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May 29, 2009

**VIA COURIER**

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

**Re: Enbridge Gas Distribution Inc. ("Enbridge")  
EB-2009-0154 2010 Natural Gas Demand Side Management (DSM) Plan**

On April 14, 2009 the Ontario Energy Board (the "Board") issued a letter to parties involved in the EB-2008-0346 DSM Guidelines for Natural Gas Distributors requesting distributors to file DSM plans for 2010 by the end of May 2009.

In accordance with the Board's request, enclosed please find the application and evidence for Enbridge's 2010 DSM Plan.

This submission has been filed through the Board's RESS, two copies are being delivered by courier and it will be available on the Enbridge website at [www.enbridge.com/ratecase](http://www.enbridge.com/ratecase) as of Saturday May 30, 2009.

If you have any questions, please contact the undersigned.

Yours truly,

A handwritten signature in blue ink that reads 'Bonnie Jean Adams'.

Bonnie Jean Adams  
Regulatory Coordinator

cc: EB-2009-0346 Interest Parties (via email)

## EXHIBIT LIST AND DESCRIPTIONS

### A- ADMINISTRATIVE

<u>Exhibit</u>	<u>Tab</u>	<u>Schedule</u>	<u>Title</u>	<u>Description</u>	<u>Witness(es)</u>
<u>A</u>	1	1	Exhibit List and Description		M.Brophy

### B- EVIDENCE

<u>B</u>	1	1	2010 Demand Side Management Plan - Summary	Provides a summary of the 2010 DSM Plan and orientation for the layout of evidence. Provides context for how the Plan relates to Board Decisions on the 2007-2009 Framework, the Company's Plan for 2007-2009 and the 2010 Program Assumptions.	M. Brophy P. Squires
		2	Summary of 2010 Budge	Provides a volumetric estimate and O&M budget estimate for the year 2010. The budget estimate was prepared in compliance with the Board's Framework decision.	M. Brophy P. Squires
		3	Fiscal 2010 DSM Monitoring and Evaluation Plan	The process for Evaluation and Audit was approved in the Board's Framework decision. This section outlines a priority list for evaluation activities for 2010 identified by the Company in consultation with the Evaluation and Audit Committee.	M. Brophy P. Squires
		4	Market Transformation	Provides a set of Market Transformation Programs, metrics and incentives developed by the Company in accordance with the Board's Framework decision.	M. Brophy P. Squires

EXHIBIT LIST AND DESCRIPTIONS

B- EVIDENCE

<u>Exhibit</u>	<u>Tab</u>	<u>Schedule</u>	<u>Title</u>	<u>Description</u>	<u>Witness(es)</u>
	2	1	Program Descriptions	Provides a program description for programs proposed as part of the 2010 Plan.	M. Brophy P. Squires
	3	1	New Programs and Program Assumptions	This section includes assumption information and substantiation for programs elements that are supplemental to the Board Decision dated April 30, 2009. These supplement the "measure specific" assumption approved by the Board to form a complete set of approved program assumptions.	M. Brophy P. Squires
		2	EGD DSM Input Assumptions for 2010 Program Year	Table of Program Assumptions	M. Brophy P. Squires
		3	Substantiation Sheets for Selected 2010 Input Assumptions	Substantiation Sheets	M. Brophy T. MacLean P. Squires
		4	2010 Free Ridership Summary	Table of Free Ridership	M. Brophy P. Squires
		5	Custom Resource Acquisitions Technologies	Table of Measure Lives	M. Brophy P. Squires
		6	Avoided Costs		M. Brophy T. MacLean P. Squires

EXHIBIT LIST AND DESCRIPTIONS

B- EVIDENCE

<u>Exhibit</u>	<u>Tab</u>	<u>Schedule</u>	<u>Title</u>	<u>Description</u>	<u>Witness(es)</u>
<u>B</u>	4	1	Industrial Monitoring and Targeting Pilot Program	Proposal for new Industrial sector support programs	M. Brophy P. Squires

C- SUPPORTING MATERIAL

C	1	1		Letter of Support – Energy Star
		2		Letter of Support – Atlantic Packaging
		3		Letter of Support – NRCAN
		4		Letter of Support – CME

2010 DEMAND-SIDE MANAGEMENT PLAN – SUMMARY

1. With over a decade of experience, Enbridge Gas Distribution Inc. (“Enbridge” or the “Company”) has been recognized as a leader in Demand Side Management (“DSM”). Delivery of DSM to Enbridge customers has resulted in net benefits of over \$1.4 billion in net energy bill reductions and reduced natural gas consumption by over 3.6 billion cubic meters. The Company has received numerous DSM awards, most recently the EnerQuality Award of Excellence - 2008 Industry Partner of the Year.
2. In August of 2006 the Ontario Energy Board (the “Board” or “OEB”) issued a Decision in the Generic DSM proceeding (EB-2006-0021) setting the Framework for a multi-year DSM plan for the gas utilities (2007-2009). In a subsequent Decision, the Board approved input assumptions for the utilities to use in their plan submissions. The Company’s DSM Plan for 2007-2009 was approved by the Board in January 2007. Late in 2008 the Board began consultation with the utilities and other interested parties on the DSM Framework and program assumptions to be used in the next multi-year plan period beginning in 2010. On April 29, 2009 the Board issued a Decision regarding some “measure specific” input assumptions to be used in 2010. Since 2010 DSM programs had not been developed or filed at that time, the Navigant review was based on the Board approved 2008 assumption list and any information that was available to Navigant regarding potential measures for 2010. Navigant indicated in their report that some elements related to 2010 would need to be addressed when the 2010 programs were available for Board approval. In April 2009, the Board instructed all rate-regulated gas utilities in Ontario to file a one year plan for 2010, extending by one year the framework and budget escalators established for the 2007-2009 three-year plan approved in EB-2006-0021 and applying the Board approved 2010 assumptions.

Witnesses: M. Brophy  
P. Squires

3. In accordance with the Board's direction, this document presents the Company's 2010 DSM plan using the DSM Framework as approved in EB-2006-0021 and the assumptions as approved in EB-2008-0346. As outlined in Exhibit B, Tab 1, Schedule 2, the 2010 plan provides a DSM budget of \$23.8 million. This amount represents an escalation of 5% from the 2009 budget in accordance with the EB-2006-0021 formula. This budget also reflects the Board's letter of May 13, 2009 to rate-regulated natural gas utilities regarding Low Income DSM programs. Funds allocated for Low Income DSM have been removed from this budget and will be considered under a separate proceeding (EB-2008-0150). Based on recent customer and industry feedback, Enbridge has proposed an additional pilot program that requires incremental funding in 2010 beyond the prescribed formula. Enbridge requests approval as part of its 2010 DSM Plan the discrete pilot program as outlined in Exhibit B, Tab 4, Schedule 1. Details of the budget are outlined in Exhibit B, Tab 1, Schedule 2. The 2010 DSM Plan will be adjusted over time as may be required to respond to changes in the marketplace, new barriers, new opportunities, and to optimize the DSM portfolio. This principle is in accordance with page 10 of the Board's Decision with Reasons Phase I (EB-2006-0021):

**Program Design and Implementation.** The Utilities agree to the principle that their DSM programs should be managed with regard to the best available information known to them from time to time. Normal commercial practice requires that a Company should react through changes to program design, implementation and/or mix, to material changes in base data as soon as is feasible given relevant operational considerations.

4. The process for Evaluation and Audit was outlined in the Board's Decision with Reasons Phase I (EB-2006-0021). The Monitoring and Evaluation Plan included here for 2010 follows the approach outlined and approved in the Multi-year Plan (EB-2006-0021). During 2010, the Company intends to continue to work with the Evaluation and Audit committee to reassess evaluation priorities. Details for the Monitoring and Evaluation Plan are included in Exhibit B, Tab 1, Schedule 3.

Witnesses: M. Brophy  
P. Squires

5. Although the Company is ultimately accountable for development and execution of the Plan, the Company did take the opportunity through a Consultative meeting in April of 2009 to obtain and consider input from Consultative members on program concepts.
6. The Company has developed a set of Market Transformation Programs and metrics for 2010 in accordance with the Board's Decision with Reasons Phase I (EB-2006-0021). The proposed budget for Market Transformation is \$995,557 in 2010.
7. Program Descriptions for programs proposed in the Plan are included in Exhibit B, Tab 2, Schedule 1. Prescriptive program assumptions reflect the Board's Decision in EB 2008-0346 regarding assumptions where applicable. Information specific to program delivery has been included such as free ridership and incremental costs. Descriptions for any new programs are also included and noted. Program Substantiation Sheets for new prescriptive programs and information specific to program delivery are included in Exhibit B, Tab 3, Schedule 3. Based on the information available at this time all proposed programs meet the benefit to cost ratio of 1.0 as outlined in the Board's Decision with Reasons Phase I (EB-2006-0021).
8. In conclusion, the Company's DSM Plan for 2010 meets the budget and framework criteria established in the Board's EB-2006-0021 Phase 1 Decision, with addition of the pilot program as mentioned. The Company respectfully requests approval of the Plan as filed.

Witnesses: M. Brophy  
P. Squires

Table 1  
Summary of 2010 Budget

Item No.	Col. 1 <u>Program Name</u>	Col. 2 <u>Participants</u>	Col. 3 <u>Net effective m3</u>	Col. 4 <u>Total O&amp;M Costs</u>
1	<b><i>Residential</i></b>			
2	Existing Homes - Water Conservation	711,165	11,889,667	\$4,543,074
3	Existing Homes - Equipment Replacement	18,000	857,660	\$1,276,000
4	Residential New Construction	62,500	3,971,705	\$1,296,500
5	Program Development and Market Research			\$500,000
6	<b>Total Residential</b>	<b>791,665</b>	<b>16,719,032</b>	<b>\$7,615,574</b>
7	<b><i>Business Markets</i></b>			
8	Small Commercial	3,655	2,736,926	\$840,200
9	Commercial		12,641,500	\$1,901,887
10	Multi-Residential	22,688	17,227,317	\$2,022,292
11	Large New Construction		3,922,185	\$920,025
12	Industrial		22,173,483	\$3,070,402
13	Agriculture		1,800,000	\$234,833
14	<b>Total Business Markets</b>	<b>26,343</b>	<b>60,501,411</b>	<b>8,989,639</b>
15	<b><i>Market Transformation</i></b>			
16	Residential			\$995,557
17	<b>Total Market Transformation</b>			<b>\$995,557</b>
18	<b>Total All Programs</b>	<b>818,008</b>	<b>77,220,443</b>	<b>17,600,770</b>
19	<b>Portfolio Administration</b>			<b>\$6,200,000</b>
20	<b>TOTAL</b>		<b>77,220,443</b>	<b>23,800,770</b>
21	<b>Supplemental Pilot Program</b>			
22	(Industrial Sector Support Programs)			\$ 1,250,000
23	<b>TOTAL all programs and Industrial Support</b>			<b>25,050,770</b>

Note: \$1,433,250 and \$154,350, represent Low Income Resource Acquisition and Market Transformation program budget allocations respectively. This was deducted from the 2009 O&M Budget to arrive at a base amount i.e. \$22,667,400 for the purpose of applying the 5% escalation factor to determine the 2010 financial budget.

Witnesses: M. Brophy  
P. Squires



## FISCAL 2010 DSM MONITORING AND EVALUATION PLAN

### Introduction

1. Development of the Company's Monitoring and Evaluation Plan for the period 2010 is in alignment with the framework outlined in the Board's Decision with Reasons Phase I (EB-2006-0021).

2. The Board's Decision with Reasons Phase I stated that:

Parties agree that the Utilities should conduct forward-looking DSM research. The appropriate level of budgets for research shall be determined by each Utility from time to time (depending upon the need, market conditions, etc.) and each Utility should include a summary of its forecasted research in its multi-year DSM plan filed with the Board.<sup>1</sup>

In addition, the Decision provided that an Evaluation Audit Committee be formed. The duties outlined for the Evaluation Audit committee include, "Consultation prior to the filing of the DSM plan on evaluation priorities for the next three years (or the duration of the multi-year plan)."<sup>2</sup>

3. Objectives and Priorities of the 2010 Evaluation Plan

Prior to development of the Evaluation Plan, the Company sought comment from the 2009 EAC on suggested evaluation priorities for 2010.

The Company identified six overall objectives for the 2007 - 2009 Evaluation Plan and will continue with these objectives for the 2010 year:

- maintain and enhance ongoing program tracking and documentation procedures;

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<sup>1</sup> EB-2006-0021, Decision With Reasons, August 25, 2006, page 15

<sup>2</sup> Ibid, page 18

- fulfill commitments from the Generic Hearing including research items listed in Appendix A, updating the DSM Potential Study and reviewing all prescriptive program assumptions (completed);
- undertake third party evaluation of custom project savings;
- provide evaluation research necessary to measure the impacts of new market transformation programs;
- support development and evaluation of new DSM programs during the plan period; and
- undertake other evaluation research on a priority basis.

4. The table below shows the completed items from 2007 and 2008, the planned items for 2009 and the Company's forecast of how these evaluation objectives will be addressed in 2010.

	<u>Activity</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
1.	Maintain and enhance program tracking and documentation	X	X	X	X
2.	Commitments from Generic Hearing				
	<ul style="list-style-type: none"> <li>• Items from Appendix A <ul style="list-style-type: none"> <li>○ EnerGuide for New Houses – savings post OBC changes</li> <li>○ Enhanced furnaces and High Efficiency Furnaces – free ridership</li> <li>○ Faucet aerators – savings</li> <li>○ Low-flow Showerheads – savings</li> <li>○ Home Rewards w/o Programmable Thermostat – assess 2008 impacts</li> <li>○ Custom projects – free ridership</li> </ul> </li> </ul>	X	X		
	• Update DSM Potential Study		X	X	
	• Review all prescriptive assumptions	X	X	X	
3.	Third party evaluation of custom project savings	X	X	X	X
4.	Evaluation Research re: new market transformation programs	X			X
5.	Development of new DSM programs	X	X	X	X
6.	Additional evaluation research as needed	X		X	X

Witnesses: M. Brophy  
P. Squires

Collaboration with Union Gas and Other Parties

5. In 2007 and 2008 the Company partnered with Union Gas to commission three studies: deemed savings for selected residential measures, free ridership and spillover for selected residential programs, and free ridership and spillover for custom programs. The Company also collaborated with Union Gas (and with the joint Union / Enbridge EACs) in the development of a Sampling Methodology and Terms of Reference for the third party engineering review of custom projects for 2007 and 2008 program years. In 2009 Union Gas and Enbridge collaborated in development of responses to the Board's Draft assumptions for 2010 and the Assumption Update for 2009. In 2010, the Company, in consultation with the Evaluation Audit Committee, will continue to look for appropriate opportunities to partner with Union Gas and other parties when executing the Evaluation Plan. Alignment of evaluation activities with Union Gas may be affected by differences in customer base, program portfolio, evaluation priorities and other factors.

MARKET TRANSFORMATION

1. This section outlines the Company's 2010 DSM Market Transformation ("MT") Plan. The format for this submission follows the "scorecard" approach requested by the Board in the EB-2006-0021 proceeding.
2. In its letter dated April 14, 2009, the Board instructed all rate-regulated gas utilities in Ontario to file a one-year plan for 2010, extending the framework and budget escalators established for the 2007-2009 three-year plan in EB-2006-0021, by one year. In its May 13<sup>th</sup> letter, the Board further directed the utilities to remove Low Income programs from the 2010 DSM budget. The target SSM level remains at \$500,000 for successful completion of the Market Transformation scorecard metrics.
3. Table 1 below presents the updated budget and SSM amounts for each initiative included in the 2010 DSM Market Transformation Plan.

TABLE 1 – 2010 Market Transformation Budget and Target SSM

		2010	
Program		<u>Budget</u>	<u>SSM</u>
	Home Performance Contractors	\$80,000	\$150,000
	Drain Water Heat Recovery	\$865,557	\$350,000
	subtotal	\$945,557	\$500,000
Other MT Initiatives			
	Channel Market Support	\$50,000	\$0
	subtotal	\$50,000	\$0
	TOTAL	\$995,557	\$500,000

Witnesses: M. Brophy  
P. Squires

4. Home Performance Contractor Market Transformation Program

Program Description

This program, launched in 2007, aims to increase the frequency of weatherization measures included in home renovation and upgrade projects in the residential sector through industry-delivered training and education.

5. In 2007 and 2008, the Home Performance Contractor workshops were very favourably received by attendees. Due to creative promotional strategies and word-of-mouth referrals, attendance was strong and workshop feedback was positive.

6. The target audience for these workshops includes renovation sales representatives (who typically work for larger renovation firms), and individual contractors (typically one- or two-person operations where the Sales Representative is also the individual doing the renovation work). The common criteria for all attendees is that these people are involved in the influencing of homeowners to include weatherization measures in the project.

7. Program Metrics

The key “ultimate outcome” metric is an average increase in frequency (as measured by a 5-point scale) of a list of eight weatherization measures (see scoring example below). Workshop participants will complete a pre-course survey prior to the start of the workshop to establish a baseline on their current use of specific air-sealing measures. Approximately six months later, a follow up survey will be administered to those same participants to measure the uptake of the air sealing measures. Respondents will be matched and only those who complete both the pre and the follow up surveys will be included in the results.

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8. Contractor engagement and the number of workshops held will also be measured.

9. Scoring Example

The five-point scale to be used is as follows: 1=Never, 2=Sometimes, 3=Often, 4=Almost always, 5=Always.

<u>Sample Data</u>			
Measures (to be based on workshop curriculum)	Baseline Frequency (average score in 5-point scale from pre-course benchmarking study)	Post-Program Frequency (average score in 5-point scale from post-course benchmarking study)	Difference
1. Comprehensive air sealing of the attic floor with 2 component foam	2.0	2.7	0.7
2. Comprehensive air sealing of the attic floor with 1 part foam, caulking and poly	2.0	2.4	0.4
3. Some air sealing of the attic floor with 1 part foam, caulking and poly	2.3	2.9	0.6
4. Air sealing baseboards, window & door trim, electrical outlets & switches	3.1	3.7	0.6
5. Air sealing basement sill plate and joint header area	3.1	3.8	0.7
6. Weather- stripping existing doors	2.9	3.5	0.6
7. Weather-stripping existing windows	2.7	2.9	0.2
8. Insulating garage ceilings, cantilevers, etc. with 2 component foam	2.2	2.3	0.1
Average Result:			0.48

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10. In the example above, the average increase in frequency scores was 0.48, achieving a metric score of 107% ( $0.48/0.45 \times 100$ ).

Budget / SSM Summary

Budget	<u>2010</u> \$80,000
Target SSM	\$150,000

Scorecard Summary

Home Contractor Performance MT Program		2010 Metric Value Levels			
Element	Metrics	50%	100%	150%	Weight
ULTIMATE OUTCOMES	a) Average Increase in frequency scores of all weatherization measures	Average increase in frequency scores of all weatherization measures of 0.3	Average increase in frequency scores of all weatherization measures of 0.45	Average increase in frequency scores of all weatherization measures of 0.6	/60
MARKET EFFECTS	b) Contractor Engagement	40	70	100	/20
PROGRAM PERFORMANCE	c) Contractor Training Workshop	5	8	11	/20

11. Drain Water Heat Recovery System Market Transformation Program

Program Description

This program was launched in 2009, and will continue into 2010. This program complements the current program being offered by Union Gas on the same technology, for the low-rise residential new construction market. Extensive consultation was held with Union Gas staff to ensure compatibility between the two utilities' programs, and consideration was given to simplify the builder's

Witnesses: M. Brophy  
P. Squires

process and administration to streamline the program for builders that operate in both franchises. The key difference between the two utility programs is that the Company will be targeting its promotional activity to the key water heater rental service providers (Direct Energy, Reliance Home Comfort and National Home Services) who will, in turn, promote the technology to the builder market, whereas Union Gas targets the builders directly.

12. The Company will be offering a builder incentive of \$400 per Drainwater Heat Recovery unit installed.

13. Program Metrics

The scorecard below outlines the program elements and metrics proposed for this program. Metric descriptions are provided below the table. The scorecard metrics for 2010 have been updated to reflect deeper market penetration after a year of program operation.

Budget / SSM Summary

	<u>2010</u>
Budget	\$865,557
Target SSM	\$350,000

Witnesses: M. Brophy  
P. Squires



Scorecard Summary

Drainwater Heat Recovery		2010 Metric Value Levels			
Element	Metrics (weighting)	50%	100%	150%	Weight
ULTIMATE OUTCOMES	a) Builders Enrolled	13	17	23	/10
	b) Units Installed	900	1,800	2,700	/40
	c) Builder Knowledge	50%	60%	70%	/15
	d) Service Provider Promotion	60%	70%	80%	/20
PROGRAM PERFORMANCE	e) Builder Training Workshops	1	3	5	/5
	f) Contractor/Sub Workshops	1	3	5	/5
	g) Trade Show Promotion	1	3	5	/5

- a) Builders Enrolled: The number of builders enrolled in the program will be tracked through the rental service providers. If a builder is enrolled, this does not necessarily mean that they are installing the technology in every home; however, it is an indicator of how widespread the awareness of the technology may be, and how many builders may be talking about the technology with potential homebuyers.
- b) Units Installed: This is the key “ultimate outcome” metric for the program, indicating the penetration of this technology in the residential new construction market, and therefore has the largest weighting of all the metrics.

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- c) **Builder Knowledge:** Non-enrolled builders will be surveyed at the end of the year to establish their level of exposure and knowledge of the technology and the Company's program. This metric will indicate how effective the service providers have been in promoting the program (regardless of uptake) and educating the market on the benefits of the technology. The baseline for this metric is assumed to be at, or close to, zero at the time of program launch.
- d) **Service Provider Promotion:** This metric will measure the extent to which participating service providers fulfill a series of prescribed promotional activities through the year to increase market awareness of the technology.
- e) **Builder Training Workshops:** The number of workshops delivered to builders with at least 10 builders in attendance.
- f) **Contractor/Sub Workshops:** The number of workshops delivered to contractors/sub-contractors with at least 10 contractors in attendance.
- g) **Trade Shows/Builder Shows:** The number of trade shows/builder shows with the Company's presence promoting Drainwater Heat Recovery.

Witnesses: M. Brophy  
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14. Channel Market Support

Program Description

As in previous years, the Company will continue to participate in market support activities that address common energy efficiency barriers of education, awareness, training, and access to reliable information on conservation opportunities.

15. Previous examples of market support activities include:

- Participation in consumer/community events and shows, where consumers have access to conservation literature and Company staff to answer specific customer questions
- Participation in industry/trade events to develop channel partners for greater leverage in program delivery and to get industry feedback on how to address specific market barriers
- Development and distribution of demographically targeted conservation literature (i.e. children or youth-oriented material, translation of conservation literature into different languages)

Budget / SSM Summary

Budget	<u>2010</u>
Target SSM	\$50,000
	\$0

Witnesses: M. Brophy  
P. Squires

## Prescriptive Resource Acquisition Program

Program Name: ENERGY STAR™ for New Homes V#3

Goal: To capture energy savings and promote excellence in building practices in residential new construction by encouraging participation in the ENERGY STAR™ for New Homes initiative. For new homes built in Ontario, compliant to OBC 2006, with permits issued prior to March 31, 2009.

Target market: Builders of new, residential, low rise homes in the Enbridge franchise territory

End-use addressed: Space heating and electricity savings

Measure: Improvements to the energy efficiency of the building envelope, mechanical systems, and appliances through adherence to ENERGY STAR™ technical requirements as outlined by Natural Resources Canada

Program elements: The program offers an incentive of \$100.00 to builders for each labelled home and supports participating builders through tradeshow, workshops and advertising campaigns.

Delivery Channel: Promotion through Enbridge New Housing Market Consultants (internal sales channel), sponsorship of EnerQuality Corporation, and marketing communications

Reference: As per EB 2008-0384 and 0385.

Measure Assumptions	2010
Resource Savings (per participant)	
Natural Gas	1018 m <sup>3</sup>
Electricity	1450 kWh
Water	
Equipment Life	25 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$4701
Free Ridership	5%

Program Assumptions	2010
Number of Participants	2200
Program Costs	
Total Variable costs	\$220,000
Fixed Costs	\$100,000
Total Program Costs	\$320,000

## Prescriptive Resource Acquisition Program

Program Name: ENERGY STAR™ for New Homes V#4

Goal: To capture energy savings by promoting excellence in building practices in residential new construction by encouraging participation in the ENERGY STAR™ for New Homes initiative. For new homes built in Ontario, compliant to OBC 2006, with permits issued after March 31, 2009.

Target market: Builders of new, residential, low rise homes in the Enbridge franchise territory

End-use addressed: Space heating and electricity savings

Measure: Improvements to the energy efficiency of the building envelope, mechanical systems, and appliances through adherence to ENERGY STAR™ technical requirements as outlined by Natural Resources Canada

Program elements: The program offers an incentive of \$100.00 to builders for each labelled home and supports participating builders through tradeshow, workshops and advertising campaigns.

Delivery Channel: Promotion through Enbridge New Housing Market Consultants (internal sales channel), sponsorship of EnerQuality Corporation and marketing communications

Reference: See Substantiation Sheet

Measure Assumptions	2010
Resource Savings (per participant)	
Natural Gas	881 m <sup>3</sup>
Electricity	734 kWh
Water	
Equipment Life	25 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$4275
Free Ridership	5%

Program Assumptions	2010
Number of Participants	300
Program Costs	
Total Variable costs	\$30,000
Fixed Costs	\$30,000
Total Program Costs	\$60,000

## Prescriptive Resource Acquisition Program

*Program Name:* Energy Savings Kit for Residential New Construction

*Goal:* To promote the adoption of energy efficiency measures in the new construction market

*Target market:* Residential New Construction Home Builders in the Enbridge franchise territory who are NOT Energy Star builders

*End-use addressed:* Water heating, electricity, and water conservation

*Measure:* Provision of package of energy saving devices to builders

*Program elements:* The program offers no-charge supply to the new home builder of the following components: programmable thermostats, low-flow faucet aerators, low-flow showerheads, and Compact Fluorescent Lightbulbs (CFLs).

*Delivery Channel:* Enbridge Channel Consultants, service organizations, Home Builder Associations, newspaper and magazine advertising, rental providers

*Reference:* See Substantiation Sheet. This is a new program delivering pre- approved measures to the new home construction market.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	
1 kitchen aerator	23m <sup>3</sup>
3 bathroom aerator (3 x 6 m <sup>3</sup> )	18 m <sup>3</sup>
1 showerhead 1.25gpm replacing 2.0 - 2.5 gpm	66 m <sup>3</sup>
1 programmable thermostat	146 m <sup>3</sup>
1 showerhead 1.5gpm replacing 2.25 gpm	46 m <sup>3</sup>
Electrical	
6 13 W CFL bulbs (6 X 45 kWh each)	270 kWh
1 programmable thermostat	54 kWh
Water	
1 kitchen aerator	7,797 L
3 bathroom aerator (2004 L each)	6,012 L
1 showerhead 1.25gpm replacing 2.0 – 2.5 gpm	10,886 L
1 showerhead 1.5 gpm replacing 2.25	6,334 L
Equipment Life	
Aerators and showerhead	10 years
Programmable thermostat	15 years
CFL's	8 years

Free Ridership	
Kitchen aerator	31%
Bathroom aerator	31%
1.25 gpm showerhead replacing 2.0 – 2.5 gpm	10%
1.5 gpm showerhead replacing 2.25 gpm	10%
Programmable thermostat	43%
CFL bulbs	24%
Incremental Costs	
1 kitchen aerator	4.00
3 bathroom aerator	5.65
1 showerhead 1.25gpm replacing 2.0-2.5 gpm	11.50
1 programmable thermostat	35.50
1 hand held showerhead 1.5 gpm replacing 2.25gpm	30.00
6 - CFL's (incr cost = 0 per sub doc)	0.00
Total incremental cost	\$ 86.65
<b>Program Assumptions</b>	2010
Number of Participants	10,000
Program Costs	
Total Variable costs	\$866,500
Fixed Costs	\$ 50,000
Total Program Costs	\$916,500

## Prescriptive Resource Acquisition Program

*Program Name:* Novitherm Panels

*Goal:* To capture energy savings by installing Novitherm reflector panels behind radiators of hydronically heated homes

*Target market:* Owners of existing homes in the Enbridge franchise territory

*End-use addressed:* Space heating (boilers)

*Measure:* Installation of reflective panels behind radiators located on exterior walls of the home

*Program elements:* The program offers the Novitherm reflector panels free of charge to customers. The customer must apply for the program, pay for shipping and self install the panels.

*Delivery Channel:* Direct mail, Contractors/Distributors

*Reference:* Savings and measure life as per EB 2008-0346. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	143 m <sup>3</sup>
Electricity	0
Water	0
Equipment Life	18 years
Incremental Cost (per participant)	
Customer Install	\$238
Contractor Install	
Free Ridership	0%

Program Assumptions	2010		
Number of Participants	4,000		
Program Costs			
Total Variable costs	\$916,000		
Fixed Costs	\$ 65,000		
Total Program Costs	\$ 981,000		



## Prescriptive Resource Acquisition Program

*Program Name:* Programmable Thermostat – Existing Homes

*Goal:* To capture energy savings by upgrading from a manual thermostat to a programmable thermostat

*Target market:* Owners of existing homes in the Enbridge franchise territory

*End-use addressed:* Space Heating (furnaces and boilers)

*Measure:* Installation of a programmable thermostat

*Program elements:* The program offers an incentive of \$15.00 to home owners who upgrade to a programmable thermostat in their home

*Delivery Channel:* Bill Inserts, direct mail, trade shows, community events, newspaper and magazine advertising

*Measure:* Installation of a programmable thermostat

*Reference:* Gas savings as per Navigant Draft Report. Electricity savings and measure life as per EB 2008-0346 Decision. Incremental cost as per EGD purchase costs. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	146 m <sup>3</sup>
Electricity	54 kWh
Water	0
Equipment Life	15 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$50
Free Ridership	43%

Program Assumptions	2010		
Number of Participants	14,000		
Program Costs			
Total Variable costs	\$ 210,000		
Fixed Costs	\$ 85,000		
Total Program Costs	\$ 295,000		

## Prescriptive Resource Acquisition Program

*Program Name:* Residential Water Conservation TAPS Program

*Goal:* To capture energy savings through the reduction of hot water use and through efficient lighting.

*Target market:* Owners of existing homes in the Enbridge franchise territory

*End-use addressed:* Water heating and electricity

*Measure:* Low-flow showerheads, bathroom and kitchen faucet aerators, and compact fluorescent light bulbs

*Program elements:* The program offers no charge installation of up to two low-flow showerheads, plus provision of a bathroom and a kitchen faucet aerator and four compact fluorescent light bulbs.

*Delivery Channel:* TAPS Program contractors

*Reference:* Aerators and Showerheads: Savings and measure life as per EB 2008-0346 Decision. Incremental cost based on EGD purchase costs. FR as per EB 2008-0384 and 0385.

Compact Fluorescent light bulbs: Savings, measure life and FR as per EB 2008-0384 and 0385.

*New Measure:* Yes - CFL

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	
Faucet Aerator – Kitchen	23 m <sup>3</sup>
Faucet Aerator – Bathroom	6 m <sup>3</sup>
Low Flow showerhead	
Base Case A bag test greater than 2.5 gallons per minute	116m <sup>3</sup>
Base Case B bag test 2.0 to 2.5 gallons per minutes	66 m <sup>3</sup>
Bag Test	
Electricity	
Compact Fluorescent Lightbulbs (13w) four/household	180 kWh
Water	
Faucet Aerator - Kitchen	7797 L
Faucet Aerator – Bathroom	2004 L
Low Flow showerhead (Base Case A)	17168 L
Low Flow showerhead (Base Case B)	10886 L
Equipment Life	
Faucet Aerator (Kitchen & Bathroom)	10 years
Low Flow showerhead	10 years

Compact Fluorescent Lightbulbs	8 years
Incremental Cost (per participant)	
Customer Install	0
Contractor Install / Delivery	
Faucet Aerator – Kitchen	\$1.00
Faucet Aerator – Bathroom	\$1.00
Low Flow showerheads	\$19.00
Compact Fluorescent Lightbulbs	\$0.00
Total incremental cost	21.00
Free Ridership	
Faucet Aerator (Kitchen and Bathroom)	31%
Low Flow showerhead	10%
Compact Fluorescent Lightbulbs	24%

Program Assumptions	2010
Number of Participants	136,500
Program Costs	
Total Variable costs	\$4,474,074
Fixed Costs	\$ 69,000
Total Program Costs	\$4,543,074

## **Custom Resource Acquisition Program**

*Program Name:* Capital Financing Program

*Goal:* To explore providing access to low or no interest capital for energy efficient equipment.

*Target market:* Large Industrial and Commercial Customers

*End-use addressed:* Natural gas, electricity, and water conservation

*Measure:* N/A

*Program elements:* If viable the program would redirect, as appropriate, DSM sector fixed or variable budget and use these funds to provide low or no interest access to capital for large customers that are facing this barrier. This element will be used where it is more effective than traditional incentives.

*Delivery Channel:* Offered through Energy Solutions Consultants who work on custom projects

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## Custom Resource Acquisition Program

*Program Name:* Agriculture

*Program Goal:* To capture energy savings in existing facilities through retrofit of building and process components

*Target market:* Agricultural customers

*End-uses addressed:* All end uses within the Agriculture sector

### Measures:

- Customized energy savings plan for facility.
- All energy efficient agricultural applications which provide demonstrable energy savings

### Program elements:

- Provision of the expertise and services of the Enbridge Industrial Energy Solutions Consultants (ESCs) to assist customers in executing and completing projects
- Incentives toward cost of audits and surveys to identify and assess opportunities and set priorities
- Incentives toward cost of implementing projects. Incentives are linked to the amount of natural gas saved.
- ESCs who work closely with the customers to identify energy efficiency opportunities and are able to participate in the implementation of energy saving measures

### Delivery Channels:

- Industrial Energy Solutions Consultants
- Industry associations (including farm organizations, co-operatives, etc.),
- Communication Network of industry experts and business associates including consulting engineers, manufacturers, and suppliers

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	3,000,000
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	11 years
Free Ridership	40%
Program Costs	
Total Variable costs	\$198,450
Fixed Costs	\$ 36,383
Total Program Costs	\$234,833

## **Custom Resource Acquisition Program**

*Program Name:* Hospitals

*Program Goal:* To capture energy savings in existing hospitals through retrofit of building components

*Target market:* Hospital Facilities Management

*End-uses addressed:* Space heating and water heating

*Measures:* Customized energy savings plan for the building may include such measures as:

- Retrofit of boilers
- Improvements to other elements of the heating system
- Improvements to ventilation system
- Upgrading of building automation system
- Building envelope improvements
- Repairs to steam traps

*Program elements:*

- Enbridge Energy Solutions Consultants (ESC) provide customized energy solutions to suit the customer's business needs
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
- Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Roof Top Units.
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Performance contractors
- HVAC contractors
- Consulting engineers and designers
- Energy management firms and industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	3,429,173
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	17 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$ 342,917
Fixed Costs	\$ 50,543
Total Program Costs	\$ 393,460

## **Custom Resource Acquisition Program**

*Program Name:* Hotels

*Program Goal:* To capture energy savings in existing hotels through retrofit of building components

*Target market:* Owners of hotels and motels and large hospitality buildings

*End-uses addressed:* Space heating, water heating and ventilation

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers
- Reflective panels for radiators
- Controls, including Building Energy Management Systems
- Building envelope upgrades including air sealing measures
- Ventilation upgrades including makeup air
- Electricity and water conservation

*Program elements:*

- Optional preliminary energy review of their facilities by an Enbridge Energy Solutions Consultant (ESC)
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Industry association



Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	1,051,133
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	18 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$105,113
Fixed Costs	\$43,583
Total Program Costs	\$148,696

## Custom Resource Acquisition Program

*Program Name:* Industrial

*Program Goal:* To capture energy savings in existing facilities through retrofit of process and building components

*Target market:* Large Industrial customers

*End-uses addressed:* All uses

### *Measures:*

- Customized energy savings plan for facility
- All energy efficient industrial applications which provide demonstrable energy savings

### *Program elements:*

- Provision of the expertise and services of Enbridge Industrial Energy Solutions Consultants (ESCs) to assist customers in executing and completing projects
- Incentives toward cost of assessments and surveys to identify and assess opportunities and set priorities. Incentives toward cost of implementing projects. Incentives are linked to the amount of natural gas saved
- ESCs who work closely with the customers to identify energy efficiency opportunities and are able to participate in the implementation of energy saving measures

### *Delivery Channels:*

- Industrial Energy Solutions Consultants
- Industry associations
- Network of industry experts and business associates including consulting engineers, manufacturers etc

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	44,346,965
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	15 years
Free Ridership	50%
Program Costs	
Total Variable costs	\$2,114,453
Fixed Costs	\$955,949
Total Program Costs	\$3,070,402

## **Custom Resource Acquisition Program**

*Program Name:* Long Term Care Facilities

*Program Goal:* To capture energy savings in existing long term healthcare facilities through retrofit of building components

*Target market:* Healthcare Facilities Management

*End-uses addressed:* Space heating and water heating

*Measures:* Customized energy savings plan for the building may include such measures as:

- Retrofit of boilers
- Improvements to other elements of the heating system
- Improvements to ventilation system
- Upgrading of building automation system
- Building envelope improvements
- Repairs to steam traps

### *Program elements:*

- Enbridge Energy Solutions Consultants (ESC) provide customized energy solutions to suit the customer's business needs
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
- Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Roof Top Units.

### *Delivery Channels:*

- Performance contractors
- HVAC contractors
- Consulting engineers and designers
- Energy management firms and industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	144,307
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	20 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$ 14,431
Fixed Costs	\$ 1,018
Total Program Costs	\$15,449

## **Custom Resource Acquisition Program**

*Program Name:* Multi-Residential (Non Profit)

*Program Goal:* Improve efficiency of space heating and water heating in multi-residential non profit housing buildings

*Target market:* Non-Profit Multi-Residential Property Owners and Property Managers

*End-uses addressed:* Space heating, water heating, ventilation, etc.

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers and boiler system improvements
- Higher efficiency combination water and space heating systems
- Controls, including Building Energy Management Systems
- Water conservation: low flow showerheads and faucet aerators
- Energy efficient washing machines
- Electricity conservation

*Program elements:*

- Enbridge Energy Solutions Consultants (ESCs) provide customized energy solutions to suit the customer's business needs
- EGD can provide preliminary review of facilities by ESC
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Roof Top Units.
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Social Housing organizations
- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Energy management firms
- Industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m3)	644,875
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m3)	
Equipment Life (estimated average for program)	15 years
Free Ridership	20%
Program Costs	
Total Variable costs	\$ 64,487
Fixed Costs	\$ 7,881
Total Program Costs	\$ 72,368

## **Custom Resource Acquisition Program**

*Program Name:* Multi-Residential (Private)

*Program Goal:* To improve the efficiency of space heating and water heating in multi-residential buildings

*Target market:* Multi-Residential Property Owners and Property Managers

*End-uses addressed:* Space heating, water heating, ventilation, etc.

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers and boiler system improvements
- Higher efficiency combination water and space heating systems
- Controls, including Building Energy Management Systems
- Water conservation: low flow showerheads and faucet aerators
- Energy efficient washing machines

*Program elements:*

- Enbridge Energy Solutions Consultants (ESC) provide customized energy solutions to suit the customer's business needs
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
- Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Roof Top Units.
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Energy management firms
- Industry associations

Program Assumptions*	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	19,848,645
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m3)	
Equipment Life (estimated average for program)	18 years
Free Ridership	20%
Program Costs	
Total Variable costs	\$ 1,695,438
Fixed Costs	\$ 124,401
Total Program Costs	\$ 1,819,839



## **Custom Resource Acquisition Program**

*Program Name:* Municipalities

*Program Goal:* To capture energy savings in existing municipal buildings through retrofit of building components

*Target market:* Municipal Facilities Management

*End-uses addressed:* Space heating and water heating

*Measures:* Customized energy savings plan for the building may include such measures as:

- Retrofit of boilers
- Improvements to other elements of the heating system
- Improvements to ventilation system
- Upgrading of building automation system
- Building envelope improvements

*Program elements:*

- Enbridge Energy Solutions Consultants (ESCs) provide customized energy solutions to suit the customer's business needs
- EGD can provide preliminary review of facilities by ESC
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Property management companies
- Performance contractors
- HVAC contractors
- Consulting engineers, and designers
- Energy management firms and industry associations.

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	2,085,137
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	16 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$208,514
Fixed Costs	\$73,196
Total Program Costs	\$281,710

## **Custom Resource Acquisition Program**

*Program Name:* Office Buildings

*Program Goal:* To capture energy savings in existing office buildings through retrofit of building components

*Target market:* Office building owners and operators

*End-uses addressed:* Space heating, water heating and ventilation

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers
- Reflective panels for radiators
- Controls, including Building Energy Management Systems
- Building envelope upgrades including air sealing measures
- Ventilation upgrades including makeup air
- Electricity and water conservation

*Program elements:*

- Optional preliminary energy review of facilities by an Enbridge Energy Solutions Consultant
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Energy management firms
- Industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	1,994,331
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	16 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$199,433
Fixed Costs	\$104,770
Total Program Costs	\$304,203

## **Custom Resource Acquisition Program**

*Program Name:* Retail and Shopping Centers

*Program Goal:* To capture energy savings in existing retail buildings and shopping centers through retrofit of building components

*Target market:* Retail and shopping center owners

*End-uses addressed:* Space heating, water heating and ventilation

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers
- Reflective panels for radiators
- Controls, including Building Energy Management systems
- Building envelope upgrades including air sealing measures
- Ventilation upgrades including makeup air
- Electricity and water conservation

*Program elements:*

- Optional preliminary energy review of their facilities by an Enbridge Energy Solutions Consultant
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

Delivery Channels:

- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Energy management firms
- Industry associations

Program Assumptions	2010
	(As filed)
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	251,343
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	14 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$25,134
Fixed Costs	\$11,342
Total Program Costs	\$36,476

## **Custom Resource Acquisition Program**

*Program Name:* Schools

*Program Goal:* To capture energy savings in existing elementary and high school buildings through retrofit of building components

*Target market:* Schools Facilities Management

*End-uses addressed:* Space heating and water heating

*Measures:* Customized energy savings plan for the building may include such measures as:

- Retrofit of boilers
- Improvements to other elements of the heating system
- Improvements to ventilation system
- Upgrading of building automation system
- Building envelope improvements
- Repairs to steam traps

### *Program elements:*

- Enbridge Energy Solutions Consultants (ESC) will provide customized energy solutions to suit the customer's business needs
- EGD can provide preliminary review of facilities by ESC
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building (Typically for secondary schools)
- Support for Monitoring & Targeting through on site qualification, billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Prescriptive Boilers:
    - \$1,000 per elementary school
    - \$4,300 per secondary school
  - Additional menu of prescriptive offerings for HVAC related measures which could include Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans

### *Delivery Channels:*

- HVAC contractors
- Consulting engineers, and designers

- Energy management firms
- Industry associations.

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	2,563,489
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	19 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$256,349
Fixed Costs	\$83,815
Total Program Costs	\$340,164



## **Custom Resource Acquisition Program**

*Program Name:* Universities

*Program Goal:* To capture energy savings in existing university and college buildings through retrofit of building components

*Target market:* University & College Facilities Management

*End-uses addressed:* Space heating and water heating

*Measures:* Customized energy savings plan for the building may include such measures as:

- Retrofit of boilers
- Improvements to other elements of the heating system
- Improvements to ventilation system
- Upgrading of building automation system
- Building envelope improvements
- Repairs to steam traps

### *Program elements:*

- Enbridge Energy Solutions Consultants (ESC) provides customized energy solutions to suit the customer's business needs.
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
- Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans

### *Delivery Channels:*

- Performance contractors, and Energy management firms
- HVAC contractors
- Consulting engineers, and designers
- Industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	1,174,441
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	11 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$ 117,444
Fixed Costs	\$ 10,957
Total Program Costs	\$ 128,401

## **Custom Resource Acquisition Program**

*Program Name:* Warehouses

*Program Goal:* To capture energy savings in existing warehouses through retrofit of building components

*Target market:* Warehouse owners and operators

*End-uses addressed:* Space heating, water heating and ventilation

*Measures:* A customized energy savings plan for the building may include:

- Higher efficiency boilers
- Reflective panels for radiators
- Controls, including Building Energy Management Systems
- Building envelope upgrades including air sealing measures
- Ventilation upgrades including makeup air
- Electricity and water conservation

*Program elements:*

- Optional preliminary energy review of facilities by an Enbridge Energy Solutions Consultant
- Availability of independent third party to conduct building audits and implementation; audit based on building annual consumption
  - Audit incentives available at a rate of \$0.01/m<sup>3</sup> of previous year's consumption up to \$5,000 per building
- Support for Monitoring & Targeting through on site qualification, providing billing history & billing review, meter exchanges where warranted (for real time monitoring) or additional meter readings (for monthly monitoring)
- Support and training for Building Recommissioning. Incentives expected to be provided for Implementation Plan and Final Report.
- Implementation Incentives:
  - \$0.10/m<sup>3</sup> of gas saved up to a maximum of \$100,000 per building
  - Menu of prescriptive offerings for HVAC related measures which could include boilers, Heat Recovery/Energy Recovery Ventilation, Demand Control Kitchen Ventilation, Air Doors, Roof Top Units, Destratification Fans
- Promotion: Trade shows, Trade magazines & Seminars, Industry associations

*Delivery Channels:*

- Property Managers
- HVAC contractors
- Consulting engineers and designers
- Energy management firms
- Industry associations

Program Assumptions	2010
Resource Savings	
Natural Gas Savings (gross m <sup>3</sup> )	223,756
Induced Electricity Savings (gross kWh)	
Induced Water Savings (m <sup>3</sup> )	
Equipment Life (estimated average for program)	12 years
Free Ridership	12%
Program Costs	
Total Variable costs	\$22,376
Fixed Costs	\$8,082
Total Program Costs	\$30,457

## Prescriptive Resource Acquisition Program

*Program Name:* Air Doors (Single and Double Doors)

*Program Goal:* To improve energy efficiency of commercial/institutional facilities by installing an air barrier on exterior doors to maintain indoor air temperature

*Target market:* Retail, commercial and institutional entrance ways – Existing Facilities

*End-use addressed:* Space conditioning

*Measure:* Installation of Air Door equipment on facility entrances.

*Program elements:* Rebate incentives are for a Single Door - \$300.00 and for a Double Door - 2 doors @ \$300.00 = \$600.00

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant) Single Door	
Natural Gas	667 m <sup>3</sup>
Electricity	172 kWh
Water	
Resource Savings (per participant) Double Door	
Natural Gas	1,529 m <sup>3</sup>
Electricity	1,023 kWh
Water	
Equipment Life	15
Incremental Cost (per participant)	
Customer Install	
Contractor Install (Single Door / Double Door)	\$1650 / \$2,500
Free Ridership	5%

Program Assumptions	2010
Number of Participants	15
Program Costs	
Total Variable costs	\$6,000
Fixed Costs	\$20,000
Total Program Costs	\$26,000

## Prescriptive Resource Acquisition Program

*Program Name:* Commercial Kitchen Ventilation (Demand Control)

*Program Goal:* To improve the energy efficiency of kitchen ventilation thereby reducing the amount of energy needed to condition the restaurant space

*Target market:* Commercial kitchens – New & Existing Facilities

*End-use addressed:* Space heating, cooling, and ventilation

*Measure:* Installation of demand control kitchen ventilation exhaust hood together with system rebalancing

*Program elements:* Incentive rebates are paid in three tiers based on the ventilation CFM rating of the system - Tier 1: 0-5000 CFM \$1000. Tier 2: 5001-10000 CFM \$1500. Tier 3: >10000 CFM \$2000

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision for Commercial Existing. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	Tier 1: 4,801m <sup>3</sup>
	Tier 2: 11,486m <sup>3</sup>
	Tier 3: 18,924m <sup>3</sup>
Electricity	Tier 1: 13,521kWh
	Tier 2: 30,901kWh
	Tier 3: 49,102kWh
Water	0
Equipment Life	15 years
Incremental Cost (per participant)	
Customer Install	0
Contractor Install	Tier 1: \$ 10,000
	Tier 2: \$ 15,000
	Tier 3: \$ 20,000
Free Ridership	5%

Program Assumptions	2010
Number of Participants	20
Program Costs	
Total Variable costs	\$31,500
Fixed Costs	\$35,000
Total Program Costs	\$66,500

## Prescriptive Resource Acquisition Program

*Program Name:* Energy Recovery Ventilator

*Program Goal:* To reduce energy use through heating buildings more efficiently

*Target market:* Commercial sector – New & Existing

*End-use addressed:* Space conditioning

*Measure:* Installation of Energy Recovery Ventilator

*Program elements:* Incentive paid is \$100 per unit

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant) Existing	
Natural Gas	1.84-5.14 m <sup>3</sup> / CFM
Electricity	
Water	
Resource Savings (per participant) New Construction	
Natural Gas	1.75-4.89 m <sup>3</sup> / CFM
Electricity	
Water	
Equipment Life	20 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$3 / CFM
Free Ridership	5%

Program Assumptions	2010
Number of Participants	50
Program Costs	
Total Variable costs	\$5,000
Fixed Costs	\$5,000
Total Program Costs	\$10,000

## Prescriptive Resource Acquisition Program

*Program Name:* Heat Recovery Ventilator

*Program Goal:* To space heat more efficiently

*Target market:* Commercial sector – New & Existing Table

*End-use addressed:* Space conditioning

*Measure:* Installation of Heat Recovery Ventilator

*Program elements:* Incentive paid is \$100 per unit

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant) Existing	
Natural Gas	1.75-4.90m <sup>3</sup> /CFM
Electricity	
Water	
Resource Savings (per participant) New Construction	1.62-4.55m <sup>3</sup> /CFM
Natural Gas	
Electricity	
Equipment Life	20
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$3.4 / CFM
Free Ridership	5%

Program Assumptions	2010
Number of Participants	75
Program Costs	
Total Variable costs	\$7,500
Fixed Costs	\$5,000
Total Program Costs	\$12,500



## Prescriptive Resource Acquisition Program

*Program Name:* High Efficiency (Condensing) Furnace (AFUE 96) Program

*Program Goal:* To heat space in existing small commercial facilities more efficiently.

*Target market:* Small commercial - Existing Facilities

*End-use addressed:* Space heating

*Measure:* Installation of an Energy Star high efficiency furnace (96% AFUE or greater). Effective January 1, 2010, Natural Resources Canada requires the minimum performance level, or the Annual Fuel Utilization Efficiency (AFUE), for residential gas-fired furnaces with an input rate not exceeding 65.92 kW (225 000 Btu/h) to be 90%.

*Program elements:* Incentive paid is \$100 per high-efficiency furnace

*Delivery Channel:* External business partners, channel consultants and manufacturers

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	1.7 /kBtu/hr
Electricity	
Water	
Equipment Life	18 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$8.4 /kBtu/h
Free Ridership	17.5%

Program Assumptions	2010
Number of Participants	100
Program Costs	
Total Variable costs	\$10,000
Fixed Costs	\$15,000
Total Program Costs	\$25,000

## Prescriptive Resource Acquisition Program

*Program Name:* Infrared Heater

*Goal:* To space heat more efficiently

*Target market:* Commercial sector – New & Existing Facilities

*End-use addressed:* Space conditioning

*Measure:* Installation of Infrared Heater

*Program elements:* Incentive rebates are based on three tiers – Tier 1: 0-75,000 Btu/h \$1,000. Tier 2: 76,000-150,000 Btu/h \$2,000, Tier 3: 151,000-300,000 Btu/h \$3,000.

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant) 0 -75,000 BTUH	
Natural Gas	.015 m <sup>3</sup> / Btu / h
Electricity	245 kWh
Water	
Resource Savings (per participant) 76,000 – 150,000 BTUH	
Natural Gas	.015 m <sup>3</sup> / Btu / h
Electricity	559 kWh
Water	
Resource Savings (per participant) 151,000 – 300,000 BTUH	
Natural Gas	.015 m <sup>3</sup> / Btu / h
Electricity	870 kWh
Water	
Equipment Life	20 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install Tier 1 / Tier 2 / Tier 3	\$0.0122 / Btu / h
Free Ridership	33%

Program Assumptions	2010
Number of Participants	60
Program Costs	
Total Variable costs	\$140,000
Fixed Costs	\$ 7,000
Total Program Costs	\$147,000

## Prescriptive Resource Acquisition Program

*Program Name:* High Efficiency Front Load Washers

*Goal:* To reduce energy and water use associated with clothes washing in Multi-Residential buildings and other commercial facilities

*Target market:* Multi-Family sector – Existing Facilities

*End-use addressed:* Water heating and water use for clothes washing and electricity for clothes drying

*Measure:* Installation of energy efficient washers

*Program elements:* Incentive of \$75.00 per energy efficient washers paid to the customers

*Delivery Channel:* Route Operators and Energy Solutions Consultants.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-03484 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	117 m <sup>3</sup>
Electricity	396 kWh
Water	58.12 m <sup>3</sup>
Equipment Life	11 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$600
Free Ridership	10%

Program Assumptions	2010
Number of Participants	688
Program Costs	
Total Variable costs	\$51,600
Fixed Costs	\$ 60
Total Program Costs	\$51,660

## Prescriptive Resource Acquisition Program

*Program Name:* Multi-residential Showerhead/Aerators

*Program Goal:* To reduce energy and water use in Multi-Residential buildings

*Target market:* Multi-Residential Property Owners and Managers

*End-use addressed:* Water Heating

*Measure:* Installation of low flow showerheads and faucet aerators

*Program elements:* Provision of low flow showerheads and aerators for installation by the property owner/manager

*Delivery Channel:* Water Services Energy Companies and Energy Solutions Consultants

*Reference:* 1.5 GPM aerators: Savings, measure life and incremental cost as per EB 2008-0346 Decision. Showerheads 1.5GPM and 2.0GPM: Savings formula and measure life based on EB 2008-0346 Decision re: showerhead at 1.25GPM. Incremental costs as per utility purchase costs. All Free ridership as per EB 2008-0384 and 0385.

Measure Assumptions:	
<ul style="list-style-type: none"> <li>Each prospective participant is required to conduct a flow rate bag test in 5-10% of the building suites, to determine the existing showerhead flow rate.</li> <li>Natural gas / water savings claimed will be based on the difference in the measured flow rate and the energy efficient flow rate.</li> </ul>	
Savings	See table below
Free Ridership	10%
Equipment Life	10 years

<b>Details of efficient equipment</b>	<b>Details of base equipment (avg, existing stock) Determined via flow rate bag test.</b>	<b>Natural gas savings</b>	<b>Water savings</b>	<b>Incremental cost</b>
1.0 GPM aerator (bathroom)	2.5 GPM aerator	11 m <sup>3</sup>	2,371 L	\$1.50
1.5 GPM aerator (bathroom)	2.5 GPM aerator	4 m <sup>3</sup>	1,382 L	\$2.00
1.0 GPM aerator (kitchen)	2.5 GPM aerator	39 m <sup>3</sup>	8,072 L	\$2.00
1.5 GPM aerator (kitchen)	2.5 GPM aerator	16 m <sup>3</sup>	5,377 L	\$2.00
1.5 GPM showerhead	2.0-2.5 GPM	28 m <sup>3</sup>	5,197 L	\$17.00
1.5 GPM showerhead	2.6-3.0 GPM	55 m <sup>3</sup>	9,490 L	\$17.00
1.5 GPM showerhead	3.1-3.5 GPM	79 m <sup>3</sup>	13,250 L	\$17.00
1.5 GPM showerhead	3.6 GPM +	91 m <sup>3</sup>	15,114 L	\$17.00
2.0 GPM showerhead	2.6-3.0 GPM	4 m <sup>3</sup>	1,727 L	\$17.00
2.0 GPM showerhead	3.1-3.5 GPM	28 m <sup>3</sup>	5,487 L	\$17.00
2.0 GPM showerhead	3.6 GPM +	40 m <sup>3</sup>	7,351 L	\$17.00

<b>Program Assumptions</b>	<b>2010</b>
Number of Participants	22,000
<b>Program Costs</b>	
Total Variable costs	\$124,300
Fixed Costs	\$18,287
Total Program Costs	\$142,587

## Prescriptive Resource Acquisition Program

*Program Name:* Programmable Thermostats Program

*Program Goal:* To reduce space heating energy consumption

*Target market:* Small commercial – Existing Facilities

*End-use addressed:* Space conditioning

*Measure:* Installation of a programmable thermostat

*Program elements:* Customer rebate incentive is \$40 per thermostat when used with a natural gas space heating system.

*Delivery Channel:* External business partners and Enbridge Channel Consultants.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas (savings vary by sector)	82-538 m <sup>3</sup>
Electricity	63-266 kWh*
Water	
Equipment Life	15 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$110
Free Ridership	20%

Program Assumptions	2010
Number of Participants	105
Program Costs	
Total Variable costs	\$ 4,200
Fixed Costs	\$ 20,000
Total Program Costs	\$ 24,200

## Prescriptive Resource Acquisition Program

*Program Name:* Rooftop Units

*Program Goal:* To reduce energy use for space heating

*Target market:* Commercial sector – New & Existing Facilities

*End-use addressed:* Space conditioning

*Measure:* Installation of efficient Roof Top Units

*Program elements:* Incentive paid is \$500 per unit

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision Commercial New Construction. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	255m <sup>3</sup>
Electricity	
Water	
Equipment Life	15 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$375
Free Ridership	5%

Program Assumptions	2010
Number of Participants	160
Program Costs	
Total Variable costs	\$80,000
Fixed Costs	\$55,000
Total Program Costs	\$135,000

## Prescriptive Resource Acquisition Program

*Program Name:* Spray N Save

*Program Goal:* To provide commercial kitchens with the ability to save energy and water in their dishwashing operations

*Target market:* Food Service applications – New & Existing Facilities

*End-use addressed:* Domestic Hot Water

*Measure:* Installation of an efficient spray rinse nozzle (0.64 or 1.24 gpm) on hoses at dishwashing stations

*Program elements:* Payment to business partner of \$100 for the provision and installation of a pre rinse spray nozzle

*Delivery Channel:* External business partners

*Reference:* 1.24 GPM unit: Savings, measure life and cost as per EB 2008-0346 Decision Commercial Existing Buildings. FR as per Union gas research. 0.64GPM unit: Savings and free ridership as per Union Gas research. Measure life as per EB 2008-0346 Decision. Incremental cost as per Union gas purchase price.

Measure Assumptions	
(Resource savings vary by type of facility)	
Resource Savings (per participant) 0.64 GPM	
Natural Gas	318-1,286 m <sup>3</sup>
Electricity	
Water	62.2-252 m <sup>3</sup>
Resource Savings (per participant) 1.24 GPM	
Natural Gas	190-886 m <sup>3</sup>
Electricity	
Water	36.48-170.32 m
Equipment Life	5 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install (0.64 / 1.24 GPM)	\$88 / \$60
Free Ridership (0.64 / 1.24 GPM)	0% / 12.4%

Program Assumptions	2010
Number of Participants	3,050
Program Costs	
Total Variable costs	\$305,000
Fixed Costs	\$ 15,000
Total Program Costs	\$320,000



## Prescriptive Resource Acquisition Program

*Program Name:* Tankless Water Heater (100 gal / day) Program

*Program Goal:* To reduce energy use through heating domestic hot water more efficiently

*Target market:* Small Commercial – New & Existing facilities

*End-use addressed:* Domestic water heating

*Measure:* Installation of a tankless water heater to replace a storage water heater

*Program elements:* Incentive paid is \$300

*Delivery Channel:* External business partners, Enbridge Channel Consultants and manufacturers.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 200809384 and 0384.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas	154 m <sup>3</sup>
Electricity	
Water	
Equipment Life	18 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	(\$1,102)
Free Ridership	2%

Program Assumptions	2010
Number of Participants	20
Program Costs	
Total Variable costs	\$6,000
Fixed Costs	\$8,000
Total Program Costs	\$14,000

## Prescriptive Resource Acquisition Program

*Program Name:* Programmable Thermostats Program

*Program Goal:* To reduce space heating energy consumption

*Target market:* Small commercial – Existing Facilities

*End-use addressed:* Space conditioning

*Measure:* Installation of a programmable thermostat

*Program elements:* Customer rebate incentive is \$40 per thermostat when used with a natural gas space heating system.

*Delivery Channel:* External business partners and Enbridge Channel Consultants.

*Reference:* Savings, measure life and incremental cost as per EB 2008-0346 Decision. FR as per EB 2008-0384 and 0385.

Measure Assumptions	
Resource Savings (per participant)	
Natural Gas (savings vary by sector)	82-538 m <sup>3</sup>
Electricity	63-266 kWh*
Water	
Equipment Life	15 years
Incremental Cost (per participant)	
Customer Install	
Contractor Install	\$110
Free Ridership	20%

Program Assumptions	2010
Number of Participants	105
Program Costs	
Total Variable costs	\$ 4,200
Fixed Costs	\$ 20,000
Total Program Costs	\$ 24,200

## NEW PROGRAMS AND PROGRAM ASSUMPTIONS

### 1. Introduction

In its letter of April 29<sup>th</sup>, 2009, the Board stated its purpose to “provide parties with the Measures and Input Assumptions that should be used by natural gas distributors for the development of the DSM Plans for 2010.” The Board went on to state that it “adopts the Navigant Measures and Input Assumptions Report dated April 16, 2009 for use in the 2010 DSM plans.”

### 2. The Navigant Report acknowledged three circumstances in which the utilities may wish to propose alternative or additional assumption values in their DSM plans.

They are to provide:

- free ridership values,
- incremental cost information which reflects the utility’s program costs, and
- information on “additional promising measures” not covered in the Navigant Report.

### 3. In order to deliver cost-effective programs in a manner consistent with the EB-2006-0021 Board Decision, all program assumptions are required.

### 4. This section describes the program assumptions that require approval as part of the 2010 DSM Plan:

- information necessary to the Utility’s program planning and reporting for 2010 but that was not included in the Navigant Report
  - free ridership
  - measure life for custom project technologies
  - information on program incremental costs specific to the Company’s program delivery

Witnesses: M. Brophy  
P. Squires

- new measures submitted with the Company's comments on the Navigant Draft Report but which were not addressed in the Final Report
  - corrections for assumptions for a limited number of measures addressed in the Navigant Final Report.
5. Exhibit B, Tab 3, Schedule 2 includes an Assumption Table showing all proposed assumptions for the Company's 2010 DSM Plan. Detailed Substantiation Sheets for measures with additional information are included in Exhibit B, Tab 3, Schedule 3. For measures where the only supplement to the Navigant Final Report is the addition of free ridership, no separate Substantiation Sheet is provided.
6. Information Necessary to Utility Program Planning
- a) Free Ridership

As noted on page 10 of the Navigant Final Report:

With respect to free ridership, Navigant Consulting is not able to provide estimates of the free-ridership for any of the technologies and measures for DSM programs to be implemented in 2010 because the design of the DSM program and the specific customer segments to be targeted by Union and/or Enbridge in 2010 and beyond are not known at this time. We believe that Union and Enbridge will be in the best position to provide free-ridership estimates for these programs for planning purposes based on evaluation results and/or experience in other jurisdictions when they are being proposed.

Free Ridership values for all measures in the Company's 2010 DSM plan, together with the source references, are shown in Exhibit B, Tab 3, Schedule 4. For most programs, the free ridership values are the same as those approved in EB-2008-0384. Where the value derives from recent research the source is referenced.

Witnesses: M. Brophy  
P. Squires

b) Measure Life Assumptions for Custom Project Technologies

Measure life assumptions for technologies used in custom projects are used to calculate TRC net benefits and cost effectiveness of the custom projects. The Measure Life Assumptions Table was last approved as part of the 2008 Update (EB-2008-0384). The Table is shown at Exhibit B, Tab 3, Schedule 5.

7. Assumptions to Reflect Program Delivery

As noted on page 8 of the Navigant Final Report:

If, through bulk purchasing by the utilities, the incremental costs for a given program will be lower than Navigant Consulting estimates, then it would be appropriate for the utilities to recommend changes to the input assumptions as part of their DSM submission.

8. The Company has accordingly applied program specific incremental costs to several programs. In some cases this results in increased incremental costs to reflect the installation cost included in the program. In other instances the incremental costs are lower, reflecting bulk purchasing of the measure by the utility. Changes to incremental costs are recorded on individual Substantiation Sheets at Exhibit B, Tab 3, Schedule 3.

9. New Measures

On page 6 of the Navigant Final Report notes:

... as new information is available on any measures not covered herein (such as from pilot studies, load research or findings from other jurisdictions), Enbridge and/or Union can propose any additional promising measures for their DSM plans for 2010 rate year and beyond.

10. This section presents measures included in the Company's 2010 DSM plan but not referenced or included in the Navigant Final Report. Individual substantiation sheets are provided for each measure.

Witnesses: M. Brophy  
P. Squires

*Compact Fluorescent Light bulbs (CFLs):*

This measure was approved in the 2008 Assumption Update (EB-2008-0384).  
Assumptions for the measure are based on OPA approved assumptions.

*Pre-Rinse spray valve 0.64GPM unit:*

Recent research commissioned by Union Gas updated deemed savings for the 1.24GPM pre-rinse spray valve and deemed savings for the newer 0.64GPM unit. The Navigant Final Report recommended the updated values for the 1.24GPM unit but did not address the 0.64GPM unit.

*Multi-residential showerheads 1.5GPM unit:*

The Company has successfully promoted the 1.25GPM showerhead for use in low-rise residential housing. However, concerns of water pressure in high-rise residential buildings limit the potential application of the 1.25GPM unit in the multi-residential sector. In order to capture available energy savings the Company proposes to install 1.5GPM and 2.0GPM showerheads in this sector.

*Multi-residential aerators 1.0GPM unit:*

Lower flow faucet aerators (1.0GPM) are now available, providing the opportunity for greater energy savings. The Company is introducing this product in the multi-residential sector and monitoring for market acceptance.

*Prescriptive Boilers:*

For Commercial customers in smaller facilities, the full custom project application process often proves onerous. The prescriptive boiler measure was developed to increase market penetration of efficient boilers in this sector. The prescriptive

measure will reduce the administrative burden for owners of commercial properties and facilitate applications for retrofit of efficient boilers.

*Rooftop Units and Tankless Water Heaters:*

The Navigant Final Report included measure assumptions for these two technologies in the New Construction sector but did not reference their application in the Existing Commercial sector. Both measures represent significant savings opportunities in the Existing sector. There are no codes or standards which would change the savings assumptions in the existing sector compared to new construction. Therefore the Company proposes to apply the same assumptions to both the New Construction and the Existing Commercial sector.

*Demand Control Kitchen Ventilation and Pre-rinse Spray Valves:*

Similar to the above, these two technologies were referenced for the Existing Commercial Sector but not New Construction in the Navigant Final Report. The Company proposes to apply the same assumptions to both the New Construction and Existing Commercial sector for these technologies.

*Energy Star for New Homes:*

The Energy Star for New Homes program was approved in EB 2006-0021. Through the program the Company provides in-kind support and an incentive to builders who build and enroll homes to the Energy Star standard. Energy Star standards have evolved with the recent changes to the Ontario Building Code. Energy Star Version 3 references energy savings compared to homes built to the Code adopted in December 2006. Energy Star Version 4 references homes built to the Code effective in 2009. Qualification for Energy Star versions depends on the date the Building Permit was issued, while the Company's claims for

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P. Squires

participants depend on when the house was completed. Hence both Version 3 and Version 4 would be in effect during 2010.

11. The Navigant Final Report does not include assumptions for the Energy Star program, commenting that: "... Navigant Consulting was not able to provide a specific estimate for the natural gas or electricity savings for an Energy Star home due to this significant variability in available measures."
12. The Energy Star program is effective in raising the level of home performance because it is a whole house approach and can be marketed to the home buyer under an easily recognizable brand. Data from EnerQuality (the program administrator) show that with cost considerations in play there is little variability in the measures which builders select in order to meet the Energy Star standard, at Tab 10 Schedule 1. With this in mind, the Company's view is that the savings assumptions submitted are reasonable. The Company has played an important role in the introduction and support of the Energy Star program in Ontario. The brand is clearly gaining acceptance but there is still a long way to go. The Company's continued support is needed and the Company is submitting this program for continuation in 2010. A letter of support is included at Exhibit C, Tab 1, Schedules 1.
13. Energy Savings Kit for New Construction:  
In 2010 the Company proposes to introduce a program in the Residential New Construction sector. The Energy Savings Kit will be directed to builders who do not participate in Energy Star and will provide an entry level opportunity for builders to improve the performance of their homes through installation of low-flow showerheads, CFLs and programmable thermostats. Through dialogue with

Witnesses: M. Brophy  
P. Squires



builders in the franchise area the Company has found that many builders still do not install these basic energy saving devices in new homes. The New Construction Energy Savings Kit will provide an opportunity for the Company to influence modest immediate improvements and develop a relationship with the builders to encourage further improvements in the energy performance of their homes. The program makes use of measures that have been pre-approved in other contexts and provides a suggested free ridership value based on the Company market knowledge until further information can be gathered.

14. Alternative Assumptions

Residential Thermostats:

The gas savings values in the Navigant Draft Report of February 6, 2009 are based on billing analysis studies which Enbridge agrees is the best available information. In the Company's comments on the Draft Report, Enbridge agreed with the Navigant proposed gas savings and made one suggestion, that the electricity savings be reduced to reflect the market penetration of central air conditioning in the low-rise residential sector in Ontario. In their Final Report, Navigant further adjusted both the gas savings and the electricity savings to account for behavioural effects. The gas savings are based on billing analysis which used actual results both with and without programmable thermostats and hence are inclusive of customer behaviour impacts. Therefore, for the gas savings, no further adjustment for behavioural impacts is required and the Company proposes to use the value from the Navigant Draft Report. In contrast, the electricity savings were based on monitored results from two test houses. The Company agrees that it is appropriate to adjust the electricity results for behavioural impacts and proposes to use the electricity savings value from the Navigant Final Report.

Witnesses: M. Brophy  
P. Squires



[illegible]

[illegible]





[illegible]









## **Substantiation Sheets for Selected 2010 Input Assumptions**

Witnesses: M. Brophy  
T. MacLean  
P. Squires

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## **RESIDENTIAL NEW CONSTRUCTION**

## ***ENERGY STAR FOR NEW HOMES (VERSION 3)***

### ***Residential, New Construction***

<b>Efficient Technology &amp; Equipment Description</b>
Energy Star for New Homes, version 3, qualified home
<b>Base Technology &amp; Equipment Description</b>
New Home built in Ontario, compliant to OBC-2006, permits issued prior to March 31, 2009.

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>1018 m<sup>3</sup></b>
As approved in EB 2008-0384 & 0385. Gas savings is based on a simple average of a new reference house, a 1 storey house, and a 2 storey house <sup>1</sup> with London's climate, and another set in North Bay's climate. The sample houses are three houses which represent the mid-range of new homes built in UG Territory. The results were weighted 70% UG South and 30% UG North. The software used for analysis is HOT2000 version 9.34b. This is the same software that is currently in use for application of the EnerQuality Version 3.0 Energy Star Criteria, which is what's mandatory to evaluate homes for ESNH. A mix of 90% AFUE furnace (weighted 80%) and 80% AFUE combo heater (weighted 20%) was assumed as the base case heating system. The upgrade system was a 92% AFUE. A 3.57 ACH50 air leakage was used to describe the simply OBC-2006 houses (default present in HOT2000), which is representative of average new home construction <sup>2</sup>	
<b>Electricity</b>	<b>1450 kWh</b>
As approved in EB 2008-384 & 0384. Electrical savings is based on a simple average of a new reference house, a 1 storey house, and a 2 storey house <sup>1</sup> with London's climate, and another set in North Bay's climate. The sample houses are three houses which represent the mid-range of new homes built in UG Territory. <sup>1</sup> The results were weighted 70% UG South and 30% UG North. The software used for analysis is HOT2000 version 9.34b. This is the same software that is currently in use for application of the EnerQuality Version 3.0 Energy Star Criteria, which is what's mandatory to evaluate homes for ESNH. A 3.57 ACH50 air leakage was used to describe the simply OBC-2006 houses (default present in HOT2000), which is representative of average new home construction <sup>6</sup>	
<b>Water</b>	<b>n/a L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>25 years</b>
As approved in EB 2008-0384 & 0385. Energy Star homes have an estimated service life of 25 years (before major renovations are expected).	
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>\$4,701</b>
As approved in EB 2008-0384 & 0385. Cost estimates for the upgrade measures were obtained from HVAC Trades and Builders who are actively building energy star homes. The upgrade costs based on a simple average of a new reference house, a 1 storey house, and a 2 storey house <sup>1</sup> .	
<b>Free Ridership</b>	<b>5 %</b>
As approved in EB 2008-0384 & 0385	

<sup>1</sup> Based on *Comparison of EnergyStar vs. Ontario Building Code 2006 Energy Use*, spreadsheets, from July and August, 2008, by Bowser Technical Inc.

<sup>2</sup> Conversation with Jennifer Tausman, ESNH files coordinator, NRCAN OEE, July 21, 2008

## ***ENERGY STAR FOR NEW HOMES (VERSION 4)***

### ***Residential, New Construction***

<b>Efficient Technology &amp; Equipment Description</b>
Energy Star for New Homes, version 4, qualified home
<b>Base Technology &amp; Equipment Description</b>
New Home built in Ontario, compliant to OBC-2006, permits issued after March 31, 2009.

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>881 m<sup>3</sup></b>
<p>Gas savings is based on a simple average of a new reference house, a 1 storey house, and a 2 storey house with London's climate, and another set in North Bay's climate. The sample houses are three houses which represent the mid-range of new homes built in UG Territory. The results were weighted 70% UG South and 30% UG North.<sup>3</sup> The software used for analysis is HOT2000 version 9.34c with weather file 9.10wthr. A mix of 90% AFUE furnace (weighted 80%) and 80% AFUE combo heater (weighted 20%) was assumed as the base case heating system. A 3.57 ACH50 air leakage was used to describe the simply OBC-2006 houses (default present in HOT2000), which is representative of average new home construction<sup>4</sup>.</p> <p>Most of the following specifications are based on the OBC 2009, specifically section 12.3: Some of the specifications are upgrades in excess of what is actually required in the code. These were established based on observations of what is representative of the market place for certain items. These items are marked with an asterisk.</p> <p><b>Walls</b> - 2x6 @ 16", R20 batt Insulation (Southern)  - 2x6 @ 16" R20 batt Insulation, R5 Code-board sheathing (Northern)  - 1/2" Gypsum interior  - 3/8" OSB Sheathing  - Brick Veneer</p> <p><b>Roof</b> - 2x4 Attic Truss w R40 Blown Insulation  - 1/2" Drywall interior on resilient channel</p> <p><b>Basement:</b> - Poured Concrete foundation  - R12 Insulation blanket to within 15" of floor slab</p> <p><b>Windows:</b> Double glazed, single low-E, air fill, metal spacer, vinyl frame</p> <p><b>Ventilation:</b> Exhaust fans (Kitchen &amp; bath) without heat recovery</p> <p><b>Heating:</b> a) Combination Heating System  - hot-water air-handler  - Induced draft fan water heater with spark ignition  (Steady State efficiency = 80%, e.g. Rheem PV75ce)  b) Conventional Heating System*  - 90% AFUE forced air furnace, PSC Blower  The model presumes that 20% of houses are equipped with Combination Heating Systems (code minimum) and the 80% are equipped with Conventional Heating Systems*</p> <p><b>Air Cond:</b> -SEER 13 entry level 410a split system*</p> <p><b>DHW:</b> a) Combination Heating System  - Induced Draft spark ignition 75 usg tank (Rheem PV75ce).  b) Conventional Heating System  - Induced Draft spark ignition 40 usg tank (GSW 5G40)</p>	

<sup>3</sup> Bowser Technical, Inc., Comparison of EnerQuality EnergyStar Version 3.0 & EnergyStar Version 4.0 Vs Ontario Building Code 2009 Energy use, March 10 2009

<sup>4</sup> Jennifer Tausman, ESNH files coordinator, NRCAN OEE, July 21, 2008

**Envelope:** 3.57 Air changes per hour @ 50 pa. ("Present" air-tightness default in HOT2000)

- General mode in HOT2000 was used. This allows overrides of default ventilation and occupancy values
- The HOT 2000 Weather file "910wthr" was used. This is an older Canadian weather file that is consistent with Hot2000 version 9.34
- Occupancy was assumed to be 2 Adults and 1 child. This models the supposition that family size and average house hold size is less than the EnergyStar baseline of 2 adults and 2 children
- 50 cfm constant ventilation rate was assumed for all houses and for all ventilation systems. This models the supposition that occupants in general do not operate their ventilation systems as intended, rather they tend to under-use them
- 13 SEER air conditioning systems were considered to be installed in all homes. The London area homes were considered to operate with 20% open windows and the North Bay homes were considered to operate with 50% open windows

The following upgrades from the OBC 2009 specification were applied to the three sample homes

#### **Southern House<sup>5</sup>**

**Walls** No upgrade

**Roof** No upgrade

**Basement:** No upgrade

**Windows:** Upgrade to Energy Star Zone C windows

**Ventilation:** Upgrade to simplified HRV (0.65/0.55 efficiency)

**Heating:** Upgrade to 92% AFUE ECM Blower EnergyStar furnace  
Supply & return trunk ducts sealed

**Air Cond:** Upgrade to SEER 14 from SEER 13

**DHW:** Upgrade to Instantaneous Gas water heater (Noritz N0751DV, E.F. = 0.83)

**Envelope:** 2.0 Air changes per hour @ 50 pa.

**Electrical:** No Upgrade

#### **Northern House<sup>6</sup>**

**Walls** No upgrade

**Roof** No upgrade

**Basement:** No upgrade

**Windows:** Upgrade to Energy Star Zone C windows

**Ventilation:** Upgrade to simplified HRV (0.65/0.55 efficiency)

**Heating:** Upgrade to 95% AFUE ECM Blower EnergyStar furnace  
Supply & return trunk ducts sealed

**Air Cond:** Upgrade to SEER 14 from SEER 13

**DHW:** Upgrade to Instantaneous Gas water heater (Noritz N0751DV, E.F. = 0.83)

<sup>5</sup> The upgrades are based on the EnerQuality Energy-Star for New Homes Technical Specifications Version 4.0 D, February '09 performance compliance method (section 5.1).

<sup>6</sup> The EnerQuality EnergyStar Version 4.0 Prescriptive options are not applicable to homes North of the Muskoka climate zone. Upgrades are based on the performance Compliance Method (section 5.1) as set out in the EnerQuality EnergyStar for New Homes Technical Specification Version 4.0, February '09..

<b>Envelope:</b> 2.0 Air changes per hour @ 50 pa. <b>Electrical:</b> No Upgrade	
<b>Electricity</b>	<b>734 kWh</b>
Electrical saving were calculated from the same models as above.	
<b>Water</b>	<b>n/a L</b>

### Other Input Assumptions

<b>Equipment Life</b>	<b>25 years</b>
As approved in EB 2008-0384 & 0385. Energy Star homes have an estimated life of 25 years (before major renovations are expected).	
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>4275 \$</b>
<p>Cost estimates for the upgrade measures were obtained from HVAC Trades and Builders who are actively building energy star homes and based on a 70/30 UG South &amp; North. The upgrade cost is based on a simple average of a new reference house, a 1 storey house, and a 2 storey house.</p> <p>The costs assigned to the particular upgrade follow:</p> <p><b>Walls:</b> \$0.0/ft<sup>2</sup> upgrade from R20 to R25 (add codeboard to 2x6 wall)  \$0.30/ft<sup>2</sup> upgrade from R25 to R27.5 (increase codeboard thickness)  s \$0.00/ft<sup>2</sup> upgrade to 2x6 @ 20" c.c. R20 (possible savings)</p> <p><b>Roof:</b> \$0.60/ft<sup>2</sup> upgrade from R40 to R50</p> <p><b>Basement:</b> \$0.20/ft<sup>2</sup> coverage upgrade to R20 full height insulation</p> <p><b>Windows:</b> \$1.00 per square foot of glazed surface upgrade to EnergyStar</p> <p><b>Ventilation:</b> \$1,500 upgrade to simple HRV  \$250 upgrade to 1.5 Sone Bath fan &amp; Interlock</p> <p><b>Heating:</b> \$871 upgrade to 92% afue Energy Star Furnace (ECM Blower)  \$871 upgrade to 95% afue Energy Star Furnace (ECM Blower)  \$250 duct sealing  \$166 saving for furnace size reduction 60 MBH to 50 MBH</p> <p><b>Air Cond.</b> \$61 saving for air conditioner size reduction 2.0 ton to 1.5 ton  \$275 saving for air conditioner size reduction 2.5 ton to 2.0 ton  \$194 upgrade to SEER 14 from SEER 13, 1.5 ton  \$168 upgrade to SEER 14 from SEER 13, 2.0 ton  \$80 upgrade to SEER 14 from SEER 13, 2.5 ton</p> <p><b>DHW:</b> \$218 upgrade to instantaneous gas water heater</p> <p><b>Envelope:</b> \$500 budget for increased air-tightness. This is highly variable from Builder to builder. Some builders will have no incremental costs.</p> <p><b>Electrical:</b> \$2.00 per Compact Fluorescent Bulb</p> <p><b>Consulting:</b> \$500 evaluation, testing, review and file processing.</p> <p><b>Fees:</b> \$125 home enrolment fees.</p> <p>Upgrade costs to ver 4.0</p>	



<b>1 Storey Southern</b>	\$4,324	
<b>1 Storey Northern</b>	\$4,324	
<b>2 Storey Southern</b>	\$4,292	
<b>2 Storey Northern</b>	\$4,198	
<b>Reference House Southern</b>	\$4,292	
<b>Reference House Northern</b>	\$4,105	
<b>Free Ridership</b>		<b>5 %</b>
As approved in EB 2008-0384 and 0385		

### ***1.5 GAL/MIN FAUCET AERATOR (KITCHEN)***

*Residential New Construction – ESK kit*

<b>Efficient Technology &amp; Equipment Description</b>
Faucet Aerator (Kitchen) (1.5 GPM)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.5 GPM)

#### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>23 m<sup>3</sup></b>
As approved for existing homes in EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>7,797 L</b>
As approved for existing homes in EB 2008-0346	

#### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved for existing homes in EB 2008-0346	
<b>Incremental Cost (Installed )</b>	<b>\$4.00</b>
Bulk purchase of kitchen aerators for new construction ESK + Packaging	
<b>Free Ridership</b>	<b>31 %</b>
Base free ridership as approved for existing homes in EB 2008-0384 and 0385.	

### ***1.5 GAL/MIN FAUCET AERATOR (BATHROOM)***

*Residential New Construction – ESK kit*

<b>Efficient Technology &amp; Equipment Description</b>
Faucet Aerator (Bathroom) (1.5 GPM)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.2 GPM)

#### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>18 m<sup>3</sup></b>
6 m3 as approved for existing homes in EB 2008-0346 x 3 aerators being installed.	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>6012 L</b>
2004 L as approved for existing homes in EB 2008-0346 x 3 aerators being installed.	

#### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved for existing homes in EB 2008-0346	
<b>Incremental Cost (Installed)</b>	<b>\$5.65</b>
Bulk purchase for bathroom aerators for new construction ESK + Packaging x 3 aerators being installed.	
<b>Free Ridership</b>	<b>31 %</b>
Base free ridership as approved for existing homes in EB 2008-0384 and 0385.	

## ***1.5 GAL/MIN LOW-FLOW SHOWERHEAD***

*Residential New Construction – ESK kit*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead (1.5 gal/min)
<b>Base Technology &amp; Equipment Description</b>
Average existing builder stock as per Enbridge survey (2.5 GPM)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>46 m<sup>3</sup></b>
As approved for distributed 1.5 gpm showerheads in existing homes, EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>6,334 L</b>
As approved for distributed 1.5 gpm showerheads in existing homes, EB 2008-0346	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved for distributed 1.5 gpm showerheads in existing homes, EB 2008-0346	
<b>Incremental Cost (Installed)</b>	<b>\$30.00</b>
Bulk purchase of showerheads for new construction ESK + Packaging.	
<b>Free Ridership</b>	<b>10 %</b>
Free ridership as per informal survey of builders in Enbridge franchise area.	

## ***1.25 GAL/MIN LOW-FLOW SHOWERHEAD***

*Residential New Construction – ESK kit*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead (1.25 gal/min)
<b>Base Technology &amp; Equipment Description</b>
Average existing builders stock as per Enbridge builder survey.

### **Resource Savings Assumptions**

<b>Natural Gas</b>				<b>66 m<sup>3</sup></b>
As approved for 1.25 gpm showerheads in existing homes, EB 2008-0346. Based on SAS analysis of a random sample of metered homes by EGD.				
Scenario	Flow Rate of 'OLD' showerhead (GPM)	Flow Rate of 'NEW' showerhead (GPM)	Gas Savings (m3)	
1	2.0-2.5	1.25	66	
<b>Electricity</b>				<b>n/a kWh</b>
<b>Water</b>				<b>10,886 L</b>
As approved for existing homes 1.25 gpm showerheads in EB 2008-0346				
Scenario	Flow Rate of 'OLD' showerhead (GPM)	Flow Rate of 'NEW' showerhead (GPM)	Water Savings (L)	
1	2.0-2.5	1.25	10,886	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved for existing homes 1.25 gpm showerheads in EB 2008-0346	
<b>Incremental Cost (Installed)</b>	<b>\$11.50</b>
Bulk purchase of showerhead for new construction ESK + Packaging.	
<b>Free Ridership</b>	<b>10 %</b>
Free ridership as per informal survey of builders in Enbridge franchise area.	

## ***PROGRAMMABLE THERMOSTAT***

*Residential New Construction – ESK kit*

<b>Efficient Technology &amp; Equipment Description</b>
Programmable thermostat
<b>Base Technology &amp; Equipment Description</b>
Standard thermostat

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>146 m<sup>3</sup></b>
Savings as recommended by Navigant Consulting. <sup>1</sup>	
<b>Electricity</b>	<b>54 kWh</b>
As approved in EB 2008-0346 Decision.	
<b>Water</b>	<b>n/a L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>15 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Installed)</b>	<b>\$35.50</b>
Based on bulk purchase price for new construction kit + Packaging.	
<b>Free Ridership</b>	<b>43 %</b>
Free Ridership rate recommended by Summit Blue Consulting. <sup>3</sup> As approved in EB 2008-0384 & 0385 for existing houses and confirmed for new construction through informal survey of builders in Enbridge franchise area.	

<sup>1</sup> Draft Report "Measures and Assumptions for Demand Side Management (DSM) Planning", Navigant Consulting Inc., Ontario Energy Board, Appendix C: Substantiation Sheets, pg. B-50-53, Feb. 6, 2009.

<sup>2</sup> "Resource Savings Values in Selected DSM Prescriptive Programs", Summit Blue Consulting, pg. 28, June 2008.

<sup>3</sup> "Residential Measure Free Ridership And Inside Spillover Study - Final Report", Summit Blue Consulting, June 2008

## **RESIDENTIAL EXISTING HOMES**

## ***1.5 GAL/MIN FAUCET AERATOR (KITCHEN)***

*Residential Existing Homes*

<b>Efficient Technology &amp; Equipment Description</b>
Faucet Aerator (Kitchen) (1.5 GPM)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.5 GPM)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>23 m<sup>3</sup></b>
As approved in EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water (Updated)</b>	<b>7,797 L</b>
As approved in EB 2008-0346	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Cust. Install) (UG/EGD)</b>	<b>\$1</b>
As per utility program costs, bulk purchase of aerators.	
<b>Free Ridership (UG/EGD)</b>	<b>33/31 %</b>
<sup>1</sup> Free Ridership rate recommended by Summit Blue Consulting. As approved in EB 2008-0384 & 0385.	

<sup>1</sup>  
“Residential Measure Free Ridership And Inside Spillover Study - Final Report”, Summit Blue Consulting, June 2008.



### ***1.5 GAL/MIN FAUCET AERATOR (BATHROOM)***

*Residential Existing Homes*

<b>Efficient Technology &amp; Equipment Description</b>
Faucet Aerator (Bathroom) (1.5 GPM)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.2 GPM)

#### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>6 m<sup>3</sup></b>
As approved in EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water (Updated)</b>	<b>2,004 L</b>
As approved in EB 2008-0346	

#### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Cust. Install) (UG/EGD)</b>	<b>\$1</b>
As per utility program costs, bulk purchase of aerators.	
<b>Free Ridership (UG/EGD)</b>	<b>33/31 %</b>
<sup>1</sup> Free Ridership rate recommended by Summit Blue Consulting. As approved in EB 2008-0384 & 0385.	

<sup>1</sup> "Residential Measure Free Ridership And Inside Spillover Study - Final Report", Summit Blue Consulting, June 2008.

## ***1.5 GAL/MIN LOW-FLOW SHOWERHEAD***

*Residential Existing Homes (Distribution)*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead (1.5 gal/min)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.2 GPM)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>46 m<sup>3</sup></b>
As approved in EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>6,334 L</b>
As approved in EB 2008-0346	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Cust. Install)</b>	<b>\$4</b>
As per utility program costs, bulk purchase of showerheads.	
<b>Free Ridership</b>	<b>10 %</b>
<sup>1</sup> Free Ridership rate recommended by Summit Blue Consulting. As approved in EB 2008-0384 & 0385.	

<sup>1</sup>  
“Residential Measure Free Ridership And Inside Spillover Study - Final Report”, Summit Blue Consulting, June 2008.

## ***1.25 GAL/MIN LOW-FLOW SHOWERHEAD***

*Residential Existing Homes (Distribution)*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead (1.25 gal/min)
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (2.2 GPM)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>63 m<sup>3</sup></b>
As approved in EB 2008-0346	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>10,570 L</b>
As approved in EB 2008-0346	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Cust. Install)</b>	<b>\$4</b>
As per utility program costs, bulk purchase of showerheads.	
<b>Free Ridership</b>	<b>10 %</b>
<sup>1</sup> Free Ridership rate recommended by Summit Blue Consulting. As approved in EB 2008-0384 & 0385.	

<sup>1</sup> "Residential Measure Free Ridership And Inside Spillover Study - Final Report", Summit Blue Consulting, June 2008.

## 1.25 GAL/MIN LOW-FLOW SHOWERHEAD

### Residential Existing Homes

Efficient Technology & Equipment Description
Low-flow showerhead (1.25 gal/min)
Base Technology & Equipment Description
Average existing stock – see below for flow rates.

### Resource Savings Assumptions

Natural Gas				See Below	m <sup>3</sup>
As approved for 1.25 gpm showerheads in EB 2008-0346. Based on SAS analysis of a random sample of Enbridge metered homes.					
Scenario	Flow Rate of 'OLD' showerhead (GPM)	Flow Rate of 'NEW' showerhead (GPM)	Gas Savings (m <sup>3</sup> )		
1	2.0-2.5	1.25	66		
2	2.6 +	1.25	116		
Electricity				n/a	kWh
Water				See Below	L
As approved in EB 2008-0346					
Scenario	Flow Rate of 'OLD' showerhead (GPM)	Flow Rate of 'NEW' showerhead (GPM)	Water Savings (L)		
2	2.0-2.5	1.25	10,886		
3	2.6 +	1.25	17,168		

### Other Input Assumptions

Equipment Life	10	Years
As approved in EB 2008-0346		
Incremental Cost (Contr. Install)	\$19	
As per utility program costs, bulk purchase of showerheads plus cost of installation.		
Free Ridership	10	%
As approved in EB 2008-0384 & 0385.		

## ***PROGRAMMABLE THERMOSTAT***

### *Residential Existing Homes*

<b>Efficient Technology &amp; Equipment Description</b>
Programmable thermostat
<b>Base Technology &amp; Equipment Description</b>
Standard thermostat

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>146 m<sup>3</sup></b>
Savings as recommended by Navigant Consulting in their Draft Report. <sup>1</sup>	
<b>Electricity</b>	<b>54 kWh</b>
As approved in EB 2008-0346	
<b>Water</b>	<b>n/a L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>15 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Contr. Install) (UG/EGD)</b>	<b>\$50</b>
Based on average thermostat cost from Union survey of hardware chains.	
<b>Free Ridership</b>	<b>43 %</b>
Free Ridership rate recommended by Summit Blue Consulting. <sup>3</sup> As approved in EB 2008-0384 & 0385.	

<sup>1</sup> Draft Report "Measures and Assumptions for Demand Side Management (DSM) Planning", Navigant Consulting Inc., Ontario Energy Board, Appendix C: Substantiation Sheets, pg. B-50-53, Feb. 6, 2009.

<sup>2</sup> "Resource Savings Values in Selected DSM Prescriptive Programs", Summit Blue Consulting, pg. 28, June 2008.

<sup>3</sup> "Residential Measure Free Ridership And Inside Spillover Study - Final Report", Summit Blue Consulting, June 2008

## ***HEAT REFLECTOR PANELS***

### *Residential Existing Homes*

<b>Efficient Technology &amp; Equipment Description</b>
A saw tooth panel made of clear PVC with a reflective surface placed behind a radiator, thereby reducing heat lost to poorly insulated exterior walls.
<b>Base Technology &amp; Equipment Description</b>
Existing housing with radiant heat with no reflector panels.

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>143 m<sup>3</sup></b>
As approved in EB 2008-0346.	
<b>Electricity</b>	<b>kWh</b>
<b>Water</b>	<b>L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>18 Years</b>
As approved in EB 2008-0346	
<b>Incremental Cost (Customer Install)</b>	<b>\$238</b>
As per utility program costs. (Cost of panels plus shipping)	
<b>Free Ridership</b>	<b>0 %</b>
Product not currently available to end-use consumers through typical retail channels. As approved in EB 2008-0346 & 0385.	

## **OTHER MEASURES**

## ***CFL SCREW-IN (13W)***

### *Existing/New Developments in All Sectors*

<b>Efficient Technology &amp; Equipment Description</b>
CFL screw-in 13W
<b>Base Technology &amp; Equipment Description</b>
60W Incandescent

### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>0 m<sup>3</sup></b>
<b>Electricity</b>	<b>45 kWh</b>
Substantiation provided by the OPA, dated September 23, 2008 and approved in EB 2008-0384 & 0385.	
<b>Water (Updated)</b>	<b>0 L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>8 years</b>
Substantiation provided by the OPA, dated September 23, 2008 and approved in EB 2008-0384 & 0385.	
<b>Incremental Cost Contractor/Customer Install</b>	<b>0.00 \$</b>
<ul style="list-style-type: none"> <li>Average cost of 60 W incandescent bulb = \$0.75 / bulb based on Canadian Tire website (2007). OPA assumes each incandescent bulb has a one year life.</li> <li>Supplied cost of 13 W CFL = \$1.72 / bulb (based on 2009 distributor price to EGD) + \$0.50 (Contractor Delivery Charge) = \$2.22</li> </ul> <p>\$2.22 CFL cost – \$6.00 (8 incandescent bulbs x .75) = (\$3.78)</p>	
<b>Free Ridership</b>	<b>24 %</b>
Based on the results of an OPA program evaluation and as approved in EB 2008-0384 & 0385.	



## **CFL SCREW-IN (23W)**

*Existing/New Developments in All Sectors*

<b>Efficient Technology &amp; Equipment Description</b>
CFL screw-in 23W
<b>Base Technology &amp; Equipment Description</b>
75W Incandescent

### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>0 m<sup>3</sup></b>
<b>Electricity</b>	<b>49.7 kWh</b>
Substantiation provided by the OPA, dated October 17, 2008 and as approved in EB 2008-0384 & 0385.	
<b>Water (Updated)</b>	<b>0 L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>8 years</b>
Substantiation provided by the OPA, dated October 17, 2008 and as approved in EB 2008-0384 & 0385 .	
<b>Incremental Cost Contractor/Customer Install</b>	<b>0.00 \$</b>
<ul style="list-style-type: none"> <li>Average cost of 75 W incandescent bulb = \$0.75 / bulb based on Canadian Tire website (2007). OPA assumes that each incandescent bulb has a one year life.</li> <li>Supplied cost of a 23 W CFL = \$2.05 (based on 2009 distributor cost to EGD) + \$0.50 (Contractor Delivery Charge) = \$2.55</li> </ul> <p>\$2.55 CFL cost - \$6.00 (8 incandescent bulbs x .75) = (\$3.45)</p>	
<b>Free Ridership</b>	<b>24 %</b>
Based on the results of an OPA program evaluation and as approved in EB 2008-0384 & 0385.	

## **COMMERCIAL NEW BUILDING CONSTRUCTION**

## ***DEMAND CONTROL KITCHEN VENTILATION (DCKV)***

### *New Building Construction*

<b>Efficient Technology &amp; Equipment Description</b>
Ventilation with DCKV
<b>Base Technology &amp; Equipment Description</b>
Ventilation without DCKV

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>4,801 m3</b>	<b>5,000 CFM</b>
	<b>11,486 m3</b>	<b>10,000 CFM</b>
	<b>18,924 m3</b>	<b>15000 CFM</b>
As approved by EB-2008-0346, Demand Kitchen Ventilation (DCKV – 5000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 10000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 15000 CFM), Decision Type: Existing.  Usage savings are not dependant on Decision Type.		
<b>Electricity</b>	<b>13,521 kWh</b>	<b>5,000 CFM</b>
	<b>30,901 kWh</b>	<b>10,000 CFM</b>
	<b>49,102 kWh</b>	<b>15000 CFM</b>
As approved by EB-2008-0346, Demand Kitchen Ventilation (DCKV – 5000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 10000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 15000 CFM), Decision Type: Existing.  Usage savings are not dependant on Decision Type.		
<b>Water</b>	<b>n/a L</b>	

### **Other Input Assumptions**

Equipment Life	15 years	
As approved by EB-2008-0346, Demand Kitchen Ventilation (DCKV – 5000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 10000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 15000 CFM), Decision Type: Existing. Measure life is not dependent on Decision Type		
Incremental Cost	\$10,000	5,000 CFM
	\$15,000	10,000 CFM
	\$20,000	15000 CFM
As approved by EB-2008-0346, Demand Kitchen Ventilation (DCKV – 5000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 10000 CFM), Decision Type: Existing. Demand Kitchen Ventilation (DCKV – 15000 CFM), Decision Type: Existing. Incremental cost is not dependent on Decision Type		
Free Ridership	5 %	
FR as per 2008-0384 and 0385		

## ***PRE-RINSE SPRAY NOZZLE (1.24 GPM)***

*Commercial, New Market*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow pre-rinse spray nozzle/valve (1.24 GPM)
<b>Base Technology &amp; Equipment Description</b>
Standard pre-rinse spray nozzle/valve (3.0 GPM)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>See below m<sup>3</sup></b>								
<table border="1"> <thead> <tr> <th>Market Segment</th><th>Natural Gas (m<sup>3</sup>/yr)</th></tr> </thead> <tbody> <tr> <td>Full Dining Establishments</td><td>886</td></tr> <tr> <td>Limited Service Establishments</td><td>190</td></tr> <tr> <td>Other Establishments</td><td>200</td></tr> </tbody> </table> <p>As approved by EB-2008-0346,  Pre-Rinse Spray Nozzle (1.24 GPM), Decision Type: Existing.</p> <p>Usage savings are not dependant on Decision Type.</p>		Market Segment	Natural Gas (m <sup>3</sup> /yr)	Full Dining Establishments	886	Limited Service Establishments	190	Other Establishments	200
Market Segment	Natural Gas (m <sup>3</sup> /yr)								
Full Dining Establishments	886								
Limited Service Establishments	190								
Other Establishments	200								
<b>Electricity</b>	<b>0 kWh</b>								
<b>Water</b>	<b>See below L</b>								
<table border="1"> <thead> <tr> <th>Market Segment</th><th>Water (L)</th></tr> </thead> <tbody> <tr> <td>Full Dining Establishments</td><td>170,326</td></tr> <tr> <td>Limited Service Establishments</td><td>36,484</td></tr> <tr> <td>Other Establishments</td><td>38,383</td></tr> </tbody> </table> <p>As approved by EB-2008-0346,  Pre-Rinse Spray Nozzle (1.24 GPM), Decision Type: Existing.</p> <p>Usage savings are not dependant on Decision Type.</p>		Market Segment	Water (L)	Full Dining Establishments	170,326	Limited Service Establishments	36,484	Other Establishments	38,383
Market Segment	Water (L)								
Full Dining Establishments	170,326								
Limited Service Establishments	36,484								
Other Establishments	38,383								

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>5 years</b>
<p>As approved by EB-2008-0346,  Pre-Rinse Spray Nozzle (1.24 GPM), Decision Type: Existing.  Equipment life is not dependant on Decision Type.</p>	
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>60 \$</b>
<p>As approved by EB-2008-0346,  Pre-Rinse Spray Nozzle (1.24 GPM), Decision Type: Existing.  Incremental cost is not dependant on Decision Type.</p>	
<b>Free Ridership</b>	<b>12.4 %</b>
<p>New information based on Free Ridership and Spillover for Low Flow Pre Rinse Spray Nozzles (Nov. 26, 2008, PA Consulting Group)</p>	

## **COMMERCIAL EXISTING BUILDINGS**

### ***1.0 GAL/MIN FAUCET AERATOR (KITCHEN)***

*Commercial Building Retrofit (Installed) – Multi-Residential*

<b>Efficient Technology &amp; Equipment Description</b>
1.0 GPM Faucet Aerator
<b>Base Technology &amp; Equipment Description</b>
Average existing stock / 2.5 GPM Faucet Aerator

#### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>39 m<sup>3</sup></b>
As per EB 2008-0346 Decision, 1.5GPM aerator adjusted for a 1.0 GPM unit.	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water (Updated)</b>	<b>8,072 L</b>
As per EB 2008-0346 Decision, 1.5GPM aerator adjusted for a 1.0 GPM unit.	

#### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 years</b>
As approved in EB 2008-0346.	
<b>Incremental Cost (Contractor Install)</b>	<b>\$2</b>
As per utility program costs.	
<b>Free Ridership</b>	<b>10 %</b>
Free ridership – EB 2008-0384 & 0385	

### ***1.0 GAL/MIN FAUCET AERATOR (BATHROOM)***

*Commercial Building Retrofit (Installed) - Multi-Residential*

<b>Efficient Technology &amp; Equipment Description</b>
1.0 GPM Faucet Aerator
<b>Base Technology &amp; Equipment Description</b>
Average existing stock / 2.2 GPM Faucet Aerator

#### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>11 m<sup>3</sup></b>
As per EB 2008-0346 Decision, 1.5GPM aerator adjusted for a 1.0 GPM unit.	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water (Updated)</b>	<b>2,371 L</b>
As per EB 2008-0346 Decision, 1.5GPM aerator adjusted for a 1.0 GPM unit.	

#### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 years</b>
As recommended by Navigant.	
<b>Incremental Cost (Contractor Install)</b>	<b>\$1.50</b>
As per utility program costs.	
<b>Free Ridership (Updated)</b>	<b>10 %</b>
Free ridership – EB 2008-0384 & 0385	

### ***1.5 GAL/MIN LOW-FLOW SHOWERHEAD (PER SUITE)***

*Commercial Building Retrofit (Installed) – Multi-Residential*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead 1.5 gal/min.
<b>Base Technology &amp; Equipment Description</b>
Average existing stock. (See below)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>28 m3</b>	<b>2.0 - 2.5 GPM</b>
	<b>55 m3</b>	<b>2.6 - 3.0 GPM</b>
	<b>79 m3</b>	<b>3.1 - 3.5 GPM</b>
	<b>91 m3</b>	<b>3.6 + GPM</b>
Based on savings calculation Navigant Draft Report <sup>7</sup> adjusted to account for 1.5 gpm replacement unit and percentage of showers taken with efficient unit in Multi- Residential setting (92%) compared to 76% in Low Rise residential as per Summit Blue, Resource Savings in selected Residential DSM Programs, June 2008		
<b>Water</b>	<b>5,197 L</b>	<b>2.0 - 2.5 GPM</b>
	<b>9,490 L</b>	<b>2.6 - 3.0 GPM</b>
	<b>13,250 L</b>	<b>3.1 - 3.5 GPM</b>
	<b>15,114 L</b>	<b>3.6 + GPM</b>
Based on savings calculation Navigant Draft Report <sup>8</sup> adjusted to account for 1.5 gpm replacement and percentage of showers taken with efficient unit in Multi- Residential setting (92%) compared to 76% in Low Rise residential as per Summit Blue, Resource Savings in selected Residential DSM Programs, June 2008.		
<b>Electricity</b>	<b>n/a kWh</b>	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 Years</b>
As approved in EB 2008-0346.	
<b>Incremental Cost (Contractor Install)</b>	<b>\$17</b>
As per utility program costs.	
<b>Free Ridership</b>	<b>10 %</b>
As per EB 2008-00384 & 0385	

<sup>7</sup> Measures and Assumptions for Demand Side Management Planning, Ontario Energy Board, Navigant Consulting Inc., February, 2009.

<sup>8</sup> ibid



## **2.0 GAL/MIN LOW-FLOW SHOWERHEAD (PER SUITE)**

*Commercial Building Retrofit (Installed) – Multi-Residential*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow showerhead 2.0 gal/min.
<b>Base Technology &amp; Equipment Description</b>
Average existing stock (see below).

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>4 m3</b>	<b>2.6 – 3.0 GPM</b>
	<b>28 m3</b>	<b>3.1 – 3.5 GPM</b>
	<b>40 m3</b>	<b>3.6 + GPM</b>
Based on savings calculation Navigant Draft Report <sup>9</sup> adjusted to account for 2.0 gpm replacement unit and percentage of showers taken with efficient unit in Multi- Residential setting (92%) compared to 76% in Low Rise residential as per Summit Blue, Resource Savings in selected Residential DSM Programs, June 2008		
<b>Water</b>	<b>1,727 L</b>	<b>2.6 – 3.0 GPM</b>
	<b>5,487 L</b>	<b>3.1 – 3.5 GPM</b>
	<b>7,351 L</b>	<b>3.6 + GPM</b>
Based on savings calculation Navigant Draft Report <sup>10</sup> adjusted to account for 2.0 gpm replacement and percentage of showers taken with efficient unit in Multi- Residential setting (92%) compared to 76% in Low Rise residential as per Summit Blue, Resource Savings in selected Residential DSM Programs, June 2008.		
<b>Electricity</b>	<b>n/a kWh</b>	

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>10 years</b>
As approved in EB 2008-0346.	
<b>Incremental Cost (Contractor Install)</b>	<b>\$17</b>
As per utility program costs.	
<b>Free Ridership</b>	<b>10 %</b>
As per EB 2008 – 0384 & 0385	

<sup>9</sup> Measures and Assumptions for Demand Side Management Planning, Ontario Energy Board, Navigant Consulting Inc., February, 2009

<sup>10</sup> ibid

## ***PRE-RINSE SPRAY NOZZLE (0.64 GPM)***

*Commercial Existing / New Market*

<b>Efficient Technology &amp; Equipment Description</b>
Low-flow pre-rinse spray nozzle/valve (0.64 GPM)
<b>Base Technology &amp; Equipment Description</b>
Standard pre-rinse spray nozzle/valve (3.0 GPM)

## **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>See below m<sup>3</sup></b>								
<table> <tr> <th><b>Market Segment</b></th><th><b>Natural Gas (m<sup>3</sup>/yr)</b></th></tr> <tr> <td>Full Dining Establishments</td><td>1,286</td></tr> <tr> <td>Limited Service Establishments</td><td>339</td></tr> <tr> <td>Other Establishments</td><td>318</td></tr> </table> <p>A field study was undertaken at 37 sites across 4 regions in Union Gas territory. Measurements of water pressure, incoming and leaving (at both burner On and Off setpoints) water temperature at the water heater and supplied to the pre-rinse spray valve, details of the make, model and type of water heater, and type of food service establishment, were collected at each site.</p> <p>Flow rate vs. pressure curves for high-flow and nominal 0.64 USgpm pre-rinse spray valves (PRSV) were developed from the Veritec studies in Waterloo<sup>11</sup> and Calgary<sup>12</sup>. An average flow rate vs pressure curve for high-flow PRSVs was developed from the Veritec Waterloo study.</p> <p>Water savings were evaluated for each region based on the difference between the flow rates of the high-flow and low-flow PRSV at the average measured water pressure, and the average usage of the PRSV for each of 3 food service establishmentc types from the Veritec studies in Waterloo and Calgary.</p> <p>Natural gas savings were determined using the US-DOE WHAM<sup>13</sup> model to establish water heater efficiency. Inputs to the model from site measurements included the average cold water and hot water setpoint temperatures for each region. Additional inputs to the model included water heater energy factor and rated water heater input (both average for the region), ambient air temperature (assumed at 70°F), and average daily volume of hot water. This last item was determined from a combination of research undertaken by FSTC<sup>14</sup>, and ASHRAE<sup>15</sup> recommendations, for each food service establishment type. The proportion of hot water delivered to the PRSV was determined from the average measured mixed water temperature for each region. Operating times are not expected to be different between 1.24 &amp; 0.64 (Bricor model B064) USgpm models based on cleanability times of 20-21 seconds according to the FTSC<sup>16</sup>.</p> <p>Resource Savings are not dependent on Decision Type, i.e., New or Existing facilities</p>	<b>Market Segment</b>	<b>Natural Gas (m<sup>3</sup>/yr)</b>	Full Dining Establishments	1,286	Limited Service Establishments	339	Other Establishments	318	
<b>Market Segment</b>	<b>Natural Gas (m<sup>3</sup>/yr)</b>								
Full Dining Establishments	1,286								
Limited Service Establishments	339								
Other Establishments	318								

<sup>11</sup> "Region of Waterloo – Pre-Rinse Spray Valve Pilot Study – Final Report", Veritec Consulting Inc., January 2005

<sup>12</sup> "City of Calgary" – Pre-Rinse Spray Valve Pilot Study – Final Report", Veritec Consulting Inc., December 2005.

<sup>13</sup> Appendix D-2. Water Heater Analysis Model. Water Heater Rulemaking Technical Support Documents.

<sup>14</sup> [http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/waterheat\\_0300\\_r.html](http://www1.eere.energy.gov/buildings/appliance_standards/residential/waterheat_0300_r.html)

<sup>14</sup> Charles Wallace and Don Fisher Energy Efficiency Potential of Gas-Fired Commercial Hot Water Heating Systems in Restaurants. FSTC April 2007

<sup>15</sup> ASHRAE Handbook 2007HVAC Applications. Chapter 49

<sup>16</sup> pg 32 & 37 "Deemed Savings for (Low Flow) Pre-Rinse Spray Nozzles" by Energy Profiles, January 30, 2009.

<b>Electricity</b>	<b>0 kWh</b>								
<b>Water</b>	<b>See below L</b>								
<table border="1"> <thead> <tr> <th>Market Segment</th><th>Water (L)<sup>16</sup></th></tr> </thead> <tbody> <tr> <td>Full Dining Establishments</td><td>252,000</td></tr> <tr> <td>Limited Service Establishments</td><td>66,400</td></tr> <tr> <td>Other Establishments</td><td>62,200</td></tr> </tbody> </table> <p>Assumptions and inputs:</p> <ul style="list-style-type: none"> <li>Water savings were evaluated for 3 food service establishment types: Full Service Restaurants, Limited Service Restaurants, and Other</li> <li>The PRSV water usage was based on the 2 Veritec studies, and incorporated the measured differences in usage time for the high-flow and low-flow PRSVs.</li> </ul> <p>Resource Savings are not dependent on Decision Type, i.e., New or Existing facilities</p>		Market Segment	Water (L) <sup>16</sup>	Full Dining Establishments	252,000	Limited Service Establishments	66,400	Other Establishments	62,200
Market Segment	Water (L) <sup>16</sup>								
Full Dining Establishments	252,000								
Limited Service Establishments	66,400								
Other Establishments	62,200								

### Other Input Assumptions

<b>Equipment Life</b>	<b>5 years</b>
As per EB 2008-0346 Decision Commercial Existing facilities.	
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>\$88</b>
<p>\$88 = (\$50/pc* + \$1/pc* shipping USD) x 1.28901** exchange rate + \$22 installation***</p> <p>*estimated by Bricor, March 2, 2009</p> <p>**Exchange rate from March 2, 2009 - <a href="http://www.xe.com/ucc/convert.cgi">http://www.xe.com/ucc/convert.cgi</a></p> <p>***estimated installation from Seattle Utilities (\$21-23/pc), based on conversation with Bricor, March 2, 2009</p>	
<b>Free Ridership</b>	<b>0 %</b>
Basis: Relatively new product probably only aware of one manufacturer (Bricor).	

## **ROOFTOP UNIT**

*Commercial Existing*

<b>Efficient Technology &amp; Equipment Description</b>
Two-stage rooftop unit, up to and including 5 tons of cooling (85% efficient)
<b>Base Technology &amp; Equipment Description</b>
Single-stage rooftop unit (80% efficient)

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>255</b>	<b>m<sup>3</sup></b>
As approved by EB – 2008-0346, Gas-fired Rooftop Unit, Decision Type: New.  The incremental cost associated with these this measure does not vary according to the type of installation being either new or retrofit. This is due to the fact that the incremental cost associated with each measure is related to the unit itself. Incremental cost is not related to the installation of the unit nor is it related to a combination of the unit itself and the installation. For example, when replacing a rooftop unit with a high efficiency rooftop unit, the only factor affecting the decision is the incremental cost of the unit itself since the infrastructure to support the operation of the rooftop unit is already in place in the building. It is merely a matter of removing an old unit and replacing it with a new unit. The same applies to new construction.		
<b>Electricity</b>	<b>n/a</b>	<b>kWh</b>
<b>Water</b>	<b>n/a</b>	<b>L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>15</b>	<b>years</b>
As approved by EB – 2008-0346, Gas-fired Rooftop Unit, Decision Type: New. Equipment life is not dependent on Decision Type.		
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>\$375</b>	
As approved by EB – 2008-0346, Gas-fired Rooftop Unit, Decision Type: New. The incremental cost is based on the difference between a new single stage unit and a new two stage unit and is therefore not dependent on Decision Type.		
<b>Free Ridership</b>	<b>5</b>	<b>%</b>
Free-ridership rate as per EB-2008-034 and 0385		

## ***TANKLESS WATER HEATER***

*Commercial – Existing/New Build*

<b>Efficient Technology &amp; Equipment Description</b>
Tankless Water Heater (84% thermal efficiency (77% adjusted thermal efficiency), where approximately 50-150 USG/day will be used.
<b>Base Technology &amp; Equipment Description</b>
Conventional storage tank gas water heater (thermal efficiency <sup>i</sup> =80%), 91 gallons.

### **Resource Savings Assumptions**

<b>Natural Gas</b>	<b>154 m<sup>3</sup></b>
As approved in EB-2008-0346, Tankless Water Heater – Commercial, Decision Type: New. Resource savings are not dependent on Decision Type.	
<b>Electricity</b>	<b>n/a kWh</b>
<b>Water</b>	<b>n/a L</b>

### **Other Input Assumptions**

<b>Equipment Life</b>	<b>18 years</b>
As approved in EB-2008-0346, Tankless Water Heater – Commercial, Decision Type: New. Equipment life is not dependent on Decision Type	
<b>Incremental Cost (Cust. / Contr. Install)</b>	<b>\$-1,102</b>
As approved by EB-2008-0346, Tankless Water Heater – Commercial, Decision Type: New. Incremental Cost is not dependent on Decision Type	
<b>Free Ridership</b>	<b>2 %</b>
Free-ridership rate as per EB-2008-0384 and 0385	

## ***HIGHER EFFICIENCY BOILERS – DOMESTIC WATER HEATING***

*Existing and New Commercial and Multi- Residential*

<b>Efficient Technology &amp; Equipment Description</b>
Hydronic Boilers for water heating (Non Seasonal)
<b>Base Technology &amp; Equipment Description</b>
80% Combustion Efficiency Domestic Water Heating Boiler

### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>Domestic Water Heating (Non Seasonal) M3 Savings by Combustion Efficiency</b>	
	<b>Boiler Size</b>	<b>83-84% 85-88%</b>
	<b>300 MBH</b>	<b>1,075 1,766</b>
	<b>600 MBH</b>	<b>1,777 2,290</b>
	<b>1,000 MBH</b>	<b>3,136 5,155</b>
	<b>1,500 MBH</b>	<b>4,317 7,095</b>
<p>Source: Prescriptive Commercial Boiler Program – Prescriptive Savings Analysis – Agviro Report Sept 10, 2008.</p> <p>An iterative approach was used to determine the annual savings in the commercial sector. The following steps were taken:</p> <ol style="list-style-type: none"> <li>The Rate 6 accounts were subdivided into bins of annual gas use. This provided the annual average gas use, number of accounts, seasonal, non-seasonal and total gas use.</li> <li>The seasonal portion of the annual gas use was normalized to 30 year weather data. This normalized gas use was correlated to a seasonal boiler size required for gas consumption.</li> <li>Categories of boiler sizes were selected to provide a suitable range of boilers available within the sector.</li> <li>The Rate 6 accounts were subdivided using the normalized average seasonal gas use for the respective categories of boilers selected. This provided the annual average gas use, number of accounts, and total gas use per seasonal boiler size category.</li> <li>Seasonal annual gas use normalization of the boiler size category accounts was completed.</li> <li>Annual seasonal efficiency of the boiler size categories for each of the combustion efficiency ranges was determined.</li> <li>Boiler costs for the boiler size categories was compiled.</li> <li>A TRC analysis was completed for each of the boiler size categories.</li> <li>A similar approach was used for the non-seasonal gas use with the exception of normalizing the data.</li> </ol>		
<b>Electricity (Updated)</b>	<b>kWh</b>	
<b>Water</b>	<b>L</b>	

### Other Input Assumptions

<b>Equipment Life</b>	<b>25</b>	<b>years</b>
As per EB 2008-0384 & 0385		
<b>Incremental Cost (Contr. Install)</b>	<b>Domestic Water Heating (Non Seasonal) Incremental Cost by Combustion Efficiency</b>	
	<b><u>Boiler Size</u></b>	<b><u>83-84%</u>   <u>85-88%</u></b>
	<b>300 MBH</b>	<b>\$3,900   \$ 4,500</b>
	<b>600 MBH</b>	<b>\$5,800   \$ 6,000</b>
	<b>1,000 MBH</b>	<b>\$7,400   \$10,300</b>
	<b>1,500 MBH</b>	<b>\$5,900   \$ 7,400</b>
Source: Prescriptive Commercial Boiler Program – Prescriptive Savings Analysis – Agviro Report Sept 10, 2008.		
<b>Free Ridership</b>	<b>Enbridge</b>	
	<b>Small Commercial</b>	<b>10%</b>
	<b>Large Commercial</b>	<b>12%</b>
	<b>Multi-Family</b>	<b>20%</b>
As per EB 2008-0384 – 0385		

## ***HIGHER EFFICIENCY BOILERS –SPACE HEATING***

*Existing and New Commercial and Multi- Residential*

<b>Efficient Technology &amp; Equipment Description</b>
Hydronic Boilers for space (Seasonal)
<b>Base Technology &amp; Equipment Description</b>
80% Combustion Efficiency Space Heating Boiler

### **Resource Savings Assumptions**

<b>Natural Gas (Updated)</b>	<b>Space Heating (Seasonal) M3 Savings by Combustion Efficiency</b>	
	<b>Boiler Size</b>	<b>83-84% 85-88%</b>
	<b>300 MBH</b>	<b>2,105 3,125</b>
	<b>600 MBH</b>	<b>3,994 5,930</b>
	<b>1,000 MBH</b>	<b>7,310 10,856</b>
	<b>1,500 MBH</b>	<b>11,554 17,157</b>
	<b>2,000 MBH</b>	<b>16,452 24,431</b>

Source: Prescriptive Commercial Boiler Program – Prescriptive Savings Analysis – Agviro Report Sept 10, 2008.

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

- The Rate 6 accounts were subdivided into bins of annual gas use. This provided the annual average gas use, number of accounts, seasonal, non-seasonal and total gas use.
- The seasonal portion of the annual gas use was normalized to 30 year weather data. This normalized gas use was correlated to a seasonal boiler size required for gas consumption.
- Categories of boiler sizes were selected to provide a suitable range of boilers available within the sector.
- The Rate 6 accounts were subdivided using the normalized average seasonal gas use for the respective categories of boilers selected. This provided the annual average gas use, number of accounts, and total gas use per seasonal boiler size category.
- Seasonal annual gas use normalization of the boiler size category accounts was completed.
- Annual seasonal efficiency of the boiler size categories for each of the combustion efficiency ranges was determined.
- Boiler costs for the boiler size categories was compiled.
- A TRC analysis was completed for each of the boiler size categories.
- A similar approach was used for the non-seasonal gas use with the exception of normalizing the data.

<b>Electricity (Updated)</b>	<b>kWh</b>
<b>Water</b>	<b>L</b>



### Other Input Assumptions

<b>Equipment Life</b>	<b>25</b>	<b>years</b>
As per EB 2008-0384 & 0385		
<b>Incremental Cost (Contr. Install)</b>	<b>Space Heating (Seasonal) Incremental Cost by Combustion Efficiency</b>	
	<u><b>Boiler Size</b></u>	<u><b>83-84%</b></u> <u><b>85-88%</b></u>
	<b>300 MBH</b>	<b>\$3,900</b> <b>\$ 4,500</b>
	<b>600 MBH</b>	<b>\$5,800</b> <b>\$ 6,000</b>
	<b>1,000 MBH</b>	<b>\$7,400</b> <b>\$10,300</b>
	<b>1,500 MBH</b>	<b>\$5,900</b> <b>\$ 7,400</b>
	<b>2,000 MBH</b>	<b>\$4,950</b> <b>\$ 7,050</b>
Source: Prescriptive Commercial Boiler Program – Prescriptive Savings Analysis – Agviro Report Sept 10, 2008.		
<b>Free Ridership</b>	<b>Enbridge</b>	
	<b>Small Commercial</b>	<b>10%</b>
	<b>Large Commercial</b>	<b>12%</b>
	<b>Multi-Family</b>	<b>20%</b>
As per EB 2008-0384 - 0385		

<sup>i</sup> Although the required minimum thermal efficiency to be in compliance with ASHRAE 90.1 is 78%, <http://www.energycodes.gov/comcheck/pdfs/404text.pdf>, only an very small percentage of commercial gas water heaters listed in the GAMA *Consumer's Directory of Certified Efficiency Ratings* had a thermal efficiency of less than 80%. [http://www.neo.ne.gov/neq\\_online/july2006/commgaswtrhtr.pdf](http://www.neo.ne.gov/neq_online/july2006/commgaswtrhtr.pdf)

### 2010 Free Ridership Summary

Efficient Equipment & Technologies	Free Ridership	Reference
RESIDENTIAL NEW CONSTRUCTION		
Energy Star Version 3 and Version 4	5%	as per EB-2008-0384
Faucet Aerator (kitchen and bathroom, installed, 1.5 GPM)	31%	as approved for existing homes in EB-2008-0384
Low-Flow Showerhead (Per unit, installed, 1.5 and 1.25 GPM)	10%	as approved for existing homes in EB-2008-0384
Programmable Thermostat (Installed)	43%	as approved for existing homes in EB-2008-0384
RESIDENTIAL EXISTING HOMES		
Faucet Aerator (kitchen and bathroom, distributed, 1.5 GPM)	31%	as per EB-2008-0384
Low-Flow Showerhead (Per unit, distributed, 1.5 and 1.25 GPM)	10%	as per EB-2008-0384
Low-Flow Showerhead (Per household, installed, 1.25 GPM)	10%	as per EB-2008-0384
Programmable Thermostat	43%	as per EB-2008-0384
Reflector Panels	0%	as per EB-2008-0384
COMMERCIAL NEW BUILDING CONSTRUCTION		
Rooftop Unit (2 stage roof top unit)	5%	as per EB-2008-0384
Tankless Water Heater 50 - 150 USG/day, 84% thermal efficiency	2%	as per EB-2008-0384
Infrared Heaters	33%	as per EB-2008-0384
Demand Control Kitchen Ventilation	5%	as per EB-2008-0384
Energy Recovery Ventilators (ERV)	5%	as per EB-2008-0384
Heat Recovery Ventilator (HRV)	5%	as per EB-2008-0384
Pre-Rinse Spray Nozzle (1.24 GPM)	12.4%	as per Union Gas Study
Pre-Rinse Spray Nozzle (0.64 GPM)	0%	
COMMERCIAL EXISTING BUILDINGS		
Faucet Aerator (kitchen and bathroom, installed, 1.5 GPM)	10%	as per EB-2008-0384
Faucet Aerator (kitchen and bathroom, High Efficiency Condensing Furnace	10%	as per EB-2008-0384
Low-Flow Showerhead (Per household, Installed, 1.5 GPM)	17.5	as per EB-2008-0384
Low-Flow Showerhead (Per household, Installed, 2.0 GPM)	10%	as per EB-2008-0384
Pre-Rinse Spray Nozzle (1.24 GPM)	12.4%	as per Union Gas Study
Pre-Rinse Spray Nozzle (1.6 GPM)	12.4%	as per Union Gas Study
Pre-Rinse Spray Nozzle (0.64 GPM)	0%	
Programmable Thermostats	20%	
Rooftop Unit	5%	as per EB-2008-0384
Tankless Water Heater 100 USG/day	2%	as per EB-2008-0384
Heat Recovery Ventilator (HRV)	5%	as per EB-2008-0384
Energy Recovery Ventilators (ERV)	5%	as per EB-2008-0384
Infrared Heaters	33%	as per EB-2008-0384
Demand Control Kitchen Ventilation	5%	as per EB-2008-0384
Air Curtains	5%	as per EB-2008-0384
CEE Qualified Energy Efficient Washers	10%	as per EB-2008-0384
Prescriptive School Boilers	12%	as per EB-2008-0384
High Efficiency Boilers (DHW) Small Commercial, Large Commercial and Multi-residential	10/12/20%	as per free ridership values approved for Small Commercial, Large Commercial and Multi-residential programs in EB-2008-0384
High Efficiency Boilers (Space) Small Commercial, Large Commercial and Multi-residential	10/12/20%	as per free ridership values approved for Small Commercial, Large Commercial and Multi-residential programs in EB-2008-0384
COMMERCIAL/INDUSTRIAL CUSTOM PROJECTS		
Custom Projects		
Agriculture	40%	as per EB-2008-0384
Industrial	50%	as per EB-2008-0384
Commercial	12%	as per EB-2008-0384
Multi-Residential	20%	as per EB-2008-0384
New construction	26%	as per EB-2008-0384
OTHER MEASURES		
CFL (13W)	24%	as per EB-2008-0384
CFL (23W)	24%	as per EB-2008-0384

Witnesses: M. Brophy  
P. Squires

## Custom Resource Acquisition Technologies

### 1. Measure Life Assumptions

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

Source: EB-2006-0021.

<sup>1</sup>Source: ASHRAE

<sup>2</sup>Source: ASHRAE updated in EB-2006-0021

<sup>3</sup>Source: Measure Life of Steam Traps Research Study, Enbridge Gas Distribution, November, 2007.

<sup>4</sup>Source: Measure Life For Retro-Commissioning And Continuous Commissioning Projects, Finn Projects,

Witnesses: M. Brophy  
P. Squires

AVOIDED COSTS

1. The Board's Decision in the Generic Proceeding (EB-2006-0021) indicated that:

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.

2. Enbridge will follow the same procedure to update the avoided costs for 2010.

Witnesses: M. Brophy  
T. MacLean  
P. Squires

2010 PILOT PROGRAM PROPOSAL:  
NEW INDUSTRIAL SECTOR SUPPORT PROGRAMS

1. This submission contains a pilot program proposal in the Company's 2010 DSM Plan to include additional resources for two new/expanded initiatives:
  - 1) Industrial Metering Support Program  
Proposed Budget: \$1,000,000
  - 2) On-Site Energy Engineers (5)  
Proposed Budget: \$250,000
2. The budget proposed for these initiatives, a total of \$1,250,000, is incremental to the \$23.8 million DSM budget for 2010 as determined by the formulaic budget escalator detailed in EB-2006-0021. This pilot initiative is considered discrete from the framework formulas outlined in EB-2006-0021; it is not proposed to have any SSM or target impacts. These initiatives are intended to respond to customer barriers in a manner similar to a market transformation program. This initiative is particularly crucial in the current economic climate. A scorecard similar to other market transformation programs has been included to illustrate the kind of outcomes that the initiative is intended to deliver.
3. Letters of support for this initiative are included at Exhibit C, Tab 1, Schedules 2 to 4.

INDUSTRIAL METERING SUPPORT PROGRAM

4. One of the greatest barriers preventing industry from taking the necessary steps to identify energy efficiency opportunities is a lack of detailed understanding of how energy is being used in their facilities.

Witnesses: M. Brophy  
P. Squires

5. Enbridge has long recognized the value of detailed energy consumption information in industry; the Company has promoted its Monitoring and Targeting (“M&T”) program since 2001. The main objective of this program has been to introduce and train industrial customers on energy consumption monitoring processes and software, and to encourage customers to make operational changes to address inefficient aspects of their energy use, as identified by the M&T process. While this program has been successful in raising awareness among industrial customers of energy monitoring systems and their value, and in encouraging some customers to take action, the key barrier to greater adoption of the M&T principles by industrial customers has been the cost of acquiring sophisticated metering and sub-metering equipment to access their consumption data.
6. For an industrial energy manager, it can be a hard sell to convince senior management to invest in potentially expensive metering equipment without any guarantee of the potential energy savings.
7. The Company is in an ideal position to assist the market in addressing this barrier. Our Energy Solutions Consultants (“ESC’s”) routinely visit Industrial customers, advising them on the benefits of sub-metering their energy-using equipment, and directing them to Monitoring and Targeting workshops, training, and third-party experts to help them interpret their findings. With the additional offer of financial support in the ESC’s toolbox, to help offset the cost of metering equipment for the customer, the customer’s business case for proceeding to the metering stage is greatly improved.
8. This type of metering support initiative has been difficult for the Company to promote under the traditional TRC-based DSM framework as it can involve a significant

Witnesses: M. Brophy  
P. Squires

investment in metering costs which may make the initiative TRC negative in the short term. The approach the Company would prefer to take is more of a Market Transformation model, wherein Enbridge helps to offset the cost of sub-metering for industrial customers with the following objectives:

- a) increasing the presence of sub-metering equipment in industrial facilities
- b) enhancing market mechanisms and market capacity to make sub-metering more affordable and accessible to industrial customers
- c) fostering a culture of more sophisticated energy monitoring as a baseline practice and long-term investment for industrial customers

9. The details of the Company's proposal for Industrial Metering Support are presented below.

10. Program Description

This program contains four main components:

A) Supplement traditional Monitoring and Targeting (M&T) efforts

- The proposal is to provide an M&T "starter kit," which covers two-thirds of the cost of metering equipment plus other required M&T data acquisition tools and software, up to a maximum value of \$20,000. One additional meter may also be included at the discretion of the Energy Solutions Consultant.
- This proposal would equate access to approximately 20 customers to the M&T program in 2010.

B) Meter Calibration Incentives

- These incentives will help offset the cost of calibration of existing meters on-site at an industrial customer's premise. The Company will pay two-

Witnesses: M. Brophy  
P. Squires

thirds of the cost of meter calibration for qualified customers, up to \$1000 per meter.

- Customers may have existing meters that have been abandoned and are not being used. Leveraging this dormant infrastructure may provide a low-cost method of achieving the same results as with new equipment.
- This program element encourages an awareness and discipline of maintenance of monitoring equipment to ensure data produced are accurate and meaningful.

#### C) Meter Only Incentives

- These incentives would help offset the cost of metering equipment for industrial customers who are not participating in a full M&T initiative when the customers do not have sufficient capital budget to invest in the equipment. The focus of metered data for these customers is more tied to capital efficiencies than operational improvements.
- This proposal would allow for approximately 50 participants to receive a subsidized meter at the discretion of the Enbridge Energy Solutions Consultant.

#### D) One Full-Time Marketing Manager

- This initiative will require additional Marketing support to manage and promote the program elements described above, and to focus on development of market-based resources to raise awareness of sub-metering benefits and accessibility and affordability of metering equipment. Approximate cost for salary and expenses: \$100,000.

Witnesses: M. Brophy  
P. Squires



11. Program Budget

A summary of the proposed budget for this program is as follows:

INDUSTRIAL METERING SUPPORT BUDGET SUMMARY	
Program Component	Budget
1) Augmentation of M&T Incentives Budget	\$500,000
2) Meter Calibration	\$100,000
3) Meter Only Incentives	\$300,000
4) Full Time Marketing Manager (salary/expenses)	\$100,000
Total Program Cost	\$1,000,000

12. Program Evaluation

The Company proposes to evaluate this program using a Market Transformation type scorecard approach (however, no Market Transformation SSM incentive is being proposed for this program). The following scorecard outlines the target metrics for this program. Metric descriptions are provided in the table on the next page.

Witnesses: M. Brophy  
P. Squires

Industrial Metering Support		2010 Metric Value Levels			
Element	Metrics	50%	100%	150%	Weight
ULTIMATE OUTCOMES	a) Operational or Capital improvements made or planned by participating customers	65% of participating customers	80% of participating customers	95% of participating customers	/50
MARKET EFFECTS	b) Expanded market capacity and/or new service offering(s) developed in cooperation with market player(s) (e.g. meter supplier)	N/A	Qualitative	N/A	/20
PROGRAM PERFORMANCE	c) M&T participants	15	20	25	/10
PROGRAM PERFORMANCE	d) Meter Calibration participants	75 meters	100 meters	125 meters	/10
PROGRAM PERFORMANCE	d) Meter Only participants	35	50	65	/10

### 13. Program Metrics

- a) Operational or Capital improvements made or planned by participating customers: The key ultimate outcome from industrial sub-metering is action taken to improve operations or invest in capital upgrades to improve the energy efficiency of the equipment on-site. Participants in this program will be surveyed after metering equipment has been installed to determine how many have taken, or are planning that action.
- b) Expanded Market Capacity and/or New Service Offerings developed in cooperation with market player(s): The Company will endeavor to work with metering equipment suppliers to build capacity, develop products, service

Witnesses: M. Brophy  
P. Squires

offerings, pricing structures, rental/lease programs, etc. to improve accessibility and affordability of energy monitoring equipment for industrial customers.

- c) The Company will target 20 M&T program participants as a result of the additional proposed budget in this Industrial Metering Support program.
- d) The Company will target 100 meter calibration participants resulting from this Industrial Metering Support program.
- e) The Company will target 50 meter only participants resulting from this Industrial Metering Support program.

#### ON-SITE ENERGY ENGINEERS (5)

- 14. At some industrial facilities, there are insufficient resources to hire and train dedicated energy managers to properly review energy consumption patterns, identify inefficiencies, and make sound energy related capital investments and operational improvements. In the current recessionary period, industry is even less likely to hire or maintain non-essential staff. In fact, many staff positions are being eliminated, including key energy efficiency positions. As a result, the potential for identification of energy efficiency opportunities is reduced or eliminated. It will be very difficult to reverse this cycle after it has occurred.
- 15. In some cases, the Company has attempted to help industrial customers offset the cost of an on-site Energy Engineer with positive results. Currently, the Company is funding five on-site Energy Engineers through its existing DSM budget. This proposal is for DSM funding for an additional five on-site Energy Engineers in 2010, for a total of 10, to broaden the opportunity for industrial customers to reap the economic benefits of professional energy management.

Witnesses: M. Brophy  
P. Squires

16. With exposure to the benefits that such a dedicated resource could bring to the table, there is increased probability that these businesses would continue to employ such resources.

17. Program Budget

The Company is proposing a budget of \$250,000 to cover the cost of five on-site Energy Engineers (average cost of \$50,000 each).

Witnesses: M. Brophy  
P. Squires



May 11, 2009

Shannon Bertuzzi  
Enbridge Gas Distribution  
500 Consumers Rd  
Toronto, ON M2J 1P8

Dear Ms. Bertuzzi:

**Re: ENERGY STAR® for New Homes – a case for support**

Please find below a discussion regarding energy savings attributed to homes built to EnerQuality's ENERGY STAR® for New Homes (ESNH) program and a case for ongoing support of this vital program by Ontario's gas utilities.

With over 24,000 homes enrolled in the program and 11,000 built and ENERGY STAR qualified since the program's launch in April 2005, ESNH has emerged as Canada's most successful energy efficient program in new housing, in the process delivering significant aggregate energy savings to Ontario. The success of the program is due to three primary drivers. Number one, EnerQuality's ESNH technical specifications provide builders with a prescriptive, whole-house approach that deliver significant reductions in natural gas and electricity consumption. Number two, the ENERGY STAR branding has allowed builders to effectively communicate the energy efficiency of their product to the homebuyer. Finally, the longstanding engagement of key industry stakeholders, in particular Ontario's gas utilities – Enbridge Gas Distribution and Union Gas – has allowed the program to grow by providing builders with the support they require to succeed.

EnerQuality considers the recommendation that the savings for an ENERGY STAR qualified home be based on the specific measures installed to be impractical from an administrative perspective and counter to the collective experience of the homebuilding industry. New housing requires a fundamentally different intervention than the retrofit of existing homes. Other energy efficient housing programs, such as Natural Resources Canada's R-2000 Standard, recognize that the various parts of a house work together as a system, and that the overall energy efficiency of a house depends on how well the system works. Not only is the whole-house approach superior as a building science practice, but participating builders typically find more success in selling an ENERGY STAR qualified home as a package of energy efficient measures than selling independent energy efficient measures as upgrades. Furthermore, assessing incremental costs by individual components discounts any cost reductions that arise from the combination of trade-offs and cost-cutting measures that often occur in a whole-house approach. This is particularly demonstrated by EnerQuality's Building Canada® initiative with a working objective of capturing efficiencies to drive the incremental cost of ENERGY STAR upgrades to zero. By helping to reduce the builder's cost structure, they can adopt ESNH and continue to compete on price with other builders. Building Canada has been a key element in EnerQuality's overall ESNH strategy.

EnerQuality's ESNH technical specifications are designed to provide builders with options in achieving a consistent energy savings target. A review of the technical specifications may lead to the conclusion of high variability in energy savings based on the number of available measures. This conclusion would be unfounded. By design, all possible combinations of available measures contained in the technical specifications are calibrated to the EnerGuide 80 target. Given the competitive pressures to minimize costs, participating ESNH builders construct their houses to achieve this energy target as closely and effectively as possible, which drastically minimizes the selection of builder option packages for their production lines. Consequently, the variance in energy savings and capital costs of ENERGY STAR qualified homes among participating builders is small in practice.

A report conducted on behalf of the Ontario Power Authority (OPA) reveals that of the range of electrical savings measures available in the technical specifications, builders predominantly choose between the installation of CFLs and electronically commutated motors (ECMs), representing 63% and 22% of the total net annual electrical savings,



respectively. The report not only verified minimal variance in electrical savings measures in ESNH, it estimated a savings of 1,522 kWh/year in electricity and 0.340 kW in summer peak demand savings for an ENERGY STAR qualified home over a standard "code built" home. EnerQuality therefore disagrees with the conclusion that ESNH be excluded from input assumptions regarding energy efficient measures and resource savings based on claims of variability.

Going forward, the active engagement of Enbridge and Union Gas is critical to meeting ESNH's stated target of 25% market penetration by 2012. The builder incentive and the deployment of the utilities' human capital are critical components of the ESNH delivery model. In the face of a major downturn in the housing market, EnerQuality and participating homebuilders rely on the ongoing support of Ontario's gas utilities to grow the program and realize its energy savings potential.

New construction offers a unique opportunity to build the better homes of tomorrow. ESNH has successfully brought energy efficiency to mainstream new housing through deliberate design, prudent management and broad engagement of the industry's key stakeholders. We look forward to building on our partnership and together transforming Ontario's new housing into the most energy efficient and sustainable in the world.

Regards,

A handwritten signature in black ink, appearing to read "Corey McBurney".

Corey McBurney  
PRESIDENT  
EnerQuality Corporation



To: Peter Goldman, Enbridge  
From: Gerry Murray  
Date: May 27, 2009  
Subject: Metering Program and On-Site Energy Engineer

We have been pleased to be part of the on-site Energy Engineer program. It has been instrumental in helping us set up this position. A new and additional staff position is difficult to get approved in the best of times and we have been living through what can easily be called the worst of times in our industry (Pulp and Paper).

We did set this position up utilizing the support offered through Enbridge. The person in this position is a very senior person (was the site manager at one of our facilities), we felt that a senior person with experience and credibility has a greater influence on modifying behavior required to capitalize on energy reduction projects. This also means this is an expensive position, the support of the Enbridge program made this position possible and has allowed us to implement energy reduction projects that normally fall behind other projects more in line with our core business.

In this position our Energy Engineer has been able to influence energy reduction projects at all three of our mill sites. We have had very successful water reduction projects (30-40% water use reduction led to the same reduction in the use of steam); several heat recovery projects and several studies just completed that should lead to future interesting energy reduction opportunities.

We also appreciate the opportunity to provide input into your proposed Metering Program for 2010. This program removes barriers needed to promote energy efficiency and we fully support this initiative.

In short the Enbridge programs help us a great deal and we hope to continue if possible and we are happy to be a reference to other businesses interested in becoming part of such a program.

C. G. Murray  
Director of Mills  
Atlantic Packaging Products Limited



Natural Resources Canada  
Ressources naturelles Canada

Ottawa, Canada  
K1A 0E4

May 28, 2009

Re: Funding for a Market Transformation Program

To whom it may concern:

We are pleased to provide this letter of support for the proposed Market Transformation program that Enbridge Gas Distribution is proposing to support detailed Energy Metering and to deploy more Energy Managers on-site at its customers' plants.

These types of initiatives are vital to successfully influence and assist industry to adopt pragmatic energy reduction practices and ensure the competitiveness of industry for the benefit of all Canadians.

Natural Resources Canada's Office of Energy Efficiency (OEE) has, for a number of years, enjoyed a cooperative and productive relationship with Enbridge Gas Distribution.

In the past we have collaborated with Enbridge on jointly supporting energy audits for customers to identify opportunities to reduce energy consumption, save operating costs and improve their competitiveness.

We also appreciate their active participation in the Canadian Industry Program for Energy Conservation (CIPEC), our flagship program promoting energy efficiency and energy conservation within Canadian industry.

More recently we have, with Enbridge Gas Distribution, co-sponsored workshops to provide training and tools to assist industrial energy users to optimize their energy use.

Sincerely,

**Michael Burke**

Director, Industrial Programs Division  
Office of Energy Efficiency  
Natural Resources Canada  
580 Booth Street, Ottawa, Ont. K1A 0E4  
Tel: (613) 996-6872 / Fax: (613) 992-3161  
mburke@nrcan.gc.ca  
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**[www.cme-mec.ca](http://www.cme-mec.ca)**

May 29, 2009

Re: Enbridge's Proposed Industrial Sector Support Programs

To Whom it May Concern:

This letter is intended to demonstrate our support for Enbridge's proposed pilot "Industrial Sector Support Programs" as part of their 2010 DSM Plan filing with the Ontario Energy Board.

Our members are highly conscious of the economic and environmental benefits of energy efficiency, but often lack the resources to invest in the tools and analysis needed to fully understand their energy use patterns. The various components of Enbridge's proposed "Metering Support Program" will enable more industrial customers to access the metering equipment needed to make informed operational and investment decisions that will ultimately save them money and reduce emissions, thereby making them more competitive and better positioned for growth.

Enbridge is a credible source for energy efficiency information and support in the industrial market. Through this proposal, Enbridge is offering to share its expertise in this area in a very specific, relevant way with our membership, and we encourage the Ontario Energy Board to approve the proposal and associated budgetary requirements.

Sincerely,

Ian Howcroft  
Vice President  
CME Ontario