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Thursday August 14th, 2008

VIA COURIER

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

Re: Enbridge Gas Distribution Inc. ("Enbridge")
EB-2008-0271 DSM Variance Accounts

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, 2009.

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,

Bonnie Jean Adams
Regulatory Coordinator

cc: Mr. D. O'Leary, Aird & Berlis (via email and courier)
EB-2007-0893 - Intervenor List (via email)

A

GENERAL

1

EXHIBIT LIST

A - ADMINISTRATION

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

EXHIBIT B – EVIDENCE

EXHIBIT	TAB	SCHEDULE	DESCRIPTION
B	1	1	2007 DSM Annual Report
	2	1	Audit Report
	3	1	Auditor's Account Reconciliation Memo
	4	1	Allocation to DSM Variance Accounts
	5	1	2007 DSM Audit Summary Report

EB-2008-0271

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, 2009

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 accounts and the disposition of these balances:

2007 Lost Revenue Adjustment Mechanism Variance Account (2007 LRAM)	$301,289 (to Ratepayers)
2007 Demand Side Management Variance Account (2007 DSMVA)	$616,134 (to Ratepayers)
2007 Shared Savings Mechanism Variance Account (2007 SSM) (comprised of $8,069,895 for Resource Acquisition programs, and $178,151 for Market Transformation)	$8,248,046

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, 2009. 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 for personal service:	500 Consumers Road Willowdale, ON M2J 1P8
Mailing Address:	P.O. Box 650 Scarborough, ON M1K 5E3
Telephone:	416.495-5499
Facsimile:	416.495-6072
E-mail:	EGDRegulatoryProceedings@enbridge.com

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

And

The Applicant's counsel:

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

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

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

Dated: August 12th, 2008, at Toronto, Ontario.

ENBRIDGE GAS DISTRIBUTION INC.

Per: Norm Ryckman

SUMMARY OF APPLICATION

1. Enbridge Gas Distribution Inc. ("Enbridge" or the "Company") is applying to the Ontario Energy Board (the "OEB" or the "Board") pursuant to Section 36 of the Ontario Energy Board Act, 1998, as amended (the "Act") for an Order or Orders approving the final balances in certain 2007 Demand Side Management ("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, 2009. The accounts which are the subject of this Application and the balances recorded are as follows:

2007 Lost Revenue Adjustment Mechanism Variance Account (2007 LRAM)	$301,289 (to Ratepayers)
2007 Demand Side Management Variance Account (2007 DSMVA)	$616,134 (to Ratepayers)
2007 Shared Savings Mechanism Variance Account (2007 SSM) (comprised of $8,069,895 for Resource Acquisition programs, and $178,151 for Market Transformation)	$8,248,046

2. The net impact of the three 2007 DSM accounts is $7,330,623. The Company seeks approval from the Board for clearance of this amount through to rates, as of July 1, 2009.

DSM Framework

3. The variance accounts which are the subject of this proceeding relate to DSM activities in 2007. This was the first year of operation of the DSM Framework approved by the Board by its Decision with Reasons ("Decision") dated August 25, 2006, in the EB-2006-0021 Natural Gas DSM Generic Issues proceeding ("Generic Proceeding"). The methodologies used by the Company to

determine the amounts recorded in each of the 2007 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 2007 consisting of representatives from the Green Energy Coalition, the School Energy Coalition, and Pollution Probe.

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 shared with the EAC and the resulting reports were provided to the auditor.

7. Consistent with the Decision at Issue 9.1, the Company prepared an evaluation report for 2007 titled *F2007 DSM Draft Annual Report* (the "Annual Report") which summarizes the savings achieved, the amounts spent, and how the results were evaluated. The results of the independent review of custom projects were included in the Annual Report. The Annual Report also includes calculations for the 2007 SSM and DSMVA. The LRAM calculation is based upon the figures set out in the Annual Report. This amount was determined while the 2007 results were being audited and is referenced in the Audit Report. A copy of the Annual

Report and the associated LRAM calculation can be found at as Exhibit B, Tab 1, Schedule 1.

8. The Annual Report was circulated for comment to the DSM Consultative April 7, 2008 and the EAC April 5, 2008.

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 EcoNorthwest as the auditor was accepted by the Company.

10. The Company consulted the EAC on the Audit work plan and the report prepared by EcoNorthwest. The EAC subsequently made recommendations respecting the clearance of the DSM variance accounts which were ultimately accepted by the Company.

11. Finally, the auditor verified the calculations underlying the proposed SSM, LRAM and DSMVA amounts. The Audit Report can be found at as Exhibit B, Tab 2, Schedule 1. The Auditor's account reconciliation memo dated July 23, 2008 is filed as evidence at Exhibit B, Tab 3, Schedule 1.

2007 Demand Side Management Variance Account

12. The amount recorded in this account, being a credit to ratepayers of $616,134, is set out and confirmed in the Annual Report (Exhibit B, Tab 1, Schedule 1, p.30) and in the Auditors reconciliation memo at Exhibit B, Tab 3, Schedule 1.

Lost Revenue Adjustment Mechanism Variance Account

13. The calculations supporting the 2007 LRAM based on the volumes in the Annual Report resulted in a variance between budget and actuals of 3.2 million m^3.

Calculated over the various rate classes, this variance resulted in an initial LRAM estimate of a credit to the Company of $199,120. This value was derived as a placeholder until adjustments could be determined in parallel with the audit. Due to the time consuming nature of the LRAM calculation, a final value was not determined until the audit was completed.

2007 Shared Savings Mechanism Deferral Account

14. The Decision provided for a new method of calculating the SSM. This included an SSM cap of $8.5 million. The Annual Report (Exhibit B, Tab 1, Schedule 1, p. 28) calculated an SSM of $8,500,000 for Resource Acquisition programs. In addition, the Annual Report included an incentive claim of $407,517 with respect to Market Transformation programs (Exhibit B, Tab 1, Schedule 1, p. 29).

Recommendations of the Evaluation Audit Committee

15. Following its review of the Annual Report and the Audit Report, the EAC made the following recommendations regarding the 2007 DSMVA, SSM and LRAM:

    a. The EAC recommended accepting the Company's DSMVA calculation of $616,134 being a credit to ratepayers. The Company notes that this is consistent with the auditor's reconciliation.
    b. The EAC recommended a Resource Acquisition SSM of $8,069,895 and a Market Transformation SSM of $178,151. The Company has accepted this recommendation which is also consistent with the auditor's reconciliation.
    c. The EAC also recommended program adjustments for the LRAM calculation resulting in a revised LRAM amount of $301,289 being a credit to ratepayers. The Company has accepted this recommendation. This change is consistent with the auditor's reconciliation.

16. 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 original amounts and the auditor verified the revised calculations.

Proposal for Clearance

17. The net amount which the Company proposes for clearance through to rates is $7,330,623. The Company respectfully requests that these amounts be included in rates, effective July 1, 2009. It should be noted that the proposed July 1st clearance date is consistent with the Board's approval of the Company's incentive regulation plan (EB-2007-0615), which provides for the annual clearance of deferral and variance accounts on July 1st of each year.

18. The allocation methodology applied by the Company was approved by the Decision. Specifically, the methodologies applied were:

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

A breakdown of these allocations can be found at Exhibit B, Tab 4, Schedule 1.

Benefits to Ratepayers

19. The Company's DSM activities in 2007 generated natural gas savings of approximately 85.1 million m^3. Net TRC during this period totaled approximately $166.9 million which correlates to the LRAM valuation.

2008 Target Impacts

20. Under the Decision, the SSM target for 2008 is to be calculated as follows:

> *"The simple average of $150 million and the actual 2007 audited TRC value as approved by the Board, increased by 1.5 times the budget escalation factor (i.e. 7.5 percent). The "actual audited TRC values" shall be the total TRC produced for the year in question, as determined by the audit in the following year. "*[1]

21. The actual 2007 net audited TRC value, as set out in the Auditor's Report, for LRAM purposes is $166.9 million. A question arose within the EAC as to whether the framework approved by the Decision in respect of the setting of an SSM target requires the 2007 audited TRC value to be adjusted for any changes to input assumptions. The EAC recommended and the Company has agreed that for the purposes of setting the SSM target for 2008, adjustments to input assumptions as a result of the 2007 audited LRAM case will be applied. In addition, the EAC recommended and the Company has accepted that for 2008 target setting purposes only, spill over for custom projects should not be included in the net TRC value. The net TRC value used to determine the 2008 SSM target is $163.1 million. The resulting 2008 SSM target is therefore calculated at $168,278,583. The basis for this calculation is shown on page 18 of the 2007 DSM Audit Summary Report at Exhibit B, Tab 5, Schedule 1. The 2008 target has been calculated based on a joint understanding by the Company and the EAC that

[1] EB-2006-0021, Natural Gas Demand Side Management Generic Issues Proceeding, Ontario Energy Board Decision, p. 25

if the 2008 net to gross value, which includes freeridership and custom projects spillover changes in 2008, that such changes will be applied to both target and actual values during the audit of the 2008 results.

B

EVIDENCE

1

ENBRIDGE GAS DISTRIBUTION INC.

DEMAND SIDE MANAGEMENT

F2007 DSM DRAFT ANNUAL REPORT

Prepared for:

Enbridge Gas Distribution Inc.,

DSM Research and Evaluation Group

March, 2008

Table of Contents

1.0 Introduction

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

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

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

1.1 Report Overview

This report presents the results of the Company's DSM program activity for 2007 as compared to the approved DSM plan. 2007 represents the second year of Calendar Year-based reporting of DSM results. The Company's DSM portfolio of programs in 2007 included both resource acquisition programs and market transformation initiatives. The resource acquisition programs are of two types – prescriptive and custom programs. Results for prescriptive programs are calculated based on the number of participants and the deemed savings and related assumptions for specific DSM measures as approved by the Board in the DSM Plan. Results for custom programs are based on engineering calculations for each individual site where efficiency improvements were made.

In addition to the Company's monitoring results, this report also incorporates results of research activities and third party evaluations undertaken in support of the programs as well as information in support of the Company's 2007 SSM claim and its 2007 DSMVA claim.

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1 EBRO 495, Decision, Page 100

The Report is structured as follows:

- Section 2 – 2007 DSM Program Results Summary
- Section 3 – Residential Programs and Performance
- Section 4 – Business Market Results and Performance
- Section 5 – Resource Acquisition Programs TRC Net Benefits and SSM
- Section 6 – Market Transformation Program and SSM
- Section 7 – DSM Cost Summary (DSM Variance Account)
- Section 8 – Evaluation Research Summary
- Section 9 - DSM Best Practices
- Appendix A – Cost Effectiveness results

2.0 2007 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 incentives to maximize participation. Results for 2007 Resource Acquisition Programs are shown below.

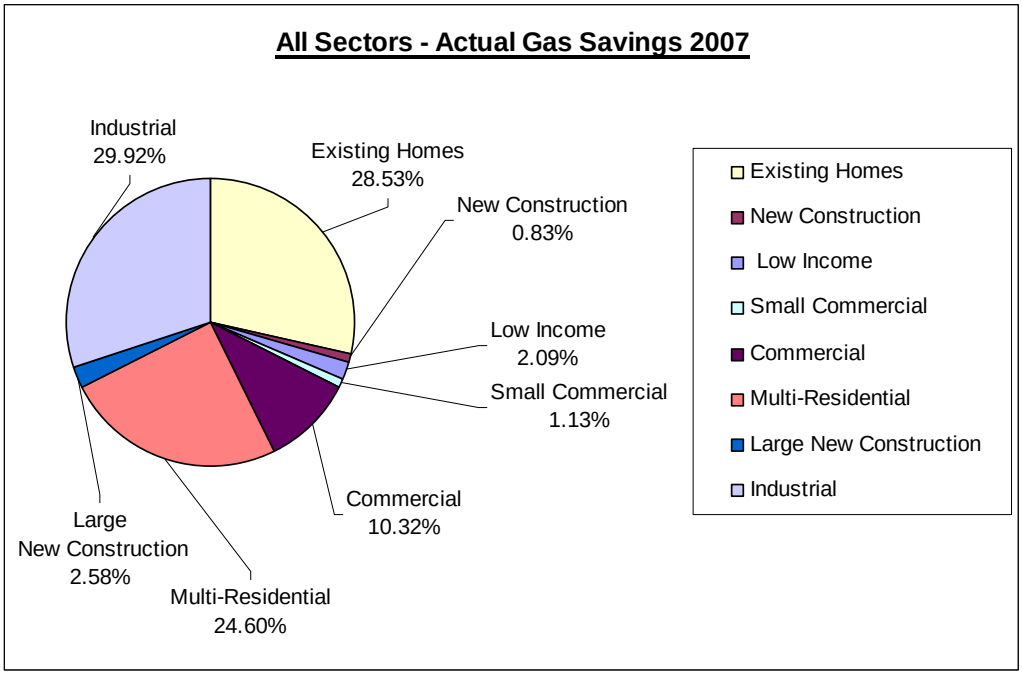
Table 2.1 2007 DSM Program Results

Program Area	Participants	Gas Savings	DSM Fixed & Variable Costs	Net TRC Results
Existing Homes	320,092	26,887,911	$ 6,460,695	$ 77,140,669
Residential New Construction	1,091	782,905	$ 238,905	$ 773,155
Low Income	20,567	1,966,539	$ 1,179,688	$ 6,017,008
Total Residential Markets	**341,750**	**29,637,356**	**$ 7,879,288**	**$ 83,930,832**
Small Commercial	641	1,067,062	$ 194,786	$ 2,115,524
Commercial	141	9,727,542	$ 1,492,808	$ 21,970,227
Multi-Residential	28,430	23,188,272	$ 2,883,472	$ 43,572,419
Large New Construction	56	2,433,345	$ 675,327	$ 6,386,572
Industrial	147	28,201,217	$ 2,333,450	$ 56,525,515
Total Business Markets	**29,415**	**64,617,438**	**$ 7,579,843**	**$ 130,570,257**
Overheads			**$ 5,282,987**	$ (5,282,987)
TOTAL ALL PROGRAMS*	**371,165**	**94,254,794**	**$ 20,742,118**	**$ 209,218,102**

Tracking the number of participants is particularly useful for the Residential Sector where savings are prescriptive and participation is a key variable. It is less useful for Business Markets where savings opportunities for custom projects are targeted based on the size or nature of the load, not necessarily on the number of participants. One large customer may offer significantly more savings than many small ones.

The Multi-Residential program is one exception since it includes both a prescriptive component (over 28,000 suites received a low-flow showerhead) and a custom component (a few hundred building sites received custom energy efficiency retrofit measures).

Figure 2.1 Savings by Program Area



The Company exceeded its annual volumetric savings target by approximately 25%, while DSM expenditures were very close to budget. The Residential sector, consisting of the New and Existing Homes and Low Income programs contributed approximately 30% of the savings, while the Industrial program also contributed about 30% of the savings. For the first time, the Commercial sector, consisting of the Multi-residential, Large and Small Commercial and New Building Construction programs contributed a larger share than either Residential or Industrial.

As in the past, the costs show a converse sector dominance where residential costs accounted for close to 40% of program spending. The delivery of programs to residential customers reflects higher costs per m^3 of gas savings. Within Business Markets, the Multi-Residential sector had the highest costs, reflecting the additional volumetric savings achieved. The Industrial sector again delivered the lowest cost per m^3 savings as it is characterized by very large projects and, because of the capped incentive that applies, incentive costs were disproportionately lower than the gas savings.

The Company's expenditures met the Board's requirements regarding spending on low income programs, i.e., that 14% of residential program expenditures be targeted to Low Income programs and that 14% of the residential market transformation budget also be directed to low income customers. Regarding market transformation, the Board's expectation was that $1 million be expended on market transformation programs. Market transformation costs were tracked through dedicated market transformation accounts for the Residential Sector. In Business Markets they were tracked both through a dedicated account and also as part of overall fixed costs.

In total the Company's DSM portfolio of programs achieved approximately 95 Million m^3 in savings at a direct cost of roughly $16 Million. These savings generated over $209 Million in net TRC benefits to the Province.

3.0 Residential Sector Results

In 2007, Enbridge delivered a comprehensive suite of residential sector programs including both Resource Acquisition programs using traditional incentive based approaches to the market and Market Transformation programs relying on strategic market interventions. Programs were delivered in two generic program areas – existing homes and new construction. Tables 3.1 and 3.2 and Figures 3.1 and 3.2 present summaries of the residential sector Resource Acquisition program results (i.e. the programs that generated natural gas savings and resulting TRC benefits).

Note that resource savings from electricity or water are not shown in this Section, however they are included in the TRC Net Benefits shown here. Detail on the TRC benefits for gas and other resources is provided in the Cost Effectiveness table in the Appendix.

Table 3.1 Residential Sector Program Results – Savings and TRC Benefits

Residential Sector Programs	2007 Net Gas Savings (m^3)			Net TRC Benefits
	Budget	Actual	Variance	Actual
Existing Homes	19,106,284	26,887,911	7,781,627	$ 77,140,669
New Home Construction	723,207	782,905	59,699	$ 773,155
Low Income	1,469,353	1,966,539	497,187	$ 6,017,008
TOTAL RESIDENTIAL	**21,298,843**	**29,637,356**	**8,338,513**	**$ 83,930,832**

Figure 3.1 – Natural Gas Savings

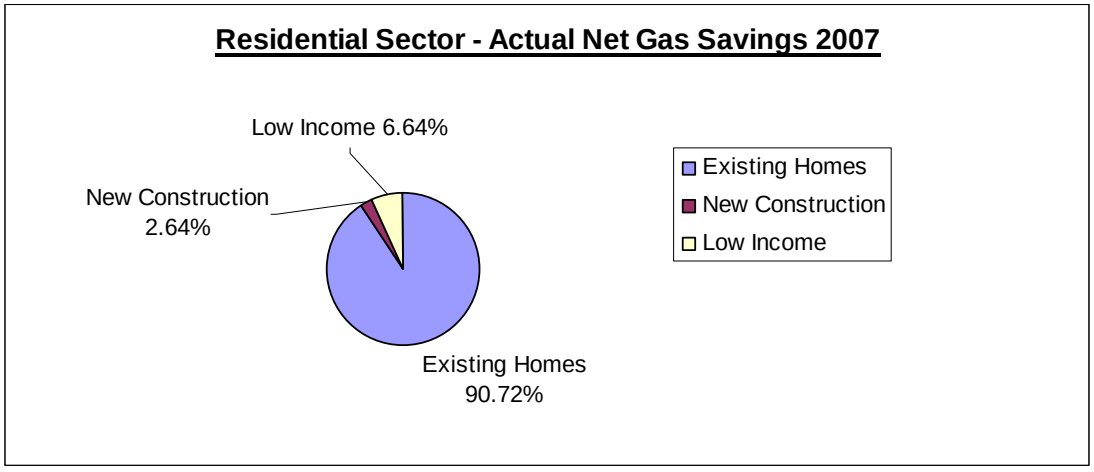
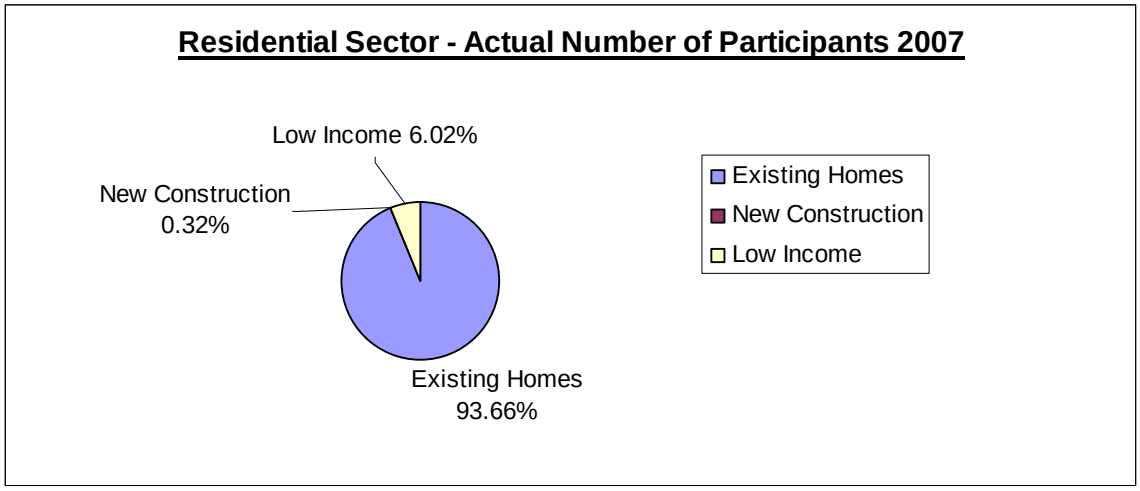


Table 3.2 Residential Sector Program Results – Participants and Program Costs

Residential Sector Programs	Number of Participants			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance
Existing Homes	304,615	320,092	15,477	$ 6,160,405	$ 6,460,669	$ 300,265
New Home Construction	1,030	1,091	61	$ 263,000	$ 238,905	$ (24,095)
Low Income	11,155	20,567	9,412	$ 1,300,000	$ 1,179,688	$ (120,312)
TOTAL RESIDENTIAL	**316,800**	**341,750**	**24,950**	**$ 7,723,405**	**$ 7,879,262**	**$ 155,857**

Figure 3.2 – Number of Participants



As shown, the residential sector programs in total surpassed both their budgeted participant and savings estimates. The majority of both the participants and the savings were in the Existing Homes market, with the New Construction and Low Income programs contributing approximately 10% of the savings. The New Construction share of the savings total exceeds its share of the participant total because of its relatively higher per unit savings.

The sector DSM costs were slightly above budget. In total, the sector generated more than $83 Million in TRC benefits. Individual program results and commentary is provided in Sections 3.2 to 3.7. Detailed cost effectiveness results are provided in the Appendix.

3.1.1 Market Transformation and Market Support.

A selection of Market Transformation (MT) initiatives were also undertaken in the residential sector in 2007. Unlike Resource Acquisition programs which "purchase" energy savings, these programs use strategic market interventions to affect a market transformation. Depending on the target and nature of the program, the outcome could be a structural change in market share, a shift in stocking or purchasing practices or a change in product price. Natural gas (or other energy form) savings are often considered a second order impact of the market transformation.

Given that the focus of a MT program is on market outcomes, the metrics for measuring performance must be consistent with market intervention. As such, MT programs typically establish specific goals regarding level of specific activity, changes in market share, availability of product etc. These metrics are then used in measuring performance. Inherent in this approach is the establishment of a "base line" against which future performance is measured. Table 3.1.1 provides the results for the MT programs, showing budget, actual expenditures, the program metrics and the results. As shown, each program has its own unique set of metrics; these were developed as part of the Multi-year Plan approved by the Board.

Table 3.1.1 Market Transformation Performance Metrics and Results

	Budget	Actual	Program Metrics	metric	achieved
RESIDENTIAL				**100%**	
Channel Support and Development Activities	$ 120,000	$ 67,163			
Low Income	$ 140,000	$ 325,000	Distribution of energy savings kits Enhanced TAPS referrals	N/A	
EnerGuide for Fireplaces	$ 100,000	$ 100,560	Number of stores with EnerGuide point-of-purchase materials	50 stores	**114**
			% increase in awareness of EnerGuide label	+10%	**0%**
			% increase in influence of EnerGuide label on customer purchase	+10%	**0%**
Home Contractor Performance	$ 100,000	$ 71,277	Number of contractor training workshops held	6	**8**
			Increase in frequency of weatherizqation measures implemented	+1	**0.67**
			Number of workshop participants	60	**68**
TOTAL RESIDENTIAL	**$ 460,000**	**$ 564,000**			

As part of its agreement with the OEB the Company developed SSM performance targets for the EnerGuide for Fireplaces and Home Contractor Performance programs where an SSM incentive would be applied if the results exceeded those established as part of the budgeting exercise. Section 6 describes how these metrics are used in the calculation of the SSM.

In addition to the Resource Acquisition and Market Transformation programs, the Company also supports the residential DSM marketing portfolio through a series of research and program development activities. As shown in Table 3.1.2 market research and program development expenditures were less than anticipated in 2007.

Table 3.1.2 Residential Research and Program Development Expenditures

Research and Development Cost Items	DSM Costs		
	Budget	Actual	Variance
Program Development	$ 245,000	$ 142,608	$ 102,392
Market Research	$ 185,000	$ 71,416	$ 113,584
Total Residential Markets	**$ 430,000**	**$ 214,024**	**$ 215,976**

Sections 3.2 to 3.7 provide the individual program results.

3.2 Residential Water Conservation - TAPS Partners

Description: The program offers no-charge installation of a variety of water savings measures. The program relies on 12 contractors (TAPS Partners) for delivery and reporting. Participating contractors visit customers' homes to install showerheads, water pipe wrap and faucet aerators (delivered, not installed)

Objectives: To capture energy savings related to hot water use

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

Tracking Methodology: Monthly reports from the contractors.

Evaluation Activities: Surveys were conducted with over 4,300 participating households. The surveys were designed to determine if the contractors were effectively installing the equipment and if the contractor-reported results were accurate. Where appropriate, the survey results were used to adjust the savings claims.[2] Research was also initiated in 2007 aimed at updating the deemed savings estimates and free ridership rates for showerheads and faucet aerators.

Program Results

TAPS Program	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Showerheads over 2.5 gpm	20,094	71,878	51,784	4,146,799	14,833,463	10,686,664	$ 718,494	$ 3,229,215	$ 2,510,721
Showerheads - 2.1 - 2.5 gpm	34,475	16,776	(17,699)	4,436,933	2,159,071	(2,277,861)	$1,024,597	$ -	$ (1,024,597)
Showerheads - EQ 2.0	29,156	263	(28,893)	2,999,278	27,055	(2,972,223)	$ 866,516	$ -	$ (866,516)
Pipe wrap	82,740	63,076	(19,664)	1,350,317	1,029,400	(320,916)	$ 414,527	$ -	$ (414,527)
Bag test	108,350	125,573	17,223	0	0	0	$ 414,981	$ -	$ (414,981)
Total	**274,815**	**277,566**	**2,751**	**12,933,326**	**18,048,989**	**5,115,663**	**$3,439,115**	**$ 3,229,215**	$ (209,900)

Comments on Results: As shown, participation from the first "bucket" of showerhead types was both above budget and the primary source of savings for the program. This was partly driven by the location of the homes that received the visits, with certain vintages of homes still having showerheads with flow rates over 2.5 gallons per minute. These homes represented a high percentage of the program participants for 2007. As well, a small survey of major retailers indicated that 2.5 gallon units were the predominant (in some cases, the only) unit stocked. As such, even homes that may have recently replaced a showerhead on their own often did so using a "high-flow" one. Note that actual expenditures on this program were below budget values because some of the contractors were not paid a performance incentive as in the past.

2 Savings were adjusted for the non-install and removal rates identified as part of the research.

3.3 Equipment Replacement

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

Objectives: To capture energy savings by upgrading to high efficiency heating systems (Energy Star™ standards, including Installation of a high efficiency heating system (90% or greater AFUE for a forced air furnace, 85% or greater AFUE for a boiler).

Metrics: Number of installations per measure

Tracking Methodology: All measures tracked through rebate processing. Furnace replacements concurrently tracked by contractor submissions.

Evaluation Activities: Research was initiated to update the annual natural gas savings for programmable thermostats and free ridership levels for thermostats and furnaces. A customer survey was used to verify the installation of the Novitherm panels.

Program Results

Equipment Replacement Program	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs (O&M)		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Furnace Replacements	13,000	17,828	4,828	2,602,600	3,569,166	966,566	$1,405,000	$ 2,147,622	$ 742,622
Enhanced Furnace Replacement	0	1,513	1,513	0	(83,593)	(83,593)	$ -	$ 59,513	$ 59,513
Programmable Thermostats	11,100	16,704	5,604	2,094,348	3,151,711	1,057,363	$ 291,790	$ 376,457	$ 84,667
Novitherm Panels	4,000	2,312	(1,688)	554,400	320,443	(233,957)	$ 902,000	$ 455,521	$ (446,479)
Total	**28,100**	**39,870**	**11,770**	**5,251,348**	**7,260,629**	**2,009,281**	**$2,598,790**	**$ 3,039,113**	**$ 440,323**

Comments on Results: The Equipment Replacement Program surpassed budget projections, with particularly strong results coming from the Furnace Replacement and Programmable Thermostat components. The furnace results were more than 6,000 units higher than in 2006. Much of the success for these two components stems from the use of multiple bill inserts that had not been contemplated in the original design. This is known to be a particularly effective marketing approach.

Enhanced Furnace Replacements targeting furnaces using ECM motors had not been planned for 2007. Results for this component are “grand-fathered” from the 2006 program wherein the Company agreed to pay incentives on these units for the first 90 days of 2007. The Novitherm Panel component did not meet its targeted participation level due to a later than anticipated launch date for the program.

The greater than anticipated number of furnaces and thermostats resulted in correspondingly higher O&M costs. These were partially off-set by lower O&M costs for the Novitherm Panel component. In total, the Equipment Replacement Program exceeded its budget O&M by approximately $440,000.

3.4 Residential Retrofit - EnerGuide for Houses

Description: The program promotes improvements to building envelope and/or mechanical systems by offering an incentive of a $75.00 “on bill” rebate to homeowners who complete a “B” assessment and who qualify for a federal grant through a participating service organization

Objectives: To capture energy savings by encouraging home owners to complete retrofit work and "B" assessment of the EnerGuide for Houses program before final program termination of March 31, 2007.

Metrics: Number of participating homes.

Tracking Methodology: Participants are tracked through rebate processing.

Evaluation Activities: Not applicable

Program Results

Retrofit Program (EnerGuide for Houses)	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Envelope Improvements	**1,500**	**2,592**	**1,092**	**911,490**	**1,575,055**	**663,565**	**$ 112,500**	**$ 191,042**	**$ 78,542**

Comments on Results: Natural Resources Canada cancelled this program, with a sunset date of March 31, 2007. The Company amplified its marketing and communications activities to ensure potential participants were aware of the deadline. In combination with other media coverage of the cancellation of the program, participant awareness of the deadline and the desire to receive the incentive resulted in higher than anticipated participation. The higher savings and O&M expenditures reflect the higher participation level.

3.5 EnergyStar™ Appliances – Front Load Washers

Description: The program offers an incentive of $50.00 to customers who have purchased an Energy Star™ front load washer. This program expired in February, 2007.

Objectives: Save natural gas through lower hot water consumption, reduced electricity from shorter dryer run cycles, and reduced water consumption

Metrics: Number of Energy Star™ front load washers purchased

Tracking Methodology: Participants are tracked through rebate processing.

Evaluation Activities: Market share and product availability research undertaken in 2007 indicated that the share of front loading washers and their general availability are significant enough to deem the market transformed.

Program Results

EnergyStar Appliances	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Front Load Axis Washer	**200**	**64**	(136)	**10,120**	**3,238**	(6,882)	**$ 10,000**	**$ 1,300**	$ (8,700)

Comments on Results: Based upon market research that indicated that the market was significantly transformed, the Company proactively ceased operating the program in February, 2007. This resulted in lower than anticipated participation and corresponding lower gas savings.

3.6 New Home Construction

Description: Recognizing that the market currently supports two predominant residential building labels, Enbridge offers two initiatives in the New Home Program portfolio supporting the two labels. The EnerGuide for New Houses Program promotes improvements to building envelope and mechanical systems by encouraging builders to participate in NRCan's EnerGuide for New Houses Program. Enbridge offers an incentive of $100 to builders for each EnerGuide labeled home. Similarly the EnergyStar Program also encourages builders to consider building envelope andother energy efficiency improvements by offering $100 to builders for each EnergyStar labeled house. It is expected that the market will continue a transition towards the EnergyStar label in the future.

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

Metrics: Number of new homes that achieve either the EnerGuide or EnergyStar qualification and receive an Enbridge incentive.[3]

Tracking Methodology: Builders prepare reports and provide supporting documentation on the number of homes achieving either qualification.

Evaluation Activities: Not applicable

Program Results

New Homes Progams	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
EnerGuide for New Houses	270	227	(43)	132,611	111,491	(21,119)	$ 87,000	$ 60,738	$ (26,262)
EnergyStar for New Houses	760	864	104	590,596	671,414	80,818	$ 176,000	$ 178,167	$ 2,167
Total New Construction	**1,030**	**1,091**	**61**	**723,207**	**782,905**	**59,699**	**$ 263,000**	**$ 238,905**	$ (24,095)

Comments on Results: The EnergyStar labeled homes continued to increase their share of the labeled homes market, while the EnerGuide labeled homes were below the projection. EnergyStar also experienced strong growth, surpassing 2006 results by more than 200 homes. In total, the program tracked very close to budgeted levels.

3 The EnergyStar home has a more comprehensive set of energy savings technologies than EnerGuide including electricity savings measures. These differences are reflected in the per unit savings and equipment cost assumptions.

3.7 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 (including the TAPS contractors) for delivery and reporting. The Weatherization program focuses on improving the homes' thermal envelope characteristics through ceiling and wall insulation as well as caulking and air sealing.[4] The Low Income programs are directed to customers in single family homes.

Objectives: To ensure that low income customers participate to the highest degree possible in the various program offerings.

Metrics: Number of installations per measure

Tracking Methodology: Monthly reports from the contractors.

Evaluation Activities: Not applicable

Program Results

Low Income Progam	Number of Participants			2007 Net Gas Savings			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Showerheads	2,900	4,455	1,555	631,722	970,455	338,733	$ 78,411	$ 864,776	$ 786,365
Pipe wrap	3,200	5,011	1,811	53,856	84,335	30,479	$ 13,632	$ -	$ (13,632)
Bag test	3,200	7,033	3,833	0	0	0	$ 21,200	$ -	$ (21,200)
Prog Thermostats	1,500	4,007	2,507	314,820	840,989	526,169	$ 145,000	$ -	$ (145,000)
Weatherization	355	61	(294)	468,955	70,760	(398,195)	$ 1,041,757	$ 314,912	$ (726,845)
Total Low Income	**11,155**	**20,567**	**9,412**	**1,469,353**	**1,966,539**	**497,187**	**$ 1,300,000**	**$1,179,688**	$ (120,312)

Comments on Results: The Low Income results are dominated by the water savings components which saw greater than anticipated results due to the strong activity from the TAPS partners. The programmable thermostat component of the TAPS program also saw greater than anticipated results. Weatherization results were lower than expected due to limitations on the number of trained delivery agents. As a result, the program did not experience a franchise-wide roll-out.

Spending on the Low Income programs exceeded the Board's requirement that 14% of residential program costs be directed to low income customers.

4 Note that the weatherization component uses Green$aver as the delivery agent.

4.0 Business Sector Results

In 2007, Enbridge delivered business sector results in five major segments: Small Commercial, Large Commercial/Institutional, Multi-residential, New Construction and Industrial, including both Resource Acquisition programs using traditional incentive based approaches to the market and Market Transformation programs relying on strategic market interventions.

In the process of identifying opportunities for gas savings through custom projects, Enbridge's Energy Solutions Consultants (ESCs) may encounter additional opportunities, where the gas measure also enables electricity or water savings. Although the Company has been providing customized solutions to its large gas users, in the past electricity and water savings have not been assessed. In April 2006, the Company sought and was granted confirmation from the Board to account for electricity and water savings arising from these custom projects.

The 2007 results reflect the expansion of the scope to include electricity and water savings results. Resource savings from electricity and water are not detailed in this Section, however they are included in the TRC results shown here. Detail on the TRC benefits for gas and other resources is provided in the Cost Effectiveness table in the Appendix.

Tables 4.1 and 4.2 and Figures 4.1 and 4.2 present summaries of the business sector Resource Acquisition program results (i.e. the programs that generated natural gas savings and resulting TRC benefits).

The Business Markets in total achieved approximately 65 Million m^3 in savings. This was approximately 20% higher than budgeted, however close to what was achieved in 2006. Most of the variance can be explained by greater than anticipated results in the Private Multi-residential and Industrial sectors. These sectors have seen strong growth in savings over the past 2 years, underscoring the targeted marketing for these markets. Together they account for approximately 80% of the total Business Markets results (see Figure 4.1).

The sector DSM costs were slightly above budget. In total, the sector generated more than $130 Million in TRC benefits. Individual program results and commentary is provided in Sections 4.2 to 4.5. Detailed cost effectiveness results are provided in the Appendix.

With the exception of the prescriptive programs in the Small Commercial segment and water savings measures in the Multi-residential segment, the Company does not develop estimates of the number of participants for Business Market programs. The Business Markets target setting approach focuses on m^3 savings, not number of participants. In reporting program results, the Multi-Residential program includes both a prescriptive component (over 28,000 suites received a low-flow showerhead) and a custom component (a few hundred building sites received custom energy efficiency retrofit measures).

Table 4.1 Business Sector Program Results – Savings and TRC Benefits

Business Sector Programs	2007 Net Gas Savings (m3)			Net TRC Benefits
	Budget	Actual	Variance	Actual
Small Commercial	3,527,657	1,067,062	(2,460,595)	$2,115,524
Large Commercial	9,846,915	9,727,542	(119,373)	$21,970,227
Multi-Residential	12,737,030	23,188,272	10,451,242	$43,572,420
Large New Construction	2,310,000	2,433,345	123,345	$6,386,572
Industrial	20,671,000	28,201,217	7,530,217	$56,525,515
TOTAL BUSINESS MARKETS	**49,092,602**	**64,617,438**	**15,524,836**	**$130,570,258**

Figure 4.1 – Natural Gas Savings

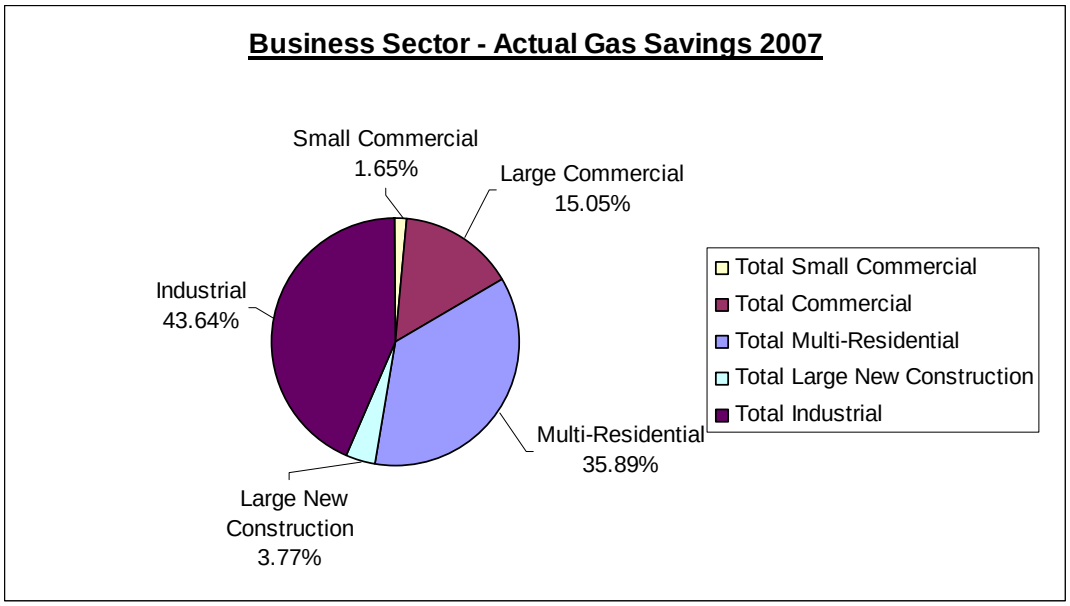
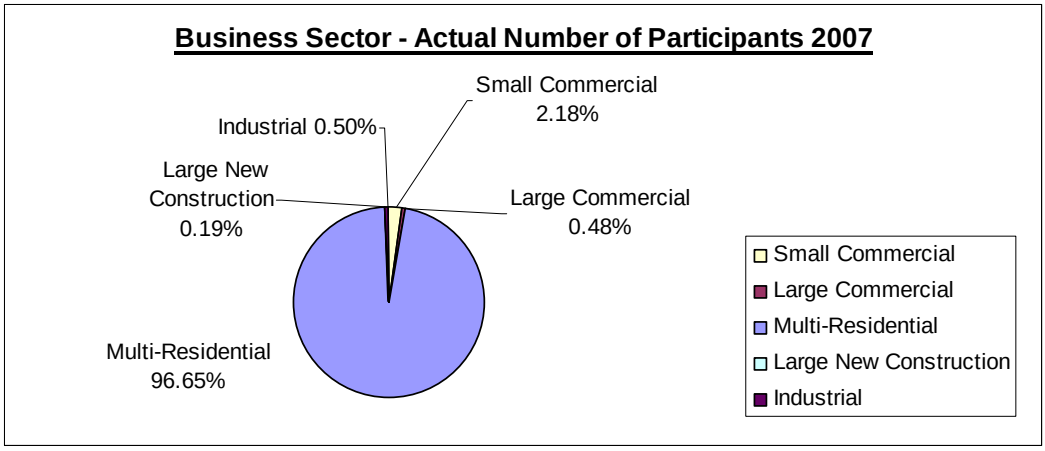


Table 4.2 Business Sector Program Results – Participants and Program Costs

Business Sector Programs	Participants*	DSM Fixed & Variable Costs		
	Actual	Budget	Actual	Variance
Small Commercial	641	$458,050	$194,786	($263,264)
Large Commercial	141	$1,651,511	$1,492,808	($158,703)
Multi-Residential	28,430	$2,114,960	$2,883,472	$768,512
Large New Construction	56	$450,796	$675,327	$224,531
Industrial	147	$2,716,093	$2,333,450	($382,643)
TOTAL BUSINESS MARKETS	**29,415**	**$7,391,410**	**$7,579,843**	**$188,433**

* Budget participant values are not derived

Figure 4.2 – Number of Business Sector Participants



4.1.1 Prescriptive Programs

The Company offers four commercial sector programs that are prescriptive in nature focusing on multi-residential water savings measures and small commercial space heating measures. As with prescriptive programs in the Residential sector, these are tracked through participant rebate applications or through business partner reporting.

4.1.2 Custom Projects

The majority of programs in the Business Markets however are classified and treated as "custom projects" for which the energy savings and incremental costs are determined on an individual project basis. While the programs might be marketed under branded names such as "Steam Saver" or "Monitoring and Targeting", the savings, equipment costs and incentive payments are tracked and reported through individual custom applications for each project wherein the incentive amount is determined using a dollar per m^3 index. Custom project applications are submitted to the Company through the

combined efforts of Enbridge Energy Solutions Consultants (ESCs), consulting engineers, and a host of delivery channel partners including HVAC contractors, equipjment suppliers and ESCOs. In any given year, the Company processes hundreds of these custom project applications.

As in previous years, an independent engineering review was undertaken to validate the savings estimates for custom projects. Summaries of the engineering reviews for custom projects in the Commercial and Industrial sectors are found in Section 8.

The 2003 Monitoring and Evaluation Report[5] identified the existence of distinct decision types in the business markets with respect to replacement and advancements. The tracking and evaluation of the 2007 custom projects relied on those definitions. For advancement projects the savings and incremental costs were adjusted using the approach identified in the 2003 Monitoring and Evaluation Report.[6] This adjustment shortens the life over which the savings are claimed and correspondingly adjusts the incremental cost of the equipment to reflect the assumption that the investment would have been made at a future date. The adjustment method was updated through the 2006 DSM audit. The updated method was then applied to the 2007 results.

The calculation of incremental costs for custom projects for the SSM calculation reflects the Settlement Agreement in the 2003 Rates Case. That is, for the purposes of the SSM calculation, the incremental costs drawn from the actual project records are applied.[7] The measure life for technologies commonly used in the custom projects were approved through the Natural Gas DSM Generic Issues Proceeding – Phase III.[8]

4.1.3 Market Transformation and Market Support

Like the Residential sector, the Business Markets also implemented market transformation initiatives in 2007. Two major areas of effort were undertaken focusing on the high efficiency boiler and HVAC/designer markets.

Table 4.1.1 provides the results for the MT programs, showing budget, actual expenditures, the program metrics and the results. As shown, each program has its own unique set of metrics as approved in the DSM Multi-year Plan. The values shown in the results column correspond to number of events, number of attendees, or results in terms of increased awareness. Section 6 describes how these metrics are used in the calculation of the SSM.

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5 Original EB-2005-0001, Exhibit A7, Tab12, Schedule 1, Page 43-44

6 IBID

7 Subject to the advancement adjustment.

8 OP CIT

Table 4.1.1 Market Transformation Performance Metrics and Results

BUSINESS MARKETS				**100%**	
Development Activities	$ 40,000	$ 20			
Boiler Market Transformation	$ 300,000	$ 43,651	% increase in engineer and contractor awareness of high efficiency boilers	+20%	**55%**
			Establishment of industry reporting structure for boiler sales	developed & in-use	**incomplete**
			Development of Benefit/Cost Sales Tools	developed & launched	**incomplete**
			Number of training events held	3	**1**
			Number of training participants	60	**40**
			Number of trade show exhibits	3	**3**
Business Partners	$ 200,000	$ 34,078	Establish baseline awareness of key market players, early adopters	Base established	**complete**
			% increase in awareness of Consulting Engineers & ESCO	+10%	**n/a**
			% increase in awareness of Manufacturers, Distributors, Contractors	+10%	**n/a**
			Number of training events held	4	**0**
			Number of training participants	40	**0**
			Number of technical guides and case studies developed	4	**0**
TOTAL BUSINESS MARKETS	**$ 540,000**	**$ 77,749**			

In addition to the expenditures directed to specific market transformation programs, a portion of the Fixed Costs in Business Markets is directed to general market transformation activities such as trade shows, promotion, and sponsorships.

In addition to the resource acquisition and market transformation programs, the Company also supports the Business sectors DSM portfolio through program development activities. These efforts ensure that the programs are supported by an appropriate foundation of market knowledge and information. Table 4.1.2 shows the program development expenditures.

Table 4.1.2 Business Market Research and Program Development Expenditures

Research and Development Cost Items	DSM Costs		
	Budget	Actual	Variance
Program Development	$450,000	$384,630	$65,370
Total Business Markets	**$450,000**	**$384,630**	$65,370

Program development expenditures were less than anticipated in 2007. Commercial technology development costs consisted of a significant re-vamping of the E-Tools energy savings calculator.

Sections 4.2 to 4.5 provide the individual program results.

4.2 Commercial Sector Results

Program activities in the commercial sector are categorized into Small Commercial and Large Commercial with the Small Commercial sector consisting of prescriptive type programs while the Large Commercial consists of segment[9] targeted custom programs.

Since individual custom projects vary greatly in size, targets in the commercial sector are set in terms of total gas savings for each market segment, irrespective of the number of participants. As shown in the accompanying tables the actual number of participants is tracked and reported.

In total, the sector was slightly below the savings target largely as a result of lower results in two segments. Costs were similarly lower due to lower variable costs in the form of incentives. Sections 4.2.1 and 4.2.2 provide the detailed Commercial sector results.

9 Projects are reported in 10 commercial sector segments – colleges/universities, government, hotel/motel, hospitals, long-term health care, offices, schools, retail, warehouse, other.

4.2.1 Large Commercial

Description: The Large Commercial program portfolio offers customers in the target segments a comprehensive suite of potential technologies and measures using incentives for both third party energy audits and equipment retrofits. Measures include boiler retrofits, improvements to HVAC systems, building automation systems, building envelope improvements and steam trap replacement. Delivery channels include performance and HVAC contractors, consulting engineers and designers, energy management firms and building and industry associations.

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

Metrics: Number of projects and per project savings

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

Evaluation Activities: 3rd party engineering review of a sample of projects as part of the annual evaluation activity for custom projects

Program Results

Large Commercial Program	Participants	2007 Net Gas Savings (m3)			DSM Fixed & Variable Costs		
	Actual	Budget	Actual	Variance	Budget	Actual	Variance
College/University	14	587,284	768,555	181,271	$87,949	$157,662	$69,713
Government	15	1,204,295	1,876,960	672,665	$180,943	$294,071	$113,128
Hospitals	8	4,186,554	2,551,962	(1,634,592)	$480,914	$276,961	($203,953)
Hotel/Motel	6	468,711	729,811	261,100	$131,416	$148,008	$16,592
Long Term Health Care	3	275,798	85,527	(190,271)	$54,700	$8,437	($46,263)
Office	14	946,681	1,371,052	424,371	$243,909	$229,869	($14,040)
Other Commercial	24	716,470	756,591	40,121	$120,793	$159,178	$38,385
Retail	6	168,917	232,533	63,616	$30,541	$48,479	$17,938
School	46	1,027,991	1,099,004	71,013	$272,286	$145,309	($126,977)
Warehouses	5	264,214	255,547	(8,667)	$48,060	$24,836	($23,225)
Total Large Commercial	**141**	**9,846,915**	**9,727,542**	(119,373)	**$1,651,511**	**$1,492,808**	($158,703)

Comments on Results: With the exception of the Hospital segment, activities and results were very close to expectations. Hospital results were lower due to unanticipated lag times in capital expenditures for at least one major project. Hotel/Motel results were higher due to promotion of the program by the 2 major industry associations. Enbridge worked closely with the associations in developing the promotional materials and engaging their respective members. Office results were higher than anticipated due to the combined effects of co-marketing with the BOMA CDM program and higher than anticipated per project savings. In total, the Large Commercial sector met the savings target for 2007, although this represented a decrease from the 2006 results. Actual expenditures were slightly below budget for the sector even though the savings target was achieved. This relates to the incentive cap having been met on a number of larger projects.

4.2.2 Small Commercial

Description: The Small Commercial program in 2007 provided prescriptive incentives for technologies prevalent in the sector including controls for ventilation, pre-rinse spray valves for commercial kitchens, higher efficiency roof-top units, tankless water heaters, and programmable thermostats. The prescriptive savings assumptions for these programs were approved in the Natural Gas DSM Generic Issues Proceeding, Phase II and Phase III. The kitchen ventilation, rooftop units, and tankless water heater efforts were new initiatives by Enbridge for this sector. The delivery of the program primarily relied on external business partners, channel consultants and manufacturers.

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

Metrics: Number of units installed.

Tracking Methodology: Monthly tracking reports provided by business partners and as part of rebate processing.

Evaluation Activities: n/a

Program Results

Small Commercial Program	Number of Participants			2007 Net Gas Savings (m3)			DSM Fixed & Variable Costs		
	Budget	Actual	Variance	Budget	Actual	Variance	Budget	Actual	Variance
Demand Control Kitchen Ventilation	100	21	(79)	560,500	213,884	(346,616)	$150,000	$32,926	($117,074)
High Efficiency Furnace	173	101	(72)	54,949	44,462	(10,487)	$20,300	$17,550	($2,750)
Pre-Rinse Spray Valve	1,100	290	(810)	2,543,530	670,567	(1,872,963)	$165,000	$99,786	($65,214)
Rooftop Units	50	21	(29)	60,563	25,436	(35,127)	$32,500	$22,661	($9,839)
Tankless Water Heaters	150	67	(83)	121,275	54,170	(67,106)	$77,500	$18,336	($59,164)
Thermostats	450	141	(309)	186,840	58,543	(128,297)	$12,750	$3,527	($9,223)
Total Small Commercial	**2,023**	**641**	(1,382)	**3,527,657**	**1,067,062**	(2,460,595)	**$458,050**	**$194,786**	($263,264)

Comments on Results: The 2007 results were lower than anticipated across all technologies. As new initiatives, the rooftop, tankless water heaters and kitchen ventilation were slow to achieve uptake. The pre-rinse spray valve which had significantly over-achieved its target in 2006 suffered from delivery channel challenges in 2007. Furnace and programmable thermostat results, while lower than target, did see three-fold increases over 2006 results.

4.3 Multi-Residential

Description: The Multi-residential program in 2007 provided a combination of prescriptive and custom incentives across a broad spectrum of potential technologies and measures. The program relied on multiple contacts to the marketplace, both public and private and included new initiatives aimed at re-commissioning and commercial front load washers in communal laundry rooms.

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

Metrics: Number of units installed and per project savings.

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

Evaluation Activities: 3rd party engineering review of a sample of projects as part of the annual evaluation activity for custom projects

Program Results

Multi-Residential Program	Participants	2007 Net Gas Savings (m3)			DSM Fixed & Variable Costs		
	Actual	Budget	Actual	Variance	Budget	Actual	Variance
Non-Profit	7	1,225,000	345,754	(879,246)	$264,476	$136,141	($128,335)
Private	273	9,086,000	18,921,722	9,835,722	$1,653,234	$2,515,596	$862,362
Recommissioning	1	350,000	34,564	(315,436)	$55,000	$30,688	($24,312)
Front Load Washers	1,471	338,580	452,774	114,194	$90,000	$118,682	$28,682
Showerheads/Aerators	26,678	1,737,450	3,433,459	1,696,009	$52,250	$82,365	$30,115
Total Multi-Residential	**28,430**	**12,737,030**	**23,188,272**	**10,451,242**	**$2,114,960**	**$2,883,472**	**$768,512**

Comments on Results: 2007 saw significant results from the private multi-residential segment as the Company made a concerted effort to capitalize on opportunities that had been identified in 2006. This segment alone accounted for 75% of the results for the multi-residential sector and the majority of the variance. The non-profit segment saw a decrease compared to both the target and the 2006 results, reflecting the challenges of engaging this segment where investments in energy efficiency are often a low priority. Re-commissioning, which is a systematic process that ensures all systems in a building perform interactively according to operational needs was a new initiative that was challenged by long lead times inherent in the bidding process. A number of projects were coming forward by year-end and will be expected to participate in 2008. Front loading washers in apartment laundry rooms saw strong results as the Company engaged a large number of building operators interested in the program. In spite of the large positive variance in the savings, the DSM Costs were relatively close to budget as many of the multi-residential projects achieved their incentive cap.

4.4 Large New Construction

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

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

Metrics: Number of projects and per project savings.

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

Evaluation Activities: 3rd party engineering review of a sample of projects as part of the annual evaluation activity for custom projects

Program Results

New Construction Program	Participants	2007 Net Gas Savings (m3)			DSM Fixed & Variable Costs		
	Actual	Budget	Actual	Variance	Budget	Actual	Variance
Total Large New Construction	**56**	**2,310,000**	**2,433,345**	**123,345**	**$450,796**	**$675,327**	**$224,531**

Comments on Results: The program saw a greater number of projects in 2007 versus 2006, closely matching its savings target. Targeted savings were lowered for 2007 versus 2006 with the expectation that some market confusion and realignment may occur with the cancellation of Natural Resources Canada's Commercial Building Incentive Program in 2006. The Company is encouraged by the level of participation and continuing interest in the program.

4.5 Industrial

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

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

Metrics: Number of projects and per project savings.

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

Evaluation Activities: 3rd party engineering review of a sample of projects as part of the annual evaluation activity for custom projects

Program Results

Industrial Sector Programs	Participants	2007 Net Gas Savings (m3)			DSM Fixed & Variable Costs		
	Actual	Budget	Actual	Variance	Budget	Actual	Variance
Industrial - Agriculture	26	1,421,000	1,728,689	307,689	$168,755	$192,671	$23,916
Industrial - Other Industrial	121	19,250,000	26,472,528	7,222,528	$2,547,338	$2,140,779	($406,559)
Heat Recovery	20		3,707,460				
HVAC	26		8,453,969				
Process Efficiency	28		9,212,295				
Steam	44		5,098,805				
Total Industrial	**147**	**20,671,000**	**28,201,217**	**7,530,217**	**$2,716,093**	**$2,333,450**	($382,643)

Comments on Results: In 2007, the Industrial sector again benefited from participation from a number of large projects where the incentive cap of $30,000 was reached. As a consequence, the variable costs were significantly under budget. These large projects were also the primary reason for the higher than anticipated savings. Fixed costs were also under budget as spending on promotion was less than expected and given the level of success, a ramp up in expenditures was not seen to be required. The Agriculture program continues to see strong interest from the greenhouse growers in the Niagara region.

5.0 Resource Acquisition Programs TRC Net Benefits and SSM Results

This section presents the cost effectiveness results for the 2007 DSM portfolio. Results are presented at both the sector and program level. Further detail is provided in the Cost Effectiveness table in the Appendix.

5.1 Background

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

TRC results are contrasted against the budgeted TRC net benefits for the portfolio plan for 2007 as approved in the Board's Decision. Plan details include volumetric targets, portfolio budget, and related assumptions for equipment cost, free ridership and measure lives.

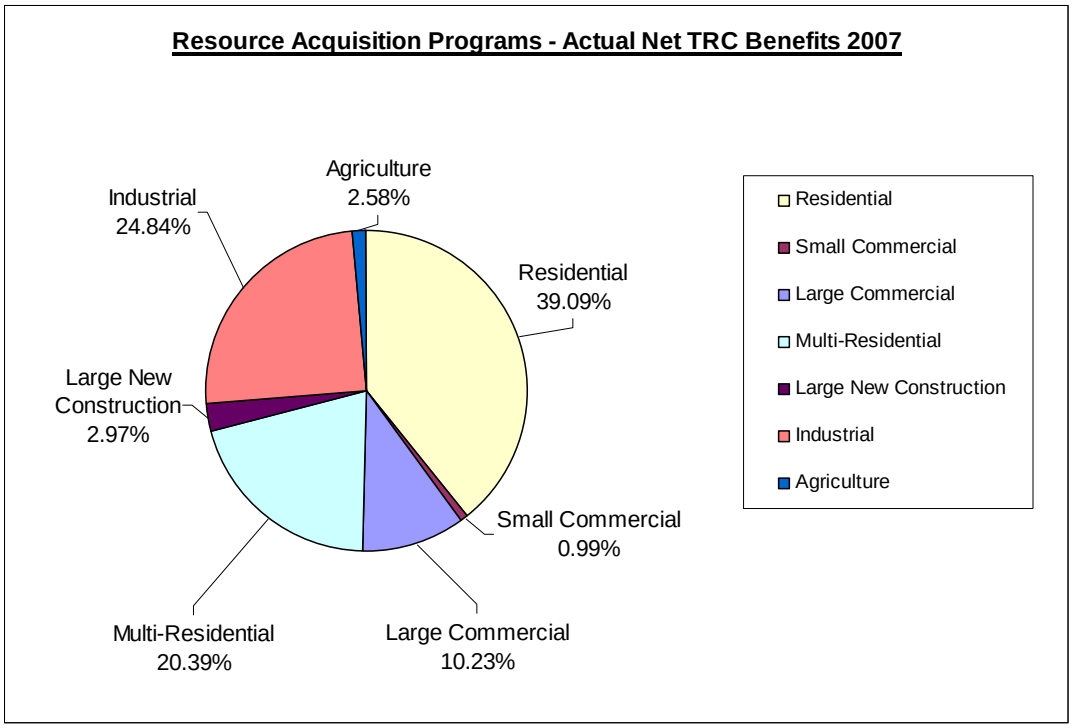
5.2 TRC Results by Sector

Table 5.1 and Figure 5.1 provide the TRC results for the Resource Acquisition programs, showing budget and actual results. As shown, the portfolio exceeded budget TRC by approximately $50 Million – a 31% variance.

Table 5.1: Summary of 2007 TRC Results

Resource Acquisition Programs	Budget TRC	Actual TRC	Variance	Variance (%)
Residential	$ 58,310,233	$ 83,930,832	$ 25,620,599	44%
			$ -	
Small Commercial	$ 6,441,206	$ 2,115,524	$ (4,325,682)	-67%
			$ -	
Large Commercial	$ 24,626,094	$ 21,970,227	$ (2,655,867)	-11%
			$ -	
Multi-Residential	$ 29,540,111	$ 43,572,420	$ 14,032,309	48%
			$ -	
Large New Construction	$ 6,179,402	$ 6,386,572	$ 207,170	3%
			$ -	
Industrial	$ 38,511,605	$ 53,340,860	$ 14,829,255	39%
			$ -	
Agriculture	$ 1,781,897	$ 3,184,655	$ 1,402,758	79%
			$ -	
2007 TOTAL DSM PROGRAMS	**$ 165,390,548**	**$ 214,501,090**	**$ 49,110,542**	**30%**
Program Dev & Market Research	$ (880,000)	$ (598,655)	$ 281,345	-32%
			$ -	
Overheads	$ (5,005,186)	$ (4,684,332)	$ 320,854	-6%
			$ -	
2007 TOTAL DSM PORTFOLIO	**$ 159,505,362**	**$ 209,218,103**	**$ 49,712,741**	**31%**

Figure 5.1 TRC Sector Distribution



5.3 Resource Acquisition Programs SSM Results

The SSM provides for an incentive to the Company for DSM activities. The Ontario Energy Board Decision in the Natural Gas DSM Generic Issues Proceeding stipulated a change to the SSM calculation for the multi-year plan period 2007 through 2009[10].

The SSM for 2007 is structured as follows:

- "For achievement of between 0 and up to 25.0% of the annual target, the SSM payout shall equal $900 for each 1/10 of 1% of target achieved.
- For achievement of greater than 25.0% up to 50% of the annual target, the SSM payout shall equal $225,000 plus $1,800 for each 1/10 of 1% of target achieved.
- For achievement of greater than 50.0% up to 75.0% of the annual target, the SSM payout shall equal $675,000 plus $6,300 for each 1/10 of 1% of target achieved above 50.0%, and
- For achievement of greater than 75.0% of the annual target, the SSM payout shall equal $2,250,000 plus $10,000 for each 1/10 of 1% of target achieved above 75.0% to a maximum of the SSM annual cap."[11]

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

11 Ibid, page 29

Through the Decision in the Generic Proceeding, the TRC target for 2007 was set at $150 million. The SSM cap for 2007 was set at $8.5 million. In accordance with the SSM formula as described, the 2007 SSM calculation is shown in Table 5.2. The portfolio TRC outcome results in Enbridge achieving the SSM cap of $8.5 Million.

Table 5.2 2007 SSM Calculation

SSM Component	$$	Percentage	Total SSM
SSM target TRC	$ 150,000,000	100	
TRC achieved	$ 209,218,101		
% of target achieved		140	
75% of target	$ 112,500,000	75	$ 2,250,000
percentage in excess of 75% of target		65	
for each 1/10 of 1% of target achieved above 75%	$ 10,000		
i.e., for each 1% of target achieved above 75%	$ 100,000		
			$ 6,500,000
Total			**$ 8,750,000**
SSM cap			**$ 8,500,000**

6.0 Market Transformation Programs SSM Results

The OEB Decision in the Natural Gas DSM Generic Proceeding provided for a Shared Savings Mechanism incentive (SSM) for Market Transformation programs to a maximum of $500,000 per year. The SSM amount for any program results is prorated on a linear basis between the scorecard levels for the program as indicated in the utility's DSM plan. The table below shows the SSM metrics for the Market Transformation programs together with the program results and the SSM calculation. As shown, the Company's market transformation efforts result in a total SSM of $407,517.

Table 6.1 Market Transformation Programs SSM Metrics

	Program Metrics	achieved		Weight	SSM Incentive	SSM per Metric	Total SSM
RESIDENTIAL			**100%**				
Low Income	Distribution of energy savings kits Enhanced TAPS referrals		N/A		N/A		N/A
EnerGuide for Fireplaces	Number of stores with EnerGuide point-of-purchase materials	**114**	50 stores	30%	$ 100,000	$ 68,400	$ 68,400
	% increase in awareness of EnerGuide label	**0%**	+10%	35%		$ -	
	% increase in influence of EnerGuide label on customer purchase	**0%**	+10%	35%		$ -	
Home Contractor Performance	Number of contractor training workshops held	**8**	6	20%	$ 100,000	$ 26,667	$ 89,533
	Increase in frequency of weatherizqation measures implemented	**0.67**	+1	60%		$ 40,200	
	Number of workshop participants	**68**	60	20%		$ 22,667	
TOTAL RESIDENTIAL					**$ 200,000**		**$ 157,933**
BUSINESS MARKETS			**100%**				
Boiler Market Transformation	% increase in engineer and contractor awareness of high efficiency boilers	**55%**	+20%	30%	$ 250,000	$ 206,250	$ 239,583
	Establishment of industry reporting structure for boiler sales	**incomplete**	developed & in-use	40%		$ -	
	Development of Benefit/Cost Sales Tools	**incomplete**	developed & launched	10%		$ -	
	Number of training events held	**1**	3	5%		$ 4,167	
	Number of training participants	**40**	60	10%		$ 16,667	
	Number of trade show exhibits	**3**	3	5%		$ 12,500	
Business Partners	Establish baseline awareness of key market players, early adopters	**complete**	Base established	20%	$ 50,000	$ 10,000	$ 10,000
	% increase in awareness of Consulting Engineers & ESCO	**n/a**	+10%	20%		$ -	
	% increase in awareness of Manufacturers, Distributors, Contractors	**n/a**	+10%	20%		$ -	
	Number of training events held	**0**	4	15%		$ -	
	Number of training participants	**0**	40	15%		$ -	
	Number of technical guides and case studies developed	**0**	4	10%		$ -	
TOTAL BUSINESS MARKETS					**$ 300,000**		**$ 249,583**
TOTAL MARKET TRANSFORMATION							**$ 407,517**

7.0 DSM Cost Summary (DSM Variance Account)

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."[12]

Program spending was less than anticipated in 2007 with a resulting reimbursement to ratepayers of $616,134. This represents a 2.8% variance from the Board-approved budget. The calculation is detailed in Table 7.1.

Table 7.1 2006 DSMVA Calculation

DSM Cost Summary	2007 Budget	2007 Actual
Residential Markets		
Fixed	$628,717	$546,532
Variable	$7,094,688	$7,332,756
Total	$7,723,405	$7,879,288
Business Markets		
Fixed	$2,532,207	$1,733,510
Variable	$4,859,202	$5,846,333
Total	$7,391,409	$7,579,843
Other		
Market Transformation	$1,000,000	$641,748
Progr Dev & Market Research	$880,000	$598,655
Overhead	$5,005,186	$4,684,332
Total	$6,885,186	$5,924,735
Total DSM		
Fixed		$8,204,777
Variable		$13,179,089
Total	**$22,000,000**	**$21,383,866**
DSM Costs covered in Rates		$22,000,000
DSMVA Adjustment to Ratepyers		$616,134

12 EB-2006-0021, Decision with Reasons, Ontario Energy Board, page 30.

8.0 Evaluation Research Summaries

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

Annual evaluations of the TAPS Partners Program are undertaken by the Company to verify results and the overall effectiveness of the program. A similar study was undertaken to verify installations of Novitherm heat reflective panels.

Evaluation research is also undertaken in support of the custom project portfolio. 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 a random sample of project application files.

In 2007, Market Transformation efforts were focused on building awareness with contractor and engineer trade allies, and on Home Performance Contractor practices and on customer awareness of EnerGuide labeling for natural gas fireplaces. Four market transformation programs were delivered: the Business Partner, Boiler, Home Performance Contractor, and the EnerGuide for Natural Gas Fireplaces Market Transformation Program. Research studies were undertaken for each program.

This section describes the purpose, methodology, and results of the program evaluations undertaken.

8.1 TAPS Program Follow-up Study

8.1.1 Background

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

8.1.2 Purpose of the Study

This research study was designed to verify visits from a TAPS contractor, verify procedures carried out during the visit, measure contractor results over time, compare results among contractors, and identify any variations between contractor claims and study results.

8.1.3 Methodology

During 2007, four waves of telephone interviews were conducted. In total, 4,311 residential customer interviews were completed across twelve contractors in the Enbridge franchise area. This sample size limits the overall margin of error to approximately 2%.

8.1.4 Results

TAPS program results are presented in relation to each energy savings measure as well as for installation and removal rates. The summary of installation and removal rate results is presented in the table below. The installation and removal rates were used to adjust the quarterly results of participant numbers and volumes and the net results were reported in the DSM Annual Report.

Table 8.1. Summary Results

Device	**1st Qtr Survey**	**2nd Qtr Survey**	**3rd Qtr Survey**	**4th Qtr Survey**
Showerheads	16%	14%	19%	18%
Aerators	31%	25%	31%	30%
Pipe Wrap	40%	38%	44%	51%

8.2 Evaluation of 2007 Commercial Sector Custom Projects

8.2.1 Background

As part of the annual evaluation and DSM audit process, Enbridge commissions third party firms to undertake an engineering review of a sample of the custom projects in the Commercial and Industrial sectors. For a detailed description of study methodology, see Section 8.4.

8.2.2 Purpose of the Study

Enbridge retained Building Innovation Inc. (BII) to conduct an engineering review of the savings for the 2007 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 2007, through a review of a statistically representative sample of the projects.[13]

8.2.3 Methodology

Using a sampling methodology developed for Enbridge, BII reviewed 17 Commercial sector custom projects. The approach to this study was three tiered: Document review, Telephone Interviews, and Calculations 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 Enbridge to obtain the appropriate data. Where clarification was required, BII interviewed Enbridge staff to gain a better understanding of project details. Telephone interviews with project contacts were then undertaken to clarify project scope and timing, and to confirm certain assumptions used in savings calculations. Using information gleaned from the first two steps of the study, BII evaluated the assumptions used in calculating the savings.

8.2.4 Results

Seventeen projects were sampled and reviewed. Gas savings calculations were adjusted in three projects. Three of the four adjustments to electricity savings resulted in an increase to the project savings.

13 See Section 8.4 for a discussion of the Sampling methodology.

Table 8.2 Commercial Sector Custom Project Audit Review Results

	EGD Posted	BII Findings
Projects Implemented	467	n/a
Projects Sampled	n/a	17
Sampled Projects with Calculation Discrepancies	n/a	5
Natural Gas Savings of Sampled Projects	5,574,284 m^3	5,448,732 m^3
Natural Gas Savings of Projects Implemented	45,975,915 m^3	45,850,363 m^3

8.3 Evaluation of 2007 Industrial and Agricultural Sector Custom Projects

8.3.1 Background

As described in *Section 8.2.1*, Enbridge commissions third party firms to undertake an engineering review of a sample of the custom projects in the Commercial and Industrial sectors as part of its annual evaluation and DSM audit process. The general guidelines and approach are described in the Generic Hearing Decision.[14]

The industrial DSM programs include: Boiler Plant audits, Steam Trap Surveys, Industrial HVAC audits, Greenhouse Audits, Special Process Studies, implementation of measures, and Monitoring and Targeting.

8.3.2 Purpose of the Study

Enbridge retained Genivar Ontario Inc. (Genivar) to conduct an engineering review of the savings for the 2007 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 2007 through a review of a statistically representative sample of the projects.[15]

8.3.3 Methodology

Using a sampling process developed for Enbridge, Genivar Ontario Inc. reviewed 10 industrial and 3 agricultural custom projects. The reviews involved site inspections with the clients, verification of installations, utility savings results, project start-up and commissioning of measure, cost and purchase timing, any changes in plant production that would change the impact of savings, any unforeseen disturbances, any savings measurements undertaken by client, review savings calculations and methodology, provide a 3rd party engineering review of the sample of projects and, where a more appropriate calculation is identified, provide the results of such a calculation.

8.3.4 Results

As a result of the site investigation, all projects were confirmed as being implemented by the client with general conformance to the scenario depicted in the files. Each file included supporting documentation in the form of either manufacturer's quotations or billings which justify the incurred cost of the project. Overall, analysis applied to each project was based on good engineering practices. Of the thirteen projects reviewed, Genivar made adjustments to the gas savings calculations for four projects (two resulted in an increase in gas savings and two in a decrease), based on information garnered through the site visits, additional information from clients, and calculation reviews. Electricity savings were increased for 3 projects.

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Table 8.3 Industrial and Agricultural Sector Custom Project Audit Review Results

	EGD Posted	**Genivar Findings**
Projects Implemented	**214**	**n/a**
Projects Sampled	**n/a**	**13**
Sampled Projects with Calculation Discrepancies	**n/a**	**5**
Natural Gas Savings of Sampled Projects	**14,062,102 m^3**	**13,406,419 m^3**
Natural Gas Savings of Projects Implemented	**42,624,460 m^3**	**41,968,777 m^3**

8.4 Sampling Methodology for Evaluation of 2007 Commercial and Industrial Sector Custom Projects

8.4.1 Background

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

- Meet Ontario Energy Board guidelines from the Generic Hearing Decision[16] re: third party or internal audit for custom projects. "A special assessment program must be implemented for custom projects. … The assessment will focus on verifying the equipment installation and estimates of savings and equipment cost."[17]

- Provide an independent, objective opinion of the reasonableness of the energy savings and equipment costs claimed by the custom projects through a review of a statistically representative sample of the projects.

Before engaging consulting firms to conduct the 2007 engineering review, Enbridge consulted with the Evaluation Audit Committee regarding the Terms of Reference for the review. Based on this consultation, Enbridge, in collaboration with Union Gas, commissioned Summit Blue Inc. to develop a sampling methodology to be used in the engineering review.

8.4.2 Purpose of the Study

The objective of the study was to develop a sample design to meet the Board requirements for sampling and support the verification of annual claimed gas savings from custom projects. The study focused on developing a sample design suitable for Enbridge and Union to apply to the 2007 custom projects and to custom projects in subsequent years.

8.4.3 Methodology

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

8.4.4 Results

The study resulted in a sample design for annual reviews of custom projects suitable for Enbridge and Union to apply in 2007 and subsequent years. The target precision for the sample design is 90 percent confidence plus/minus 15 percent precision but the design is likely to yield a result of 90/20. This is within the range of precision for Monitoring and Verification studies which generally use 90/20 to 80/20 levels of confidence and precision for commercial and industrial program-wide estimates.

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

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

8.5 Natural Gas Fireplaces Market Transformation Program

8.5.1 Background

In 2007, Enbridge developed a program that encouraged customers to consider energy efficiency when purchasing a natural gas fireplace. Enbridge launched an in-store program to increase awareness of the EnerGuide label for natural gas fireplaces through point of purchase communication material and sales associate training.

8.5.2 Purpose of the Study

The objectives of this program were to i) measure the change in awareness of the EnerGuide label for natural gas fireplaces following the in-store point-of-purchase campaign, and, ii) Determine if the EnerGuide label had an influence on which the natural gas fireplace was purchased.

8.5.3 Methodology

Two surveys were administered to Enbridge residential customers who purchased a gas fireplace. The first survey was administered in 2007 to customers who purchased a natural gas fireplace in 2006 prior to the launch of the Enbridge point-of-purchase awareness campaign (wave 1). This survey established baseline awareness of the Ener-Guide label. A second survey was administered to Enbridge residential customers who purchased a natural gas fireplace in 2007 (wave 2). For wave 2, customers were contacted from a list of contestants 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 wave 2 survey was conducted in January and February of 2008. There were 105 respondents who qualified by indicating they had purchased a natural gas fireplace in 2007 and were Enbridge customers.

The responses for wave 2 are compared to results of the baseline study to identify changes in awareness and influence of the EnerGuide rating.

8.5.4 Results

Overall, there was no statistically significant change in the awareness of the EnerGuide rating on fireplaces between the first and second waves of the survey. In addition, there was no statistically significant change in the perceived influence of the EnerGuide rating on purchase. Table 8.5 summarizes the results of the study.

Table 8.5. Survey Results

Survey Results		
BASE	**WAVE 1**	**WAVE 2**
Fireplace Purchasers & EGD Customers	*n=485*	*n=105*
Q4. Aware of EnerGuide Rating on Fireplace	64%	61%
Q6. EnerGuide influence on Purchase	37%	35%

8.6 Home Performance Contractor Market Transformation Program - Survey Results

8.6.1 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." The focus of the program was on air sealing and insulation.

8.6.2 Purpose of the Study

This program aims to increase the frequency of weatherization measures (air sealing and insulation) included in home renovation and upgrade projects in the residential sector through industry-delivered workshops. The program uses surveys to determine the degree to which participants had increased the frequency of implementing weatherization measures following the workshops.

8.6.3 Methodology

During the first phase, a series of seven workshops ran from March 27 to May 8, 2007. A self-administered survey was completed just before the course began and the results of this survey established baseline measurements regarding how frequently the participants included weatherization measures in their projects. A total of 56 surveys were completed.

Approximately six months later, participants were contacted again and asked to complete the same questionnaire. Three methods were used to collect survey data (November 2007):

1. The survey was emailed to workshop participants, who could a) download, complete, and return the survey via email; b) print the survey and fax it back; c) phone a toll-free number and complete the survey over the phone. To help achieve a high response rate, 1 out of 10 respondents was randomly selected to receive $200.

2. Response rates were low for the first email survey (n=8), therefore, participants were phoned and asked to participate in the survey. An additional 21 completions were achieved via telephone. A minimum of three calls were placed to each participant.

3. To exhaust all possibilities of achieving a higher response rate, non-responders were emailed and asked to participate via an online survey (n=3). The incentive was increased to $70 per respondent

8.6.4 Results

In total, 32 out of a possible 56 course participants completed the follow-up survey (57%). The program's success is based on the increase in frequency of weatherization measures implemented by the participating contractors. Specifically, the 100% target for this metric is an average increase of at least 1.0 (i.e. one response level on a five-point scale), in at least three weatherization measures, relative to the baseline survey. Thirteen weatherization measures were assessed.

Following the baseline survey the list of "qualified" respondents was reduced to exclude energy assessors and consultants whose businesses do not involve installation of energy efficiency measures. Table 8.6 summarizes the participant results of the study.

Table 8.6. Participation Results

Survey Participation Results				
	Qualified Respondents		Total Respondents	
	Baseline	Post Course	Baseline	Post Course
Total	46	27	56	32
Owners	24	14	32	18
Employees	22	13	24	14

In total, participant behaviour was assessed on thirteen weatherization measures. One measure met the 100% metric value level ("include measures to meet ventilation and combustion air supply") and another three measures met the 50% metric value level ("comprehensive air sealing of the attic floor with 2-component foam", "air sealing baseboards, window/door trim, electrical outlets/switches" and "air seal and insulate basement sill plate and joint header area").

8.7 Boiler Market Transformation Program 2007: Contractor, Engineer & Customer Awareness Research

8.7.1 Background

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

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

8.7.2 Purpose of the Study

The scope of the research was focused on assessing the awareness 'Market Effect' that training events had on Contractors and Engineers. The Market Effect assessment was a survey design measuring any increase in awareness and knowledge at the end of the workshop compared to the baseline responses taken at the beginning of the workshop. The survey was administered to the participants of the High Efficiency and Condensing Boiler workshop at the PM Exposition Conference held in Toronto on November 28-30, 2007.

8.7.3 Methodology

To assess the market effect of contractor, engineer, and customer awareness relating to the Boiler Market Transformation Program, Enbridge's Research & Business Intelligence unit used the following approach:

- A survey was administered to the participants of the High Efficiency and Condensing Boiler workshop at the PM Exposition Conference held in Toronto on November 28-30, 2007.
- At the beginning of the workshop, the instructor passed out a questionnaire that tested participants' knowledge and awareness of high efficiency and condensing boilers. At the end of the workshop, the instructor asked the participants to answer the survey again as a measure to assess the change in knowledge and awareness among participants as a result of the workshop.
- The results were tabulated and analyzed by the Enbridge Research & Business Intelligence unit.
- Of the 26 participants in attendance, 24 completed the questionnaire. This produces results accurate to within approximately +/- 5.7 percentage points, 95% of the time.

8.7.4 Results

Results showed that there was a 55% increase in average test results, substantially above the 30% increase required to meet the 150% metric level. Table 8.7 summarizes the key results of the study.

Table 8.7. Awareness and Knowledge Results

Survey Awareness and Knowledge Results			
Question No.	**Pre**	**Post**	**% Change**
Question 1: financial tests used by managers in making decisions on capital projects	21%	88%	320%
Question 2: different financial analysis methods	50%	33%	-33%
Question 3: required operating conditions for condensing boilers	63%	88%	40%
Question 4: applications best suited for condensing boilers	50%	76%	52%
Average Questions 1 - 4	46%	71%	55%

8.8 Business Partner Market Transformation Program: Technology Awareness

8.8.1 Background

Enbridge has established a strong and long-standing relationship with HVAC contractor firms operating in its service territory. In its interest in understanding how much emphasis is placed on energy efficient technology adoption by the HVAC contractors, the Company engaged its Research & Business Intelligence unit to perform a baseline assessment. The baseline will be used as a benchmark to determine changes in technology adoption in 2008.

8.8.2 Purpose of the Study

The purpose of this study was to establish the number of HVAC designs/projects that had been undertaken in 2007 as well as the percentage of energy-saving technologies currently implemented.

The research objectives for the baseline survey were to:

- Complete a list of business partners (consulting engineers and HVAC contractors) that represent a large majority of the HVAC design market activity, in support of Metric (b):"Identify & target top market players / early adopters."
- Conduct a baseline survey to establish: The number of HVAC designs that have been undertaken in the past twelve months, and the percentage that have included any of a specific list of technologies, in support of metric (a): "% increase in design incorporation plans."

8.8.3 Methodology

Using lists, developed by Enbridge, of consulting engineers and HVAC contractor firms, research was conducted as follows:

An invitation to an online survey was issued by Enbridge to firms where key contact information was confirmed. The online survey was administered by Quadra Research.

Telephone interviews were conducted among firms where key contact information was missing. Telephone interviews were conducted by Canadian Viewpoint.

Additional telephone interviews were conducted among firms who had not completed the online survey.

Research was conducted during November 2007. This report combines the findings from all three methodologies.

To ensure interest in participation, respondents were paid $70 to complete the survey.

8.8.4 Results

For both Engineers and Contractors, the majority completed fewer than 50 HVAC designs/projects over the past 12 months (73% and 65% respectively). Table 8.8 summarizes the participation results of the study.

Table 8.8. Participation Results

Survey Participation Results			
	Engineers	**Contractors**	**Total**
Base Number of Respondents	52	66	118
1 – 50 Projects	73%	65%	69%
>51 Projects	27%	35%	31%

Respondents estimated that they completed a total of 9,609 new and replacement or retrofit projects/designs in Ontario in the past 12 months. An average of 32.8% of the projects included at least one of the listed energy efficiency technologies as shown in Table 8.8.1

Table 8.8.1. Adoption of Energy Efficiency Technology Results

Adoption of Energy Efficiency Technology Results			
	Total	**Engineers**	**Contractors**
Total number of projects	9,609	2,471	7,138
Average percent of projects that included at least one energy-saving technology	32.8%	41.3%	26.2%
Listed energy efficiency technologies were: natural gas-fired Dessiccant Dehumidification, Natural gas-fired Humidification, Ceiling-mounted Destratification Fans, Air Doors / Air Barriers / Air Curtains and Demand Control Ventilation.			

8.9 Novitherm Panels

8.9.1 Background

Through this program, target customers (homes heated with a gas boiler using radiators or convectors) are offered the heat reflecting Novitherm panels through a direct mail campaign. Enbridge provides the panels at no charge. The homeowners provide all the necessary measurements, pay a $25 fee for shipping and handling, and install the panels themselves.

8.9.2 Purpose of the Studies

Follow-up research is required to verify that the panels were actually installed and to determine if any panels were later removed.

8.9.3 Methodology

A telephone survey will be conducted of a sample of program participants.

8.9.4 Status

The follow-up study will be conducted in 2008 and the results reported during the DSM audit process.

8.10 Enbridge / Union Joint Research re: Program Assumptions

8.10.1 Background

In Phase II of the DSM Generic Proceeding, assumptions were developed for prescriptive programs and for free ridership for custom projects; these assumptions apply to programs of both gas utilities. As well, a number of program assumptions were identified as priorities for evaluation research in both the residential sector and business markets.

In 2007, Enbridge collaborated with Union Gas to jointly undertake three studies to address some of these priority research items.

8.10.2 Purpose of the Studies

The studies were designed to address the following issues:

Study #1: residential deemed savings for:
- showerheads,
- aerators, and
- thermostats.

Study #2: residential free ridership for:
- showerheads,
- aerators,
- thermostats, and
- furnaces.

Study #3: custom project free ridership

8.10.3 Status

Following a Request for Proposal process, Summit Blue Canada was engaged to conduct all three studies and began work in the fall of 2007. It is expected that the studies will be completed in 2008.

9.0 DSM Best Practices

During 2007 several initiatives were undertaken to enhance the utility's capabilities in monitoring and tracking DSM results. Included in these were a number of efforts that were identified as potential areas for improvement in the 2006 Auditor's Report.

Induced Electricity and Water Savings in Custom Projects

Following the Board's confirmation regarding induced electricity and water savings for custom projects, the Company engaged in ESC training and a subsequent update to the ETools software to ensure consistent and appropriate calculations of electricity savings, particularly in the Commercial sector. In addition, the Documentation Protocol established in 2005 was expanded to include similar documentation requirements for electricity and water savings.

DSM Engineering Fundamentals Committee (EFC)

The Engineering Fundamentals Committee (EFC) was formed in early 2007, representing Business Markets, Commercial and Industrial Sales, and the Planning and Evaluation Department (P&E). The initial mandate of the committee was to review recommendations from the 2002 to 2006 audits and the 2005 to 2006 engineering reviews regarding custom projects. Of the approximately 60 recommendations accepted by the EFC, a committee decision or implementation of the recommendation had been achieved in over 80% of them. During the year, the scope of the committee grew to include issues, questions, and requests identified by committee members. The initiatives of the committee have resulted in research, updates to business rules and guidelines, enhanced practices and processes, additional documentation requirements, revised program assumptions, and the creation of software applications.

DSM Standards

In mid 2007, the position of DSM Standards, Energy Solutions Manager was created and filled. The position was created to provide technical expertise and assistance to Commercial and Industrial Sales and to the DSM group. The position has been invaluable in providing a consistent approach in the review of custom project files and as a liaison between the DSM group and Sales.

Data Analysis and Reporting System (DARTS)

The DSM Data Analysis and Reporting System (DARTS) is a software application developed for the Planning and Evaluation Department (P&E). It was created to provide a centrally managed database, since in any given year P&E manages at least 3 years of program data and the associated Word documents and Excel spreadsheets. In 2006, for example, P&E handled 6 years of data: 2004 Audit, 2005 Evaluation, 2006 Tracking, and the 2007-2009 Plan Budgets.

The application went "live" in Dec. 2006, allowing for a variety of real-time information such as volumetric savings, fixed and variable costs, and TRC to be available during 2007. Standard monthly reporting capabilities were available and an Ad Hoc feature allowed for more advanced and flexible reporting. DARTS has provided for easy access to real time information, reduced the amount of manual entry, and allowed for the efficient management of DSM information.

Total Resource Cost (TRC) Calculator

A Total Resource Cost (TRC) calculator was distributed to all Energy Sales Consultants (ESC) in 2007. The TRC Calculator provided each of the ESCs the ability to determine the TRC of a project earlier in the energy efficiency application process by entering the required inputs. ESCs can now work with customers in determining what measure(s) can be installed to achieve a positive TRC project.

Appendix: Cost Effectiveness Results

Cost Effectiveness Results

	Program Benefits			Program Costs			Net Benefits
Program Name	**Avoided Gas Costs**	**Other Avoided Costs (water, electricity)**	**Total Benefits @Zero Emissions**	**Utility Program Costs (Direct Costs)**	**Incremental Customer Equipment Costs**	**Total Costs**	**Net Benefits @Zero Emissions**
TAPS Partners Program - Showerheads over 2.5	$ 27,551,780	$ 24,785,937	$ 52,337,717	$ 179,565	$ 1,358,494	$ 1,538,060	$ 50,799,657
TAPS Partners Program - 2.1 - 2.5	$ 4,010,274	$ 3,786,919	$ 7,797,193	$ -	$ 317,066	$ 317,066	$ 7,480,127
TAPS Partners Program - EQ 2.0	$ 50,252	$ 48,927	$ 99,179	$ -	$ 4,971	$ 4,971	$ 94,208
TAPS Partners Program - Pipe wrap	$ 2,442,327	$ -	$ 2,442,327	$ -	$ 242,212	$ 242,212	$ 2,200,115
TAPS Partners Program - Bag test	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Energy Star Front Load Axis Washer	$ 7,083	$ 12,986	$ 20,069	$ -	$ 20,608	$ 20,608	$ (539)
Existing Homes - Water Conservation	**$ 34,061,715**	**$ 28,634,769**	**$ 62,696,484**	**$ 179,565**	**$ 1,943,351**	**$ 2,122,916**	**$ 60,573,568**
Furnace Replacements	$ 10,187,533	$ -	$ 10,187,533	$ 104,831	$ 6,025,864	$ 6,130,695	$ 4,056,839
Enhanced Furnace Replacement	$ 864,580	$ -	$ 864,580	$ -	$ 511,394	$ 511,394	$ 353,186
Enhanced Furnace Replacement	$ (238,602)	$ 927,574	$ 688,972	$ -	$ 707,328	$ 707,328	$ (18,356)
Thermostats	$ 8,995,984	$ 1,468,852	$ 10,464,837	$ 72,113	$ 966,326	$ 1,038,439	$ 9,426,398
Novitherm	$ 914,647	$ -	$ 914,647	$ 39,801	$ 487,531	$ 527,332	$ 387,315
Existing Homes - Equipment Replacement	**$ 20,724,143**	**$ 2,396,426**	**$ 23,120,569**	**$ 216,744**	**$ 8,698,443**	**$ 8,915,187**	**$ 14,205,382**
Home Rewards - Energuide for Houses	$ 5,180,003	$ 410,545	$ 5,590,547	$ 26	$ 3,228,803	$ 3,228,829	$ 2,361,719
Existing Homes - Thermal Envelope Improvements	**$ 5,180,003**	**$ 410,545**	**$ 5,590,547**	**$ 26**	**$ 3,228,803**	**$ 3,228,829**	**$ 2,361,719**
EnerGuide for New Houses	$ 366,669	$ -	$ 366,669	$ 43,438	$ 128,096	$ 171,534	$ 195,135
EnergyStar for New Houses	$ 2,208,132	$ 942,071	$ 3,150,203	$ 93,367	$ 2,478,816	$ 2,572,183	$ 578,020
Residential New Construction	**$ 2,574,801**	**$ 942,071**	**$ 3,516,872**	**$ 136,805**	**$ 2,606,912**	**$ 2,743,717**	**$ 773,155**
TAPS Partners Program - Showerheads	$ 1,802,530	$ 1,621,579	$ 3,424,109	$ 10,139	$ 88,877	$ 99,017	$ 3,325,092
TAPS Partners Program - Pipe wrap	$ 200,091	$ -	$ 200,091	$ -	$ 19,844	$ 19,844	$ 180,248
TAPS Partners Program - Bag test	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Prog Thermostats	$ 2,400,450	$ 391,942	$ 2,792,393	$ -	$ 357,024	$ 357,024	$ 2,435,369
Weatherization program	$ 225,360	$ 12,790	$ 238,151	$ 3,252	$ 158,600	$ 161,852	$ 76,299
Low Income	**$ 4,628,432**	**$ 2,026,312**	**$ 6,654,744**	**$ 13,391**	**$ 624,345**	**$ 637,736**	**$ 6,017,008**

	Program Benefits			Program Costs			Net Benefits
Program Name	**Avoided Gas Costs**	**Other Avoided Costs (water, electricity)**	**Total Benefits @Zero Emissions**	**Utility Program Costs (Direct Costs)**	**Incremental Customer Equipment Costs**	**Total Costs**	**Net Benefits @Zero Emissions**
Hotels/Motels	$ 1,500,421	$ 538,591	$ 2,039,012	$ 65,782	$ 618,294	$ 684,076	$ 1,354,936
Offices	$ 3,492,722	$ -	$ 3,492,722	$ 110,740	$ 1,285,773	$ 1,396,513	$ 2,096,209
Retail	$ 514,725	$ 353,747	$ 868,473	$ 18,412	$ 300,084	$ 318,496	$ 549,976
Warehouses	$ 647,148	$ 164,245	$ 811,393	$ 2,295	$ 147,069	$ 149,364	$ 662,029
Other Commercial	$ 1,897,368	$ 349,313	$ 2,246,681	$ 82,916	$ 1,191,280	$ 1,274,196	$ 972,485
Hospitals	$ 6,285,959	$ 2,057,429	$ 8,343,388	$ 33,868	$ 2,746,916	$ 2,780,784	$ 5,562,604
Long Term Care	$ 189,746	$ 40,985	$ 230,731	$ 4,995	$ 102,361	$ 107,356	$ 123,375
Municipalities	$ 4,583,275	$ 5,355,493	$ 9,938,767	$ 85,320	$ 3,445,327	$ 3,530,647	$ 6,408,121
Schools	$ 2,817,446	$ 983,287	$ 3,800,733	$ 25,531	$ 1,052,509	$ 1,078,040	$ 2,722,693
Universities	$ 1,847,304	$ 869,199	$ 2,716,502	$ 57,557	$ 1,141,148	$ 1,198,704	$ 1,517,798
Restaurants - PRSV	$ 768,268	$ 395,377	$ 1,163,646	$ 29,434	$ 27,550	$ 56,984	$ 1,106,662
Restaurants - CKV	$ 555,061	$ 255,844	$ 810,905	$ 4,426	$ 159,600	$ 164,026	$ 646,879
Air Doors	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Rooftop Units	$ 76,311	$ -	$ 76,311	$ 15,911	$ 24,938	$ 40,848	$ 35,462
Tankless Water Heaters	$ 148,418	$ -	$ 148,418	$ (2,083)	$ 144,452	$ 142,369	$ 6,049
Furnace Replacements	$ 126,909	$ -	$ 126,909	$ 8,150	$ 58,987	$ 67,138	$ 59,771
Programmable thermostats	$ 167,101	$ 102,645	$ 269,746	$ 1,712	$ 7,332	$ 9,044	$ 260,702
Commercial	**$ 25,618,180**	**$ 11,466,157**	**$ 37,084,336**	**$ 544,966**	**$ 12,453,620**	**$ 12,998,585**	**$ 24,085,751**
Multi - Residential Private	$ 42,258,700	$ 2,713,866	$ 44,972,566	$ 58,087	$ 15,145,098	$ 15,203,185	$ 29,769,381
Multi - Residential Non Profit	$ 739,363	$ 941,516	$ 1,680,879	$ 67,211	$ 909,389	$ 976,600	$ 704,279
Multi - Residential ReCommissioning	$ 89,698	$ -	$ 89,698	$ 21,250	$ 70,330	$ 91,580	$ (1,881)
Showerheads/Aerators	$ 6,377,330	$ 6,022,140	$ 12,399,471	$ 877	$ 504,214	$ 505,091	$ 11,894,380
Energy Efficient Washers	$ 840,985	$ 963,363	$ 1,804,349	$ 2,332	$ 595,755	$ 598,087	$ 1,206,261
Multi Residential	**$ 50,306,077**	**$ 10,640,886**	**$ 60,946,962**	**$ 149,757**	**$ 17,224,786**	**$ 17,374,543**	**$ 43,572,419**
Large New Construction	$ 7,642,666	$ 3,375,881	$ 11,018,547	$ 502,571	$ 4,129,405	$ 4,631,975	$ 6,386,572
Large New Construction	**$ 7,642,666**	**$ 3,375,881**	**$ 11,018,547**	**$ 502,571**	**$ 4,129,405**	**$ 4,631,975**	**$ 6,386,572**
Industrial	$ 63,322,951	$ 5,092,980	$ 68,415,931	$ 506,402	$ 14,568,669	$ 15,075,071	$ 53,340,860
Agriculture	$ 3,809,576	$ 1,180,968	$ 4,990,544	$ 29,814	$ 1,776,074	$ 1,805,889	$ 3,184,655
Industrial	**$ 67,132,526**	**$ 6,273,948**	**$ 73,406,474**	**$ 536,216**	**$ 16,344,744**	**$ 16,880,959**	**$ 56,525,515**
Total DSM Programs	**$ 217,868,543**	**$ 66,166,994**	**$ 284,035,537**	**$ 2,280,041**	**$ 67,254,407**	**$ 69,534,449**	**$ 214,501,088**
Program Development	$ -	$ -	$ -	**$ 598,655**	**$ -**	**$ 598,655**	$ (598,655)
Portfolio Administraton	**$ -**	**$ -**	**$ -**	**$ 4,684,332**	**$ -**	**$ 4,684,332**	$ (4,684,332)
Total DSM Plan (Resource Acquisition)	**$ 217,868,543**	**$ 66,166,994**	**$ 284,035,537**	**$ 7,563,028**	**$ 67,254,407**	**$ 74,817,435**	**$ 209,218,101**

Audit Report on Enbridge Gas Distribution 2007 DSM Evaluation

A Report to the Audit Subcommittee of the DSM Consultative

Final Report

June 24, 2008

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Acknowledgements

This report was prepared by ECONorthwest's Portland office for Enbridge Gas Distribution and the Audit Subcommittee of the DSM Consultative. Dr. Stephen Grover was the ECONorthwest project manager for this analysis and was the primary author of this report. Questions regarding the report should be directed to him at grover@portland.econw.com or by phoning the Portland office at (503) 222-6060. Logan Van Ert at ECONorthwest assisted with this analysis. Mike Kennedy also provided a review of the prescriptive schools savings research.

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1. INTRODUCTION

ECONorthwest was asked by Enbridge Gas Distribution (Enbridge) in consultation with the DSM Audit Subcommittee to conduct an audit of the Enbridge 2007 DSM Annual Report. The structure of this audit is different than those that ECONorthwest has conducted for Enbridge in prior years in that there was no detailed review of project files by the auditor for a sample of custom projects. A review of project files was conducted by third party engineering firms as part of Enbridge's 2007 DSM evaluation. Consequently, the audit was limited to a more general review of the 2007 savings estimates and reviewing the supporting research provided by Enbridge for these programs. Throughout this process, Enbridge was very responsive and provided us with all the requested background materials in a timely manner.

The tasks done as part of the 2007 audit include the following:

- Confirmed that the TRC calculations utilized the agreed upon values for free ridership and per unit savings.
- Replicated the savings and TRC amounts reported in the SSM.
- Reviewed the DSMVA calculations
- Reviewed the LRAM calculations
- Reviewed two 3rd party engineering reports that evaluated the savings estimates for a sample of custom commercial, industrial, and agricultural projects.
- Interviewed the firms that conducted the engineering reviews.
- Reviewed a Summit Blue report researching residential free ridership rates (for showerheads, aerators, programmable thermostats, and furnaces)
- Reviewed a Summit Blue report researching deemed savings values for showerheads, thermostats, and aerators.
- Reviewed Enbridge study on combustion efficiency for boilers
- Reviewed Enbridge studies on 2007 market transformation activities
- Assessed the underlying assumptions used in savings estimates
- Reviewed program database and participation tracking systems
- Reviewed Enbridge studies used to determine installation rates for TAPS and Novitherm measures
- Reviewed two reports by Agviro that develop prescriptive savings values for boilers installed in secondary and elementary schools

- Reviewed status of recommendations from previous audits
- Reviewed specific issues as raised by the Audit Subcommittee;

Our review focused on the 2007 program areas as defined in the 2007 Annual Report:

- Residential Sector
  - Residential Water Conservation (TAPS Partners)
  - Equipment Replacement
  - Residential Retrofit – EnerGuide for Houses
  - ENERGY STAR Appliances – Front Load Washers
  - New Home Construction
  - Low Income
- Business Sector Results
  - Commercial Sector Results
  - Multi-Residential
  - Large New Construction
  - Industrial
- Market Transformation

The level of savings and TRC benefits associated with the residential and business sector resource acquisition programs as reported by Enbridge in the 2007 Annual Report is shown in Table 1. (This table is consistent with Table 2.1 in the 2007 Annual Report).

Table 1: 2007 Program Savings and Net Benefits (TRC) From Enbridge's 2007 Annual Report

Program Area	Participants	Gas Savings (m^3)	Net TRC Results
Existing Homes	320,092	26,887,911	77,140,669
Residential New Construction	1,091	782,905	773,155
Low Income	20,567	1,966,539	6,017,008
Small Commercial	641	1,067,062	2,115,524
Commercial	141	9,727,542	21,970,227
Multi-Residential	28,430	23,188,272	43,572,419
Large New Construction	56	2,433,345	6,386,572
Industrial	147	28,201,217	56,525,515
Overhead Costs			(5,282,987)
Total All Programs	**371,165**	**94,254,794**	**209,218,102**

2. REVIEW OF SSM CALCULATIONS

As part of the 2007 audit, ECONorthwest replicated the SSM calculations as shown in the 2007 Annual Report. This was done by obtaining an Excel file from Enbridge that contained all the savings and TRC calculations. The calculations shown in the report were actually done within Enbridge's program tracking database DARTS. At the beginning of the audit, we also met with Enbridge staff and walked through the DARTS data system. We also talked to Enbridge staff to gain an understanding of how participation, savings, and cost data are entered and tracked in the DARTS system.

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

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

Based on our review, we recommend the following adjustments be made to the 2007 SSM claim:

- Adjust the Novitherm free ridership rate from 1 percent to zero (the value approved by OEB).
- Adjust the low income TAPS installations using the same installation adjustment factors used for the other residential programs

- Reduce the Novitherm installation adjustment from 85 percent to 76 percent based on the actual installation rate estimated from the Enbridge's Novitherm installation survey.

- Reduce the total custom commercial gas savings values by 2.3 percent based on the findings from the engineering review.

- Reduce the total custom industrial gas savings values by 3.6 percent based on the findings from the engineering review.

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

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

Based on these adjustments, the audit recommended savings values for SSM are 92,719,087 m^3, which represents a decrease of 2 percent from the 94,254,794 m^3 SSM savings volume published in the 2007 Annual Report. Similarly, the recommended savings volumes result in a TRC value of 204,461,613, which is a decrease of 2 percent from the TRC value of $209,218,102 published in the 2007 Annual Report. The recommended TRC value results in an SSM claim payout of $8,380,774.

Additional detail on these recommended changes is provided below.

3. REVIEW OF DSMVA CALCULATIONS

As part of this audit, we reviewed the calculations used to determine the Demand Side Management Variance Account (DSMVA) adjustment. This involved reviewing the values input by Enbridge into the SSM spreadsheet provided for the audit review. Our review did not involve any review of financial records beyond what was included in the SSM spreadsheet.

Based on our review, we accept the DSMVA numbers as reported in the 2007 Annual Report.

4. REVIEW OF LRAM CALCULATIONS

The sample LRAM calculation provided by Enbridge was reviewed in this audit and was found to be calculated correctly using the same gas savings values utilized in the 2007 SSM calculation provided in the 2007 Annual Report. Additional adjustments to the SSM and/or LRAM calculations will likely be done later based on resolution of policy issues with the EAC or negotiations with interveners.

In addition to the SSM recommendations above, we recommend the following additional adjustments for the LRAM calculation:

- Revise savings values for showerheads (per our discussion of the Summit Blue analysis below)

- Adopt Summit Blue savings values for programmable thermostats and aerators

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

When these adjustments are taken into account, the gas savings values for LRAM recommended by the audit are 84,100,032 m^3. This represents a decrease of 11 percent from the 94,254,794 m^3 SSM volume published in the 2007 Annual Report.

The following sections present audit findings as they relate to the residential and business sector programs. In most cases, the savings estimates were consistent with the methods and values set for the 2007 programs as part of the Settlement Proposal. We have provided suggestions for evaluation research to improve the savings estimates for future years. These recommendations are all presented in the final section of this audit report.

5. RESIDENTIAL PROGRAM AUDIT RESULTS

For the Residential programs, we reviewed the savings calculations as well as some of major assumptions and evaluation research that is used in developing the savings estimates. The programs reviewed included:

- TAPS Partners

- Existing Homes (Water Conservation, Equipment Replacement, Thermal Envelope)

- Residential New Construction

- Low Income

The audit process also involved investigating specific issues raised by the Audit Subcommittee.

We also reviewed two evaluation reports completed by Summit Blue Canada that address free ridership and savings values for selected measures:

- *Residential Measure Free Ridership and Inside Spillover Study* (June 4, 2008)

- *Resource Savings Values in Selected Residential DSM Prescriptive Programs* (June 4, 2008)

The audit findings for each of these issues are discussed below.

5.1 SUMMIT BLUE FREE RIDERSHIP STUDY

As part of the audit process, we reviewed a residential free ridership and inside spillover study completed by Summit Blue. This study surveyed a sample of participants that adopted aerators, furnaces, low-flow showerheads, or a programmable thermostat through either an Enbridge or

Union Gas DSM program. For furnaces, a survey of furnace installation contractors was also completed.

We have significant concerns about the methodology employed in the free ridership study. While the self-report survey questions are commonly used to estimate free ridership and spillover rates, they are notoriously sensitive to how questions are worded and the algorithm used to score responses. How "don't know" or "refused/missing" responses are weighted, for example, can dramatically change the overall free ridership or spillover estimate.

Specific issues include the following:

- Because the scoring method is multiplicative (scores from different questions are multiplied or averaged together to estimate free ridership), the mere process of adding questions to the battery will tend to change the free ridership estimates, especially if the scores are multiplied together. It appears that for the most part scores are averaged rather than multiplied, which should lessen this effect.

- The question scoring algorithm is very elaborate and the report would benefit from including a table (or series of tables) to show how responses from sample questions would be used to calculate the free ridership rate. The weights chosen to score responses appear to be arbitrarily determined.

- In addition to the survey responses, some of the scores are adjusted through a comparison with an upper and lower "influence bound". The weighting used to adjust the free ridership estimates relative to these bounds also seems to be arbitrary.

- Some free ridership estimates are adjusted using the results from a contractor survey. The contractor perspective will be a very noisy measure of customer intentions as they may not have interacted enough with the customer to assess what type of equipment they may have been considering or the timing of when the equipment was selected.

- The inside spillover results do not appear to remove any additional high efficiency installations that were rebated by a DSM program. Without removing these rebated installations, inside spillover will be overstated.[1]

- Some questions are not worded properly to get at the free ridership issues. In particular, the question on prior participation reads "How important was your experience with those energy efficiency programs in the past?" It does not specifically ask how important the prior participation was on selecting the measure currently being explored in the survey.

[1] As part of the Enbridge 2002 DSM Audit, ECONorthwest made a similar comment regarding participant spillover calculations done by Summit Blue in their earlier study for commercial projects.

- For some questions, "don't know" or similar uncertain responses are weighted using a value of 0.5, while in other questions the same responses are weighted using a value of 0.25 or 0.

- Only a very high level of discussion of the furnace market analysis is presented in this report, yet these results determine 50 percent of the free ridership calculation.

For these reasons, we do not recommend that the free ridership rates from the Summit Blue study be used for the 2007 (or future) programs. Until a different free ridership estimate can be completed, we recommend that the previous free ridership values be used for these measures.

5.2 Summit Blue Study on Savings Values for Residential Prescriptive Programs

The second Summit Blue study addressed the per unit savings values for aerators, low-flow showerheads, and programmable thermostats. For each of these measures, adjusted savings values have been developed based on a review of related research and impact studies conducted in other areas.

In general, this study appears to do a thorough job in exploring the related literature and developing savings estimates. Given time limitations, the audit did not attempt to review the sources used by Summit Blue or conduct an additional literature review to determine if other sources may be relevant.

In our review on the savings estimates for low flow showerheads, there were adjustments presented based on changes in water temperature and "throttling" where users increase the volume of water during a typical shower to make up for a lower flow. There was not much supporting evidence for these adjustments. We recommend that these adjustments be omitted from the impact estimates for showerheads.

Given the widespread promotion of low-flow showerheads in these programs, we recommend that Enbridge and Union work together to conduct their own study to estimate showerhead savings by metering customers in their service territories before and after the low flow showerhead installation. Given the volume of savings claimed for the showerheads each year, we recommend that conducting this study be a high priority. Until that time, we recommend that the savings values from the Summit Blue study be used without the changes suggested for temperature change and throttling.

Table 2 shows the savings values for low-flow showerheads (corresponding to Table 3-9 in the Summit Blue report). The highlighted column shows the savings values by ECONorthwest that do not include adjustments for throttling and water temperature.

Table 2: Adjustments to Low-Flow Showerhead Savings Estimates From Summit Blue Report

(Shaded Areas Are The Audit Recommended Values)

Sector	Gallons per Minute (Existing)	Gallons per Minute (Replaced)	Gas Savings: No Throttling (m^3)	Gas Savings: No Throttling or Temp Change (m^3)
Per Household	2.0	1.25	47	51
	2.1 – 2.5	1.25	74	78
	2.6+	1.25	114	117
	2.0	1.50	29	33
	2.1 - 2.5	1.50	59	60
	2.6+	1.50	95	100
Per Showerhead		2.00	11	16
		1.50	45	49
		1.25	65	67

There appears to have been less secondary research available for use by Summit Blue to develop savings estimates for programmable thermostats and aerators. As with showerheads, we recommend that the Summit Blue estimates be adopted for these measures until a study can be conducted by Enbridge to develop savings estimates that are tailored to its own customers.

5.3 New Home Construction

The Enbridge New Home Construction program currently pays builders a $100 incentive for each EnerGuide home and $100 for each ENERGY STAR home. There is no supporting evaluation research indicating that the $100 incentive is having any affect on the decision to build a new home to either the EnerGuide or ENERGY STAR standard. Given the small rebate relative to overall home building costs and the incremental costs associated with meeting the higher standard, it seems unlikely that this program is having any significant effect on the new construction market. We recommend that Enbridge conduct some evaluation research in this area to demonstrate the effectiveness of this program for future years.

5.4 Novitherm Panels

The Enbridge report on Novitherm panel installation is used to derive an 85 percent installation adjustment factor for the 2007 Annual Report. However, 9 percent of this reflects respondents that had not yet installed the Novitherm panel but planned to do so in within the next six months. Since the follow-up survey was done several months after the customer received the Novitherm panels, it seems unlikely that these panels will ever be installed. Even though the intended installer adjustment was already discounted by a factor of 50 percent by Enbridge (from 18 percent to 9 percent), we do not recommend that any of these intended installations be counted in the 2007 SSM calculations. We recommend that the installation adjustment factor be reduced

from 85 percent to 76 percent for Novitherm panels for the 2007 SSM and that only actual installations be counted in this adjustment factor in future years.

5.5 Other Residential Issues Raised by the Audit Subcommittee

Additional issues raised by the Audit Subcommittee are listed below, along with the information obtained during the audit addressing these issues.

Programmable thermostats – were customers with existing programmable thermostats screened out?

Enbridge indicated that the following steps are taken in their programs to screen out customers that had existing programmable thermostats replaced:

1. All applicants are considered eligible for the rebate
2. All applications are entered into the tracking system
3. Applications are screened to eliminate those that have already participated in the program
4. Customer are separated into 2 groups: those replacing programmable thermostats and those replacing manual thermostats
5. Only those applicants replacing a manual thermostat are forwarded to the DSM group for tracking savings.

TAPS adjustments due to non-installation – confirm that non-installation adjustment is applied to savings and not to participants or costs

We examined this calculation and confirmed that the adjustment is done to savings and participants in the SSM spreadsheet. The adjustment is not made for incentives, which have been appropriately reallocated to program direct costs for inclusion in the TRC calculation.

EnerGuide for Houses– Confirm that only 50 percent of benefits are claimed by Enbridge

We examined the per home savings values in the SSM calculations. The value used to calculate savings is 660.5 m^3, which is 50 percent of the 1,321 m^3 value approved in the Generic Hearing for the EnerGuide program.

New Home Construction – Confirm that, since the building codes changed in 2007, program participation in 2007 was restricted to those homes that were permitted in 2006 under the old code.

During the course of the audit, Enbridge checked on this issue with the program implementer EnerQuality. EnerQuality said that most builders rushed to get permits ready under the old code before the more stringent code was enacted in 2007. As a consequence, they assumed that the 2007 participants were all permitted under the old code and EnerQuality did not adjust their savings estimates to account for the new code. It does not appear that any evaluation work was

done to investigate this issue further by examining the actual building permits for homes that participated in 2007.

6. BUSINESS MARKET PROGRAM AUDIT RESULTS

The major business market program issues examined by the audit are described below, followed by a discussion of specific issues raised by the Audit Subcommittee on these programs.

6.1 REVIEW OF ENGINEERING STUDIES

As part of the audit, we reviewed two studies completed by engineering firms to review the savings estimates for custom projects in the industrial, commercial, and agricultural sectors. Our review was limited to reviewing the reports and discussing the results with the engineers who managed these projects.

The two reports reviewed were:

- Genivar report *Evaluation of 2007 Industrial Projects* (May 1, 2008)
- Building Innovations, Inc. report *Engineering Review of Enbridge Gas Distribution Custom Projects 2007* (March 2008)

It appears from the reports that the engineers generally had confidence in the savings estimates and recommend only small adjustments to the claimed savings (discussed below). In the case of the commercial custom projects, there were cases that projects were not very well documented and are noted in the report.

From an audit standpoint, there was little for us to review in these reports, as the description of the savings calculations for each project was generally limited to a page or less. Consequently, the audit was relying on the word of the reviewing engineer that the underlying calculations were sound and adequately documented. We were unable to review firsthand the underlying assumptions (beyond what is included in the engineering report) or see any of the supporting documentation due to time constraints for this audit. Consequently, the actual savings calculations were not reviewed as part of this audit.

For future audits, we recommend that the audit involve reviewing the background files for a sample of projects reviewed by the engineering firms. This would include reviewing any relevant background information on individual projects including engineering studies, audit documents, e-tool printouts, invoices, baseline consumption data, existing equipment efficiency data, operating hours, and documentation on the new equipment as installed. Due to time constraints, we were unable to conduct such a review as part of the 2007 DSM audit, although Enbridge expressed a willingness to cooperate with this effort.

In the engineering reports, each firm made some recommendations for future evaluation work and we agree with these recommendations. Recommendations from both engineering reports that are not already being discussed in this audit report are summarized below. Additional context for these recommendations is available in the engineering reports.

From the Genivar industrial and agricultural project engineering review:

- **Extend engineering review period**. Consider spreading the file review and site investigation process over a longer period. To arrange 13 site investigations and maintain credible notes for later review and reporting is problematic – particularly with other project commitments and weather (travel) issues to overcome in the time allotted.

- **Avoid double selection.** Enbridge may wish to consider a process to ensure that clients are not double interviewed for the engineering review and then some other evaluation or implementation task. This occurrence was noted by a few clients who expressed inconvenience to participate in two interviews.

- **Client preparation.** Enbridge may wish to provide a standard template of questions to be provided to the clients in advance of our site inspection so they may be better prepared.

- **Include additional documentation for project files.** Enbridge should require the following items in the project file. (Note that similar documentation recommendations have been made in past audits):

  - EGD files may consider addition of the following items to aid in the file review process;

  - Photos before and after measure.

  - "Cut sheets" of major new equipment – it is noted in some cases EGD files provide excerpts of reports and manufacturer's correspondence and /or quotations (which contain some technical information).

  - Commissioning reports by contractors and/or field-testing by EGD.

  - In some cases, the feasibility of the measure was prepared using a degree-day model to account for the variation in the year. EGD may wish to include a spreadsheet graph to track the natural gas consumption pre and post implementation of the measure versus degree-days.

From the Building Innovation commercial file review:

- **Benchmark data.** Enbridge should collect data on the number of suites and floor area of all buildings as part of their EEP application. These data will help to highlight problem areas, improve savings estimates, and identify problems with utility balances and assumptions about base case seasonal efficiency.

- **Seasonal Efficiency.** The seasonal efficiency of a boiler will vary from close to combustion efficiency during peak load condition, to a worst-case value during low load conditions. The E-tools calculation for seasonal efficiency should be based on a Bin model approach to account for these differences. In addition, it is recommend

that Enbridge complete a study of the combustion efficiency of newly installed boilers to account for possible differences in laboratory published efficiency numbers and the actual efficiency achieved by the installed boilers.

- **Heating Distribution System.** The E-tools should take into account the nature of the heating distribution system when evaluating their savings. Savings are claimed based on control of the heating loop temperature without regard for the nature of the heating loop. The following are some factors that will impact the effectiveness of a heating loop temperature reset strategy:
  - Zone controls
  - Nature of zone controls (separate thermostat, unit mounted thermostat, valve)
  - Condition of zone controls
  - Age of building
  - Thermal resistance (R value) of walls and windows
  - Evidence of windows being opened during heating season
  - Degree of reset possible
  - Controls have selective or representative zone temperature feedback
  - In cases where a building has new zone controls, the impact of loop temperature rest, load compensation, and zone feedback will be an order of magnitude lower than an older building with no zone controls and evidence of suite overheating. The gas savings resulting from prescribed measures such as reflective heating panels will also be impacted by these factors.
- **District Steam.** EnWave produces district steam to customers in the downtown core of Toronto and claimed gas savings based on a reduction in steam use for certain projects. This leads to the possibility of double counting if EnWave offers similar incentive programs. In addition, assumptions regarding conversion and transmission efficiency of the EnWave boilers should be consistent across projects. Factors to be considered in setting this conversion factor include the existence of co-generation, or reuse of waste heat in the steam generation process, which could impact savings.
- **Reflective Heating Panels.** The gas savings resulting from the installation of reflective heating panels is dependent on the following factors:
  - The area of reflective panels installed on outside walls.
  - The indoor wall temperature, which should vary according to distribution water temperature, and local controls.

- The thermal resistance (R value) of the wall construction
- Average outdoor air temperature in the heating season.
- It is recommended to create prescribed gas savings per square foot of installed panel (on outside walls only) to improve accuracy with only a modest increase in complexity.

- **Ventilation Scheduling.** Many multi-unit residential buildings rely on outdoor air being supplied to the corridors and then transferred into the suites for indoor air quality purposes. The practice of scheduling make up air units, or reducing fan speed during certain periods, to achieve energy savings may be in violation of local building codes and bylaws, although there is a variation of opinion in the industry regarding these requirements. The mater is further complicated by legal "grandfathering" issues, changes to air quality standards, and delays in local adoption of such standards. To address these issues, it is recommended that Enbridge obtain a professional opinion on the practice of reducing ventilation in occupied residential buildings, and use these recommendations to form business rules around savings based on these practices. In projects where a professional engineer is involved in the project, it is recommended that Enbridge obtain a written statement from the local authorities or engineer confirming code compliance.

6.2 PROJECT SAMPLING

The sampling method used for the custom projects is consistent with the method agreed on for the 2007 program year. However, the current sampling method does not result in adequate coverage of projects with electricity and water savings. Of the 13 industrial and agricultural projects sampled, only 3 had electricity savings and none had water savings. For the 17 commercial custom projects sampled, only 5 had electricity savings and none had water savings.

In addition to expanding the sample (or drawing a separate sample to cover electricity and water savings), we also recommend that the sample be expanded to cover a representative sample for large measure groups and end uses within each business market. For example, a sample should be drawn to achieve a 90/10 relative precision for large measure/end use categories such as steam traps, boilers, process adjustments, heat recovery within both the commercial and industrial sectors. This would allow the results from the sample review to be applied more accurately to the measure groups being reviewed (e.g., apply the sample steam trap results to all of the steam trap measures for that program year within that sector).

The purpose of drawing a representative sample of projects is to allow for sample results to be applied to the entire population. Consequently, we recommend that the results of the engineering review be applied to all of the projects within that sector for gas savings.

As discussed, there were only a handful of projects with electrical savings reviewed by third party engineers and no projects were reviewed with water savings. Given the very small sample sizes, we do not recommend adjusting the electricity and water savings claims. We recommend that these samples be increased in future years so that the kWh and water savings estimates can receive an adequate review.

6.3 PRESCRIPTIVE SAVINGS VALUES FOR SCHOOLS

As part of the 2007 Audit, two studies were reviewed that relate to boiler installations in schools:

- *Elementary Schools Prescriptive Savings Analysis* (Final Report, November 23, 2007)
- *Secondary Schools Prescriptive Savings Analysis* (Final Report, November 23, 2007)

These studies were completed by the engineering firm Agviro and are designed to provide a single prescriptive savings value for boilers replaced in schools. The audit team reviewed this report but did not review any of the background calculations or data were reviewed as part of this audit.

The prescriptive schools program began with a few projects in 2007, although it was not formally supposed to begin until 2008. For this audit, we reviewed the savings study to determine if the savings values should be used for the 2007 prescriptive projects and to provide suggestions for using the savings values in future program years.

In general, it appears that the Agviro report is a sound study and we recommend that the study values be used for gross savings for the prescriptive schools projects in 2007, as the study currently represents the best available information for a prescriptive savings values.

Moving forward, there should be more information provided on how the baseline boiler condition is calculated. The Agviro study relies on Enbridge boiler E-tool but there is no background information provided that supports the underlying assumptions for the baseline. The base case needs to reflect a typical boiler installation and should be supported with some documentation. A couple of parameters appear to assume overly optimistic values that result in a higher savings estimates:

- **Flue Damping.** Flue damping is set to "none" in the base case calculations. While there are certainly cases of this, there are also forced draft burners available and installed in these boilers. Some sort of base case saturation should be established and the base case assumption regarding flue damping needs to be the weighted average of these two cases.
- **Modulation.** Currently the base case assumes no modulation. Modulation would be required in this boiler in most US energy codes and it is unlikely the base case is always non-modulating in Canada. This is particularly true in the larger boiler used in the secondary schools analysis.
- **School size restrictions.** For the secondary schools analysis, only schools with consumption of 100,000 m3 or more were used in the analysis. For elementary schools, only schools with less than 100,000 m^3 were used. The elementary school sample was reduced further by eliminating all small schools with consumption less than 30,000 m^3. It is unclear why any of these restrictions were made and omitting the smaller schools will tend to inflate the savings values. Given that this study is designed to create a single prescriptive savings number that will be applied to

schools of all sizes, the smaller schools should not have been excluded from either sample. Omitting the small schools will also tend to inflate the savings estimate if these schools typically have smaller than average boilers.

We recommend that additional support for these assumptions be provided if these savings values are to be used in future years. This includes supporting background information for the base case for the nine input parameters used in the Enbridge boiler e-tool. Depending on how well these assumptions are documented, the recommended savings value may change for future program years. We also recommend that the savings values be recalculated using the small schools in the sample.

6.4 Other Business Market Issues Raised by the Audit Subcommittee

Multi-residential showerheads and aerators – review validity and support provided for installation rates.

This issue was raised with Enbridge as part of the audit. Enbridge reports that they are unable to survey the multi-family residents about these installations due to privacy legislation. They are looking for other alternatives for conducting these verifications. Consequently, the installation rates assumed for these measures have not been verified, beyond relying on what the contractors are reporting as installed.

We recommend that Enbridge work with the program implementers to obtain waivers from the customers that receive showerheads and aerators so that some form of verification can occur, either by phone or through an on-site inspection.

If a study for the multi-residential sector is not done in the next year, we recommend in the future that the non-installation adjustment factors from the single family TAPS survey be applied to multi-family for these measures.

Multi-residential Recommissioning – Review assumption regarding 5-year measure life

Enbridge models their program on a similar NRCan program, which uses the same 5-year measure life assumption for recommissioning. The measure life assumption for commissioning is currently being researched in the large California impact evaluations and there is very little research that has been conducted on this topic. Given the lack of research, we do not have any suggestions for improving the 5-year measure life assumption.

The Company's proposed Recommissioning program was approved in the Multi-year plan. However, the Company did not put forward any projects under this program in 2007 as the program is still in development. The Company is working with NRCan and other stakeholders to form a Canadian building commissioning association. Once formed, this new group will develop standards and/or guidelines for recommissioning. The Company will then bring forward any necessary changes to its program assumptions.

Multi-residential Washing Machines – Review assumptions on savings and free ridership and determine if these take into account the new minimum efficiency standards.

Enbridge provided the audit information on the parameters used to calculate savings and the audit confirmed that these savings parameters are the ones being used in the SSM savings calculations for these measures.

The savings are calculated relative to existing equipment, not the new minimum efficiency standard. Enbridge says that this is justified as the programming is targeting early replacements, but it is not clear how this is being accomplished. We recommend that savings be calculated relative to a new standard efficiency clothes washer rather than using the existing equipment efficiency.

In this audit, we completed a very limited online search for clothes washer savings values for multifamily buildings that assume a new, standard efficiency machine as the baseline. From this review, we found that the Energy Trust of Oregon uses a value of 28.3 therms for clothes washer replacements in multi-family buildings. We recommend that this savings value be used until Enbridge can develop a better estimate.

Large New Construction – examine the program and participant screening process and determine if it accounts for the 2007 code changes.

During the course of this audit, Enbridge found that the new code was implemented in April 2007 but that no changes were made in the program administration to reflect the higher standards. During the course of this audit, Enbridge has reviewed the individual large new commercial files and found one project that was likely built under the new 2007 code. The savings for this project have been revised and this change has been incorporated into the audit version of both the SSM and LRAM calculations.

7. MARKET TRANSFORMATION

We reviewed the market transformation projects and reports and it appears that Enbridge has attempted to examine the metrics established for these programs. However, we have concerns that the methods used may not be showing discernible progress on these metrics. As discussed below, we believe that progress on these metrics should be considered valid only when the increase in the metrics is statistically significant.

For future program years, we strongly suggest that new metrics be established for these programs. The first step in this process should be developing logic models and program theory for each market transformation program. The logic models will clearly show the links between program activities and outcomes, and how these outcomes translate into short-term, mid-term, and long-term market changes.

Once these links have been established, then appropriate metrics of market transformation can be established. These metrics need to reflect changes in the marketplace that can logically be traced back to program activities. For example, measuring increased contractor awareness of a program or construction practice that is promoted by a program or program-sponsored training session might be considered a valid indicator of market transformation, depending on the context. Some of the current indicators used for the 2007 are actually program activities and not measures of market change. These include:

- Number of training events held
- Number of training participants
- Number of trade show exhibits
- Number of technical guides and case studies developed

These program activities are not appropriate indicators for market transformation.

Below are comments about the specific market transformation metrics and recommended adjustments to the 2007 claims.

7.1 EnerGuide for Fireplaces

In 2007, Enbridge started an in-store program designed to increase awareness of the EnerGuide label for natural gas fireplaces through point of purchase communication material and sales associate training. Evaluation research was conducted to address the following metrics:

- 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 study correctly examines whether the differences in survey findings are statistically significant across survey waves. It also conducts the surveys 6 months apart, which is appropriate to determine if the program activities have made a lasting impression and therefore might be good indicators of market transformation. Based on the survey findings, no statistically significant differences in awareness were observed and consequently no SSM claim is being made for these metrics.

As discussed below, we recommend that a method similar to those used in this study be adopted for the other market transformation metrics. In particular, only statistically significant differences between survey waves should be considered as evidence for meeting a set market transformation performance goal. The survey waves should also be fielded an appropriate period apart in order to measure any lasting changes.

7.2 Home Contractor Performance

The Home Performance Contractor Market Program was designed to increase the frequency of weatherization measures (air sealing and insulation) included in home renovation and upgrade projects in the residential sector through industry-delivered workshops. During the first program phase, a series of eight workshops ran from March 27 to May 8, 2007. A self-administered survey was completed just before the course began and the results of this survey established baseline measurements.

Approximately six months later, participants were re-contacted and asked to complete the same questionnaire. The purpose was to determine the degree to which they had increased the frequency of implementing weatherization measures, following the course. The metric examined is a shift of 1.0 on a 5.0 scale, where a 1.0 shift corresponds to 100 percent of the SSM incentive being paid. While there was an increase in survey responses for the metrics, given the sample sizes it is unlikely that this difference is statistically significant.

Although this metric was set for 2007, it is difficult to justify as it is unclear how a change in these numeric ratings translate into actual market progress. We do not recommend that SSM incentives be paid for this metric for 2007 based on the results of this study as the results are not significantly different across surveys. If this metric is going to be continued in future program years, we recommend that the average change in responses be calculated with a confidence interval and only a statistically significant increase in ratings be eligible for an SSM incentive.

7.3 BOILER MARKET TRANSFORMATION

A similar survey was used for the Boiler Market Transformation program to measure changes in knowledge for contractors and engineers. Progress on this metric was measured using a survey administered to 24 participants of the High Efficiency and Condensing Boiler workshop at the PM Exposition Conference held in Toronto on November 28-30, 2007. This survey was designed to measure the increase in awareness and knowledge at the end of the workshop compared to results taken at the beginning of the workshop. The follow up survey for these contractors was done immediately after the workshop was completed and compared with the same survey questions administered at the start of the workshop (approximately 1 hour earlier).

This is not an appropriate measure of market transformation. Fielding the follow-up survey immediately after the workshop is not a reliable indicator of how well the information is being retained. As discussed above, the attendees should be surveyed only after an appropriate period of time has passed to determine if any of the training is being retained and (ideally) that the information is actually being translated into sustained changes in market activity.

In addition to the problem of when the follow-up survey was administered, two of the questions appear to be unrelated to the metrics set for this program:

- Q1. According to research, what criterion is most commonly used by managers when deciding whether to spend capital funds on projects? (select one answer) (a) First cost, (b) Net present value (NPV) and internal rate of return (IRR), (c) Simple payback, (d) Discounted payback

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

These two questions are not measuring any type of market change as they cannot be linked to any sort of practice or activity done by those taking the survey.

The fourth question in the survey is as follows:

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

In this case, multiple responses were allowed which diminishes the value of this question as a metric, as it is unclear if the correct response is provided first (as the primary responses) or as secondary response.

We do not believe that this survey has adequately demonstrated any progress on this metric in 2007. Consequently, we recommend that no SSM payments be made on the boiler market transformation component for 2007.

7.4 BUSINESS PARTNERS

The Business Partners study was designed to establish a baseline of awareness among HVAC contractors and engineers. The study was completed by Enbridge was designed to establish the number of HVAC designs/projects that have been undertaken in the past 12 months and determine the percentage of energy-saving technologies currently implemented.

As with the other studies, the change in the metrics should be calculated using a confidence interval. In this study, it also appears that the reported precision from the results is calculated incorrectly. The group of 242 contractors and engineers listed in the report is a sample of contractors, not the population, as there are presumably more contractors than this working in the Enbridge service territory. Assuming a population of 1,000, for example, then the precision level for the sample of 66 HVAC contractors falls to +/- 12% (at 95% confidence). With the same population, the precision for the sample of 52 engineers is +/-13% at a 95% confidence level.[2] With these larger confidence ranges, it does not appear that there are significant differences in this metric over time.

The final metric value is calculated as a weighted average among the frequency of responses for the following technologies:

- Natural gas fired Desiccant Dehumidification
- Natural gas fired Humidification
- Ceiling-mounted Destratification Fans
- Air Doors / Air Barriers / Air Curtains
- Demand Control Ventilation

It would also be useful to see how the survey responses changed for the individual technologies, rather than just the weighted average value. If the weighted average calculation is being skewed

[2] These confidence ranges do not vary much across different assumed population values once the population reaches a few hundred.

too much by one technology, it may be more appropriate to use a metric that is calculated for each technology separately.

Furthermore, since this study is being done to establish a baseline, it is unclear why it is being considered as a measure of market transformation. By definition, the baseline measure would not have anything to do with Enbridge's market transformation efforts. Consequently, we recommend that no SSM payments be made for this metric.

7.5 Market Transformation Adjustment Summary

Table 3 shows the recommended values to be used for the market transformation SSM payments based on the audit discussion above. Based on the suggested revisions, we recommend that the market transformation SSM payments be reduced from $434,601 to $178,151.[3]

[3] Note that the totals do not match the values in the 2007 DSM Report as Enbridge has subsequently reported additional progress on two metrics for the Boiler Market Transformation program.

Table 3: Market Transformation SSM Adjustments

Program	Metric	Enbridge 2007 SSM Claim	Recommended 2007 SSM Claim
EnerGuide for Fireplaces	# of stores with EnerGuide point-of-sale materials	$68,400	$68,400
Home Contractor Performance	# of contractors training workshops	$26,667	$26,667
Home Contractor Performance	Increase in frequency of weatherization measures implemented	$40,200	$0
Home Contractor Performance	# of workshop participants	$22,667	$22,667
Boiler Market Transformation	% increase in engineer and contractor awareness of high efficiency boilers	$206,250	$0
Boiler Market Transformation	Benefit/Cost Sales Tools	$25,000*	$25,000
Boiler Market Transformation	# training events held	$6,250*	$6,250
Boiler Market Transformation	# training participants	$16,667	$16,667
Boiler Market Transformation	# trade show exhibits	$12,500	$12,500
Business Partners	Baseline established	$10,000	$0
Total		**$434,601**	**$178,151**

*Payment value adjusted by Enbridge after completing the 2007 DSM report.

8. AUDIT RECOMMENDATIONS

We found that the 2007 Annual Report generally conformed to the methods agreed upon for these programs. As discussed above, we were unable to conduct a detailed review of the custom savings estimates due to the limited information available in the 3rd party engineering reports completed for the 2007 evaluation.

We recommend the following adjustments be applied to the 2007 DSM results:

- Adjust savings values for low income TAPS measures (showerheads, aerators, pipe wrap) based on the results of the TAPS installation survey
- Adjust custom project savings for gas based on the results of the engineering review studies.
- For market transformation, reduce the SSM claim to $178,151.
- Use the prescriptive schools boiler savings values from the Agviro reports for 2007 only for those sites that are considered to be part of the prescriptive schools program.

- Use a 76 percent installation adjustment factor (instead of 85 percent) for residential Novitherm panels.

We recommend that the following adjustments be made to future DSM claims (2008 onward):

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

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

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

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

The following are recommendations for future evaluation research.

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

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

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

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

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

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

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

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

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

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

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

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MEMORANDUM

TO: Mike Brophy, Judith Ramsay, Rodney Idenouye
Kai Millyard, Jay Shepard, Jack Gibbons

DATE: July 23, 2008

RE: 2007 Audit Review of Custom Project Files

This memo documents the findings of the audit review of the 3rd party engineering studies completed as part of the 2007 Enbridge DSM claim. The purpose of this review was to examine selected projects within the original sample of 30 projects in order for the audit to achieve a level of comfort with the overall savings claim for the 2007 custom projects. Given time and budget constraints, we were unable to review all 30 projects. Projects were not randomly selected for this review, but rather selected based on those that involved more complicated installations and/or appeared to be in greatest need of review based on the descriptions contained in engineering reports. For the audit review, we selected 12 of the 30 projects for review. These 12 projects represented 45 percent of the claimed gas savings of the original 30 projects reviewed by the 3rd party engineers.

The purpose of this exercise was to develop a blanket adjustment factor to correct for any issues that were discovered during the audit that were not adequately addressed in the evaluation. To accomplish this, it was not necessary (or even preferable) that a random sample of projects be used, as the intent was to develop a conservative adjustment factor given the limited resources available. In this context, the sample used by the audit achieved the primary objective of creating a single adjustment factor that could be used to correct for multiple issues. Developing and applying a single adjustment factor to all projects also avoids having the audit attempt to do evaluation work, which has been a problem in previous audits of these programs.

A conservative adjustment factor was also desired by the audit based on the auditors' experience with reviewing the custom projects in previous years. In these previous audits, we noted that the assumptions used to calculate savings (especially those that are used to determine the baseline conditions) were sometimes overly generous and tended to inflate the estimated savings. It is important to stress that the savings calculations used to show a customer the potential bill

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savings with new equipment is often not the same savings calculation that should be used for evaluation purposes. As demonstrated below, it would be useful for future engineering reviews to examine these assumptions more critically and within the context of the evaluation.

We have also commented in previous audit reports that there is a need for better documentation and support for the calculation assumptions used for custom projects. (Both engineering reports also commented on the lack of good documentation on some of the projects reviewed.) While the custom project documentation has noticeably improved, there is still a need for better supporting information, particularly in those cases where the parameter assumptions are resulting in unusually high savings estimates.

Details on our review and the audit adjustments to the savings are shown in Table 1. Note that of the 12 projects selected, we did not receive complete answers to some of our questions for 2 of the projects.[1] Consequently, only 10 projects were ultimately reviewed by the audit.

For this review exercise, we were directed by the EAC to calculate an adjustment factor from the 10 files reviewed based on the estimated savings from all 30 projects reviewed by the 3rd party engineers. While this dilutes the adjustment value as it includes 20 projects in the adjustment calculation that were not reviewed by the audit, it was felt that this was a fair compromise given the time and resources allocated to the audit and would yield an appropriate adjustment factor. This method is being used for 2007 only and should not be applied in future years without changes to the sampling method.

Based on the audit review of 10 project files, the savings adjustment factors are as follows:

Commercial custom projects = 5.3 percent
Industrial and Agricultural custom projects = 5.5 percent

These adjustment factors have been based on the 10 project review by the audit, and then averaged over the 30 projects in the original sample. It also incorporates the original adjustment factors recommended from the 3rd party engineering reports.

We recommend that this adjustment factor be applied to all custom projects for 2007 in the commercial, industrial, and agricultural sectors, except for those 30 that were originally included in the 3rd party engineering review.

Using these adjustment factors in addition to the other adjustments detailed in the 2007 Audit Report, the final audit-recommended values for the 2007 programs are as follows:

SSM: $8,069,895
Market Transformation SSM: $178,151 (unchanged from the 2007 Audit Report)
DSMVA to Ratepayers: $616,134 (unchanged from the 2007 Annual Report)
LRAM: $301,289 (amount to be returned to ratepayers)

[1] Enbridge was very responsive to our requests for information, but the information requested for some projects was not always documented and therefore not readily available in the time allotted for the audit review.

Table 1: Audit Adjustments to 2007 Custom Projects

Project #	Evaluation Savings	Audit Savings	Reduction	Reason for Reduction
cm.mun.015.07	77,493	58,120	25%	Several issues with boiler efficiency calc even if existing baseline accepted. File indicates power draft units with 66% seasonal (or 78% in letter). eTools run models natural draft boiler and gets 61% efficiency. Also the proposed case has 50% more boiler capacity but the boiler oversize factor within eTools is set to 1 in both cases . Assuming 66% rather than 61% for basecase efficiency savings are reduced by 25%.
cm.hos.006.07	1,633,676	1,633,676	0%	A lot of good measures here though they are fairly common the hospital sector these days so there will be a significant free rider effect. Note some of the important measures here are as simple as resetting set points and it is unclear who did these and why the utility should being claiming savings for them. The emphasis with temperature normalizing in a hospital is also questionable as humidity and patient load would likely have a far bigger impact. Enbridge was not able to answer the questions raised by the audit on this file.
cm.hos.008.07	742,000	593,600	20%	Very unclear how eTools and hand calc relate to same building. Enbridge states eTools is not good for steam boilers but the number and size of the boilers is totally different. Output increased 50% which indicates that the basecase should have been a new standard boiler rather than the existing boilers. The existing plant probably could have made this but with no margin of safety, which would be bad practice. Enbridge did not include any details of the existing boilers such as size in the file and this information was not provided when requested by the audit. Savings reduced 20% to assume new boiler baseline with existing boiler in lag position
cm.multi-priv.243.07	18,191	14,553	20%	Base load is not adjusted for seasonal effect would decrease space heat. Control savings lower the supply temperature 10F but that may get restored if winter conditions require. Etools boiler spreadsheet gives savings of around 1.5% for this change. Savings adjusted to this lower level. Utility needs to develop a control measure that installs reset/cutout controllers where not already present. Reduced savings 20% to account for reduced control adjustment savings from 3.5% to 1.5%.
cm.multi-priv.187.07	196,876	196,876	0%	It seems very unlikely that the lag boiler will operate to meet less than 1% of the load, as claimed in this file. Enbridge should document how the lag boiler is controlled. Most installations would bring it on long before the lead boiler was totally maxed out.
ind.all.079.07	183,028	81,584	55%	Based upon phone call previous enbridge descriptions of the measures are incorrect. The MUA is on the oven side, the destrat fan is just on the storage side. Enbridge submitted recalculation of MUA savings based upon using existing unit heaters rather than new indirect MUA for base. We believe that savings calculations for this site are still flawed for the following reasons. 1. New MUA calculations assume that every cfm provided by the MUA was previously infiltrated air that was heated by the unit heaters. There are two problems with this unit heater baseline. First, Enbridge admits that the current heaters can not adequately keep the space warm, and second the baking oven gives off significant heat but the calculation assumes that it never offsets space heat. Original calculation seems more robust here in that it was just comparing new standard tech with new efficient tech. 2. The destratification calculation assumes the destrat fan reduces the ceiling temperature from 86 to 68 and that the heat content of all 19000cfm of exhuasted air is reduced by this temp diff and further that this same quantity of heat (3,227 mmBtu) is mixed into the space as a whole and offsets heat that would have occured. Since the MUA eliminates infiltration the only heat that can be offset is conduction losses. Based upon the file the storage space UA is 4515 (wall area implies very, very long skinny building). Assuming 6800dd the conduction losses for this space are 737 MMBTU/yr assuming no useful heat gains in the space. Presumably the oven side has about the same amount of heat requirements but again the oven heat likely offsets much of that. 3. We do not believe that the programmable set back as a measure here as it should be considered in the baseline. We recommend keeping the original MUA calculation and reducing the destratificaiton savings from 3227mmBtu to 737mmBtu.
ind.agr.015.07	57,700	56,480	2%	Calculations are across the board savings from a statement in publication of the National Greenhouse Manufacturers Association, "The amount of heat retained and fuel saved varies according to the type of material in the curtain. Experimental results indicate savings of 50-60% of fuel cost in greenhouses with heat retention curtains vs. uncovered houses. Growers who have installed curtain systems commonly report annual savings of 30% or more." Enbridges choice of 20% is conservative relative to this statement but the source is a poor source for program savings estimates. For a standard measure the utility should acquire the available basic research and have a specification of the material. Savings should very dramatically depending upon season and whether the greenhouse is single or double layer material. Shade curtain savings reduced 3% for interactive impacts of linkage less boiler measure.
ind.all.102.07	1,441,779	1,441,779	0%	Not clear if Enbridge's response to audit questions answered the basic question of interaction between combustion efficiency and energy recovered by the recuperator. No corrections, savings included in the adjustment calculations.
ind.all.110.07	3,599,385	3,599,385	0%	
ind.all.052.07	373,009	373,009	0%	Measure seems to impact the exhaust fan directly. Impacts on the MUA depend upon how unit is controlled. Decreased exhaust would also lead to an increase in infiltration. Consultant correction seems to be based on hand written comment in the program file. Actual calc uses arbitrary assumption that seems conservative. Not sure this claim should be increased without detailed measurement of actual air flows. Original claim restored due to poor documentation of increased savings claim.

Allocation to DSM Variance Accounts

Rate Allocation by Account

	2007			TOTAL
	DSMVA	LRAM	SSMVA	
RATE 1	$ (70,423)	$ (1,379,740)	$ 3,301,323	$ 1,851,160
RATE 6	$ (713,934)	$ 146,630	$ 1,169,063	$ 601,760
RATE 100	$ 1,375,689	$ 1,275,391	$ 2,067,611	$ 4,718,690
RATE 110	$ 1,231,188	$ 476,927	$ 910,155	$ 2,618,270
RATE 115	$ (740,191)	$ (62,673)	$ 339,207	$ (463,658)
RATE 135	$ (24,242)		$ 25,794	$ 1,551
RATE 145	$ (235,770)	$ (97,571)	$ 205,353	$ (127,989)
RATE 170	$ (1,438,450)	$ (660,253)	$ 229,540	$ (1,869,162)
RATE 200				
TOTAL	$ (616,134)	$ (301,289)	$ 8,248,046	$ 7,330,623

Enbridge Gas Distribution's 2007 DSM Audit Summary Report

July 2008

I Introduction

In keeping with Ontario Energy Board (the Board) requirements, an independent audit was conducted of the Enbridge 2007 DSM program results as reported in the Company's 2007 DSM Annual Report. This document provides an summary of the process followed to audit the 2007 DSM Annual Report; a summary of Enbridge Gas Distribution Inc.'s responses to the Auditor's recommendations and discussion with the Evaluation and Audit Committee (EAC); and a report on the corresponding impacts to the 2007 DSM savings and associated Shared Savings (SSM) and Lost Revenue Adjustment (LRAM) claims.

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]

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

This document is organized into the following sections:

In Sections III, IV and V, the recommendations of the Auditor are presented first including any EAC commentary on the recommendation. This is followed by additional advice from the EAC which was not part of the auditors recommendations.

II Audit Process

Selection of 2007 Evaluation and Audit Committee

The Evaluation and Audit Committee (EAC) was comprised of three representatives elected from the DSM Consultatve and one representative from the utility. The 2007 EAC representatives are:

- Jack Gibbons - Pollution Probe
- Kai Millyard - Green Energy Coalition
- Jay Shepherd – School Energy Coalition
- Judith Ramsay – Enbridge Gas Distribution

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 ECONorthwest as the auditor of the 2007 Annual Report was made by the EAC and accepted by the Company.

The 2007 Audit Terms of Reference described the overall objective of the audit as follows, and it was on this basis that the Auditor accepted the assignment:
"…to recommend appropriate values that lead to the DSMVA, LRAM and SSM claims for the Company, given a set of pre-approved assumptions, and to give confidence that the claims are reasonable. The Company intends to use the Audit as evidence to clear the relevant DSM accounts at the OEB."

Project Start up and Workplan

The Draft 2007 Annual Report was circulated to the 2007 EAC and ECONorthwest on April 5, 2008 and to the Consultative on April 7, 2008. Written comments were requested by end of day Friday, April 11, 2008.

Following receipt of the comments, including issues which the EAC requested the auditor to investigate based on the information it had available to it at that time, the auditor submitted a revised workplan.

Information Exchange

At the outset of the audit, Enbridge provided the auditor with all requested materials related to the 2007 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.

2007 Audit Tasks

As described in their report, the tasks undertaken by EcoNorthwest as part of the 2007 audit include the following:

- Confirmed that the TRC calculations utilized the agreed upon values for free ridership and per unit savings.
- Replicated the savings and TRC amounts reported in the SSM.
- Reviewed the DSMVA calculations

- Reviewed the LRAM calculations
- Reviewed two 3rd party evaluation reports on savings estimates for a sample of custom commercial, industrial, and agricultural projects.
- Interviewed the firms that conducted the studies.
- Reviewed a Summit Blue report researching residential free ridership rates (for showerheads, aerators, programmable thermostats, and furnaces)
- Reviewed a Summit Blue report researching deemed savings values for showerheads, thermostats, and aerators.
- Reviewed Enbridge study on combustion efficiency for boilers
- Reviewed Enbridge studies on 2007 market transformation activities
- Assessed the underlying assumptions used in savings estimates
- Reviewed program database and participation tracking systems
- Reviewed Enbridge studies used to determine installation rates for TAPS and Novitherm measures
- Reviewed two reports by Agviro that develop prescriptive savings values for boilers installed in secondary and elementary schools
- Reviewed status of recommendations from previous audits
- Reviewed specific issues as raised by the Audit Subcommittee

In addition, following submission of the Final Report, EcoNorthwest conducted an additional detailed file review of selected custom projects.

2007 Audit Report

A draft of ECONorthwest's 2007 Audit Report was circulated to the EAC on June 14, 2008 and the Final Report was provided on June 24, 2008.

Towards the end of June a number of issues remained unresolved by the auditor's report and the EAC requested that Enbridge request an extension from the Board. The Company notified the Board of this intention, based on the proposal that the EAC would seek to conclude the process by July 23, which would enable the Company to complete an application for account clearance by the end of July.

Following resolution of all outstanding issues with the EAC and completion of the additional engineering review work by the auditor on July 22nd, Enbridge recalculated the SSM and LRAM as reported in this document. The auditor then verified the revised SSM and LRAM calculations and issued a supplementary memo to the Audit Report on July 23rd.

III TRC Results and SSM Calculations

A. Auditor Recommendations

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

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

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

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

   Enbridge Response:
   Enbridge recalculated the program results to correct this clerical error.

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

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

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

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

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

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

   Enbridge Response:
   See item #5 below

5. Recommendation:

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

Enbridge Response:

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

6. Recommendation:

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

Enbridge Response:

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

7. Recommendation:

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

Enbridge Response:

The Company pointed out that the Ontario Energy Board may assign SSM incentives for milestones in market transformation programs beyond market effects. "The Board remains satisfied that market outcomes should not be the exclusive metric for shareholder incentives."[2] Enbridge expressed concern that where the Company has met the performance of an approved metric, the SSM should apply. Changes to market transformation SSM metrics should only apply going forward. To expedite resolution of the 2007 results, Enbridge recalculated the Market Transformation SSM calculation for 2007 as recommended.

Enbridge acknowledged the Board's "… expectation that continuous improvement can be achieved within the new long term collaborative framework."[3] Further to the auditor's report, Enbridge intends to work to improve evaluation methods for the market transformation programs in consultation with the EAC. Further, Enbridge will investigate the application of the program theory and logic model approach to at least one market transformation program for 2009 and submit any resulting proposed change in program metrics to the Board for approval.

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

B. EAC Recommendations

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

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

9. Large New Construction Custom Project Savings
Recommendation:
Calculation of savings for custom projects in Large New Construction should reflect the introduction of the new Building Code effective April, 2007.

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

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

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

TRC Results

Program Area	Annual Report Gas Savings	Annual Report Net TRC Benefits	Post Audit Gas Savings	Post Audit Net TRC Benefits
Existing Homes	26,887,911	$ 77,140,669	26,813,466	$ 76,048,054
Residential New Construction	782,905	$ 773,155	782,905	$ 773,155
Low Income	1,966,539	$ 6,017,008	1,732,330	$ 5,222,829
Total Residential Markets	**29,637,355**	**$ 83,930,832**	**29,328,701**	**82,044,038**
Small Commercial	1,067,062	$ 2,115,524	1,067,062	$ 2,115,525
Commercial	9,727,542	$ 21,970,227	9,404,197	$ 20,752,556
Multi-Residential	23,188,272	$ 43,572,419	22,518,941	$ 41,002,340
Large New Construction	2,433,345	$ 6,386,572	2,411,119	$ 5,360,755
Industrial	28,201,217	$ 56,525,515	27,190,619	$ 53,806,193
Total Business Markets	**64,617,438**	**$ 130,570,257**	**62,591,938**	**123,037,369**
Overheads		$ (5,282,987)		$ (5,282,987)
TOTAL ALL PROGRAMS	**94,254,793**	**$ 209,218,102**	**91,920,639**	**199,798,420**

SSM Calculation

Item		Amount	Percentage		Total SSM
target TRC	$	150,000,000	100		
TRC achieved	**$**	**199,798,420**			
% of target achieved			133.20%		
75% of target	$	112,500,000		$	2,250,000
TOTAL Resource Acquisition Programs				**$**	**8,069,895**
Market Transformation Programs				**$**	**178,151**
TOTAL				**$**	**8,248,046**

IV LRAM

A. Auditor Recommendations

11. Recommendation :

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

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

Enbridge Response:

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

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

12. Recommendation:

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

Enbridge Response:

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

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

13. Recommendation:

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

Enbridge Response:

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

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

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

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

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

B. EAC Recommendations

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

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

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

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

LRAM Results

Program Area	Annual Report Gas Savings	Annual Report Net TRC Benefits	Post Audit Gas Savings	Post Audit Net TRC Benefits
Existing Homes	26,887,911	$ 77,140,669	13,578,980	$ 32,312,942
Residential New Construction	782,905	$ 773,155	782,905	$ 773,155
Low Income	1,966,539	$ 6,017,008	1,052,902	$ 2,680,529
Total Residential Markets	**29,637,355**	**$ 83,930,832**	**15,414,787**	**$ 35,766,626**
Small Commercial	1,067,062	$ 2,115,524	1,067,062	$ 2,115,525
Commercial	9,727,542	$ 21,970,227	10,613,308	$ 23,481,024
Multi-Residential	23,188,272	$ 43,572,419	24,566,336	$ 43,955,680
Large New Construction	2,433,345	$ 6,386,572	2,721,120	$ 6,113,235
Industrial	28,201,217	$ 56,525,515	30,686,555	$ 60,791,093
Total Business Markets	**64,617,438**	**$ 130,570,257**	**69,654,381**	**$ 136,456,557**
Overheads		$ (5,282,987)		$ (5,282,987)
TOTAL ALL PROGRAMS	**94,254,793**	**$ 209,218,102**	**85,069,168**	**$ 166,940,196**

LRAM Calculation

2007 Audit Report LRAM Calculation

based on 65,475,862 FE m3 built into rates

Rate	Budget Net Partially Effective	Actual Net Partially Effective	Volume Variance	Q1 Distribution Margin	$
Rate 1	14,698,593	7,763,821	6,934,772	8.4205	$ 583,945
Rate 6	6,607,467	7,344,452	(736,985)	5.2676	$ (38,822)
Rate 100	4,552,789	10,963,084	(6,410,295)	3.6573	$ (234,441)
Rate 110	2,105,854	4,502,957	(2,397,103)	1.5927	$ (38,178)
Rate 115	1,340,089	1,025,085	315,004	0.9226	$ 2,906
Rate 145	1,737,990	1,247,584	490,407	1.8370	$ 9,009
Rate 170	4,423,310	1,104,786	3,318,525	0.5084	$ 16,870
Totals	35,466,092	33,951,768	1,514,324		**$ 301,289**

V SSM and LRAM Table

	SSM Case		LRAM Case	
	gas m^3	net TRC benefits	gas m^3	net TRC benefits
TAPS Program - Showerheads >2.5	12,847,127	$ 42,243,565	4,339,814	$ 13,097,172
TAPS Program - 2.1 - 2.5	2,159,010	$ 6,985,369	882,378	$ 2,627,260
TAPS Program - EQ 2.0	27,029	$ 86,106	10,336	$ 29,521
Aerators	1,986,440	$ 8,364,668	1,522,938	$ 5,408,590
TAPS Program - Pipe wrap	1,029,400	$ 2,019,251	1,029,400	$ 2,019,251
TAPS Program - Bag test	0	$ -	0	$ -
Furnace Replacements	3,569,166	$ 4,056,839	2,402,323	$ 2,696,293
Enhanced Furnace Replacement	302,903	$ 353,186	203,877	$ 237,722
Enhanced Furnace Replacement	-83,593	$ (18,356)	-83,593	$ (18,356)
Thermostats ($15)	3,151,711	$ 9,426,398	1,447,235	$ 3,684,460
Novitherm	245,980	$ 169,848	245,980	$ 169,848
Energuide for Houses	1,575,055	$ 2,361,719	1,575,055	$ 2,361,719
Energy Star Front Load Washers	3,238	$ (539)	3,238	$ (539)
TOTAL EXISTING HOUSING	26,813,466	$ 76,048,054	13,578,980	$ 32,312,942
EnerGuide for New Houses	111,491	$ 195,135	111,491	$ 195,135
EnergyStar for New Houses	671,414	$ 578,020	671,414	$ 578,020
TOTAL RES'L NEW CONSTRUCTION	782,905	$ 773,155	782,905	$ 773,155
TAPS Program - Showerheads	542,725	$ 1,781,203	183,335	$ 549,918
TAPS Program - Showerheads	138,201	$ 446,817	56,482	$ 167,849
TAPS Program - Showerheads	492	$ 1,569	188	$ 539
Aerator	93,419	$ 392,885	93,419	$ 331,278
TAPS Program - Pipe wrap	45,744	$ 88,687	45,744	$ 88,687
TAPS Program - Bag test	0	$ -	0	$ -
Prog Thermostats	840,989	$ 2,435,369	602,973	$ 1,465,959
Weatherization program	70,760	$ 76,299	70,760	$ 76,299
TOTAL LOW INCOME	1,732,330	$ 5,222,829	1,052,902	$ 2,680,529
TOTAL RESIDENTIAL	29,328,702	$ 82,044,037	15,414,787	$ 35,766,625
Hotels / Motels	691,130	$ 1,275,414	779,989	$ 1,447,854
Offices	1,363,082	$ 1,986,198	1,538,335	$ 2,255,338
Retail	247,320	$ 515,694	279,118	$ 583,838
Warehouses	242,003	$ 627,730	273,118	$ 708,733
Other Commercial	774,232	$ 911,621	873,777	$ 1,038,986
Hospitals	2,400,966	$ 5,222,073	2,709,661	$ 5,897,836
Long Term Care	96,121	$ 94,921	108,479	$ 107,474
Municipalities	1,800,684	$ 6,108,253	2,032,200	$ 6,904,045
Schools	1,057,162	$ 2,627,321	1,193,083	$ 2,968,402
Universities	731,498	$ 1,383,333	825,548	$ 1,568,518
TOTAL LARGE COMMERCIAL	9,404,197	$ 20,752,556	10,613,308	23,481,024
Restaurants - Pre-rinse Spray Valve	670,567	$ 1,106,662	670,567	$ 1,106,662
Restaurants - DC Kitchen Ventilation	213,884	$ 646,879	213,884	$ 646,879
Air Doors				
Rooftop Units	25,436	$ 35,462	25,436	$ 35,462
Tankless Water Heaters	54,170	$ 6,049	54,170	$ 6,049
Furnace Replacements	44,462	$ 59,771	44,462	$ 59,771
Programmable Thermostats	58,543	$ 260,702	58,543	$ 260,702
TOTAL SMALL COMMERCIAL	1,067,062	$ 2,115,525	1,067,062	$ 2,115,525
TOTAL COMMERCIAL	10,471,259	$ 22,868,081	11,680,370	25,596,549
Multi-residential Private	18,175,124	$ 27,289,152	20,511,925	$ 30,801,073
Multi-residential Non Profit	424,853	$ 619,182	479,477	$ 705,543
Multi-residential Recommissioning	32,730	$ (6,635)	36,940	$ (4,756)
Showerheads / aerators	3,433,459	$ 11,894,380	3,433,459	$ 11,894,380
Front Load Washers	452,774	$ 1,206,261	104,535	$ 559,441
TOTAL MULTI-RESIDENTIAL	22,518,941	$ 41,002,340	24,566,336	43,955,680
TOTAL NEW CONSTRUCTION	2,411,119	$ 5,360,755	2,721,120	$ 6,113,235
Industrial All	25,521,751	$ 50,778,056	28,803,119	$ 57,370,176
Agriculture	1,668,867	$ 3,028,137	1,883,436	$ 3,420,917
TOTAL INDUSTRIAL	27,190,619	$ 53,806,193	30,686,555	$ 60,791,093
TOTAL BUSINESS MARKETS	61,591,937	$ 123,037,369	69,654,381	$ 136,456,557
TOTAL RESIDENTIAL AND BUSINESS MARKE	91,920,638	$ 205,081,407	85,069,168	$ 172,223,181
PORTFOLIO ADMINISTRATION		$ (5,282,987)		$ (5,282,987)
TOTAL		$ 199,798,420		$ 166,940,195

VI Future Research and Savings Calculations

A. Auditor Recommendations

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

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

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

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

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

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

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

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

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

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

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

EcoNorthwest made the following recommendations regarding future evaluation research.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Enbridge Response:

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

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

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

B. EAC Recommendations

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

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

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

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

33. **Recommendation:**
For greater transparency, report TAPS showerhead and aerator savings separately.

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

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

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

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

Enbridge Response:

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

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

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

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

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

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

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

VII 2008 Avoided Costs

The purpose of this information is to update commodity costs for 2008, 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".[4]

A. Avoided Gas Costs

The commodity price forecast has been updated for the four existing DSM measures: water heating, space heating, industrial process, and water and space heating combination as shown in Table 1. 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 in the Table are adjusted for a nominal growth rate of 2%.

B. Avoided Electricity Costs

Avoided electricity costs have been updated using the same methodology as for previous DSM plans. The avoided electricity costs are based on the wholesale price of electricity as reported in the Annual Report of the Independent Electricity System Operator ("IESO"). The avoided electricity costs of $0.0745/kWh represent the wholesale cost of electricity, i.e., the cost of the commodity price plus wholesale market services, transmission and debt retirement charges which are passed from the IESO to the Local Distribution Utilities. The values represent the latest full year of data available from the IESO (December 2006 to December 2007). Forecast values are adjusted for the Consumer Price Index.

C. 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 sewage collection.

A weighted average cost of $0.7782/$m^3$ (or 1,000 litres) 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.

[4] EB-2006-0021. Decision With Reasons. Ontario Energy Board. August 25, 2006. Page 38.

Year		avoided costs	NPV	avoided costs	NPV	avoided costs	NPV	avoided costs	NPV
		Water Heating		Space Heating		Space & Water		Industrial	
1	2008	$ 0.2747	$ 0.27	$ 0.2948	$ 0.29	$ 0.2915	$ 0.29	$ 0.2771	$ 0.28
2	2009	$ 0.2966	$ 0.55	$ 0.3220	$ 0.59	$ 0.3174	$ 0.58	$ 0.2994	$ 0.55
3	2010	$ 0.2907	$ 0.79	$ 0.3167	$ 0.86	$ 0.3116	$ 0.84	$ 0.2946	$ 0.80
4	2011	$ 0.2945	$ 1.02	$ 0.3250	$ 1.11	$ 0.3195	$ 1.09	$ 0.2982	$ 1.03
5	2012	$ 0.2806	$ 1.21	$ 0.3067	$ 1.32	$ 0.3018	$ 1.30	$ 0.2841	$ 1.23
6	2013	$ 0.3017	$ 1.41	$ 0.3288	$ 1.53	$ 0.3237	$ 1.51	$ 0.3051	$ 1.43
7	2014	$ 0.3150	$ 1.60	$ 0.3474	$ 1.74	$ 0.3417	$ 1.71	$ 0.3186	$ 1.61
8	2015	$ 0.3207	$ 1.77	$ 0.3536	$ 1.93	$ 0.3477	$ 1.90	$ 0.3243	$ 1.79
9	2016	$ 0.3066	$ 1.92	$ 0.3380	$ 2.10	$ 0.3324	$ 2.07	$ 0.3100	$ 1.94
10	2017	$ 0.3128	$ 2.06	$ 0.3448	$ 2.26	$ 0.3391	$ 2.22	$ 0.3162	$ 2.09
11	2018	$ 0.3190	$ 2.20	$ 0.3517	$ 2.40	$ 0.3458	$ 2.37	$ 0.3226	$ 2.22
12	2019	$ 0.3254	$ 2.32	$ 0.3587	$ 2.54	$ 0.3528	$ 2.50	$ 0.3290	$ 2.35
13	2020	$ 0.3319	$ 2.44	$ 0.3659	$ 2.67	$ 0.3598	$ 2.63	$ 0.3356	$ 2.47
14	2021	$ 0.3386	$ 2.55	$ 0.3732	$ 2.79	$ 0.3670	$ 2.74	$ 0.3423	$ 2.58
15	2022	$ 0.3453	$ 2.65	$ 0.3807	$ 2.90	$ 0.3743	$ 2.85	$ 0.3492	$ 2.68
16	2023	$ 0.3522	$ 2.74	$ 0.3883	$ 3.00	$ 0.3818	$ 2.96	$ 0.3561	$ 2.77
17	2024	$ 0.3593	$ 2.83	$ 0.3961	$ 3.10	$ 0.3895	$ 3.05	$ 0.3633	$ 2.86
18	2025	$ 0.3665	$ 2.91	$ 0.4040	$ 3.19	$ 0.3973	$ 3.14	$ 0.3705	$ 2.95
19	2026	$ 0.3738	$ 2.99	$ 0.4121	$ 3.28	$ 0.4052	$ 3.23	$ 0.3779	$ 3.03
20	2027	$ 0.3813	$ 3.06	$ 0.4203	$ 3.36	$ 0.4133	$ 3.31	$ 0.3855	$ 3.10
21	2028	$ 0.3889	$ 3.13	$ 0.4287	$ 3.43	$ 0.4216	$ 3.38	$ 0.3932	$ 3.17
22	2029	$ 0.3967	$ 3.20	$ 0.4373	$ 3.50	$ 0.4300	$ 3.45	$ 0.4011	$ 3.23
23	2030	$ 0.4046	$ 3.25	$ 0.4460	$ 3.57	$ 0.4386	$ 3.51	$ 0.4091	$ 3.29
24	2031	$ 0.4127	$ 3.31	$ 0.4550	$ 3.63	$ 0.4474	$ 3.57	$ 0.4173	$ 3.35
25	2032	$ 0.4209	$ 3.36	$ 0.4641	$ 3.69	$ 0.4563	$ 3.63	$ 0.4256	$ 3.40
26	2033	$ 0.4294	$ 3.41	$ 0.4733	$ 3.74	$ 0.4655	$ 3.68	$ 0.4341	$ 3.45
27	2034	$ 0.4380	$ 3.45	$ 0.4828	$ 3.79	$ 0.4748	$ 3.73	$ 0.4428	$ 3.49
28	2035	$ 0.4467	$ 3.50	$ 0.4925	$ 3.83	$ 0.4843	$ 3.77	$ 0.4517	$ 3.54
29	2036	$ 0.4556	$ 3.54	$ 0.5023	$ 3.88	$ 0.4939	$ 3.82	$ 0.4607	$ 3.58
30	2037	$ 0.4648	$ 3.57	$ 0.5124	$ 3.92	$ 0.5038	$ 3.86	$ 0.4699	$ 3.61
Discount Rate 9.14%									

Year	Ont. CPI	Electri-city Rates ¢/kWh	NPV	Water Rates ¢/1000 litres	NPV
1	1.73	*7.45*	*$ 0.07*	*77.82*	$ 0.78
2	1.84	7.59	$ 0.14	79.25	$ 1.50
3	2.00	7.74	$ 0.21	80.83	$ 2.18
4	1.80	7.88	$ 0.27	82.29	$ 2.82
5	1.81	8.02	$ 0.33	83.78	$ 3.41
6	1.95	8.18	$ 0.38	85.41	$ 3.96
7	1.93	8.33	$ 0.43	87.06	$ 4.47
8	2.05	8.51	$ 0.47	88.85	$ 4.95
9	2.01	8.68	$ 0.52	90.63	$ 5.41
10	1.96	8.85	$ 0.56	92.41	$ 5.83
11	1.96	9.02	$ 0.60	94.22	$ 6.22
12	1.60	9.16	$ 0.63	95.72	$ 6.58
13	1.85	9.33	$ 0.66	97.49	$ 6.93
14	1.79	9.50	$ 0.69	99.24	$ 7.24
15	1.88	9.68	$ 0.72	101.11	$ 7.54
16	1.90	9.86	$ 0.75	103.03	$ 7.82
17	1.89	10.05	$ 0.77	104.97	$ 8.08
18	1.93	10.24	$ 0.80	107.00	$ 8.32
19	2.02	10.45	$ 0.82	109.16	$ 8.55
20	2.06	10.67	$ 0.84	111.41	$ 8.76
21	1.99	10.88	$ 0.86	113.63	$ 8.95
22	2.08	11.10	$ 0.87	116.00	$ 9.14
23	2.11	11.34	$ 0.89	118.45	$ 9.31
24	2.00	11.57	$ 0.91	120.82	$ 9.47
25	2.00	11.80	$ 0.92	123.23	$ 9.63
26	2.00	12.03	$ 0.93	125.70	$ 9.77
27	2.00	12.27	$ 0.95	128.21	$ 9.90
28	2.00	12.52	$ 0.96	130.78	$ 10.02
29	2.00	12.77	$ 0.97	133.39	$ 10.14
30	2.00	13.03	$ 0.98	136.06	$ 10.24
Discount Rate 9.14%					

Filed: 2008-08-14
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Exhibit B
Tab 1
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VIII 2008 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 2008 target formula is "The simple average of $150 million and the actual 2007 audited TRC value as approved by the Board increased by 1.5 times the budget escalation factor (i.e., 7.5%)."

Further to the agreement noted in Recommendation #15 above, the interim 2008 target is calculated on the basis of Actual 2007 TRC results for LRAM excluding spillover, with free ridership on a program by program basis,and using 2008 avoided costs.

2007 TRC Target	Actual 2007 TRC results	Actual 2007 TRC results for LRAM, including spillover, on a sector basis and with 2007 avoided costs	Actual 2007 TRC results for LRAM excluding spillover, on program by program basis and with 2008 avoided costs	2008 TRC Target
(a)	(b)	(c)	(d)	(a+d) /2 * 1.075%
$150,000,000	$199,798,420	$166,940,196	$163,072,713	$ $168,276,583