quotations or billings used or is some adjustment made to distinguish incremental cost from total cost?	The incremental cost of an energy savings measure is that portion of the cost specifically related to the measure. Project invoices are selectively apportioned to reflect only the incremental cost of the measure. This process is done on a best effort basis by the ESC. The following general rules are applied by our energy saving consultants: • If a project has no base case, then the incremental cost = total cost (based on selectively apportioned project invoices and billings) • If there is a base-case, then incremental cost = total cost(based on selectively apportioned project invoices and billings) – base case cost.	6/15/2010
5/27/2010	CFL Program Costs: the CFL lines in the TRC spreadsheet have no costs associated with them. Can you tell me where their program related costs (purchasing, delivery, etc) are located?	There are no incremental costs for CFLs. The direct costs are included at the program level; RE2R38S for regular CFLs and RE.LIHP.SH for low income CFLs.	5/28/2010

Date	Question	Response	Response Date
6/9/2010	Marco, I'm puzzled by the thermostat savings. The Navigant report shows 53 m3 and 54 kWh "MEASURES AND ASSUMPTIONS FOR DEMAND SIDE MANAGEMENT (DSM) PLANNING APPENDIX C: SUBSTANTIATION SHEETS", APRIL 16, 2009, page 43 and page 90 (low income). The substantiation sheet for the 2009 approved values references a draft version of the same report with 146 m3 and 123 kWh savings. Can you tell me why the final version of these values was not approved by the board? I see that we used the final version in the LRAM TRC calculations for the 2008 audit.	In EB-2009-0103, the OEB made the following decision: "Enbridge Gas Distribution Inc. is granted approval to use the Board approved Navigant 2010 input assumptions, with the revisions noted in Appendix B of Enbridge Gas Distribution Inc.'s reply submission." I think what happened is that when the considered the timing of the proceeding within the 2009 year, it was decided that it would be appropriate to agree to the assumption in Appendix B for 2009 and move to updated assumption in 2010.	6/15/2010
6/10/2010	Marco, I'm trying to compare the 2009 and 2008 low income thermostat reduction factors (see attached spreadsheets). The 2008 thermostat had a 61% not installed factor and a 14% survey reduction factor. The 2009 thermostat had a not installed rate of 30%, 30%, 35%, 7% by quarter and a survey reduction factor of 0%, 0%, 4%, 4% by quarter. This is a significant shift between 2008 and 2009. Was there a change in the TAPS Low Income program design that caused the contractors to install thermostats at twice the rate in 2009 compared to 2008?	We updated a survey question relating to the thermostats in 2009. In the past the question asked about whether the contractor offered to sell the customer a thermostat. In the low income TAPS program, the thermostats are installed for free so the question was updated to ask whether the contractor offered to install the free thermostat. This change in survey question affected the not installed factor. The removal rate (or reduction factor) changed from 2008 to 2009 as a result of different survey results between 2008 and 2009. In 2008 very few respondents answered the question. Approximately 1 in 7 (14%) of a small number of respondents answered the question. Better response rates in 2009 gave us a more accurate removal rates. From another perspective…. It is unlikely anyone would have removed a programmable thermostat once it was installed. The low removal rates found in 2009 seem to intuitively make more sense than the 1 in 7 removal rate used in 2008.	

Date	Question	Response	Response Date
6/11/2010	The files you attached show gas savings of 146 m3 and electric savings of 182 kWh. The 2009 DSM Input Assumptions approved by the board have 146 m3 for gas, but 123 kWh for electricity. Can you tell me why there is a difference? Also, the final Navigant report has 53 m3 for gas and 54 kWh for electricity. If I understand your filing you argue that they are double counting behavior impacts, i.e. the billing analysis that determined a 6% average savings fully incorporates the behavior impacts so Navigant's final report errs in that it provides a separate weighting for behavior. Are you arguing that the values should be 146 and 123 (182) for 2010 as well or should I be using the final Navigant report values for LRAM as best available information?	Navigant calculated electricity savings as follows: "assuming an average home has both space cooking using CAC and force air heating, the total electricity savings = 138 kWh/year + 44 kWh/year = 182 kWh/year." (see Feb. 2009 Navigant Assumptions Draft: Page B52). Enbridge calculated electricity savings as follows: Summit Blue reports a penetration rate of 57% for CAC across the province based on information from EGD and NRCan. Using 57% penetration the electricity savings are (44 + (138*.57) = 122.7kWh. (see EGD Appendix: Page 25 of 119, EB-2009-0103) Enbridge, applied the penetration rate of central air conditioners to the electricity savings estimate. Navigant assumed the average home has central air conditioning. Enbridge adopted a more conservative savings estimate. For 2010 EGD is using 53 m3 for gas and 54 kWh. For best available information for 2009 LRAM we recommend 53 m3 for gas and 54 kWh for electricity.	6/15/2010
6/11/2010	Marco, I have verified that the draft Navigant report uses $0.0122/kBtu/hr for installed cost of infrared heaters and that the cost included in the TRC spreadsheet is based on $.02/kBtu/hr. Do you plan to have updated TRC costs based on $0.0122 for the LRAM calculation. I don't see where those costs are calculated in either the attached spreadsheet or the TRC spreadsheet so that I may update them directly.	Good catch. We have changed the assumption from $0.02 to $0.0122 in our TRC calculation and $0.0122 should be used for LRAM purposes. It appears the change to TRC is around $25k.	6/15/2010

Date	Question	Response	Response Date
6/14/2010	Marco, while attempting to update the TRC spreadsheet for the changes you sent today I found that many of the totals that are pulled forward to the "Actuals" tab from the detail spreadsheet(s) are hard coded in the detail spreadsheet(s). Consequently, updating the cells as noted by Sharon does not flow through to the "Actuals" tab. Can you tell me the correct total for incentives for the ERV measure? The TRC spreadsheet shows $27,750, however the sum of the projects in the "DPA-SC Custom (linked)" tab is $28,000. It would be useful to have a version of the TRC spreadsheet with working formulas in the detail tabs to assure that all changes have been accurately reflected if one is available.	The source worksheets are hard coded because they come from a DARTS report. DARTS does the calculations and produces a report with values only. We take these values and input them into the "actuals" worksheet in order to show the calculations. For ERV, the incentive amount of $27,750 is correct. This is the value that has come through our EFS (Financial Tracking system). All programs that are input as "custom" in DARTS will have incentive amounts at the project level that will often not add up to what went through EFS for the year. This is due to payments being made in the next year, or carried over from the previous year. We record and show the incentive payment per project for cost per m3 or cost per participant/device analysis.	6/15/2010

ENBRIDGE GAS DISTRIBUTION

2009 DSM EAC AUDIT SUMMARY REPORT

SEPTEMBER, 2010

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ENBRIDGE GAS DISTRIBUTION'S 2009 DSM EAC
AUDIT SUMMARY REPORT

1. INTRODUCTION

In accordance with Ontario Energy Board (the Board) requirements, an independent audit was conducted of the Enbridge 2009 DSM program results as reported in the Company's 2009 DSM Draft Annual Report. This document provides a summary of:

- the process followed to audit the 2009 DSM Draft Annual Report;
- Enbridge Gas Distribution Inc.'s responses to the Auditor's recommendations;
- discussion with the Evaluation and Audit Committee (EAC);
- issues raised by the Evaluation and Audit Committee (EAC);
- the impacts of Audit results on the 2009 DSM savings, associated Shared Savings (SSM), Lost Revenue Adjustment (LRAM) claims; and
- calculation of the 2010 TRC Target.

The EAC has endorsed the 2009 Audit and Enbridge's post-audit SSM claim as presented in this report.

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 in the following sections:

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

1. Introduction
2. Audit Process
3. TRC Results and SSM Calculations
4. LRAM
5. 2010 TRC Target

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

The auditor made 11 recommendations and Enbridge agreed to all of them.

2.0 AUDIT PROCESS

2.1 SELECTION OF 2009 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 2009 EAC representatives are:

- Ian Mondrow – Industrial Gas Users Association (IGUA)
- Chris Neme – Green Energy Coalition (GEC)
- Norman Rubin – Energy Probe
- Judith Ramsay – Enbridge Gas Distribution

2.2 TERMS OF REFERENCE AND SELECTION OF AUDITOR

The EAC participated in development of the Auditor Terms of Reference and the review of proponents' proposals. A recommendation to select The Cadmus Group Inc. (Cadmus) as the auditor of the 2009 Draft Annual Report was made by the EAC and accepted by the Company. In making this recommendation, the EAC balanced concerns regarding repeated audit engagements against the benefits of familiarity that re-engaging a previous auditor provide. As CADMUS had done only one preceding audit, the EAC concluded that, in this instance, the benefits outweighed the concerns.

The 2009 Audit Terms of Reference described the overall objective of the audit as well as required tasks and deliverables; 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 WORK PLAN

The Draft 2009 Annual Report was circulated to the 2009 EAC, Cadmus and the Consultative on April 29, 2010. It was requested that comments be provided within the 21 days following April 29th.

GEC was the only organization to submit comments on the 2009 Draft Annual Report. Following a meeting with the EAC on April 15, 2010, and the gathering of issues which the EAC requested the auditor to investigate, and informed by their work auditing Enbridge's 2008 DSM Annual Report, the auditor submitted a Final Work Plan on April 16, 2010. 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 2009 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 2009 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 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. (A list of documents reviewed is included in Appendix A.)
- Review and verification of EAC recommendations and Enbridge responses from the 2007 and 2008 audit (included as Appendix B).
- In-person and telephone discussions with Enbridge staff.
- Meetings with Enbridge and the EAC.
- Detailed, in-person "walkthroughs" of program participation processes and quality assurance procedures.
- Follow-up telephone discussions with Enbridge staff and report authors, as necessary.

2.6 2009 AUDIT REPORTS

A first draft of the Cadmus 2009 Audit Report was circulated to the EAC on May 28, 2010. Following meetings with EAC and Company personnel on June 2 and June 3, a second Draft Report was circulated to the EAC on June 17, 2010. Following EAC meetings on June 23 and June 24, the Final Audit Report was published and circulated on June 29 and filed with the Board pursuant to the Regulatory Reporting Requirements on June 30, 2009.

2.7 2009 RECOMMENDED TRC, SSM, LRAM AND DSMVA

Table 1: TRC, SSM, LRAM and DSMVA Recommendations

	2009 Draft DSM Annual Report	Final Audit Report	Post Audit Results
TRC Savings	$213,394,074	$215,833,455	$215,833,455
SSM Amount Recoverable (Resource Acquisition)	$4,891,973	$5,007,909	$5,007,909
SSM Amount Recoverable (Market Transformation)	$375,512	$356,303	$356,303
LRAM (Owing to Ratepayers)	N/A	$45,722	$45,722
DSMVA Amount Recoverable from Ratepayers	$1,165,061	$1,165,061	$1,165,061

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:

Table 2: SSM/LRAM Adjustment Detail
Note: In Source column, page numbers refer to page numbers of Final 2009 DSM Audit Report.

Adjustment	Original Value	Revised Value	SSM TRC Impact	LRAM m3 Impact	Source
CFL Installation Rate	4.0 CFLs per home	3.3 CFLs – TAPS, 3.4 CFLs – Low Income	-$1,609,809	0	TAPS Annual Report (see page 13)
Showerhead gas savings	116 m3 >2.5 gpm, 66 m3 2.1-2.5 gpm	88 m3 >2.5 gpm, 46 m3 2.1-2.5 gpm	$0	-2,161,874	SAS Showerhead study (see page 12)
Showerhead water savings	17.1 m3 >2.5 gpm, 10.89 m3 2.1-2.5 gpm	22.59 m3 >2.5 gpm, 14.33 m3 2.1-2.5 gpm	$4,068,136	0	Navigant report substantiation sheets adjusted for reduction factor (see page 12)
Residential Thermostats	146 m3 / 123 kWh	53 m3 / 54 kWh	$0	-1,340,231	Navigant report substantiation sheets (see page 13)
Infrared heaters	$2,860.56 / unit	$1,744.94 / unit	$107,635	0	Navigant report substantiation sheets (see page 13)
ERV project correction	135,593 m3	43,998 m3	-$325,438	-87,015	TRC spreadsheet correction (see page 14)
ERV cost correction	$3.4/cfm for November projects	$3.0/cfm for November projects	(embedded in ERV project correction)	0	TRC spreadsheet correction (see page 14)
Prescriptive School Boilers and Demand Controlled Kitchen Ventilation	Commercial realization rate applied	No realization rate applied	$198,858	42,316	TRC spreadsheet correction (see page 14)

In addition, during discussions with the EAC in preparation of this report, the Company agreed to an adjustment in the free ridership rate for the Energy Star New Homes program that will have an impact on the LRAM m3. The adjustment changed the free ridership from 5% to 48% with a reduction in LRAM volumes of 962,590m3.

3. TRC RESULTS AND SSM CALCULATIONS

3.1 AUDITOR RECOMMENDATIONS

The auditor made the following recommendations that may affect SSM and LRAM for application in the current year and/or future years:

1. Custom Commercial Programs, p. 16 of Final Audit Report

"EGD should collect the building simulation runs for the Commercial New Construction program. Currently EGD documents the results of the simulation, but does not provide the inputs and interim results for review. While we feel that the results are reasonable, without the complete files the auditors cannot verify the assumptions. The auditors are not proposing to re-run the simulations."

Enbridge Response:
Enbridge is in agreement with this recommendation and will begin to collect simulation runs by the end of 3Q 2010. The files collected will provide a summary of as built and as assumed for baseline conditions.

EAC Response:
The EAC endorses this response.

2. Customs Savings Programs, p. 15 of Final Audit Report

"*EGD should consider claiming savings for measures and operation changes recommended by staff, but not available for program incentives, if these measures are adopted and save energy.* Discussions with program staff indicated that efficiency improvements have been recommended in addition to program measures for commercial and industrial customers. These adoptions cannot be classified as "spillover", but rather they are direct effects of the program interaction with customers. While "spillover" is currently not counted, direct program effects legitimately could be. The process for claiming savings should include developing methodologies for documenting, monitoring and verification of the claims as well as independently evaluating the claims."

Enbridge Response:

Enbridge intends to study this recommendation further. A trial program may be implemented in 2011 in order to provide an opportunity for issues and topics of discussion such as, but not limited to, the following to be discussed and reviewed between the EAC and Enbridge.

- What are the appropriate free ridership rates to be applied to these measures?
- How can the Company best motivate customers to adopt more energy savings measures in the absence of approved incentives or savings metrics specific to these measures?
- Is a scorecard approach appropriate for such a program?
- What is the appropriate evaluation, measurement and validation (EM&V) requirements for these measures or programs? EGD will work with the EAC to define the appropriate EM&V requirements.

EAC Response:

The DSM Auditor recommended that EGD consider claiming savings for measures and operational changes recommended by EGD staff, but not available for program incentives.

The issue of whether such savings are appropriate to be claimed is one that must go to the broader Consultative for consideration, and ultimately must be ruled on by the OEB. Until this happens there should not be any program initiated or any savings said to result from such a program included in EGD's SSM or LRAM claims.

It would be appropriate for EGD to "consider" the matter, which is what the auditor recommended. If EGD wishes to provide a proposal for consideration by the EAC and, ultimately, the OEB, it would be perfectly reasonable for EGD to take steps to gather some empirical evidence to support such a proposal, and perhaps even consult with the EAC on how such a program could best work and be evaluated. The EAC would support such steps expressly in the interests of

providing the best information for consideration of a program proposal, and not with any implicit acceptance or approval for such a program proposal.

3. Recommendations, p.20 of Final Audit Report
"EGD should provide the disposition of prior year recommendations as part of the draft Annual Report. The disposition document was late and in draft form. Certainly an update would be reasonable as the Audit report is finalized, but an early disposition document would minimize surprises."

Enbridge Response:
Enbridge is in agreement with this recommendation. The 2010 DSM Draft Annual Report will have a summary disposition of prior year Auditor and EAC recommendations.

EAC Response:
The EAC endorses this response.

4. Recommendations, p.20 of Final Audit Report

"EGD should begin implementing agreed-upon action items within a month of the final OEB close of proceedings. While many of the recommendation were acted upon expeditiously, those involving commissioning of new studies lagged significantly. The effect of the lag means that results of new studies or activities may not be available until the end of 2010 or early 2011. In some cases the studies would have been useful to have for the 2009 Audit (the Steam Trap measure life review, for example).We understand that EGD staff is busy, and cannot control the regulatory process, but earlier attention to these action items agreed to would be helpful."

Enbridge Response:

Of the 20 recommendations made by the auditor as part of the 2008 DSM audit, as of May 2010, 5 were still in process, 12 had been implemented and 3 were no longer warranted. 15 of the 20 had been addressed and closed.

Enbridge is in agreement with this recommendation and will begin to implement agreed upon action items within a month of the final OEB approval to clear the accounts for the 2009 DSM Program year.

EAC Response:

The EAC endorses Enbridge's response.

5. Drain Water Heat Recovery System Market Transformation Program (DWHR), p. 19 of Final Audit Report

"EGD should work with their evaluators to refine the market transformation surveys of builders and market actors to eliminate "leading" questions that can bias responses. Although we commend the approach to evaluating new market transformation programs (DWHR) and linking metrics to program logic models, care must be taken to ensure that questions and response categories lead to unbiased responses. This includes eliminating questions that steer respondents to response that EGD prefers. Since this is the first evaluation of the DWHR Program there is room for improvement."

Enbridge Response:

Enbridge designed their survey based on a survey that had been developed and used by Union in previous years for a similar DWHR Market transformation program. There was no indication from previous audits of the Union program or from Union staff that the survey should have been improved or was inappropriate. Enbridge assumed the survey was acceptable for our program. Enbridge understands that multiple choice surveys are not always the best choice and may not provide the necessary insights to understand the performance of a program.

The survey was removed from the 2010 DWHR program design as developed in consultation with the EAC and approved by the Board in 2009. Metrics for the 2011 program have been developed in consultation with the DSM consultative; the metrics do not include such a survey and are presently before the Board for approval. If approved, this ongoing concern will no longer exist.

EAC Response:

The EAC accepts Enbridge's response.

6. Custom Commercial Programs, p. 17 of Final Audit Report
"EGD should update the commercial and industrial sampling methodology if water savings becomes more prevalent. The sampling methodology established in a memo from Summit Blue dated October 31, 2008 notes that water savings account for less than 1% of the TRC benefits. Consequently, sites with water savings are only evaluated if they happen to be part of the sample drawn for gas and electric savings. In the memo, Summit Blue notes that this may need to be revisited – "If TRC benefits from water savings increase substantially in the future, then this approach—that only verifies water savings if these savings happen to occur in conjunction with sampled gas and electric savings within the joint-sample—might need to be modified".

Chronology of sampling methodology re: custom project water savings:

August 2008 – following recommendation from the 2007 audit, EGD requested Summit Blue to revise sampling methodology for the Engineering Review to address electricity and water savings as well as gas savings.

October 2008 – Summit Blue recommended a revised sampling methodology which included electricity savings. Re: water savings, Summit Blue recommended that water savings only be verified if they occurred in a project that happened to be selected on the basis of gas or electricity savings.

Nov, 2008 – Summit Blue's proposed methodology reviewed by joint Union / Enbridge EAC. EAC expressed concern that sampling methodology address water savings as well as gas and electricity.

December, 2008 – EGD memo to joint EAC outlined response of Summit Blue to EAC concerns and utilities' resulting method for sampling re: 2008 custom projects. The method involved a separate sample pull for industrial and commercial projects with respect to gas and electricity savings and a common sample pull from the industrial and commercial sectors for water projects. In other words, the Engineering Review of water savings to be based on six projects to be selected from the total population of water projects regardless of sector.

January 2010 - Summit Blue presented the final sample pull for 2009 projects which resulted in all sampled water projects originating in the industrial sector. In response to EGD's query, Summit Blue replied that the results from the sample of 6 projects should be applied to all water savings. In previous years, the methodology resulted in projects being pulled from both the commercial and the industrial sector. This year was not a typical year and thus the recommendation from the auditor and exploration of the issue.

Enbridge Response:
Enbridge will develop and implement, with the EAC, an updated sampling approach to select custom projects with water savings from both the commercial and industrial sectors separately. This sampling approach will allow different water savings realization rates to be developed for the industrial and commercial sectors.

As part of the updated sampling approach, Enbridge and the EAC will develop a guideline to determine when and how many commercial custom projects with water savings will be selected and reviewed by a 3rd party to verify savings. The guideline will clarify questions such as when water savings are significant enough to warrant an outside party to verify claimed savings.

EAC Response:
The EAC accepts Enbridge's response.

7. Showerheads, p.12 of Final Audit Report

"EGD should update the showerhead savings values based on the 2009 SAS study."

Enbridge Response:

Enbridge is in agreement with this recommendation. Showerhead gas savings assumptions used in the following calculations have been changed based on the 2009 SAS study:

- Calculation of the 2009 LRAM
- Calculation of the 2010 TRC target

Enbridge brought forward the 2009 SAS Report in the 2009 audit. Due to timing of the audit, the SAS Report results were not included in the 2010 Assumptions Update or the 2011 DSM Plan submission (EB2010-0175). As the audit is now complete and the SAS report is considered best available information by the auditor, the EAC and Enbridge, Enbridge will notify the OEB and update the 2010 assumptions and 2011 DSM Plan at the earliest opportunity.

Note:
When the recommendation from the 2009 SAS Report was first published, it was hypothesized that a reduction in gas savings would have a corresponding reduction in water savings. If this hypothesis was held to be true, the reduction in gas savings seen from March 31, 2009 to those based on the last 2009 SAS study would suggest a decrease in water savings would be appropriate. Although this hypothesis was thought to be true, it had not been determined if the same ratio of old to new gas savings from the load research could be applied to calculate new water savings. Factors such as incoming cold water temperature and hot water tank energy factors also influence gas savings. How to account for these factors in an updated water savings value was unclear. Enbridge asked Navigant to review water savings assumptions for showerheads and recommend how to proceed.

Navigant published a memo on July 14 presenting a timeline of events that led to the final OEB approved gas and water savings and their recommendation not to change water savings for the showerhead measure. A copy of this memo can be found in Appendix C.

The following figure was pulled from the Navigant memo and serves to better understand the sequence of events that led to the final gas and water savings assumptions for 2010.

Figure 1: Timeline of Gas and Water Savings Estimates for Low-Flow Showerheads

Nomenclature key:

Scenario Name - Feb 6 Draft Sheet	Scenario Name - Approved and Published by OEB	Scenario Description
Scenario A:	N/A	1.25 GPM replacing 2.0 GPM
Scenario B:	Scenario A:	1.25 GPM replacing 2.25 GPM
Scenario C:	Scenario B:	1.25 GPM replacing 3.0 GPM

For clarity, the scenario nomenclature used in the OEB approved subsantiation sheets is that which applies below.

Feb 6, 2009 Draft		
Scenario	Gas Savings (m^3)	Water Savings (L)
A	62	10,866
B	102	17,168

↓ Intervenors provide updated input assumptions related to the quantity of gas required to heat a given quantity of water.

Savings revised based on intervenor feedback (unpublished) - mid-March 2009		
Scenario	Gas Savings (m^3)	Water Savings (L)
A	43	10,866
B	71	17,168

↓ March 26, 2009 – Enbridge provides first SAS load study

March 31, 2009 Final Draft - Approved and Published by OEB		
Scenario	Gas Savings (m^3)	Water Savings (L)
A	66	10,866
B	116	17,168

↓

SAS Institute Revised Savings, 2010		
Scenario	Gas Savings (m^3)	Water Savings (L)
A	45	10,866
B	88	17,168

In February of 2009, Navigant published Draft Assumptions for prescriptive measures. In mid-March, Navigant revised the gas savings for low-flow showerheads based on intervenor comments regarding values used in the savings calculation for inlet water temperature and water heater efficiency. This calculation was not published.

On March 26, 2009, EGD provided Navigant with a SAS load study. With this study, gas savings increased from the numbers developed in mid-March 2009. Navigant did not see cause to adjust water savings numbers. From mid-March 2009 to March 31, 2009, gas savings estimates increased but water savings remained the same.

In 2010, EGD provided Navigant with a revised SAS study. With this study, gas savings were reduced in 2010. However, as in March 2009, there was no cause to change water savings. The mid-March gas savings and water savings estimates were unpublished and, as a result, the EAC, Consultative and others did not see the reduction in gas savings with unchanged water savings from Feb. 6, 2009 to mid-March 2009. Without this missing piece of information, the hypothesis that a reduction in gas savings would have a corresponding reduction in water savings appeared to be appropriate.

EAC Response:
The EAC accepts this response.

8. ENERGY STAR for New Houses, p. 13 of Final Audit Report

"EGD should conduct a free-rider study for the ENERGY STAR® for New Houses if the program is continued."

Enbridge Response:

Due to the low TRC and projected short life span of this program, the EAC and Enbridge feel a free-ridership study is not warranted at this time. Enbridge will not conduct a free ridership study for this program.

In discussing this program with the EAC, the EAC recommended that a 48% free ridership rate be applied to this program. The 48% recommendation was based on comments made by the auditor in the Final Audit Report when presenting their view of the Salt River Project's (SRP) Power Wise Homes program (FY2009) in Arizona.

In the interest of expediting the close of the 2009 DSM audit process and clearing the 2009 DSM accounts, Enbridge will adopt a 48% free ridership rate for the Energy Star program. Enbridge notes that no compelling evidence is available to suggest an appropriate free ridership rate for Enbridge's program. Other programs such as the Arizona Public Service (APS) Residential New Construction program publish free ridership rate of 20% and a net to gross ratio of 90%. It can be argued that 20% is also an appropriate free ridership rate for our program based on the APS program. A 48% free ridership will be applied when calculating 2010 results. 2011 assumptions will be updated and approved by the Board at the earliest appropriate time.

A 48% free ridership rate for the Energy Star program has been implemented and used in the following calculations:

- Calculation of the 2009 LRAM
- Calculation of the 2010 TRC target

EAC Response:

The EAC accepts this response.

9. CFL, Table 3@ p. 7 and p.13 of Final Audit Report

"EGD should adjust the CFL distribution rate based on the result of the participant surveys."

Enbridge Response:

Enbridge is in agreement with this recommendation.

CFL per unit savings remain unchanged. Data from results of recent participant surveys have been used to adjust the number of CFLs installed per household. With this adjustment, the following were updated:

- 2010 CFL program savings
- Calculation of the 2010 TRC target
- Calculation of 2009 TRC

EAC Response:

The EAC accepts this response.

10. Thermostats, p.13 of Final Audit Report

"EGD should adopt the final Navigant thermostat savings assumptions for the 2009 LRAM and the 2010 savings estimate."

Enbridge Response:

Enbridge is in agreement with this recommendation and has implemented it in the calculation of 2009 LRAM. The Navigant savings assumptions were already approved by the OEB in the Enbridge 2010 DSM Plan (EB-2009-0154).

EAC Response:

The EAC accepts this response.

11. Low Income Weatherization, p. 13 of Final Audit Report

"EGD should conduct an impact evaluation of the low income program savings before adjusting the current OEB approved savings estimate."

Enbridge Response:

This recommendation is specific to the low income weatherization program, not all low income programs. Based on modeling of participant homes, Enbridge has proposed to increase savings by 44% over OEB approved savings values. However, after EGD completed a rough cursory review of pre and post gas consumption data for a small sample of homes that participated in the low income weatherization program, it was concluded that although the trend of growing gas savings was true, the model used to estimate savings would benefit from being calibrated based on more extensive pre and post gas consumption data. This calibration will be part of an impact evaluation to be conducted by EGD. Target completion for the terms of reference for this impact evaluation is end of 3Q, 2010. Target completion for the impact evaluation is end of 1Q 2011.

OEB approved savings assumptions were used for the calculation of low income weatherization energy savings in reporting the 2009 program results. Enbridge did not apply the proposed savings numbers to 2009 results.

Any future proposed changes will be based on the results of forthcoming impact evaluation.

EAC Response:

The EAC endorses Enbridge's response.

3.2 EAC RECOMMENDATIONS & COMMENTS

1. Commercial tankless water heater incremental cost assumption.

The current Board-approved assumptions for commercial applications of tankless water heaters (replacing a 30 gallon standard water heater) include both a substantially negative incremental cost (-$1102) and a free rider rate of only 2%. This combination of assumptions raises serious questions. Normally, a measure with a substantially negative incremental cost would quickly penetrate the market – even a niche market – naturally (i.e. without a DSM program). That would not happen only if the non-cost barriers to market adoption were extremely high. A classic example would be proper sizing (with lower costs to consumers) rather than over-sizing (with attendant efficiency penalties) of HVAC equipment. In that example, there are a combination of barriers that lead to over-sizing even though proper sizing would be cheaper, including:

A. consumers do not know what size equipment they need;
B. consumers do not understand that there is an efficiency penalty for over-sizing;
C. many contractors do not know how to properly size equipment;
D. contractors tend to err on the side of over-sizing because it covers up for other typical installation problems and therefore reduces likelihood of "call-backs", while proper sizing raises risks of under-sizing, which always produces "call-backs";
E. consumers do not know how to identify which contractors are knowledgeable and capable of quality sizing and installation.

It is hard to imagine how or why sales of tankless water heaters would have similarly steep market barriers. While consumer lack of information on product benefits is likely, that alone would not be enough to offset a substantial negative incremental cost. If tankless water heaters do not face such steep barriers, then either the incremental cost is not actually negative (perhaps because the initial assessment of incremental cost did not capture costs of adding pipe or other costs) or the free ridership rate is very high. Thus, the EAC recommends that Enbridge conduct an assessment of the severity of the barriers to installation of tankless water heaters with the aim of either confirming that barriers are so steep that a significant negative incremental cost (and low free rider rate) is plausible or flagging adjustments that should be made to either the incremental cost or free ridership assumptions.

Enbridge Response:

Enbridge intends to conduct an assessment of the nature and severity of the barriers to the installation of tankless water heaters as recommended by the EAC. This study will be included on the list of possible research and study activities for review of evaluation priorities with the EAC.

2. Prescriptive approach to school boilers.

The 2008 auditor recommended that the Company revert back to custom (rather than prescriptive) calculations of school boiler savings because that approach would more accurately estimate savings without imposing undue burdens on participants. The EAC concurred with that recommendation. However, the Company did not concur and has not changed its approach to estimating school boiler savings. Indeed, it is has proposed and received Board approval to make some other commercial boiler savings estimates prescriptive rather than custom calculations. At the same time, there have been on-going discussions between the Company and the EAC regarding the need to assess appropriate baseline efficiency assumptions for boilers. The Company recently committed to conducting a comprehensive study of boilers that would identify the key features of boilers (i.e. not just efficiency ratings, but also outdoor resets, modulation and others) that affect actual operating efficiency and assess the frequency with which all such features are typically installed in its service territory (i.e. a comprehensive baseline assessment). That study is expected to be complete by March 2011. Since the results of that study may have some bearing on the question of whether savings should be calculated prescriptively or not, the Company and the EAC have agreed to defer, until after the completion of the study, further discussions on what to do with the 2008 auditor's recommendation on this matter.

Enbridge Response:

Enbridge agrees with the approach recommended by the EAC.

3. Steam trap measure life.
Following the 2008 audit, Enbridge agreed to both lower its assumption regarding the measure life of steam traps from 13 to 6 years and conduct a new measure life study that was consistent with the auditor's proposed approach. Neither of those things happened. GEC identified during its review of the Company's 2009 Annual Report that Enbridge had inadvertently neglected to revise its measure life assumption. The Company subsequently corrected this assumption before the auditor reviewed its TRC and SSM calculations. Thus, while the final TRC and SSM values reported in the audit report reflect the correct steam trap measure life, the audit report does not discuss the issue. Enbridge has also agreed to use the 2008 Auditor's recommended 6 year measure life in future years' TRC and SSM calculations unless and until better information is developed.

Enbridge Response:
The Company has filed corrections to its assumptions for 2010 and 2011 with the Board that reflect this commitment. Enbridge plans to conduct a new study of steam trap measure life in the second half of 2010, using a study design that is also consistent with the 2008 Auditor's recommendations. The Company is consulting with the EAC on the design of the study and will also seek input from the EAC both on draft work products from the study and on any proposed change to measure assumptions resulting from the study.

4. Rules for market transformation incentive payments.

In its review of Enbridge's 2009 Annual Report, GEC noted that Enbridge incorrectly calculated the market transformation incentive payment to which it was entitled because it incorrectly applied the Board approved rules for calculating payments for partial achievement of goals. Consider, for example, the Company's EnerGuide Fireplace program. One of the performance metrics for that program was the "% point increase in customer awareness of the EnerGuide label", with the Company eligible for 50% of the performance incentive for that metric if it achieved an 80% awareness level and 100% of the incentive if it achieved an 85% awareness level. The Company actually achieved an 81% awareness level. Thus, using what we will call the correct "interpolation approach" hereafter, the Company should have been entitled to 60% (50% for 80% awareness plus, interpolating between 80% and 85%, 10% incentive for every 1% point above 80% awareness). However, the Company calculated that it was entitled to only 20% of the performance incentive for that metric. There were other metrics with similar miscalculations that were too low, as well as others with miscalculations that were too high. Enbridge corrected all of these calculations before providing its estimates of the market transformation incentives to the Auditor. As a result, the Auditor does not discuss this issue in its report. A spreadsheet showing the revised market transformation shareholder incentive calculations using the correct interpolation approach is attached as Appendix D to this report. The Company has committed to using the interpolation approach discussed above to calculate shareholder incentives to which it may be entitled in future years. The Company has also committed to capping shareholder incentives for any one performance metric at 150% of what would be earned for reaching 100% of the metric target. Both of these commitments are consistent with recent Board rulings.

The EAC understands that the Company applies the Board's rules for market transformation incentive calculations such that shareholder incentives are available, on a pro-rated basis, even if the Company does not reach the first performance incentive metric tier (i.e. even if it does not reach the target associated with earning 50% of the assigned incentive to the metric). The EAC is concerned that this approach could result in incentives being awarded even if the market retracts rather than expands, if metrics are not carefully designed as year over year metrics. If not resolved in the interim, this issue should be addressed in the new DSM framework under consideration by the Board.

Enbridge Response:

Please refer to appendix D for a spreadsheet that presents the SSM calculation for 2009 Market transformation programs. The SSM calculation was audited and follows the Board approved rules as described above. A cap of 150% on individual market transformation metrics was also implemented in the 2009 MT SSM calculation. This is in line with the Board Decision regarding the Enbridge 2010 DSM plan, found in EB-2009-0154.

5. Logic models for market transformation programs.
(Audit Report pages 18- 19)
In its 2008 Audit Report Cadmus recommended development of "logic models" and new metrics for market transformation programs. In their 2009 audit Cadmus noted similar concerns with the EnerGuide for Natural Gas Fireplaces and the Home Performance Contractor Market Transformation programs. The latter program was discontinued in 2009. The EAC requested an update on the status of this recommendation.

Enbridge Response:
Enbridge has adopted logic models for Market Transformation programs as part of its DSM practice. The Company will continue to review and discuss logic models with the EAC. As an example, Enbridge developed a logic model for the Drain Water Heat Recovery program. The model was circulated to the EAC and was reviewed by the 2009 auditor, Cadmus.

Metrics for the Drain Water Heat Recovery program in the 2010 plan were developed in consultation with the EAC and approved by the OEB. Metrics for scorecard programs in the 2011 plan were developed in consultation with a working group of the DSM Consultative and submitted to the OEB with the consensus of the full Consultative. At time of this report, the 2011 DSM Plan application is still before the Board.

6. Custom project "advancement" vs. "replacement" rules.
(Audit Report page 31)
In its 2008 Audit Report Cadmus recommended that Enbridge document the decision rules for categorizing customer project equipment upgrades as "replacements" versus "advancements". Enbridge agreed with this recommendation and proposed to use the rules suggested by the auditor as a starting point for development of Enbridge-specific decision rules, for phase in during 2009 and full implementation in 2010. The EAC requested an update on the status of this recommendation.

Enbridge Response:
The following decision rules (as recommended by Cadmus) have been adopted as business guidelines.

- If a boiler is replaced beyond its effective useful life (if a boiler is older than 25 years), it should be categorized a replacement.
- If a boiler burns out or is inoperable, regardless of its age, it should be categorized as a replacement.
- If a customer had already decided to replace a boiler, regardless of age or condition, it should be a replacement.
- Installing new equipment 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. Evidence that the utility program convinced the customer to replace an operating boiler before the end of its effective useful life may come in many forms including e-mails from customers, meeting minutes and correspondence between Enbridge and partners.

7. Site visits for commercial custom project verification studies.
(Audit Report page 32)
In its 2008 Audit Report Cadmus recommended conducting site verification visits for commercial custom project verification studies. EGD agreed to do so for 2009 and to use that experience to inform future commercial project verification efforts. The EAC has asked for a status update on this recommendation.

Enbridge Response:
In 2010, all commercial custom projects that will be verified include a site visit. Enbridge intends to continue with this practice for 2011.

8. Annual free ridership studies for custom projects.
(Audit Report page 33)
In its 2008 Audit Report Cadmus recommended conducting annual free-rider surveys for custom project participants. There was discussion in the 2008 audit about the cost/benefit trade off of this recommendation. EGD agreed to investigate this recommendation. EGD's internal resolution is documented under the "status" heading for this item in the 2009 Audit Report. That internal resolution indicates that free ridership studies would be conducted each year, and the free-ridership rates developed in one year will be applied to custom projects in the following year. Enbridge has not discussed this internal resolution with the EAC. The EAC requested an update on the status of this recommendation.

Enbridge Response:
Enbridge is preparing to bring the Terms of Reference for a free ridership study of custom projects to the EAC for review in Q3 of 2010. The issue of free ridership is a matter of some discussion in the consultation regarding the 2012 DSM Framework and will be addressed in the Board's Guidelines for natural gas DSM. Publication of the Guidelines is expected later this year. Due to the ambiguity surrounding the 2012 DSM Framework and the significant costs associated with free ridership studies, it may not be prudent to undertake a free ridership study when the results would only apply to the 2011 DSM program year. In reviewing the draft Terms of Reference, EGD will discuss this matter with the EAC.

9. Documentation of program process flow and quality assurance/quality control procedures.
(Audit Report page 35)
In its 2008 Audit Report, Cadmus praised EGD's practices in respect of program process quality assurance and quality control, and recommended that Enbridge better document such procedures. The "status" report in the 2009 Audit Report indicates that this will be done for new programs. The EAC suggests that Enbridge should consider whether there are any existing programs of a scale and scope sufficient to justify additional documentation in this respect.

Enbridge Response:
As a matter of continuous improvement in DSM practice, Enbridge has undertaken to develop program evaluation plans as an integrated element of the planning process beginning with new programs as they are introduced. The evaluation plans will include a description of any verification requirements as well as a description of quality assurance procedures in tracking program results. In documenting existing programs, Enbridge will give priority to programs of larger scale and significance in the overall DSM portfolio.

3.3 TRC RESULTS

The following table was taken from the auditor's Final Audit Report. It presents TRC adjusted as per the adjustments recommended by the auditor and described in Table 2.

Table 3: Auditor Recommended Adjusted Gas savings and TRC

	Draft Annual Report				Audit Adjusted	
Program Area	**Participants**	**Gas Savings (m3)**	**DSM Fixed and Variable Costs**	**Net TRC Results**	**Adjusted Net Gas Savings (for SSM)**	**Adjusted Net TRC Results (for SSM)**
Existing Homes	813,254	14,084,047	$10,234,502	$55,851,242	14,084,047	$58,286,208
Residential New Construction	2,199	2,126,653	$241,527	$2,218,179	2,126,653	$2,218,179
Low Income	18,857	991,192	$1,512,339	$3,021,894	991,192	$3,045,256
Total Residential	**834,310**	**17,201,892**	**$11,988,368**	**$61,091,315**	**17,201,892**	**$63,549,643**
Small Commercial	3,261	2,116,485	$681,906	$5,631,139	2,029,469	$5,413,335
Large Commercial	85	4,939,382	$662,774	$11,728,493	4,941,743	$11,751,835
MUSH	233	10,395,978	$1,232,232	$25,528,858	10,435,933	$25,704,373
Multi-Residential	41,053	15,094,725	$2,333,850	$35,265,374	15,094,725	$35,265,374
Large New Construction	21	2,287,063	$488,615	$7,906,422	2,287,063	$7,906,422
Industrial	120	22,330,732	$2,400,862	$70,984,411	22,330,732	$70,984,411
Total Business Markets	**44,773**	**57,164,364**	**$7,800,239**	**$157,044,697**	**57,119,665**	**$157,025,752**
Market Transformation Programs	0	0	$889,516	$0	-	$0
Program Development	0	0	$155,632	($155,632)	-	($155,632)
Market Research	0	0	$71,084	($71,084)	-	($71,084)
Overheads	0	0	$4,515,222	($4,515,222)	-	($4,515,222)
Total All Programs	**879,083**	**74,366,257**	**$25,420,061**	**$213,394,074**	**74,321,558**	**$215,833,455**

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 4: Auditor Recommended SSM Calculation

	Original	Adjusted for Audit
2009 Actual TRC	$213,483,107	$215,833,455
2009 TRC Target	$210,406,868	$210,406,868
Percent of Actual	101%	103%
Base Target	75%	75%
Percent over 75%	26.46%	27.58%
$ 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%	$2,646,204	$2,757,909
Total Program Related	$4,896,204	$5,007,909
Market Transformation	$375,512	$356,303
Total SSM	**$5,271,716**	**$5,364,212**
Market Transformation Detail		
Energuide	$8,750	$37,500
Home Contactor	$88,750	$36,303
Drain Water Heat Recovery	$278,012	$282,500
Total	$375,512	$356,303

EAC Response:

The EAC supports the foregoing SSM calculations.

4.0 LRAM

4.1 AUDITOR RECOMMENDATIONS

The following are recommendations made by the auditor that affect 2009 LRAM:

- *"EGD should update the showerhead savings values based on the 2009 SAS study."*
- *"EGD should adopt the final Navigant thermostat savings assumptions for the 2009 LRAM and the 2010 savings estimate."*

Both recommendations have been implemented by Enbridge and used in the calculation of 2009 LRAM.

In addition, in response to Recommendation #8 of the Auditor, Enbridge agreed to adopt a 48% free ridership rate for the Energy Star New Homes program. This adjustment was implemented and used in the calculation of the 2009 LRAM.

4.2 LRAM RESULTS

Table 5 below presents a summary of all changes in gas savings and TRC seen from the Annual Report to the Final Audit Report published by the auditor and from the Final Audit Report to the EAC Audit Summary Report. Tables 6 and 7 that follow detail the changes in volumes by sector based on best available information.

Table 8 illustrates the LRAM by rate class and the variance that will need to be reimbursed to (positive number) or collected from (negative number) rate payers. In total, $45,722 needs to be returned to rate payers.

Table 5: LRAM Results, Draft Annual Report to Post Audit Results

	Annual Report		Final Audit Report (Board Approved Assumptions & Auditor Adjustments)		EAC Audit Summary Report (Best Available Information)	
Program Area	**Gas Savings**	**Net TRC Results**	**Gas Savings**	**Net TRC Results**	**Gas Savings**	**Net TRC Results**
Existing Homes	14,084,047	55,851,242	14,084,047	58,286,208	10,887,952	48,988,731
Residential New Construction	2,126,653	2,218,179	2,126,653	2,218,179	1,164,063	1,207,133
Low Income	991,192	3,021,894	991,192	3,045,256	685,181	1,889,959
Total Residential	**17,201,892**	**61,091,315**	**17,201,892**	**63,549,643**	**12,737,196**	**52,085,824**
Small Commercial	2,116,485	5,631,139	2,029,469	5,413,335	2,029,469	5,413,335
Large Commercial	15,335,359	37,257,350	15,377,676	37,456,208	15,377,676	37,456,208
Multi Residential	15,094,725	35,265,374	15,094,725	35,265,374	15,094,725	35,265,374
Large New Construction	2,287,063	7,906,422	2,287,063	7,906,422	2,287,063	7,906,422
Industrial	22,330,732	70,984,411	22,330,732	70,984,411	22,330,732	70,984,411
Total Business Markets	**57,164,364**	**157,044,697**	**57,119,665**	**157,025,752**	**57,119,665**	**157,025,752**
Market Transformation Programs			-	-	-	-
Prog. Dev. & Market Research		(226,716)	-	(226,716)	-	(226,716)
Overheads		(4,515,222)	-	(4,515,222)	-	(4,515,222)
TOTAL ALL PROGRAMS	**74,366,257**	**213,394,074**	**74,321,558**	**215,833,455**	**69,856,861**	**204,369,636**

Table 6: LRAM Tables: Residential

2009 DSM Program	Net Annual Gas Savings	
EXISTING HOMES		
Water Conservation		
Tankless Water Heating	898,552	
TAPS Partners Program - Showerheads over 2.5	4,835,416	
TAPS Partners Program - 2.1 - 2.5	1,360,258	
TAPS Partners Program - Kitchen Aerators	1,513,866	
TAPS Partners Program - Bathroom Aerators	322,740	
Equipment Replacement		
Furnace Replacements	1,097,943	
Thermostats	607,584	
Novitherm	251,594	
Total Existing Homes		**10,887,952**
RESIDENTIAL NEW CONSTRUCTION		
EnergyStar for New Houses	1,164,063	**1,164,063**
LOW INCOME		
LI TAPS Partners Program - Showerheads 2.5+	99,613	
LI TAPS Partners Program - Showerheads 2.1 - 2.5	510	
LI TAPS Partners Program - Kitchen Aerators	16,478	
LI TAPS Partners Program - Bathroom Aerators	3,002	
LI Prog Thermostats	156,204	
LI Weatherization program	409,374	
Total Low Income		**685,181**
TOTAL RESIDENTIAL		**12,737,196**

Table 7: LRAM Table: Commercial and Industrial

Note: The sum of all residential, commercial and industrial programs from both Table 6 and Table 7 is found at the bottom of Table 7

2009 DSM Program	Net Annual Gas Savings	
SMALL COMMERCIAL		
Air Doors (Single)	15,208	
Air Doors (Double)	23,241	
Demand Control Kitchen Ventilation (0 - 4999 CFM)	41,049	
Demand Control Kitchen Ventilation (5000 - 9999 CFM	196,411	
Demand Control Kitchen Ventilation (10000 - 15000 C	35,956	
Energy Recovery Ventilators (ERV)	209,830	
Furnace Replacements	41,536	
Heat Recovery Ventilator (HRV)	3,544	
Infrared Heaters	206,990	
Pre-Rinse Spray Nozzle	1,074,325	
Rooftop Units	136,629	
Tankless Water Heaters	4,528	
Programmable thermostats	40,225	
Total Small Commercial		**2,029,469**
LARGE COMMERCIAL		
Hotel/Motel	605,555	
Office	2,057,905	
Retail	381,609	
Warehouses	264,889	
Other Commercial	1,631,785	
Hospitals	4,526,318	
Long Term Health Care	531,088	
Government	3,158,996	
School	1,734,432	
College/University	485,098	
Total Large Commercial		**15,377,676**
MULTI RESIDENTIAL		
Multi-Residential Private	13,907,770	
Multi-Residential Non-Profit	374,632	
Multi-Residential Water Conservation		
Condo	83,868	
Rental	680,754	
Front Load washers	47,701	
Total Multi-Residential		**15,094,725**
LARGE NEW CONSTRUCTION	2,287,063	**2,287,063**
INDUSTRIAL		
Industrial	20,953,163	
Agriculture	1,377,570	
Total Industrial		**22,330,732**
TOTAL BUSINESS MARKETS		**57,119,665**
TOTAL GAS SAVINGS (Bus. Markets & Residential)		**69,856,861**

Table 8: Auditor Recommended LRAM Calculation

2009 Audit Report LRAM Calculation

based on 60,011,037 FE m3 built into rates

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin (cents / m^3)	$	
Rate 1	8,153,242	5,924,543	(2,228,700)	~~7.01~~	~~$ (156,220)~~	24.3%
Rate 6	14,235,533	11,489,960	(2,745,573)	~~3.77~~	~~$ (103,438)~~	30.0%
Rate 110	2,191,564	1,499,067	(692,497)	1.54	$ (10,643)	7.6%
Rate 115	1,394,632	1,032,480	(362,152)	0.97	$ (3,516)	4.0%
Rate 135	0	18,796	18,796	1.39	$ 261	-0.2%
Rate 145	1,921,623	936,892	(984,731)	1.92	$ (18,878)	10.7%
Rate 170	4,609,385	2,441,975	(2,167,410)	0.60	$ (12,947)	23.7%
Totals	32,505,979	23,343,711	-9,162,268		~~$ (305,380)~~	
Total Excluding Rate 1 and Rate 6					**$ (45,722)**	

Notes:

- The volume of 60,011,037 fully effective (FE) m3 was the assumption used in the 2009 LRAM budget.
- The EAC and Enbridge, following the application of best available information, have agreed on 2009 LRAM FE volumes of 69,856,861m3.
- Fully Effective volumes assume savings from implemented measures delivered savings for the entire year.
- Partially Effective volumes assume savings were realized in 2009 only for the period of time in 2009 in which a measure was implemented and delivering gas savings.

5.0 2010 TRC TARGET

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

For Enbridge the 2010 target formula is presented in Table 9: 2010 TRC Target calculation.

The target calculation has been reviewed and approved by the auditor, the Cadmus Group.

Table 9: 2010 TRC Target Calculations

Actual Audit 2007 TRC Results	Actual 2007 TRC results for LRAM with 2010 avoided costs	Actual Audit 2008 TRC Results	Actual 2008 TRC results for LRAM with 2010 avoided costs	Latest prepared 2009 TRC Results at Jun 16, 2010	Latest 2009 TRC results (col E) with Final 2010 avoided costs with LRAM changes	2010 Target
A	B	C	D	E	F	=(B+D+F)/3 * 1.075%
$199,798,420	$184,156,243	$182,706,679	$200,474,811	$215,833,455	$180,045,503	$202,342,433

Note:
2010 Target = [(184,156,243 + 200,474,811 + 180,045,503) / 3] x
[1 + (1.5 x 5%)]

Enbridge

Terms of Reference:

Independent Audit of 2009 DSM Program Results

BACKGROUND

Since 1995, Enbridge Gas Distribution ("Enbridge") has been delivering Demand-Side Management (DSM) programs to its customer markets. Each year since then, Enbridge has been successful in achieving significant natural gas savings through its program portfolio. (See the attached DSM Factsheet for an overview of the Enbridge DSM programs.) Enbridge delivers its DSM programs in accordance with the rules and procedures defined by the Ontario Energy Board ("OEB").

The OEB DSM procedures include three financial mechanisms: the Demand Side Management Variance Account (DSMVA), the Lost Revenue Adjustment Mechanism (LRAM), and the Shared Savings Mechanism (SSM).

The DSM budget is set at the beginning of the year. "The DSMVA (DSM Variance Account) shall be used to "true up" the variance between the spending estimate built into rates for the year and the actual spending in that year. If spending is more than what was built into rates, the utility shall be reimbursed up to a maximum of 15% of its DSM budget for the year. All additional funding must be utilized on incremental program expenses only (i.e., cannot be used for additional utility overheads)." [1]

As described in the Board's Decision that first established the LRAM, "LRAM is a mechanism to adjust for margins the utility loses if its DSM Program is more successful in the period after rates are set than was planned in setting the rates."[2] The continuance of the LRAM was recently confirmed in the Board's Decision in the Generic Proceeding.[3]

The SSM provides the Company a share of the DSM results calculated using the TRC Test. In the recent Generic Proceeding the Board approved a proposal whereby the amount of the SSM is determined by a formula based on a percentage of the actual net benefits.[4] The net benefits are calculated using the "Total Resource Cost Test",

[1] EBO 2006-0021, Decision with Reasons, Issue 6.1, 6.2 and 6.3, page 30
[2] EBRO 495, Decision, Pg 100, item 4.2
[3] EBO 2006-0021, Decision with Reasons, Issue 4.1, page 39
[4] EBO 2006-0021, Decision with Reasons, Issue 5.2, page 27-30

developed by the California Energy Commission and the California Public Utilities Commission.[5]

Enbridge maintains systems to monitor and track DSM results. In addition, the Company commissions independent evaluations of selected DSM programs. The DSM Annual Report is the Company's documentation of program results, evaluation research, and calculation of the DSMVA, LRAM, and SSM amounts.

OBJECTIVE

The objective of the independent audit is to provide an independent opinion as to the reasonableness of the Company's claims regarding DSMVA, LRAM & SSM. The Company intends to use the Audit as evidence to clear the relevant DSM accounts at the OEB.

The auditor should include in their final report or subsequent memo an independent professional opinion in the following form, with or without qualifications:

"We have audited the Annual Report, Total Resource Cost (TRC) savings, Shared Savings Mechanism (SSM), Lost Revenue Adjustment Mechanism (LRAM) and Demand Side Management Variance Account (DSMVA) of Enbridge Gas Distribution for the calendar year ended December 31, 2009. The Annual Report, and the calculations of TRC, SSM, LRAM, and DSMVA are the responsibility of the company's management. Our responsibility is to express an opinion on these amounts based on our audit.

We conducted our audit in accordance with the rules and principles set down by the Ontario Energy Board in its Decision with Reasons dated August 6, 2006 in EB-2006-0021. Details of the steps taken in this audit process are set forth in the Audit Report that follows, and this opinion is subject to the details and explanations therein described.

In our opinion, and subject to the qualifications set forth above, the following figures are calculated correctly using reasonable assumptions, based on data that has been gathered and recorded using reasonable methods and accurate in all material respects, and following the rules and principles set down by the Ontario Energy Board that are applicable to the 2009 DSM programs of Enbridge Gas Distribution:

TRC Savings	-	*$xxx,xxx,xxx*
SSM Amount Recoverable	-	*$x,xxx,xxx*
LRAM Amount Recoverable	-	*$x,xxx,xxx*
DSMVA Amount Recoverable	-	*$xxx,xxx"*

[5] "Standard Practice Manual. Economic Analysis of Demand-Side Management Programs." California Energy Commission and California Public Utilities Commission, 1987.

SCOPE AND REQUIREMENTS

As stated in the Decision from the Generic Proceeding,

> "The parties agree that a third party audit of the Evaluation Report is required. The auditor will be retained by the utility who determines the scope of the audit. It will be the role of the auditor to:
>
> - Provide an opinion on the DSMVA, SSM and LRAM amounts proposed and any amendment thereto
> - Verify the financial results in the Evaluation Report to the extent necessary to give that opinion
> - Review the reasonableness of input assumptions.
> - Recommend any forward looking evaluation work to be considered
>
> The auditor shall be expected to take such actions by way of investigation, verification or otherwise as are necessary for the auditor to form their opinion. The auditor, although hired by the utility, must be independent and must ultimately serve to protect the interests of stakeholders."[6]

The Auditor selected for this task will be expected to exercise his/her expert judgment to determine the elements of the audit, and to set the approach and process that will be followed in the audit in order to meet the regulatory requirements as stated above.

The deliverable will be written reports outlining the principles of the audit, the methodology followed, and the findings and recommendations of the audit, including an opinion in the form set forth above.

The following list of audit activities is suggested. It represents the minimum set of tasks the auditor will be expected to carry out. The Auditor is encouraged to propose other tasks that it believes would be helpful in reaching the ultimate goal of assessing the accuracy of Enbridge's DSMVA, LRAM, and SSM calculations.

Audit Activities

1. Consider and respond to stakeholder comments on Enbridge's Annual DSM Report for 2009, including those of the EAC.
2. Review Enbridge's 2009 procedures for tracking program participants and determine whether they lead to accurate counts, particularly for programs that do not provide customer rebates.
3. Determine whether Enbridge's reported values for participation, costs, measure lives and savings (gas, electricity and water) are appropriate for calculation of TRC, LRAM and SSM. This shall include assessing: (1) whether values are adequately documented by program records, evaluation studies and other relevant data; (2) where applicable, whether assumptions regarding measure costs, savings and lives are in line with Board approved

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

values for calculation of the SSM; and (3) the reasonableness of costs, measure lives and savings for the calculation of LRAM and SSM. Where appropriate, the auditor shall recommend alternative costs, measure lives & savings values to be used for LRAM purposes. For measure assumptions that were not previously approved by the Board, the auditor is expected to propose alternatives to those put forward by EGD if it deems the EGD values less accurate. Consideration should be made to measures that are considered advancements rather than replacements to ensure costs, measure lives and savings are treated appropriately. As part of such consideration of advancement measures the auditor shall assess both whether cost, savings and measures lives are estimated in line with models developed in the last 2 years and whether such models are reasonable.

4. Determine that all other assumptions are consistent with those approved in the forecast or that they properly reflect accepted recommendations from previous audits or new program designs.
5. Review and verify the accuracy of all calculations leading up to the proposed TRC, DSMVA, LRAM, and SSM amounts.
6. Verify that the methodology and assumptions used to calculate the "actual" LRAM volume savings are consistent with the methodology and assumptions used to calculate the LRAM budget volume savings and identify and quantify any inconsistencies.
7. Verify that the calculations are consistent with the OEB-approved prescribed methodology.
8. Verify the calculation of the Market Transformation incentive. As part of such efforts, the auditor should provide an opinion on the accuracy of EGD's reporting of performance against program metrics and the reasonableness of EGD's interpretation of program metric results. The auditor shall also provide an opinion as to the usefulness of Enbridge's market transformation metrics as indicators of success in market transformation and, where applicable, propose alternatives that may be better indicators to use in the future.
9. In accordance with OEB direction, Enbridge has retained independent third party engineering consultants to undertake a detailed review of the savings estimates for Industrial and Commercial custom projects. The auditor should review the final reports from these consultants and provide an opinion as to the quality of their review and the consultant's adherence to the terms of reference. The auditor should also provide an opinion on the reliability and reasonableness of the error ratio (and/or realization rate) when applied to a larger population of custom projects.
10. Review other studies conducted in support of the DSM Annual Report.
11. Identify any assumptions underlying Enbridge's DSM program design strategy, and TRC calculations, that should be modified prospectively, based on the auditor's experience, the results of the audit, and knowledge of other

studies or data. Propose the amounts of those modified assumptions.

12. Identify opportunities to enhance the assumptions used to calculate the SSM and LRAM that should be addressed in future evaluation work.
13. Work with the EAC and Enbridge to resolve any relevant issues prior to completion of the audit.
14. Work with firms contracted to review customs projects and provide guidance to these firms and Enbridge to ensure the final reports from these firms meet the needs of the audit.
15. Review methodology and calculation used to calculate 2010 TRC target. Ensure methodology used is in line with Board approved guidelines and decisions. Recommend 2010 TRC Target.
16. Any other matters considered by the auditor to be relevant to an assessment of Enbridge's DSMVA, LRAM and SSM claims.

Audit Resources

To assist the Auditor in conducting the audit, all relevant Company documentation will be made available to the Auditor for review. The Company is committed to providing the necessary data and tools the Auditor deems reasonably necessary in order to meet the ultimate goal of the audit. The list below provides examples of the resources that can be made available to the Auditor, but the list should not be considered as necessarily complete or exhaustive:

1. access to the Company's program tracking system and documentation of program participants;
2. access to the Company's cost-effectiveness screening spreadsheet tool;
3. access to all regulatory decisions and agreements which outline the requirements for DSM evaluation and the independent audit;
4. access to all regulatory decisions and guidelines that outline the DSMVA, LRAM and SSM calculations and procedures;
5. access to comments provided by DSM Consultative members on the 2009 DSM Annual Report;
6. access to all relevant evaluation and market research conducted by the Company relating to or informing the results for 2009 including a third party engineering review of a sample of custom projects in business markets, and including any research carried out after 2009, whether final or in draft form;
7. access to all previous audit reports;
8. Enbridge's DSM and Program Evaluation department staff time; and
9. Communication as required by the Auditor with the EAC.

REPORTING STRUCTURE

The Auditor will be under contract with Enbridge. Pursuant to the requirements established by the Board, a group of stakeholder representatives has been selected by the interveners to act in an advisory role to the auditor and Enbridge during this process. This group is defined as the "EAC" below.

Decision Issue 9.4, page 17 and 18
"…the EAC (Evaluation Audit Committee) will continue to have an advisory role in …

- Selection of the independent auditor to audit the Evaluation Report and determine the scope of the audit. The EAC will ensure that all comments on the Evaluation Report from the Consultative are reviewed by the auditor.
- The EAC will be responsible for meeting the reporting guidelines of the Board (found at Section 2.1.12 of the Natural Gas Reporting & Record Keeping Requirements Rule for Gas Utilities). The EAC will provide a final report within 10 weeks from the later of, the receipt of the Evaluation Report and supporting evaluation studies from the Utility, or the hiring of the auditor. Recommendations of the EAC with respect to DSMVA, LRAM and SSM clearances shall be included in the EAC's final report. The EAC shall not consider any further information subsequent to the Board's filing deadline each year."

The EAC consists of a Company representative and three stakeholders elected from the DSM Consultative Group. The DSM Consultative Group is a multi-stakeholder body which meets from time to time to discuss and review the Company's DSM activities.

In keeping with the guidelines above, the auditor will be selected by the Company in consultation with the EAC.

The EAC will also help to ensure that the process enables the Company to file the completed audit and recommended DSMVA, LRAM and SSM claims by June 30th as required by the OEB Directive.

The start-up meeting with the Auditor will be held with all members of the EAC to ensure a consistent understanding among all parties of the scope and expectations of the independent audit. Additional meetings between all Committee members and the Auditor will be arranged for group discussion and progress reporting. Meetings will be held at Enbridge offices or through conference calls as appropriate.

The Company may review preliminary drafts of the audit report to resolve matters of clarification, prior to review by the EAC. If any member of the EAC seeks to review drafts of the audit report from time to time, the auditor, subject to approval by the Company, will be required to provide those drafts to the EAC. In keeping with the independence of the auditor, neither the Company nor any members of the EAC will seek to influence the audit report in any way, other than by providing factual information and

asking questions to clarify the intent of the report. The independent auditor will present their Draft Report to the Company and the Committee for review and possible revisions before it is finalized.

SCHEDULE

Following the Board Directive of December 2004, the independent audit of DSM results is to be completed and a recommendation filed with the Board by the last day of the sixth month after the financial year end.

Due to the importance to meet these Board imposed deadlines, the Auditor will be contractually bound to meet the deadlines outlined in their proposal. If due to the Auditor's negligence, the Auditor has not provided Enbridge with the deliverables, Enbridge may, in its sole discretion and after consulting with the EAC, deduct 10% of the amount payable to the Auditor for each week beyond the deliverable dates specified herein that the Auditor has not provided Enbridge with the deliverables.

The schedule below meets this requirement.

RFP issued	Tuesday, December 01, 2009
Proposals due	Tuesday, December 22, 2009
Contract awarded	Tuesday, January 12, 2010
Contract signed	Friday, February 12, 2010
Auditor Review of Custom Project Engineering Reviews	Monday, January 18, 2010
Auditor Meeting At Enbridge Offices	Tuesday, January 26, 2010
2009 DSM Annual Report circulated	Friday, April 02, 2010
Comments on DSM Annual Report from EAC and Consultative	Friday, April 16, 2010
Draft Work Plan	Friday, April 09, 2010
Meeting with EAC to review scope and work plan	Wednesday, April 14, 2010
Final Detailed Work Plan	Friday, April 16, 2010
Progress meetings with EAC	Weekly
Draft Audit Report #1 submitted	Friday, May 28, 2010
Review Meeting with EAC	Thursday, June 03, 2010
Review Meeting with EAC	Tuesday, June 01, 2010
Draft Audit Report #2 submitted	Friday, June 04, 2010
Review Meeting with EAC	Wednesday, June 09, 2010
Final Audit Report submitted	Friday, June 11, 2010

CRITERIA

Proposals will be evaluated on the following criteria:

- experience and qualifications of the firm: direct experience in evaluation or audit of utility DSM programs,
- methodology proposed,
- demonstrated understanding of Enbridge rules and requirements,
- proposed schedule and ability to meet timelines, and
- price proposal.

PROPOSAL REQUIREMENTS

The proposal should include the following elements:

- a description of the methodology and approach to be used in the audit,
- a list of proposed tasks,
- suitable information for Enbridge to determine the qualifications of individuals and their roles in the project,
- confirmation that the proponent will be able to meet the Enbridge contractor insurance and WSIB requirements as described in the attachment, and
- confirmation of ability to meet timelines or specific reasons why a deviation from the schedule is required.

The cost proposal should include:

- breakout of costs by task and roles,
- assumptions regarding the number of meetings at the Enbridge offices and the associated costs, and
- hourly rates for additional related work such as appearing as an expert witness at the OEB.

Proposals are due no later than 4:00 PM on December 22, 2009. Proposals may be submitted in hard copy or via email.

Questions of clarification should be directed to Marco Spinelli at the coordinates indicated below. Responses to questions of clarification will be circulated to all respondents.

All correspondence should be sent to the attention of:
Marco Spinelli
DSM Research and Evaluation
Phone: 416-495-5294
Email: marco.spinelli@enbridge.com

Attachment #1: DSM Fact sheet (see attached file)

Attachment #2

Enbridge contract requirements regarding Insurance and WSIB

Insurance

(a)commercial general liability insurance having a minimum inclusive coverage limit, including personal injury and property damage, of at least Two Million Dollars ($2,000,000). Enbridge must be added as an additional named insured in the insurance policy, which should be extended to cover contractual liability, products/completed operations liability, owners'/ contractors' protective liability and must also contain a cross liability clause;

(b)automobile liability insurance on all vehicles used in connection with this Agreement and such insurance shall have a limit of at least Two Million Dollars ($2,000,000) in respect of bodily injury (including passenger hazard) and property damage inclusive of any one accident; and

(c)non-owned automobile liability insurance and such insurance shall have a limit of at least Two Million Dollars ($2,000,000) in respect of bodily injury (including passenger hazard) and property damage, inclusive in any one accident.

WSIB

The Consultant agrees to comply with the Occupational Health and Safety Act (Ontario) and the Workplace Safety and Insurance Act (Ontario) and with all other prevailing federal, provincial and municipal laws and regulations or any other laws or regulations in force in any jurisdiction where the consulting services are performed (the "Laws") and which are applicable to the Consultant, its subcontractors and the consulting services provided hereunder, and the Consultant shall familiarize itself and procure all required permits and licenses and pay all charges and fees necessary or incidental to the due and lawful prosecution of this Agreement and shall indemnify and save harmless Enbridge, its directors, officers, agents and employees thereof against any claim or liability from or based on the violation of any Laws, whether by the Consultant, its officers, employees, subcontractors, representatives or agents

THE CADMUS GROUP, INC.

Final Work Plan

Independent Audit of 2009 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

April 16, 2010

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Methodology and Approach, and Work Plan

As with the audit of the 2008 programs, the scope of work addresses these primary 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 are they lacking. In particular we will focus on areas we found to be deficient in the 2008 audit.
- Are market effects adequately tracked and attributable to the program(s)? 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 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, free-ridership and spillover[1], 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.

The RFP identifies 16 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 the Enbridge and interested parties to come to a shared understanding of the goals and requirements of the audit. We will solicit input to identify key issues and uncertainties associated with the audit data and procedures. We will use the opportunity to gather appropriate background information, including hands-on demonstrations of appropriate tracking databases, financial calculations and benefit cost analysis. (Experience has shown that documentation of these systems is often difficult to interpret, and the direct-use approach is a very cost-effective way deal with the learning curve.) In addition to these goals, we will use the kick-off meeting to discuss

- ***Project objectives***. We will confirm expectations for this project to be sure we fully understand Enbridge and the stakeholders' goals and objectives so that the direction of our analysis and the allocation of resources are appropriate.
- ***Proposed methodologies for achieving objectives***. We will review the audit principles and the process we propose to use on this review effort. Adjustments to the approach will be made as necessary to meet the Enbridge's objectives.

[1] Spillover is not currently allowed by the OEB and will be excluded from savings calculations.

- ***Schedule and deliverables***. A detailed schedule for performance of the tasks and the formats of deliverables is presented in this proposal. Cadmus is committed to meeting the schedule outlined below; the detailed schedule developed in this task will show how we will achieve these objectives.

Task 2: Review of Background Materials

We will review the 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 is not limited to:

- The Annual DSM report for 2009, including comments from stakeholders
- Data or documents from Enbridge's DSM tracking system
- 2009 TRC/SSM spreadsheet
- Commercial and industrial sector reports and project files
- Verification (evaluation) studies
- 2009 OEB approved assumptions
- Free-ridership/spillover analysis
- 2008 Audit report and issues list
- Recommendations taken in response to the 2008 DSM audit report

Task 3: Discussion of Revised Scope of work

Our approach for this type of program review is based on a process that is iterative, interactive, and consensus building. 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 the stakeholders develop confidence in the accuracy, validity, and reliability of our ultimate findings. Issues will be identified throughout the course of the audit in discussions with the Company and the EAC. Their resolution will be tracked and incorporated in the final audit report.

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 that Enbridge is using the values appropriate to the market penetration and market maturity in the service territory, and that they are well documented and commensurate with program design objectives, including:

- ***Program planning assumptions***. Program planning assumptions will reviewed according to the following criteria:
  - We will verify that the calculated savings are based on OEB approved deemed savings
  - We will Enbridge program designs to determine whether program delivery affects the OEB approved deemed savings

- We will verify that the custom projects are evaluated using generally acceptable engineering methods, are well documented and have reasonable savings estimates
- We will review the assumptions underlying the OEB deemed savings to determine whether they continue to be based on best available information

- ***Program evaluation assumptions***. We identified several areas of improvement in program evaluation during the 2008 audit. We will determine whether these recommendations have been incorporated in the 2009 program evaluations. As with the 2008 audit, verification and evaluation approaches will be examined and compared to best practices, including those recommended in the California protocols, IPMVP protocols, and other. 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. This was another area identified in the 2008 audit for improvement. We will review the changes made by Enbridge to address our concerns. Where appropriate we will benchmark the market transformation metrics against metrics for similar efforts, and make recommendation for future market transformation programs.
- ***Program tracking systems.*** During the 2008 audit we determined that the program tracking systems were well designed and accurate. We will continue to review the program tracking systems in this audit to identify any changes that have been incorporated in the systems. For programs that are not driven by rebates we will review the participation estimating methodology.

Task 5: Data Analysis/Financial Calculations

Our assessment of the 2009 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 evaluation and verification studies.

The major goal here is to highlight areas where differences might be relevant or significant and to ensure that attention is focused on those variables and calculations that make a difference.

Task 6: Draft and Final Report

Cadmus will prepare a draft and final report that will summarize the findings of this audit. Included in our recommendations will be modifications to the assumptions and program design that 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 amounts recoverable.

The report, which will be revised and finalized to address Enbridge and stakeholder comments, will contain the following sections:

- Executive summary
- Background or introduction
- Methodology

- Findings
- Recommendations, including current status and resolution of outstanding recommendations from prior audits
- 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 the revisions from the original schedule.

2009 DSM Audit Schedule	Milestone or Meeting	April 5th, 2010 Schedule
RFP issued		Completed
Proposals due		Completed
Contract awarded		Completed
Contract signed		Completed
Auditor Review of Custom Project Engineering Reviews		In progress
Auditor Meeting At Enbridge Offices		Completed
Delivery of TRC Spreadsheet, MT Program Results & Back-up, Supporting Documents, Studies, Research & Draft Annual Report to Cadmus	Milestone	Monday April 05, 2010
2009 DSM Annual Report circulated	Milestone	Target: Friday, April 9, 2010
Comments on DSM Annual Report from EAC and Consultative	Milestone	Friday, April 23, 2010
Draft Work Plan	Milestone	Friday, April 14, 2010
Meeting with EAC to review scope and work plan	Meeting	Thursday, April 15, 2010 (12-1pm)
Final Detailed Work Plan	Milestone	Friday, April 16, 2010
Progress meetings with EAC	Meeting	Weekly (Tuesday 1:30 – 2:30pm)
Draft Audit Report #1 submitted	Milestone	Thursday, May 27, 2010
Review Meeting with EAC & Cadmus	Meeting	Thursday, June 03, 2010 (1-3pm)
Review Meeting with EAC & Cadmus	Meeting	Thursday, June 10, 2010 (2-4 pm)
Draft Audit Report #2 submitted	Milestone	Tuesday, June 15, 2010
Review Meeting with EAC & Cadmus	Meeting	Friday June 18th, 2010 (1-3pm)
Final Audit Report submitted	Milestone	Friday, June 25, 2010

NAVIGANT CONSULTING

1 Adelaide St. E.
Suite 3000
Toronto, ON, M5C 2V9
416-777-2440 phone
416-777-2441 fax

Memorandum

To: **Corrie Morton, Demand Side Management, Enbridge Gas Distribution**

From: **Peter Steele-Mosey, Consultant, peter.steele-mosey@navigantconsulting.com**

Date: **July 16, 2010**

Re: **1.25 GPM Showerhead – Revised Input Assumptions**

On February 6, 2009, Navigant Consulting submitted a first draft of natural gas substantiation sheets to the Ontario Energy Board (OEB) for review by board staff and intervenors. These drafts are attached for your reference.

Having reviewed the draft measures submitted by Navigant Consulting, the intervenors suggested some changes to the input assumptions used to calculate savings. These were principally the provision of more locally specific input assumptions. Navigant Consulting accepted many of these suggestions and agreed that their adoption improved the accuracy of its engineering estimates and provided a more accurate estimate of gas savings.

The revised input assumptions provided by the intervenors that applied to low-flow showerheads (and indeed all residential water-related measures) and accepted by Navigant Consulting included:

- Revised inlet water temperature
- Using recovery efficiency instead of energy factor in the calculation of savings.

All of the input assumptions that were revised were those which affected the quantity of gas required to heat a given quantity of water. No water savings assumptions were revised.

Navigant Consulting then prepared revised substantiation sheets reflecting the two input assumption changes cited above. Prior to submitting its final draft to the OEB (due on March 31 of 2009), Enbridge was able to provide Navigant Consulting with a just-completed (March 26, 2009) load impact analysis study conducted by the SAS Institute[1].

Provided that the analysis is robust, empirical estimates of energy savings are generally preferable to engineering estimates, capturing as they do the effects of the multitude of interactions which occur in the real world and eliminating the need for a battery of input assumptions which may fail to completely capture the complexity of what actually occurs in real households.
Given the SAS Institute's position as an industry leader in econometric and statistical analysis and the level of sophistication in the analysis performed, Navigant Consulting decided to use the SAS

[1] SAS Institute (Canada), *SAS® Analysis for Enbridge Gas Distribution Inc.: Estimating the Impact of Low-Flow Showerhead Installation*, March 26, 2009

Institute's empirical estimates of gas savings rather than its own engineering estimates. These are the savings estimates approved, and currently published online, by the OEB[2].

The SAS Institute report did not, however, provide any estimates of water savings. Given the large number of interacting factors which contribute to the magnitude of gas savings, Navigant Consulting concluded that it would not be appropriate to inflate water savings based on the higher gas savings estimated by the SAS Institute. Accordingly, Navigant Consulting applied its previously calculated water savings.

The SAS Institute has recently completed a second load impact study which has revised its estimates of gas savings downwards. Navigant Consulting does not believe that this should in any way affect the water savings estimates as they were calculated independently of the SAS Institute's results (both initial and updated) and were agreed to by the board and the intervenors previously.

It is furthermore noteworthy that when the two input assumption adjustments suggested by the intervenors (see bullets above) are applied to the engineering estimates of gas savings, the resulting gas savings are only 4% different from those most recently reported by the SAS Institute for the 2.25 – 1.25 GPM showerhead conversion and 19% of those reported for the 3.0 – 1.25 GPM[3]. The proximity of these estimates suggests that the estimated water savings are in fact reasonable and in line with the current SAS Institute findings regarding gas savings. The unpublished revised engineering estimates of gas savings (based on intervenor input) are shown in Figure 1 below. Interested parties may calculate these revised estimates for themselves by applying the revised input assumptions[4] to the savings calculation shown in the February draft substantiation sheets.

Please see Figure 1 below for a time-line of the various estimates.

In conclusion, due to the fact that:

- Water savings were calculated independently of the OEB-approved, SAS Institute-estimated gas savings numbers,
- The two input assumptions which intervenors suggested be revised were both factors which alter the quantity of gas required to heat a given quantity of water, rather than the quantity of water which must be heated.
- With the revised input assumptions provided by the intervenors, the engineering estimates of gas savings (which are themselves based on engineering estimates of water savings) are very close to the SAS Institute's most recent estimate of gas savings,

Navigant Consulting does not believe that there is cause to revise the water savings estimates for the showerhead measure.

Please contact me if you have any questions regarding the above.

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[2] http://www.oeb.gov.on.ca/OEB/_Documents/EB-2008-0346/Navigant_Appendix_C_substantiation_sheet_20090429.pdf

[3] It should be noted that the categories used by the SAS institute are 2.0 – 2.5 GPM converted to 1.25 GPM and greater than 2.5 GPM converted to 1.25 GPM. Following the convention established in the OEB approved substantiation sheets, Navigant Consulting has assumed that the average GPM for showerheads in the 2.0 – 2.5 GPM range is 2.25 and that the average GPM for showerheads with greater than 2.5 GPM is 3.0 GPM.

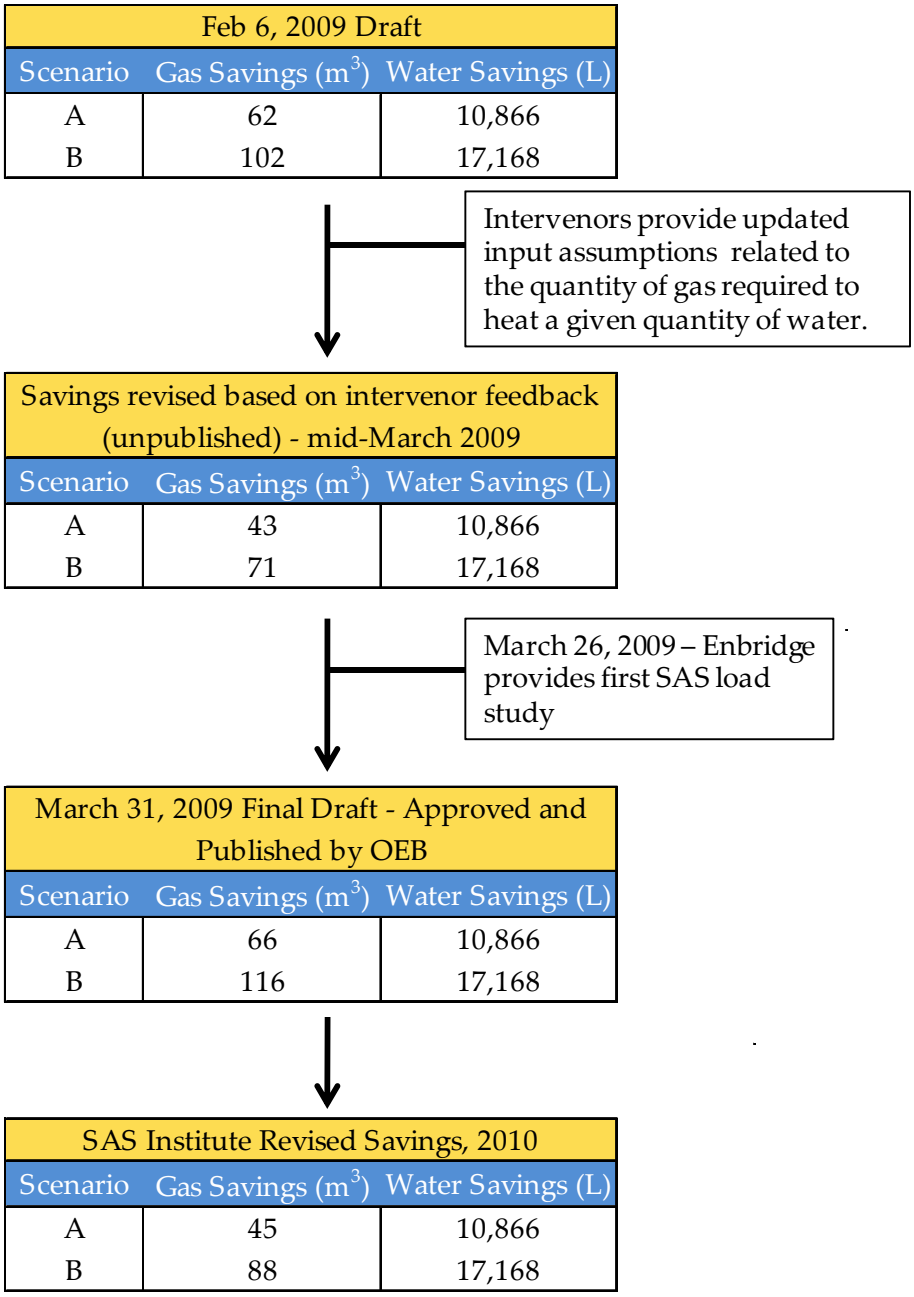
[4] Using 48.8F instead of 45F for the inlet water temperature and 0.76 recovery efficiency instead of 0.57 energy factor.

Figure 1 - Timeline of Gas and Water Savings Estimates for Low-Flow Showerheads

Nomenclature key:

Scenario Name - Feb 6 Draft Sheet	Scenario Name - Approved and Published by OEB	Scenario Description
Scenario A:	N/A	1.25 GPM replacing 2.0 GPM
Scenario B:	Scenario A:	1.25 GPM replacing 2.25 GPM
Scenario C:	Scenario B:	1.25 GPM replacing 3.0 GPM

For clarity, the scenario nomenclature used in the OEB approved subsantiation sheets is that which applies below.



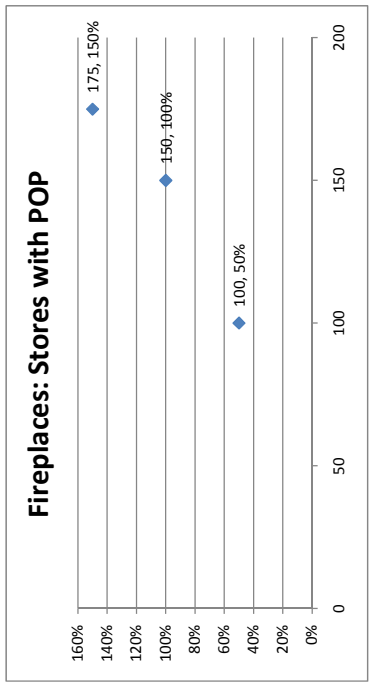
2009 Market Transformation Programs

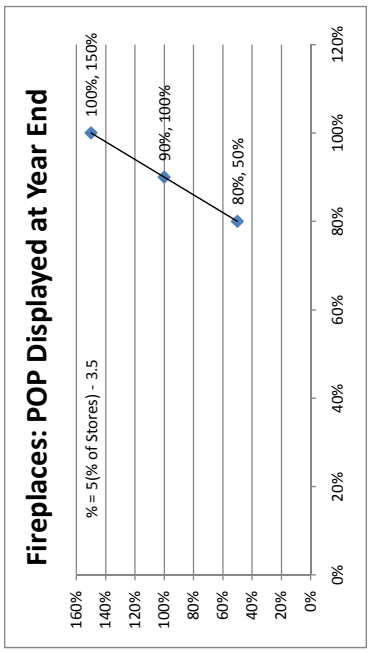
Metrics

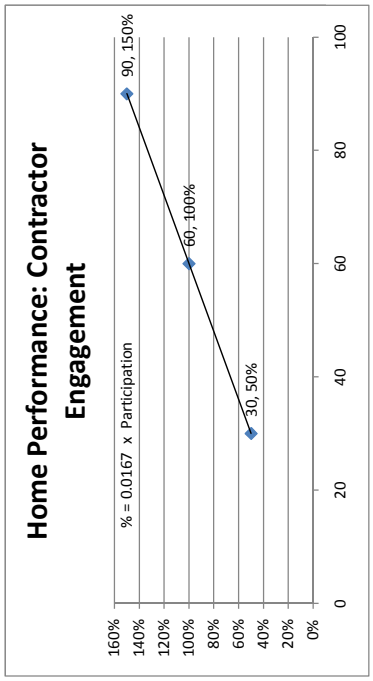
	Program Metrics	2009 100% Target	Weight	50%	100%	150%	Actual Achieved	Applied Weight	SSM at 100% of Target	2009 SSM
EnerGuide for Fireplaces	% Point increase in customer awareness of the EnerGuide label	5 percentage points	35%	0	5	10	1%	21%	$125,000	$ 37,500
	% point increase in the influence of the EnerGuide label on purchase decision	5 percentage points	35%	0	5	10	-2%	0%		
	Number of stores with EnerGuide POP promotional material	150 Stores	15%	100	150	175	97	7%		
	Share of stores which received the EnerGuide POP material which still have it displayed at year end	90%	15%	80%	90%	100%	82%	9%		

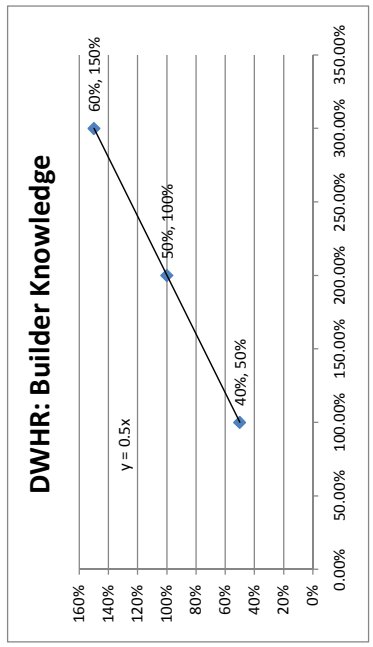
	Program Metrics	2009 100% Target	Weight	50%	100%	150%	Actual Achieved	Applied Weight	SSM at 100% of Target	2009 SSM
Home Performance Contractor	Average Increase in frequency scores of all weatherization measures	Average increase of 0.45	60%	0.3	0.45	0.6	0.3	0.0%	$ 125,000	$ 36,303
	Contractor engagement (participation in workshop)	60 individuals from renovation & contracting	20%	30	60	90	63	21%		
	Contractor training workshop	8 workshops per year	20%	5	8	11	4	8.0%		

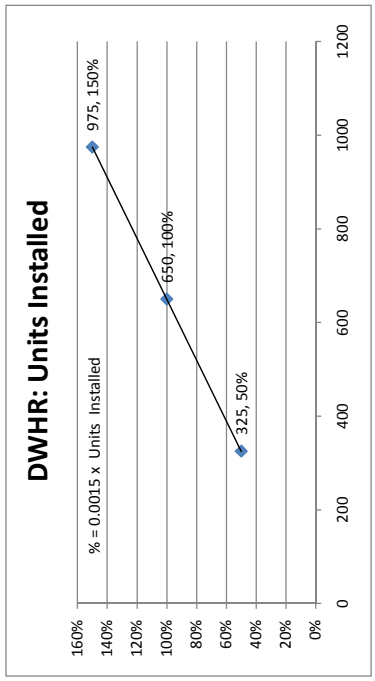
	Program Metrics	2009 100% Target	Weight	50%	100%	150%	Actual Achieved	Applied Weight	SSM at 100% of Target	2009 SSM
Drain Water Heat Recovery	a) Builders Enrolled	12	10%	6	12	16	24	15%	$ 250,000	$ 282,500
	b) Units Installed	650	40%	325	650	975	455	28%		
	c) Builder Knowledge (Answer 2 or more of Below noted key measurements correctly) 1. Knowledge of Program Incentives 2. How the Technology works. 3. Benefit of Technology	50%	15%	40%	50%	60%	71%	23%		
	d) Service Provider Promotion	70%	20%	60%	70%	80%	100%	30%		
	e) Builder Training Workshops	3	5%	1	3	5	5	8%		
	f) Contractor / Sub Workshops	3	5%	1	3	5	3	5%		
	g) Trade Show Promotion	3	5%	1	3	5	3	5%		
									$ 500,000	**$ 356,303**


Fireplaces: Stores with POP
175, 150%
150, 100%
100, 50%
160%
140%
120%
100%
80%
60%
40%
20%
0%
0
50
100
150
200


Fireplaces: POP Displayed at Year End
% = 5(% of Stores) - 3.5
100%, 150%
90%, 100%
80%, 50%
160%
140%
120%
100%
80%
60%
40%
20%
0%
0%
20%
40%
60%
80%
100%
120%


Home Performance: Contractor Engagement
% = 0.0167 x Participation
90, 150%
60, 100%
30, 50%
160%
140%
120%
100%
80%
60%
40%
20%
0%
0
20
40
60
80
100


DWHR: Builder Knowledge
y = 0.5x
60%, 150%
50%, 100%
40%, 50%
160%
140%
120%
100%
80%
60%
40%
20%
0%
0.00%
50.00%
100.00%
150.00%
200.00%
250.00%
300.00%
350.00%


DWHR: Units Installed
% = 0.0015 x Units Installed
975, 150%
650, 100%
325, 50%
160%
140%
120%
100%
80%
60%
40%
20%
0%
0
200
400
600
800
1000
1200

THE CADMUS GROUP, INC.

Date: **September 14, 2010**

To: **Judith Ramsay**

From: **Brian Hedman**

Re: **Corrected Audit Report Tables 1 and 2**

During the final review of the Audit Summary Report an error was found in Tables 1 and 2 of the Audit report. These tables incorrectly included only the business markets portion of the market transformation DSM fixed and variable costs. Corrected versions of these tables are included below. The Adjusted Net TRC Results (for SSM) and Adjusted Net TRC Results (for 2010 Target) are not affected by this error.

Table 1. Adjusted TRC and LRAM Savings

	Draft Annual Report				Audit Adjusted	
Program Area	Participants	Gas Savings (m3)	DSM Fixed and Variable Costs	Net TRC Results	Adjusted Net Gas Savings (for SSM)	Adjusted Net TRC Results (for SSM)
Existing Homes	813,254	14,084,047	$10,234,502	$55,851,242	14,084,047	$58,286,208
Residential New Construction	2,199	2,126,653	$241,527	$2,218,179	2,126,653	$2,218,179
Low Income	18,857	991,192	$1,512,339	$3,021,894	991,192	$3,045,256
Total Residential	**834,310**	**17,201,892**	**$11,988,368**	**$61,091,315**	**17,201,892**	**$63,549,643**
Small Commercial	3,261	2,116,485	$681,906	$5,631,139	2,029,469	$5,413,335
Large Commercial	85	4,939,382	$662,774	$11,728,493	4,941,743	$11,751,835
MUSH	233	10,395,978	$1,232,232	$25,528,858	10,435,933	$25,704,373
Multi-Residential	41,053	15,094,725	$2,333,850	$35,265,374	15,094,725	$35,265,374
Large New Construction	21	2,287,063	$488,615	$7,906,422	2,287,063	$7,906,422
Industrial	120	22,330,732	$2,400,862	$70,984,411	22,330,732	$70,984,411
Total Business Markets	**44,773**	**57,164,364**	**$7,800,239**	**$157,044,697**	**57,119,665**	**$157,025,752**
Market Transformation Programs	0	0	$889,516	$0	-	$0
Program Development	0	0	$155,632	($155,632)	-	($155,632)
Market Research	0	0	$71,084	($71,084)	-	($71,084)
Overheads	0	0	$4,515,222	($4,515,222)	-	($4,515,222)
Total All Programs	**879,083**	**74,366,257**	**$25,420,061**	**$213,394,074**	**74,321,558**	**$215,833,455**

Table 2. Best Currently Available Information Adjusted Savings

	Draft Annual Report				Audit Adjusted	
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 2010 Target)**
Existing Homes	813,254	14,084,047	$10,234,502	$55,851,242	10,887,952	48,988,731
Residential New Construction	2,199	2,126,653	$241,527	$2,218,179	2,126,653	$2,218,179
Low Income	18,857	991,192	$1,512,339	$3,021,894	685,181	$1,889,959
Total Residential	**834,310**	**17,201,892**	**$11,988,368**	**$61,091,315**	**13,699,786**	**$53,096,870**
Small Commercial	3,261	2,116,485	$681,906	$5,631,139	2,029,469	$5,413,335
Large Commercial	85	4,939,382	$662,774	$11,728,493	4,941,743	$11,751,835
MUSH	233	10,395,978	$1,232,232	$25,528,858	10,435,933	$25,704,373
Multi-Residential	41,053	15,094,725	$2,333,850	$35,265,374	15,094,725	$35,265,374
Large New Construction	21	2,287,063	$488,615	$7,906,422	2,287,063	$7,906,422
Industrial	120	22,330,732	$2,400,862	$70,984,411	22,330,732	$70,984,411
Total Business Markets	**44,773**	**57,164,364**	**$7,800,239**	**$157,044,697**	**57,119,665**	**$157,025,752**
Market Transformation Programs	0	0	$889,516	$0	-	$0
Program Development	0	0	$155,632	($155,632)	-	($155,632)
Market Research	0	0	$71,084	($71,084)	-	($71,084)
Overheads	0	0	$4,515,222	($4,515,222)	-	($4,515,222)
Total All Programs	**879,083**	**74,366,257**	**$25,420,061**	**$213,394,074**	**70,819,452**	**$205,380,682**

THE CADMUS GROUP, INC.

Date: **September 9, 2010**

To: **Marco Spinelli**

From: **Brian Hedman**

Re: **Review of 2010 TRC Target**

During the audit of Enbridge's 2009 DSM programs Cadmus reviewed the calculation of the 2010 target. Our review was based on the best information available at the time of the audit. This initial calculation of the 2010 target is documented in the final audit report on page 11.

Subsequent to the completion of the audit of the 2009 programs Enbridge and the EAC agreed to adjust the free-ridership for the residential new construction program from the OEB approved 5% to 48%. The adjustment impacted the TRC calculation for the 2009 programs and, consequently, the calculation of the 2010 target.

Cadmus has reviewed the calculation of the revised 2009 TRC and verified the new value. Cadmus has also recalculated the 2010 target based on the revised 2009 TRC and finds that the target should be $202,342,433.

In conducting our review we verified that the methodology employed adheres to the methodology outlined in the Ontario Energy Board's August 25, 2006 Decision with Reasons in docket EB-2006-0021. Specifically, we verified that:

- The 2007, 2008 and 2009 audited gas savings as adjusted for LRAM were employed
- The 2010 avoided costs were calculated using the same methodology as the calculation of the 2007, 2008 and 2009 avoided costs
- The 2007, 2008 and 2009 TRC results were updated to reflect the 2010 avoided costs
- The 2010 target is the average of the updated 2007-2009 TRC results increased by 1.5 times the budget escalation factor of 5.0%

The following table illustrates the calculation of the revised 2010 target.

Actual Audit 2007 TRC Results	Actual 2007 TRC results for LRAM with 2010 avoided costs	Actual Audit 2008 TRC Results	Actual 2008 TRC results for LRAM with 2010 avoided costs	Latest prepared 2009 TRC Results at Jun 16, 2010	Latest 2009 TRC results (col E) with Final 2010 avoided costs with LRAM changes	2010 Target
A	B	C	D	E	F	=(B+D+F)/3 * 1.075%
$199,798,420	$184,156,243	$182,706,679	$200,474,811	$215,833,455	$180,045,503	$202,342,433

ALLOCATION TO DSM VARIANCE ACCOUNTS

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

Table 1

2009 Rate Allocation by Account

Rate Class	SSM		Market Transformation		LRAM		DSMVA		TOTAL
Rate 1	**$1,442,821**		**$356,303**		**$0**	-	**$1,623,340**	-	**$3,422,464**
Rate 6	**$1,212,288**		**$0**		**$0**	-	**($2,732,008)**	-	**($1,519,720)**
Rate 100	**$473,302**		**$0**		**$0**		**$2,195,163**		**$2,668,465**
Rate 110	**$577,338**		**$0**		**($10,643)**		**$717,937**		**$1,284,632**
Rate 115	**$431,014**		**$0**		**($3,516)**		**($342,829)**		**$84,669**
Rate 135	**$580**		**$0**		**$261**		**($49,150)**		**($48,309)**
Rate 145	**$134,181**		**$0**		**($18,878)**		**$51,758**		**$167,061**
Rate 170	**$736,385**		**$0**		**($12,947)**		**($299,149)**		**$424,289**
Total	**$5,007,909**		**$356,303**		**($45,723)**		**$1,165,062**		**$6,483,551**

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

Table 2

Estimated Impact of DSM Clearance on a Typical Customer

	Annual Volume for Typical Customer (m^3)	Annual Bill for Typical Customer ($)	DSM Amount for Recovery** ($)	Estimated % of Annual Bill
Rate 1	3,064	1,077	2	0.2%
Rate 6	22,606	6,753	(8)	-0.1%
Rate 100	339,188	90,064	9,026	9.1%
Rate 110	9,976,121	2,260,334	22,186	1.0%
Rate 115	4,471,609	946,634	815	0.1%
Rate 145	339,188	80,754	228	0.3%
Rate 170	9,976,121	2,014,241	7,775	0.4%

* Annual bills based on October 1, 2010 rates.

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

1. 2010 AVOIDED COSTS

The purpose of this information is to update commodity costs for 2010, 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 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 latest full year of data available from the IESO. 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 water 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:

2010 Avoided Costs Summary

Year	Water Heating		Space Heating		Heating		Industrial	
	Avoided Costs	NPV	Avoided Costs	NPV	Avoided Costs	NPV	Avoided Costs	NPV
2010	$ 0.278	$ 0.278	$ 0.303	$ 0.303	$ 0.298	$ 0.298	$ 0.2820	$0.28
2011	$ 0.274	$ 0.530	$ 0.303	$ 0.581	$ 0.298	$ 0.571	$ 0.2777	$0.54
2012	$ 0.268	$ 0.754	$ 0.293	$ 0.826	$ 0.288	$ 0.813	$ 0.2710	$0.76
2013	$ 0.294	$ 0.980	$ 0.320	$ 1.072	$ 0.315	$ 1.055	$ 0.2968	$0.99
2014	$ 0.313	$ 1.201	$ 0.345	$ 1.316	$ 0.340	$ 1.294	$ 0.3167	$1.22
2015	$ 0.326	$ 1.412	$ 0.360	$ 1.548	$ 0.354	$ 1.523	$ 0.3301	$1.43
2016	$ 0.334	$ 1.609	$ 0.368	$ 1.766	$ 0.362	$ 1.737	$ 0.3376	$1.63
2017	$ 0.333	$ 1.790	$ 0.367	$ 1.965	$ 0.361	$ 1.933	$ 0.3366	$1.81
2018	$ 0.314	$ 1.945	$ 0.346	$ 2.137	$ 0.340	$ 2.102	$ 0.3172	$1.97
2019	$ 0.320	$ 2.091	$ 0.353	$ 2.297	$ 0.347	$ 2.260	$ 0.3235	$2.12
2020	$ 0.326	$ 2.227	$ 0.360	$ 2.447	$ 0.354	$ 2.407	$ 0.3300	$2.25
2021	$ 0.333	$ 2.354	$ 0.367	$ 2.587	$ 0.361	$ 2.545	$ 0.3366	$2.38
2022	$ 0.340	$ 2.473	$ 0.374	$ 2.718	$ 0.368	$ 2.674	$ 0.3433	$2.50
2023	$ 0.346	$ 2.584	$ 0.382	$ 2.841	$ 0.375	$ 2.794	$ 0.3502	$2.61
2024	$ 0.353	$ 2.688	$ 0.389	$ 2.955	$ 0.383	$ 2.907	$ 0.3572	$2.72
2025	$ 0.360	$ 2.785	$ 0.397	$ 3.062	$ 0.391	$ 3.012	$ 0.3643	$2.82
2026	$ 0.368	$ 2.876	$ 0.405	$ 3.162	$ 0.398	$ 3.110	$ 0.3716	$2.91
2027	$ 0.375	$ 2.961	$ 0.413	$ 3.256	$ 0.406	$ 3.202	$ 0.3791	$2.99
2028	$ 0.382	$ 3.040	$ 0.422	$ 3.343	$ 0.415	$ 3.288	$ 0.3866	$3.08
2029	$ 0.390	$ 3.114	$ 0.430	$ 3.425	$ 0.423	$ 3.368	$ 0.3944	$3.15
2030	$ 0.398	$ 3.183	$ 0.439	$ 3.501	$ 0.431	$ 3.443	$ 0.4023	$3.22
2031	$ 0.406	$ 3.248	$ 0.447	$ 3.572	$ 0.440	$ 3.513	$ 0.4103	$3.29
2032	$ 0.414	$ 3.308	$ 0.456	$ 3.639	$ 0.449	$ 3.579	$ 0.4185	$3.35
2033	$ 0.422	$ 3.365	$ 0.465	$ 3.701	$ 0.458	$ 3.640	$ 0.4269	$3.40
2034	$ 0.431	$ 3.418	$ 0.475	$ 3.759	$ 0.467	$ 3.697	$ 0.4354	$3.46
2035	$ 0.439	$ 3.467	$ 0.484	$ 3.814	$ 0.476	$ 3.751	$ 0.4441	$3.51
2036	$ 0.448	$ 3.513	$ 0.494	$ 3.865	$ 0.486	$ 3.801	$ 0.4530	$3.55
2037	$ 0.457	$ 3.556	$ 0.504	$ 3.912	$ 0.495	$ 3.848	$ 0.4621	$3.60
2038	$ 0.466	$ 3.596	$ 0.514	$ 3.956	$ 0.505	$ 3.891	$ 0.4713	$3.64
2039	$ 0.475	$ 3.634	$ 0.524	$ 3.998	$ 0.515	$ 3.932	$ 0.4807	$3.68

Discount Rate 9.14%

Year	Ont. CPI	Electricity		Water	
		Cents/kWh.	NPV	Water Rates $ / 1000 liters	NPV
2010	1.82	$ 0.083	$ 0.083	$ 1.342	$ 1.342
2011	2.15	$ 0.085	$ 0.161	$ 1.371	$ 2.597
2012	2.32	$ 0.087	$ 0.234	$ 1.402	$ 3.775
2013	2.41	$ 0.089	$ 0.302	$ 1.436	$ 4.879
2014	2.38	$ 0.091	$ 0.366	$ 1.470	$ 5.916
2015	2.43	$ 0.093	$ 0.426	$ 1.506	$ 6.888
2016	2.51	$ 0.096	$ 0.483	$ 1.544	$ 7.802
2017	2.38	$ 0.098	$ 0.536	$ 1.581	$ 8.658
2018	2.17	$ 0.100	$ 0.585	$ 1.615	$ 9.461
2019	2.20	$ 0.102	$ 0.632	$ 1.650	$ 10.212
2020	2.24	$ 0.104	$ 0.675	$ 1.687	$ 10.916
2021	2.24	$ 0.107	$ 0.716	$ 1.725	$ 11.575
2022	2.27	$ 0.109	$ 0.754	$ 1.764	$ 12.192
2023	2.29	$ 0.112	$ 0.790	$ 1.805	$ 12.771
2024	2.26	$ 0.114	$ 0.824	$ 1.846	$ 13.314
2025	2.20	$ 0.117	$ 0.855	$ 1.886	$ 13.822
2026	2.22	$ 0.119	$ 0.884	$ 1.928	$ 14.298
2027	2.19	$ 0.122	$ 0.912	$ 1.970	$ 14.743
2028	2.23	$ 0.125	$ 0.938	$ 2.014	$ 15.160
2029	2.23	$ 0.127	$ 0.962	$ 2.059	$ 15.551
2030	2.10	$ 0.130	$ 0.985	$ 2.102	$ 15.917
2031	2.00	$ 0.133	$ 1.006	$ 2.144	$ 16.258
2032	2.00	$ 0.135	$ 1.026	$ 2.187	$ 16.578
2033	2.00	$ 0.138	$ 1.044	$ 2.231	$ 16.876
2034	2.00	$ 0.141	$ 1.061	$ 2.276	$ 17.155
2035	2.00	$ 0.144	$ 1.077	$ 2.321	$ 17.416
2036	2.00	$ 0.146	$ 1.092	$ 2.367	$ 17.659
2037	2.00	$ 0.149	$ 1.107	$ 2.415	$ 17.887
2038	2.00	$ 0.152	$ 1.120	$ 2.463	$ 18.100
2039	2.00	$ 0.155	$ 1.132	$ 2.512	$ 18.299

Discount Rate 9.14%