

2016 Demand Side Management Annual Report

17 November 2018



Preface

In preparation of Enbridge's Application for 2016 Demand Side Management Clearance of Deferral and Variance Accounts, EB-2018-0301, this final 2016 Demand Side Management Annual Report has been updated from its original draft following the release of the Evaluation Contractor's (DNV-GL) final 2016 Natural Gas Demand Side Management Annual Verification Report, dated October 30th, 2018.

In accordance with details provided in Enbridge's 2016 Clearance Application, this 2016 DSM Annual Report reflects 2016 verified program results as presented in the Evaluation Contractor's aforementioned Annual Verification Report.



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Executive Summary

Enbridge Gas Distribution summarized its 2016 DSM Plan in the 2015-2020 Multi-Year DSM Plan (EB-2015-0049), filed on April 1st, 2015. The Company's 2016 DSM Plan was outlined consistent with the provisions set out by the Ontario Energy Board in the Report of the Board: Demand Side Management Framework for Natural Gas Distributors (2015-2020), published December 22nd, 2014 (EB-2014-0134).

In its Decision and Order, published January 20th, 2016, and the update to the Decision and Order, published February 24th, 2016, the Board responded to the details outlined in the Company's Plan and determined that Enbridge reasonably interpreted the DSM Framework. The Decision summarized the Board approved 2016 programs, budgets, metrics and targets for all scorecards. The 2016 Annual Report provides an overview on the Company's results.

The Company is pleased to report that in the 2016 DSM program year, the portfolio generated total audited gas savings of 837.1 million net lifetime (cumulative) cubic meters. These savings are a direct result of the Company's ongoing efforts delivering the Resource Acquisition and Low Income programs. Natural gas savings attributable to Market Transformation and Energy Management program delivery are not captured in these totals, since results for this program are not measured on the basis of cubic meters (m^3) or lifetime (cumulative) cubic meters saved.

As outlined in the Filing Guidelines to the Demand Side Management Framework for Natural Gas Distributors (2015-2020), submitted by the Board on December 22nd, 2014 (EB-2014-0134), the Board calls for application of a Total Resource Cost (the TRC-Plus) test as well as the introduction of the Program Administrator Cost (PAC) test to screen for cost-effectiveness of programs. In 2016, the portfolio demonstrated cost-effective program delivery based on positive results from both the TRC-Plus and PAC screening tests. The TRC-Plus ratio for the Resource Acquisition program was 2.7, while the TRC-Plus ratio for the Low Income program was 2.0 – both well above cost-



effectiveness screening thresholds. The 2016 portfolio had an overall TRC-Plus ratio of 2.6 and an overall PAC ratio of 2.7. The TRC-Plus ratio and the PAC ratio for the Resource Acquisition program were 2.7 and 2.9 respectively, while both the TRC-Plus ratio and the PAC ratio for the Low Income program were 2.0.

Table ES.0 2016 DSM Portfolio Results

Program	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Budget	2016 Spending	TRC-Plus Ratio	PAC Ratio
Resource Acquisition						
Home Energy Conservation	14,988,260	229,695,730	\$12,148,317	\$22,057,458	2.0	1.7
Adaptative Thermostats	3,024,528	45,367,920	\$876,371	\$1,666,753	2.7	4.5
C&I Prescriptive	3,174,750	51,377,592	\$7,020,664	\$1,001,671	3.2	7.9
C&I Direct Install	5,277,573	79,163,595	\$2,196,952	\$2,390,902	10.8	5.2
C&I Custom	18,327,992	315,357,341	\$4,955,421	\$6,746,119	4.0	6.9
Small New Construction	-	-	\$396,933	\$0	-	-
Energy Leaders	67,119	671,186	\$400,000	\$73,775	1.5	1.4
Run It Right (RA)	387,468	1,937,342	\$1,260,162	\$300,962	0.7	0.7
Comprehensive Energy Mgmt (RA)	-	-	\$48,805	\$0	-	-
Overheads	-	-	\$5,033,048	\$4,630,077	-	-
Total RA	45,247,691	723,570,707	\$34,336,673	\$38,867,717	2.7	2.9
Low Income						
Single Family (Part 9)	1,155,256	28,814,754	\$5,806,064	\$4,543,350	1.1	0.9
Multi-Residential (Part 3)	4,120,642	84,728,581	\$3,279,028	\$2,326,325	3.4	5.5
New Construction	-	-	\$1,116,696	\$258,877	-	-
Overheads	-	-	\$1,743,622	\$1,604,019	-	-
Total LI	5,275,898	113,543,335	\$11,945,410	\$8,732,572	2.0	2.0
Market Transformation						
Residential Savings by Design	-	-	\$3,250,842	\$3,469,121	-	-
Commercial Savings by Design	-	-	\$1,345,890	\$1,398,940	-	-
School Energy Competition	-	-	\$302,197	\$289,555	-	-
Run It Right (MT)	-	-	\$250,824	\$225,819	-	-
Comprehensive Energy Mgmt (MT)	-	-	\$464,930	\$106,806	-	-
Overheads	-	-	\$964,351	\$887,140	-	-
Total MT	0	0	\$6,579,034	\$6,377,381	-	-
Portfolio Overheads	-	-	\$3,500,000	\$1,670,616	-	-
Grand Total	50,523,589	837,114,042	\$56,361,117	\$55,648,285	2.6	2.7

* Not all values may compute exactly due to rounding

In 2016, the Resource Acquisition program contributed a total of 723.6 million net cumulative cubic meters (CCM) in natural gas savings; the Low Income program delivered 113.5 million net CCM natural gas savings, and Market Transformation and



Energy Management offers continued to demonstrate substantial results. The cumulative net gas savings of the individual offers are outlined above in Table ES.0.

DSM results for 2016 were achieved with total spending of \$55,648,285. In comparison, the OEB approved budget for 2016 as per the Board's Decision was \$56,361,117.

Table ES.1 2016 DSM Results Summary

2016 DSM Results Summary	
Net CCM Savings	837,114,042 m³
DSMIDA amount recoverable from Ratepayers	\$6,365,751
LRAMVA amount payable to Ratepayers*	-\$95,625
DSMVA amount payable to Ratepayers*	-\$712,832

* The LRAMVA and DSMVA are negative indicating that these amounts are payable to ratepayers.

The maximum DSM shareholder incentive (DSMI) available for the 2016 program year is \$10,450,000. The determination of the Company's incentive is based on 2016 DSM performance in relation to the weighted scoring approach. The resulting DSM Shareholder Incentive earned by the Company for 2016 is \$6,365,751, as outlined in Table ES.1. The DSM Incentive Deferral Account (DSMIDA) is utilized to record the shareholder incentive amount earned by Enbridge as a result of its DSM program results.

The Lost Revenue Adjustment Mechanism Variance Account (LRAMVA) is utilized to true-up the lost distribution revenues associated with DSM activity relative to what was included in the forecast for rate-setting purposes. The Lost Revenue Adjustment Mechanism calculation based on 2016 results is \$14,656. As such the Lost Revenue Adjustment Mechanism Variance Account amount relative to the forecasted impact included in distribution rates for 2016 is \$95,625 to be refunded to ratepayers.



The DSM Variance Account (DSMVA) is utilized to track the difference between DSM spending in 2016 and the amount already built into rates which equals the 2016 OEB approved DSM budget. This amount totalled \$712,832.

In the face of evolving and fluctuating government policies and mandates in the Province's energy efficiency landscape, the Company continues to be proud of its accomplishments in DSM and is pleased to demonstrate successful results across the range of 2016 offers.

1. Introduction

The continuing need for DSM efforts in the province of Ontario was outlined by the Ontario Energy Board (the “Board”) in the Report of the Board: Demand Side Management Framework for Natural Gas Distributors (2015-2020), published December 22nd, 2014 (the “Framework”).

To guide the utilities’ DSM portfolios, the Framework established a number of goals including, assisting consumers in managing their energy bills, promoting energy efficiency and creating a culture of conservation. The Framework also provides direction for DSM programs and outlines the proposed weighted scorecard approach to measuring DSM performance.

Enbridge Gas Distribution (“Enbridge”, the “Company”) has demonstrated significant achievement in results since Demand Side Management was introduced to its customers in the mid-1990s. Between 1995 and 2016, Enbridge’s energy efficiency programs reduced customer consumption by 11.1 billion cubic meters of natural gas. These gas savings have resulted in a reduction of 20.8 million tonnes of greenhouse gas emissions¹, roughly equal to removing 4 million cars from the road for one year.²

Enbridge’s 2016 DSM portfolio included programs directed towards Resource Acquisition, Low Income, and Market Transformation and Energy Management as follows:

Resource Acquisition Program

- Home Energy Conservation Offer
- Residential Adaptive Thermostat Offer
- Custom Commercial Offer
- Custom Industrial Offer

¹ Assumes 1.875kg of CO_{2e} is emitted for each m³ gas that is consumed.

² Assumes the average automobile produces 5.1 tonnes of CO₂ per year.



- Run it Right Offer
- Commercial and Industrial Prescriptive Offer
- Commercial and Industrial Direct Install Offer
- Energy Leaders Initiative

Low Income Program

- Home Winterproofing Offer
- Low Income Multi-Residential Offer
- Low Income New Construction Offer

Market Transformation and Energy Management Program

- Savings by Design – Residential Offer
- Savings by Design – Commercial Offer
- School Energy Competition
- Run it Right Offer
- Comprehensive Energy Management Offer

The 2016 Annual Report (the “Report”) on Enbridge’s Demand Side Management programs provides a summary of the results achieved over the program year as demonstrated by each program’s scorecard performance. The Report provides a comparison of actual and target results for each program and also provides an opportunity for Enbridge to highlight successes as well as lessons learned. In addition the Report offers information in support of the Company’s 2016 Demand Side Management Incentive Deferral Account (DSMIDA), Demand Side Management Variance Account (DSMVA), and the Lost Revenue Adjustment Mechanism Variance Account (LRAMVA) claims.

As requested in the Framework, Enbridge and Union Gas consulted to align on the general format of each utility’s Annual Report. The report will be reviewed by the OEB’s third party Evaluation Contractor, DNV GL, to facilitate the 2016 program evaluation.



As outlined in the Framework, beginning in 2015 the governance structure changed significantly such that the Board is now responsible for the oversight responsibility of the annual audit and evaluation of the utilities' DSM results, including selecting the Evaluation Contractor. Board Staff now plays the primary role in coordinating this process and contracted DNV-GL as the Evaluation Contractor for 2016. The final 2016 Natural Gas Demand Side Management Annual Verification Report, was issued by DNV-GL on October 30th, 2018.

Enbridge remains committed to the objective of continually improving its DSM practices, program design and delivery. A significant component of this effort includes the consideration of recommendations and expertise provided by stakeholders through the annual audit and evaluation process. In past years for example, learnings which could evolve program design, enhance delivery or improve savings calculation methodologies have been incorporated in the Company's DSM offerings. The delayed 2016 process however has limited the Company's ability to consider recommendations or incorporate learnings in a timely fashion to support continuous improvements.

Despite evolving government policies and mandates that are presenting new challenges to operating in the energy efficiency landscape, as well as the continuing low cost of natural gas relative to increasing electricity prices, Enbridge is pleased to continue to offer DSM programming through the Board approved 2015-2020 Multi-Year DSM Plan to help its customers reduce their energy bills, and at the same time provide support for the Province's greenhouse gas reductions emissions targets.

2. Demand Side Management

2.1 2016 DSM Plan

On March 31st, 2014 the Minister of Energy issued a Directive to the Board calling for the development of a new DSM policy framework. This new framework was to span a period of six years beginning January 1st, 2015 and, among other things, enable the achievement of all cost-effective DSM.

On September 15th, 2014 the Board issued a Draft Report of the Board outlining its proposed 2015-2020 DSM Framework for Natural Gas Distributors (EB-2014-0134) and called upon all interested parties to provide comment. On October 15th, 2014 Enbridge, Union Gas, and a wide variety of stakeholders provided comment on the Board's proposed 2015-2020 DSM Framework.

On December 22nd, 2014 the Board released its Framework and the accompanying Guidelines.

On April 1, 2015, Enbridge filed the Multi-Year Demand Side Management Plan (2015-2020) (EB-2015-0049) in accordance with the 2015-2020 Framework. In the Decision and Order, published January 20th, 2016, and the update to the Decision and Order, published February 24th, 2016, the Board responded to the details outlined in the Multi-Year Demand Side Management Plan (the "Plan"), and on January 20th, 2016 and February 24th, 2016 provided a Decision and a Revised Decision respectively to support the Plan which included Enbridge's 2016 approved programs and budgets.

Enbridge's 2016 to 2020 DSM portfolio includes offers that have existed in the past as well as others that are new in this Plan. These new or enhanced offers have been developed based on industry input, stakeholder input, Enbridge's experience, and research from best practices in other jurisdictions. They are responsive to market fundamentals, including opportunities and challenges, and perhaps most importantly,

they are directly responsive to the Board's EB-2014-0134 Framework guiding principles and key priorities.

The provisions set forth in the Plan were intended to be flexible within reason, allowing the Company to introduce, change, or discontinue activities or initiatives as is necessary to respond to market conditions and the needs of its customers, within the constraints of the DSM budgets and scorecards approved by the Board and the terms of the Framework and the Board's EB-2014-0134 Filing Guidelines.

2.2 Program and Portfolio Design

The Company's DSM activities continue to drive change in the market through focused efforts to deliver natural gas savings and related benefits to customers. Enbridge's 2016 DSM Plan includes three distinct programs; Resource Acquisition, Low Income, and Market Transformation and Energy Management. Within each of these programs, Enbridge makes a variety of energy efficiency offers available in support of its customers and the province's greenhouse gas (GHG) emission reduction efforts.

The Resource Acquisition program and its offers focus on achieving direct, volumetric natural gas savings customer by customer that commonly involve the installation of energy efficient equipment or the implementation of operational improvements. These improvements are often supported by technical assistance and financial incentives among other approaches.

The activities undertaken and offers made available in the Low Income program are largely similar to offers included within Resource Acquisition and Market Transformation and Energy Management. However, delivering energy efficiency to the low income market presents a unique set of challenges and requires a tailored approach. While the Low Income program will often yield lower net Total Resource Cost (TRC) benefits relative to Resource Acquisition, delivery of energy efficiency to these consumers yields various benefits which are difficult to quantify, justifying a Board-approved threshold for cost-effectiveness which is lower than that of Resource Acquisition.

Lastly, Enbridge's Market Transformation and Energy Management program focuses on facilitating fundamental changes in the market, such as increased market shares of energy efficient products and services, or the influencing of consumer behavior and attitudes to reduce the consumption of natural gas. Enbridge's Market Transformation and Energy Management offers have a long-term and holistic view of the use of energy in Ontario and seek to operate where competitive forces are not expected to yield the results sought within an acceptable timeframe.

2.3 Cost-Effectiveness Screening

The utility is expected to assess its DSM portfolio through a method of calculating and screening the cost-effectiveness of its programs as a means of assessing economic value of the DSM portfolio. As outlined in the Framework, beginning in 2015, the Board adopted "an enhanced TRC test, or the "TRC-Plus" test, which the gas utilities should use to screen all potential DSM programs when developing their multi-year DSM plans." The utilities were instructed to apply a 15% non-energy benefit adder to the benefit side of the TRC test calculation. Furthermore, the Board directed the utilities to also "incorporate the PAC test as a secondary cost-effectiveness reference tool to help better inform which programs should be proposed."

"The TRC-Plus test measures the benefits and costs of DSM programs for as long as those benefits and costs persist and applies a 15% non-energy benefit adder." The 15% non-energy benefit adder accounts for other benefits not related to the reduction in natural gas such as environmental, economic and social benefits.

In the case of the Resource Acquisition program, if the TRC-Plus ratio (which compares the present value of the natural gas, electricity and water savings and 15% non-energy benefits adder to the present value of the costs) exceeds 1.0, the program is considered cost-effective.



In recognition that the Low Income program may include additional benefits that are not reflected in the TRC-Plus test, the Low Income program is screened using a TRC-Plus threshold of 0.7.

As highlighted in the Guidelines, some programs, such as Market Transformation are not typically amenable to a screening approach (such as TRC-Plus) and instead are reviewed and assessed on their own merits based on the objectives of the program.

The Company has also applied the Program Administrator Cost (PAC) test as a secondary reference tool in assessing the programs' cost-effectiveness. As outlined in the Guidelines, "the costs included in the PAC test calculation include all expenditures by the utility to administer DSM programs (i.e., costs to design, plan, administer, deliver, monitor and evaluate)."

The Annual Report provides an opportunity to report both TRC-Plus and PAC assessments for the 2016 DSM program results. Cost-effectiveness screening for 2016 is summarized in Section 4.3.

2.4 Program Evaluation

As outlined in the Framework, beginning in 2015, the Board introduced that it would be taking on the coordination function of the Evaluation, Measurement & Verification (EM&V) process. Additional clarity regarding a new governance structure for the 2015-2020 DSM evaluation process of program results was provided on August 21st, 2015, in the memo from the Board to the utilities and to participants in the EB-2014-0134 consultation (EB-2015-0245). The focus of the memo was the establishment of the OEB's process to evaluate the results of Natural Gas Demand Side Management programs from 2015 to 2020. This document included the following evaluation responsibilities:

- The OEB would be responsible for coordinating and overseeing the evaluation and audit process, including selecting a third party Evaluation Contractor.



- The Evaluation Contractor (EC) would carry out the evaluation and audit processes and would draft an EM&V Plan for the natural gas utilities' DSM programs.
- An Evaluation Advisory Committee (EAC), which includes representation from each of the utilities, would be formed to provide input and advice to the OEB on the development of the plan and on the evaluation and audit of DSM results.

2.5 2016 Annual Audit and Evaluation of DSM Results

Enbridge's 2016 DSM results, as summarized in the DSM Annual Report are subject to an independent external audit. As referenced in section 2.4, the Board's August 21st, 2014 memo (EB-2015-0245) specified that the OEB would be responsible for coordinating and overseeing the evaluation and audit process, including selecting a third party EC and publishing the final evaluation results on an annual basis. The memo specified that the EC will carry out the annual evaluation and audit processes of all DSM programs and provide an opinion on whether the claimed DSM Incentive (DSMI) amount, LRAMVA, and DSMVA have been correctly calculated using reasonable assumptions. The EAC which includes utility representation as described in Section 2.6 below will provide input and play an advisory role throughout the evaluation and audit effort to facilitate the achievement of the audit objectives. Board Staff communicated it had issued an RFP on February 8th, 2016, for the procurement and selection of the EC. Subsequently, Board staff announced it had selected DNV GL as the EC and a "kick-off" EAC meeting introducing DNV GL convened on May 12th, 2016. Board Staff communicated that the expectation was that DNV GL would be the EC for the both the 2015 and 2016 program years.

2.6 Evaluation Advisory Committee

As detailed in the August 21st, 2015 memo from the Board (EB-2015-0245), the EAC provides input and advice as required throughout the DSM evaluation process. The EAC is comprised of:

- Experts representing non-utility stakeholders, with demonstrated experience and expertise in the evaluation of DSM technologies and programs, natural gas energy efficiency technologies, multi-year impact assessments, net-to-gross studies, free ridership analysis and natural gas energy efficiency persistence analysis;
- Expert(s) retained by the OEB;
- Representatives from the Independent Electricity System Operator (IESO);
- Representatives from each natural gas utility; and
- Representatives from the Ministry of Energy (MOE) and the Environmental Commissioner of Ontario (ECO), who will participate as observers.

The OEB appointed the following non-utility stakeholders as members of the EAC:

- Chris Neme, Energy Futures Group
- Jay Shepherd, Jay Shepherd Professional Corporation
- Marion Fraser, Fraser & Company

On May 5, 2016, two additional independent experts were added to the EAC:

- Ted Kesik, Knowledge Mapping Inc.
- Robert Wirtshafter, Wirtshafter Associates Inc.

Non-utility stakeholders are expected to provide input and advice based on their experience and technical expertise and not to advocate positions of parties they have represented before the OEB in various proceedings.



3. OEB Data Reporting Requirements

The following tables summarize the annual reporting key elements outlined in Section 14.2 of the Guidelines.

Table 3.0 Annual and Long-Term DSM Budgets
(\$/year and \$/6 years)

OEB Approved Annual and Long-Term Budgets							
	2015	2016	2017	2018	2019	2020	2015-2020 Total
Resource Acquisition (RA)							
Residential	\$1,872,720	\$13,024,688	\$16,705,000	\$20,175,000	\$20,578,500	\$20,990,070	\$93,345,978
Commercial / Industrial	\$12,571,070	\$16,278,937	\$17,679,381	\$17,737,977	\$16,355,713	\$16,685,480	\$97,308,558
RA Program Costs	\$14,443,790	\$29,303,625	\$34,384,381	\$37,912,977	\$36,934,213	\$37,675,550	\$190,654,536
RA Overheads	\$4,731,485	\$5,033,048	\$5,104,327	\$5,249,479	\$5,122,057	\$5,232,967	\$30,473,363
Total RA	\$19,175,275	\$34,336,673	\$39,488,708	\$43,162,456	\$42,056,270	\$42,908,517	\$221,127,899
Low Income (LI)							
LI Program Costs	\$6,864,090	\$10,201,788	\$10,908,121	\$11,690,496	\$11,923,306	\$12,160,772	\$63,748,573
LI Overheads	\$517,988	\$1,743,622	\$1,619,299	\$1,618,681	\$1,653,531	\$1,689,078	\$8,842,199
Total LI	\$7,382,078	\$11,945,410	\$12,527,420	\$13,309,177	\$13,576,837	\$13,849,850	\$72,590,772
Martket Transformation (MT)							
MT Program Costs	\$4,890,900	\$5,614,683	\$5,849,381	\$6,045,400	\$6,174,079	\$6,305,335	\$34,879,778
MT Overheads	\$1,353,687	\$964,351	\$868,335	\$837,054	\$856,225	\$875,783	\$5,755,435
Total MT	\$6,244,587	\$6,579,034	\$6,717,716	\$6,882,454	\$7,030,304	\$7,181,118	\$40,635,213
Total Program Costs (without overheads)	\$26,198,780	\$45,120,096	\$51,141,883	\$55,648,873	\$55,031,598	\$56,141,657	\$289,282,887
Total Program Overheads	\$6,603,160	\$7,741,021	\$7,591,961	\$7,705,214	\$7,631,813	\$7,797,828	\$45,070,997
Total Program Costs (with overheads)	\$32,801,940	\$52,861,117	\$58,733,844	\$63,354,087	\$62,663,411	\$63,939,485	\$334,353,884
Portfolio Overheads							
EM&V	n/a	\$1,500,000	\$1,700,000	\$1,700,000	\$1,736,746	\$1,774,228	\$8,410,974
Collaboration & Innovation ^{1 2}	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,021,616	\$1,043,663	\$6,065,279
DSMIT ³	n/a	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$5,000,000
Energy Literacy	n/a	\$0	\$500,000	\$500,000	\$0	\$0	\$1,000,000
Total Portfolio Overheads ^{1 2 3}	n/a	\$3,500,000	\$4,200,000	\$4,200,000	\$3,758,362	\$3,817,891	\$19,476,253
2015 Incremental Budget ^{1 2}	\$4,920,291	n/a	n/a	n/a	n/a	n/a	n/a
Total Portfolio Budget	\$37,722,231	\$56,361,117	\$62,933,844	\$67,554,087	\$66,421,773	\$67,757,376	\$358,750,428

1. In 2015, the Collaboration & Innovation amount of \$1M was included in the incremental budget of \$4.92M.

2. Total Collaboration & Innovation budget as approved by the Board is \$6M for 2015-2020.

3. Total DSMIT budget as approved by the Board is \$5M for 2015-2020 with \$1M accrued per year between 2016-2020.



Table 3.1 Actual Annual Total DSM Costs
(including DSM spending³, overheads, evaluation, shareholder incentive, lost revenues)
for each rate class dating back to 2007

Annual Actual Total DSM Costs										
RATE CLASS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
RATE 1	\$11,894,135	\$12,545,981	\$14,794,795	\$12,467,796	\$14,214,627	\$17,935,484	\$13,881,901	\$23,507,037	\$26,855,974	\$42,390,914
RATE 6	\$2,848,384	\$7,519,262	\$7,486,577	\$10,713,308	\$15,103,141	\$17,127,050	\$15,172,590	\$13,901,251	\$15,646,361	\$17,001,090
RATE 9	\$0	\$0	\$0	\$0	\$0	\$1,425	\$1,420	\$1,712	\$1,839	\$2,030
RATE 100	\$8,949,764	\$3,201,527	\$2,667,170	\$86,297	\$17,677	\$0	\$0	\$0	\$0	\$0
RATE 110	\$3,658,449	\$1,041,758	\$1,943,819	\$1,470,858	\$1,048,222	\$783,904	\$937,258	\$1,189,687	\$1,899,864	\$1,250,531
RATE 115	\$643,144	\$1,716,735	\$1,314,146	\$545,382	\$602,386	\$1,329,072	\$1,420,390	\$567,271	\$657,559	\$532,093
RATE 125	\$0	\$0	\$0	\$0	\$0	\$53,449	\$53,268	\$64,223	\$68,967	\$76,131
RATE 135	\$1,762	\$79,757	\$11,685	\$59,163	\$121,756	\$441,318	\$320,401	\$123,739	\$58,863	\$85,564
RATE 145	\$855,487	\$901,590	\$676,730	\$729,534	\$655,237	\$495,925	\$369,074	\$253,864	\$152,227	\$84,478
RATE 170	\$294,508	\$1,860,562	\$1,843,628	\$2,040,735	\$2,195,089	\$536,445	\$149,399	\$457,841	\$403,107	\$574,392
RATE 200	\$0	\$0	\$0	\$0	\$0	\$18,529	\$18,466	\$22,264	\$23,909	\$26,392
RATE 300	\$0	\$0	\$0	\$0	\$0	\$3,563	\$3,551	\$4,281	\$4,598	\$5,075
TOTAL	\$29,145,632	\$28,867,172	\$30,738,550	\$28,113,075	\$33,958,134	\$38,726,165	\$32,327,718	\$40,093,170	\$45,773,267	\$62,028,692

Table 3.2 Historic Actual Annual DSM Spending

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total DSM Spending (\$ millions) ¹	\$21.20	\$23.03	\$25.42	\$24.00	\$27.24	\$30.61	\$27.84	\$32.51	\$35.78	\$55.65

1. Total DSM Spending includes variable costs, fixed costs and DSMVA where applicable

Table 3.3 DSM Spending as a Percent (%) of Distribution Revenue

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total DSM Spending (millions \$) ¹	\$21.2	\$23.0	\$25.4	\$24.0	\$27.2	\$30.6	\$27.8	\$32.5	\$35.8	\$55.6
Total Distribution Revenue (millions \$) ^{2 3 4 5}	\$980.9	\$995.9	\$1,012.1	\$960.4	\$978.8	\$972.0	\$1,055.0	\$1,044.0	\$1,055.4	\$1,122.0
DSM Spending as % of Distribution Revenue	2.2%	2.3%	2.5%	2.5%	2.8%	3.1%	2.6%	3.1%	3.4%	5.0%

1. Total DSM Spending includes variable costs, fixed costs and DSMVA where applicable

2. Distribution Revenue is equal to the gas distribution margin, and is the gas sales and distribution revenue less the cost of gas

3. Distribution Revenue includes gas sales and transportation of gas less gas commodity cost

4. Distribution Revenue excludes transmission, compression, and storage

5. Distribution Revenue is based on data unnormalized for weather

³ As the request is for actual costs, Enbridge interprets this to be 'DSM spending' rather than 'DSM budget' as written in Section 14.2 of the Guidelines.

Table 3.4 Historic Shareholder Incentive Amounts Available and Earned

	2007	2008	2009	2010	2011	2012 ¹	2013	2014	2015	2016 ²
	\$ millions									
Total Shareholder Incentive Earned	\$8.25	\$5.80	\$5.36	\$4.16	\$6.77	\$8.16	\$4.54	\$7.65	\$10.08	\$6.37
Maximum Shareholder Incentive Available	\$9.00	\$9.22	\$9.24	\$9.40	\$10.16	\$10.45	\$10.66	\$10.87	\$11.09	\$10.45

1. 2012 Shareholder Incentive includes reduction of -\$657,223 per Board's decision (EB-2013-0352)

2. 2016 Shareholder Incentive subject to Board approval

Table 3.5 Shareholder Incentive Earned as a Percent (%) of DSM Spending⁴

	2007	2008	2009	2010	2011	2012 ²	2013	2014	2015	2016 ³
Total Shareholder Incentive (\$ million)	\$8.25	\$5.80	\$5.36	\$4.16	\$6.77	\$8.16	\$4.54	\$7.65	\$10.08	\$6.37
Total DSM Spending ¹	\$21.20	\$23.03	\$25.42	\$24.00	\$27.24	\$30.61	\$27.84	\$32.51	\$35.78	\$55.65
Shareholder Incentive Earned as a % of DSM Spending	39%	25%	21%	17%	25%	27%	16%	24%	28%	11%

1. Total DSM Spending includes variable costs, fixed costs and DSMVA where applicable

2. 2012 Shareholder Incentive includes reduction of -\$657,223 per Board's decision (EB-2013-0352)

3. 2016 Shareholder Incentive subject to Board approval

Table 3.6 Annual and Long-Term Natural Gas Savings Targets

Annual Natural Gas Savings Targets						
Scorecard	2015	2016	2017 ¹	2018	2019	2020
Resource Acquisition	1,011.9	631.1	806.5	<i>Targets are formulaic based on past year's performance</i>		
Low-Income	92.8	96.7	167.1			
Total	1,104.7	727.8	973.6			

1. 2017 targets are calculated based on 2016 audited results multiplied by the 2017 budget multiplied by the productivity improvement of 2% in accordance with the Board's direction for a target adjustment mechanism beginning in 2017.

⁴ Enbridge interprets this request as requesting values as a percentage of 'DSM spending' rather than 'DSM budget' as written in Section 14.2 of the Guidelines.



**Table 3.7 2016 Total Annual & Cumulative Natural Gas Savings
(Gross and Net)**

	2016 Annual Gas Savings		2016 Cumulative Gas Savings	
	Gross	Net	Gross	Net
Resource Acquisition	84,749,901	45,247,691	1,365,482,647	723,570,707
Low-Income	5,282,139	5,275,898	113,605,747	113,543,335
Total	90,032,041	50,523,589	1,479,088,394	837,114,042

**Table 3.8 Total Historic Annual Natural Gas Savings
(Gross and Net)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ¹
Total Net Gas Savings (millions m3)	85.07	77.25	69.86	64.58	76.40	60.14	47.74	43.54	48.97	50.52
Total Gross Gas Savings (millions m3)	85.99	121.98	117.62	98.82	114.14	92.53	66.06	60.62	67.09	90.03

1. 2016 DSM results subject to Board approval

**Table 3.9 Total Historic Cumulative Natural Gas Savings
(Gross and Net)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ¹
Total Net CCM (millions m3)	1,214.10	1,118.98	1,039.18	951.40	1,253.82	1,068.98	826.91	719.84	826.17	837.11
Total Gross CCM (millions m3)	1,233.54	1,809.65	1,801.77	1,455.74	1,811.35	1,593.05	1,148.12	993.62	1,114.13	1,479.09

1. 2016 DSM results subject to Board approval



Table 3.10 Total Annual Natural Gas Savings as Percent (%) of Total Annual Natural Gas Sales

(Gross and Net)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ¹
Net Annual Gas Savings (millions m3)	85.1	77.3	69.9	64.6	76.4	60.1	47.7	43.5	49.0	50.5
Net Annual Gas Savings as % of Natural Gas Sales	0.7%	0.7%	0.6%	0.6%	0.7%	0.6%	0.4%	0.4%	0.4%	0.5%
Gross Annual Gas Savings (millions m3)	86.0	122.0	117.6	98.8	114.1	92.5	66.1	60.6	67.1	90.0
Gross Annual Gas Savings as % of Natural Gas Sales	0.7%	1.0%	1.1%	0.9%	1.0%	0.9%	0.6%	0.5%	0.6%	0.8%
Total Natural Gas Sales (millions m3) ²	11,862.9	11,686.5	11,114.9	10,742.3	11,303.2	10,304.4	11,338.3	12,434.3	11,728.3	10,736.2

1. 2016 DSM results subject to Board approval

2. Total Gas Sales include only rate classes that are eligible for DSM and subject to DSM costs

Table 3.11 Total Cumulative Natural Gas Savings as Percent (%) of Total Annual Natural Gas Sales

(Gross and Net)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 ¹
Net Cumulative Gas Savings (millions m3)	1,214.1	1,119.0	1,039.2	951.4	1,253.8	1,069.0	826.9	719.8	826.2	837.1
Net CCM Gas Savings as % of Natural Gas Sales	10.2%	9.6%	9.3%	8.9%	11.1%	10.4%	7.3%	5.8%	7.0%	7.8%
Gross Cumulative Gas Savings (millions m3)	1,233.5	1,809.7	1,801.8	1,455.7	1,811.3	1,593.0	1,148.1	993.6	1,114.1	1,479.1
Gross CCM Gas Savings as % of Natural Gas Sales	10.4%	15.5%	16.2%	13.6%	16.0%	15.5%	10.1%	8.0%	9.5%	13.8%
Total Natural Gas Sales (millions m3) ²	11,862.9	11,686.5	11,114.9	10,742.3	11,303.2	10,304.4	11,338.3	12,434.3	11,728.3	10,736.2

1. 2016 DSM results subject to Board approval

2. Total Gas Sales include only rate classes that are eligible for DSM and subject to DSM costs

Table 3.12 Actual Annual Gas Operating Revenue

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Operating Revenue (millions \$) ¹	\$3,095.0	\$3,233.8	\$2,952.3	\$2,394.1	\$2,393.6	\$2,240.9	\$2,613.4	\$2,861.3	\$2,892.1	\$2,588.7
Less Total Gas Cost (millions \$) ²	\$2,113.0	\$2,236.1	\$1,938.6	\$1,432.3	\$1,413.3	\$1,267.6	\$1,556.8	\$1,815.5	\$1,834.8	\$1,466.7
Total Distribution Revenue (millions \$) ³	\$982.0	\$997.7	\$1,013.7	\$961.8	\$980.3	\$973.3	\$1,056.6	\$1,045.8	\$1,057.3	\$1,122.0

1. Operating Revenue includes gas sales and transportation, transmission, compression, and storage. All values are unnormalized for weather

2. Gas Cost is based on data unnormalized for weather

3. Distribution revenue is equal to the gas distribution margin and is the gas sales plus transportation less the cost of gas



Table 3.13 Total Natural Gas Sales per Rate Class Subject to DSM Costs

Rate Class	2016 Natural Gas Volumes (millions m3)
<u>General Service</u>	
Rate 1	4,506.7
Rate 6	4,488.6
Total General Service	8,995.3
<u>Contract Service</u>	
Rate 100	3.2
Rate 110	827.6
Rate 115	497.6
Rate 135	64.6
Rate 145	45.7
Rate 170	302.2
Total Contract Service	1,740.9
Grand Total	10,736.2

**Natural Gas Sales (Volumes) for rate classes that are subject to DSM only*

Table 3.14 Number of Customers by Customer Type

Customer Type	# of Customers 2016
Residential ¹	1,959,569
Commercial	158,811
Industrial	6,303
Total	2,124,683

1. Residential customers include Low Income, which cannot be differentiated



Table 3.15 Number of Customers Broken Out by Rate Class

Rate Class	# of Customers
	2016
Rate 1	1,959,569
Rate 6	164,692
Rate 9	6
Rate 100	2
Rate 110	269
Rate 115	27
Rate 125	5
Rate 135	45
Rate 145	38
Rate 170	25
Rate 200	1
Rate 300	2
Rate 315	2
Total	2,124,683



4. 2016 DSM Program Results Summary

4.1 2016 DSM Scorecard Summary

The 2016 DSM program scorecard performance is presented in Table 4.0.

Table 4.0 2016 DSM Program Scorecard Summary

	Component	Metric	Weight	Targets			2016 Results
				Lower Band	Target	Upper Band	
Resource Acquisition	Large Volume Customers	Cumulative Savings (million m ³) ¹	40%	249.1	332.2	498.3	328.75
	Small Volume Customers	Cumulative Savings (million m ³)	40%	224.2	298.9	448.4	394.82
	Residential Deep Savings	Participants ²	20%	6,194	8,259	12,389	12,986
Low Income	Single Family (Part 9)	Cumulative Savings (million m ³)	45%	23.8	31.8	47.7	28.81
	Multi-residential (Part 3)	Cumulative Savings (million m ³)	45%	48.7	64.9	97.4	84.73
	New Construction	Participants	10%	5	6	9	6
Market Transformation	Residential Savings by Design	Builders	10%	25	33	50	31
		Homes Built	15%	2,063	2,751	4,127	2,206
	Commercial Savings by Design	New Developments	25%	25	33	50	43
	School Energy Competition	Schools	10%	41	55	83	25
	Run It Right	Participants	20%	62	83	124	84
	Comprehensive Energy Mgmt	Participants	20%	5	7	11	7

1. Large volume consumers include commercial customers with a 3 year average annual consumption of greater than 75,000 m³/year or industrial customers with a 3 year average consumption of greater than 340,000 m³/year.

2. Number of participants with at least 2 qualifying measures (average annual gas savings across all participants is at least 15% of combined baseline space heating and water heating usage as calculated by HOT2000).

The 2016 weighted scorecard is the basis for the calculation of the Demand Side Management Shareholder Incentive. DSMI amounts for the 2016 program year are outlined in Section 9 of this report.

Table 4.1 2016 CCM Savings Results by Sector

Program/Sector	2016 Net CCM Results (m ³)
Resource Acquisition	
<i>Residential</i>	<i>275,063,650</i>
<i>Commercial & Industrial</i>	<i>448,507,056</i>
Resource Acquisition Total	723,570,707
Low Income	113,543,335
Combined Total	837,114,042

As summarized in Table 4.1, in terms of Net Cumulative Cubic Meters (CCM) savings, 2016 results totalled 837,114,042 cumulative m³ for all offers that include CCM as a metric. In 2016, the Commercial and Industrial sector was the largest overall contributor to CCM savings, accounting for 448,507,056 CCM or 54% of the total net CCM results. The Residential sector and the Low Income program were responsible for 33% and 14% of CCM, respectively.

In 2016, Enbridge delivered five offers through the Market Transformation and Energy Management scorecard. Results for the Market Transformation program offers are reviewed in Section 7 of this report.

4.2 Annual and Cumulative (Gross and Net) Results

As outlined in the Guidelines, the utilities “should provide the annual and cumulative resource savings attributable to each program, presented as both net and gross of the adjustment factors”⁵ in the Annual Report.

⁵ EB-2014-0134. Filing Guidelines to the Demand Side Management Framework for Natural Gas Distributors (2015-2020), OEB, December 22, 2014, page 18.



Table 4.2 2016 Annual and Cumulative Natural Gas Savings

	Program/Sector/Offer	Gross Annual Gas Savings (m ³)	Net Annual Gas Savings (m ³)	Gross CCM (m ³)	Net CCM (m ³)
Resource Acquisition	Residential				
	<i>Home Energy Conservation</i>	17,633,248	14,988,260	270,230,271	229,695,730
	<i>Adaptative Thermostats</i>	3,150,550	3,024,528	47,258,250	45,367,920
	Total Residential	20,783,798	18,012,788	317,488,521	275,063,650
	Commercial & Industrial				
	<i>Custom Industrial</i>	31,026,926	10,409,534	489,779,784	164,321,118
	<i>Custom Commercial</i>	22,807,626	7,918,458	409,751,690	151,036,223
	<i>Run It Right</i>	774,008	387,468	3,870,040	1,937,342
	<i>Prescriptive</i>	3,735,085	3,174,750	60,591,326	51,377,592
	<i>Direct Install</i>	5,555,340	5,277,573	83,330,100	79,163,595
Low Income	<i>Energy Leaders</i>	67,119	67,119	671,186	671,186
	Total C & I	63,966,104	27,234,902	1,047,994,126	448,507,056
	Low Income				
	<i>Single Family (Part 9)</i>	1,159,201	1,155,256	28,854,208	28,814,754
	<i>Multi-Residential (Part 3)</i>	4,122,938	4,120,642	84,751,540	84,728,581
	Total Low Income	5,282,139	5,275,898	113,605,747	113,543,335
	Grand Total	90,032,041	50,523,589	1,479,088,394	837,114,042

Table 4.2 details the annual gas savings and cumulative lifetime natural gas savings results (in cubic meters) for each of the offers in the Resource Acquisition and Low Income programs that have CCM as a performance metric. Savings results are summarized for both gross and net savings (net of applicable adjustment factors).



4.3 2016 Program Cost-Effectiveness Screening

Table 4.3 summarizes the TRC-Plus screening calculations for the 2016 Enbridge DSM Portfolio for illustrative purposes. The portfolio as a whole was cost-effective with an overall TRC-Plus ratio of 2.6. Further, the each of the Resource Acquisition and Low Income programs to which this screening applies, were also cost-effective to deliver as individual programs.

Table 4.3 2016 TRC-Plus Screening Summary

	Program/Sector/Offer	NPV TRC Plus Benefits	Total TRC Costs	Net TRC Plus Benefits	TRC Plus Ratio *
RESOURCE ACQUISITION	Residential				
	<i>Home Energy Conservation</i>	47,079,000	24,007,000	23,072,000	2.0
	<i>Adaptive Thermostats</i>	13,388,000	4,947,000	8,441,000	2.7
	Residential Total	60,467,000	28,954,000	31,513,000	2.1
	Commercial & Industrial				
	<i>Custom Industrial</i>	36,698,000	6,335,000	30,363,000	5.8
	<i>Custom Commercial</i>	28,151,000	9,694,000	18,457,000	2.9
	<i>Run It Right</i>	407,000	609,000	-202,000	0.7
	<i>Prescriptive</i>	11,636,000	3,640,000	7,996,000	3.2
	<i>Direct Install</i>	13,191,000	1,221,000	11,970,000	10.8
LOW INCOME	<i>Energy Leaders</i>	<u>219,000</u>	<u>146,000</u>	<u>73,000</u>	<u>1.5</u>
	Commercial & Industrial Total	90,302,000	21,645,000	68,657,000	4.2
	<i>Overheads</i>		<u>4,630,000</u>	<u>-4,630,000</u>	
	Resource Acquisition Total	150,769,000	55,229,000	95,540,000	2.7
	Low Income				
LOW INCOME	<i>Single Family (Part 9)</i>	4,855,000	4,318,000	537,000	1.1
	<i>Multi-Residential (Part 3)</i>	<u>15,634,000</u>	4,559,000	11,075,000	<u>3.4</u>
	<i>Overheads</i>		<u>1,604,000</u>	<u>-1,604,000</u>	
LOW INCOME	Low Income Total	20,489,000	10,481,000	10,008,000	2.0
	Combined RA/Low Income **	171,258,000	65,710,000	105,548,000	2.6

* Note values may not compute exactly due to rounding.

** This summary does not include calculations for the Market Transformation program.



As proposed in the Guidelines, the Company is expected to use the PAC test as a secondary reference tool in assessing the programs' cost-effectiveness. Table 4.4 below summarizes the PAC screening calculations for the 2016 Enbridge DSM Portfolio. The portfolio as a whole had a positive overall PAC ratio of 2.7.

Table 4.4 2016 PAC Screening Summary

	Program/Sector/Offer	NPV PAC Benefits	Total PAC Costs	Net PAC Benefit	PAC Ratio *
RESOURCE ACQUISITION	Residential				
	<i>Home Energy Conservation</i>	37,497,000	22,057,000	15,440,000	1.7
	<i>Adaptive Thermostats</i>	7,450,000	1,667,000	5,783,000	4.5
	Residential Total	44,947,000	23,724,000	21,223,000	1.9
	Commercial & Industrial				
	<i>Custom Industrial</i>	23,531,000	2,318,000	21,213,000	10.2
	<i>Custom Commercial</i>	22,929,000	4,428,000	18,501,000	5.2
	<i>Run It Right</i>	354,000	527,000	-173,000	0.7
	<i>Prescriptive</i>	7,901,000	1,002,000	6,899,000	7.9
	<i>Direct Install</i>	12,325,000	2,391,000	9,934,000	5.2
LOW INCOME	<i>Energy Leaders</i>	<u>106,000</u>	<u>74,000</u>	<u>32,000</u>	<u>1.4</u>
	Commercial & Industrial Total	67,146,000	10,740,000	56,406,000	6.3
	<i>Overheads</i>		<u>4,630,000</u>	<u>-4,630,000</u>	
	Resource Acquisition Total	112,093,000	39,094,000	72,999,000	2.9
	Low Income				
	<i>Single Family (Part 9)</i>	4,213,000	4,543,000	-330,000	0.9
	<i>Multi-Residential (Part 3)</i>	<u>12,707,000</u>	2,326,000	10,381,000	<u>5.5</u>
	<i>Overheads</i>		<u>1,604,000</u>	<u>-1,604,000</u>	
	Low Income Total	16,920,000	8,473,000	8,447,000	2.0
	Combined RA/Low Income **	129,013,000	47,567,000	81,446,000	2.7

* Note values may not compute exactly due to rounding.

** This summary does not include calculations for the Market Transformation program.



5. Resource Acquisition Scorecard

Enbridge works across the entire marketplace to build awareness of the energy efficiency opportunities supported through its Resource Acquisition (RA) program. The ongoing education, customer support and technical assistance provided by DSM consultants continue to be key drivers in delivering results for the RA program.

The performance metrics in Enbridge's Resource Acquisition scorecard encompass results attributable to offers which are geared to the Residential, Commercial, and Industrial market segments. Performance for the Resource Acquisition program is measured primarily in terms of net CCM of natural gas savings, and in one case, the Home Energy Conservation (HEC) offer also includes a participant metric.

RA offers focus on achieving direct, volumetric natural gas savings customer by customer that commonly involve the installation of energy efficient equipment or the implementation of operational or process improvements.

In 2016, the RA scorecard introduced separate CCM metrics for large and small customers. The large volume metric includes savings from offer participants who have a three year average annual consumption of greater than 75,000 m³/year in the Commercial sector or 340,000 m³/year in the Industrial sector. The small volume metric includes savings from DSM participants with a three year average annual consumption of less than 75,000 m³/year in the Commercial sector or 340,000 m³/year in the Industrial sector, and also includes savings from the Residential sector.

In the past, all CCM were captured in a single metric, which created a tendency for the utility to focus on its largest Commercial and Industrial customers as both cost efficiency and shareholder incentive were maximized through the pursuit of the largest projects. As a result, the smaller Commercial and Industrial market has been under-served. By separating Small and Large Volume Customer CCM metrics, Enbridge can focus on both customer groups and generate results through higher participation levels.



In the Residential Sector there are two offers, HEC and Adaptive Thermostats. The HEC offer comprises upgrades to space and water heating equipment and home building envelope upgrades and the Adaptive Thermostats offer focuses on a single measure upgrade.

For Commercial customers, Custom and Prescriptive offers are available for new and existing Commercial building customers and include the installation of efficient heating, ventilating and air conditioning (HVAC) systems, operational improvements, and custom solutions specific to the customer's needs.

Industrial customers tend to have differing and unique considerations. In addition to selected prescriptive measures, projects for Industrial customers are most often customized solutions, engineered to meet the specific needs of a customer's manufacturing process and facility.

Results for Enbridge's 2016 RA program were divided into Large Volume and Small Volume Customers. As outlined in Table 5.0, the achievement for the Large Volume Customers metric was 328.75 million CCM. The Small Volume Customers result exceeded the target, with 394.82 million CCM. The Resource Acquisition program scorecard also includes a deep savings metric specific to the Residential sector. There were 12,986 Residential Deep Savings Participants, exceeding the upper band.



Table 5.0 2016 Resource Acquisition Scorecard

Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Large Volume Customers	Cumulative Savings (million m ³) ¹	40%	249.1	332.2	498.3	328.75
Small Volume Customers	Cumulative Savings (million m ³)	40%	224.2	298.9	448.4	394.82
Residential Deep Savings	Participants ²	20%	6,194	8,259	12,389	12,986

1. Large volume consumers include commercial customers with a 3 year average annual consumption of greater than 75,000 m³/year or industrial customers with a 3 year average consumption of greater than 340,000 m³/year.

2. Number of participants with at least 2 qualifying measures (average annual gas savings across all participants is at least 15% of combined baseline space heating and water heating usage as calculated by HOT2000).

Within the RA program, each of the Residential, Commercial and Industrial sectors contributed to the CCM savings achievement as detailed below in Table 5.1. Further detail on the offers within each of these sectors is provided in the following pages.

Table 5.1 2016 Resource Acquisition Program Sector Results

Resource Aquisition Program Sector	2016 Net CCM (m ³)	# of Projects	# of Units
<i>Residential</i>	275,063,650	30,016 ¹	17,030 ²
<i>Commercial & Industrial</i>	448,507,056	1,404 ³	7,254 ⁴
Total Resource Acquisition	723,570,707	31,420	24,284

1. # of Projects summarizes the total number of unique projects for HEC and adaptive thermostats.

2. # of Units summarizes the number of units installed for adaptive thermostats

3. # of Projects summarizes the number of unique projects for custom, prescriptive, direct install, RIR, and energy leaders offers.

4. # of Units summarizes the number of units installed for prescriptive, and direct



All Resource Acquisition offers delivered to Enbridge customers in 2016 and discussed below will be continued in the Resource Acquisition DSM program in 2017.

5.1 Residential Resource Acquisition

Enbridge serves over 1.9 million Residential sector customers across the Company's franchise territory. Residential customers represent the largest segment in Enbridge's service area, consequently the Company undertakes significant efforts to serve these customers, including through its DSM offers and initiatives.

Offers marketed to Residential customers in 2016 include Home Energy Conservation and Adaptive Thermostats. Enbridge introduced HEC in 2012. In addition to helping homeowners understand energy improvement opportunities through the completion of a home energy audit, this offering looks at whole home energy savings and encourages participants to install measures that generate ongoing energy savings. The Adaptive Thermostat offer is new in market in 2016 and provides customers with rebates to support the installation of smart thermostats, which use sensors and wi-fi technology allowing homeowners to maintain comfort while achieving energy savings.

2016 DSM Results for Residential Resource Acquisition offers are provided in Table 5.2. Further detail on the Residential Resource Acquisition offers is provided in the following pages.

Table 5.2 2016 Residential Resource Acquisition Results

Resource Acquisition Residential Sector	2016 Net CCM (m ³)	# of Participants	# of Units	TRC-Plus Ratio	PAC Ratio
<i>Home Energy Conservation</i> ¹	229,695,730	12,986	-	2.0	1.7
<i>Adaptive Thermostats</i>	45,367,920	17,030	17,030	2.7	4.5
Total Residential	275,063,650	30,016	17,030	2.09	1.89

1. Number of participants with at least 2 qualifying measures (average annual gas savings across all participants is at least 15% of combined baseline space heating and water heating usage as calculated by HOT2000).



5.11 Home Energy Conservation

Objectives	The aim of the Home Energy Conservation offer is to promote meaningful improvements to Residential customers' gas consumption and thereby help customers lower their energy bills. The goal of the HEC offer is to achieve deep energy savings in existing homes and to raise awareness of the benefits of energy efficiency. The initiative is designed to reduce gas use for space and water heating using a holistic approach, encouraging conservation through the installation of high efficiency equipment as well as thermal envelope improvements to reduce the space heating load. With financial incentives, the offer helps homeowners make their homes more energy efficient and reduces the burden of high energy costs.
Target Customer	HEC is targeted to Rate 1 Residential customers.
Metrics	As part of the Resource Acquisition program, HEC has two metrics. The first metric is lifetime natural gas savings – CCM savings. The second metric is the total number of Residential participants who install at least two qualifying measures. The aggregate annual gas savings across all participants in the portfolio must achieve on average at least a 15% reduction in annual natural gas use in comparing the results of the D (pre-installation) assessment to the results of the E (post-installation) assessment as determined by HOT2000 (NRCAN's) accredited energy modelling software.
Offer Description	The HEC offer is a direct-to-consumer delivered initiative. Participants work with an Enbridge partner Service Organization (SO) to undergo a preliminary energy assessment to determine the home's current energy use. The SO assigns a Certified Energy Auditor (CEA) to audit



	the home and complete a blower door test to measure the home's air tightness. The CEA models the home using HOT2000 and completes an energy efficiency report for the homeowner. This report details energy savings tips and information and outlines the energy savings opportunities for the home as well as provides an EnerGuide rating. The homeowner is therefore in a position to make informed decisions regarding potential improvements. Participants are required to install at least two eligible measures. Once energy upgrades are completed, the CEA completes a post-installation audit to model for the customer the energy savings achieved, as determined by HOT2000. Funding is directed at covering the cost of the energy audits and providing a tiered incentive. Natural gas savings claims are determined based on pre and post HOT2000 modelled consumption. CEAs submit modeling simulation files along with supporting data to NRCan. Enbridge receives pre and post audit data from NRCan and compiles monthly reports. This data is tracked and reviewed with SOs for validation. Tracking reports summarize information regarding project specifics, including participant details, project dates, measures installed and gas savings (m³).
Cost-Effectiveness	The HEC offer is cost-effective as supported by the TRC-Plus and PAC ratios summarized in Table 5.3 below.
2016 Results	As outlined in Table 5.3 below, the HEC offer contributed 229.70 million CCM to the Resource Acquisition Small Volume Customer metric in 2016 with a total of 12,986 participants.

Table 5.3 2016 Home Energy Conservation Results

Resource Acquisition Residential Sector	2016 Net CCM (m ³)	# of Participants	TRC-Plus Ratio	PAC Ratio
<i>Home Energy Conservation</i> ¹	229,695,730	12,986	2.0	1.7

1. Number of participants with at least 2 qualifying measures (average annual gas savings across all participants is at least 15% of combined baseline space heating and water heating usage as calculated by HOT2000).

2016 Commentary and Lessons Learned

- When the HEC offer was launched in 2012, efforts were strategically targeted to the Markham community, which was identified based on location, age of homes, and community interest in energy efficiency. The HEC offer grew with the expansion into areas across the Enbridge franchise area, including York Region, The City of Toronto, Ottawa, Barrie, Durham, Niagara, Peel, Dufferin County, and Simcoe County. With continued expansion of the HEC offer across the Enbridge franchise area, HEC has grown substantially from 271 participants in 2012 to 12,986 participants during the 2016 program year.
- Enbridge's market delivery strategy focuses marketing and communication efforts on the home improvement contractor community. In 2015, funding for the HEC offer was halted mid-year in order to manage budget requirements. As a result, dedicated efforts were required in 2016 to re-engage contractors and ensure customers understood that the offer was resuming. Enbridge was able to take advantage of the heating months early in 2016 despite a lack of momentum after the program was cancelled in 2015.

- Continuing increases in energy related costs remain a driving force for homeowners to consider energy-efficient improvements and upgrades. The educational home audit and incentive support for upgrades offered in HEC provides customers with increased understanding and the opportunity to improve their personal energy usage and reduce their carbon footprint.

Your Home Energy Upgrades Guide



Add Attic Insulation: Attic insulation will prevent heated and cooled air from escaping through the top of your home.



Increase Wall Insulation: Better insulation helps to keep heat in during the winter and out during the summer, providing more comfort and lower energy bills.



Upgrade Basement Wall Insulation: A properly insulated basement helps to prevent heat loss and mold-causing condensation. It also makes for a more comfortable living space.



Air Sealing: Air leakage means your furnace will need to work harder to heat your home. Proper sealing prevents drafts, increasing comfort and lowering energy bills."



Replace Windows: Better windows help to prevent costly drafts and condensation. They also allow for solar gains, which heat your home, and solar shading, which helps cool your home.



Convert Furnace: Installing a high-efficiency furnace will give you improved climate control, energy savings and a more comfortable indoor environment overall.



Upgrade Water Heater: A high-efficiency or tankless water heater can reduce your natural gas consumption, saving you money.



Drain Water Heat Recovery: Drain Water Heat Recovery units preheat the water going into your water tank with warm water from the shower or dishwasher, so your water tank doesn't have to work as hard. Your water heater will use less energy, for lower bills.



Exposed Floor Insulation: Insulating the underside of floors exposed to unheated spaces (such as a room over the garage) can keep floors warmer and provide a more cozy living space.

EARN UP TO \$2,100 IN INCENTIVES

\$1,600	Achieve 25% - 49% gas savings as per final energy audit
	\$500 covering the full energy audit costs, not including HST
	• An instant rebate of \$150 will be applied to the first audit and \$350 for the remainder of the audit cost will be reimbursed in the total remaining incentive amount.
	Total amount of incentive to homeowner is \$1450
\$2,100	Achieve 50% or above in gas savings as per final energy audit
	\$500 covering the full energy audit costs, not including HST
	• An instant rebate of \$150 will be applied to the first audit and \$350 for the remainder of the audit cost will be reimbursed in the total remaining incentive amount.
	Total amount of incentive to homeowner is \$1950

To find out if you can reach 25% annual gas savings, a pre- and post-home energy audit is required by an Enbridge approved Certified Energy Auditor (CEA). Additional information on the program can be found at knowyourenergyscore.ca. Program may be subject to change or cancellation without notice at any time.



- Following a consultation process, Enbridge determined that the lower tier incentive of \$1000 (\$500 for pre and post energy audits and \$500 for achieving 15%-24% annual gas savings) may not be motivation enough for participants to install gas savings measures through this offer. As a result, marketing efforts focused on the middle and higher tiers with the objective of driving higher gas savings. This simplified two-tiered approach was promoted effective January 1, 2016 with minimal change to the offer design as participants who reached the lower tier were still eligible.

- Enbridge Gas Distribution retained a third party evaluator, Econoler Inc. to perform a process evaluation of the HEC offer in 2016. The Econoler report can be found in Appendix C. Some key research objectives included evaluating the offer details and delivery, evaluating the HEC database and documentation, determining sources of awareness and customer recruitment efforts, determining the levels of satisfaction, and identifying barriers that affect performance. The process evaluation involved benchmarking against similar offers, as well as surveys and interviews with participants, Certified Energy Auditors, contractors, and delivery agents. Based on their findings, Econoler provided recommendations, such as:
 - o Improve the program database by introducing better uniformity and some additional participant information, such as the participants' email address, the incentive amount, and D Audit file number, and savings potential,
 - o Providing a brief program description leaflet for contractors to hand out to potential participants summarizing the participation process, eligibility criteria, eligible upgrades, and incentives,
 - o Working to improve levels of satisfaction by endeavouring to have participants receive audit reports in a timely manner, and

In its efforts to evolve offers with an eye to continuous improvement, Enbridge is considering how to address these recommendations. Some have been fully implemented such as providing program description leaflets to contractors to assist with customer understanding of the offer.



- In early 2016, Enbridge and Niagara Peninsula Energy Inc. (NPEI) worked on a collaborative venture promoting a combined electricity and natural gas conservation offering. This effort involved Energy Advisors in the Niagara area and provided a Save on Energy coupon booklet for all participants of HEC.
- In 2016, significant efforts were undertaken to support the Independent Electric System Operator Whole Home Pilot (WHP) initiative, launching Q2 2017. The WHP provides consumers with a combined offer to promote gas and electric savings. This collaboration will allow IESO to utilize the HEC infrastructure to perform an electric assessment of the home at the time the customer completes the pre-audit. In addition to the existing HEC incentives, the Pilot provides further electricity incentives.
- As the program has grown, Enbridge continues to improve internal processes. Significantly increasing participation numbers has necessitated streamlined data collection and rigorous reconciliation to ensure quality control. Enbridge continues to work diligently with Service Organizations and Energy Auditors in order to effectively manage processes and continue to support participation.
- Despite recent success, there remain challenges in delivering this offer. In particular, the cost of natural gas remains relatively low when compared with competing fuels, which makes natural gas upgrades less attractive from a return on investment perspective. Despite this, Enbridge was able to enroll participants in this offer by providing positive messaging through marketing and education efforts.
- As the marketplace evolves with the addition of new programs (IESO Heating and Cooling Program, Green Investment Fund (GIF) Program, etc.), it will be increasingly important to have clear messaging and communication with both



customers and contractors to mitigate confusion and ensure understanding of the offer.

- The HEC offer will continue in 2017. Enbridge is working to expand the reach of the offering by increasing efforts in the marketplace with insulators, window installers and hot water tank distributors to help drive offer awareness, encourage uptake of multiple measures, and drive participation.
- Targeted marketing will be developed promoting specific bundles of measures to reach savings thresholds. The objective is to provide specific customer segments an illustrated pathway to achieve results given their housing features.

5.12 Residential Adaptive Thermostat

Objectives	The goal of this offer is to broadly reach the mass market with a straight forward prescriptive approach that can help customers achieve gas savings.
Target Customer	The Adaptive Thermostat offer is targeted to Rate 1 Residential customers.
Metrics	As part of the Resource Acquisition program, the primary metric for the Adaptive Thermostat offer is lifetime natural gas savings - CCM savings.
Offer Description	Beyond HEC, the company introduced an additional opportunity to offer support to the mass market in 2016, through the Adaptive Thermostat offer. Customers can benefit from the potential savings generated by installing and using a smart thermostat. This offer provides a stand-alone prescriptive opportunity for Residential customers.



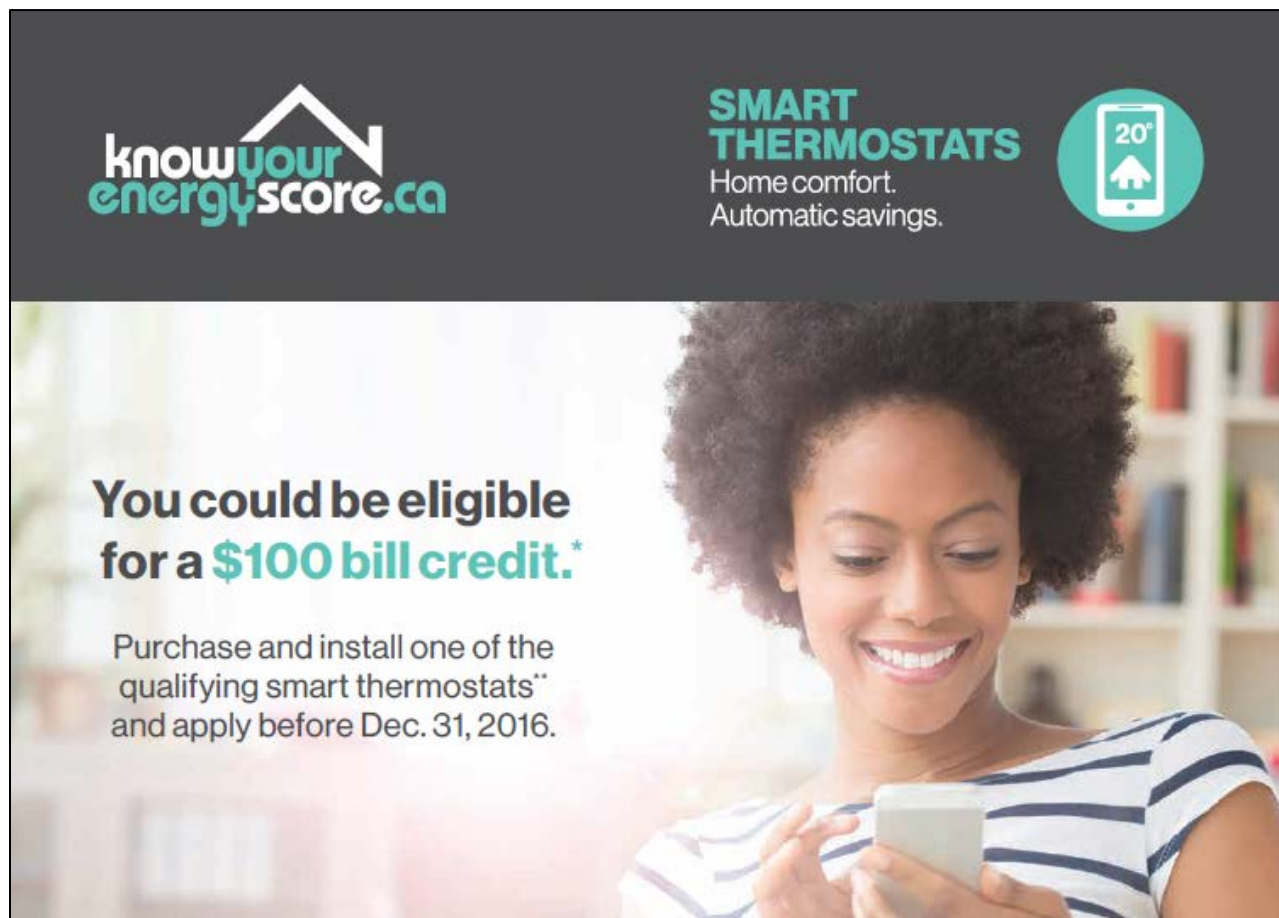
	An incentive is provided to customers upon qualified / approved installation. To receive an incentive, customers must meet the following eligibility criteria: • Be a Residential customer in Enbridge franchise area; • Have a valid Enbridge account number; and, • Register the device to confirm installation and activation of the unit and facilitate incentive payment. Through partnerships with participating manufacturers, the Company utilizes web portals specific to each manufacturer to facilitate customer participation. These sites provide confirmation of installation and activation, as well as allow for customized incentive payment processing. As part of the customer registration process, these portals track the thermostat connection date for each customer, identifying when the thermostat was actually activated in the home.
Cost-Effectiveness	The Residential Adaptable Thermostat offer is cost-effective as supported by the TRC-Plus and PAC ratios summarized in Table 5.4 below.
2016 Results	The Residential Adaptive Thermostat offer was successful in 2016, the first year of the offer, as Enbridge claimed 17,030 units through its DSM program.

Table 5.4 2016 Residential Adaptive Thermostat Results

Resource Acquisition Residential Sector	2016 Net CCM (m ³)	# of Units	TRC-Plus Ratio	PAC Ratio
<i>Adaptive Thermostats</i>	45,367,920	17,030	2.7	4.5

2016 Commentary and Lessons Learned

- When the 2015-2020 Plan was drafted in April 2015, it was anticipated that the incentive level for an Adaptive Thermostat should be \$75. However in 2016, smart thermostats retailed at \$250 and above (in part due to the lower Canadian dollar). Therefore, Enbridge determined it would be necessary to increase the incentive level to \$100 to encourage uptake of this newer technology. Later in the year, as new generations of smart devices were released, the price of the technology further increased.
- As a new offering in 2016, Enbridge was able to support the offer in partnership with two major manufacturers of smart thermostats. Both manufacturers have reported substantial sales increases across the Enbridge franchise since offer inception. A third vendor was introduced to the program in Q4 2016.



**knowyour
energyscore.ca**

**SMART
THERMOSTATS**
Home comfort.
Automatic savings.

**You could be eligible
for a \$100 bill credit.***

Purchase and install one of the
qualifying smart thermostats**
and apply before Dec. 31, 2016.



- Enbridge worked with vendors in supporting the promotion of the offer through in-store marketing and digital advertising such as online ads and YouTube videos. In addition, Enbridge created a website to supplement the strong marketing partnerships in place with vendors.
- Enbridge also worked with the participating manufacturers to leverage web portals to facilitate a customer registration process that would confirm installation and activation, adding customized incentive payment processing.
- The dual-fuel savings generated by this technology makes it a good opportunity for collaboration with an electric LDC and Enbridge successfully entered into an agreement with Toronto-Hydro Electric System Limited (THESL) in Q4 2016. Through this collaboration, THESL and Enbridge each paid \$50 toward the \$100 incentive for participants in the THESL franchise area with air conditioning. In 2016, 2,026 devices were installed through this collaboration, allowing Enbridge to provide rebates to more customers than they might have otherwise been able to support.
- The Residential Adaptive Thermostat offer will continue in 2017 and incentive levels are expected to remain the same as Enbridge will continue to market this offer province wide and maintain the collaboration effort with THESL.
- Also for 2017, Enbridge is exploring inclusion of other eligible manufacturers as well as looking at the opportunity to add contractor direct install as an option for the consumer.



5.13 Expansion of Residential Offers through the Green Investment Fund

In February 2016, the Ontario Government announced the allocation of \$100 million from the GIF toward helping homeowners reduce their energy bills and cut greenhouse gas emissions. In partnership with Enbridge Gas Distribution and Union Gas, this effort was intended to help about 37,000 homeowners conduct audits to identify energy-saving opportunities and complete retrofits. Consequently, in 2016, Enbridge and the Province signed an agreement for the establishment of \$58 million of this funding toward the expansion of the Company's HEC and Adaptive Thermostat offerings and the introduction of a behavioural initiative. Beyond the reach of Enbridge's DSM offer, this effort is targeting inclusion of 25,000 residential homeowners over the three year term of the agreement.

GIF funding in support of Residential participation in a whole home retrofit will drive incremental uptake of gas customers beyond what would have been achieved with DSM HEC funding alone. The foundation for this effort however is the existing HEC offer, which was introduced in the Company's DSM portfolio and has been offered in the market since 2012. The expanded initiative is designed to leverage the existing design, delivery and execution of the DSM HEC and Adaptive Thermostat offers already in place. For this reason, attribution of in-franchise gas customer Residential results cannot be determined merely based on the source of funding.

In addition, GIF funding will extend the market for this offer to the inclusion of homes with a primary heating fuel that is non-gas (oil, propane or wood), as well as to homes outside of the Company's franchise territory; these participants and results will be fully attributable to GIF.

Though this expanded effort did not officially go into market until November 2016, initial efforts to expand the offer to leverage the GIF funding focused on upfront planning,

staffing and logistics. Residential results attributed to GIF in 2016 are outlined in Table 5.5.

Table 5.5 2016 Residential Results Attributed to GIF

Offer	# of Participants/ Units
Home Energy Conservation	10 homes (all non-gas)
Adaptive Thermostats	2,000 units

Initial spending in 2016 from GIF funding totalled approximately \$950,000. Beyond incentives tied to these GIF results, much of the early GIF spending in 2016 related to bringing on staff, implementing systems, initiating marketing plans and expansion to the non-gas and out-of-franchise markets.

The agreement with the Province earmarked \$2.2 of the \$58 million GIF funds to support a Residential behavioural initiative. This program is intended to influence customers to change their energy use decisions and actions through the delivery of customized energy reports including benchmarking to the community and past performance. The communications will also provide energy savings tips and other tools to motivate behavioural changes, and will be leveraged to promote the benefits of participation in the HEC and Adaptive Thermostat offerings. 100% of the results from the behavioural offer will be attributed to the GIF initiative.

5.2 Commercial and Industrial Resource Acquisition

Enbridge serves large and small volume Commercial and Industrial customers that span a wide variety of sub-sectors. Some of these include multi-residential buildings, commercial office buildings, schools/universities, hotels/motels, warehouses, retail facilities, food services, hospitals/health-care, and government/municipal facilities in the Commercial sector and agricultural, manufacturing, and automotive facilities in the Industrial sector.



Offers designed for Commercial and Industrial customers include custom, prescriptive and direct install approaches supporting the installation of energy efficient equipment and the adoption of energy efficient practices. This is accomplished through the provision of energy audits, technical support, opportunity assessment, data and consumption analysis, education initiatives, and incentives.

DSM programming available to Commercial and Industrial customers is delivered directly by Enbridge's Energy Solutions Consultants (ESCs) to customers, building owners, and facility managers and operators, as well as through supply chain channels and business partners, including HVAC contractors, engineering firms and energy service advisors.

2016 results for Commercial and Industrial Resource Acquisition offers are provided in Table 5.6. Further detail on the Commercial and Industrial Resource Acquisition offers is provided in the following pages.

Table 5.6 2016 Commercial and Industrial Resource Acquisition Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects ¹	# of Units ²	TRC-Plus Ratio	PAC Ratio
<i>Custom Commercial</i>	151,036,223	496	-	5.8	10.2
<i>Custom Industrial</i>	164,321,118	181	-	2.9	5.2
<i>Run It Right</i>	1,937,342	39	-	0.7	0.7
<i>Prescriptive</i>	51,377,592	555	6,909	3.2	7.9
<i>Direct Install</i>	79,163,595	129	345	10.8	5.2
<i>Energy Leaders</i>	671,186	4	-	1.5	1.4
Total/Average	448,507,056	1,404	7,254	4.2	6.3

1. # of Projects summarizes the number of unique projects for custom, prescriptive, direct install, RIR, and energy leaders offers.

2. # of Units summarizes the number of units installed for prescriptive and direct install offers.



5.21 Custom Commercial

Objectives	The goal of the Commercial Custom offer is to promote energy efficiency and to reduce natural gas use through the capture of energy efficiency opportunities in commercial buildings, including retrofits of building components and upgrades at the time of replacement. The objective is to provide technical support, business support services, and financial incentives to help customers meet energy efficiency and budgetary goals.
Target Customer	The Custom Commercial offer targets Commercial customers who are in Rates 6, 110, 115, 135, 145, and 170.
Metrics	As part of the Resource Acquisition program, the primary metric for the Commercial offer is lifetime natural gas savings - CCM savings. There are two metrics defined in the 2016 scorecard, one for Large Volume Customers and one for Small Volume Customers. Large Volume Consumers include Commercial customers with a 3 year average annual gas consumption greater than 75,000 m ³ /year. Small Volume Customers include Commercial customers with a three year average annual gas consumption below 75,000 m ³ /year.
Offer Description	The Commercial Custom offer provides technical assistance and financial incentives aimed at encouraging Commercial customers to implement energy efficient technologies. The offer consists of variable incentives based on project specific details wherein custom calculations are used to estimate the savings. Enbridge provides consultative services to customers and third party service providers aimed at assessing building energy consumption and making recommendations for gas-saving measures. Upon implementing recommended energy efficiency projects, customers are eligible to



	receive financial incentives under this offer. Beginning in 2016, Enbridge implemented a tiered Commercial custom incentive structure as described in the table below: <table border="1" data-bbox="444 373 1430 724"> <tr> <th data-bbox="444 373 1024 457">% of Annual Consumption (m³) Saved</th><th data-bbox="1024 373 1430 457">\$/m³ Incentive</th></tr> <tr> <td data-bbox="444 457 1024 548">0-10%</td><td data-bbox="1024 457 1430 548">\$0.10/m³</td></tr> <tr> <td data-bbox="444 548 1024 638">10-20%</td><td data-bbox="1024 548 1430 638">\$0.20/m³</td></tr> <tr> <td data-bbox="444 638 1024 724">20% and above</td><td data-bbox="1024 638 1430 724">\$0.30/m³</td></tr> </table> The Commercial Custom offer provides up to 50% of the project's capital cost or a maximum of \$100,000 per project. The objective of the tiered incentive structure is to drive completion of projects that yield incremental savings. The additional incentive for these projects should encourage the adoption of additional efficiency measures and/or the installation of the most efficient equipment possible to achieve the highest result. From the customer's perspective, the higher incentive helps offset the increased capital requirement that may be associated with achieving greater savings, allowing the customer to increase the project scope and making the project(s) more feasible.	% of Annual Consumption (m ³) Saved	\$/m ³ Incentive	0-10%	\$0.10/m ³	10-20%	\$0.20/m ³	20% and above	\$0.30/m ³
% of Annual Consumption (m ³) Saved	\$/m ³ Incentive								
0-10%	\$0.10/m ³								
10-20%	\$0.20/m ³								
20% and above	\$0.30/m ³								
Cost-Effectiveness	The Commercial Custom offer was cost-effective, as supported by the TRC-Plus screening summarized in Table 5.7.								
2016 Results	As summarized in Table 5.7, 496 Commercial custom projects were claimed in 2016; these projects accounted for 151.04 million CCM in net natural gas savings. Custom projects traditionally drive the highest percentage of Commercial results.								



Table 5.7 2016 Custom Commercial Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects	TRC-Plus Ratio	PAC Ratio
<i>Custom Commercial</i>	151,036,223	496	5.8	10.2

2016 Commentary and Lessons Learned

- A significant portion of Enbridge's Resource Acquisition results continue to be driven through delivering custom projects. In 2016, in the Commercial sector, a revised tiered incentive has been successful with an increase of multi-measure projects in 2016 as well as an increase in the average CCM savings generated per project.
- Fundamental to the Custom offer, Enbridge continues to provide technical expertise to support and influence Commercial customers and business partners to identify and implement energy efficient projects. Enbridge's Commercial sales team is comprised of Energy Solutions Consultants, each with a sector(s) focus. In an effort to create and encourage energy efficient retrofits these ESCs employ a three-pronged approach, specifically working with customers (including key accounts), business partners (who provide services or products promoting the energy efficient technologies), and industry associations.
- In addition, municipal and government customers continue to require dedicated account management. Company representatives works closely with municipalities throughout the year to identify and provide technical support for energy efficiency projects to propel their energy management plans.
- Business partners play a significant role in promoting the Custom Commercial offer and influencing customers to choose higher efficiency options. These business partners include contractors, distributors, manufacturers, wholesalers, and consulting engineers. In 2016, Enbridge launched an initiative to improve the way Enbridge works with these groups and expand the number of business partners supporting our programs. With the help of Enbridge's ESCs, an active

database comprising business partners was amalgamated to more effectively serve mutual customers. As a result, these partners have registered to be part of our e-commerce plan, which includes the following benefits:

- o Quarterly Webinars (Program Launches and Cap and Trade)
 - o Email blasts (program updates, changes to regulations, codes and standards, and time limited campaigns)
 - o Online applications
 - o Access to a micro site
- Enbridge engages key stakeholders and organizations in efforts to further support education and build awareness of the Enbridge services and DSM support available. These groups include:
- o American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
 - o Association of Condominium Managers of Ontario (ACMO)
 - o Canadian Condominium Institute (CCI)
 - o Canadian Healthcare Engineering Society (CHES)
 - o Centre for Energy Advancement through Technological Innovation (CEATI)
 - o Continental Automated Buildings Association (CABA)
 - o Eastern Ontario Landlord Organizations (EOLO)
 - o Federation of Rental Providers of Ontario (FRPO)
 - o Gas Technology Institute (GTI)
 - o Greater Toronto Apartment Association (GTAA)
 - o Hotel Engineering/Facilities Manager's Association of Toronto (HEAT)
 - o Ontario Association of School Business Officials (OASBO)
 - o Ontario Long-Term Care Association (OLTCA)
 - o Ontario Recreation and Facilities Association (ORFA)
 - o Ontario Refrigeration and Air Conditioning (ORAC)
 - o Ontario Restaurant Hotel & Motel Association (ORHMA)
 - o Professional Retail Store Maintenance Association (PRSM)

- o Restaurants Canada
- o The Building Owners and Managers Association (BOMA Toronto, BOMA Ottawa)
- o The Heating, Refrigeration and Air Conditioning Institute (HRAI)
- o Toronto and Region Conservation Authority (TRCA)

Enbridge Gas Distribution

Commercial Custom Retrofit Incentive Program




Earn up to
50%
of Project Costs*

Energy saved is money earned



Tier	Incentive	Eligibility
TIER 3	\$0.30/m ³	For remaining gas savings above 20%
TIER 2	\$0.20/m ³	For gas savings >10% or ≤ 20%
TIER 1	\$0.10/m ³	For the first ≤ 10% gas savings

* Savings are in reference to customer's total gas consumption prior to the retrofit.

Tiered incentives offer incremental percentage incentives over three levels of savings.

- In addition, Enbridge ESCs were active at major events and conferences to further build DSM program awareness, hear from stakeholders, and provide

customers with opportunities to discuss their challenges directly with DSM representatives. Some of these events included:

- o City of Toronto – Live Green, Toronto Hotel Sustainability Conference
 - o Canadian Healthcare Engineering Society, Provincial Trade Show & Education
 - o Ontario Long Term Care Association, Industry Event
 - o TRCA, Greening Health Care and Mayor's Megawatt Challenge Events
 - o Canadian Condominium Institute, Ottawa Conference / Tradeshow
 - o Federation of Rental Providers of Ontario, MAC Awards
 - o Eastern Ontario Landlord Organization, Spring and Fall Networking Events
 - o BOMA Toronto, PM Expo
 - o Operations, Maintenance & Construction of Ontario Association of School Business Officials Annual Tradeshow
- Competing priorities for Commercial customers continued to be one of the major challenges to DSM project uptake in 2016. With limited capital to invest into energy efficiency upgrades, customers must weigh a variety of options. Investing in gas utility DSM initiatives to decrease natural gas consumption is considered among other alternatives often including investing in Conservation Demand Management (CDM) initiatives to reduce higher cost electricity consumption. Customers often stand to benefit from a significantly larger incentive to pursue CDM upgrades on a per energy unit basis.
- In addition to strengthening relationships with business partners, Enbridge continues to promote collaboration efforts with the IESO and applicable Local Distribution Companies (LDCs) to further encourage energy conservation among all the energy sources, whether water, electricity or gas. Despite considerably lower funding to provide financial incentives relative to CDM programs, Enbridge recognizes the value this co-ordination can bring to customers who participate in DSM by also highlighting CDM incentives and accessing LDC expertise wherever



efficiency opportunities are considered. Enbridge will continue to act in the best interest of its customers by leveraging all support and funding available to customers, to supplement the Company's own technical expertise and project implementation support.

- In 2016, Enbridge collaborated with LDCs in various targeted areas including:
 - o A hotel/motel energy concierge initiative with Niagara Peninsula Energy Inc. was designed to test a comprehensive electricity and natural gas program in the LDC's service area. The goal was to create a 'one stop shop' for natural gas and electricity conservation for customers. In 2017, IESO and other LDCs will discuss expanding the program in other regions.
 - o In December 2016, Enbridge participated in the first Networking Initiative planned by the GTHA Sales Force Collaboration sub-committee. Enbridge and LDC Energy Solutions Consultants within the Greater Toronto and Hamilton Area met for a half-day session at the Powerstream office in Vaughan.
 - o Successful Collaboration Case Studies sessions were held, discussing projects such as the dual fuel benefits of Demand Control Kitchen Ventilation (DCKV) and Hospital Ventilation.

- Moving into 2017, the goal of the Commercial group is to continue to further strengthen collaboration with IESO, LDCs, municipalities and key alliances to jointly promote energy conversation, maximize the benefits for customers, and improve program cost effectiveness.



5.22 Custom Industrial

Objectives	The Industrial Custom offer is designed to capture cost-effective energy savings within the Industrial sector by delivering customized energy solutions, including providing technical and financial support to customers. Industrial ESCs focus on assisting customers with the adoption of energy efficient technologies by overcoming financial, knowledge or technical barriers. This offer provides engineering technical support, business support services, and financial incentives to help customers meet production, energy efficiency, and budgetary needs. The primary objectives of this offer include: • Maximizing the energy savings potential of the Industrial sector; • Increasing adoption of energy efficient technologies among Industrial customers; • Assisting customers in overcoming implementation hurdles including financial, knowledge, and technical barriers to increasing energy efficiency; • Supporting customers' project planning by enhancing the return on investment of projects.
Target Customer	The Custom Industrial offer is available to Industrial customers (including Agricultural) in Rates 6, 110, 115, 135, 145 and 170. Custom projects encompass opportunities where savings are linked to unique industrial processes, building specifications, uses and technologies. With the Custom offer, Enbridge mainly targets Industrial customers (both large and small) whose gas usage is primarily consumed through process loads.



Metrics	As part of the Resource Acquisition program, the primary metric for the Industrial Custom offer is lifetime natural gas savings - CCM savings. For the purposes of the scorecard, Industrial customers are divided into Large and Small Volume customers, with corresponding incentives applied to each group. Large Volume Industrial customers are defined as having a three year average annual consumption of greater than 340,000 m³/year. Small Volume Industrial customers are defined as having a three year average annual consumption of less than 340,000 m³/year.
Offer Description	In the Industrial sector, offers include the Industrial Custom offer and the Prescriptive offer together with a number of enabling initiatives, such as support for Industrial customers in identifying energy-saving opportunities through to assistance with project implementation. These offers are primarily promoted and delivered by ESCs (professional engineers) who are active in the marketplace. ESCs are trusted energy advisors that work with customers to determine solutions to address multiple objectives, namely production, energy efficiency and budgetary considerations. Work involves addressing technical barriers to energy efficiency adoption as well as financial barriers that may hinder business justification and implementation. Enabling initiatives allow ESCs to work with the customers to identify potential opportunities, quantify benefits, and justify action. Such initiatives include: ESCs leveraging their skills and tools to identify efficiency opportunities; involvement of third-party vendors to conduct specific types of audits or assessments of facilities; and/or ESCs assisting with the development of project implementation plans. Due to the unique nature of Industrial customers, custom solutions developed by ESCs are designed and engineered to meet the specific



	requirements of each particular customer facility. Five core components are common to the Custom offer: Knowledge Development: Technical publications, quarterly updates, themed workshops and a resource based energy solutions portal are offered to provide customers with the knowledge to make informed decisions through education. Opportunity Identification: ESCs provide support to assist customers in the identification of efficiency opportunities, such as equipment testing and assessment and thermal imaging. Measurement: ESCs assist customers in selecting appropriate means of measurement to quantify key energy inputs. Engineering Analysis: ESCs assist customers who do not have the resources needed to conduct financial, technical and enterprise risk evaluations for potential projects. Implementation Support: ESCs work with customers on an implementation plan and connect them with business partners to complete the project. The following tiered incentive structure is provided with the Custom Industrial offer: • \$0.20/m³ for first 50,000 m³ gas saved • \$0.05/m³ for gas savings above 50,000 m³ This incentive structure is designed to provide additional support to customers (both large and small) with the implementation of smaller projects. A higher tier for smaller projects makes energy efficiency implementation for these efforts more attractive to Enbridge's Industrial customers. This is particularly true for smaller customers. Enbridge believes it is important to directly engage this under-served market in light of the Board's direction to achieve all cost-effective
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	DSM with a reasonable rate impact. The Custom Industrial offer is largely influenced by the relationship fostered between Enbridge's ESCs and customers. ESCs are responsible for providing sound technical and business support, in addition to preparing engineering calculations, documenting substantiated savings claims and key project information. Savings for each custom project are calculated on an individual basis. Each custom project includes applicable supporting project documentation that outlines key parameters and details gas savings calculations.
Cost-Effectiveness	Enbridge continues to demonstrate a high level of cost-effectiveness for the Custom Industrial offers as supported by the TRC-Plus and PAC screening summarized in Table 5.8 that follows.
2016 Results	As summarized in Table 5.8, there were 181 projects completed in the Industrial Custom offer in 2016, which contributed 164.32 million CCM. Custom projects for Industrial customers can be varied across a wide range of technologies and improvements. In 2016, results from custom projects were led by savings from projects focused on industrial process efficiency improvements, the installation of control systems, and operational improvements unique to specific customers.

Table 5.8 2016 Custom Industrial Resource Acquisition Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects	TRC-Plus Ratio	PAC Ratio
<i>Custom Industrial</i>	164,321,118	181	2.9	5.2

2016 Commentary and Lessons Learned

- The Industrial sector utilizes most of its energy for process related consumption as opposed to heating and ventilation purposes. Most often, the building itself consumes a small portion of energy compared with the process equipment within the facility. Many Industrial customers lack the technical knowledge regarding energy efficient technologies that may help improve these processes and reduce overall energy consumption. Consequently, the industrial team focuses its efforts on helping customers identify ways to improve manufacturing efficiency through improved equipment efficiency and the optimization of process lines.
- Overall, the Custom offer remained largely unchanged in 2016 from the previous year. Enbridge is pleased with strong Industrial custom results in 2016. Project focuses reflect a developing trend, shifting from capital-intensive projects, such as equipment upgrades, to opportunities focused on process improvements. The outcome has been an increasing proportion of projects which continue to drive annual savings, but yield a lower CCM.
- Custom projects tend to be resource intensive, requiring extensive technical expertise and data analysis as well as the development of relationships over many years and an understanding of the customer's business. Regardless of the size of the customer or the project, this effort is consistent.
- The Company continues to pursue opportunities to undertake audits and studies at Industrial customers' facilities (e.g., plant energy assessments, steam trap audits, or meter studies) to identify for the customer potential savings that could be realized with the implementation of recommended improvements. Enbridge's financial incentives towards audits (such as air-balance audits) have helped uncover savings potential in areas that customers would not have otherwise explored. As a result, Enbridge is able to increase these customers' overall

process efficiency by reducing their existing energy consumption and increasing their energy efficiency. Approximately 70 audits were completed in 2016.

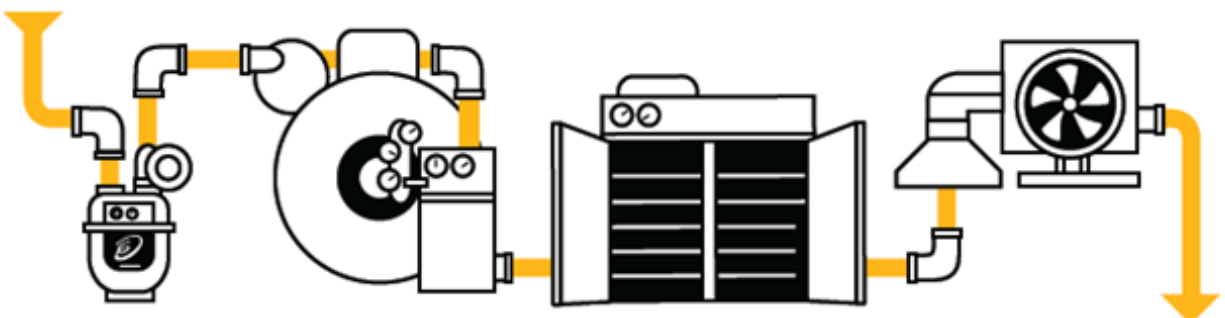
Our Approach

Making energy work for you

Enbridge Gas Distribution offers industrial customers complementary technical support and financial incentives to help you identify and implement energy efficiency initiatives that save energy, cut operating costs, reduce carbon emissions and improve your bottom line.

At Enbridge, rather than offering a transactional approach to energy efficiency, we focus on continuous energy improvement. A dedicated Enbridge **Energy Solutions Consultant (ESC)** will work with you year round to understand your business needs and help you make the most out of the energy you consume.

Although energy flows from your meter to your equipment...



savings opportunities are evaluated from your product's energy requirements upstream.

- Enbridge offered a variety of materials and forums aimed at increasing awareness of energy efficiency opportunities and benefits, educating Industrial customers and providing resources to research and evaluate potential improvement solutions. Efforts in 2016 included offering quarterly newsletters, developing and marketing the Industrial Energy Solutions Portal and hosting energy efficiency workshops and webinars.



- The industrial team hosted workshops focused on educating customers and their employees on identifying energy conservation opportunities and providing information to help evaluate potential projects. These workshops helped customers identify projects that not only resulted in natural gas savings, but also identified electric and water savings opportunities. The 2016 workshops included the following:
 - o Energy Management in Industrial Facilities
 - o Minimize the Impact of Cap and Trade through HVAC Efficiency
 - o Heat Recovery Workshop
 - o Water Heating and Management Workshop

- Over 120 customers took part in these workshops in 2016 and most workshop participants attended more than one event, which serves as an indication that these customers value the information provided. Workshop feedback survey results were excellent with ratings of 95% support in terms of relevancy of the content covered.

- Enbridge has seen some success with limited time incentive campaigns, launched to coincide with workshops. For example, a successful campaign offered increased incentives to complete a facility air balance assessment. This led to an increased number of heating and ventilation projects considered. Further, as part of the HVAC workshop, a campaign to fund the design and installation of a customized control system for exhaust fans was introduced. These campaigns will be continued in 2017.

- Over its 20 plus years offering DSM in the province, the Company has established and developed solid relationships with many of the larger Industrial customers; however as outlined in the 2016-2020 Plan, the Company recognizes there is more work needed to support the small industrial facilities in addressing energy efficiency. Efforts in 2016 have focused on improved engagement and relationship development with the smaller Industrial customer base. As a result of



this work, Enbridge saw an increase in the number of projects in this segment. The Company will continue to look at ways to tailor efforts to realize achievement in this challenging market segment.

- The Industrial Custom offer is centered on understanding customers' needs and creating solutions in line with each customer's specific goals. Industrial customers can lose between 20% and 50% of thermal energy as waste. Customers often do not have enough time or knowledge to investigate potential ways to recover waste heat. Through relationships built between Enbridge and customer site contacts, Enbridge takes the time to understand customers' processes, risk tolerances, and financial boundaries. As a result, Enbridge is seen as an unbiased source of information that the customer can rely upon when making investments. The Industrial Custom offer is an important component in Enbridge's DSM portfolio and will continue in 2017.

5.23 Run it Right

The Run it Right offer includes two metrics, one in each of the Resource Acquisition and Market Transformation and Energy Management (MTEM, MT, "Market Transformation") scorecards. For the purposes of this report, details regarding the Run it Right offer in 2016 are included in Section 7.4 which provide a summary of the MTEM Program.



5.24 Commercial & Industrial Prescriptive (Fixed) Incentive

Objectives	The goal of the Prescriptive offer is to reduce natural gas use through the capture of cost effective energy efficiency opportunities in new and existing Commercial and Industrial sector buildings.
Target Customer	The Commercial and Industrial Prescriptive offer is intended for Commercial and Industrial customers in Rates 6, 110, 115, 135, or 145.
Metrics	As part of the Resource Acquisition program, the primary metric for the Commercial and Industrial Prescriptive (Fixed) Incentive offer is lifetime natural gas savings - CCM savings. Commercial and Industrial customers are divided into Large and Small Volume customers. Large Volume Commercial customers are defined as having a three year average annual consumption of greater than 75,000 m³/year. Small Volume Commercial customers are defined as having a three year average annual consumption of less than 75,000 m³/year. Large Volume Industrial customers are defined as having a three year average annual consumption of greater than 340,000 m³/year. Small Volume Industrial customers are defined as having a three year average annual consumption of less than 340,000 m³/year.
Offer Description	The method of determining annual savings for measures included in the Prescriptive offer is based on substantiation documents that detail deemed cubic meter savings. The costs of energy efficient upgrades are intended to be offset by energy savings. The Prescriptive offer encompasses both pure prescriptive and quasi-prescriptive measures. Gas savings for pure prescriptive technologies are based



	on simple deemed values. Examples of prescriptive technologies include demand control kitchen ventilation, dishwashers, and Energy Star equipment. Enbridge also provides incentives for quasi-prescriptive technologies, which use simple calculations incorporating relevant inputs. These measures include demand control ventilation (DCV), infrared heaters, make-up air units, and high efficiency boilers. In 2016, Enbridge increased selected fixed incentives as part of a strategy to target more participation among Commercial and Industrial customers, specifically smaller customers. It was anticipated that higher incentives, covering a large proportion of the incremental cost of more energy efficient capital equipment, would work to overcome one of the main barriers to adoption. In some cases, the Company has determined that higher fixed incentives are necessary in order for the offer to be competitive and relevant to customers, especially in light of low natural gas prices, and the greater incentive levels for electricity conservation offered by LDCs.
Cost-Effectiveness	The Commercial & Industrial Prescriptive (Fixed) Incentive offer was cost-effective, as supported by the TRC-Plus screening summarized in Table 5.9.
2016 Results	As outlined in Table 5.9, Prescriptive offers generated 51.38 million CCM and included 6,909 units installed across Commercial and Industrial facilities.

Table 5.9 2016 Commercial and Industrial Prescriptive Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects	# of Units	TRC-Plus Ratio	PAC Ratio
<i>Prescriptive</i>	51,377,592	555	6,909	3.2	7.9

2016 Commentary and Lessons Learned

- Enbridge markets the Commercial and Industrial Prescriptive Incentive offer through a variety of channels, which include the following:
 - o Mass marketing through the Enbridge website, email blasts, and bill inserts,
 - o ESCs working directly with the end use customer in order to provide expertise and education,
 - o Marketing through a network of industry partners. The market delivery efforts geared to the network of industry partners yield the most significant results. These industry partners include service provers, associations, engineering firms, and distributors.

- In 2016, Enbridge marketed the Prescriptive offer to industry partners through presentations, sponsorships and events, and communication channels, including:
 - o Presentations:
 - Annual General Meetings - Hotel Engineering Facility Managers Association of Toronto (HEAT)
 - Sustainability Partner Meetings – Buildings Owner and Managers Association Toronto (BOMA Toronto)
 - Retail Energy Innovation Workshop - Retail Council of Canada (RCC) and the Professional Retail Store Maintenance Association (PRSM)
 - Educational Days – Canadian Boiler Society (CBS)
 - o Sponsorships and Events:
 - Fall Networking Event – Eastern Ontario Landlord Association (EOLO)
 - MAC Awards - Federation of Rental-housing Providers of Ontario (FRPO)
 - PM Expo – BOMA Toronto



- OMC Workshop - Ontario Association of School Business Officials (OASBO)
 - ACMO CCI-T Conference - Association of Condominium Managers of Ontario (ACMO) and Canadian Condominium Institute (CCI)
 - o Communication Channels:
 - Newsletters - Ontario Restaurant Hotel Motel Association (ORHMA), Ontario Refrigeration & Air Conditioning Contractors Association (ORAC), Greater Toronto Apartment Association (GTAA), and FRPO
- The 2016 Commercial and Industrial Prescriptive Incentive offer is a continuation from previous years, with the following updates in 2016:
- o In an effort to drive increased participation in certain measures, corresponding incentives were increased. The previous rebate did not provide an adequate incentive to offset the measure's incremental cost. Measures that saw an incentive increase in 2016 included: Air Doors (all), Energy Recovery Ventilation/Heat Recovery Ventilation (ERV/HRV), Ozone Laundry, ENERGY STAR Dishwashers and ENERGY STAR Fryers.
 - o The Prescriptive suite of offerings in 2016 introduced incentives for the following technologies: Condensing Furnaces, Condensing Unit Heaters, specified Destratification Fans, Condensing Storage Water Heaters, and Condensing Tankless Water Heaters.
 - o Enbridge increased promotion to support prescriptive incentives in the new construction market. Specifically, efforts focused on infrared heaters and DCVs.
 - o Recognizing the need to identify and target smaller and harder to reach customers, a renewed focus was developed to deliver DSM offers, including the Prescriptive offer, to this audience.
 - Online Resources: In 2016, the successful Industrial Energy Solution Portal, which engaged customers in Enbridge offers

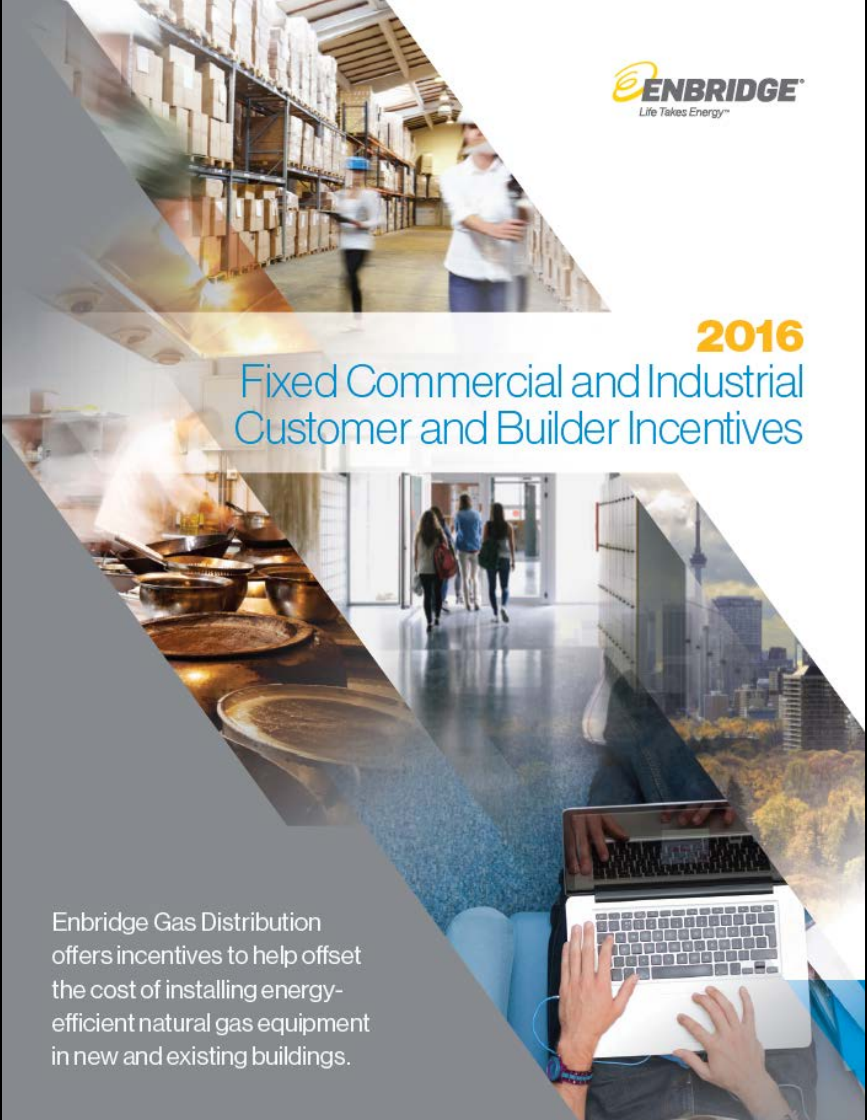


through education, tools, and resources, was leveraged to include the Prescriptive offer. Enhancements were made to the Portal in order to make the web platform appeal to a broader audience, which might be less technical than the traditional large Industrial customer.

- **Business Partner Network Database:** In an effort to better leverage potential delivery channels, qualitative research was conducted through phone calls and emails that resulted in the creation of a database of the channel partners in the small Commercial and Industrial sectors. This allowed the Company to directly target Channel Partners, classified as contractors, distributors, manufacturers, and engineering firms, who have enrolled to receive electronic communication. Specifically, webinars and targeted emails were launched to inform channels and customers of program offers, limited-time offers, sector specific information, and important industry topics (i.e. cap and trade).
- In an effort to provide convenience to customers, Enbridge continues to investigate collaboration opportunities with LDCs by highlighting incentives for dual fuel measures.
 - In 2016, a Demand Control Kitchen Ventilation campaign was launched in partnership with PowerStream. The campaign's objective was to create awareness of the DCKV technology and potential savings available to food service and food sales operations in the Enbridge/ PowerStream franchise areas. Using direct mail, email blasts and outbound calling, 800 customers were contacted; these efforts resulted in over 80 leads for Enbridge.
- Enbridge investigated the application of upstream incentives (providing an incentive at the distributor or manufacturer level to make the price of that equipment more attractive) through qualitative and quantitative research. For the

specific technologies researched, Enbridge concluded that adoption of high efficiency technologies was best achieved through direct engagement with customers and business partners. Enbridge continues to explore measures that may be suitable for upstream incentivizing.

- Enbridge has had success leveraging relationships with various associations to disseminate offer information to a mass audience and will continue to collaborate with associations such as ORAC and HRAI moving into 2017.



2016
Fixed Commercial and Industrial
Customer and Builder Incentives

Enbridge Gas Distribution offers incentives to help offset the cost of installing energy-efficient natural gas equipment in new and existing buildings.



5.25 Commercial and Industrial Direct Install

Objectives	As an expansion to the Prescriptive offer, the primary goal of the Direct Install offer is to more effectively reach the small Industrial and Commercial market segments, who remain reluctant to participate in DSM offers. The Direct Install offer, intends to extend the reach of fixed incentive DSM offers by largely supporting the cost and installation of specified measures.
Target Customer	The Commercial and Industrial Direct Install offer is intended for smaller Commercial and Industrial customers in Rates 6, 110, 115, 135, or 145, though larger customers are not precluded from participation.
Metrics	As part of the Resource Acquisition program, the primary metric for the Commercial and Industrial Direct Install offer is lifetime natural gas savings - CCM savings. Commercial and Industrial customers are divided into Large and Small Volume customers. Large Volume Commercial customers are defined as having a three year average annual consumption of greater than 75,000 m³/year. Small Volume Commercial customers are defined as having a three year average annual consumption of less than 75,000 m³/year. Large Volume Industrial customers are defined as having a three year average annual consumption of greater than 340,000 m³/year. Small Volume Industrial customers are defined as having a three year average annual consumption of less than 340,000 m³/year.
Offer Description	The Direct Install offer is a “turnkey” solution that makes it easy and affordable for the targeted customers to increase their energy efficiency. Enbridge and its selected contractors assist customers in



	their decision making processes, beginning with an assessment of the customer's current equipment and concluding with the installation of eligible, efficient equipment. Direct Install offers are such that measures are incented up to 100% of the cost of the equipment and installation. In 2016, Enbridge's Direct Install offer focused on Air Curtains. Air Curtains provide a stream of downward blowing air which prevents outdoor air infiltration. Air Curtains are commonly used on openings to the outdoors or to unheated portions of a building that need to remain open because of high traffic volumes or because of the inconvenience of constant door movement. They are suitable for installation in warehouses, manufacturing, industrial, or retail buildings with forced air space heating.
Cost-Effectiveness	The Commercial and Industrial Direct Install offers were cost-effective, as supported by the TRC-Plus screening summarized in Table 5.10.
2016 Results	As summarized in Table 5.10, Commercial and Industrial Direct Install measures totaling 345 units contributed 79.16 million CCM.

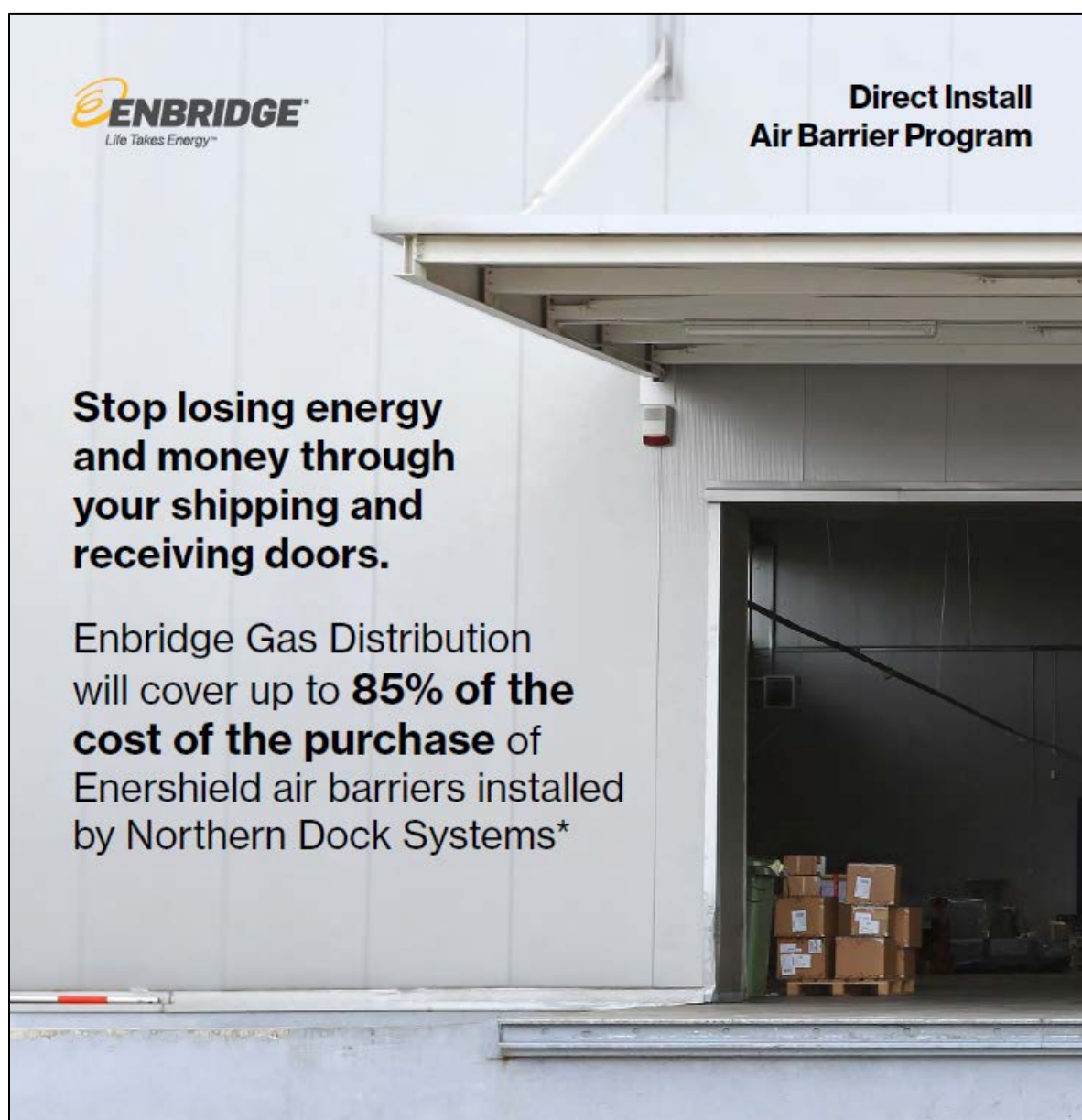
Table 5.10 2016 Commercial and Industrial Direct Install Results

Resource Acquisition	2016 Net CCM (m³)	# of Projects	# of Units	TRC-Plus Ratio	PAC Ratio
<i>Direct Install</i>	79,163,595	129	345	10.8	5.2

2016 Commentary and Lessons Learned

- 2016 was the first year that the Commercial and Industrial Direct Install offer was available to Enbridge customers.

- In assessing measures suitable for a Direct Install offer, the Company analyzed prescriptive technologies and determined that Air Curtains provided a good market opportunity to effectively serve the smaller Commercial and Industrial market segment cost-effectively. Though the existing Prescriptive offer provided an incentive for Air Curtains, the upfront cost of installation was a barrier for small Commercial and Industrial customers. In addition, these customers typically lacked the technical expertise and resources required to select a quality product and qualified contractor.





- In continuing efforts to engage the historically hard-to-reach small customer segment, this offer specifically targeted small customers who had never participated in the DSM program previously by providing an upfront financial incentive, a prequalified product, and an experienced installation contractor.
- In order to qualify for the offer, participants were expected to undertake an energy efficiency audit of their facility. These efforts benefitted the customer as the audits helped Enbridge further identify and evaluate energy efficiency opportunities within the facility.
- The Direct Install offer was successful because the total solution approach was important for Commercial and Industrial customers who typically have budgetary, personnel, and technical knowledge constraints. Moving forward, Enbridge intends to continue to evaluate other technologies to assess their suitability for a Direct Install approach.



5.26 Energy Leaders Initiative

Objectives	The intention of the initiative is to review, determine, and support areas for incremental energy efficiency activity among customers who are deemed energy leaders and are interested in exploring innovative ways to achieve energy efficiency.
Target Customer	The Energy Leaders Initiative is intended for energy leaders in the following rate classes: Rates 6, 110, 115, 135, 145, and 170.
Offer Description	The Energy Leaders initiative focuses on early adopters of new and emerging technologies. The initiative is intended to provide these early adopters increased incentives for implementing new and innovative technologies. In its first year, Enbridge focused efforts on an emerging ice resurfacing technology to test the market. <u>Emerging Technology – Ice Resurfacing</u> A new Ice Resurfacing approach was promoted in 2016 as a means of supporting early adoption of an emerging technology in the commercial recreational ice arena sector. The Ice Resurfacing method uses a high precision de-aeration process to remove micro-air bubbles from water when laying or resurfacing ice in arenas. This process does not require heated water traditionally required in building or resurfacing ice pads. Ice resurfacing practices have been well established for decades in a manner that provides a high quality of ice. In exploring new resurfacing approaches and in consideration of the cost of the technology, facility managers needed assurance that ice quality would not be compromised. Consequently, the market uptake for the Ice Resurfacing technology was challenging and required strong implementation support to change long standing practices.



Results	As summarized in Table 5.11, there were four projects completed in the Energy Leaders Initiative in 2016, which contributed 0.67 million CCM.
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Table 5.11 2016 Energy Leaders Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects	TRC-Plus Ratio	PAC Ratio
<i>Energy Leaders</i>	671,186	4	1.5	1.4

2016 Commentary and Lessons Learned

- In total, four ice resurfacing projects were completed in 2016. Given the seasonality of the technology, Enbridge plans to continue this offer into the 2017 winter and spring season.
- Enbridge completed two case studies of ice resurfacing technology, which are available on the Enbridge website. George Bell Arena and De La Salle College Arena were selected for the case studies, which promote the benefits emerging technology through existing communication channels, manufacturers, and industry associations.
- The aim of the Energy Leaders Initiative is to investigate the implementation of emerging technologies with customers who are responsive to new opportunities to improve their energy efficiency, and then apply the learnings such that the technology can be delivered to a larger audience. The participants in the adoption of the Ice Resurfacing technology were able to benefit from gas savings, and as a result, this technology will be offered to other DSM participants.
- Enbridge intends to move forward with promoting the technology as part of the Custom offer in 2017.

Enbridge Gas Distribution

Case Study

George Bell Arena



New Cold Water Resurfacing Technology is a Game Changer

"Enbridge's rebates were the saviour for our rink. They allowed us to take advantage of this new cold water resurfacing technology with a payback of less than a year."

Larry Woodley, Facilities Manager
George Bell Arena

George Bell Arena in Toronto's west end is a City of Toronto facility that provides quality ice all year round for amateur hockey games. The arena's non-profit board has a mandate to keep costs down to ensure affordability for its user groups. With ice arenas one of the biggest contributors to the city's energy use, board and staff also have a laser focus on reducing environmental impacts.

By 2016 George Bell's facilities manager, Larry Woodley, had already undertaken a number of energy efficiency upgrades at the aging facility including desiccant dehumidification, a lighting makeover, and a building automation system for the compressors. But energy costs were still rising.

Woodley knew that water heating was a major energy driver. In busy season their single rink is in use 62 hours a week and is flooded every 50 minutes. Each flood was using 150 gallons of water heated to 160°F (71°C).

The **REALice** system offered a solution. This emerging technology enables arenas to use cold rather than hot water for resurfacing the ice sheet. It is a method that delivers both natural gas and electricity savings. But there were two concerns. First that it would be a significant investment for the cost-conscious facility. Second, could it ensure the same high ice quality that was the pride of arena staff. Cold water resurfacing was gaining momentum worldwide but no other Toronto arena had installed it, so this would be its first test in the city.

Enter Enbridge's **Energy Leaders** initiative. This incentive program was set up to promote early adoption of emerging technologies among commercial and industrial natural gas customers. By participating in the program George Bell Arena qualified for a rebate to cover 50% of the cost of the **REALice** technology.

The **REALice** system was installed in early December 2016 and was up and running for the prime season. Utility bills dropped dramatically from the first months. Based on an average weather year Enbridge estimates annual natural gas savings of 14,366 m³ — around 21% reduction in overall use. There are also substantial electricity savings because the ice surface can be maintained at minus 6°C with a higher brine set point and that means fewer compressor runs. Load on the dehumidifier is also reduced. It's a big boost to the facility's environmental profile.

Best of all ice quality is outstanding — the new sheet is harder and clearer than previously. User groups are happy and ice resurfacing staff have given the new system a thumbs up.

REALice System de-aerates water without heat

The **REALice** System, developed in Sweden and distributed in Canada by SWiCH Services Inc, eliminates the need for hot water to resurface ice — without any chemicals, filters or additional energy input. A specially designed valve, installed upstream of the resurfer's feeder hose, features intake holes positioned to create a powerful vortex or swirling action that separates the micro-air bubbles from the incoming cold water.

George Bell arena staff easily installed the **REALice** system themselves. The compact wall-mounted unit is a space saver in the arena's small equipment room.

Results¹

- Estimated 14,366 m³ annual natural gas savings
- 53,320 kWh annual electricity savings
- CO₂ (greenhouse gas) reduced by 27,000 tonnes over the life of the unit
- \$17,440 Enbridge **Energy Leaders** incentive

Utility cost savings amount to several thousand dollars annually. The Enbridge incentive reduced the payback of the project at George Bell arena to less than one year. But even without incentives, energy savings can pay for a **REALice** installation in 2 to 3 years at a single pad arena and 1 to 2 years for twin rinks using a single water feed.

¹Enbridge models natural gas and electricity savings based on average temperatures over the course of a year. Actual savings will vary with weather conditions.



Enbridge Energy Solutions Consultant, Daniel Duhamel, being shown the compact **REALice** installation by Facilities Manager, Larry Woodley

Take advantage of our Energy Leaders offer

Enbridge's new **Energy Leaders** initiative rewards and showcases our commercial and industrial customers who install leading edge technologies for incremental energy savings.

The initiative is aimed at customers who have already installed typical conservation measures and want to gain further energy savings. If you have identified an innovative technology that you would like to explore or if you would like some help to identify and assess new energy saving technologies for your facility, contact your Enbridge Energy Solutions Consultant.

Eligible projects can qualify for incentives of up to 50% of the project cost.

For more information:

☎ 1-855-659-0549

✉ energyservices@enbridge.com



5.27 Small Commercial New Construction

The Small Commercial New Construction pilot was proposed to provide small commercial builders and owners access to cost-effective energy modelling alternatives that would encourage builders to build to a higher level of energy efficiency. This offer was intended for commercial buildings that are too small to satisfy the size requirements of the Company's existing Savings by Design Commercial offer. Incentives were intended to help participants cover the costs of modelling including incentives for achieving energy efficiency targets.

The blanket 10% increase of 2016 targets as prescribed in the Board's Decision created implications for the Company's incentive budgets. As outlined in Enbridge's DSM Plan (2015 to 2020) Written Comments and Draft Accounting Order⁶ dated February 3, 2016, the Company advised the Board that particular offers may need to be reconsidered, such that "monies ... be directed from other programs to pay participant incentive amounts." The Company found itself in a challenging position where it was unable to meet its new targets without additional budget to payout incentives. The Company believed the value for rate payers was more certain by not launching the pilot in 2016, and instead using the budget to pursue results in other program offers that have been fully designed, launched, and evaluated for cost-effectiveness. As a result, the Company reassessed the portfolio giving priority to opportunities that the Company believed would maximize results and best serve rate payers. As a result funds from the Small Commercial New Construction pilot were reallocated to offers currently in market.

⁶ Enbridge Gas Distribution Inc. (File: EB-2015-0049) Multi-Year Demand Side Management Plan (2015 to 2020) Written Comments and Draft Accounting Order, February 3, 2016.



6. Low Income Scorecard

Enbridge is a leader in the delivery of energy efficiency programs specifically designed for low income customers. Programming has evolved considerably since DSM activities for this market were first offered in the Enbridge franchise in 2004.

Low Income offers are set apart to recognize the unique needs of their target customer base. Although the offers may result in a lower benefit/cost ratio, Total Resource Cost, than similar offers delivered to non-low income customers, they are expressly designed to address the needs of these consumers and include other important societal benefits.

Design and delivery considerations for this segment have been unique and as such, Enbridge has adopted non-traditional approaches to effectively reach these vulnerable customers, raise customer awareness, encourage resident and building staff engagement, and in turn, build participation. Enbridge's delivery strategy for the Low Income sector focuses on leveraging available channels and resources, community-based organizations (CBOs) and local community service providers. These groups have established relationships with trusted organizations that support the social service needs (housing affordability and environmental sustainability) of low income consumers.

The Company has also been particularly effective in building collaborative partnerships in the marketplace with LDCs and municipalities. Enbridge has recognized the benefits of collaboration with these partners, as well as with social and assisted housing support networks, in helping to inform and improve program delivery. Proactive stakeholder and customer relationship management has led to continuous program improvement and the refocusing of program strategies to be responsive to housing providers' needs and the evolution of affordable housing.

In the past, Enbridge's Low Income offers have primarily focused on the full funding and installation of energy efficient equipment or measures. In 2016, the Low Income Program expanded to include an offer similar to Enbridge's existing Savings by Design



offer. With available government funding for low income new construction, Enbridge recognized the opportunity to work with low income builders to encourage higher energy efficiency in the design of these buildings. Consequently, in 2016, Enbridge introduced the Low Income New Construction (“Affordable Housing New Construction”) offer. This offer aims to work with municipalities, as well as community housing providers, and low income builders and developers to encourage energy efficiency in new construction projects.

The 2016 Low Income Program is now comprised of three offers. In addition to Low Income New Construction, as in previous years, Low-Income Multi-Residential (targeting Part 3 buildings) and Low Income Single Family (targeting Part 9 buildings) both continue to focus on reducing the energy costs facing low income customers and their housing providers through the installation of measures and thermal envelope improvements to achieve water and space heating savings.



Want to lower your
ENERGY COSTS?
ENBRIDGE CAN HELP.

Enbridge Gas Distribution is committed to helping social and assisted housing providers save energy and money, while at the same time improve comfort for their residents.

We can help you manage your energy use and reduce your operating expenses.

Our special incentive offers are available on retrofit installations that result in natural gas savings for projects completed by December 31, 2016.

To learn more, visit www.enbridgegas.com/affordablehousing
or www.enbridgegas.com/winterproofing.

Incentives are available only to program eligible Enbridge Gas customers.





The Low Income program exhibited strong results in 2016 relative to overall scorecard performance targets, as outlined in Tables 6.0 and 6.1. Results in the Multi-Residential (Part 3) segment were strong, exceeding the target and totalled 84.73 million CCM in natural gas savings. The Low Income New Construction offer achieved its target of six participants in its first year in market.

Table 6.0 2016 Low Income Scorecard

Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Single Family (Part 9)	Cumulative Savings (million m ³)	45%	23.84	31.79	47.69	28.81
Multi-residential (Part 3)	Cumulative Savings (million m ³)	45%	48.68	64.90	97.35	84.73
New Construction	Participants	10%	5	6	9	6

Table 6.1 2016 Low Income Results

Low Income Component	2016 Net CCM (m ³)	# of Projects	# of Units	TRC-Plus Ratio	PAC Ratio
Single Family (Part 9)	28,814,754	1700 ¹	656 ²	1.1	0.9
Multi-Residential (Part 3)	84,728,581	125 ³	622 ⁴	3.4	5.5
Total/Average	113,543,335	1,825	1,278	2.0	2.0

1. # of Projects summarizes the number of unique projects for Home Winterproofing and prescriptive offers.

2. # of Units summarizes the number of units installed for prescriptive offers.

3. # of Projects summarizes the number of unique projects for custom and prescriptive offers.

4. # of Units summarizes the number of units installed for prescriptive offers.

All Low Income offers delivered to Enbridge customers in 2016 will be continued in the Low Income DSM program in 2017. Details regarding individual offers are discussed below.

6.1 Single Family (Part 9)

Home Winterproofing and Prescriptive Measures

Objectives	The goal of the Single Family Low Income offer is to enable energy savings through the reduction of hot water use and space heating demand in low income single family households through the installation of thermal envelope improvements, space heating and water saving measures. The Home Winterproofing offer aims to reduce energy costs for Part 9 low-income households by increasing the energy efficiency of their homes, while addressing comfort and some health and safety matters within the homes.
Target Customer	The Home Winterproofing offer targets social housing and assisted housing, and income qualified customers residing in low-rise buildings (Ontario Building Code (OBC, the “Code”) Part 9). This offer targets Rate 1 homeowners and tenants within the Enbridge franchise area who need assistance with their energy costs. Income verification is a requirement for participation in this offer. Eligible Enbridge customers must meet the following criteria: • Income is at or below 135% of Statistics Canada's Low Income Cut-Off (LICO) or tenants reside in social and assisted housing, regardless of gas bill payment responsibility; • Occupants of single detached and low-rise multi-family (3 stories or less); and • Private homeowner or tenant who pays their own gas bills.
Metrics	The primary metric for the Home Winterproofing offer is lifetime natural gas savings - CCM savings.



Offer Description	The offer provides a free home assessment and weatherization services (i.e., insulation and air sealing) to qualified Enbridge customers who meet income and customer eligibility criteria. As a direct install offer, there is no financial cost to the participant for the energy assessment or for the weatherization products and services provided. As a health and safety value-add on, a carbon monoxide monitor is included where one is not present in the home. At the time of assessment, the home is also prequalified for water conservation measures (e.g., showerheads and aerators) as well as a programmable thermostat, and heat reflector panels. Customers that qualify for the Board's Low Income Emergency Assistance Program (LEAP) or the LDC delivered Home Assistance Program (HAP) initiative automatically meet the income eligibility requirements of the offer. Enbridge promotes the Home Winterproofing offer through community based organizations, which have strong relationships with low income interest groups and are well entrenched and trusted within the communities that they serve. Enbridge delivers the offer through selected qualified Delivery Agents who are responsible for designated areas within the Company's franchise area. For each project, documentation is submitted by Delivery Agents summarizing installation site information (e.g., address, ownership, housing type) and natural gas savings (m³). Natural gas savings claims are determined based on pre and post HOT2000 modelled consumption. These customized energy audits are conducted by energy auditors for income qualified participants. Documentation includes:



	• A completed pre and post audit data collection sheet • Work order including work proposed to be carried out • Cost estimate for suggested authorized retrofits • HOT2000 pre and post audit files • Pre and post project photos • Completed participant agreement/acknowledgement form Participation is tracked by type of tenancy (i.e., social housing or privately-owned dwellings). Similarly, monthly reporting is provided by delivery agents and summarizes unit installations for any prescriptive measures installed.
Cost-Effectiveness	Low Income programs are often amongst the most expensive to deliver. As per the Guidelines, the Low Income program screening threshold is 0.70; the Low Income Part 9 offer was cost-effective as supported by the TRC-Plus and PAC screening in Table 6.2.
2016 Results	In 2016, actual cumulative savings for single family (Part 9) were 28.81 million CCM, as outlined in Table 6.2. These results exceeded the lower target of 23.85 million CCM. The Enbridge Home Winterproofing offer reached 1,512 low income households in 2016. Some of these homes also received basic prescriptive measures including showerheads and aerators where appropriate.

Table 6.2 2016 Single Family (Part 9) Low Income Results

Low Income Component	2016 Net CCM (m ³)	# of Projects ¹	# of Units ²	TRC-Plus Ratio	PAC Ratio
<i>Single Family (Part 9)</i>	28,814,754	1,700	656	1.1	0.9

1. # of Projects summarizes the number of unique projects for Home Winterproofing and prescriptive offers.

2. # of Units summarizes the number of units installed for prescriptive offers.

Table 6.3 Home Winterproofing – Breakdown of Results

Low Income Component	2016 Net CCM (m ³)	# of Projects ¹	TRC-Plus Ratio	PAC Ratio
Home Winterproofing				
<i>Private</i>	16,993,553	803	1.1	1.0
<i>Social Housing</i>	11,771,021	709	1.1	0.8
Total/Average	28,764,574	1,512	1.1	0.9

1. # of Projects summarizes the number of unique projects for Home Winterproofing.

2016 Commentary and Lessons Learned

- A total of 1,512 homes participated in the Home Winterproofing offer in 2016, of which 803 were private homes and 709 were social housing properties, as outlined in Table 6.3.
- Despite challenges onboarding social housing providers, due to their internal board approvals and upfront engagement efforts to obtain resident support, Enbridge continues to diligently work with these stakeholders given the remaining opportunities in most regions within this segment. However, almost all social housing units that were eligible for retrofits in the Ottawa geographic territory have been depleted.
- Enbridge received Ottawa Community Housing's (OCH) Partnership Award on May 12th, 2016. This award was presented to Enbridge and EnviroCentre by the OCH Board of Directors in appreciation for all the improvement work completed in that community through Enbridge's Home Winterproofing Program.
- In 2016, Enbridge and the United Way of Simcoe Muskoka improved the process where LEAP customers have the opportunity to participate in the Home

Winterproofing offer when applying for LEAP. The agency promoted Home Winterproofing to the customer and if interested, the agency filled out the application form on the United Way's database, similar to Enbridge's online application form. The application was sent directly to the Delivery Agent in the customer's area for follow-up.



**Yes, it's free.
No catch.
Just coziness.**

Prepare your home for winter by applying to our Home Winterproofing Program. If you qualify, you can save and stay that much warmer during the long winter months. Now that's something to cozy up to.

Increase comfort
We want to help you afford home improvements that will keep you warm and comfortable

Be healthier
Living in drafty conditions can be hard on your health. Fewer drafts mean a more comfortable home for you and your family.

If you qualify, you could receive

New insulation and draft proofing installed by experienced professionals.

Enjoy savings of up to 30% of your energy use and lower energy bills.

This program is absolutely free to all homes that qualify. Enbridge will pay for the cost of energy saving improvements such as insulation and draft proofing preventing against cold drafts that are common in old homes. We want to help you afford home improvements that will keep you warm and comfortable.

We see the greatest energy savings in homes that are 35 years and older.

How to qualify

In order to qualify for this great program, you will need to meet the customer and income requirements described below:

- 1** Is your home heated by natural gas?
- 2** Are you a customer of Enbridge Gas Distribution?
- 3** Do you pay your own natural gas bill?

How to apply

- 1**  Visit winterproofing.ca and complete the online Program application form then submit the form to the Program Delivery Agent in your Area. The Program Delivery Agent will contact you within a few weeks.
- 2**  Call the Enbridge Program Delivery Agent in your area. They may be able to pre-qualify your home over the phone.
 - Signed application, proof of income
 - The account number on your gas bill
 - A copy of your last income tax assessment or benefit statement
- 3**  Mail or fax the attached Program application form to the Program Delivery Agent in your area listed on the back of this brochure.

- As of August 2016, the Home Winterproofing offer included a joint delivery initiative with Toronto Hydro, which is expected to continue through to December 31, 2017. Toronto Hydro and Enbridge are collaborating in this initiative in the delivery of their respective residential Home Assistance Conservation Demand Management and Home Winterproofing DSM Low Income offers, using a single delivery agent in the City of Toronto. The collaboration effort is targeting 400 homes and aims to provide a simplified and enhanced customer experience. In 2017, Enbridge will continue exploring opportunities to expand collaboration with other LDCs in the Enbridge franchise area.
- In line with the changing dynamics often seen in the social housing sector, in 2016, some expected completions of Home Winterproofing projects were not realized due to a revised strategy by Toronto Community Housing. In addition, forecasted results from Delivery Agents did not fully materialize. These factors contributed to an underspend in Low Income.
- Enbridge continued to work with Toronto Community Housing on a specialized initiative to identify gas savings opportunities with external cladding technologies. As a result, in 2017 and 2018, it is anticipated that 230 units will benefit from this customized approach through the Home Winterproofing offer. This technology is increasingly being utilized within the social housing sector; it is more feasible and less disruptive to residents versus interior insulation.
- Enbridge Gas Distribution retained a third party evaluator, Econoler, in 2016 to perform a process evaluation of the Home Winterproofing offer. The Econoler Process Evaluation can be found in Appendix C. Some key research objectives included evaluating the offer details and delivery, evaluating the Home Winterproofing database and documentation, determining sources of awareness and customer recruitment efforts, determining the levels of satisfaction, and identifying barriers that affect performance. The process evaluation involved benchmarking against similar offers, as well as surveys and interviews with participants, Certified Energy Auditors, contractors, delivery agents, and social

housing providers. Based on their findings, Econoler provided three recommendations, as follows:

- o Define and monitor program performance indicators, such as the number of customers making applications, projects completed, Social Housing Providers contacted, as well as the customers' levels of awareness and satisfaction related to the program.
- o Further complement the program database with some additional participant information, such as the participants' email address, and the pre-retrofit and post-retrofit house energy consumption values, and
- o Make Social Housing Provider buildings pass a pre-application test for screening purposes related to health and safety concerns, such as moisture, asbestos, or old electric wiring.

Some of the recommendations have been implemented, such as monitoring program performance indicators.

- Looking forward, Enbridge is reassessing the eligibility criteria for this offer as Statistics Canada no longer updates the LICO numbers. Consequently, Enbridge is considering utilizing Low-Income Measure (LIM) as a determinant of income thresholds for program eligibility to be aligned with the LDC CDM program requirements and LEAP.
- Enbridge recognizes the need to support furnace replacements for this sector. However, it is challenging to offer a cost effective program. Enbridge will continue to explore opportunities to support furnace replacement as there is need to assist low income customers who are unable to afford a new furnace.
- Enbridge worked with Delivery Agents to develop a multi-channel marketing plan for 2017. These efforts will focus on engaging private homeowners and tenants and encourage them to participate in the Home Winterproofing Program.

6.2 Multi-Residential (Part 3)

Custom Projects and Prescriptive Measures

Objectives	The goal of the Low Income Multi-Residential (“Affordable Housing Low Income”) offer is to enable energy savings through the reduction of space heating demand and hot water use in Low Income Part 3 Multi-Residential buildings through the installation of thermal envelope improvements, space heating, and water savings measures.
Target Customer	The Low Income Multi-Residential offer is intended for social and assisted housing providers who own and operate Part 3 buildings that provide housing to low income households. In addition, shelters and supported housing are eligible. The offer also targets eligible owners and property managers of privately-owned multi-unit residential buildings (MURBs), based on screening criteria established in collaboration with Enbridge’s Low Income Consultative Working Group, which provide housing to a market that includes low income customers and families.
Metrics	The primary metric for the Low-Income Multi-Residential offer is lifetime natural gas savings - CCM savings.
Offer Description	The Low Income Multi-Residential offer includes the following: • Custom incentives are determined based on projected annual natural gas savings at a rate of \$0.40/m³ saved, up to 50% of the cost of the retrofit. Eligible measures that would result in gas savings include, but are not limited to: - o Boilers – Space and Water Heating; - o Ventilation Systems; and, - o Building Controls.



	As with Commercial custom projects, the savings for each custom project are calculated on an individual basis. Each custom project includes a project documentation checklist that outlines key parameters for the project and applicable supporting documentation to support gas savings calculations. • Prescriptive incentives calculated based on a fixed dollar amount. Eligible measures that would result in gas savings include: - o Condensing boilers; - o High efficiency boilers; - o Energy recovery ventilation systems; - o Heat recovery ventilation systems; and, - o Condensing Water Heaters. • Free in-suite direct install measures will be as follows: - o Showerheads from Enbridge supplied and installed; and, - o Supply and installation of heat reflector panels. • Financial support is also provided to fund half the cost of an energy audit up to \$5,000 per building or \$0.01/m³ of gas consumed in the past calendar year (whichever is less); • Free Gas Savings Opportunity Assessment (similar to an ASHRAE Level 1 Building Assessment); and, • Resident engagement programs. Enbridge outlines the following eligibility criteria for the Affordable Housing offer: • Part 3 Buildings owned and operated by social housing
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	providers as well as privately owned buildings identified as low income; and • Social housing and assisted housing buildings as described in the Housing Reform Act of 2011 and 2015-2020 DSM Framework.
Cost-Effectiveness	As per the Guidelines, the Low Income program TRC-Plus screening threshold is 0.70. The Low Income Multi-Residential – Affordable Housing offer was cost-effective as supported by the TRC-Plus and PAC screening – see Table 6.4.
2016 Results	The Low Income Part 3 Multi-Residential offer achieved strong results in 2016 with 84.73 million CCM natural gas savings. This result exceeded the target of 64.90 million CCM.

Table 6.4 2016 Multi-Residential (Part 3) Low Income Results

Low Income Component	2016 Net CCM (m ³)	# of Projects ¹	# of Units ²	TRC-Plus Ratio	PAC Ratio
<i>Multi-Residential (Part 3)</i>	84,728,581	125	622	3.4	5.5

1. # of Projects summarizes the number of unique projects for custom offers.

2. # of Units summarizes the number of units installed for prescriptive offers.

2016 Commentary and Lessons Learned

- Despite Enbridge providing an increased financial incentive through the Low Income Multi Residential offer above the Commercial Multi-Residential offer for custom projects, the low income sector continues to face inherent financial barriers due to limited capital availability.
- In 2016, the Provincial government introduced assistance through the Green Investment Fund, which has created capital investment opportunities across the sector. Despite the increased available capital, Enbridge continues to be critical



in the implementation of projects through facilitation assistance, technical and financial support.

Enbridge Gas Distribution

Affordable Housing Multi-Residential Program

Upgrade and Save
Investing in efficient equipment will help lower your building energy costs and improve resident comfort.

Receive up to \$100,000 in Incentives
... under our Custom Program when you undertake an energy retrofit to upgrade equipment and improve efficiency.

Free In-Suite Measures
We will install in all eligible units: • Low-Flow Showerheads • Novitherm Heat Panels

Energy Audits
Do an energy audit and receive either half the cost back, up to \$5,000 per building, or \$0.01/m³ of natural gas consumed in the last calendar year (whichever is less).

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Contact Cam Black, your Enbridge Energy Solutions Consultant, at cam.black@enbridge.com

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- The key driver for success and participation across the social housing market is the development and maintenance of strong supportive relationships with staff and management within the Municipal Housing providers. As an example, Enbridge works with Toronto Community Housing (TCH) by hosting regular working group meetings to identify needs and opportunities. Reflector panel installations for instance have provided benefits to both the tenants and the building as a whole beyond energy savings, allowing for not only increased comfort but also improved air quality due to the process of cleaning convectors.
- Delivering the Low Income Multi-Residential offer presents unique challenges, which Enbridge undertakes significant efforts to overcome. For example, there

are often a variety of languages spoken by tenants in these multi-residential buildings and Enbridge works to ensure that the residents are informed of upcoming work. The following flyer shows an entry notification in multiple languages to best accommodate the residents of the building. In this example, tenants are being notified of entry for the installation of a heat reflector panel.

1234 ENBRIDGE ST. Heat Reflector and Radiator Cleaning		
	BENEFITS: Heat reflectors will make your units more comfortable in the winter. Radiator cleaning will help improve the indoor air quality.	Starting _____, 2016 We will be entering your unit to install heat reflectors and clean your radiators at no cost to you. Please move any furniture at least 4 feet (1.2 metres) away from the radiators. If you are not able to move your furniture, please let the superintendent know and we'll make alternate arrangements.
	Questions or comments? Please contact your building's superintendent or email EnergyServices@enbridge.com	
1234 ENBRIDGE ST. Reflector de calor y Limpieza de los radiadores		
	BENEFICIOS: Los reflectores de calor harán que sus unidades sean más confortables en el invierno. La limpieza de los radiadores ayudará a mejorar la calidad del aire interior.	A partir de _____, 2016 Estaremos ingresando a su unidad para instalar los reflectores de calor y limpiar los radiadores sin costo alguno para usted. Traslade los muebles a una distancia de, al menos, 4 pies (1.2 metros) de los radiadores. Si no puede trasladar los muebles, informe a su superintendente y haremos planes alternativos.
	Preguntas o comentarios? Comuníquese al superintendente de su edificio o envíe un correo electrónico a EnergyServices@enbridge.com	
HAGAAJINTA XIGTA Kuleyl Gudbiyaha iyo Nadiifinta Qaboojiyaha		
	FAA'IDOOYINKA: Gudbiyaasha kuleylka waxay qeybahaaga ka dhigi doonaan kuwa raaxo badan qaboobaha. Nadiifinta qaboojiyaha waxay caawin doontaa hagaajinta tayada hawada gudaha. ka caawin doontaa hagaajinta tayada hawada gudaha.	Laga Bilaabo Luuliyo _____, 2016 Waxaan geli doonaa qeybahaaga si aan u gelino gudbiyaha kuleylka waxaana kugu nadiifinaynaa doona qaboojiyaha lacag la'aan. Fadlan dhaqaaji alaab walba ugu yaraan 4 fit (1.2 meter) Haddii aadan awoodin inaad dhaqaajiso alaabtaada, fadlan haa ogaado kormeeraha guud waxaan samayn doonaa diyaarin kale.
	Su'aalo ama faallo? Fadlan laxiriir isduwaha sartaada ama iimail EnergyServices@enbridge.com	
		

- Enbridge continues to recognize the importance of relationships with key stakeholders, including the Low-Income Energy Network (LIEN), Federation of Rental-Housing Providers of Ontario (FRPO), Ontario Non-Profit Housing

Association (ONPHA), and Housing Services Corporation (HSC). Enbridge utilizes these associations to promote programs through webinars, conference sponsorships, and speaking engagements at various events.

- Enbridge collaborated with Toronto Community Housing and Toronto Atmospheric Fund (TAF) to support custom projects highlighting gas absorption heat pumps. This emerging technology is part of a test initiative which will provide one year of monitoring data. Enbridge will be able to use the data and lessons learned from this initiative in order to determine the viability of this technology in future programming for both low income and commercial applications.
- Enbridge collaborated with Peel Living and Ottawa Community Housing to identify capital investments and funding opportunities. In 2016, Enbridge provided Social Housing Apartment Retrofit Program (SHARP) audit funding, which enabled these municipalities to meet SHARP application requirements.
- Enbridge partnered with Summerhill to develop and deliver the Enbridge Private Low Income Laundry Initiative, a cold water wash laundry initiative intended to change tenant behavior through engagement, education, and incentives. The initiative included seven private low income buildings and engaged tenants through education, free samples of detergent, and incentives. The lessons learned from 2016 informed continuation of this initiative. Enbridge received the award for Program Design and Implementation (Residential) at the annual Association of Energy Services Professionals (AESP) conference in February 2017.
- Enbridge will continue to deliver the Low Income Multi-Residential offer in 2017.

6.3 Low Income New Construction

Objectives	The overarching goal of the Low Income New Construction offer is to promote the adoption of higher levels of energy efficiency among developers and builders of affordable housing. This offer is designed to encourage stakeholders to take a proactive role by providing financial incentives and enabling support in incorporating higher energy efficiency levels in affordable housing planning and design. The Low Income New Construction offer aims to increase the efficiency of new construction developments to a level that is above current building code. Affordable housing builders and developers benefit through needed financial support to offset the costs of implementing energy efficiency. In addition, the Low Income New Construction offer provides added benefit to offset the energy costs that are ultimately borne by low income residents or social housing providers.
Target Customer	The offer is specifically directed to builders and developers of residential and multi-residential affordable housing projects. Eligible participants must meet the following criteria: • Developers and builders of new “affordable housing” as qualified by a municipal, provincial and/or federal housing program. • Developers and builders of both single family Part 9 houses and multi-residential Part 3 buildings are eligible to participate.
Metrics	Affordable housing projects enrolled by builders and developers to participate in the offer are eligible to be counted towards performance targets.



Offer Description	The Low Income New Construction offer was originally informed by the Company's Savings By Design offers. However, due to the wide range of builders, types and project sizes, certain offer elements have been modified to meet the needs of the target market. The offer provides financial incentives and extends technical support to assist affordable housing builders in exceeding Ontario Building Code requirements by at least 15%. Enbridge engages the affordable housing community to encourage adoption of energy efficiency measures and technologies as a means to maintain housing affordability. Specifically, in 2016 the Low Income New Construction offer incorporated the following: • Step 1 - Plan Review: The Participant will provide copies of the design plans including mechanical, electrical and lighting drawings and specifications, as available, to Enbridge and its consultants for review and modelling analysis. A plan review summary report is generated for further discussions during the Design Consultation Process. • Step 2 - Design Consultation Phase (DCP): During the DCP, the Participant will participate in a building design team meeting to identify the optimal mix of design elements and technologies to encourage maximum energy efficiency. - o \$7,500 for Part 3 developments - o \$5,000 for Part 9 developments • Step 3 – Part 3 Developments - o Energy Efficiency Design Implementation: Following construction, an “as-built” energy model is completed and an energy performance report is provided to confirm incentive payout, up to a maximum of \$120,000 per building as follows:
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	<table> <tr> <th>Building Energy Efficiency Achieved Above OBC</th><th>Energy Efficiency Implementation Incentive</th></tr> <tr> <td>15%</td><td>\$600.00/unit</td></tr> <tr> <td>15%-20%</td><td>\$750/unit</td></tr> <tr> <td>21%-25%</td><td>\$850/unit</td></tr> <tr> <td>>26%</td><td>\$1,000/unit</td></tr> </table> • Step 3 – Part 9 Developments - o Energy Performance: A further incentive of \$5,000 will be paid to Participants who commit to move forward and design Part 9 OBC residential units which meet the requirements of the ENERGY STAR for New Homes program. • Step 4 - Part 3 Developments - o Commissioning: A building commissioning incentive up to \$15,000 is available to participants. A final commissioning report provided by commissioning agent will initiate the payment. • Step 4 – Part 9 Developments - o Energy Efficiency Design Implementation: An incentive of \$1,500 for each residential home that achieves an ENERGY STAR certification, up to a maximum of \$120,000 per project.	Building Energy Efficiency Achieved Above OBC	Energy Efficiency Implementation Incentive	15%	\$600.00/unit	15%-20%	\$750/unit	21%-25%	\$850/unit	>26%	\$1,000/unit
Building Energy Efficiency Achieved Above OBC	Energy Efficiency Implementation Incentive										
15%	\$600.00/unit										
15%-20%	\$750/unit										
21%-25%	\$850/unit										
>26%	\$1,000/unit										

	Enrollment entails a signed application with an eligible builder or developer committing to participate in the Low Income New Construction offer. Modelling reports for each DCP are maintained to provide a record of information on preliminary estimated savings for each project.
2016 Results	Enbridge was successful in enrolling six affordable housing developments in the Low Income New Construction offer in 2016 that met eligibility requirements and completed the IDP process. This result reached the target.

2016 Commentary and Lessons Learned

- This offer, which was included in 2015-2020 Plan to come into market in 2016, was created as a response to the Federal-Provincial Investment in Affordable Housing (IAH) Program. Through the IAH Program, municipal governments own and develop their own affordable housing plans, and can prescribe action to ensure energy efficiency is a consideration for their affordable housing projects. The Low Income New Construction offer was developed because the IAH Program presented an opportunity to support design and construction of these newly financed projects to achieve increased levels of energy efficiency.
- Due to the multi-year nature of this offer from enrolling a participant through to construction completion, expenditures related to a specific participant are not realized within the same program year. This poses two challenges, as follows:
 - Spending on this offer in 2016 was limited to costs associated with supporting participants through the design phase. However, most of the funding available in the offer is directed towards financial incentives that will be paid upon building completion of the units. As a result, the majority of the budget has yet to be paid out. This underspend has a significant

impact on the Target Adjustment Mechanism (TAM). Specifically, Enbridge's target for 2017 is artificially inflated and unrealistic.

- o The Company had proposed a variance account to hold the funds that remained in the budget, which were intended to pay participant incentives as outlined above. In the Board's Decision, however, this fund was denied and as a result, the 2016 surplus in the Low Income New Construction budget will be returned to the ratepayer as part of the 2017 clearance of accounts. Moving forward, given the nature of the offer, the Company cannot accurately forecast in which year buildings and projects may be completed over 3 to 5 years and receive incentive payments. In a situation where incentive payments materially exceed amounts budgeted, the Company would necessarily have to direct funds intended for new program participants to continuing participants thereby undercutting Enbridge's ability to meet the current year's targets. Enbridge is left in the position to determine how to access the funds to pay participants upon completion of their projects. Enbridge is considering possible options to help remedy this challenge in the 2017 Low Income New Construction offer.

- As the offer is still relatively new, Enbridge retained a process improvement consultant, C2C Strategies. The C2C Strategies report can be found in Appendix D. The consultant conducted interviews with modelers and participants to determine potential improvements for the offer. Some of the consultant's recommendations included the following:
 - o Engaging builders and developers during the earliest stages of project development, before the architects have finalized the design of the building, would improve offer efficiency. In this way, any changes that may be required can be implemented as the architects are creating the design.
 - o Participants in the Low Income New Construction offer would benefit from the introduction of a charrette component, similar to those provided through the Company's Savings by Design offers. First, in the Design



Consultation Phase Meeting, Enbridge's consultant will develop three options for the project based on the Plan Design Meeting. After the developer picks an option, a full-day charrette will take place, involving all experts in order to finalize the outcome of the design.

- o After project consultants complete the project's final energy savings verification and applicants apply for the final incentive, it would be beneficial to review the applicant's experience with ongoing technical support from a project consultant during the Energy Efficiency Design Implementation phase. This feedback will provide insight into the level of necessary support from project consultants through the entire process of the offer.

- Enbridge will move forward in 2017 with consideration of these recommendations and other learnings from participants and stakeholders to continue to refine the offer in its second year in market.

New Construction Program for Affordable Housing



Multi-Residential?

Enbridge Gas Distribution is providing financial incentives and technical support to help affordable housing builders exceed Ontario Building Code requirements by at least 15% and build more energy efficiently. The first step is to complete your application for the New Construction Program.

There are four stages to the program:

Plan Review. Participants provide design plans and specifications to Enbridge for review and analysis. A report is generated for discussions during the Design Consultation Process.

Design Consulting Phase. Teams identify design elements and technologies to maximize energy efficiency. Participants receive a Technical Assistance incentive up to \$7,500* to help offset consultation fees.

Energy Efficiency Design Implementation. Depending on the achieved energy performance of the building once constructed, receive financial incentives depending on the number of housing units, up to \$120,000.*

Commissioning. Participants receive an incentive up to \$15,000* when they meet the requirements for the Energy Efficiency Design Enbridge Implementation incentive and submit their final commissioning report to Enbridge.

Act now! Contact Cam Black at cam.black@enbridge.com

416-758-4748

enbridgegas.com/affordable_housing

* Incentives are based on the building performance as a percentage above the Ontario Building Code. For complete terms and conditions please visit the website.



7. Market Transformation and Energy Management Scorecard

MTEM programs are designed with the aim of influencing consumer behaviour and attitudes in support of reducing energy consumption. MTEM activities focus on enabling fundamental changes that lead to increased acceptance and market share of energy efficient products, services, and practices, and on influencing consumer behaviour and attitudes that support reductions in natural gas consumption.

Enbridge's MTEM program is comprised of five offers. Savings by Design – Residential and Savings by Design – Commercial are directed to the new construction sector, Run it Right (RiR) and Comprehensive Energy Management (CEM) focus on supporting the adoption of a culture of energy efficiency at existing Commercial and Industrial facilities, and the School Energy Competition promotes energy efficiency education by building awareness in the younger generation. The Savings by Design offers and Run it Right are being continued from 2015. The School Energy Competition and Comprehensive Energy Management are new additions to the MTEM scorecard in 2016.

All MTEM offers are aimed at continuing to build awareness and recognition in the marketplace, with the objective of educating and influencing the respective target market groups in support of reductions in natural gas consumption.

Enbridge is pleased to report that 2016 was a successful year with respect to the overall performance of the MTEM Program. Individual offer results are provided below in Table 7.0.



Table 7.0 2016 Market Transformation and Energy Management Scorecard

Market Transformation						
Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Residential Savings by Design	<i>Builders</i>	10%	25	33	50	31
	<i>Homes Built</i>	15%	2,063	2,751	4,127	2,206
Commercial Savings by Design	<i>New Developments</i>	25%	25	33	50	43
School Energy Competition	<i>Schools</i>	10%	41	55	83	25
Run it Right	<i>Participants</i>	20%	62	83	124	84
Comprehensive Energy Management	<i>Participants</i>	20%	5	7	11	7

All of the offers will be continued in 2017. Details regarding individual offers are discussed below.

7.1 Savings by Design – Residential

Objectives	The goal of the Savings by Design (SBD) Residential offer is to demonstrate to builders the potential for achieving higher levels of energy and environmental performance through the application of alternative design approaches through the use of an Integrated Design Process (IDP). In order to realize the potential that the IDP demonstrates to the builder, performance incentives are provided. These incentives encourage the construction of new homes to an energy efficiency standard 25% above the level prescribed in the 2012 OBC. The Residential SBD offer is intended to help builders see the value of the IDP approach, and encourage adoption of higher efficiency design on an ongoing basis.
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Target Customer	The offer targets builders and designers of new, Part 9 residential low rise houses (townhouses, semi-detached and detached homes) in the Enbridge franchise area. The intent is to engage builders who construct multiple homes in a given year. Ultimately, Rate 1 Residential customers who purchase these properties will be the beneficiaries of better designed, more energy efficient homes.
Metrics	There are two metrics for SBD Residential. The first metric tracks the number of eligible builders/developments that enroll and take part in the IDP process; the second metric tracks the number of homes built to the SBD specifications over the course of the year.
Offer Description	SBD Residential is designed to provide a variety of support activities for builders of new homes from the early design phase through to construction. The primary means to educate and change the marketplace remains the IDP. The SBD offer incorporates a total energy approach, as opposed to a gas only approach in encouraging builders to build to higher levels of energy efficiency. Savings by Design is a process-based approach involving: • Visioning Session – to define the builder’s sustainability priorities and opportunities; • Integrated Design Process Session – to identify and evaluate strategies to meet the builder’s sustainability goals and the SBD energy reduction target of 25% beyond 2012 OBC through application of energy modelling; • Building Energy Modelling – to evaluate energy performance baselines and proposed improvements. This SBD consultation process involves connecting participating design teams with leading industry experts and other stakeholders to encourage improved approaches to energy and environmental



	performance. Through this process, the team works with the builder to explore opportunities to achieve higher energy performance. Starting with the building envelope (windows, wall structure, insulation) and moving inward with HVAC mechanicals and lighting, the Savings by Design team guides the builder through a design process to achieve a modelled building that performs to at least 25% better than the 2012 OBC. In addition, depending on the specific priorities identified during the visioning session, experts from fields such as lighting, storm water management, sustainable land-use planning, indoor air quality and renewable energy can be engaged to provide further value to the IDP. Channel Consultants maintain regular contact with builders to follow up on builder commitments, to ensure energy audits are completed, and required documentation is submitted as required for the builders to receive incentives. Commitment letters and eligibility documents along with IDP reports are tracked for all participants and a third-party service provider undertakes testing and verification to ensure that constructed homes are built with 25% greater energy efficiency than required under the 2012 OBC to support incentive payments. As introduced in the 2015-2020 DSM Plan, beginning in 2016, builders are permitted to participate in SBD for identified subdivisions or developments. The Company has established a descending incentive scale for continued participation. Performance incentives for the offer are as follows: • Builders that complete the IDP portion of the offer for the first time are eligible to receive \$2,000 per home completed to the SBD standard (up to 50 homes);
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	• Builders that complete the IDP portion of the offer for the second time are eligible to receive \$1,000 per home completed to the SBD standard (up to 100 homes); • Builders that complete the IDP portion of the offer for the third time are eligible to receive \$500 per home completed to the SBD standard (up to 200 homes). A repeated incentive over time better supports the sustainability of a market change. An incentive that is reduced each time a builder goes through the SBD process allows participants to apply the IDP across their portfolio considering different communities or developments.
2016 Results	As illustrated in Table 7.0, Residential SBD was successful in enrolling 31 builders who completed the IDP process in 2016. In addition, for builders who have enrolled in SBD and completed the IDP process, there were 2,206 new homes constructed in 2016 through this initiative with features consistent with SBD standards of 25% above 2012 OBC (as illustrated in the builder's IDP) in relation to the completed units metric.

2016 Commentary and Lessons Learned

- The overarching goal of the Savings by Design Residential offer has been to encourage the design and construction of more efficient homes. In 2016, the effort expanded from educating builders and encouraging the building of better homes to designing and building better communities. To support this goal, the offer was revised (as outlined in the Board approved Plan) to permit builders to participate in the SBD process for successive developments.
- Builders who participate in the IDP benefit from educational content and design considerations that are customized for each builder's development. Specifically, the visioning session is intended to help identify the technologies suitable for

each development. In turn, the appropriate panel of experts is assembled to explore opportunities and design considerations.

- SBD experts are providing education, technical expertise, and incentives to assist builders in the challenging task of moving toward Net Zero. In the meantime, Enbridge is supporting the builder in preparing for the next building code change by transforming the market before code changes come into effect.
- In 2016, Savings by Design won the Quality Urban Energy Systems of Tomorrow (QUEST) Smart Energy Community Award for Utility and Energy Service Providers. QUEST presented the award to recognize leadership and innovation in advancing Smart Energy Communities in Canada.
- Ontario, and in particular the GTA, has experienced a seller's real estate market in recent years. New housing has been in high demand, and consequently builders have not appreciated the value in building to specifications beyond code requirements. The SBD team has worked to inform builders of the advantages of the offer and has been successful convincing builders that improving energy efficiency above building code can be a competitive market tool with added value to the consumer.
- In some municipalities, builders participating in the SBD offer have benefitted from the added value of experiencing a reduction in processing time for building permits as the municipality has recognized that these builders are designing and building homes that are above the required building code as a result of the SBD offer.



Get the support you need to build more energy efficient homes.

The demand for energy efficient homes is increasing and building codes are getting stricter. Enbridge can help. Our **Savings by Design (SBD) program** gives you the support you need to construct sustainable homes beyond code requirements.

To get started or to learn more, visit residential.savingsbydesign.ca

Build  SAVINGS BY DESIGN™

 ENBRIDGE™
Life Takes Energy™

To qualify for the program, your project must be located in the Enbridge Gas Distribution franchise area. Participation is a three-year commitment. During that time, builders are expected to design and construct at least one new construction home based on resulting recommendations. In order to receive incentive payments, you must agree to all program terms and conditions, must fully participate in all stages of the program and must meet all program requirements.

- SBD has been well received by the builder community Feedback from participants continues to confirm that the SBD offer provides builders with an effective and focused facilitation and encourages builders to achieve energy efficient building goals. In addition to the IDP process, funding has assisted the efforts of builders to continually improve. In January 2017, Ontario Building Code requirements will increase energy efficiency from the 2012 Code. As a result, the Savings by Design Residential offer will continue in 2017 as it becomes more difficult to build to code, let alone above code, however, Enbridge will change the offer requirement to 15% greater energy efficiency than required under the 2017 OBC as outlined in the Company's Multi-Year DSM Plan 2015-2020.⁷

⁷ EB-2015-0049, Exhibit B, Tab 2, Schedule 1, Page 57 of 100



7.2 Savings by Design – Commercial

Objectives	The goal of the Commercial Savings by Design offer is to use the Integrated Design Process to demonstrate to builders of commercial and multi-residential buildings the potential for achieving higher levels of energy and environmental performance through the application of alternative design approaches. The offer supports participants in this process with incentives that encourage builders to use the knowledge gained in the IDP to design and build buildings that are more energy efficient. Enbridge expects that Commercial SBD will help builders see the value of the IDP approach, and encourage adoption on an ongoing basis. In 2016, the goal of SBD Commercial is to increase the number of buildings built to 25% above the 2012 OBC in the new construction market, while also preparing builders for the upcoming Code update in 2017.
Target Customer	This offer is targeted at builders and designers of new, Part 3 commercial buildings in the Enbridge franchise territory. Enbridge targets its promotional activity to owners, builders and developers, design teams including architects, design engineers and energy modelers.
Metrics	Builders and developers who enroll in the offer and complete the IDP process are eligible to be counted towards performance targets. Metrics are based on the number of projects to which a developer commits. Eligibility criteria include the following: • Commercial, multi-residential or industrial buildings covered under the Ontario Building Code Part 3; • A minimum threshold of 50,000 square feet per project (including aggregate multi-location projects);



	• Building(s) must be within Enbridge's franchise area, or for aggregate projects 75% of the project square footage must be in the franchise area; and, • Building(s) must be in the design phase such that they have the flexibility of making design changes as recommended through the process.
Offer Description	The SBD Commercial offer is delivered by an internal sales team directly to builders and developers. The offer consists of an Integrated Design Process and continues with post charrette support. The IDP is comprised of a Visioning Session and a charrette, which addresses energy efficiency, site sustainability, sales and marketing, design commissioning, energy modelling, and additional educational support as required. The IDP culminates with a final SBD report. The offer also provides for performance incentives. With the finalization of a pre-construction certified energy model demonstrating that the building will be built 25% above the 2012 Code, along with final design stage plans and specifications, builders are eligible to receive \$15,000. Upon completion of a post-construction certified model demonstrating that the building has been built 25% above the 2012 Code, along with the final certified commissioning report, builders are eligible to receive \$15,000. Enrollment entails a signed memorandum of understanding with a builder or developer containing a commitment to participate in the Commercial Savings by Design offer and participate in the IDP. The builder commits to constructing building(s) to the IDP standard within five years in order to receive performance incentives. Enbridge Channel Consultants maintain regular contact with builders to track project status to project completion. Charrette reports for each IDP



	are maintained to provide a record of information on preliminary estimated savings for each project.
2016 Results	As illustrated in Table 7.0, Enbridge was successful in enrolling 43 new developments in 2016 that met eligibility requirements and completed the IDP process. This result exceeded the target.

2016 Commentary and Lessons Learned

- Extensive promotion throughout the industry on behalf of Enbridge consultants has resulted in increased recognition of the Savings by Design Commercial offer within the new commercial construction sector. Participation in the offer has become a marketable achievement to showcase the pursuit of energy efficiency and can be a selling feature for properties.
- The offer continues to receive positive feedback from builders. For example, a letter was received from a participant, who shared the following: *"... we are very grateful to the program as well as all of the support that has been provided by it. The one-day design charrette proved extremely valuable in helping us to develop an exceptionally energy efficient design for our building, and the incentives that have been made available from this program have allowed us to further validate our participation in the program, and in our energy efficient design choices."*
- In an effort to continue to build offer awareness throughout the building community, Enbridge has undertaken significant efforts to build relationships through industry associations and sponsorship support as a primary channel to market. SBD has been offered for five years and has evolved to include projects across the building industry, such as multi-residential buildings, academic and government facilities, and hospitals. Enbridge also increased its focus on adult lifestyle and long term care facilities in light of increased government support in this sector.



- In 2016, SBD was particularly successful in enrolling apartment building projects due to the increasing need to keep utility costs down for owners and operators. Working with these developers in the early design stages of their projects, when changes have a lower associated cost, has been a successful strategy for achieving higher energy efficiency.
- The SBD offer aims to inform participants that achieving higher energy efficiency can be both economical and sustainable. Builders want to take steps to be more energy efficient, particularly in light of increased pressure from local municipalities, but many do not have the knowledge to construct energy efficient buildings. The Savings by Design Commercial offer provides education and expertise to highlight existing and new technologies to achieve energy efficiency for Commercial new construction stakeholders.
- As noted previously, in 2016, Savings by Design won the Quality Urban Energy Systems of Tomorrow (QUEST) Smart Energy Community Award for Utility and Energy Service Providers. QUEST presented the award to recognize leadership and innovation in advancing Smart Energy Communities in Canada.
- Introduced in 2013, “Net Zero” is a label that is being adopted by stakeholders of the building industry, including municipalities, the Home Builders Associations, and the Canadian Green Building Council. Enbridge recognizes there will be a growing need to support builders and developers who are open to investigating moving towards Net Zero, which focuses on buildings that produce as much energy as they use. Initially, the concept of Net Zero was applied to single homes, but now includes six storey wood buildings and will eventually progress to larger buildings. Through the SBD Commercial offer, Enbridge is supporting builders in navigating the path to Net Zero.



- In addition to Energy Quest software, which is the industry standard in new construction modelling, in 2016 Enbridge supported Integrated Environmental Solutions software for increased flexibility in modelling. As well as providing drawings, this software can be used to consider weather conditions, improving successful design with all Part 3 buildings.

- With the impending Ontario Building Code change, builders in 2016 were highly receptive to learn how to achieve greater energy efficiency. In January 2017, Ontario Building Code requirements increased energy efficiency by approximately 13% from the 2012 Code. As a result, the Savings by Design Commercial offer will continue in 2017, however, consistent with Savings by Design Residential, Enbridge will change the offer requirement to 15% greater energy efficiency than required under the 2017 OBC as discussed in the Company's Multi-Year DSM Plan 2015-2020.



We make better energy performance possible.

Building for energy efficiency doesn't need to be costly and complicated. The Enbridge **Savings by Design (SBD) program** gives you free access to industry experts and performance incentives for constructing energy efficient buildings beyond code. **Plus, smaller projects can now qualify – we've changed the square footage requirements from 100,000 to 50,000.**

Up to **\$60,000 in incentives** and benefits are available.

The Savings by Design program supports you with expertise and rewards you with performance incentives through the three primary stages of your project:

1. Integrated Design Process (IDP)

Benefit – up to \$30,000

The IDP is a full-day workshop with a team of experts, to determine the optimal mix of design elements and technologies to maximize energy and environmental performance. Savings by Design covers all costs of the IDP, up to a \$30,000 value, including:

- Visioning session and report
- Preliminary energy model and IDP energy model
- Integrated Design Process logistics, catering facilitation and design expert fees
- Final IDP report

2. Energy Performance Incentive – \$15,000

Implementing the recommendations from the IDP can qualify you for valuable incentives. Receive **\$15,000** upon the completion of a pre-construction certified energy model that demonstrates that the building will be **built 25% above code**, along with final design stage plans and specifications.

3. Commissioning Incentive – \$15,000

The commissioning process confirms that design, construction and system operations meet the project requirements. Receive **\$15,000** upon the completion of a post construction certified energy model that demonstrates that the building has been built 25% above code, along with the final certified commissioning report.

To get started or to learn more, visit commercial.savingsbydesign.ca



To qualify for the program, your project must be a minimum of 50,000 square feet or aggregate buildings to equal 50,000 square feet or greater. Building(s) must be in the Enbridge Gas Distribution franchise area. In order to receive incentive payments, you must agree to all program terms and conditions, must fully participate in all stages of the program and must meet all program requirements.



7.3 School Energy Competition

Objectives	This offer is aimed at educating and empowering students to take action on energy use within their schools, homes and communities. The offer builds on the premise that students are the future leaders of society and influencing energy management awareness, education, and behavior from a young age will help to permeate deeper values of conservation in society.
Target Customer	This offer is targeted to primary and secondary schools, which are primarily Rate 6 customers.
Metrics	Participants eligible for this offer are schools that register, implement activities, and have access to an Energy Management Information System (EMIS) to track natural gas consumption. Participating schools must be part of a school board within one of the publicly funded systems in the Enbridge franchise area in Ontario.
Offer Description	The School Energy Competition (SEC) was launched in 2016 to increase engagement in conservation initiatives. The offer focused on students and teachers, providing them with information on energy use generally, and natural gas in particular, including safety, conservation, and greenhouse gas emissions. Educational efforts are intended to build awareness of energy efficiency and begin to influence behavioural modification. At the high school level, for grades 9 -12, Enbridge sponsors an annual competition to encourage participation through a combination of engaging activities, behavioural changes, and educational challenges. To facilitate the offer, Enbridge employs an EMIS to provide a web-based dashboard that illustrates the school's gas consumption, its baseline usage prior to enrolling in the competition, and gas usage



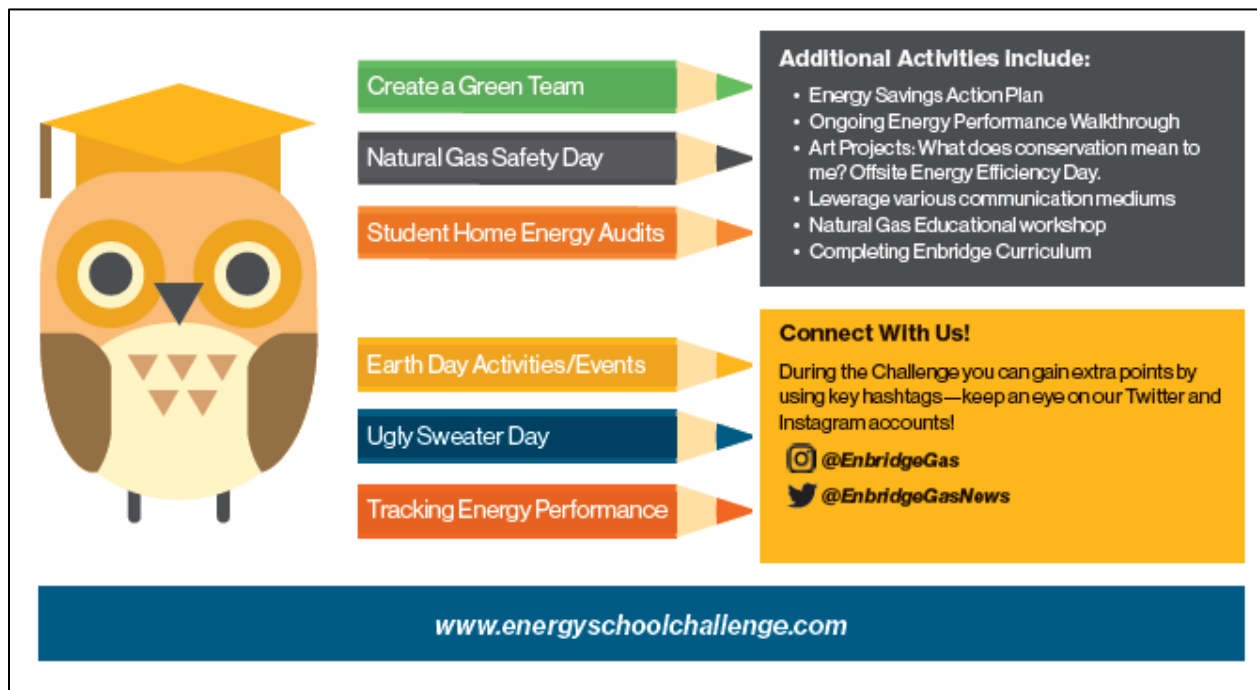
	relative to conservation goals. The objective is to have students gain a deeper understanding of how their school consumes energy and how their actions can reduce energy consumption. Marketed under the Energy School Challenge (the “Challenge”), which engaged schools in a friendly competition, the offer has five main elements: i. Education – An educational component was developed for grades 9-12 for the 2016/2017 school year. The curriculum was developed to focus on real world energy consumption and follows two young adults moving into their first apartment. The curriculum covers everything from natural gas safety to understanding how consumers utilize and are billed for natural gas. An interactive website and energy dashboard provided participants with energy efficiency tips at school and at home. In addition, educational materials were developed to highlight residential consumption for the students to consider in their own homes. ii. Behavioural Change – Community based social marketing (CBSM) research indicates that goal-setting and providing rewards and community awareness is an effective behaviour change tool. In addition to promoting events such as Sweater Day in schools to encourage reduction in heating, specific actions and topic areas that were targeted include: - o Building envelope – reducing consumption via windows/door openings; - o Safety – natural gas safety in schools and homes; - o Water conservation; and, - o Utilization of social media and dashboards to keep students engaged in the competition. iii. Implementation of Activities – Students were encouraged to complete an Activities List to achieve points in the Challenge.
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	Activities included: - o Participation in or staging an event for Earth Day; - o Completion of home energy audits by students; - o Creation of an Energy Savings Plan for the school - o Creation of a Communications Strategy to implement the energy savings plan, utilizing various posters, assemblies, or guest speakers to encourage energy and water conservation; - o Participation in Earth Hour events; and, - o Submissions for Enbridge to utilize and promote participating schools' engagement on social media iv. Monitoring – Upon registering, schools were provided access to an EMIS dashboard and meters were supplied by Enbridge to support consumption tracking. Dashboard information provided historical consumption comparisons for participating schools. v. Performance – Individual schools were scored on the implementation of activities and the achievement of energy savings in the school. Enrollment entails a signed application from the school board and a signed participation agreement from the individual school (the participant).
2016 Results	As detailed in Table 7.0 above, 25 schools participated in 2016, representing 7 different school boards across the Enbridge franchise.

2016 Commentary and Lessons Learned

- SEC launched in 2016 with great success. In order to accommodate available URLs, the offer launched under the banner of Energy School Challenge.
- Participating schools received a welcome package, including prizes to support student activities. The three winning schools were selected based on their final points achievement in the Challenge. The top schools completed multiple recommended activities, including:
 - o Conducting a School Energy Audit;
 - o Creating a Communications Strategy;
 - o Creating an EcoTeam;
 - o Developing an Energy Savings Action Plan; and,
 - o Completing an Art Project.



The graphic features a stylized owl wearing a yellow graduation cap. To the right of the owl are several activity suggestions, each represented by a colored pencil pointing right:

- Create a Green Team (green pencil)
- Natural Gas Safety Day (dark grey pencil)
- Student Home Energy Audits (orange pencil)
- Earth Day Activities/Events (yellow pencil)
- Ugly Sweater Day (dark blue pencil)
- Tracking Energy Performance (red pencil)

To the right of these activities are two boxes:

Additional Activities Include:

- Energy Savings Action Plan
- Ongoing Energy Performance Walkthrough
- Art Projects: What does conservation mean to me? Offsite Energy Efficiency Day.
- Leverage various communication mediums
- Natural Gas Educational workshop
- Completing Enbridge Curriculum

Connect With Us!

During the Challenge you can gain extra points by using key hashtags—keep an eye on our Twitter and Instagram accounts!

 @EnbridgeGas

 @EnbridgeGasNews

www.energyschoolchallenge.com



- Overall, engagement in Challenge activities was excellent and participants provided positive feedback. As an example, one of the school's Green Team student leads submitted *"On behalf of the students and staff at ... we would extend a big thank you for supporting our efforts with the Enbridge Energy Challenge. The BBQ was a big success and our students got a chance to see their peers as leaders capable of creating change in their own community. The Eco team is already planning for next year's challenge with great enthusiasm. Events ... inspire students to get involved in leadership opportunities which promote self-confidence and stewardship."*
- Through the offer, the schools were provided templates to support activities, for example the development of a Green Team Communications plan and submissions from the schools were unique and well thought out. Schools were encouraged to complete art projects, in one case, a school developed a video, while another school created an art installation within their main lobby. An innovative and tech savvy school created an online quiz for students to take as part of their Earth Day events supported by prizes provided through the offer.
- Enbridge has shared some of the competition submissions on their Instagram and Twitter feeds (@enbridgegas). By utilizing social media as a tool, the Challenge has appealed to its youth participants. Students were encouraged to share posts that had been approved by the schools, school boards, and Enbridge.
- Enbridge was keenly interested in feedback from first year participants so the Company solicited and received suggestions for further improvement. For example, teachers suggested compressing audits to one page or making audits available online to reduce printing costs for teachers and schools. In addition, teachers suggested creating an online enrollment for teachers and green teams.



- Since this was the first year Enbridge offered SEC, there were many lessons learned.
 - o Of note, the time required for school boards to approve the Energy School Challenge was much longer than originally estimated. This delay limited opportunities for the schools to participate due to the registration deadline and school year limitation. Moving into 2017, Enbridge is better able to meet the school board's schedule requirements.
 - o It is clear that students and teachers are better engaged with programs that focus on online, interactive platforms. Enbridge put significant efforts into interactive website development for the Challenge. Enbridge will utilize social media and online platforms wherever possible to appeal to the younger demographic and remain mindful of school's monetary restraints.
 - o Enbridge provided the schools with an energy dashboard, which students were able to use to view their natural gas consumption online. However, Enbridge was unable to track the schools that were accessing the energy dashboard due to the limitations of the software provider. In addition, meter limitations caused some schools to access delayed data. In 2017, Enbridge will explore leveraging school boards to provide their own dashboards and work with them to improve these systems by upgrading meters with wireless automatic meter readers where necessary.
 - o One of the key findings in 2016 was that students should be the champions of this program, whether through their classes or their Green Teams. Students have little to no control over the operation of the school, therefore increasing the emphasis on the activity portion of the Challenge can allow students to feel empowered to make a positive change.



- Enbridge is exploring potential changes to the Challenge in 2017, such as:
 - o Making participation more inclusive, by allowing all schools (elementary as well as secondary school) to participate in 2017.
 - o Introducing elementary school curriculum based activities where energy efficiency is a focus.
 - o Altering the points scoring system for the Challenge to put more emphasis on the engagement of students through the implementation of activities. This will be significant in promoting energy conservation awareness and behaviour changes, and will allow the schools with high participation to be rewarded for their efforts.

7.4 Run it Right

Objectives	The goal of the Run it Right offer is to engage Commercial and smaller Industrial customers in the pursuit of enhanced energy performance. RiR supports this outcome through the identification of low cost/no cost operational improvement opportunities, monitoring, measurement, and benchmarking. Along with energy savings opportunity assessments and the identification of low cost/no cost operational improvement measures, this offer promotes the awareness and visibility of building consumption patterns through an EMIS. Ultimately, this offer aims to lead customers toward data-driven decision-making. The objective of RiR is to align with the Board's identified priority for the utilities' 2015 – 2020 Program, as outlined in the Framework, specifically implement DSM programs that are evidence-based and rely on detailed customer data.
Target Customer	This offer is available to customers in the Rate 6, 110, 115, 135, 145, and 170 classes. More specifically, the offer is designed for energy

	managers and building operators of commercial and small industrial buildings where daily consumption data is accessible.
Metrics	As part of the MTEM scorecard, the RiR offer includes a participant metric. In addition, gas savings resulting from operational improvements identified through this offer also contribute to the CCM metric in the RA scorecard in the year following implementation.
Offer Description	Run it Right supports building managers through the identification and implementation of no cost/low cost operational improvements and facilitates continuous monitoring to increase and maintain efficiency. Efforts can help lower operating costs, improve occupant comfort and functionality of building systems, as well as identify future capital improvements. The RiR offer is designed to motivate customers to optimize the operation of their buildings. The provision and analysis of detailed energy data aims to allow building operators and managers to make strategic data-driven decisions regarding energy savings and future capital investments. Support Every Step of the Way Register Investigate • Free Building Investigation by our Investigation Agents • Receive an Investigation Report including: • Energy consumption analysis & load profile • List of operational opportunities & recommendations Implement • Implementation incentive between \$2,500 to \$10,000* depending on building consumption and complexity. • Receive a customizable checklist and calculation tool to select measures with your Service Provider/Contractor Monitor • Free access to an Energy Management Information System (EMIS) for the 12 month monitoring term • Training and Support Operational Tune Up Enhanced Operations & Maintenance Following enrollment, Enbridge's Investigation Agents take participants through a facility investigation. Upon completion, an



	Investigation Report is generated outlining facility specific measures (low cost/no cost operational improvements) recommended for the achievement of energy savings. In support of this effort, Enbridge provides incentives to offset the implementation cost of identified improvements. RiR participants are provided free access to an EMIS, which allows for the analysis of consumption data (relative to a baseline) to illustrate the impact of improvements over a one year monitoring period. Ongoing consumption data tracking occurs through a 3rd party EMIS for all participants. The 2016 participant results captured in the MTEM scorecard are based on customers that implemented measures identified in the RiR offer during the 2016 calendar year. Gas savings associated with improvements undertaken by customers who enrolled in 2015 and completed the implementation of measures are included in 2016 towards the CCM metric of the Resource Acquisition scorecard. Applicant information includes site address and building details, also consumption information and meter type are tracked. In addition, details regarding recommendations made by the investigation agent conducting the assessment, milestone dates, measures implemented and incentive amounts are recorded. A third party firm is retained to determine the claimed savings for the RiR offer. Gas consumption data for the 12 months prior to implementation (the base year) is used as the base case. Gas consumption is then monitored for 12 months following implementation (the reference year). Gas savings results are weather normalized and are based on a standardized statistical regression analysis for each participant. Final regression analysis reports for each participant are completed and calculated savings are tracked.
2016 Results	As outlined in Table 7.0 above, 84 participants enrolled and



	completed implementation in the RiR offer in 2016, exceeding the MTEM scorecard participant target. Gas savings achieved through the operational improvements implemented by these customers will be assessed in 2017 following the monitoring period. For RiR participants who enrolled in the offer and implemented measures in 2015, a total of 1,937,342 CCM of net natural gas savings was achieved contributing to the RA scorecard CCM metric, as outlined in Table 7.1. The volumetric savings of 1.94 million CCM were achieved by 39 eligible participants. A further 24 participants were deemed ineligible for savings verification as they either undertook capital projects (19 participants) or were statistically insignificant (5 participants). In 2016, average savings were 6.1%.
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Table 7.1 2016 Run it Right Results

Resource Acquisition	2016 Net CCM (m ³)	# of Projects	TRC-Plus Ratio	PAC Ratio
<i>Run It Right</i>	1,937,342	39	0.7	0.7

2016 Commentary and Lessons Learned

- RiR is a highly resource intensive offer. Beginning with customer engagement, enrollment, investigation of facilities, implementation of measures, provision of data and investigation reports, through to consumption monitoring and the calculation of gas savings, the offer demands a significant commitment from customers and utility staff alike. Further, the offer spans multiple calendar years and, in order to quantify only operational improvement, requires that customers do not plan to undertake capital improvements during the monitoring period. Operational improvements do not generally drive significant gas savings. For this reason, it is important to recognize that beyond the CCM savings generated through the offer, the education provided to participants, their increased understanding of energy usage, and the identification of further energy efficiency

opportunities, provides significant value in influencing customers towards energy awareness and data driven decision making.

- Customers have responded positively to RiR, as the process encourages participants to achieve gas savings through the implementation of low cost/no cost operational improvements. Despite the perceived ease of identifying such opportunities, improvements recommended through the identification process would have gone undiscovered without RiR's focus on building optimization.
- In previous years, Enbridge identified that despite many customers who showed initial interest and had an investigation completed, some of these customers were unable or unwilling to follow through and complete implementation. As an example, in 2015, there were 49 customers who agreed to participate in investigations, but did not proceed with the implementation of measures. In 2016, Enbridge continued to work to mitigate this challenge by increasing participant engagement through training, follow up visits from investigation agents, and increased support from Enbridge ESCs. Improved outreach has had a positive impact on ensuring customers follow through with implementation of measures.



Hard to think with the current temperatures, that in just a few weeks we will be back into the heating season. During the heating season approximately **80%** of your natural gas bill will be from heating your facility. We can help you to reduce your consumption through low cost/no cost operational improvements.



- In an effort to further improve converting enrolled customers through to implementation, processes were revised in 2016. The incentive structure was modified to streamline payments after all implementation is completed.
- Enbridge has focused efforts on training customers on the value of the EMIS to encourage continuous energy savings throughout the monitoring term. The offer provides participants with monthly performance updates, in addition alerts are sent to participants when their consumption exceeds expected usage to provide an opportunity for investigation. Participants who utilize the system have a better understanding of their energy consumption to facilitate adjustments for improvements throughout the monitoring term.
- Training and webinars remain a positive engagement piece with participants. In 2016, Enbridge developed and delivered Builder Operator training to four municipalities in ten different sessions. This training is intended to provide municipal building operators with the understanding of how to ensure learnings through RiR persist beyond the scope of the offering.
- Assessing and interpreting metered data to determine RiR savings remains challenging. Although metered data reflects building consumption, it does not necessarily reflect the building and operating conditions that can change daily, monthly, or yearly. Because operational improvements only generate small savings relative to capital improvements, isolating those savings can be challenging using metered data.
- Participation in the RiR offer requires customers do not undertake capital projects. This expectation remains a large barrier to offer participation and calculating savings. Enbridge continues to explore how to appropriately apply a methodology to capture concurrent operational and capital savings.



- For 2017, delivery of the offer will be modified. Third party contractors (Efficiency Partners) will have the ability to work with their existing customers to deliver the offer. Previously, participation was limited to requiring use of an Enbridge contracted Investigation Agent assigned to complete the investigation. Moving forward, Enbridge customers will have flexibility to work with the Efficiency Partner of their choice for all steps of the offer.

- RiR will continue to be an important facet of the 2017 portfolio. The offer not only provides important educational benefits and training for commercial building operators but the objectives of the RiR offer align with the Board's identified priority for the utilities' 2015 – 2020 Program, as outlined in the Framework, specifically, *"Implement DSM programs that are evidence-based and rely on detailed customer data."*



7.5 Comprehensive Energy Management

Objectives	The goal of Enbridge's Comprehensive Energy Management (CEM) offer is to help customers reduce operational costs by presenting energy as a controllable input cost, and seek to create a sustainable culture of energy efficiency. This offer intends to build and expand on the Company's existing offers to guide and help customers with a structured approach to identifying, quantifying and implementing energy efficient measures.
Target Customer	The CEM offer is targeted to Commercial and Industrial consumers in the rate classes 6, 110, 115, 135, 145, and 170. The primary target market is Industrial and Institutional customers.
Metrics	As part of the MTEM scorecard, the CEM offer has a participant metric. In addition, gas savings results identified through participation in CEM also contribute to the CCM metric in the RA scorecard following implementation.
Offer Description	As a facilitator and educator, Enbridge leads and assists customers through a set of tools, guidelines, resources and technical expertise, to support a sustainable culture of energy efficiency for the client. Enbridge works with participants in the offer by examining their unique energy usage, creating an energy model, and guiding customers to undertake recommended actions suitable to their operation, including: • Make energy usage a specific performance goal; • Provide resources to follow through with energy management; • Create energy or sustainability teams (at least one dedicated energy manager or champion who allocates some time towards energy efficiency activities);



	• Demonstrate commitment to improve operations and maintenance practices; • Provide the data for Enbridge to create an energy consumption model and be willing to invest in energy management tools, as applicable, to better control and manage their energy; and, • Participate in training to support sustained energy management. Energy Solution Consultants have established relationships with the majority of the target customer base. Therefore, the ESCs serve as the primary point of contact for customers. Through the CEM offer, ESCs further engage with participants both at the energy manager and senior management levels to develop and reinforce their corporate energy plans and identify energy goals. Depending on the requirements of each CEM participant, ESCs help customers justify energy management activities and resource needs based on their business. CEM offers financial incentives as follows: • Funds to offset the cost of energy assessments and monitoring systems where necessary • Incentives for gas savings achieved through identified projects • Funds to promote energy awareness and encourage energy efficiency training
2016 Results	As outlined in Table 7.0, seven participants enrolled in the CEM offer in 2016, achieving the target.

2016 Commentary and Lessons Learned

- In 2016, Enbridge's ESCs enrolled seven customers to participate in the Comprehensive Energy Management offer. As a first step, Enbridge undertook a



detailed analysis of the energy consumption of each participant with the objective of creating a representative energy model for each facility based on energy use, production data, and weather data. This model served as the basis to determine where energy management efforts should be focused as well as identifying specific opportunities for potential improvements.

- The overriding objective of CEM is to help customers reduce operational costs by presenting energy as a controllable input cost that can be monitored through energy management practices. As a starting point, participation in CEM provides customers with a roadmap to guide them through energy based decisions and to support building a culture of sustained energy efficiency at the customer facility. Commitment to energy efficiency investments, however, is often dependent on the customer's operational cycle, which can be several years. Energy management is a transformational process, which requires a multi-year commitment in effort, time, and funding. As a result, through the offer, ESCs will continue to work with participants to support actionable energy improvements beyond the first year of participation.
- In some cases, where energy use is complex, Enbridge has recommended that there is value in installing an EMIS system. Enbridge has learned, however, that some customers have had difficulty obtaining corporate approval for the funding of these systems despite the assistance of Enbridge incentives, particularly when compared to undertaking other capital investments. In these cases, for modelling and monitoring purposes, Enbridge and the customer have continued to utilize existing on-site metering and data collection infrastructure. Though not optimal, this has reduced some of the financial commitment while also involving the customer in energy management practices.
- For first year participants, while working with existing data has allowed Enbridge to create natural gas consumption models on a facility level, looking forward, ESCs will focus on identifying any additional metering structure needed to create

energy models on a smaller scale. It is anticipated this may be more impactful in allowing detailed day-to-day operations to be analyzed and further identify opportunities for improvements.

- Customers often do not recognize the value of adopting a formal energy management plan. Looking forward, Enbridge will need to continue to leverage opportunities to educate target customers about CEM and the benefits of creating a sustainable culture of energy efficiency. In 2016, Enbridge gave presentations on the CEM offer at the following events:
 - o The Enbridge sponsored bi-annual Energy Summit
 - o The feature presentation at the Energy Into Action forum
 - o The Canadian Manufacturers & Exporters (CME) Energy Conference
 - o The Greening Healthcare workshop
 - o Enbridge hosted Customer Workshops

Our Approach

Comprehensive Energy Management Program

Whether for environmental stewardship, emission reduction or cost savings purposes, managing energy is becoming increasingly important in industrial settings.

Succeeding in energy management requires the ability to set the right strategy and make it happen. Enbridge Gas Distribution's Comprehensive Energy Management (CEM) Program is designed to help you do just that. Through the program, you will gain a better understanding of your key energy drivers so you can shape your energy goals and set the right strategy.

The program will also help you "make it happen" by ensuring you put an action plan in place that is flexible and responsive enough to withstand changing business conditions.

CEM Program participants will:

- Identify key energy drivers and establish baselines
- Identify areas of improvement and set targets to:
 - Reduce energy consumption and emissions
 - Improve process efficiencies and productivity
 - Save money across the organization
- Empower and engage employees to work together towards a common energy saving goal





- As Enbridge continues to refine this offer and determine how to best assist customers, the Company's intention ultimately is to change energy management in participant's facilities from a transactional activity to a transformational one. Enbridge will accomplish this by making energy a visible, and therefore controllable, input for the customer. Success with the offer will also entail setting up a structure within the customer's operation, which adds an energy element to all existing jobs rather than a single job function. Recognizing this is not a one year effort, Enbridge's ESCs will continue to help CEM participants to achieve this in years ahead.



8. Lost Revenue Adjustment Mechanism Variance Account

The Lost Revenue Adjustment Mechanism (LRAM) allows the Company to recover the lost distribution revenue associated with DSM activity. The LRAMVA is a mechanism to adjust for margins the utility loses/gains if its DSM program is more/less successful in the period after rates are set than was planned in setting the rates. As outlined in the Guidelines, LRAMVA is used to track, by rate class, the impact of DSM activities undertaken in relation to the forecasted impact included in distribution rates.

LRAM is calculated using the volumetric impact of the measures implemented on a monthly basis over the course of the program year. The LRAMVA amount is an adjustment which may be an amount refundable to, or receivable from, the Company's customers (depending on whether the actual natural gas savings resulting from the natural gas utility's DSM activities are less than or greater than what was included in the forecast for rate-setting purposes). The 2016 LRAM calculation is provided in Table 8.0.

Table 8.0 2016 LRAM Calculation

2016 Annual Report LRAM Calculation						
Rate Class	Based on		Volume Variance	Distribution Margin	56,548,757 FE m3 built into rates	
	Budget Net Partially Effective	Actual Net Partially Effective			LRAM Allocation \$	Actual LRAM \$
Rate 110	1,776,378	498,134	(1,278,243)	1.8530	(\$23,685)	\$9,230
Rate 115	1,130,422	122,241	(1,008,181)	0.9782	(\$9,862)	\$1,196
Rate 135	0	17,840	17,840	1.6703	\$298	\$298
Rate 145	1,921,039	16,542	(1,904,497)	1.9652	(\$37,428)	\$325
Rate 170	3,956,478	499,760	(3,456,717)	0.7217	(\$24,947)	\$3,607
Totals	8,784,317	1,154,518	(\$7,629,799)		(\$95,625)	\$14,656
Amount to be paid back to Ratepayers					\$95,625	
* Rate 1 and Rate 6 are not included in the LRAM amount for clearance above as these rate classes are covered under the Average Use True-Up Variance Account (AUTUVA)						



9. DSM Shareholder Incentive

Enbridge earns a shareholder incentive based on its performance against targets outlined for Resource Acquisition, Low Income and Market Transformation scorecards. The DSM Incentive provides that incentive to the Company in relation to its DSM activities. Further to approved amounts outlined in EB-2015-0049, Table 9.0 summarizes how the maximum incentive available in 2016 is allocated across each program.

Table 9.0 2016 DSM Maximum Incentive Allocation

Program	Maximum Incentive Available
<i>Resource Acquisition</i>	\$6,787,943
<i>Low Income</i>	\$2,361,462
<i>Market Transformation</i>	\$1,300,595
	\$10,450,000

Scorecard results and the corresponding DSMI earned for each program is detailed in the following tables.

Table 9.1 2016 Resource Acquisition Scorecard & DSMI

Resource Acquisition						
Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Large Volume Customers	<i>Cumulative Savings (million m³)</i>	40%	249.1	332.2	498.3	328.75
Small Volume Customers	<i>Cumulative Savings (million m³)</i>	40%	224.2	298.9	448.4	394.82
Deep Residential Savings	<i>Participants</i>	20%	6,194	8,259	12,389	12,986
Total Weighted Scorecard Target Achieved						123.9%
Scorecard Incentive Achieved						\$4,658,886



Table 9.2 2016 Low Income Scorecard & DSMI

Low Income						
Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Single Family (Part 9)	Cumulative Savings (million m ³)	45%	23.8	31.8	47.7	28.81
Multi-Residential (Part 3)	Cumulative Savings (million m ³)	45%	48.7	64.9	97.4	84.73
New Construction	Participants	10%	5	6	9	6
Total Weighted Scorecard Target Achieved						109.5%
Scorecard Incentive Achieved						\$1,214,842

Table 9.3 2016 Market Transformation Scorecard & DSMI

Market Transformation						
Component	Metric	Weight	Targets			2016 Result
			Lower Band	Target	Upper Band	
Residential Savings by Design	Builders	10%	25	33	50	31
	Homes Built	15%	2,063	2,751	4,127	2,206
Commercial Savings by Design	New Developments	25%	25	33	50	43
School Energy Competition	Schools	10%	41	55	83	25
Run it Right	Participants	20%	62	83	124	84
Comprehensive Energy Management	Participants	20%	5	7	11	7
Total Weighted Scorecard Target Achieved						98.6%
Scorecard Incentive Achieved						\$492,023

Table 9.4 2016 DSMIDA Summary

Program	DSMIDA by Program
Resource Acquisition	\$4,658,886
Low Income	\$1,214,842
Market Transformation	\$492,023
TOTAL	\$6,365,751



10. 2016 Budget and Program Spending

10.1 Budget

Table 10.0 provides the 2016 DSM budget as outlined in the 2015-2020 Multi-Year DSM Plan (EB-2015-0049). The Board approved a 2016 budget of \$56,361,117 in its Decision on January 20th, 2016.

Table 10.0 2016 DSM Plan Budget

Program	Program Budget	Overheads	Total Budget
<i>Resource Acquisition</i>	\$29,303,625	\$5,033,048	\$34,336,673
<i>Low Income</i>	\$10,201,788	\$1,743,622	\$11,945,410
<i>Market Transformation</i>	\$5,614,683	\$964,351	\$6,579,034
Total Program Budget	\$45,120,096	\$7,741,021	\$52,861,117
<i>Portfolio Overheads</i>			\$3,500,000
Total 2016 DSM Budget			\$56,361,117



10.2 2016 Spending

Table 10.1 2016 OEB Approved Budget vs. Spending

Program	OEB Approved Budget (Built Into Rates)	2016 Spending	Variance
Resource Acquisition	\$34,336,673	\$38,867,717	\$4,531,044
Home Energy Conservation	\$12,148,317	\$22,057,458	\$9,909,141
Residential Adaptive Thermostats	\$876,371	\$1,666,753	\$790,382
Commercial & Industrial Prescriptive	\$2,196,952	\$1,001,671	-\$1,195,281
Commercial & Industrial Custom	\$7,020,664	\$6,746,119	-\$274,545
Commercial & Industrial Direct Install	\$4,955,421	\$2,390,902	-\$2,564,519
Small Commercial New Construction	\$396,933	\$0	-\$396,933
Energy Leaders (Large & Small C/I)	\$400,000	\$73,775	-\$326,225
Run it Right (RA)	\$1,260,162	\$300,962	-\$959,200
Comprehensive Energy Management (RA)	\$48,805	\$0	-\$48,805
Overheads	\$5,033,048	\$4,630,077	-\$402,971
Low Income	\$11,945,410	\$8,732,572	-\$3,212,838
Home Winterproofing	\$5,806,064	\$4,543,350	-\$1,262,714
Low-Income Multi-Residential - Affordable Housing	\$3,279,028	\$2,326,325	-\$952,703
Low-Income New Construction	\$1,116,696	\$258,877	-\$857,819
Overheads	\$1,743,622	\$1,604,019	-\$139,603
Market Transformation	\$6,579,034	\$6,377,381	-\$201,653
Residential Savings by Design	\$3,250,842	\$3,469,121	\$218,279
Commercial Savings by Design	\$1,345,890	\$1,398,940	\$53,050
School's Energy Competition	\$302,197	\$289,555	-\$12,642
Run it Right (MT)	\$250,824	\$225,819	-\$25,005
Comprehensive Energy Management (MT)	\$464,930	\$106,806	-\$358,124
Overheads	\$964,351	\$887,140	-\$77,211
Program Cost Subtotal	\$45,120,096	\$46,856,434	\$1,736,338
Overhead Subtotal	\$7,741,021	\$7,121,236	-\$619,785
Portfolio Overheads	\$3,500,000	\$1,670,616	-\$1,829,384
Total	\$56,361,117	\$55,648,285	-\$712,832

As outlined in Table 10.1 above, total spending in 2016 amounted to \$55,648,285.

10.3 Collaboration and Innovation Fund

In the DSM Multi-Year Framework (2015-2020), released December 22, 2014, the Board gave strong indications to the gas utilities to pursue greater coordination and integration with electric distributors on key energy efficiency and conservation programming. In Enbridge's Multi-Year Plan, the Company highlighted its current

involvement in discussions with electric Local Distribution Companies LDCs for collaborative Conservation and Demand Management programs and pilots, as well as the Company's intent to explore greater integration with CDM activities throughout the 6-year Plan.

In the Plan, the Company proposed the creation of a Collaboration and Innovation Fund (CIF) that would give the Company flexibility to commit to pilot funding opportunities from electric LDCs and other ongoing developments of innovative initiatives and research. In the Decision and Order, released January 20, 2016, the Board approved Enbridge's proposal for a \$6 million fund to be spent over the term of the 2015-2020 Multi-Year DSM Plan.⁸

Spending in 2015 was limited and largely focused on identification and planning of collaborative pilots and initiatives for 2016 and beyond, as the CIF had not yet been approved. In 2016, the Company was approved to spend the CIF on development and implementation of collaborative pilots and initiatives. Several initiatives funded in 2016 were focused on raising the level of awareness and engagement on joint gas and electric programming. These initiatives were undertaken to generate gas and electric savings, and serve as templates for future collaborative programming with other electric LDCs.

In collaboration with industry partners, CIF funding was also directed towards the exploration and research of new and innovative technologies with the potential for greater gas reduction to enhance future DSM programming. The introduction of Cap and Trade increased the significance of DSM for customers and as a result has created a need to expand the Company's efforts towards greater research and innovation in reducing natural gas consumption.

Table 10.2 provides an outline of the collaboration, innovation and research efforts undertaken by Enbridge in combination with various electric LDCs and industry partners

⁸ Decision and Order (EB-2015-0049); Ontario Energy Board, page 82.



throughout 2016. It is not a comprehensive listing of all collaboration and innovation efforts undertaken by the Company, but rather the initiatives and pilots that received funding from the CIF in 2016.

Table 10.2 CIF Overview

Partner	Customer Segment/ Topic	Overview
IESO and Union Gas	Residential	On June 10, 2016 the Ministry of Energy directed the IESO to deliver a province-wide whole home CDM pilot in coordination with natural gas distributors. ⁹ Enbridge, Union Gas and the IESO partnered to deliver the Whole Home Pilot. Leveraging the program infrastructure of the Home Energy Conservation offer, the pilot offers a province wide delivery offering of both gas and electric savings.
Toronto Hydro	Residential	Enbridge collaborated with an electric LDC to deliver Enbridge's Adaptive Thermostats program. The dual-fuel savings generated by the technology makes it ideal to collaborate on an integrated CDM and DSM program offer.
Toronto Hydro	Low Income	Enbridge and an electric LDC pursued a collaborative delivery model for two separate programs with similar customer eligibility criteria and administrative requirements. Through a joint procurement process, a single delivery agent for the two programs was identified, aiming for cost efficiencies for each utility and enhanced customer experience.

⁹ June 10th, 2016; Ministry of Energy Directive to the Independent Electricity System Operation, Re: Conservation First Framework.



Partner	Customer Segment/ Topic	Overview
Multiple LDCs	Commercial	Enbridge participated in a regional electric LDC energy conservation information and networking event in the Greater Toronto Area. The event connects customers, industry partners and utilities to share industry trends and enhance knowledge sharing and networks. Enbridge participated to provide perspective and influence to a predominately electric conference for a more holistic energy understanding.
Multiple LDCs	Commercial	Enbridge participated in a regional electric LDC energy conservation information and networking event in the Hamilton/Niagara Area. The event connects customers, industry partners and utilities to share industry trends and enhance knowledge sharing and networks. Enbridge participated to provide perspective and influence to a predominately electric conference for a more holistic energy understanding
Multiple LDCs	Commercial	Enbridge partnered with the 13 electric LDCs representing the Greater Toronto Hamilton Area to form an 'Energy Sales Force.' The Energy Sales Force developed an online web portal for each utility to provide LDC/gas utility contact and program information, and to encourage leads and opportunities sharing between utilities. The web portal will increase collaboration and knowledge sharing between utilities thus improving the efficiency of program delivery for both DSM and CDM program offerings.
PowerStream	Commercial	Enbridge and an electric LDC collaborated to create a co-branded DCKV campaign for the food service



Partner	Customer Segment/ Topic	Overview
		industry. DCKV is a dual savings technology.
Toronto Hydro	Commercial	Enbridge developed a Combined Heat and Power (CHP) Tool that screens CHP project viability. Enbridge partnered with an electric LDC to give it user rights over the tool. In exchange the LDC provides data and feedback to Enbridge to help refine the tool for accuracy and inform the Company's research on CHP gas savings.
Enersource	Commercial	Enbridge partnered with an electric LDC to deliver energy audits for small and medium Commercial and Industrial customers to identify energy efficiency opportunities for electric and gas savings.
Multiple Industry Partners	Combined Cooling and Heating technology	Multiple industry partners have collaborated to test and validate an in-field demonstration of the May Ruben Thermal Solutions (MRTS) Combined Heating and Cooling technology. Enbridge is looking to test modifications that may increase the overall efficiency of the natural gas components.
Multiple Industry Partners	Canmet ENERGY's Energy Efficiency Workshops	Natural gas utilities provide funding to deliver six workshops across Canada. Enbridge provided funding for the workshop in Ontario to showcase innovative natural gas heating equipment to Canadian homebuilders, including a 'Design Guide' that will demonstrate natural gas equipment for an energy efficient home.
Multiple Industry Partners	Combined Heat and Power	Enbridge is participating in a CHP consortium with a focus on debate and understanding of issues surrounding CHP technologies by a group of key and



Partner	Customer Segment/ Topic	Overview
		diverse industry stakeholders.
Multiple Industry Partners	Micro Combined Heat and Power (MCHP)	A project to test and measure the performance of a micro combined heat and power unit for residential applications. MCHP lends itself well in a heat and power micro-grid system.
Multiple Industry Partners	Natural Gas Heat Pumps	Field tests to inform the potential inclusion of natural gas heat pumps as a cost effective custom DSM measure.

It is important to note that developing a collaborative pilot or testing a new technology can take several years of resources and funding commitments to achieve full implementation. After identifying an opportunity, the time required for the Company to implement a pilot or new technology into the market can extend to several years as initiatives need time to develop a business case, sort process compatibilities, develop comparable evaluation and measurement metrics, sort attribution of savings, and execute legal contracts. Having available budget over a period of time will be paramount to the success of the Company's collaborative and innovative initiatives. The Company anticipates that CIF spending post-2016 will steadily ramp up as increased work will be needed to fully develop these collaborative templates and research partnerships. The 2016 spending associated with the CIF was \$248,279.



10.4 Demand Side Management IT (DSMIT)

In 2016, Enbridge began working to reach the goal of implementing a new IT application. Following the RFP process that began in 2015, a contract was awarded to start design and blueprint activities in June 2016.

As per the Board's Decision, Enbridge has an annual \$1 million chargeback for DSMIT. In 2016, Enbridge spent \$100,000 in O&M and \$7,000 in capital on DSMIT, primarily on project management and Business Requirement Gathering and Documentation. It is understood that Enbridge may underspend in some years but overspend in other years. Enbridge expects the bulk of the expenditure to take place in 2017, and will include activities such as technical design, development, configuration, and testing.

10.5 Demand Side Management Variance Account

As specified in the Guidelines, the DSMVA "should be used to track the variance between actual DSM spending by rate class versus the budgeted amount included in rates by rate class."¹⁰

The DSM budget built into rates for the 2016 calendar year was \$56,361,117. This amount was provided to Enbridge by the Board in its Decision and Order in EB-2015-0049 on January 20th, 2016.

Table 10.3 shows the variance between the DSM budget built into rates and the 2016 DSM spending (as summarized previously in Table 10.1). The resulting DSMVA for 2016 is \$712,832 (payable to ratepayers).

¹⁰ EB-2014-0134. Filing Guidelines to the Demand Side Management Framework for Natural Gas Distributors (2015-2020), OEB, December 22, 2014, page 38.

Table 10.3 DSMVA Determination: 2016 Spending vs. Amount Built Into Rates

DSM Budget Previously Built Into Rates	2016 DSM Spending	Variance = DSMVA
A	B	Variance = B-A
\$56,361,117	\$55,648,285	-\$712,832

10.6 Demand Side Management Cost-Efficiency Incentive Deferral Account

As noted in the OEB's revised Decision and Order, dated February 24, 2016, "The purpose of the DSMCEIDA is to record, as a credit in Deferral Account No. 179-046, the differences between Enbridge Gas Distribution Inc.'s (Enbridge or the Company) annual approved DSM budget and the actual amounts spent to achieve the total aggregate annual lifetime savings (cumulative cubic meters of natural gas, or CCM) targets made up of all 100% CCM targets across all programs, in accordance with the program evaluation results."¹¹

For the 2016 program year, Enbridge is not proposing any amount be recorded in the DSMCEIDA.

¹¹ EB-2015-0049, Decision and Order, OEB, February 24, 2016, page 6.



10.7 DSM Rate Allocation

Table 10.4 illustrates the allocation to rate classes of the DSM Variance Accounts.¹²

Table 10.4 2016 Rate Allocation

Rate Class	DSMIDA	LRAMVA ^{1 2}	DSMVA	TOTAL
Rate 1	\$4,351,434	N/A	\$8,533,554	\$12,884,989
Rate 6	\$1,745,165	N/A	-\$7,697,178	-\$5,952,013
Rate 9	\$208	\$0	-\$726	-\$517
Rate 100	\$0	\$0	\$0	\$0
Rate 110	\$127,420	-\$23,685	-\$135,140	-\$31,406
Rate 115	\$54,497	-\$9,862	-\$740,365	-\$695,731
Rate 125	\$7,815	\$0	-\$39,641	-\$31,827
Rate 135	\$8,753	\$298	-\$222,707	-\$213,656
Rate 145	\$8,638	-\$37,428	-\$422,424	-\$451,213
Rate 170	\$58,591	-\$24,947	\$23,041	\$56,685
Rate 200	\$2,709	\$0	-\$9,433	-\$6,723
Rate 300	\$521	\$0	-\$1,814	-\$1,293
Total	\$6,365,751	-\$95,625	-\$712,832	\$5,557,294

1. Rate 1 and Rate 6 are not included in the LRAM amount as these rate classes are covered under the Average Use True-Up Variance Account (AUTUVA).

2. Rates 9, 125, 200 & 300 do not have any LRAM component in the rate allocation since customers in these rate classes are not eligible for DSM programs. These rate classes will however be subject to rate allocations for DSMVA and applicable DSMIDA related to Low Income Program.

¹² As in prior years, Low Income DSM spending is allocated to all rate classes, to be consistent with the electricity conservation framework, as well as the LEAP Emergency Financial Assistance program. Allocation for the LEAP fund was outlined in EB-2008-0150 Report of the Board: Low Income Energy Assistance Program, Section 5.1.1 Funding LEAP, page 11.

Appendix A: Input Assumptions

On December 16th, 2015, Enbridge Gas Distribution Inc. and Union Gas Limited submitted a joint application which sought approval from the Ontario Energy Board for new and updated Demand Side Management measures. The Board assigned file number EB-2015-0344 to this application.

Input assumptions for the 2016 program year were based on EB-2015-0344. In the application, Enbridge and Union stated that a Technical Reference Manual (TRM) would be finalized and submitted to the Board in 2016. In anticipation of that upcoming submission, the Board issued a letter on April 26th, 2016, stating that a review of the December 16th, 2015 joint application was not required and instead the Board would provide further direction once the TRM was filed, including all substantiation documents as well as net-to-gross adjustment factors and any other assumptions.

The contents of EB-2015-0344 were again included in the December 21st, 2016 submission (EB-2016-0246) which included the full TRM. The Board approved those original input assumptions in its Decision on June 22nd, 2017.



Appendix B: 2016 Avoided Costs

The 2016 Avoided Costs used in the determination of 2016 results are included here for reference in the following charts:

Year	2016 Gas Avoided Costs							
	Water Heating		Space Heating		Combined Space & Water Heating		Industrial	
	Baseload (\$/m ³)		Baseload (\$/m ³)		Baseload (\$/m ³)		Baseload (\$/m ³)	
	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV
1	0.1400	0.1438	0.1600	0.1740	0.1560	0.1688	0.1420	0.1460
2	0.1710	0.3055	0.1890	0.3527	0.1870	0.3457	0.1730	0.3096
3	0.1970	0.4817	0.2210	0.5503	0.2160	0.5388	0.1990	0.4875
4	0.1940	0.6457	0.2170	0.7338	0.2130	0.7189	0.1970	0.6541
5	0.1998	0.8055	0.2235	0.9125	0.2194	0.8944	0.2029	0.8164
6	0.2058	0.9611	0.2302	1.0866	0.2260	1.0652	0.2090	0.9744
7	0.2120	1.1127	0.2371	1.2561	0.2328	1.2316	0.2153	1.1283
8	0.2183	1.2603	0.2442	1.4213	0.2397	1.3937	0.2217	1.2782
9	0.2249	1.4041	0.2516	1.5821	0.2469	1.5516	0.2284	1.4242
10	0.2316	1.5442	0.2591	1.7388	0.2543	1.7054	0.2352	1.5665
11	0.2386	1.6806	0.2669	1.8914	0.2620	1.8552	0.2423	1.7050
12	0.2458	1.8134	0.2749	2.0400	0.2698	2.0010	0.2496	1.8399
13	0.2531	1.9429	0.2831	2.1847	0.2779	2.1431	0.2570	1.9713
14	0.2607	2.0689	0.2916	2.3257	0.2863	2.2815	0.2648	2.0993
15	0.2685	2.1917	0.3004	2.4631	0.2948	2.4163	0.2727	2.2240
16	0.2766	2.3112	0.3094	2.5968	0.3037	2.5476	0.2809	2.3454
17	0.2849	2.4277	0.3187	2.7271	0.3128	2.6755	0.2893	2.4637
18	0.2934	2.5411	0.3282	2.8540	0.3222	2.8000	0.2980	2.5789
19	0.3022	2.6516	0.3381	2.9775	0.3318	2.9213	0.3069	2.6911
20	0.3113	2.7592	0.3482	3.0979	0.3418	3.0395	0.3161	2.8003
21	0.3207	2.8641	0.3587	3.2152	0.3521	3.1546	0.3256	2.9068
22	0.3303	2.9662	0.3694	3.3294	0.3626	3.2666	0.3354	3.0105
23	0.3402	3.0656	0.3805	3.4406	0.3735	3.3758	0.3454	3.1114
24	0.3504	3.1624	0.3919	3.5489	0.3847	3.4822	0.3558	3.2098
25	0.3609	3.2568	0.4037	3.6544	0.3962	3.5857	0.3665	3.3056
26	0.3717	3.3486	0.4158	3.7572	0.4081	3.6866	0.3775	3.3989
27	0.3829	3.4381	0.4283	3.8573	0.4204	3.7849	0.3888	3.4897
28	0.3944	3.5253	0.4411	3.9548	0.4330	3.8806	0.4005	3.5782
29	0.4062	3.6102	0.4543	4.0498	0.4460	3.9738	0.4125	3.6645
30	0.4184	3.6929	0.4680	4.1422	0.4594	4.0645	0.4248	3.7484

The Nominal Inflation Rate used in the table is 2.0%

The Discount factor used in the table is 4.0%



2016 Water and Electricity Avoided Costs																
Year	Water Heating				Space Heating				Combined Space & Water Heating				Industrial			
	Electricity (¢/kwh)		Water (\$/1000 litre)		Electricity (¢/kwh)		Water (\$/1000 litre)		Electricity (¢/kwh)		Water (\$/1000 litre)		Electricity (¢/kwh)		Water (\$/1000 litre)	
	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV
1	0.1225	\$0.12	0.8936	\$0.89	0.1225	\$0.12	0.8936	\$0.89	0.1225	\$0.12	0.8936	\$0.89	0.1225	\$0.12	0.8936	0.8936
2	0.1249	\$0.24	0.9114	\$1.76	0.1249	\$0.24	0.9114	\$1.76	0.1249	\$0.24	0.9114	\$1.76	0.1249	\$0.24	0.9114	1.7555
3	0.1276	\$0.35	0.9310	\$2.59	0.1276	\$0.35	0.9310	\$2.59	0.1276	\$0.35	0.9310	\$2.59	0.1276	\$0.35	0.9310	2.5880
4	0.1310	\$0.47	0.9555	\$3.40	0.1310	\$0.47	0.9555	\$3.40	0.1310	\$0.47	0.9555	\$3.40	0.1310	\$0.47	0.9555	3.3960
5	0.1337	\$0.57	0.9750	\$4.18	0.1337	\$0.57	0.9750	\$4.18	0.1337	\$0.57	0.9750	\$4.18	0.1337	\$0.57	0.9750	4.1756
6	0.1365	\$0.68	0.9954	\$4.93	0.1365	\$0.68	0.9954	\$4.93	0.1365	\$0.68	0.9954	\$4.93	0.1365	\$0.68	0.9954	4.9283
7	0.1393	\$0.78	1.0159	\$5.65	0.1393	\$0.78	1.0159	\$5.65	0.1393	\$0.78	1.0159	\$5.65	0.1393	\$0.78	1.0159	5.6547
8	0.1421	\$0.87	1.0369	\$6.36	0.1421	\$0.87	1.0369	\$6.36	0.1421	\$0.87	1.0369	\$6.36	0.1421	\$0.87	1.0369	6.3558
9	0.1451	\$0.96	1.0584	\$7.03	0.1451	\$0.96	1.0584	\$7.03	0.1451	\$0.96	1.0584	\$7.03	0.1451	\$0.96	1.0584	7.0325
10	0.1481	\$1.05	1.0805	\$7.69	0.1481	\$1.05	1.0805	\$7.69	0.1481	\$1.05	1.0805	\$7.69	0.1481	\$1.05	1.0805	7.6858
11	0.1512	\$1.14	1.1030	\$8.32	0.1512	\$1.14	1.1030	\$8.32	0.1512	\$1.14	1.1030	\$8.32	0.1512	\$1.14	1.1030	8.3164
12	0.1544	\$1.22	1.1260	\$8.93	0.1544	\$1.22	1.1260	\$8.93	0.1544	\$1.22	1.1260	\$8.93	0.1544	\$1.22	1.1260	8.9252
13	0.1576	\$1.30	1.1496	\$9.51	0.1576	\$1.30	1.1496	\$9.51	0.1576	\$1.30	1.1496	\$9.51	0.1576	\$1.30	1.1496	9.5129
14	0.1609	\$1.38	1.1736	\$10.08	0.1609	\$1.38	1.1736	\$10.08	0.1609	\$1.38	1.1736	\$10.08	0.1609	\$1.38	1.1736	10.0803
15	0.1642	\$1.46	1.1981	\$10.63	0.1642	\$1.46	1.1981	\$10.63	0.1642	\$1.46	1.1981	\$10.63	0.1642	\$1.46	1.1981	10.6280
16	0.1677	\$1.53	1.2231	\$11.16	0.1677	\$1.53	1.2231	\$11.16	0.1677	\$1.53	1.2231	\$11.16	0.1677	\$1.53	1.2231	11.1567
17	0.1712	\$1.60	1.2487	\$11.67	0.1712	\$1.60	1.2487	\$11.67	0.1712	\$1.60	1.2487	\$11.67	0.1712	\$1.60	1.2487	11.6672
18	0.1748	\$1.67	1.2748	\$12.16	0.1748	\$1.67	1.2748	\$12.16	0.1748	\$1.67	1.2748	\$12.16	0.1748	\$1.67	1.2748	12.1600
19	0.1784	\$1.73	1.3015	\$12.64	0.1784	\$1.73	1.3015	\$12.64	0.1784	\$1.73	1.3015	\$12.64	0.1784	\$1.73	1.3015	12.6358
20	0.1821	\$1.80	1.3287	\$13.10	0.1821	\$1.80	1.3287	\$13.10	0.1821	\$1.80	1.3287	\$13.10	0.1821	\$1.80	1.3287	13.0951
21	0.1860	\$1.86	1.3565	\$13.54	0.1860	\$1.86	1.3565	\$13.54	0.1860	\$1.86	1.3565	\$13.54	0.1860	\$1.86	1.3565	13.5385
22	0.1898	\$1.91	1.3849	\$13.97	0.1898	\$1.91	1.3849	\$13.97	0.1898	\$1.91	1.3849	\$13.97	0.1898	\$1.91	1.3849	13.9666
23	0.1938	\$1.97	1.4138	\$14.38	0.1938	\$1.97	1.4138	\$14.38	0.1938	\$1.97	1.4138	\$14.38	0.1938	\$1.97	1.4138	14.3798
24	0.1979	\$2.03	1.4434	\$14.78	0.1979	\$2.03	1.4434	\$14.78	0.1979	\$2.03	1.4434	\$14.78	0.1979	\$2.03	1.4434	14.7788
25	0.2020	\$2.08	1.4736	\$15.16	0.2020	\$2.08	1.4736	\$15.16	0.2020	\$2.08	1.4736	\$15.16	0.2020	\$2.08	1.4736	15.1639
26	0.2062	\$2.13	1.5044	\$15.54	0.2062	\$2.13	1.5044	\$15.54	0.2062	\$2.13	1.5044	\$15.54	0.2062	\$2.13	1.5044	15.5358
27	0.2106	\$2.18	1.5359	\$15.89	0.2106	\$2.18	1.5359	\$15.89	0.2106	\$2.18	1.5359	\$15.89	0.2106	\$2.18	1.5359	15.8948
28	0.2150	\$2.23	1.5680	\$16.24	0.2150	\$2.23	1.5680	\$16.24	0.2150	\$2.23	1.5680	\$16.24	0.2150	\$2.23	1.5680	16.2413
29	0.2195	\$2.27	1.6008	\$16.58	0.2195	\$2.27	1.6008	\$16.58	0.2195	\$2.27	1.6008	\$16.58	0.2195	\$2.27	1.6008	16.5759
30	0.2240	\$2.32	1.6343	\$16.90	0.2240	\$2.32	1.6343	\$16.90	0.2240	\$2.32	1.6343	\$16.90	0.2240	\$2.32	1.6343	16.8989

The Nominal Inflation Rate used in the table is 2.0%

The Discount factor used in the table is 4.0%



Appendix C: DSM Conservation Programs Process Evaluation – Home Energy Conservation & Home Winterproofing, Econoler



Appendix D: Enbridge Gas Distribution Inc. Affordable Housing New Construction Program – Stakeholder Research and Analysis of Program Soft Launch, Phase 1 of 2, C2C Strategies



engage wisely

Enbridge Gas Distribution Inc. Affordable Housing New Construction Program

Stakeholder Research and Analysis of Program Soft Launch DRAFT Report

16 December 2016

Prepared by:
Emay Cowx CPF, Principal

www.c2cstrategies.ca



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INTRODUCTION

The Affordable Housing New Construction Program (Program) was rolled out in 2016 as part of Enbridge Gas Distribution's (Enbridge) 2016-2020 natural gas demand side management (DSM) Low Income Program portfolio. The Program was implemented by way of a 'soft launch' during the first half of the year. Enbridge identified participants through its regular DSM work in the social and affordable housing, and building development sectors.

C2C Strategies was asked by Enbridge to undertake an early review of the Program by conducting a series of interviews with soft launch participants. The purpose of the research was to assess the incentive approach, program delivery effectiveness and participants' general experience with the Program during the early stages. Findings from this research are expected to inform future refinements of the Program methodology and approach.

RESEARCH METHODOLOGY

Enbridge identified three different projects that are currently enrolled in the Program as the basis for the research. The projects included both Part 3 multi-residential buildings and Part 9 Single family dwellings. For this research C2C conducted one-on-one telephone interviews with eight individuals, including

- Applicants (who were the project owners or building developers);
- Selected members of the Applicant's architectural team; and
- Consultant representatives working on behalf of EGD to provide technical energy modeling support in the delivery of the Program.

The research approach consisted of a telephone interview lasting approximately 30 minutes and was conducted in a conversational style guided by questions designed to elicit interviewee perspectives on the following topics:

- Level of knowledge of the Program generally, the participation process and incentive structure.
- Experience to date in participating in the Program as either an Applicant or as a Consultant delivering key program components.
- Thoughts, ideas and suggestions for building Program awareness and marketing.

Respondents were assured of confidentiality in respect to their specific input.

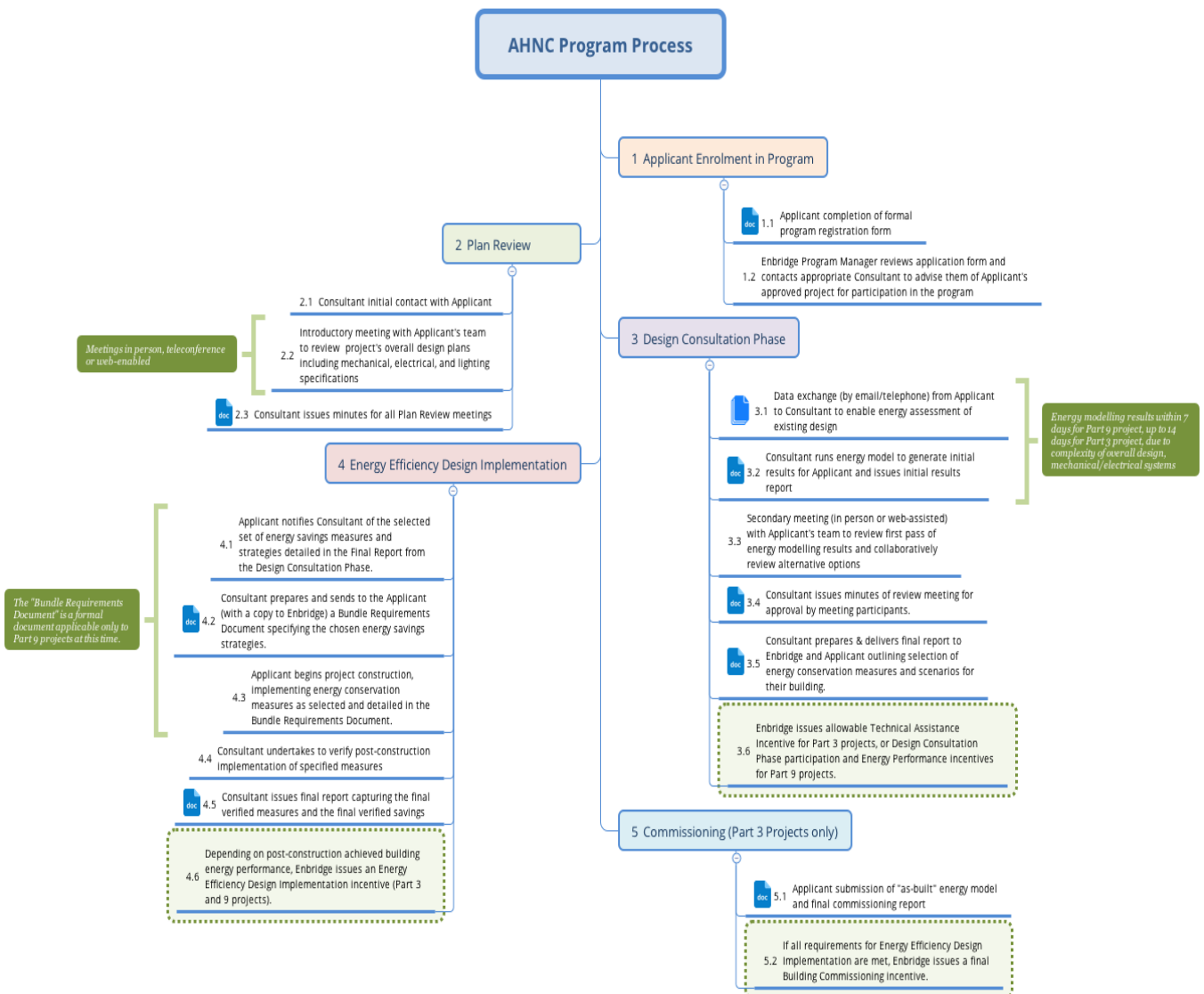


RESEARCH FINDINGS

Where it was necessary to reference a specific perspective in this research, the term “Applicant” will mean an individual who is the project owner, building developer or a member of the Applicant’s architectural team. Where the term “Consultant” was used in the body of this report, this will refer to the group of individuals who provided technical energy modeling expertise in the delivery of the Program.

1. Program Process

The illustration below provides an overview of the program process:





Where there are blue document icons noted to the left of the numbered step, there is either an exchange of information or data between the Consultant and the Applicant; or the delivery of a formal record including meeting minutes or a report. For record keeping, Enbridge receives a copy of all meeting minutes and reports developed by the Consultant on each project.

a) Step 1 – Program Enrolment

The expected process for participating in the Program would begin with an Applicant enrolling in the project by completing an application form available from Enbridge. Applicants did not experience any difficulty with the enrolment process, indicating that completing the form was “pretty simple” and “straightforward”.

One of the Consultant interviewees noted that since they have assisted builders in the past to complete application forms for other commercial building programs, it wouldn’t be a burden for them to consider completing application forms for both Part 3 and Part 9 builders who might be interested in participating in the Program. This option would make sense when the energy evaluation company introduces a potential participant to the Enbridge Program. Enbridge would still authorize approval for acceptance to the Program.

Key Finding: Enbridge to consider allowing energy efficiency evaluation companies to identify potential program participants and facilitate their application for enrolment for approval by Enbridge.

b) Step 2 – Plan Review and Step 3 – Design Consultation Phase

All Applicant interviewees had completed a full cycle of the Plan Review and Design Consultation Phases (Steps 2 and 3) and were able to share their experiences.

A common theme from the feedback was the importance of identifying and involving projects at an early stage of the building project design. It was noted that ideally, projects (regardless of building type) should be at a conceptual draft plan stage.

- *Once we’d got an architect, maybe meet before we even put pen to paper or anything. Your modelers could then say ok here’s what you need to do...because it costs us to change to the new modeling. - Applicant*
- *Now you’ve got lots of time. The architectural aren’t done, the mechanicals aren’t done, and you’ve got some ability now to really make things happen. - Consultant*
- *Generally the plans might not be finalized, but changes can still be made, at least they have a set of drawings, they have the mechanical, the electrical. - Consultant*
- *We [Consultant] can take a project as long as they have a general plan with geometry and base layouts done and a general idea of what they’re looking at in terms of mechanical systems. From there it allows us to bring the potential options*



forward for their consideration before they make those major decisions in terms of specific mechanical system with this efficiency and before those major systems are purchased. - Consultant

In some cases during the soft launch period Applicants had already entered the project construction phase, which made changes to building design or alternative equipment considerations impossible or difficult. In one case there was time to make a change order to shop drawings that had been already issued. In that situation there was, however, an additional cost that the Applicant would have preferred to avoid.

Key Finding: There is an opportunity for the Program application/enrolment form to add questions that will enable an assessment of the stage of an Applicant's project. This preliminary assessment will ensure that once a project has been accepted into the Program, it will gain maximum benefit from the Plan Review and Design Consultation Phases with the assigned Consultant. Resulting in potentially a higher chance for implementation of energy efficiency measures identified during this phase of Program work.

Although not a significant impediment to the process, it was mentioned by Consultants that initial Plan Review meetings did not always involve all necessary individuals from the Applicant's support team. These introductory and initial contact meetings were important for the Consultant to fully understand the scope of the project and key design details. Sometimes project or building owners were not as familiar with the necessary design details that would inform the set up of an energy modeling simulation. This required the Consultant to conduct follow up meetings with the Applicant's design team to obtain the necessary information. It was also suggested that if there was an identified contractor for the mechanical and electrical systems that they be available to participate in the Plan Review meeting (particularly for Part 3 projects) so that the Consultant could not only better understand the contractor's thinking, but to also help overcome potential contractor bias for traditional forms of equipment or technologies.

- *There has to be a discussion between the energy modelers and the design engineers about what was possible for the project, where would the boundary be between the code response for the highest performance response possible, and what's the reasonable place in the middle. That discussion needs to take place with the actual mechanical designer in the room. - Applicant*



c) Step 4 – Energy Efficiency Design Implementation and Step 5 - Commissioning

None of the projects reviewed for this research had yet completed requirements for either Steps 4 or 5 of the Program. Consequently feedback to provide specific insight into the Program at these steps is not available.

2. Program Knowledge and Support

Since Applicants were brought into the Program directly by Enbridge during the soft launch period, a Consultant's first contact with an Applicant took place during the Plan Review meeting. At that initial meeting Consultants noted that knowledge of the Program steps (or phases) and details regarding the incentive structure was relatively weak among Applicants. One Consultant surmised the reason as possibly being a lack of shared knowledge among the builder's staff assigned to the project. Specifically the person on the builder's side to whom Enbridge had introduced and described the Program, might not have been the same person representing the project at the Plan Review meeting. This resulted in the Consultant having to explain in detail the Program features and guidelines.

In reflecting on Applicants' level of knowledge about the Program, Consultants offered the following feedback:

- *Something up front that is more clear. Better laid out, maybe it's just the way the program is presented. - Consultant*
- *The first couple of projects there was a representative from Enbridge, but the last one there wasn't. So now the builders call me and ask me what are the next steps. I'm more than happy to give this information to them, but when it comes to the incremental cost of building energy star it should come from Enbridge. - Consultant*

Deeper knowledge of the Program elements appeared to become evident to Applicants during the Plan Review phase and the following Design Consultation phase, where the role of the incentives were demonstrated in the outcomes of the design modeling simulation:

- *We had one of the representatives at one of the construction meetings. So they were also able to share light on the program with ourselves, the contractor and the owner's representative. I think it was very self explanatory. When you get a grasp and navigate through the description you start to understand its context. - Applicant*
- *I don't think I went through the process, how many steps. We did the modeling, everything being put into effect now. - Applicant*

In summary, it appears that during the soft launch period it was common to have an Enbridge representative participating in those early meetings with Applicants and therefore available to directly answer any Program-related questions. In the future as the volume of Applicants increases, familiarity with the program steps and incentive structure could be better supported by providing Consultants with marketing resources and website links to



reference during those early meetings. These materials and references would be particularly useful where the Applicant is a large organization with different staff assigned to work on different projects, not all of which might be in the affordable housing sector.

Additionally, the deeper complexity involved in engineering the mechanical and electrical components of a Part 3 project suggests that an Applicant's team will be comprised of specialized individuals brought in to support those building design elements, and who will have had no prior exposure to the Program. Feedback also indicated that participants working on behalf of an Applicant who went through the process of a technical energy modeling consultation led to experiential learning, which reinforced Program understanding and the phased incentive approach.

Key Finding: Consultants would benefit from having additional Program marketing materials and online resources that provide an overview of the steps and phased incentive structure. These materials would be particularly effective during Consultants' early meetings with Applicants and their team. Enbridge would also benefit from requiring that Consultants brought on to deliver the Program have a deep understanding of the phases and incentive structure so that when required, Consultants are confident and capable of describing the Program in detail directly to Applicants.

3. Information Trail

Participating in an energy design modeling simulation required the Applicant to provide to the Consultant a variety of documents and data, including architectural and technical drawings and layouts, mechanical and electrical specification data, and other building design and construction information. Consultants were uniformly in agreement that they kept a detailed record of what information was provided. The data was generally obtained by email, although sometimes through telephone conversations.

Formal written records developed by the Consultant would take the form of minutes to capture discussions that occurred during the Plan Review phase, and Design Consultation phase results meetings. A copy of these minutes was provided to all meeting participants for review and approval, and a final copy provided to Enbridge for its reference and retention.

Other types of formal documentation generated again by the Consultants during the soft launch period included two formal reports per Applicant project: an Initial Results report from the energy modeling simulation, and a Final Report capturing the final measures and energy savings strategies that an Applicant may select from to incorporate as the project



advances to construction. An outcome of the final results meeting is the selection by the Applicant of a 'bundle' of energy saving strategies based on what they learned from the modeling simulation and outcomes of alternative design scenarios. Both of these reports are also provided to meeting participants for review, with copies again provided to Enbridge for its reference and retention.

Following the Final Results meeting and report, the Applicant is then sent by the Consultant a "Bundles Requirement Document" based on the final selected strategies. This document would then form the basis of verification during the Energy Efficiency Design Implementation phase to determine if the selected strategies and measures have been implemented following construction and determine the final level of incentive to be paid. The Bundle Requirements Document is noted as a specific report generated by Consultants supporting Part 3 projects.

A similar reporting process was not referenced by Consultants supporting Part 9 projects. Given that energy evaluators working on behalf of the Consultant assigned to support Part 9 projects are Natural Resources Canada certified, it is presumed that similar reporting protocols and documentation are in place. The Consultant supporting Part 9 projects did indicate that since the Program had set Energy Star standards as the target, the project *"has been given a file number by the government."* Inferring that an official record resided in a federal government database.

Key Finding: If not already in place, to facilitate alignment in formal reporting processes and documentation between the two streams of projects (Part 9 and Part 3), it is suggested that Consultants for either type of project provide to Enbridge a formal document detailing the energy savings strategy and collection of measures agreed on by the Applicant following delivery of the final results report from the Design Consultation phase. This document would provide a clear record of intent to build selected measures and/or adopt specific energy savings strategies into the Applicant's project, for future reference and verification purposes.

4. Program Design and Incentive Structure

All interviewees spoke very highly of the Program and its staged incentive structure. In comparison to other energy conservation programs targeted at buildings, such as Sustainable Buildings Canada (referenced by one interviewee), the Program was viewed as simple to navigate and it entrenched real learning among participating Applicants. Having the energy modeling based on an Applicant's project made the learning both immediately



practical and relatable, rather than a training exercise using a generic scenario whose learning was often forgotten over time.

- *It made their company think about things in a whole new way with an industry that's willing to help them. - Consultant*

So far the Program has achieved its desired objective for one particular project by demonstrating to the building owner through the modeling results, how an early design by the architect was in fact superior in energy performance than the design ultimately selected to accommodate project budget constraints. The Design Consultation phase provided savings and monetary data that ended up convincing the Applicant to invest in slightly more costly (but energy effective) technology earlier, rather than later.

- *So knowing that there are systems that are cost effective and energy savings systems that are going to save them money over the long term life cycle of the equipment and project is a big plus. And then on top of that be able to get some incentives to encourage them to spend a little more money up front for the greater benefit down the road, I think that was huge. - Consultant*
- *The best thing that's going to come out of this is that we're going to have over \$15,000 that's going to go to commissioning and the costs of the better energy decisions that we've made so I would call that a very big success. ... There are things like the occupancy sensors, or the vacancy sensors that may have not gotten done without being a requirement in here. So there definitely have been a few things that have been added in that may have been forgotten had we not participated. - Applicant*

It was encouraging to note that Consultants supporting the program have had a very positive experience with the Program during this soft launch period of learning how the program will work for Applicants, and how they as Consultants are expected to support them. The administrative burden was seemingly acceptable, and the Program's design apparently a pleasant surprise. One Applicant who has had previous experiences with many other federally funded and utility-based energy efficiency programs indicated surprise that a "roadblock" or "bureaucracy" never occurred. In their words, "We were always waiting for a negative, but it never happened like that. It was just so positive!"

a) Templated Modeling Approach

The Program design is supported primarily on two features:

1. Technical support provided during the design phase by an energy modeling consultant; and
2. Incentives that are determined based on level of building performance that exceeds the Ontario Building Code (OBC).



Consultants supporting the program for both Part 9 and Part 3 buildings were all highly experienced energy evaluators. In conducting this work they utilized computer-based energy modeling software in order to assess various design scenarios and deliver results for discussion with Applicants.

Feedback from Applicants highlighted a few shortcomings with using a templated modeling approach. First, prices and data reported by one Consultant were provided in U.S., rather than Canadian currency and metric units. The Applicant did provide feedback directly to the Consultant who subsequently translated the data to be consistent with Canadian references.

Second, the level of energy modeling knowledge and sophistication varied among Applicants. Where an Applicant was least knowledgeable and sophisticated in the area of building design efficiencies (in other words generally built only to OBC), working with an energy modeler utilizing a templated approach delivered a high learning factor and introduced primary level strategies that made it simple to exceed OBC. Where an Applicant was highly sophisticated, to the degree that the project had its own energy modeler on staff, the templated approach was challenged in making the Program fit the already high standards imposed on the defined project. In this specific case the project was designed to achieve what is known as “passive house” certification, which relied heavily on extraordinary levels of insulation and designed to have less reliance on mechanical systems. In this situation and elsewhere, various Applicants described the shortcomings of the approach in the following ways:

- *One of the problems we had with the program is that it's not able to model how good of a building we've produced. - Applicant*
- *Every model makes a certain set of assumptions so it's always good to have someone else looking at it to work out if something critical has been missed, or you're getting carried away on something you wouldn't have to. I didn't get a strong feeling that they've done a very detailed model. - Applicant*
- *It's more a question of what the scope of work of the models will be. - Applicant*
- *It's a question of having the flexibility in the development team on the owner's side and the development team on the [modeling] side to get the best out what the opportunities are. A templated approach may actually not allow you to get the best opportunities in play. - Applicant*
- *Maybe Enbridge already knows the answer and they're not necessarily looking for what the building can be, perhaps they just already know the answers that they want and they're just trying to find it inside of the design. Once again that's not necessarily a bad thing, because I have no doubt that not everybody is building the way that we are, and there's guarantee you could be making a lot of buildings*



better by making sure that people go through this checklist because a lot of people don't. - Applicant

- *My biggest feeling is they [Enbridge] could be looking even bigger. I feel they put themselves in a box and gave themselves a limit as how efficient a building could be. They could be incenting and looking at making even bigger and better buildings and more efficient buildings than what they've limited themselves to. - Applicant*

Key Finding: By involving Applicants who represent a continuum of energy modeling knowledge and sophistication during the soft launch period, the templated modeling approach has shown some gaps in terms of delivered value to Applicants who are at the high end of the range. One suggestion was for Enbridge to consider offering both modeling and constructability analysis as part of the Design Consultation phase. This would be achieved by having Consultants with demonstrated competencies in both modeling and implementation to help an Applicant identify the opportunities best suited and tailored for their specific projects.

b) Incentive Structure

All interviewees acknowledged that the phased incentive approach was the right one. They believed that it was an important contributing factor to ensuring continued Program participation; except in the case where one project was already preparing for construction and too far along to alter the design in a manner that would work within defined Program rules.¹ Applicants were quite candid about the draw that financial incentives had for encouraging Program participation. As not-for-profit developers, not one interviewee mentioned that proffered amounts were inadequate or lacking.

A few interviewees indicated that the program's models and therefore incentives were focused primarily on the mechanical/electrical aspects of a project.

- *It's easier to incent things at the manufacturing level than it is at the design and construction level. - Applicant*
- *They put a lot of effort into their mechanical strategy. If I look at the requirements document that we've been given, half of it is related to the mechanical system. I can understand makes sense from perhaps the old that we're building and from Enbridge's point of view because that's where gas is consumed; it's going to be in*

¹ Despite not continuing in the Program with that specific project, both the Consultant and the Applicant noted in their respective interviews that the learning, combined with the benefits offered through the Program, has led the Applicant to notify the Consultant of an eligible, upcoming project that will be applying to the Program in the near future.



the boilers, or in the air makeup units. I feel they focused heavily on that. Whereas in our building we're doing such high insulation with a simple mechanical system and focusing on a huge heat recovery ventilation on that mechanical system. I think that this entire program, these requirements listed here might almost be obsolete when the new building code comes out. The new building code will make the extras listed in here the baseline. So this program has an expiry date of three years. – Applicant

In contrast, others felt that basing efficiency improvements against OBC was a flexible approach.

- *The new building code will require more insulation, and more efficiency on the mechanicals...when the code goes up it now just raises the benchmark for the Enbridge program. The new energy star will jump up by 20% over code when the code goes up. A lot of it is dependent on the architecture. We're seeing a lot more glass and it has a certain R-value. So to get more efficient you might have to look at the mechanicals more. - Consultant*

In summary, financial incentives geared towards the affordable housing sector are always welcomed as one Applicant noted, “*The commonality for this is there isn't enough money to do the job.*”

Key Finding: At this time, satisfaction with the incentive approach and levels notionally appears high. Another review of these Program elements should be considered in the future, with projects that have completed construction and gone through a full Program cycle.

5. Program Support

As a market transformation program, there were a variety of areas where interviewees felt that Enbridge might provide additional support to Applicants as they participate in various phases or steps of the Program. As noted earlier, interacting with energy evaluators/Consultants through a modeling process is both a learning exercise and an opportunity to help building contractors and tradespeople overcome bias for traditional building practices and technologies. To entrench the learning and support the market transformation brought about by the Program, it was suggested that Enbridge consider delivering focused training in the following ways:

- *Enbridge could, as the project moves through one of the phases where the builder could be, provide a half day of in-class training for the developer or builder's team. They can choose how many people they want in it, just a half day with ourselves*



[Consultant]... here are the future opportunities around the world, cool building science, lessons learned. We always find that the builders and developers are keen to get that kind of information. Union Gas has done a little more by virtue of some of their programs, Optimum Homes and others where they've targeted pure consulting, pure instruction with the builders. - Consultant

- *Some builders work with the same trades and some trades are not willing to change. I sometimes think if we could get some of these head trades people trained, and then they can pass that information on. So it's building practices. Little changes, nothing big, but it makes a difference. – Consultant*
- *If a builder commits to it, I think there should be some trades training. If they've never built or have any experience building a more energy efficient home. – Consultant*

One interviewee mentioned that the real benefit of training at the trades level was the development of shared understanding of how trades people all have a role in delivering an energy efficient building by adjusting the manner in which they complete their tasks. A situation was described where a design may call for the application of high insulation into a building's walls. The framers and insulator trades people do their jobs, but when it comes to installing the electrical boxes, etc. the question was asked whether the electrician followed up by sealing the plastic when completing their task in order to maintain the integrity of the building envelope.

Another interviewee (who was an energy modeler brought on to a Part 3 Applicant's team) suggested a more aggressive support framework similar to one adopted at Hydro Quebec. In this structure Enbridge would internalize the energy modeling expertise by having technical staff available to directly support large projects. Further to that, it was also suggested that Enbridge might consider undertaking a robust economic study that would help to demonstrate to affordable housing project developers how upfront investments in a better performing building would result in an immediate stream of lower operating costs, thereby overcoming the general anxiety of taking on the perceived financial risk of doing something new.

- *The providers, even the necessarily sophisticated ones don't have the building expertise to tune their instincts and they always are short of cash so the risk of trying something new and having to fix it could be fatal. The investment is always questioned and the tendency is to push towards cheaper buildings that actually need more maintenance, but deferring the maintenance. It's the social side, not necessarily the bricks and mortar side that are the trickier parts of the equation. – Applicant*



At the project level, particularly for the more complex Part 3 buildings it was noted that ongoing modeling support beyond the Design Consultation phase would be valuable.

- *To be really, really effective in taking advantage of the opportunity, the applicant would actually have to have a fairly sophisticated understanding of what was possible from the mechanical, electrical and control side of the project. That's probably beyond what most of the providers have in-house. - Applicant*

During this soft launch period assessing the adequacy of ongoing Consultant technical support to Applicants would not be possible until projects have completed one full cycle of the Program (i.e., final verification has been completed). Enbridge may want to consider the degree to which modeling Consultants might be required to provide ongoing technical support to Applicants as project move through to completion under the Program.

Key Finding: Interviewees provided a number of suggestions where Enbridge might consider providing additional support to the Program. These ideas ranged from targeted training sessions for builders, contractors and tradespeople, developing its own technical energy modeling competencies (rather than contract out), and undertaking a robust economic study that would assist affordable housing developers overcome anxiety over the perceived financial risks of building to high energy efficient standards. After Consultants complete a project's final energy savings verification, and Applicants apply for the final incentive, it would be beneficial to review an Applicant's experience with ongoing technical support from a Consultant during the project's Energy Efficiency Design Implementation phase. This feedback will provide insight into the level of desired and/or necessary support from Consultants through the entire Program process.

6. Developing Program Awareness

To create a sustained Affordable Housing New Construction Program, it will be necessary to build program awareness in order to create a pipeline of potential Applicants. A common remark among interviewees was that regular liaison with the builder industry and with the energy evaluator community would be the first approach to finding out about projects ahead of time when they're at the conceptual draft plan stage. One Consultant mentioned that they learned about the Program through the Ontario Not for Profit Housing Association (ONPHA), further sharing that the Canadian Mortgage and Housing Corporation (CMHC) had been discussing the funding of new affordable housing developments. This



would suggest that there's an opportunity for Enbridge to get information about their Program to CMHC, for when their outreach occurs. Other suggestions include

- *Getting out to agencies, like local construction associations, getting out to consultants so they can inform their clients of some of the incentive programs. – Applicant*
- *Architects, I'm sure they have a website they go on to or they're part of an architect. – Consultant*
- *Through our evaluators. They're closest to them. Were putting something on our website. They're the closest to the builder. They're on the ground floor. Builders will pick demographically someone who's closest to where they're building. – Consultant*
- *More visibility is going to get interest because the basic condition of a housing provider is not having any money. Anyone who offers to help out with that load is going to get attention, but they have to be visible. It might be just as easy having a representative go direct to the providers: OCH [Ottawa Community Housing], TCHC [Toronto Community Housing Corp.] and all the municipal housing agencies. Just go direct. It's going to be more effective than manning a booth at a trade show. Talk to specific people. Talk to the people doing the stuff. - Applicant*

Key Finding: Due to pent up demand for a unique program such as the one created by Enbridge for new construction in the affordable housing sector, creating Program visibility appears key. Interviewees provided a number of suggestions including leveraging from the networks already held by the modeling Consultants currently supporting its delivery.

CONCLUSION

The Enbridge Affordable Housing New Construction Program clearly fills a need in the energy efficiency construction marketplace. Soft launch interviewees generally felt that the Program was much easier to navigate and understand in comparison to other programs that Enbridge offers in the building construction sector. Given that Applicants' experience with the Program during this soft launch stage has been only in the early Plan Review and Design Consultation phases, a full assessment of the Program will be achieved by revisiting their experience once they've completed the latter phases of the Program. Research conducted at this future time will also provide an opportunity to examine the desire, or need by Applicants for ongoing technical support from Consultants contracted by Enbridge to deliver the Program.



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Our operating principles are built on:

- Relationships – We firmly believe that long term relationships are developed from thoughtful and considerate actions.
- Collaboration – Keeps the lines of communication open, allowing us to work in a focused and productive way with clients and their stakeholders.
- Co-creation – Is the space in which we build new paths forward together.
- Innovation – Transcends current thinking to establish “next” practices that will carry into the future.

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