

2016 Demand Side Management Final Annual Report

30 November 2018

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Glossary of Terms

Audit

The Audit is an annual Evaluation, Measurement and Verification (“EM&V”) process to assess Union’s reported DSM results. Ontario Energy Board (“OEB”) Staff is responsible for retaining the auditor, also known as the Evaluation Contractor, whom ultimately serves to protect the interests of ratepayers with respect to Union’s DSM claims.

Avoided Costs

Avoided costs are a measurement of the reduction in the delivered costs of supplying all resources (natural gas, electricity and water) to customers as a consequence of a program.

Base Case

The base case is a projection of the future without the effects of the utility’s DSM program. The difference between the base case and the energy efficient case represents the saving attributable to the energy efficient measure.

Building Envelope

The building envelope refers to the exterior surfaces (such as walls, windows, roof and floor) of a building that separate the conditioned space from the outdoors.

Channel Partner

A Channel Partner is a company that, in the course of its business, can influence consumers to choose gas over competing fuels, or one method of increasing energy efficiency over another. Examples of Channel Partners include appliance retailers, HVAC contractors, engineers and architects.

Cost Effectiveness

Cost effectiveness refers to the analysis that determines whether or not the benefits of a project/measure are greater than the costs. It is based on the net present value of savings over the equipment life of the measures.

Demand Side Management ("DSM")

DSM is the modification in end-use customer demand for natural gas through conservation programs. While the focus of Union's DSM is natural gas savings and the reduction in greenhouse gas emissions, it may also result in the saving of a number of other resources such as electricity, water, propane, and heating fuel oil.

Demand Side Management Incentive Deferral Account ("DSMIDA")

The account used to record the DSM Shareholder Incentive amount earned by Union as a result of its DSM programs.

Demand Side Management Variance Account ("DSMVA")

The account used to track the variance between actual DSM spending by rate class versus the budgeted amount included in rates by rate class. Union may record in the DSMVA, in any one year, a variance amount of no more than 15% above its DSM budget for that year.

Direct Access ("DA") Budget Mechanism

The DA budget mechanism is offered to Union's largest industrial customers (Rate T2 and Rate 100). It provides each customer dedicated access to the customer incentive budget they pay in their rates to support energy efficiency projects and studies on an annual basis.

Discount Rate

The interest rate used to calculate the net present value of expected yearly benefits and costs.

DSM Shareholder Incentive

The incentive available to Union for achieving Board approved performance targets.

Effective Useful Life ("EUL")

EUL is the length of time that a piece of equipment or measure is anticipated to last and perform as expected.

Evaluation Contractor ("EC")

As part of the new 2015-2020 evaluation governance structure, the EC is a third party who carries out the evaluation and audit processes of Union's DSM programs. The EC, also known as the auditor, is retained by OEB Staff.

Evaluation and Audit Committee ("EAC")

As part of the new 2015-2020 evaluation governance structure, the EAC provides input and advice to OEB Staff on the evaluation and audit of DSM results. The EAC consists of representatives from Union, Enbridge, non-utility stakeholders, independent experts and observers, all working with OEB Staff. The EAC replaces the Audit Committees and Technical Evaluation Committee from the previous DSM framework.

Evaluation, Measurement & Verification ("EM&V")

EM&V is the collection of methods and processes used to assess the implementation and performance of energy efficiency activities. The main objective of EM&V is to assess the performance of a program and to measure (through data collection, analysis, and reporting of data) and verify program impacts to ensure the expected level of savings are being achieved. EM&V data, in addition to various evaluation studies, such as Net-to-Gross ("NTG") or persistence studies, inform recommendations for improvements in program performance.

Free Ridership

Free Riders are program participants who would have installed an energy efficient measure without the influence of Union's DSM programs. Free Ridership is not a binary concept and consequently, different levels of Free Ridership exist. Free Rider rates are estimated based on research, market penetration studies, through negotiations in prior evaluation processes or by surveying participants. The Free Rider rates are applied to the gross program savings results to derive savings generated by the program.

Incentive

An incentive is a payment from Union to DSM participants to encourage participation in a DSM program.

Incremental Cost

The incremental cost is the difference in price between the high efficiency case and the base case.

Input Assumptions

Assumptions such as operating characteristics and associated units of resource savings for DSM technologies and measures. These cover a range of typical DSM activities, measures and technologies with residential, low-income, commercial and industrial applications.

Lifetime Cumulative cubic meters ("cumulative m³")

Total natural gas savings over the effective useful life of a DSM measure. Frequently used at the measure or program level and can also summarize the benefits of an entire portfolio.

Lost Revenue Adjustment Mechanism Variance Account ("LRAMVA")

The LRMVA captures the differences between the actual contract market margin reductions (distribution revenues) related to Union's DSM plans and the contract market margin reduction included in gas delivery rates as approved by the Board.

Measure

A measure is any particular energy efficient technology (e.g. an energy recovery ventilator, condensing boiler, etc.)

National Account

National Account customers are those customers that have multiple property locations and are similar in design and use. National Account customers include retail chains, property management firms and foodservice chains.

Net Present Value ("NPV")

The NPV is the sum of the discounted yearly benefits arising from an investment over the lifetime of that investment.

Net-to-Gross Ratio

Gross impacts are the program impacts prior to accounting for program attribution effects. These effects include Free Ridership and Spillover. Net impacts are the program impacts once program attribution effects have been accounted for. The NTG Ratio is defined as $1 - \text{Free Rider Rate} + \text{Spillover Rate}$.

Offering

A DSM offering exists where there are either bundles of energy efficiency measures or performance/maintenance based enhancements to existing measures marketed together (e.g. home retrofit measures or custom equipment/process improvements) or where support is delivered through a suite of services (e.g. customer engagement, site energy assessments, etc.).

Participants

The units used by Union to measure participation in its DSM programs. Participant units of measurement may include customers, projects and measures or technologies installed. Not all participants result in energy savings.

Persistence

Persistence is the extent to which a DSM measure remains installed and performing as originally predicted. Persistence of DSM savings takes into account how long a DSM measure is kept in place relative to its useful life, the net impact of the measure relative to the base case scenario, and the impact of technical degradation.

Prescriptive Offering

A prescriptive DSM offering includes natural gas savings from various measures or technologies that are based on previously substantiated and pre-approved inputs. Prescriptive DSM measures apply to all of Union's customer market segments including residential, low-income, commercial and industrial.

Program

A program is the utility specific approach to providing one or more DSM offerings to customers.

Program Costs

DSM program costs include the following components:

- Development and Start-up
- Promotion
- Delivery
- Evaluation, Measurement and Verification (“EM&V”) and Monitoring
- Administration

Of the above costs, only start-up, promotion, delivery, and a portion of the evaluation and verification costs are applicable to individual programs. Other costs related to the design and deliveries of DSM programs are appropriately considered at the DSM portfolio level. These include development, a portion of the evaluation costs, monitoring, tracking and administration costs.

Program Evaluation

Program evaluation refers to activities related to the collection, analysis, and reporting of data for purposes of measuring program impacts from past, existing or potential program impacts.

Resource Acquisition

Programs that seek to achieve direct, measurable savings customer-by-customer through the incenting or promotion of specific energy efficiency upgrades.

Social and Assisted Housing

Residential social housing includes all non-profit housing developed, acquired or operated under a federal, provincial or municipally funded program including shelters and hostels.

Spillover

Spillover effects refer to customers that adopt energy efficiency measures because they are influenced by a utility’s program-related information and marketing efforts, but do not actually participate in the program.

Technical Evaluation Committee ("TEC")

In the 2012-2014 framework, the TEC established DSM technical and evaluation standards for natural gas utilities. The TEC consisted of seven individuals: three intervenor members, a representative from Union, a representative from Enbridge, and two independent members with technical and other relevant expertise. The TEC was replaced by the EAC as part of the 2015-2020 evaluation governance structure.

Total Resource Cost Test ("TRC")

The TRC Test provides a measure of the benefits and costs that accrue as a result of the installation of a DSM measure.

Trade Allies

Trade allies include organizations (e.g. architectural and engineering firms, building contractors, appliance manufacturers and dealers, and banks) that influence the energy-related decisions of customers who might participate in DSM programs.

Units

Units provided within report tables can represent different items, such as the number of measures installed or homes retrofitted, depending on the program being reported on. Units are not equivalent to the number of participants since a single participant can install several units.

Acronyms

	Acronym	Full Name
A	AFUE	Annual fuel utilization efficiency
C	CBS	Canadian Boiler Society
	CEA	Certified Energy Auditor
	CEE	Consortium for Energy Efficiency
	CFM	Cubic feet per minute
	CI	Commercial/Industrial
	CSBD	Commercial savings by design
D	DA	Direct access
	DCKV	Demand control kitchen ventilation
	DCV	Demand control ventilation
	DSM	Demand side management
	DSMVA	Demand side management variance account
E	EAC	Evaluation advisory committee
	EC	Evaluation contractor
	EEP	Energy efficiency plan
	EM&V	Evaluation, measurement, and verification
	ERV	Energy recovery ventilation
G	GIF	Green Investment Fund
H	HRR	Home Reno rebate
	HRV	Heat recovery ventilation
	HSC	Housing Services Corporation
	HVAC	Heating, ventilation and air conditioning
	HWP	Home Weatherization Program
I	IDP	Integrated design process
	IESO	Independent Electricity System Operator
L	LICO	Low-income cut-offs
	LRAMVA	Lost revenue adjustment mechanism variance account
N	NRCan	Natural Resource Canada
	NTG	Net-to-gross study
O	OBC	Ontario building code
	OEB	Ontario Energy Board a.k.a. Board
	OH	Optimum home
	OHBA	Ontario Home Builders Association
	ONPHA	Ontario Non-Profit Housing Association
Q	QA/QC	Quality assurance/quality control
S	SEM	Strategic energy management
	SO	Service organization
T	TEC	Technical Evaluation Committee
	TRC-Plus	Total resource cost plus
	TRM	Technical reference manual

Executive Summary

In its twentieth year of offering Ontario's Demand Side Management ("DSM") programming, Union Gas Limited ("Union") is pleased to report that we continue to drive incremental year-over-year natural gas savings for many of our DSM programs. In Union's large volume program, however, savings achieved in 2016 were less than previous years. There was some delay in modifying and relaunching the large volume program following the Ontario Energy Board's ("Board") direction to continue the program for the term of the new framework. These customers were also contending with operational changes and economic constraints in 2016 causing projects to be smaller in size than they were historically. Union's utility incentive specific to the resource acquisition and low-income scorecards is also lower in 2016 compared to previous years. Although natural gas savings on these scorecards were higher than 2015, scorecard target increases presented a significant challenge. A summary of 2016 results is tabulated below (Table ES.1).

Table ES. 1- 2016 DSM Results Summary

2016 DSM Results Summary*	
Net Cumulative Natural Gas Savings (m ³)	959,435,258 m ³
DSM Shareholder Incentive amount	\$ 4,120,731
DSM Variance amount**	\$ (6,155,723)
Lost Revenue Adjustment Mechanism amount	\$ 181,681

*Post-audit, post-verification

**The DSMVA represents the difference between the 2016 budget already built into rates and the 2016 overspend

Delivering DSM to commercial, industrial and large volume customers presented a number of new obstacles for Union in 2016. In 2016 DSM was in direct competition with several government policies and mandates as well as electric utility programs. As a result of this changing energy efficiency landscape, customers were left to triage limited resources, both financial capital and human capacity, to adhere to carbon policies while still achieving business performance and profit goals. This, combined with relatively low natural gas commodity pricing (compared with rising electricity prices), impacted customer investments in natural gas conservation.

In addition to the changing energy efficiency landscape in Ontario, the Board staff now plays a more active role as evaluation coordinators for DSM activities. The Board staff coordinated process took significantly longer than the annual audit process had previously. As a result, the release of this 2016 DSM Report is delayed by seven months; eleven months after the program year was completed. Union relies on the feedback provided by stakeholders through the audit and evaluation process to enhance program design and implementation practices and ensure knowledge and expertise from other jurisdictions are incorporated in the DSM portfolio. The delayed determination of evaluation and audit results impacts Union's ability to adapt to any continuous improvement recommendations in a timely manner, finalize targets for the following year, as well as clear accounts at regular intervals with rate-payers.

1. Introduction

The Board's first DSM policy was introduced more than 20 years ago. In response to this original regulatory framework,¹ Union has been pursuing and promoting opportunities to help customers reduce their natural gas energy consumption since 1997.

DSM has evolved and continued to grow through several subsequent regulatory frameworks. The 2006 Generic Proceeding² Decision guided DSM from 2007 to 2011. Recognizing that DSM is a voluntary business function for natural gas utilities, the Shared Savings Mechanism, which was later renamed the DSM Shareholder Incentive, was established to motivate the utilities to actively and effectively pursue DSM savings by providing financial incentives.

As part of the 2012 DSM guidelines³ period (2012 to 2014), measurement of DSM performance transitioned from a Total Resource Cost ("TRC")-based incentive mechanism (providing an incentive based on the economic benefits produced by DSM programs) to a weighted scorecard approach with multiple performance metrics. It also shifted emphasis to lifetime (cumulative) cubic metre natural gas savings (m³) to encourage delivery of long-life energy efficiency measures and sustained benefits from DSM efforts.

The current framework⁴ governs DSM activities from 2015 to 2020 and reflects the changing environment and commitment to energy conservation in the province. It is informed by the March 31, 2014 Directive to the Board from the Minister of Energy (the "Conservation Directive") and incorporates the government's policy of putting "conservation first"⁵ into distributor planning processes for both electricity and natural gas utilities. The framework sets out specific goals and guiding principles for DSM programs to achieve all cost-effective DSM, provide opportunities for all customers to better manage their energy consumption, promote a culture of energy conservation and potentially avoid building additional natural gas infrastructure.

¹ E.B.O. 169-III Report of the Board, July 23, 1993.

² DSM Generic Proceeding, EB-2006-0021.

³ DSM Guidelines for Natural Gas Distributors, EB-2008-0346.

⁴ Report of the Board: DSM Framework for Natural Gas Distributors (2015-2020), EB-2014-0134.

⁵ Achieving Balance, Ontario's Long-Term Energy Plan, December 2013, Conservation First, pg. 21.

Union has demonstrated considerable success delivering energy efficiency programs and helping customers to realize energy savings and adopt lasting conservation behaviours. Union is pleased to continue offering DSM programming through its Board approved 2015-2020 DSM Plan (EB-2015-0029); to remain a trusted advisor to customers in helping them reduce their energy bills as well as supporting putting “conservation first” in the province.

This DSM Annual Report presents a summary of Union’s performance in 2016 and the resulting balances in the Lost Revenue Adjustment Mechanism Variance Account, DSM Shareholder Incentive Deferral Account, and DSM Variance Account.

This report satisfies the following objectives:

- Provides an overview of key elements of the DSM framework and evaluation structure (section 2);
- Presents reporting requirements established in section 14.2 of the filing guidelines⁶ (section 3);
- Summarizes savings achieved and budget spent (section 4);
- Describes in detail the scorecards, programs and offerings included in the DSM portfolio (section 5 to 9);
- Outlines the expected lost revenue (section 10) and shareholder incentive amounts (section 11) that will be sought for approval, as well as the balance of the DSMVA (section 12) that will be requested for disposition; and,
- Discusses how DSM will continue in 2017.

This report also benchmarks the results of this second year under the 2015-2020 DSM Plan and highlights successes and lessons learned in delivering the DSM portfolio.

The DSM portfolio is shown in Table 1.0. Each scorecard contains one or more programs and each program provides one or more DSM offerings to customers. Offerings are bundles of energy efficiency measures, enhancements or support. Sections five through nine of this report describe the scorecards and programs as well as provide a detailed view of the offerings, including the target market, market incentive, market delivery and education and awareness initiatives.

⁶Filing Guidelines to the DSM Framework for Natural Gas Distributors (2015-2020), EB-2014-0134, pp.44-45.

Table 1.0 - Union's 2016 DSM Portfolio by Scorecard, Program and Offering

Scorecards	Programs	Offerings
Resource Acquisition Scorecard	Residential Program	Home Reno Rebate Offering
	Commercial/Industrial Program	- Commercial/Industrial Prescriptive Offering - Commercial/Industrial Direct Install Offering - Commercial/Industrial Custom Offering
Low-Income Scorecard	Low-Income Program	- Home Weatherization Offering - Furnace End-of-Life Upgrade Offering - Indigenous Offering - Multi-Family Offering
Large Volume Scorecard	Large Volume Program	Large Volume Direct Access Offering
Market Transformation Scorecard	Market Transformation Program	- Optimum Home Offering - Commercial Savings By Design Offering
Performance-Based Scorecard	Performance-Based Program	- RunSmart Offering - Strategic Energy Management Offering

2. Demand Side Management Framework

The purpose of this section is to outline the Board-approved plan that sets the parameters for 2016 DSM programming, lay out the portfolio at the scorecard level, and discuss the related evaluation work.

2.1 2016 DSM Plan

In 2016, Union entered the second year of the EB 2015-0029 multi-year 2015-2020 DSM Plan filed on April 1, 2015,⁷ in accordance with the Board's Demand Side Management Guidelines for Natural Gas Utilities (EB-2014-0134).

Although 2016 is the second year of Union's 2015-2020 DSM Plan, it is the first year the new framework came into full effect for DSM programs in Ontario, as 2015 was considered a "roll-over" year. Included in the changes of the new framework is a significant increase in budgets which enable the introduction of a number of new and expanded program offerings.

On January 20, 2016, the Board released its EB-2015-0029/49 Decision on Union and Enbridge Gas Distribution Inc. ("Enbridge") 2015-2020 DSM Plans ("2015-2020 DSM Plan Decision"). As part of this Decision, the Board approved many of Union's 2016 programs, scorecards, metrics, targets, incentives and budgets but also directed certain changes to be made.

The following amendments to Union's 2016 DSM Plan were made as a result of the Decision:

- The residential energy savings kit offering was not approved and concluded at the end of 2015;
- The new residential behavioural offering was not approved and, therefore, not launched as planned in 2016;
- The proposed direct install pilot in the commercial/industrial program was modified to be a full program offering on the resource acquisition scorecard;
- The Board directed Union to continue its large volume self-direct program offering with cumulative m3 savings targets rather than adopt a program focused solely on technical support and training; and,

⁷ The plan was amended July 3, 2015 to capture minor corrections.

- The Board directed Union to establish a new market transformation offering targeting commercial and industrial new construction.

2.2 Portfolio Design

Union's DSM activities are continuing to drive market change through focused efforts on delivering natural gas savings and related customer benefits. This annual report highlights Union's achievements in 2016 within five scorecards:

- Resource Acquisition
- Low-Income
- Large Volume
- Market Transformation
- Performance-Based

The resource acquisition scorecard contains a residential and a commercial/industrial program. Resource acquisition programs are designed to achieve direct, measureable savings for an individual customer and involve the installation of energy efficient equipment.

The low-income scorecard has one program – the low-income program, which includes various single family and multi-family offerings. While the low-income program is essentially a resource acquisition program, it is treated independently to recognize the unique needs of this customer base and a different cost-effectiveness screening threshold.

The large volume program, on the large volume scorecard, is comprised of the direct access program offering. This offering has been re-launched based on the 2015-2020 DSM Plan Decision. The offering uses a self-direct funding model that grants Rate T2 and Rate100 customers direct access to the incentive budget they pay in rates. This motivates customers to better plan expenditures on projects that will reduce energy usage in their facility.

Market transformation programs focus on facilitating fundamental changes that lead to greater market adoption of emerging and/or leading edge energy efficient products and services. Unlike resource acquisition programs, market transformation programs approach adoption barriers and energy savings related to a technology or service within an entire market or industry, including non-participants of the program. Resource acquisition programs

target adoption barriers specific to the individual customer and energy savings resulting directly from customers who participate. Union's market transformation program, captured on the market transformation scorecard, includes an offering for residential new construction (Optimum Home) as well as commercial new construction (Commercial Savings By Design).

Performance-based conservation uses energy monitoring as an educational tool to enable commercial and industrial customers to identify and implement system-wide operational energy efficiency enhancements. Savings are measured by comparing energy usage before and after improvements are made.

2.3 Cost Effectiveness Screening

The Board mandates cost effectiveness screening as the means for determining the economic value of a DSM program. Cost effectiveness screening for the new framework has adopted an enhanced TRC test, called the "TRC-Plus" test, which includes a 15 percent adder to account for positive corollary effects of DSM, such as improvements to the environment, economy and society.

The TRC-Plus test is used to screen for cost effectiveness at the program and portfolio level.

TRC benefits include the avoided costs associated with natural gas, electricity, and water savings over the life of the energy efficient equipment. TRC costs include the incremental equipment costs⁸ associated with the energy efficient equipment in relation to its less-efficient equivalent, as well as any program, administrative, and evaluation costs attributed directly to the program.⁹ For programs measured by cumulative m³ natural gas savings, excluding the low-income program, the program is considered cost effective if the ratio of the present value of the TRC benefits to the present value of the TRC costs exceeds 1.0. To recognize that the low-income program may result in significant benefits not captured by the

⁸ Incremental costs include capital, cost of removal less salvage value, installation, operating and maintenance and/or fuel costs.

⁹ By definition of the TRC test, incentive costs provided to program participants are benefits to participants and are not included as TRC costs.

TRC test, this program is screened using a TRC threshold of 0.7. The market transformation program is assessed based on the objectives of the program.

2.4 Program Evaluation

There are two broad categories of evaluations: impact evaluation and process evaluation. Impact evaluations focus on participation and related savings resulting from DSM programs. Process evaluations focus on the effectiveness of program design and delivery, and assess why program outcomes occur.

As part of the 2015 – 2020 DSM framework, Board staff have taken over coordinating the impact evaluation of Union’s DSM programs and have engaged DNV GL to be the Evaluation Contractor (“EC”) to undertake that work.¹⁰ Details specific to 2016 impact evaluation activities proposed by the EC are provided in its 2016-2018 Natural Gas DSM Evaluation, Measurement, and Verification (“EM&V”) Plan provided to the utilities and available on the OEB’s DSM Evaluation webpage.¹¹ Board staff is coordinating the implementation of elements in the plan, including preparing the scope of work and selecting vendors.

In a letter dated March 15, 2017,¹² the “deadline for gas utilities to file their respective 2016 Draft [Annual DSM] Evaluation Reports will be one month following the OEB’s release of the 2015 results.” As such, the 2016 Draft Annual DSM Report was filed November 16, 2017 and this triggered the initiation of the second impact evaluation of DSM portfolio results coordinated by Board staff. Initially engaged to audit the utilities’ 2015 DSM activities, Board staff determined that DNV GL would continue to act as the EC, or independent third party auditor, in 2016 to assess DSM program results for both Union and Enbridge, known collectively as “the utilities.”

Process evaluations are planned and managed by the utilities.

¹⁰ Board letter, 2015-2020 DSM Evaluation Process of Program Results, EB-2015-0245, August 21, 2015.

¹¹ oeb.ca/industry/policy-initiatives-and-consultations/natural-gas-demand-side-management-dsm-evaluation

¹² Board letter dated March 15, 2017 Re: Union Gas Limited 2016 DSM Draft Evaluation Report.

2.5 Evaluation Advisory Committee

An Evaluation Advisory Committee (“EAC”) was established per a memo from the Board dated August 21, 2015 to provide input and advice for DSM evaluation activities coordinated by Board staff. 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 Board
- Representatives from the Independent Electricity System Operator (“IESO”);
- Representatives from each natural gas utility; and,
- Representatives from the Ministry of Energy and the Environmental Commissioner of Ontario, who will participate as observers.

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

- Chris Neme, Energy Futures Group
- Jay Shepherd, Shepherd Rubenstein 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 and independent stakeholders are expected to provide input and advice based on their experience and technical expertise and not to advocate for the position of parties they have represented before the Board in various proceedings.

2.6 Transition Plan of TEC Activities to the OEB

The Technical Evaluation Committee (“TEC”) evaluation activities were transitioned to the Board under the new DSM evaluation governance structure.¹³ Projects that were under management by the TEC were reviewed with Board staff and the remaining deliverables were to be managed as follows:

- **Technical Reference Manual (“TRM”) Development.** Development of the TRM with updated measures and input assumptions was completed and filed jointly by the utilities with the Board on December 21, 2016 (EB-2016-0246) and approved in June 2017. The TRM maintenance and update process, including posting the final TRM online, has now been transitioned to the Board staff coordinated evaluation process.
- **Custom Project Net-to-Gross Study (“NTG”).** Under direction from Board staff, the free-ridership and spillover study, also known as the NTG study, were combined with custom program savings verification completed by the EC.¹⁴ The combined study is intended to produce free ridership and spillover ratios applicable to commercial, industrial and large volume projects through the use of end user self-reports and interviews. The study was initiated in March 2016 and is expected to be completed January 2018.
- **Boiler Baseline Study.** The TEC selected ICF Consulting Canada, Inc. for the boiler baseline study. The study is currently underway and is expected to be completed in 2018.
- **Persistence Study.** Board staff will be responsible for the procurement process and management of the persistence study, including management of project deliverables and contractual obligations through to completion of the study, with input from the EAC. This project has yet to be initiated.

¹³ As outlined in the letter from the Board dated March 4, 2016 (EB-2015-0245).

¹⁴ Custom Program Savings Verification is an integral part of the annual DSM audit.

2.7 Audit of the 2016 DSM Results

Union's DSM results are subject to an independent external audit. The intention of the audit is to have the EC provide an opinion on whether the claimed DSM Shareholder Incentive amount ("DSMIDA"), Lost Revenue Adjustment Mechanism Variance Account ("LRAMVA"), and Demand Side Management Variance Account ("DSMVA") have been correctly calculated using reasonable assumptions. The EAC, as described in Section 2.6, is intended to provide input and advice throughout the audit to facilitate the achievement of the audit objectives.

2.8 Input Assumptions for 2016 Scorecard Targets and Results

In setting the original 2016 DSM targets, as part of its OEB-approved 2015-2020 DSM Plan, Union applied the prescriptive input assumptions and NTG Factors that resulted from Union's 2014 EM&V process, which were the most recent OEB-approved adjustment factors available at the time. These included: (i) OEB-approved TRM prescriptive input assumptions established in the March 2015 joint utility filing (EB-2014-0354); and (ii) a 46% NTG Factor established in 2008.

Targets have now been updated to reflect the outcomes of the 2015 EM&V process including updated prescriptive input assumptions from the December 2015 joint utility filing (EB-2015-0344) and the NTG Factors that resulted from the 2015 NTG Study. These same assumptions and factors were used to calculate Union's 2015 LRAM during the 2015 EM&V process.

3. OEB Data Reporting Requirements

This Section of the Annual Report is dedicated to tabulating required elements outlined in section 14.2 of the DSM guidelines as follows:

Key element	Table number
Annual and long-term DSM budgets (\$/year and \$/6 years)	Table 3.0
Actual annual total DSM costs (including DSM budget ¹⁵ , overheads, evaluation, DSM Shareholder Incentive, lost revenues) for each rate class dating back to 2007	Table 3.1
Historic actual annual DSM spending (\$/year) dating back to 2007	Table 3.2
DSM spending as a percent (%) of distribution revenue	Table 3.3
Historic annual DSM Shareholder Incentive amounts available and earned (\$/year) dating back to 2007	Table 3.4
DSM Shareholder Incentive earned as a percent (%) of DSM budget ¹⁶	Table 3.5
Annual and long-term natural gas savings targets (m ³ /year and m ³ /6 years)	Table 3.6
Total annual and cumulative gross and net natural gas savings (m ³) for each year of the DSM framework (2015 to 2020)	Table 3.7
Total historic annual and cumulative gross and net natural gas savings (m ³) dating back to 2007	Table 3.8 – Table 3.9
Total annual and cumulative gross and net natural gas savings (m ³) from 2007 to the reporting year as a percent of total annual natural gas sales	Table 3.10 – Table 3.11
Actual annual gas operating revenue (\$/year)	Table 3.12
Actual annual operating revenue less cost of natural gas commodity (\$/year)	Table 3.12
Total cost of gas (\$ million/year)	Table 3.12
Total natural gas sales (m ³ /year)	Table 3.13
Number of customers, broken out by rate class and by customer type (i.e. residential, low-income, commercial and industrial, relative to the DSM programs offered by the gas utility) per year	Table 3.14 and Table 3.15

¹⁵ As the request is for actual costs, Union interprets this request to be 'DSM Spending' rather than 'DSM budget'.

¹⁶ Union interprets this request as requesting values as a percentage of 'DSM Spending' rather than 'DSM budget'.

Table 3.0 - Annual and Long-Term DSM Budgets (\$ millions)

Program	2015*	2016**	2017**	2018**	2019**	2020**	Total (\$/6 years)
Residential	\$ 3.163	\$ 8.612	\$ 11.369	\$ 13.908	\$ 13.908	\$ 13.908	\$ 64.867
Commercial / Industrial	\$ 10.859	\$ 19.316	\$ 22.035	\$ 22.726	\$ 22.403	\$ 22.403	\$ 119.743
Low-Income	\$ 6.839	\$ 11.407	\$ 12.343	\$ 13.571	\$ 14.145	\$ 15.005	\$ 73.310
Large Volume	\$ 4.534	\$ 4.000	\$ 4.000	\$ 4.000	\$ 4.000	\$ 4.000	\$ 24.534
Market Transformation	\$ 1.379	\$ 1.703	\$ 2.338	\$ 2.338	\$ 2.338	\$ 2.338	\$ 12.434
Performance-Based Conservation	NA	\$ 0.548	\$ 0.843	\$ 1.088	\$ 0.833	\$ 1.053	\$ 4.365
Portfolio Level Research, Evaluation and Administration ^{1,2}	\$ 4.717	\$ 11.235	\$ 5.642	\$ 5.642	\$ 5.642	\$ 5.642	\$ 38.520
Inflation	\$ 2.497						\$ 2.497
Total	\$ 33.988	\$ 56.821	\$ 58.570	\$ 63.272	\$ 63.269	\$ 64.350	\$ 340.270

* 2015 includes budget amounts for the Achievable Potential Study, Future Infrastructure Planning Study and DSM Tracking and Reporting System Upgrades

** 2016-2020 includes budget amounts for pilots and DSM Tracking and Reporting System Upgrades

Table 3.1 - Actual Annual Total DSM Costs (\$ millions)
 (including DSM spending, overheads, evaluation, DSM Shareholder Incentive, lost revenues)

Rate Class	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
M1	NA	\$ 12.107	\$ 12.743	\$ 11.348	\$ 11.498	\$ 13.502	\$ 13.657	\$ 15.415	\$ 16.752	\$ 23.338
M2	\$ 11.619	\$ 2.487	\$ 2.022	\$ 2.118	\$ 4.097	\$ 4.968	\$ 5.818	\$ 6.728	\$ 4.958	\$ 6.505
M4	\$ 1.488	\$ 1.353	\$ 0.828	\$ 1.098	\$ 1.817	\$ 3.319	\$ 3.244	\$ 3.296	\$ 3.645	\$ 3.808
M5	\$ 0.295	\$ 1.044	\$ 1.226	\$ 1.086	\$ 3.150	\$ 2.660	\$ 3.484	\$ 2.394	\$ 1.421	\$ 2.453
M7	\$ 0.886	\$ 0.116	\$ 0.256	\$ 1.474	\$ 1.304	\$ 0.538	\$ 0.571	\$ 2.143	\$ 3.370	\$ 3.760
T1	\$ 3.147	\$ 3.988	\$ 5.596	\$ 3.964	\$ 7.749	\$ 6.111	\$ 2.265	\$ 1.078	\$ 0.889	\$ 1.409
T2	NA	NA	NA	NA	NA	NA	\$ 3.365	\$ 2.875	\$ 2.673	\$ 3.758
Rate 01	\$ 2.229	\$ 2.162	\$ 2.093	\$ 1.869	\$ 3.050	\$ 3.532	\$ 3.560	\$ 4.161	\$ 3.555	\$ 4.447
Rate 10	\$ 1.612	\$ 1.371	\$ 2.293	\$ 0.510	\$ 1.109	\$ 1.939	\$ 1.637	\$ 1.613	\$ 0.953	\$ 1.322
Rate 20	\$ 0.323	\$ 0.496	\$ 0.771	\$ 0.881	\$ 1.030	\$ 1.607	\$ 1.573	\$ 1.791	\$ 1.005	\$ 0.806
Rate 100	\$ 1.535	\$ 4.542	\$ 3.950	\$ 4.471	\$ 1.614	\$ 2.305	\$ 1.828	\$ 1.517	\$ 0.799	\$ 0.541
Total	\$ 23.134	\$ 29.666	\$ 31.778	\$ 28.819	\$ 36.418	\$ 40.481	\$ 41.002	\$ 43.011	\$ 40.019	\$ 52.146

Table 3. 2 - Historic Actual Annual DSM Spending

\$ millions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total DSM Spending*	\$ 16.13	\$ 20.26	\$ 22.04	\$ 21.61	\$ 27.97	\$ 31.32	\$ 32.84	\$ 33.71	\$ 32.39	\$ 47.84

* Total DSM spending includes direct, indirect and DSMVA where applicable

Table 3. 3 - DSM Spending as a Percent (%) of Distribution Revenue

\$ millions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total DSM Spending*	\$ 16	\$ 20	\$ 22	\$ 22	\$ 28	\$ 31	\$ 33	\$ 34	\$ 32	\$ 48
Total Distribution Revenue**	\$ 655	\$ 675	\$ 658	\$ 699	\$ 713	\$ 727	\$ 772	\$ 778	\$ 800	\$ 812
Total DSM Spending as a % of Distribution Revenue	2%	3%	3%	3%	4%	4%	4%	4%	4%	6%

* Total DSM spending includes direct, indirect and DSMVA where applicable

** Distribution revenue is equal to the gas distribution margin and is the gas sales and distribution revenue less the cost of gas; where gas sales and distribution revenue is the sum of the delivery revenue and gas supply revenue (and earning sharing, if applicable)

Table 3. 4 - Historic Annual DSM Shareholder Incentive Amounts Available and Earned

\$ millions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
DSM Shareholder Incentive Earned	\$ 6.23	\$ 8.70	\$ 8.75	\$ 6.58	\$ 7.63	\$ 8.21	\$ 7.78	\$ 8.99	\$ 7.47	\$ 4.12
Shareholder Incentive Available	\$ 8.50	\$ 8.70	\$ 8.92	\$ 8.94	\$ 9.24	\$ 10.45	\$ 10.68	\$ 10.82	\$ 11.00	\$ 10.45

Table 3. 5 - DSM Shareholder Incentive Earned as a Percent (%) of DSM Spending

\$ millions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Shareholder Incentive Earned	\$ 6.23	\$ 8.70	\$ 8.75	\$ 6.58	\$ 7.63	\$ 8.21	\$ 7.78	\$ 8.99	\$ 7.47	\$ 4.12
Total DSM Spending*	\$ 16.13	\$ 20.26	\$ 22.04	\$ 21.61	\$ 27.97	\$ 31.32	\$ 32.84	\$ 33.71	\$ 32.39	\$ 47.84
Shareholder Incentive Earned as a % of DSM Spending	38.64%	42.92%	39.71%	30.43%	27.29%	26.21%	23.70%	26.66%	23.07%	8.61%

* Total DSM Spending includes direct, indirect and DSMVA where applicable

Table 3. 6 - Annual and Long-Term Natural Gas Savings Targets*

Scorecard	2015	2016	2017	2018**	2019	2020
Resource Acquisition	816,561,818	1,120,259,599	1,005,614,776	<i>Targets are formulaic based on past year's performance.</i>		
Low-Income	43,600,000	59,238,065	81,957,527			
Large Volume	1,236,097,404	890,890,721	463,549,872			

* Values are cumulative m³ gas savings at the target (100%) band

** 2018 targets require OEB-approved 2017 DSM audited results

Table 3. 7 - Total Annual and Cumulative Natural Gas Savings for 2016 (Gross and Net)

10 ³ m ³	Annual Gas Savings		Cumulative Gas Savings	
	Gross	Net	Gross	Net
Resource Acquisition	110,284	46,527	1,839,468	814,758
Low-Income	2,715	2,671	65,831	64,829
Large Volume	75,742	6,772	853,596	79,848
Total	188,741	55,970	2,758,895	959,435

Table 3. 8 - Total Historic Annual Natural Gas Savings (Gross and Net)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total <u>Net</u> Annual Natural Gas Savings (10³ m³)	55,854	61,852	92,604	121,116	139,027	137,438	179,967	131,825	125,077	55,970
Total <u>Gross</u> Annual Natural Gas Savings (10³ m³)	Not reported for 2007 – 2011					282,177	370,474	267,465	255,169	188,741

Table 3. 9 - Total Historic Cumulative Natural Gas Savings (Gross and Net)

	2007-2011	2012	2013	2014	2015	2016
Total <u>Net</u> Cumulative Natural Gas Savings (10³m³)	Not reported for 2007-2011	2,336,351	2,820,834	1,889,459	1,750,765	959,435
Total <u>Gross</u> Cumulative Natural Gas Savings (10³m³)	Not reported for 2007-2011	4,777,826	5,752,390	3,752,366	3,482,496	2,758,895

Table 3. 10 - Total Annual Natural Gas Savings as a Percent (%) of Total Annual Natural Gas Sales (Gross and Net)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<u>Net</u> Annual Natural Gas Savings (10³m³)	55,854	61,852	92,604	121,116	139,027	137,438	179,967	131,825	125,077	55,970
<u>Net</u> Annual Natural Gas Savings as a % of Natural Gas Sales	0.42%	0.47%	0.75%	0.95%	1.02%	1.03%	1.29%	0.93%	0.93%	0.43%
<u>Gross</u> Annual Natural Gas Savings (10³m³)	Not reported for 2007 – 2011					282,177	370,474	267,465	255,169	188,741
<u>Gross</u> Annual Natural Gas Savings as a % of Natural Gas Sales						2.11%	2.65%	1.88%	1.90%	1.46%
Total Natural Gas Sales*	13,158,018	13,231,158	12,327,846	12,778,870	13,654,990	13,396,120	13,992,688	14,204,104	13,404,980	12,935,767

* Total Natural Gas Sales only includes rate classes eligible for DSM and subject to DSM costs

Table 3. 11 - Total Cumulative Natural Gas Savings as a Percent (%) of Total Annual Natural Gas Sales (Gross and Net)

	2007-2011	2012	2013	2014	2015	2016
Net Cumulative Natural Gas Savings (10³m³)	Not reported for 2007-2011	2,336,351	2,820,834	1,889,459	1,750,765	959,435
Net Cumulative Natural Gas Savings as a % of Natural Gas Sales		17.44%	20.16%	13.30%	13.06%	7.42%
Gross Cumulative Natural Gas Savings (10³m³)	Not reported for 2007-2011	4,777,826	5,752,390	3,752,366	3,482,496	2,758,895
Gross Cumulative Natural Gas Savings as a % of Natural Gas Sales		35.67%	41.11%	26.42%	25.98%	21.33%
Total Natural Gas Sales*		13,396,120	13,992,688	14,204,104	13,404,980	12,935,767

* Total Natural Gas Sales only includes rate classes eligible for DSM and subject to DSM costs

Table 3. 12 - Actual Annual Gas Operating Revenues

\$ millions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gas Sales and Distribution Operating Revenue	\$ 1,811	\$ 1,852	\$ 1,684	\$ 1,493	\$ 1,468	\$ 1,365	\$ 1,621	\$ 1,755	\$ 1,675	\$ 1,529
Less Total Cost of Gas	\$ 1,156	\$ 1,177	\$ 1,026	\$ 794	\$ 755	\$ 638	\$ 849	\$ 977	\$ 875	\$ 717
Total Distribution Revenue*	\$ 655	\$ 675	\$ 658	\$ 699	\$ 713	\$ 727	\$ 772	\$ 778	\$ 800	\$ 812

* Distribution revenue is equal to the gas distribution margin and is the gas sales and distribution revenue less the cost of gas; where gas sales and distribution revenue is the sum of the delivery revenue and gas supply revenue (and earning sharing, if applicable)

Table 3. 13 - Total Natural Gas Sales (Volumes)*

10 ³ m ³	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Natural Gas Sales	13,158,018	13,213,158	12,327,846	12,778,870	13,654,990	13,396,120	13,992,688	14,204,104	13,404,980	12,935,767

* Only includes rate classes eligible for DSM and subject to DSM costs

Table 3. 14 - Number of Customers by Customer Type

Customer Type	# of Customers in 2016
Residential	1,042,748
Low-Income*	294,108
Commercial	121,385
Industrial	473
Wholesale	6
Total	1,458,720

* Low-income customers are estimated to be 22% of all Residential customers

Table 3. 15 - Number of Customers by Rate Class

Rate Class	# of Customers in 2016
<u>General Service</u>	
M1	1,105,497
M2	7,608
O2	342,946
10	2,190
Total	1,458,241
<u>Contract</u>	
M4	178
M5	63
M7	30
T1	37
T2	23
20	47
100	11
Total	389
<u>Non-DSM Rate Classes</u>	
M9	3
M10	2
T3	1
25	84
30	0
77	0
Total	1,458,720

4. 2016 DSM Program Results Summary

To illustrate and compare the impact that Union's DSM programs had in 2016, this section provides a summary of results that reflect 959,435,258 cumulative m³ in natural gas savings for customers. As illustrated in Figure 4.0, the commercial/industrial program delivered the largest proportion of savings, followed by the large volume, residential and low-income programs respectively.

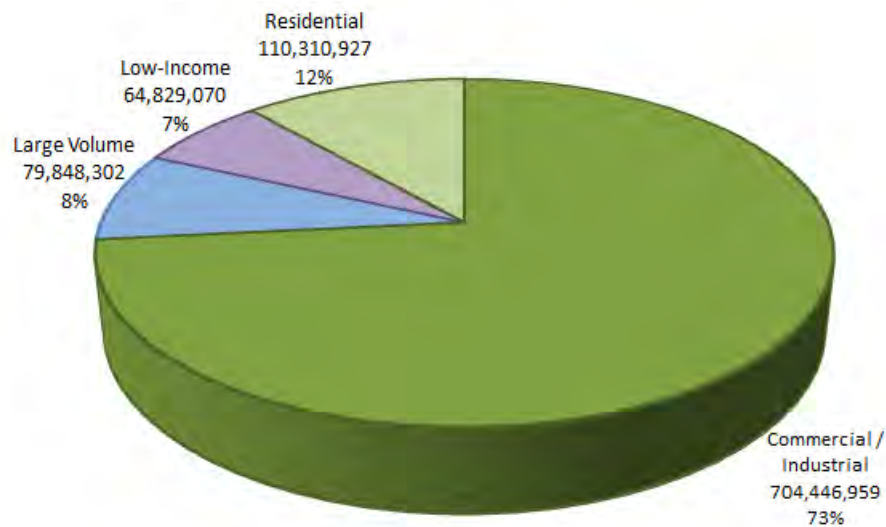


Figure 4.0 - Major Drivers in 2016 Natural Gas Savings (Cumulative m³ and Percentage)

Table 4.0 summarizes Union's DSM results by program for 2016 including annual and cumulative natural gas savings, number of units, expenditures, and the associated net TRC-Plus and TRC-Plus ratio.

DSM expenditures are detailed on a program level in Table 4.1. Gross and net annual and cumulative savings are provided in Table 4.2 and have been expanded to provide offering level detail. Program scorecard accomplishments and specific program elements that contributed to those results are outlined in sections 5 through 9.

Table 4.0 - 2016 Program Results

Program	Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Units	Expenditures	Net TRC-Plus	TRC-Plus Ratio
Residential	4,412,437	110,310,927	6,595	\$11,201,397	\$ 9,401,169	1.56
Commercial/Industrial	42,114,316	704,446,959	4,018	\$16,384,544	\$115,655,388	3.57
Low- Income	2,670,900	64,829,070	2,010	\$10,400,612	\$ 4,899,408	1.50
Large Volume	6,772,053	79,848,302	71	\$ 2,989,176	\$ 13,142,160	5.20
Market Transformation	-	-	-	\$ 1,004,693	NA	NA
Performance-Based	-	-	-	\$ 274,604	NA	NA
Program Subtotal	55,969,706	959,435,258	12,694	\$42,255,026	\$143,098,125	2.91
Portfolio Costs				\$3,050,268		
Portfolio Total				\$45,305,294¹	\$140,140,207	2.80

¹ Does not include pilots, tracking and reporting system upgrades and incremental spend. See table 4.1 for further details.

Table 4.1 - 2016 Direct DSM Program Costs

Program	Administration	Evaluation	Promotion	Incentives	Total
Residential	\$510,346	\$1,001,900	\$1,294,961	\$8,394,192	\$11,201,397
Commercial / Industrial	\$3,680,463	\$120,578	\$1,196,169	\$11,387,335	\$16,384,544
Low-Income	\$861,489	\$161,733	\$2,712,933	\$6,664,457	\$10,400,612
Large Volume	\$509,939	\$37,682	\$322	\$2,441,233	\$2,989,176
Market Transformation	\$302,149	\$7,933	\$526,970	\$167,641	\$1,004,693
Performance-Based	\$140,948	\$401	\$133,255	\$ -	\$274,604
Program Total	\$6,005,334	\$1,330,225	\$5,864,609	\$29,054,857	\$42,255,026
Portfolio Costs					
Research					\$517,567
Evaluation					\$168,121
Administration					\$2,364,580
Pilot Programs					\$183,200
DSM Tracking System Upgrades					\$2,041,209
Portfolio Total					\$5,274,676
Incremental Spend ¹					\$314,145
Total Spend	\$6,005,334	\$1,330,225	\$5,864,609	\$29,054,857	\$47,843,847

¹ Incremental spend includes achievable potential study and future infrastructure planning study

Table 4. 2 - 2016 Gross and Net Natural Gas Savings

Program	Offering	Annual Gross Gas Savings (m ³)	Cumulative Gross Gas Savings (m ³)	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)
Residential	Home Reno Rebate	4,644,671	116,116,589	4,412,437	110,310,927
Residential Program Total		4,644,671	116,116,589	4,412,437	110,310,927
Commercial/Industrial	Prescriptive	8,821,926	173,961,414	8,034,415	159,584,767
	Direct Install	-	-	-	-
	Custom	96,817,327	1,549,389,969	34,079,900	544,862,192
Commercial/Industrial Program Total		105,639,253	1,723,351,383	42,114,316	704,446,959
Low-Income	Home Weatherization	1,831,659	45,754,577	1,831,630	45,754,201
	Furnace End-of-Life Upgrade	1,617	29,106	1,617	29,106
	Indigenous	-	-	-	-
	Multi-Family	881,704	20,047,428	837,653	19,045,763
Low-Income Program Total		2,714,980	65,831,111	2,670,900	64,829,070
Large Volume	Large Volume Direct Access	75,741,890	853,595,991	6,772,053	79,848,302
Large Volume Program Total		75,741,890	853,595,991	6,772,053	79,848,302
Market Transformation	Optimum Home	-	-	-	-
	Commercial Savings By Design	-	-	-	-
Market Transformation Program Total		NA	NA	NA	NA
Performance-Based	RunSmart	-	-	-	-
	Strategic Energy Management	-	-	-	-
Performance-Based Program Total		NA	NA	NA	NA
Portfolio Total		188,740,794	2,758,895,074	55,969,706	959,435,258

5. Resource Acquisition Scorecard

Resource acquisition programs aim to achieve direct, measureable savings for customers through the installation of energy efficient equipment and/or operation and process improvements. These programs provide customers with rebates or financial incentives that reduce the overall cost of upgrading to more efficient technologies and equipment, motivate them to act, and promote a culture of energy conservation through education and awareness initiatives.

The resource acquisition scorecard contains both a residential and commercial/industrial program and is comprised of two performance metrics: Cumulative Natural Gas Savings (m³) and Home Reno Rebate ("HRR") Participants (Homes).

The Cumulative Natural Gas Savings (m³) metric measures the total lifetime natural gas saved for both the residential and commercial/industrial resource acquisition programs delivered by Union, net of free riders.

Homes that count towards the HRR Participants (Homes) metric must meet the following two requirements:

- A homeowner must complete at least two eligible renovations as listed in Table 5.7.
- The aggregate of all the homes counted towards the metric must achieve, on average, at least a 15 percent reduction in annual natural gas use as determined by comparing pre and post energy assessments modelled using Natural Resource Canada ("NRCan") HOT2000 software.

Table 5.0 presents the results of the resource acquisition scorecard, demonstrating an achievement of 105 percent of the overall scorecard target, resulting in a DSM Shareholder Incentive of \$2.907 million.

Table 5.0 - 2016 Resource Acquisition Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Cumulative Natural Gas Savings (m3)	840,194,699	1,120,259,599	1,680,389,398	75%	814,757,886	73%	55%
Home Reno Rebate Participants (Homes)	2,475	3,300	4,950	25%	6,595	200%	50%
Total Scorecard Target Achieved							105%
Scorecard Utility Incentive Achieved							\$2,907,230

Table 5.1 presents the results of programs on the resource acquisition scorecard along with total program spend.

Table 5.1 - 2016 Resource Acquisition Scorecard Results by Program and Offering

Program	Offering	Units	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Total Spend	Net TRC-Plus	Net TRC-Plus Ratio
Residential	Home Reno Rebate	6,595	4,412,437	110,310,927	\$11,201,397	\$9,401,169	1.56
Commercial/Industrial	Prescriptive	3,586	8,034,415	159,584,567	\$5,584,228	\$25,397,837	3.13
	Custom	432	34,079,900	544,862,192	\$10,800,316	\$90,257,550	3.73
Resource Acquisition Total		10,613	46,526,753	814,757,886	\$27,585,942	\$125,056,556	3.02

5.1 Residential Program

The residential program encourages a holistic approach to energy efficiency through education and financial incentives that help offset the cost of efficiency upgrades in residential homes.

Union's 2015-2020 DSM Plan (EB-2015-0029) proposed three offerings under the residential program: Home Reno Rebate ("HRR"), energy savings kits and a new behavioural offering. For 2016, only the Home Reno Rebate offering was approved by the Board in its 2015-2020 DSM

Plan Decision due to concerns with market saturation of energy savings kits and uncertainty of value for money in the behavioural offering. The Board directed the energy savings kit program offering to conclude at the end of 2015. The behavioural offering was never launched.

Table 5.2 shows the results of the residential DSM program and Table 5.3 breaks down the total spend into its components.

Table 5.2 - 2016 Residential DSM Program Results

Program	Offering	Units	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Total Spend	Net TRC-Plus	Net TRC-Plus Ratio
Residential	Home Reno Rebate	6,595	4,412,437	110,310,927	\$11,201,397	\$ 9,401,169	1.56
Residential Total		6,595	4,412,437	110,310,927	\$11,201,397	\$ 9,401,169	1.56

Table 5.3 - 2016 Residential DSM Program Spend

Item	Total
Incentives	\$ 8,394,192
Administration	\$ 510,346
Evaluation	\$ 1,001,900
Promotion	\$ 1,294,961
Total Residential Program Spend	\$11,201,397

Table 5.4 shows the calculation of the Residential Program's TRC-Plus ratio.

Table 5.4 - 2016 Residential DSM Program Cost-Effectiveness

	TRC-Plus Benefits (a)	TRC Costs (b)	Net TRC-Plus (c)=(a-b)	TRC-Plus Ratio (d)=(a/b)
Measures	\$ 26,331,257	\$14,122,882	\$12,208,375	1.86
Administration		\$ 510,346		
Evaluation		\$ 1,001,900		
Promotion		\$ 1,294,961		
Residential Program Total	\$ 26,331,257	\$ 16,930,088	\$ 9,401,169	1.56

The residential program consists of a single program offering, HRR. Union enhanced the HRR offering in 2016 to drive higher customer participation by implementing the improvements outlined in the 2015-2020 DSM Plan¹⁷ as well as entering into a major partnership with the Government of Ontario that provided funds from the province's Climate Change Action Plan.

5.1.1 Home Reno Rebate Offering

Union introduced the HRR offering in 2012. The offering focuses on whole home energy savings by helping homeowners understand improvement opportunities throughout their home and encouraging them to install measures that generate long-lived energy savings. By participating in HRR, customers can increase the energy efficiency of their home and decrease their energy bills each year; enhance home comfort in the winter and summer months; avoid unsightly mould and condensation caused by poor insulation; and, improve health through better indoor air quality.

The "existing HRR offering" refers to the offering structure prior to the partnership with the Government of Ontario, as outlined in Union's 2015-2020 DSM Plan (EB-2015-0029).

Modifications made to the existing HRR offering in 2016 included:

- Continued expansion of the HRR offering across the Union franchise area;
- Introduction of a multi-measure bonus incentive of \$250 for each measure installed beyond the first two. This rebate was intended to encourage homeowners to pursue all energy savings opportunities available to them;
- Raising the maximum rebate allowance per home from \$2,500 to \$5,000 to encourage residential customers to pursue all identified natural gas savings opportunities in their home;
- Changing the approach for modeling the heating system efficiency to assume all heating systems were at Code, even where the existing system efficiency was below this level. This is a more conservative approach to measuring savings as it reduces the annual savings for measures compared to previous years of the program offering; and,
- Adjusting the aggregate savings threshold of all of the homes counted so that it must achieve, on average, at least a 15 percent reduction in annual natural gas use,

¹⁷ Union's DSM Plan (EB-2015-0029), Exhibit A, Tab 3, Appendix A, p.2

comparing the results of the D Assessment to the results of the E Assessment produced by NRCan energy rating software HOT2000.

The existing HRR offering included four components and was the basis for the partnership with the Government of Ontario:

1. Participants work with a partner Service Organization ("SO") to complete an initial, pre-installation energy assessment to determine the home's current energy use and profile. A critical component of this assessment is a blower door test that measures the home's air tightness;
2. A Certified Energy Auditor ("CEA") with the SO models the home using HOT2000 in EnerGuide mode and delivers an energy efficiency report to the homeowner that outlines all energy saving opportunities, along with the home's EnerGuide rating and energy saving tips and information;
3. Using the report, participants can make informed energy decisions on the most effective improvements to carry out. Rebates are available for completing the assessments and at least two eligible measures recommended in the energy efficiency report;
4. After upgrades to the home are complete, participants complete a second, post-installation energy assessment with the CEA to learn the energy savings achieved by the retrofits, as determined by HOT2000.

5.1.2 *Enhanced HRR Offering*

The enhanced HRR offering leverages the design, promotion and delivery of the existing HRR offering while increasing homeowner participation (approximately 12,000 homes over a three-year period) and avoiding greenhouse gas emissions beyond what would have been realized through DSM funding alone.

In 2016, the Government of Ontario established a Green Investment Fund ("GIF"), with a \$100M allocation, targeted at reducing greenhouse gas emissions while strengthening the economy. Union was provided \$40M of this allocation to enhance the existing HRR offering as well as \$2M to launch a behavioural offering.

The existing HRR offering with GIF enhancements was designed to operate as a single HRR offering in the market, known as the “enhanced HRR offering”. Union launched the enhanced HRR offering in July 2016.

Funding from the GIF allocation was used to expand the target market for HRR to include homes in Union’s program area that use oil, propane or wood as their primary heating fuel as well as natural gas heated homes outside of Union’s franchise area. The funding also allowed measure rebates to be increased to drive higher participation levels and to provide incentives for additional energy efficiency measures. These additional measures include: high-efficiency oil and propane furnaces/boilers, wood burning systems and smart thermostats.

The behavioural offering will use customized energy reports to influence customers to change their energy use decisions and actions. Along with benchmarking to peers and past performance, the reports provide energy savings tips and other tools to motivate behavioural changes, and will be used to promote the benefits of participating in the enhanced HRR offering. This offering will launch in 2017 and be fully funded and results fully attributed to the GIF.

5.1.3 Attribution of the Enhanced HRR Offering Results

As informed by section 7.2.2 of the filing guidelines,¹⁸ attribution between Union and the province was defined as part of a partnership agreement made prior to the program’s launch.

While funding from the GIF drives incremental participation, the existing DSM offering continues to be the foundation of the offering. For this reason, attribution of the enhanced HRR offering’s results is not determined simply based on the source of funding. Instead, attribution occurs based on the following rules:

1. 100% of the results from homes outside of Union’s franchise area are attributed to the GIF.

¹⁸ Filing Guidelines to the DSM Framework for Natural Gas Distributors (2015-2020), EB-2014-0134, pp.21-22.

2. 100% of the results from homes within Union's franchise that use a primary heating fuel other than natural gas (electrically heated homes are not included in the offering) are attributed to the GIF.
3. 100% of the results directly related to the smart thermostat are attributed to the GIF.
4. For all other results, there is a two-phased approach to attribution each year. During Phase 1, 80% of the results are attributed to Union and 20% are attributed to the GIF. If at any point in a given year DSM funding is exhausted or Union elects to stop using DSM funds for the enhanced HRR offering, Phase 2 of attribution begins. During Phase 2, 100% of the offering's results are attributed to the GIF.

Attributable results include the number of homes participating, the amount of energy saved, and the amount of greenhouse gas emissions avoided by the enhanced HRR offering. Savings are determined based on HOT2000, except for smart thermostats, which uses prescriptive savings assumptions from the Technical Reference Manual.

Table 5.5 shows the total number of homes that participated in the HRR offering, both existing and enhanced, in 2016 and the manner in which the homes were attributed.

Table 5. 5 - 2016 Total HRR Offering Participants

Offering	Attribution Details	Homes
Existing HRR Offering (Pre-GIF Agreement)	100% to DSM	3,126
Enhanced HRR Offering, Phase 1 (Post-GIF Agreement)	80% to DSM	3,469
	20% to GIF	868
Enhanced HRR Offering, Phase 2 (Post-GIF Agreement)	100% to GIF	562
Enhanced HRR Offering, homes not heated by Union Gas (Post-GIF Agreement)	100% to GIF	214
HRR Offering Total		8,239

Savings resulting from the offering attributed to DSM are shown in Table 5.6 below. GIF results are presented in Table 5.7 in the manner prescribed in the GIF agreement.

Table 5. 6 - 2016 HRR Offering Results Attributed to DSM

Offering	Homes	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Total Spend	Net TRC-Plus	Net TRC-Plus Ratio
Existing HRR Offering (Pre-GIF Agreement)	3,126	2,162,974	54,074,391	\$11,201,397	\$9,401,169	1.56
Enhanced HRR Offering (Post-GIF Agreement)	3,469	2,249,463	56,236,682			
HRR Offering Total	6,595	4,412,437	110,311,073¹	\$11,201,397	\$9,401,169	1.56

¹ Values shown do not match exactly to the 2016 DSM Annual Verification Report due to rounding.

Table 5. 7 - 2016 Enhanced HRR Offering Results Attributed to GIF

Fuel Type	Gross Cumulative Energy Savings (GJ)	Avoided Greenhouse Gas Emissions (t)
Natural Gas	1,309,904	67,230
Oil	108,598	7,771
Propane	-19,497	-1,179
Wood	39	5
Electricity	29,816	414
Total	1,428,860	72,241

The DSM budget spent on the HRR offering is shown in Table 5.8. In 2016, a total of \$5.7M of GIF funding was used to deliver the enhanced HRR offering.

Table 5. 8 - 2016 HRR Offering DSM Program Spend

Item	Total
Incentives	\$ 8,394,192
Administration	\$ 510,346
Evaluation	\$ 1,001,900
Promotion Costs	\$ 1,294,961
DSM Program Spend	\$11,201,397

Target Market

The existing HRR offering targeted Union's residential customers in detached, semi-detached, townhouses and individually metered row townhouses with a natural gas heating system.

Participants had to complete both the pre- and post-installation assessments and install at least two eligible energy efficiency upgrades to qualify for rebates.

The reach of the program was expanded in 2016 to the East and Northeast regions of Union's franchise, including communities such as: Bruce County, Kenora District, Sudbury District, and Thunder Bay District, to name a few.

The enhanced HRR offering further broadened the target market to include:

- Homes that use oil, propane, or wood as their primary heating fuel (electric customers are not eligible); and,
- Non-Union natural gas customers (i.e. Kitchener Utilities, NRG, Utilities Kingston, and Six Nations Natural Gas customers).

Market Incentive

Rebates are structured in a prescriptive manner to ensure simplicity for participants. The predictable nature of this type of rebate enables participants to make fully informed decisions and assists SOs and channel partners in communicating accurate information.

Table 5.9 outlines the measures, criteria and incentives of the existing and enhanced HRR offering.

Table 5.9 - HRR Offering Measure Rebates

Measure	Criteria	Existing HRR Offering	Enhanced HRR Offering
Attic Insulation	Increase insulation from R12 or less to at least R50	\$500	\$500
	Increase insulation from R13 to R25 to at least R50	\$250	\$250
	Increase cathedral/flat roof insulation by at least R14	\$500	\$500
Air Sealing	Achieve 10% or more above base target	\$150	\$150
	Achieving base target	\$100	\$100
Basement Insulation	Add at least R23 insulation to 100% of basement	\$1,000	\$1,250
	Add at least R12 insulation to 100% of basement	\$500	\$750
	Add at least R23 insulation to 100% of crawl space wall	\$800	\$1,000
	Add at least R10 insulation to 100% of crawl space wall	\$400	\$500
	Add at least R24 insulation to 100% of floor above crawl space	\$450	\$500
Exterior Wall Insulation	Add at least R9 insulation to 100% of building to achieve a minimum of R12	\$1,500	\$1,750
	Add at least R3.8 to 100% of building to achieve a minimum of R12	\$1,000	\$1,250
Furnace/Boiler	Replace a 94% or less AFUE with a 95% or higher AFUE natural gas, propane, or oil furnace. OR Replace an 89% or less AFUE with a 90% or higher AFUE natural gas, propane, or oil boiler.	\$500	\$1,000
Wood Burning System	Replace a wood-burning system or appliance with a certified indoor wood-burning appliance, an indoor pellet-burning appliance, or an indoor masonry heater. OR Replace a solid fuel-fired outdoor boiler with a certified outdoor wood-burning appliance.	N/A	\$375
Water Heater	Replace a water heater with an ENERGY STAR® natural gas water heater with an energy factor of 0.82 or higher.	\$200	\$500
Window/Door/Skylight	For each window, door or skylight replaced with an ENERGY STAR®-qualified model.	\$40	\$80
Smart Thermostat ²	Purchase and install a Wi-Fi enabled thermostat with learning capabilities utilizing sensor technology.	N/A	\$100

² Smart thermostats are not considered one of the eligible energy efficiency upgrades to qualify for the offering and will not contribute towards eligibility for the bonus rebate offer.

From the perspective of participants, there was a single HRR offering in the market in 2016. This was a key element of the GIF agreement. Prior to the GIF agreement, participants received the existing HRR rebates as outlined in Union's 2015 - 2020 DSM Plan (EB-2015-0029). Following the introduction of the enhanced HRR offering, participants were eligible for the enhanced HRR rebates.

The maximum rebate payment was \$5,000 per home, which includes rebates for the home energy assessments, measure upgrades, and bonuses.

Assessment Rebate (existing and enhanced HRR offering)

Since pre and post assessments are participation requirements, customers were eligible for a rebate of up to \$500, intended to cover the full cost of the assessments.

Bonus Rebate (existing and enhanced HRR offering)

Starting in 2016, a bonus rebate of \$250 was available for each measure installed beyond the first two. This rebate was intended to encourage homeowners to pursue all energy savings opportunities available to them

Market Delivery

Union established a network of SOs and Contractors to deliver the HRR offering and also used traditional marketing tactics in 2016, such as mass-media and targeted promotion, to create awareness and encourage participation.

Service Organization and Contractor Network

Union continued to develop and rely on a strong network of energy professionals to generate participant leads and provide an effective and efficient customer experience from start-to-finish.

SOs employ CEAs to perform energy assessments, recommend eligible upgrades to the customer based on the pre-assessment and findings presented in the energy efficiency report, and submit all required paperwork to Union on behalf of the customer. Customers could select any one of the partner SOs serving their area and contact them directly. Two new SOs, EnerQuality and EnviroCentre, were added in 2016 to increase CEA capacity and offering coverage. The SOs delivering the HRR offering in 2016 were:

- Amerispec of Canada
- Barrier Sciences Group
- BuyWise Consulting
- Eco Advantage Energy Advisors
- EnerCare
- Energuy Canada
- EnerTest Corporation
- Green Communities Canada (REEP Green Solutions, Green Venture, ELORA Environment, Environment Network, GreenUP, Red Squirrel Conservation Services, Baerg's Home Performance Solutions, EcoSuperior)
- Ridge Energy Consultants
- Canada Energy Audit
- EnerQuality (added in 2016)
- EnviroCentre (added in 2016)

Contractors perform a variety of services including HVAC, insulation and window installations, as well as general renovations. The customer could select any contractor servicing their area or complete the installations themselves.

SOs, contractors, and other channel partners were provided with promotional materials, training and ongoing coaching to help them understand the logistics of the HRR offering, how to "sell" energy efficiency, and how to provide a positive customer experience.

Figure 5.0 is an example of promotional material provided to SOs. This customer brochure was used by CEAs during customer visits to explain the offering and given to customers for reference.



Figure 5.0 - HRR Customer Brochure

In 2016, Union launched an online and magazine campaign targeting contractors (HVAC, insulation, window installers and renovators) to create awareness of the offering and its benefits. Ads (as shown in Figure 5.1) were placed in several industry-specific publications, such as Canadian Contractor, Contracting Canada, Contractor Advantage, and Renovation Contractor. As a primary contact for customers, contractors can effectively promote the HRR offering directly to the target market.



Figure 5.1 - HRR Contractor Ad

Marketing Tactics

Mass-media promotion efforts in 2016 relied on radio and online marketing, bill inserts and Union's website to build widespread awareness of the benefits and cost savings of home renovations and advantages of Union's HRR offering.

- A 30-second radio campaign ran in all major cities within Union's program delivery area.
- Geo-coded online marketing campaigns were used on Kijiji (kijiji.ca), Style at Home (styleathome.com) and Rogers Home Channel (rogers.com). Banner ads were displayed on these websites for customers in Union's delivery areas that enticed them to learn more by clicking on the ad and being directed to Union's website.
- Union also used its own media channels to promote the offering and direct customers to participating SOs to schedule a pre-renovation energy assessment. This included bill inserts to all of Union's residential customers and use of the Union website (uniongas.com/homereno).
- Targeted promotion was used for homes identified as most likely to benefit from the offering, such as older homes (built prior to 1977) and neighbouring homes of HRR participants likely to be of the same vintage. Door hangers (shown in Figure 5.2) were used by CEAs and sales teams to promote the offering during their visits and were distributed to other homes on the same street post-visit.



Figure 5.2 - HRR Door Hangers

5.1.4 Education and Awareness

Education and awareness efforts in the residential sector are crucial in influencing customer decisions and ensuring the success of Union's DSM programs. In 2016, Union continued to distribute educational materials and promote DSM offerings through various channels:

- Residential Energy Efficiency Webpage - energy efficiency, environmental stewardship and conservation are a central focus of Union's website¹⁹. Under the residential section of the site, customers can find information on Union rebates and promotions, do-it-yourself projects and upgrades, energy saving resources, and various other tips to help them save money and energy.
- MyAccount - Union's online account management tool for residential and small business customers provides access to personalized tools to help them better understand their energy use, such as natural gas use and billing history, a "compare bills" feature to graph consumption or bill amounts for two or more months, and a download feature to export energy data into a spreadsheet or energy management software. MyAccount is also used as a promotional vehicle for Union's DSM programs.
- Residential HVAC Newsletter - in 2016, Union continued to target residential HVAC contractors through the GasFacts newsletter. The newsletter provides updates to the HVAC community related to Union's energy efficiency programs, Codes and Standards, recalls and manufacturers' notifications, as well as rebate offers from third party organizations.
- Dedicated HVAC Webpage – a section on Union's website²⁰ was designed to inform the HVAC industry of relevant information, updates, Codes and Standards, and provide links to Union's conservation programs. The website hosts past *GasFacts* editions as well as FAQs, rebate and incentive information, equipment and technical support and other useful information.

¹⁹ uniongas.com/residential/save-money-energy

²⁰ uniongas.com/business/your-business/hvac

5.1.5 *Lessons Learned*

- ***Contractor media campaigns result in higher program awareness***

Feedback has shown that a significant number of participants hear about the program through their contractors. Contractors present the first point of contact with potential participants. To leverage this relationship as an effective channel to reach potential participants, Union needs to continue focusing on education and awareness initiatives targeting these trade allies.

- ***Online tracking tool (Parachute Software) enhanced overall program efficiency***

Since the launch of the HRR offering, a simple manual database was used by CEAs to document and submit customer information. Missing or incorrect information created delays in processing and issuing rebate cheques. Tracking errors could also occur due to limitations in document control. In 2016, Union developed and launched Parachute, an online tracking tool that has resulted in improvements in productivity and benefited all stakeholders.

Real time tracking of files entered into the online tool significantly reduced the time required to process files and issue incentive payments to customers. This created a central repository for all activities impacting an application and a way to streamline communications amongst CEAs and Union. In addition, it has supported an even better customer experience by providing CEAs information on the status of applications and timing of when customers can expect cheques.

- ***The enhanced HRR offering has demonstrated a successful approach to coordinating and integrating DSM efforts***

Leveraging the design, promotion and delivery of existing DSM programs creates opportunities to increase overall efficiency, maximize program impacts, and make energy efficiency offerings accessible across Ontario. The partnership with the Government of Ontario has paved the way for continued collaboration and expansion of the HRR offering. Union began working with the Independent Electricity System Operator ("IESO") in 2016 to develop a program that extended the HRR offering to electrically heated homes through the IESO's whole home pilot program. The pilot will

also include incentives for electricity measures, like upgrading to ENERGY STAR® fridges and window AC units, for all homes. This program will be implemented in 2017.

The HRR offering continues to grow and deliver positive results. It has become an attractive platform for integration efforts with both government-sponsored programs as well as the IESO and offers residential customers across the province the opportunity to better manage their energy usage while maintaining home comfort.

5.2 Commercial/Industrial (“CI”) Program

In addition to the residential program, performance from the CI program is also measured on the resource acquisition scorecard. The CI program aims to advance customer energy efficiency and productivity in the commercial, institutional, agricultural and industrial markets by providing a mix of prescriptive and custom incentive offerings to customers.

Goals for the CI program consist of the following:

- Increase customer’s awareness and knowledge of energy efficient practices
- Deliver a comprehensive suite of cost effective DSM initiatives across all sectors and customer types
- Generate long term energy savings in commercial, institutional and industrial facilities and
- Attract participation from customers who have not yet embraced a culture of conservation in their facility.

The CI program is comprised of three offerings: prescriptive, direct install and custom. Financial incentives are offered for eligible technologies with deemed savings values through the prescriptive offering. The direct install offering provides customers with turnkey installation for certain prescriptive measures. The custom offering, in contrast, addresses energy savings opportunities unique to a particular customer and facility. Projects were developed based on customer-specific information and could include new capital equipment, retrofit (or replacement) equipment, and building/system optimization.

CI program offerings generated significant savings and benefits in 2016, as shown below in Table 5.10. Budget spend and program TRC-Plus is found in Tables 5.11 and 5.12.

Table 5. 10 - 2016 Commercial/Industrial Program Results

Program	Offering	Units	Annual Natural Gas Savings (m ³)	Cumulative Natural Gas Savings (m ³)	Total Spend	Net TRC-Plus	TRC-Plus Ratio
Commercial/ Industrial	Prescriptive	3,586	8,034,415	159,584,767	\$5,584,228	\$25,397,837	3.13
	Custom	432	34,079,900	544,862,192	\$10,800,316	\$90,257,550	3.73
Commercial/Industrial Total		4,018	42,114,316	704,446,959	\$16,384,545	\$115,655,387	3.57

Table 5. 11 - 2016 Commercial/Industrial Program Spend

Item	Total
Incentives	\$ 11,387,335
Administration	\$ 3,680,463
Evaluation	\$ 120,578
Promotion Costs	\$ 1,196,169
Program Spend	\$ 16,384,544

Table 5. 12 - 2016 Commercial/Industrial Program Cost-Effectiveness

	TRC Benefits (a)	TRC Costs (b)	Net TRC-Plus (c)=(a-b)	TRC-Plus Ratio (d)=(a/b)
Measures	\$ 160,648,127	\$ 39,995,530	\$ 120,652,597	4.02
Administration		\$ 3,680,463		
Evaluation		\$ 120,578		
Promotion		\$ 1,196,169		
Commercial/Industrial Program Total	\$ 160,648,127	\$ 44,992,740	\$ 115,655,388	3.57

5.2.1 Prescriptive Offering

Union's prescriptive offering provides customers with a list of recommended efficient technologies and equipment, also known as measures, which have pre-determined incentive and natural gas savings amounts, defined by facility and equipment size. The application process for the prescriptive offering promotes ease of participation as customers know upfront the incentive available for each measure. This allows customers with multiple facilities to make informed decisions and roll out technologies to their entire building stock.

In 2016, new measures were added to the suite of eligible measures, incentive amounts were increased and the incentive structure was modified to reflect the size of the equipment (i.e. cubic feet per minute, annual pounds of laundry). These changes were intended to increase uptake in the marketplace, especially from customers who do not traditionally participate in DSM programs.

Target Market

All CI customers are eligible to participate in the prescriptive offering however Union continued to use a segmented approach to the market through various delivery channels and tailored initiatives. Eligible measures were grouped into initiatives that targeted water heating, space heating, and foodservice applications.

By using a segmented approach, Union targeted similar business types with customized communications on the measures most relevant to each segment while gaining valuable market insights on Union's CI customer base and barriers to DSM uptake.

CI market segments specifically targeted in 2016 included: Education, Entertainment, Foodservice, Healthcare, Hotel/Motel, Manufacturing, Multi-Unit Residential, Retail and Warehouses. CI segments beyond those specifically targeted are also eligible to participate, where the technology is appropriate, and were included in the outreach and marketing efforts.

Market Incentive

A range of incentives directed towards the end-use customer (also known as downstream incentives) encourage the adoption of energy efficient technologies. Incentive levels were

established based on a number of considerations including natural gas savings generated, effectiveness of the incentive to influence customers and reach non-participants in DSM, and the equipment useful life. The 2016 prescriptive incentives are outlined in Table 5.13.

The Water Heating initiative includes measures that are designed to reduce a customer's energy use and water consumption; the Space Heating Initiative urges customers to retire older inefficient space heating equipment and install new energy-efficient equipment; and, the Commercial Foodservice Initiative encourages food establishment owners and operators to install high efficiency technologies designed to reduce hot water consumption and natural gas use.

National Account Multi-Unit Incentive

National Account customers are those that have multiple property locations throughout Union's franchise with similar design and use, such as retail chains, property management firms and foodservice chains. National Account customers have the ability to install various energy efficient technologies within numerous locations across Union's franchise.

Recognizing that this customer group has a greater number of savings opportunities, Union continued to offer a multi-unit installation bonus incentive in 2016:

- 25 percent incentive increase on 6-30 installations per National Account
- 50percent incentive increase on 30 or more installations per National Account

Service Provider Limited Time Bonus

A limited time bonus was offered on select measures between September and December 2016 to drive awareness of Union's program offerings amongst trade allies, attract new service providers and influence incremental participation. The bonus offer included a one-time \$250 participation bonus and an additional bonus: \$250 for installing three or more eligible measures and \$500 for installing five or more select prescriptive measures. Eligible measures included: condensing boilers, ERVs, HRVs, infrared heaters, makeup air units and air curtains. The maximum incentive available was \$750 per service provider.

Table 5. 13 - 2016 Commercial/Industrial Prescriptive Offering Measure Incentives

Initiative	Measure	Customer Incentive	Service Provider
Water Heating	Condensing Storage Water Heater – Low, Medium, and High utilization	\$450	\$100
	Condensing Tankless Water Heater – Low, Medium, and High utilization	\$450	\$100
	Front Loading Clothes Washer, CEE Tier 2	\$200	\$50
	Ozone Laundry Equipment – All incentive categories (Max \$8,000 per unit)	\$0.02 x total annual lbs of laundry processed	\$100
Space Heating	Air Curtain Single Pedestrian Door 7' x 3'	\$300	\$100
	Air Curtain Single Pedestrian Door 7' x 6'	\$400	\$100
	Air Curtain Single Pedestrian Door 8' x 6'	\$500	\$100
	Air Curtain Double Pedestrian Door (2) 7' x 3'	\$600	\$100
	Air Curtain Double Pedestrian Door (2) 7' x 6'	\$800	\$100
	Air Curtain Double Pedestrian Door (2) 8' x 6'	\$1,000	\$100
	Air Curtain Shipping and Receiving 8' x 8 or 8' x 10'	\$1,200	\$100
	Air Curtain Shipping and Receiving 10' x 10'	\$1,800	\$100
	Boiler Cycling Controls - Purchase	\$3,000 per building	\$100
	Boiler Cycling Controls – Lease (min 5 year)	\$1,200 per building	\$100
	Condensing Boiler - ≤ 299 MBtu/hr	\$1,000	\$100
	Condensing Boiler - 300 to 999 MBtu/hr	\$2,000	\$100
	Condensing Boiler - ≥ 1,000 MBtu/hr	\$6,000	\$100
	Condensing Make-up Air (MUA) Constant Speed	\$0.30/CFM per unit	\$100
	Condensing Make-up Air (MUA) 2 Speed	\$0.35/CFM per unit	\$100
	Condensing Make-up Air (MUA) VFD	\$0.40/CFM per unit	\$100
	Condensing Furnace	\$200	\$50
	Condensing Unit Heater	\$75	\$100
	ERV (no existing ERV, or not required by code)	\$1.15/CFM/unit*	\$100
	ERV Improved Effectiveness ≥65% to ≤ 74%	\$0.50/CFM per unit*	\$100
	ERV Improved Effectiveness ≥75% to ≤ 84%	\$0.75/CFM per unit*	\$100
	ERV Improved Effectiveness ≥85%	\$1.15/CFM per unit*	\$100
	HRV (no existing HRV, or not required by code)	\$0.75/CFM per unit**	\$100
	HRV Improved Effectiveness >65% to < 74%	\$0.25/CFM per unit**	\$100
	HRV Improved Effectiveness >75% to < 84%	\$0.50/CFM per unit**	\$100
	HRV Improved Effectiveness >85%	\$0.75/CFM per unit**	\$100
	Infrared Heater Single Stage	\$300	\$100
	Infrared Heater Two Stage	\$400	\$100
	Demand Control Ventilation (DCV) Retail, Rooftop Unit (RTU)/MUA < 5,000 sq. ft.	\$400	\$50
	DCV Retail RTU/MUA ≥ 5,000 sq. ft.	\$500	\$50
	DCV Office RTU/MUA < 2,500 sq. ft.	\$200	\$50
	DCV Office RTU/MUA ≥ 2,500 sq. ft.	\$300	\$50
Commercial Kitchen	ENERGY STAR® Fryer	\$700 per vat	\$50 per vat
	ENERGY STAR® Dishwasher - Undercounter	\$100	\$50
	ENERGY STAR® Dishwasher – Stationary Rack	\$200	\$50
	ENERGY STAR® Dishwasher – Rack Conveyor	\$450	\$50
	DCKV Fast Food - ≤ 4,999 CFM	\$1,400	\$100
	DCKV Full Menu - 5,000 – 9,999 CFM	\$3,200	\$100
	DCKV Dinner House - 10,000 – 15,000 CFM	\$4,600	\$100
	ENERGY STAR® Convection Oven	\$300	\$50
	ENERGY STAR® Steam Cooker	\$400	\$50
	High Efficiency Under-Fired Broiler	\$500	\$50

**For ERVs: Min \$200/Max \$6,000 per unit; **For HRVs Min \$200/Max \$4,000 per unit

Further information on how the technologies work and can help customers reduce energy costs can be found on Union's website.²¹

Market Delivery

All of Union's CI energy efficiency offerings are aligned and delivered under the brand platform EnerSmart. This ensures a seamless, recognizable brand throughout Union's franchise.

For the CI prescriptive offering, Union continued to rely on a combination of direct and indirect delivery channels supported by a comprehensive set of marketing tools and strategies customized by segment.

Delivery Channels

Within each segment, Union identified and targeted key influencers and leaders. Offers were delivered both directly to the customer, supported through Union's Account Management team, and indirectly, through delivery channels comprised of manufacturers, distributors, and service providers.

Direct delivery channels focused on end-use customers and included:

- **Direct Sales.** Union account managers worked directly with end-use customers to explore potential improvements to the energy efficiency of their facilities, provide technical support to implement changes and apply for financial incentives.
- **Mass Market.** A number of tactics were used to reach the widest range of CI end-use customers, such as digital and social media, bill inserts, direct mailing campaigns, email blasts, and segment specific advertising. Union also engaged customers and industry partners alike through event-based marketing such as tradeshow, customer workshops, sponsorships, and other similar events.
- **National Accounts.** Union's National account managers develop and maintain relationships with customers where decisions impacting multiple property locations are made using a top-down, centralized approach.

²¹ uniongas.com/business/save-money-and-energy/equipment-incentive-program

Indirect channels, such as strategic relationships with trade allies and delivery agents, allow Union to maximize alliance opportunities and influence the market as a whole. These industry allies promote or install energy efficient equipment and are in a position to directly educate or influence Union's customers to adopt natural gas energy efficient equipment. Cultivating and maintaining relationships with each of the following industry allies ensures that they are aware of the savings, benefits and incentives provided by Union's programs and offerings and can market long-life energy-efficient technologies to their customers:

- **Manufacturers.** Manufacturers are a key ally to promote higher efficiency equipment through their network of distributors and service providers. Union's account management team provided educational and promotional materials on Union's CI program to manufacturer representatives and engineering consultants.
- **Distributors.** Distributors were also targeted by Union's account management team and received marketing materials. Further, Union offered a \$50 incentive in 2016 to any distributor who influenced the sale of an applicable technology and administered the application process. Condensing gas water heaters, condensing unit heaters, ERVs, HRVs, and infrared heaters were measures eligible for the incentive.
- **Service Providers.** HVAC contractors, engineering consultants, design architects and other service providers play an integral role in the sales cycle to encourage uptake of energy efficient technologies. Union worked directly with service providers across the province, hosted information sessions and provided reference materials to increase awareness of energy efficient technologies and advance adoption of this equipment in the market. Union provided a \$50 to \$100 incentive to service providers to recognize their impact in endorsing prescriptive DSM measures directly with end-use customers and administering the application process.

Marketing Tools and Strategies

In 2016, Union used an integrated marketing strategy to target CI customers as well as trade allies in key markets; promoting both prescriptive measures and custom offerings. A number of marketing tools and tactics were deployed through the delivery channels:

- Printed materials were developed to communicate Union's CI program offerings to the mass CI market as well as targeted segments. Sell sheets and brochures served as

discussion tools and reference sheets to support customer and trade ally decision making. Figure 5.3 is one of the brochures used in 2016 to broadly communicate Union's CI prescriptive and CI custom offerings.

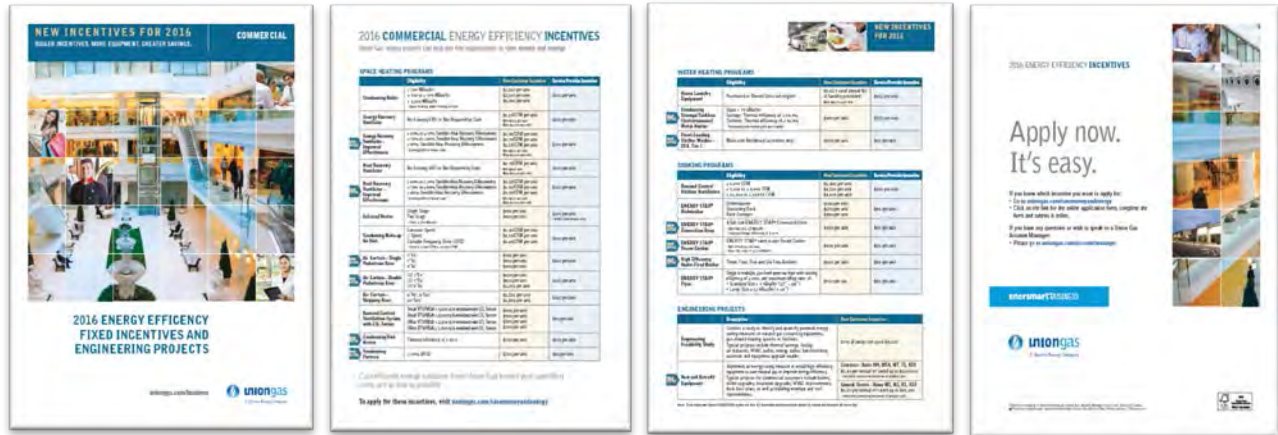


Figure 5.3 - 2016 Energy Efficiency Fixed Incentive & Engineering Projects Brochure

- Email marketing was used by the account management team in 2016 as part of the ongoing promotion of the prescriptive offering and to communicate special offers. Messaging was developed to convey the benefits of energy-efficient technology, incentives available and highlight specific measures in the commercial and industrial customer segments.
- Union distributed targeted bill insert communications (Figure 5.4) monthly in 2016 to select customer segments with customized information on applicable measures and program offerings. Targeted segments included Healthcare, Hospitality, Education, Foodservice, Manufacturing, Multi-Unit Residential, and Municipalities.



Figure 5.4 - Bill Insert Targeting Manufacturing Customers

- An *Energylink* newsletter was also distributed with gas bills to all CI customers to provide education on energy efficient practices and equipment and highlight the support Union can provide in implementing such practices.
- Digital and social media campaigns were designed to reach end-use customers and trade ally decision makers in the Education, Healthcare, and Multi-Residential segments as well as the CI market as a whole.
 - o Display ads and search ads in Google and LinkedIn appeared on website pages of the targeted audience and directed customers to Union's dedicated EnerSmart website page²² to learn more about energy efficient equipment and CI program offerings.
 - o A LinkedIn campaign in 2016 displayed information on Union's program offerings in LinkedIn members' feed for all CI segments and trade allies; while LinkedIn InMail sent direct email messages to LinkedIn members based on industry, job title and role/seniority.
 - o Magazine advertising in industry publications provided wide-ranging access to end-use CI customers and key trade allies and allowed for segment-specific content to be communicated. In 2016, Union carried out association advertising through a number of publications, such as Canadian Healthcare Facilities (Figure 5.5), Canadian Facility Management & Design, Canadian Property Management, and Heating, Plumbing & Air-Conditioning Magazine, to name a few.



Figure 5.5 - Content featured in the Canadian Healthcare facilities Magazine

²² uniongas.com/business/save-money-and-energy

5.2.2 Commercial/Industrial Direct Install Offering

The newest offering added to the CI program is the direct install offering. In response to the Board's 2015-2020 DSM Plan Decision, the proposed direct install pilot was modified to a full program offering on the resource acquisition scorecard. The direct install offering differs from the prescriptive offering by providing commercial customers with direct equipment installation to seamlessly upgrade current equipment and technologies to more efficient options. This simplified, turnkey process will address barriers to participation providing energy savings to typically hard-to-reach small commercial customers.

To transition to a full program offering, activities in 2016 for direct install focused on program offering design and establishing and finalizing an agreement with an electric Local Distribution Company. The goals were to coordinate, design and integrate delivery into an existing offering between the gas and electric utilities for small to mid-sized businesses and determine appropriate natural gas technologies and incentive requirements.

Union identified a co-delivery opportunity with Alectra Utilities (previously Horizon Utilities), that will create an all-inclusive experience for customers. Union and Alectra investigated various program offering models and determined that Alectra's small business lighting program will provide the best fit for initial collaboration of Union's direct install offering efforts in the market.

Target Market

The direct install offering will target small to mid-sized businesses who do not typically participate in DSM, specifically those who:

- pay their own natural gas bill; whether they rent or own the building,
- are in the Union/Alectra franchise area, and
- are commercial customers who operate less than two buildings (national account customers are not eligible).

Market Incentive

Union's direct install offering will initially focus on pedestrian air curtains and provide an incentive up to 100 percent of the total cost of installation. Other prescriptive measures that yield a TRC-plus ratio exceeding 1.0 may also be recommended to customers.

Market Delivery

Program delivery will be implemented through a third party delivery agent/program administrator who will operate on behalf of Union and Alectra. The program administrator will function as a central channel for program coordination, including direct outreach to customers, identifying and installing measures through channel partners, organizing payments and producing reports for Union and Alectra.

5.2.3 *Commercial/Industrial ("CI") Custom Offering*

Union's custom offering is the largest offering of the CI programs in terms of cumulative natural gas savings (m³) as well as the largest contributor to achievement on the resource acquisition scorecard. The custom offering focuses on opportunities where energy savings are linked to unique building specifications, design concepts, processes and/or new technologies that are outside the scope of prescriptive and quasi-prescriptive measures. The offering and incentives were targeted directly to the end user, while trade allies involved in the design, engineering and consulting communities assist to expand the message of energy efficiency.

The goal of the CI custom offering is to generate long-term and cost effective energy savings in CI facilities while supporting continuous energy use improvement through long-term relationships with customers.

Custom DSM project savings are determined for each customer specific project by considering a high efficiency option compared against a lower efficiency base case option.

A few changes were made to the CI custom offering in 2016:

- General Service customers received an enhanced incentive to recognize that projects for this customer size typically require additional funding to drive participation

- Customer incentives were no longer available for routine maintenance projects due to a shift of focus to other custom initiatives; and,
- As part of the 2015 audit, the Evaluation Contractor recommended that Union and Enbridge achieve better uniformity in custom offering input assumptions. Consistent with this recommendation and supported by audit findings, Union aligned with Enbridge's 25-yr default EUL for boilers in their custom offering.

Target Market

The CI custom offering focused on commercial /industrial general service, contract and mid-sized contract customers.

Targeted market segments included, but were not limited to: Manufacturing, Industrial Processing and Refining, Municipalities, Universities, Schools, Hospitals, Warehouses and Greenhouses.

Market Incentive

Custom incentives addressed non-prescriptive energy savings opportunities to improve natural gas usage and were based on the estimated annual gas savings of the project. Other incentives were also available for studies, meters and education. Table 5.14 outlines the incentives available in the CI custom offering.

Table 5. 14 - 2016 Commercial/Industrial Custom Incentive Guidelines

Measures	Commercial Incentives	Industrial Incentives
New and Retrofitted Equipment	Contracts \$0.10/m ³ up to \$100,000	Contracts \$0.10/m ³ up to \$100,000
	General Service \$0.20/m ³ up to \$40,000	General Service \$0.20/m ³ up to \$40,000
	Incentive cannot exceed 50% of project cost	
Engineering Feasibility Studies	50% up to \$4,000	50% up to \$10,000
Process Improvement Studies	--	66% up to \$20,000
Meters	--	50% of installed cost up to \$3,500 limit of 5 meters a year per site
Total incentives capped at \$250,000 a year per site		

New and Retrofitted Equipment and Process Improvements

Customer financial incentives were provided to encourage the installation of new equipment, retrofit equipment, and building/system optimization that resulted in energy efficiency gains and/or improvements in the productivity of the customer's operations.

Studies, Meters and Education

Engineering feasibility and process improvement studies help customers identify, justify and prioritize DSM custom project opportunities. Quantifying the financial costs and benefits of energy efficiency opportunities underpins the customer's internal decision making process and is a crucial element in the CI custom offering. Customers received financial incentives to support the installation of energy meters. Customers were also able to apply for incentives to help cover the cost of training and education courses that increase their knowledge of energy efficiency.

Market Delivery

The custom offering relied on a direct sales, customer centric approach to market. The most effective way to promote and encourage energy efficiency is by considering the individual energy needs of each customer.

Union's value proposition to its customers is the technical expertise and guidance provided with respect to energy-related decision making and business justifications. Union's guidance, along with financial incentives, help customers prioritize energy efficiency projects against their own internal competing factors (such as those activities which are deemed more business critical) and demonstrate the competitive advantage customers can gain through efficiency upgrades.

Custom projects were identified and supported through the collaborative efforts of Union's account managers and project managers. Account managers administer the full range of applicable services within the Union service portfolio, including DSM offerings. They are uniquely positioned to identify customer-specific information and custom project savings opportunities. Project managers are Professional Engineers who assist customers in recognizing and developing specific energy efficient natural gas based solutions to their business problems. The project manager works with the account manager as well as third party engineers, equipment manufacturers, service providers and others, as necessary, to

complete the DSM custom project application and confirm the appropriate base case, high efficiency option and measure life for the project.

Savings claims were subsequently assessed through Union's internal quality assurance/quality control process to validate the project results.

Internal Quality Assurance/Quality Control ("QA/QC")

A rigorous quality control process was used for all custom projects. Each custom project underwent an internal QA/QC project review prior to finalizing the savings and issuing the incentive cheque to the customer. The review was conducted by Engineers within the Commercial/Industrial Energy Efficiency Programs team who assessed the calculated savings and underlying customer-specific factors including base case, high-efficiency case and project life assumptions as well as "other" factors affecting gas demand (e.g. production and weather) and project costs.

Project savings calculations were based on the best information available at the time of review.

5.2.4 Education and Awareness

A wide variety of training materials and workshops were used to promote and expand knowledge of energy efficient technologies to CI customers. The objective was to educate stakeholders (including service providers and trade allies) on how to identify energy conservation opportunities, supply them with the resources to research and evaluate possible solutions, and motivate them to take action to install and/or market these technologies.

Education and awareness initiatives for the CI program included:

- EnerSmart website
- GasWorks newsletter
- Workshops promoting the efficient use of natural gas and awareness of energy savings opportunities
- Participation in independent professional development groups, trade organizations, and government workshops
- Attendance and sponsorship at trade shows and specific industry events; and,

- Partnering in pilot projects and studies.

EnerSmart Website

Union's dedicated webpage for the EnerSmart program (Figure 5.6)²³ provides:

- Program details and incentives for the prescriptive and custom offerings
- Instructions on how to contact an account manager or a Service Provider (a directory of trade allies that have experience with Union's CI program and offerings was added in 2016)
- Instructions on how to submit an application
- Tools and calculators for customers to assess their energy usage, evaluate energy sources and reduce energy costs; and,
- Equipment details and tips. Enhanced in 2016 with easy-to-understand information on energy saving equipment, such as how the equipment works and its benefits, typical building applications and maintenance information to optimize equipment performance.

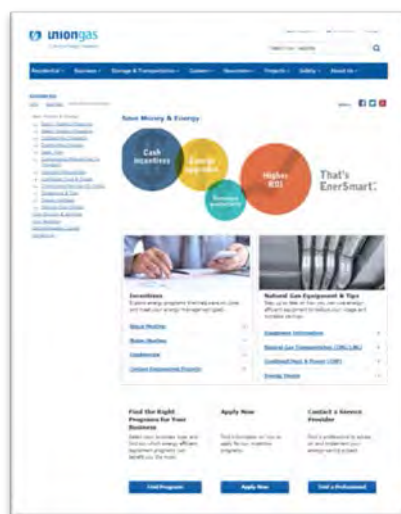


Figure 5.6 - EnerSmart Webpage

²³ uniongas.com/business/save-money-and-energy

GasWorks Newsletter

GasWorks is a technology and energy conservation newsletter targeted to CI customers. *GasWorks* provides industry trends, technology and energy efficiency information to help businesses improve process productivity, enhance reliability of equipment and control energy expenses. The newsletter was distributed to CI customers and was also available on Union's website.

Workshops and Educational Forums

Union was involved with two large workshop and educational outreach efforts in 2016:

1. Canadian Boiler Society ("CBS") Educational Days: Raising the Bar on Raising Steam

Union partnered with CBS to deliver educational forums in London, Burlington, Toronto and Kingston to over sixty attendees. Participants learned common boiler solutions to increase energy efficiency and save natural gas; with a focus on boiler selection and sizing, operation and maintenance, burner upgrades for lower emissions, and improved performance.

2. HVAC Information Sessions

Union hosted 23 information sessions across its franchise to educate and train local HVAC contractors. Content included information on energy efficient equipment, incentive offerings available to end use customers, and ways to promote the benefits of higher efficient equipment. Materials were provided to session participants to use with customers to guide discussions on higher efficient equipment and Union's available offerings.

Additionally, Union sponsored, participated and presented at a number of conferences and events throughout 2016, including:

- Cap and Trade Strategies for all Manufacturers with Canadian Manufacturers and Exporters
- CBS Technology Fair and Educational Forum
- Canadian Healthcare Engineering Society Conference
- Energy Monitoring, Targeting and Reporting Workshop
- Union's Large CI Customer Conference
- Union's Greenhouse Growers Luncheon

Participation in Industry Organizations

Union benefits from shared learning by working closely with government and professional organizations to understand the latest trends and technologies. Some examples of industry partnerships include:

- Consortium for Energy Efficiency (“CEE”). Union networked with energy efficiency program administrators from across Canada and the United States with a focus on developing common approaches to advancing energy efficiency.
- Energy Solutions Centre. Union collaborated with energy utilities, municipal energy authorities, equipment manufacturers, and vendors to discuss strategies for accelerating the acceptance and deployment of new energy efficient, gas-fueled technologies.
- Canadian Boiler Society. Union partnered with CBS to provide technical training through the CBS Educational Days workshop; helping customers learn to operate their equipment at optimum efficiency.

Tradeshows and Events

Tradeshows and organized events provided Union with an opportunity to engage, educate and influence customers and trade allies. Associations hosting these events are credible sources of information and attendees rely on the content and resources they provide. As shown in Table 5.15, Union participated in a number of tradeshows and association events in 2016, both as an exhibitor and sponsor, to create awareness of CI program offerings and generate leads among attendees.

Table 5. 15 - 2016 Tradeshow Participation

Name	Target Audience
Canadian Mechanical & Plumbing Exposition Tradeshow	Manufacturers Service Providers
Hamilton & District Apartment Association Tradeshow	Multi-unit Residential Owners Property Managers Service Providers
London Poultry Show	Agricultural Customers
Federation of Rental-Housing Providers of Ontario : 2 Information Sessions, Golf Tournament and Annual Gala	Multi-unit residential owners Property Managers Service Providers
Ontario Association of School Business Officials Annual Conference & Education Industry Show	School Board Officials
Natural Resources Canada Energy Summit	Energy Efficiency Experts Industry Decision Makers
Canadian Healthcare Engineering Society Conference	Healthcare Facility Managers
Operations, Maintenance & Construction Annual Conference	College/University/School Board Decision Makers
London Property Management Association Tradeshow and Golf Tournament	Multi-unit Residential Owners Property Managers Service Providers
Eastern Region of APPA, Leadership in Education Facilities Annual Conference	College/University/ School Board Decision Makers
Professional Retail Store Maintenance Association National Conference	Large Retail Customers

Pilot Projects and Studies

By partaking in pilot projects and studies, Union can gain insight into the viability of potential energy-efficient technologies and important information to shape program design and delivery. Partnering with other utilities and distribution companies also allows Union to assess collaboration opportunities between natural gas and electricity utilities; all with minimal investment.

Union was involved in two ongoing pilot projects/studies in 2016: the Performance-Based Conservation Pilot and the Energy Pathfinder Initiative.

- **Performance-Based Conservation Pilot**

This pilot was launched in 2015 and continued through 2016. Led by the Toronto Region Conservation Authority and Enerlife Consulting, project partners include: Union, Enbridge, IESO, Halton Hills Hydro, Milton Hydro, Brampton Hydro One, Region of Peel Water, Halton Region Water and the Real Property Association of Canada.

The strategic concept of the pilot is to use large-scale energy benchmarking diagnostics to enhance conservation program performance and drive the adoption of energy benchmarking as a standard practice in the Ontario Commercial & Institutional sector. The pilot seeks to enroll up to 150 buildings to assess high-potential buildings by market segment, identify facility-specific conservation measures, quantify energy (gas and electricity) and water savings opportunities, and monitor and verify performance improvements over time.

In 2016, the pilot was still in the Data Collection and Analysis stage. Union has enlisted 10 public buildings in the Town of Halton Hills and 17 buildings of the Halton Hills Catholic District School Board to participate.

- **Energy Pathfinder Initiative**

The Energy Pathfinder Initiative is a pilot project initiated by the Canadian Manufacturers and Exporters in collaboration with ICF International, Union, Enbridge, IESO and Hydro One Networks Inc. The pilot is designed to explore, define and quantify opportunities to optimize end-use operations and energy intensive processes, as well as develop best practices for energy optimization and waste energy reduction within the Ontario manufacturing sector. The project was kicked off in 2015 and continued through 2016.

Union Gas has recruited an industrial facility into the pilot. A data logging system, including pulse meter and sub-meter, have been installed at the customer site. The consultants are currently analyzing natural gas and electricity consumption data to investigate energy savings opportunities at the facility.

5.4.2 *Lessons Learned*

Prescriptive and Quasi-Prescriptive Offering

- **Downstream incentive model limitations**

An end-user incentive model coupled with complex measures is creating challenges in driving incremental results. Union will continue to investigate and test additional program delivery channels as well as upstream and midstream incentive models in 2017.

- **Responding to best available information**

The CI prescriptive offering must remain responsive to changing information on the characteristics and long-term energy savings of equipment by continually assessing and modifying the measure mix in the prescriptive portfolio; adding new measures supported by research and vetted through the TRM process and discontinuing measures where savings are unable to be reliably substantiated. For example, in 2016, tankless water heaters were added to the available measure list while destratification fans were discontinued.

Direct Install Offering

- **Designing a cost-effective program offering that addresses small to mid-sized business barriers is challenging**

High upfront cost of equipment and installation limits market potential for many energy-efficient prescriptive measures. The investment required to provide a turnkey model design, all while striving to achieve cost-efficient savings, were also difficult barriers to manage in designing a suitable program offering.

To address this, Union sought out opportunities to cost share with an electric utility while also choosing a solution that should aid in customer adoption. Promoting technologies such as air curtains provides both natural gas and electricity savings, improves the potential incentive level that can be offered to the customer and boosts the overall cost effectiveness of the offering.

Custom Offering

- **Aligning definitions and terminology**

To ensure clarity amongst all stakeholders, it is important to use common definitions and terminology. Where differences between internal and external language has been found, Union has begun modifying internal terminology to align with the framework or Board Decisions. In 2016, for example, Union modified the labelling of project measure types to align with the measure categories in the framework: Early Replacement, Natural Replacement, New Construction and Retrofit.

- **Continuous improvement of custom project documentation**

To demonstrate influence in custom projects and the due diligence put forward in estimating custom project savings, Union must remain focused on standardizing and improving documentation practices based on the feedback of customers, account managers, project managers, auditors and other stakeholders. In 2016, Union continued to improve on the base case documentation form introduced in 2015. Additional information on operating characteristics of the base case condition, less efficient options customers considered, and changes in process or operations that could impact estimated savings will now be gathered in one place; on the base case form.

CI prescriptive and custom program offerings will be offered throughout the 2016-2020 timeframe of this framework. Union will continue to refine its approach to market to increase participation from customers who have not yet embraced a culture of conservation in their facility, increase awareness and knowledge of energy efficient best practices, and generate significant long term energy savings in C/I facilities.

Union's direct install program offering will launch in 2017, delivered in partnership with Alectra Utilities.

6. Low-Income Scorecard

A low-income program is a resource acquisition program tailored to low-income customers; recognizing the unique characteristics and special needs of this customer segment. Given the distinctive features of a low-income program and additional guiding principles and design characteristics set out in the framework, this program is included on a separate low-income scorecard.

Performance on the low-income scorecard is measured by three metrics: single family cumulative natural gas savings (m³), social and assisted multi-family cumulative natural gas savings (m³), and market rate multi-family cumulative natural gas savings (m³).

In 2016, the single family metric consists of cumulative natural gas m³ savings from the Home Weatherization Program ("HWP") offering and the furnace end-of-life upgrade offering. The multi-family metrics consist of cumulative natural gas m³ savings from the multi-family offering, which includes social and assisted multi-family housing as well as low-income market rate multi-family buildings.

Table 6.0 presents the results of the low-income scorecard. Union achieved 103 percent of the overall scorecard target, resulting in a DSM Shareholder Incentive of \$1.152M.

Table 6.0 - 2016 Low-Income Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Single Family Cumulative Natural Gas Savings (m ³)	28,339,761	37,786,348	56,679,522	60%	45,783,307	121%	73%
Social and Assisted Multi-Family Cumulative Natural Gas Savings (m ³)	13,836,358	18,448,477	27,672,716	35%	10,894,573	59%	21%
Market Rate Multi-Family Cumulative Natural Gas Savings (m ³)	2,252,430	3,003,240	4,504,860	5%	8,151,190	200%	10%
Total Scorecard Target Achieved							103%
Scorecard Utility Incentive Achieved							\$1,151,656

6.1 Low-Income Program

The low-income program is designed to reduce the energy burden facing low-income single family and multi-family dwelling customers and minimize the barriers that low-income customers face in participating in energy conservation programs.

Building on past successes, Union enhanced the low-income program beginning in 2016 in the following manner:

- Single family offerings
 - o Continued expansion of the Home Weatherization offering to new and smaller geographic areas across Union's franchise to ensure that the offering is accessible to low-income customers across the province
 - o Introduced a furnace end-of-life upgrade offering in the social and assisted housing market that provided incentives to upgrade to a 95 percent or greater AFUE rating when an existing furnace reaches end-of-life and is being replaced; and,
 - o Designed an Indigenous offering that combines delivery of the Home Weatherization and furnace end-of-life upgrade offerings within Indigenous communities (expected to launch in 2017).
- Multi-family offerings
 - o Extended the current multi-family offering to market rate buildings that are occupied by low-income tenants, since a portion of low-income customers reside in such buildings, to ensure that they can also benefit from the DSM offerings.

Table 6.1 shows the results of the low-income program. The total spend for the low-income program is administered on a program level. Table 6.2 breaks down the total spend into its components.

Table 6. 1 - 2016 Low-Income Program Results

Program	Offering	Units	Annual Net Gas Savings (m ³)	Cumulative Net Gas Savings (m ³)	Total Spend	Net TRC-Plus	TRC-Plus Ratio
Low-Income	Home Weatherization	1,867	1,831,630	45,754,201	\$10,400,612	\$4,899,408	1.50
	Furnace End-of-Life	24	1,617	29,106			
	Multi-Family	119	837,653	19,045,763			
Low-Income Total		2,010	2,670,900	64,829,070	\$10,400,612	\$4,899,408	1.50

Table 6. 2 - 2016 Low-Income Program Spend

Item	Total
Incentives	\$ 6,664,457
Administration	\$ 861,489
Evaluation	\$ 161,733
Promotion Costs	\$ 2,712,933
Total Low-Income Program Spend	\$10,400,612

Table 6.3 shows the calculation of the low-income program's TRC-Plus ratio.

Table 6. 3 - 2016 Low-Income Program Cost-Effectiveness

	TRC-Plus Benefits (a)	TRC Costs (b)	Net TRC-Plus (c)=(a-b)	TRC-Plus Ratio (d)=(a/b)
Measures	\$ 14,759,156	\$ 6,123,593	\$ 8,635,563	2.41
Administration		\$ 861,489		
Evaluation		\$ 161,733		
Promotion		\$ 2,712,933		
Low-Income Program Total	\$ 14,759,156	\$ 9,859,748	\$ 4,899,408	1.50

6.1.1 Home Weatherization Program (“HWP”) Offering

The HWP offering falls under the single family metric on the low-income scorecard and is a full service retrofit program that provides low-income customers living in single family homes with free energy assessments, weatherization upgrades, and prescriptive conservation measures to improve the energy efficiency of the customer’s home. A single delivery agent entity coordinates all elements of the offering – from energy assessments to installation of measures; ensuring ease of participation. Customers also benefit from one-on-one energy conservation education by auditors and contractors.

An initial home energy assessment identifies the eligible building envelope upgrades, including attic insulation, wall insulation, basement insulation and draft-proofing measures. To capture lost opportunities for energy savings, spray foam insulation was introduced in 2016; allowing homes with a rubble/ concrete finish in the basement to fully participate in all deep measures. After all upgrades are completed, a final post renovation home energy assessment is conducted to evaluate the energy savings realized in the home using NRCan’s HOT2000 modelling software.

Basic measures, such as showerheads, aerators, pipe insulation and programmable thermostats, are installed for qualified customers at the time of the home energy assessment if they have not previously received them.

To improve health and safety in low-income customer’s homes and ensure income eligible customers can participate, Union addressed treatable environmental hazards within the building envelope identified during the assessment and prior to commencing any installation work. Hazards include: inadequate ventilation, combustion safety, mould, moisture and excessive clutter. The issues are often the result of poor structural design, age of the home, as well as the inability of the homeowner to address maintenance concerns due to lack of time, knowledge and money. Another safety measure, a carbon monoxide detector, was left behind for self-installation in all participating homes where one was required.

Union successfully delivered the HWP offering to 172 homes in the social housing market and 1,576 homes in the private market for a total of 1,748 homes. Approximately four percent of the natural gas savings were derived from social housing and ninety-six percent from the private market.

Target Market

HWP targeted both the social and assisted housing market and the private market. Income verification was required to participate in the offering and customers had to meet the following criteria:

Social and Assisted Housing Market:

- Household income was at or below 135 percent of the most recent Statistics Canada Pre-Tax Low-income Cut-Offs ("LICO") for communities of 500,000 or more; and,
- Customers were occupants of a single/semi-detached, town/row house or low-rise multi-family housing (three stories or less, as defined by Part 9 of the Ontario Building Code).

Private Market:

- Household income was at or below 135 percent LICO OR the customer had received one of the following social benefits in the last twelve months prior to participation:
 - o National Child Benefit²⁴
 - o Allowance for Survivors
 - o Guaranteed Income Supplement
 - o Allowance for Seniors
 - o Ontario Works
 - o Ontario Disability Support Program; or
 - o Low-income Energy Assistance Program Emergency Financial Assistant Grant.

AND,

- Customer was an occupant of a single/semi-detached, town/row house; and,
- Customer was a private homeowner or tenant who paid their own gas bills.

In 2016 Union expanded the geographic reach of the HWP offering into smaller Northern communities, to include: Muskoka, Whitefish, Elliott Lake, Val Therese, South River, Azilda, Ingersoll, Walkerton, Hanover, Wingham and Dunnville. Union also continued to broaden participation in the communities that are currently served by the offering, such as: Sudbury,

²⁴ The National Child Benefit was repealed July 2016. It is no longer included in income qualification criteria.

Thunder Bay, North Bay, Belleville and Cobourg in the North and Cambridge, Hamilton, Waterloo, Windsor, London, Grey Bruce County, Huron County, Sarnia and St. Thomas.

Market Incentive

The HWP offering was delivered at no cost to the customer, including energy assessments, all recommended thermal envelope upgrades, basic prescriptive measures, carbon monoxide detectors, individualized energy conservation education, and health and safety work. The health and safety incentive varied by home and depended on the expected cost-effectiveness of the home.

Market Delivery

HWP relied on experienced and reliable delivery agents to provide a turnkey solution - from energy assessments to measure installation and calculation of savings. In 2016, delivery agents of the HWP offering were Ecofitt and EnviroCentre.

To maximize uptake of HWP, Union approached the social and assisted housing market and private market uniquely.

Social and Assisted Housing Market Delivery

A primary focus in previous years was building awareness of the offering in this segment and establishing delivery channels. In 2016, Union continued to approach the social and assisted housing market through a direct sales approach executed by Union's account managers targeting housing providers directly backed by association and organization partnerships.

Union developed and continued to foster partnerships with key associations and organizations including, but not limited to: the Ontario Non-Profit Housing Association, the Ontario Municipal Social Services Association, and the Institute of Housing Management. Through these relationships, Union gained key housing provider contacts and insights that account managers were able to use in their outreach efforts.

Private Market Delivery

In 2016, Union shifted focus to educate and encourage participation in the private market. Several tools were used to further this goal, including traditional and new media marketing, partnerships and community outreach, and the Union Gas customer contact centre.

Traditional Marketing

- To create awareness and demand within the private market, an aggressive mass media campaign on TV, radio and through digital platforms was launched in August 2016. This was the first time such an expansive and multi-dimensional campaign was used in the private market. Nearly 73 percent of the annual leads originating from Union's website were generated post campaign, demonstrating the effectiveness of this strategy.

Several mass marketing campaigns were also launched to attract new customers, including:

- Direct mail advertising and advertorials in community newspapers - these efforts have proven successful in generating customer interest in the past and were increased in 2016.
- Advertising was placed in libraries, via posters and bookmarks.
- Advertising was displayed on televisions in Tim Horton's stores and drive-thrus.
- Bill inserts (Figure 6.0) were piloted in 2 cities, Thunder Bay and Hamilton, to assess the ability to effectively reach low-income customers without creating confusion and unintended traffic from non-low-income customers. This proved to be a successful communication tool and will be continued in 2017.



Figure 6.0 - 2016 Bill Insert

- New Media Marketing
 - o Search Engine Marketing was used to target customers looking for information about energy conservation programs through Google search. When users searched key phrases, such as “weatherization program Ontario”, HWP was promoted by increasing the visibility in search engine results.
 - o Online digital display advertising was launched on the Weather Network as well as Postmedia and Metroland Media platforms that deliver advertising on local news, shopping, lifestyle, and entertainment websites. These digital advertisements (Figure 6.1) were strategically placed to target the low-income private customer market segment and generate internet traffic to the HWP webpage.



Figure 6.1 - Digital Display Advertising

- Union’s HWP webpage
Union’s HWP offering webpage²⁵ gave private homeowners, renters and social housing providers the ability to explore the benefits of the offering, obtain information on eligibility criteria and to apply. The webpage was updated to provide an improved user experience; adding customer testimonials, FAQ’s and yet another option to apply - to download the income qualification documents and email them directly to [‘weatherization@uniongas.com’](mailto:weatherization@uniongas.com). This complimented the online application tool and the information on how to apply by phone.

²⁵uniongas.com/weatherization

- Partnerships and Community Outreach

Union worked with several organizations in its franchise area to promote and deliver HWP to low-income customers.

- o United Way

In 2016, Union entered into an agreement with United Way Simcoe Muskoka to provide referrals for HWP. United Way Simcoe Muskoka is the lead intake agency for all Hydro One Low-Income Energy Assistance Program Grants. The objective of the program was to screen Union customers applying for a the grant for HWP eligibility.

- o United Way Sudbury Tax Clinic

Union sponsored a tax clinic hosted by the United Way of Sudbury, where low-income community members received help in filing free Canadian income tax returns. Marketing materials, volunteers and a representative from the delivery agent were on hand to promote the offering during the clinic. Having this presence was an efficient way to address the barrier of gathering the necessary income eligibility documentation as well as targeting the low-income customer segment.

- o Emerge Guelph

In 2016, Union continued a second year of partnership with Emerge Guelph. Emerge Guelph is a social and environmental organization that connects citizens to innovative solutions that maximize resource efficiency and community wellbeing. Home owners sign up for a free one-hour consultation where they are led through a structured interview about their home that identifies and recommends efficient retrofits and behavioural changes that save money and improve home comfort. As part of the process, the home is screened for HWP eligibility, and qualified applicant information is automatically forwarded to the delivery agent servicing the Guelph area.

- o Community Outreach

A new pilot outreach strategy was developed to engage customers one-on-one at community-based events. The goal was to increase participation in HWP and

provide the delivery agent with completed applications ready for an initial assessment. GreenBrain, a marketing company, was hired to attend three street festivals in Hamilton over the summer months in 2016. The community-based outreach program was successful in providing a local presence as well as engaging and educating the community about HWP. While there were interested customers at these events, there was a lower than anticipated number of applicants that were both home and income eligible.

- **Union Gas Customer Contact Centre**
Union's customer contact centre has daily contact with low-income customers in need of assistance with their bills. To increase awareness and encourage participation in the program, customer service representatives are trained to promote HWP to callers identified to have a high propensity to be home and income eligible. Interested customers are transferred to the appropriate delivery agent or provided with a phone number to call the delivery agent at a later time. Alternatively, representatives inform customers about the online application tools available.

6.1.2 *Furnace End-of-Life Upgrade Offering*

The furnace end-of-life upgrade offering is another offering counted towards the single family metric on the low-income scorecard. The offering provides social and assisted housing providers and private market customers with an incentive to upgrade to a 95 percent or greater AFUE rating furnace when their existing furnace reaches end-of-life and is being replaced.

Target Market

In 2016, the furnace end-of-Life upgrade offering targeted social and assisted housing providers with tenants that met the following eligibility criteria:

- A household income at or below 135 percent of the most recent Statistics Canada Pre-Tax LICO for communities of 500,000 or more (income eligibility was confirmed by the housing provider); and,
- An occupant of either a:
 - o Single family detached home, semi-detached home, row home or town home

OR

- o Part 9 building (as defined by Part 9 of the Ontario Building Code).

Market Incentive

Social and assisted housing providers were provided with an incentive amount equal to approximately half of the incremental cost of upgrading to a 95% or greater AFUE rating furnace as indicated in the Technical Reference Manual substantiation document. In 2016, this amounted to \$275.

Market Delivery

The furnace end-of-life upgrade offering was included in delivery efforts aimed at the social and assisted housing market through HWP. See *Market Delivery* under [section 6.1.1](#) for more information.

6.1.3 *Indigenous Offering*

The final single family offering on the low-income scorecard is the Indigenous offering. It combines the home weatherization and furnace end-of-life offerings and will be delivered within Indigenous communities. Eligible customers will receive free weatherization upgrades and natural gas energy efficiency measures installed by a delivery agent as well as a financial incentive to upgrade their existing furnace to an energy efficient furnace when it needs to be replaced. Through this offering, customers will also benefit from direct installation of an energy saving kit/basic measures and supplied with a carbon monoxide detector.

In 2016, Union focused on securing a First Nations delivery agent that has experience working with Indigenous communities. This will be critical to building customer trust and generating awareness and participation based on the unique culture and characteristics of this customer group. The RFP process was completed in mid-December 2016. After evaluating bids from five vendors, the contract was awarded to First Nations Engineering Services Ltd.

Target Market

The Indigenous offering detailed and approved as part of Union's 2015 – 2020 DSM Plan (EB-2015-0029) stated a target market of 13 Indigenous communities reserves with residential

gas service in Union's franchise area. Union revised the scope of work to include all 16 locations within its franchise area as of 2016. Union will continue to assess the potential target market for this offering as new communities begin to be serviced by Union with natural gas.

Market Incentive

The Indigenous offering will adopt the incentive structure for HWP ([section 6.1.1](#)) and furnace end-of-life upgrade offering ([section 6.1.2](#)).

Market Delivery

Union will leverage existing Band Council relationships and the expertise of the delivery agent, First Nations Engineering Services, to form a promotion and delivery approach that ensures maximum buy-in and take-up of the Indigenous offering.

6.1.4 *Multi-Family Offering*

There are two multi-family metrics on the low-income scorecard: social and assisted multi-family and market rate multi-family. These metrics represent the markets serviced by the multi-family offering. The Multi-family offering provides social and assisted housing and low-income market rate multi-family customers with incentives for a variety of energy efficiency measures, energy assessments and education. In recognition of the limited capital available for upgrades in social housing and to encourage housing managers to invest wisely in their housing stock, Union offers enhanced incentives to implement any measures available to commercial multi-family customers in the CI prescriptive offering, including prescriptive measures and custom projects.

Target Market

The multi-family offering targets two markets: social and assisted housing and low-income market-rate multi-family.

Social and Assisted Housing

Social and assisted housing is housing developed, acquired or operated under a federal, provincial or municipally funded program. To be eligible, providers must operate Part three

buildings with tenants who have a household income at or below 135 percent of the most recent Statistics Canada Pre-Tax LICO for communities of 500,000 or more. Income eligibility was confirmed by the housing provider.

Examples of social and assisted housing are:

- Non-profit corporations as outlined in the Social Housing Reform Act, 2000
- Public housing corporations owned by municipalities directly or through Local Housing Corporations
- Non-profit housing co-operatives as defined in the Co-operative Corporations Act, 1990; and,
- Non-profit housing corporations that manage or own rural and native residential housing.

Union has established strong relationships with 27 municipal social housing providers in its franchise area and assists them in proactively planning their energy efficiency upgrades. The majority of these 27 municipal housing providers have participated in the offering over the past five years. In 2016, Union continued to increase its focus on the 400+ smaller housing providers, including non-profit housing providers, low-income co-operative housing providers and faith- and ethnic-based providers.

Low-Income Market-Rate Multi-Family

Low-income market rate housing consists of privately owned, multi-family, Part Three buildings that have a high propensity of low-income tenants as determined by building location and average rents of the building. To be eligible:

1. The building must be located in a low-income neighbourhood according to one of the following data sources:
 - The forward sortation area (i.e. the first three digits of a postal code) has a 70percent or greater likelihood of being low-income, as determined by data sourced from Statistics Canada LICO information
 - Census tract data shows there is a 40percent or greater likelihood of being low-income, as determined by data sourced from Statistics Canada Low-income Measure
 - A poverty or other neighbourhood report indicating that it is low-income

- A high percentage of Ontario Works recipients, as determined by data sourced from Municipal Ontario Works recipient postal code maps; or,
- Any neighbourhood or building identification method as agreed upon through consultation with low-income stakeholders.

AND,

2. Average rents of the building must be at or below the average market rent for that municipality based on one of the following:
 - Rent roll review, demonstrating average rent levels
 - Existence of Rent Geared to Income or rent supplement contract(s) with the designated Service Manager Office; or,
 - The building has participated in Ontario Renovates or Canadian Housing and Mortgage Corporation's Residential Rehabilitation Assistance Program in the last five years.

Market Incentive

Through the offering, multi-family customers could receive enhanced incentives for energy efficient upgrades, conducting a building assessment, and basic hot water conservation in suite-measures as well as benefit from education initiatives.

Enhanced incentives encourage energy efficient upgrades by addressing the capital barriers that face this customer group. Eligible upgrades include:

- Prescriptive measures such as condensing boilers, condensing make up air units, and gas water heaters; all measures offered to the multi-family segment within the standard CI prescriptive offering; and,
- Custom projects such as building envelope improvements and controls.

Prescriptive measures and custom projects – customers could receive \$0.10 per cumulative m³ saved up to 50 percent of the fully installed project cost.

Building / Energy Assessments – Housing providers could receive up to \$5,000 per building (to a maximum of \$25,000 per housing entity for the year) for conducting building / energy assessments. These assessments identify and recommend high-efficiency space heating,

water heating and envelope upgrade opportunities that will generate energy savings at the site.

Basic Measures - Eligible multi-unit properties could receive installation of up to two energy efficient showerheads with kitchen and bath aerators left behind for free.

Education - building operators and tenants were educated about their building's energy usage and ways to increase energy efficiency at no cost.

Market Delivery

Consistent with Union's single family offering, direct sales and association and organization partnership channels have been found to be the most successful and cost effective means to reach these customer segments and address barriers for participation.

Direct Sales

Union's account managers met directly with housing providers and building owners to assess the energy needs of their buildings, provide support in developing multi-year energy conservation plans and to present Union's suite of offerings. A sales package, or sell sheet, was used as a discussion tool to communicate the incentives and benefits of the offering (Figure 6.2).

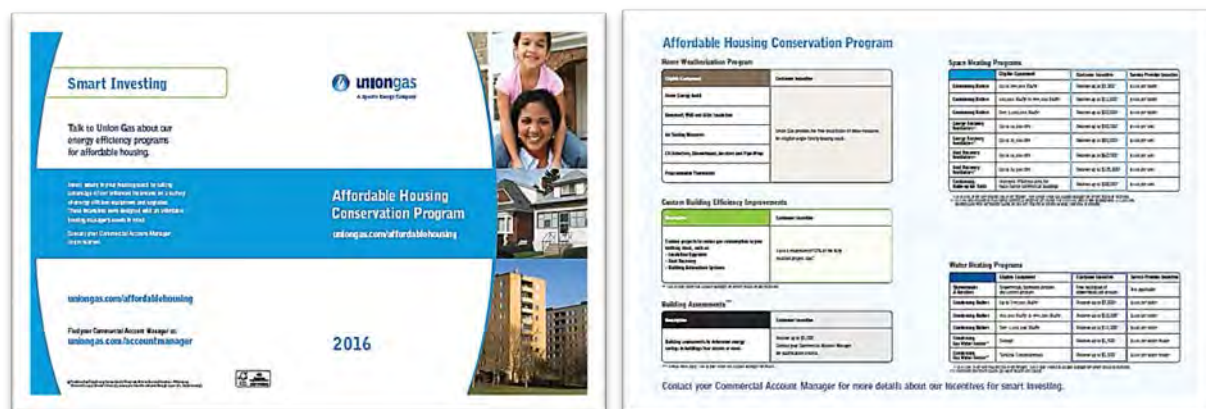


Figure 6.2 - Sales Package for Social and Assisted Housing Providers

For the social and assisted housing market, Union continued targeting key influencers in municipalities and district social services administration boards. Building and leveraging relationships with consolidated municipal service managers also remained a focus in 2016. These service managers administer the distribution of subsidies and technical services to all social housing providers in a given municipality, including municipal, non-profit and co-operative housing organizations. This relationship provides valuable insights into the social housing market structure, funding models, building condition assessments and decision making processes associated with the different types of housing while allowing Union to promote participation in the multi-family offering.

Association and Organization Partnerships

To support the direct sales efforts, Union leveraged the same housing and social service associations from the HWP offering as well as the Housing Services Corporation (“HSC”), the Federation of Rental Housing Providers of Ontario, and Municipal Property Management Associations.

Union engaged in specific partnership opportunities with Ontario Non-Profit Housing Association (“ONPHA”) and HSC to connect with housing provider, building owner and property managers’ contacts and increase exposure to the offering.

- **Partnership with the ONPHA**
Union has found that this partnership is an effective means of educating social and assisted housing providers on the cost benefits of Union’s multi-family offering and driving participation from members. Union sponsored regional meetings in London, Windsor, Sudbury, Hamilton, Kingston, Kitchener and Thunder Bay; participated in the 2016 ONPHA tradeshow in Toronto; continued to advertise in the ONPHA bi-monthly newsletter Quick Connections; and, posted program information on a section of the ONPHA website dedicated to funding opportunities.
- **Partnership with HSC**
Union has a long-standing partnership with HSC, a non-profit organization that delivers province-wide programs to Ontario’s affordable housing sector. In 2016, Union was a key sponsor for the Measuring Matters Conference for the third year in a row. This conference provided practical energy efficiency solutions for social housing providers. Real-life case studies were used to illustrate how to reduce natural gas consumption

by understanding and integrating energy benchmarking data, overcoming technical and organizational challenges, and maximizing human and financial resources. These case studies included past DSM participants who discussed how their organization had benefitted from Union's multi-family offering and achieved significant natural gas savings in several multi-family buildings.

6.1.5 *Education and Awareness*

Educational and awareness initiatives are the foundation of all low-income program offerings, included in market delivery efforts and are always provided at no cost to customers.

In 2016, the mass media campaign allowed Union to reach new customers, both single family and multi-family, to increase awareness of energy conservation and promote participation in DSM program offerings.

For multi-family building owners and housing providers, materials were provided to distribute to tenants to increase their understanding and impact of energy use in their building. Housing providers were also eligible for free enrollment in a benchmarking tool that provides active monitoring and reporting for two subsequent years. This tool increases housing providers' awareness of energy measurement and management and can assist them in identifying areas of improvement.

Organization partnerships have provided the opportunity to participate in special educational forums. In 2016, Union continued to be a participant in the Community Champions Workshop, delivered by HSC. A total of seven workshops were conducted in multiple communities including: Simcoe, Thunder Bay and Cochrane District Social Services Administration Board. HSC's Community Champion Program supports the development of healthy, sustainable communities within Ontario's social housing sector by educating, engaging and supporting staff and residents in conservation activities. Training sessions addressed a variety of topics, including reducing energy and water consumption and minimizing waste.

6.1.6 *Lessons Learned*

HWP Offering

- **Community Outreach**
Feedback from the community outreach sessions conducted by GreenBrain revealed that there was confusion over income criteria and documentation required to participate in the program. Union is refining the process with its delivery agents to provide additional follow-up and assistance in completing applications.
- **Mass Media Campaign**
The mass media campaign was successful in generating awareness of HWP. To maximize results, the campaign needs to be launched earlier in the year, possibly in the first quarter, to help generate sufficient leads and target channels with high viewership.
- **Improvements in the Application Package**
In assessing why some customers elected not to continue with or complete participation in HWP, a couple of potential improvements were identified regarding the application package. First, prospective customers pointed out the value in highlighting the workmanship and material guarantee from the contractors on the HWP consent form. Second, application packages should be modified to include better samples of income criteria documentation and clearer instructions on redacting sensitive information to reduce customers' privacy apprehension. Union has made these modifications in 2017.

Furnace End-of-Life Upgrade Offering

- **Furnace end-of-life upgrade offering was launched**
The furnace end-of-life upgrade offering was launched in September 2016 to the social housing market. By the end of the year, Union was able to incent 30 furnace upgrades and expects participation to grow significantly by the end of 2017 as awareness increases through additional marketing and promotion initiatives as well as cross-promotional opportunities with the other offerings. This offering provides a new opportunity to help customers reduce their natural gas consumption in a finite market, and contributes to a well-rounded and comprehensive incentive program for the low-income market.

Multi-Family Offering

- **Overlapping programs**

New funding programs from the provincial government add an extra layer of complexity in delivering DSM programs. It is important that Union remains apprised of competing or complimentary funding sources available to customers to ensure attribution agreements are made, where required, or that application processes include consideration of stacking incentives. Union's multi-family offerings, in conjunction with provincially funded energy conservation programs, provide considerable opportunities to improve energy efficiencies and reduce greenhouse gas emissions in many of the province's large social housing buildings.

- **Basic Measure Installation**

Union has provided free installation of showerheads to eligible multi-family housing properties for several years. Review of these measures has concluded that they are no longer financially viable and the market is greatly saturated. For these reasons, Union has decided to discontinue this element/incentive at the end of 2016.

Significant natural gas savings were achieved in both the single family and multi-family low-income markets in 2016. While municipal social housing entities comprised the majority of participation in the multi-family offering, the non-profit and co-operative segment of the market continues to grow.

The Low-income program is well positioned heading into 2017 to build on past successes while expanding into new markets and exploring new offerings. The HWP offering, furnace end-of-life upgrade offering, and multi-family offerings (social and assisted housing as well as low-income market-rate) will continue throughout the 2016-2020 timeframe of this framework. The Indigenous offering will launch in 2017.

7. Large Volume Scorecard (Rate T2/Rate 100)

The large volume program is a resource acquisition program targeted towards Union's largest natural gas users with very high natural gas consumption. The delivery model for the large volume program differs from other resource acquisition programs and, as such, is measured on a dedicated large volume scorecard.

According to Union's Board approved 2015-2020 DSM Plan (EB-2015-0029), Rate T1 has been moved into the CI program on the resource acquisition scorecard in 2016 rather than remain part of the large volume program, where it has been since 2012. This change reflects the significant differences between Rate T1 and Rate T2 in terms of daily contracted demand and annual consumption as well as the fact that DSM program offerings for Rate T1 customers have been consistent with the CI custom offering on the resource acquisition scorecard since 2012.

The 2016 large volume scorecard consists of cumulative m³ natural gas saved from customers within Rate T2 and Rate 100.

Table 7.0 presents the results of the large volume scorecard. In 2016, Union achieved below the threshold that earns a DSM Shareholder Incentive on this scorecard.

Table 7.0 - 2016 Large Volume Rate T2/Rate 100 Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Cumulative Natural Gas Savings (m ³)	668,168,041	890,890,721	1,336,336,082	100%	79,848,302	9%	9%
Total Scorecard Target Achieved							9%
Scorecard Utility Incentive Achieved							\$0

7.1 Large Volume Program

As part of the 2015-2020 DSM Plan Decision, the Board directed Union to continue its large volume self-direct program offering rather than adopt a program focused solely on technical support and training. In response, Union has extended the large volume program by continuing the Large Volume Direct Access ("DA") offering into 2016, with a similar structure from previous years.

The large volume program has a single offering – the DA offering. Results for the large volume program are shown in Table 7.1. Table 7.2 breaks down the total program spend into its components and Table 7.3 shows the large volume program's TRC-Plus ratio.

Table 7.1 - 2016 Large Volume Program Results

Program	Offering	Units	Annual Natural Gas Savings (m ³)	Cumulative Natural Gas Savings (m ³)	Total Spend	Net TRC-Plus	TRC-Plus Ratio
Large Volume	Direct Access Offering	71	6,772,053	79,848,302	\$2,989,176	\$ 13,142,160	5.20
Large Volume Program Total		71	6,772,053	79,848,302	\$2,989,176	\$ 13,142,160	5.20

Table 7.2 - 2016 Large Volume Program Spend

Item	Total
Incentives	\$ 2,441,233
Administration	\$ 509,939
Evaluation	\$ 37,682
Promotion	\$ 322
Total Large Volume Program Spend	\$ 2,989,176

Table 7.3 - 2016 Large Volume Program Cost-Effectiveness

	TRC-Plus Benefits (a)	TRC Costs (b)	Net TRC-Plus (c)=(a-b)	TRC-Plus Ratio (d)=(a/b)
Measures	\$ 16,272,683	\$ 2,582,579	\$ 13,690,103	6.30
Administration		\$ 509,939		
Evaluation		\$ 37,682		
Promotion		\$ 322		
Large Volume Program Total	\$ 16,272,683	\$ 3,130,522	\$ 13,142,160	5.20

7.1.1 Large Volume Direct Access (“DA”) Program Offering

To better address the unique characteristics of large volume customers, generate broad customer participation, and encourage these customers to pursue all cost-effective conservation, Union uses a self-directed funding model. The direct access budget mechanism grants each customer direct access to the incentive budget they pay in rates. Under this model, customers know exactly how much funding they have available each program year. This ensures they can appropriately plan their expenditures to reduce energy usage in their facility.

Customers are required to submit an Energy Efficiency Plan (“EEP”), authored with the assistance of Union’s energy experts. The EEP serves as a roadmap allowing customers and Union to actively work together, driving energy efficiency projects at customers’ operations, sites and facilities. Projects identified on the EEP are earmarked for funding.

If a customer elects not to submit an EEP or if the direct access budget funds are not fully earmarked or used by a certain date, the funds are dispersed via an aggregated pool approach. Funds transferred to create the Large Volume Aggregate Pool are used to fund energy efficiency projects for all Rate T2 and Rate 100 customers.

This ‘use it or lose it’ approach ensures each customer has first access to the amount of incentive budget funded by their rates, which minimizes cross-subsidization.

Target Market

The DA offering is exclusive to large volume firm service contract customers that are either Rate T2 (Union South) or Rate 100 (Union North).

Large volume customers are those with very high natural gas consumption and include large volume industrial operations, power generators, chemical plants, and petroleum refineries.

Market Incentive

The large volume market is heterogeneous, with most projects tied directly to unique processes or technology requirements. Accordingly, all large volume projects are custom.

Table 7.4 shows the incentive guidelines for the 2016 large volume DA offering.

Table 7.4 - 2016 Large Volume Direct Access Offering Incentive Guidelines

Offer	Incentive
Engineering Feasibility Study	50% of the cost, up to \$10,000
Process Improvement Study	66% of the cost, up to \$20,000
Steam Trap Survey	50% of the cost, up to \$6,000
Meters	50% of the cost, up to \$3,500 per meter
Customer Education	Provided by or funded by Union Gas
New and Retrofit Equipment, Process Improvement & Operational Improvement	
Direct Access Budget	\$0.10 per annual m ³ saved, up to \$100,000*
Aggregate Pool Funded	\$0.05 per annual m ³ saved, up to \$40,000*

*Incentive cannot exceed 50% of project cost

Engineering Feasibility Studies

Engineering feasibility studies include an analysis of natural gas equipment as well as electricity, compressed air, water and wastewater. These feasibility studies help customers formulate a priority list of energy efficiency projects geared to site-specific energy plans and budgets. As required, Union also assists the customer's technical staff in generating business cases to enable the customer to secure corporate capital funding for energy efficient equipment and/or process changes.

Process Improvement Studies

Union provided customer incentives for conducting detailed engineering analyses and designing specific process equipment or operational improvements identified with or without a general plant assessment. This included performance testing and analyses of industrial boilers, total steam plants, thermal fluid heaters, vaporizers, furnaces and special process equipment. Testing identifies and quantifies energy saving opportunities, cost saving opportunities, and implementation costs as well as related environmental benefits.

Steam Trap Surveys

Steam trap surveys conducted by qualified service companies can identify losses from steam distribution systems. Each survey identifies leaking, over-sized or under-sized, blocked and/or flooded traps, as well as possible performance improvements in condensate return systems.

Meters

Incentives were offered for customers to install a natural gas, steam or hot water meter to measure and monitor energy usage. This allows customers to better manage the energy intensity of their operations and identify energy-efficiency improvements.

Customer Education

Union provided education, training and technical expertise to increase awareness of energy efficiency opportunities and benefits.

New Equipment, Process Improvement and Operational Improvements

Union's role in promoting and implementing energy efficient options continued to help companies control energy costs and remain competitive in today's global economy. With the continual focus on cost reduction, many industrials lack the resources required to analyze potential energy saving opportunities. Union helps fill this gap with its reliable and knowledgeable Project Managers in conjunction with incentives designed to influence equipment choices.

Retrofit Equipment

Union worked with customers to identify and incent retrofit custom projects that the customer would not have otherwise completed. Projects are related to the repair, replacement, or optimization of an existing piece of equipment or system.

Market Delivery

All CI custom offerings, including those targeted to large volume customers, are jointly delivered through a direct sales approach by Union's account managers and Project Managers since these projects require in-depth knowledge of individual business facilities and customer energy needs.

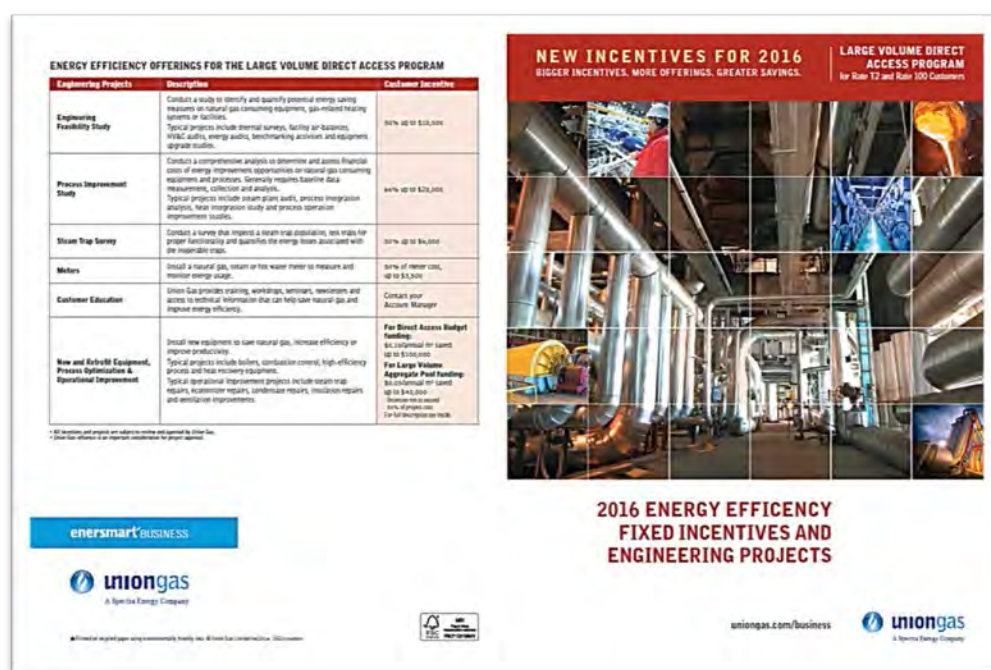
Account managers work with customers to identify opportunities and gather customer and site specific information, which are critical inputs into the assessment of project savings estimates.

The Project Managers (who are all engineers with a Professional Engineering designation in Ontario) work with the account managers as well as third party engineers, equipment

manufacturers and service providers, as necessary, to complete the custom applications.

Union's experienced Project Managers effectively become energy conservation and/or technology subject matter experts with respect to the customer businesses, support these customers in identifying best-practice energy conservation solutions to meet their needs, and assist them throughout the project implementation process.

The DA offering also used similar marketing tools and strategies as the CI program. An EnerSmart sell sheet specific to large volume customers and the large volume direct access offering is just one tool used to promote the offering (Figure 7.0).



The brochure is titled "ENERGY EFFICIENCY OFFERINGS FOR THE LARGE VOLUME DIRECT ACCESS PROGRAM" and "NEW INCENTIVES FOR 2016". It features a table of offerings and a collage of industrial images.

Engineering Projects	Description	Customer Incentive
Engineering Feasibility Study	Conduct a study to identify and quantify potential energy saving measures on natural gas consuming equipment, gas-related heating systems or facilities. Typical projects include thermal surveys, factory air balances, HVAC audits, energy audits, benchmarking activities and equipment upgrade studies.	50% up to \$10,000
Process Improvement Study	Conduct a comprehensive analysis to determine and assess financial costs of energy improvements, opportunities on natural gas consuming equipment and processes. Generally requires baseline data measurements, collection and analysis. Typical projects include steam plant audits, process integration analysis, flare integration study and process operation improvement studies.	50% up to \$20,000
Steam Trap Survey	Conduct a survey that inspects a steam trap population, test traps for proper functionality and quantifies the energy losses associated with the inoperable traps.	50% up to \$4,000
Motors	Inspect a natural gas, steam or hot water motor to measure and monitor energy usage.	50% of motor cost, up to \$3,000
Customer Education	Union Gas provides training, workshops, seminars, newsletters and access to technical information that can help save natural gas and improve energy efficiency.	Contact your Account Manager
New and Retrofit Equipment, Process Optimization & Operational Improvement	Install new equipment to save natural gas, increase efficiency or improve productivity. Typical projects include boilers, combustion control, high-efficiency process and heat recovery equipment. Typical operational improvement projects include steam trap repairs, compressor repairs, condenser repairs, insulation repairs and venturi repairs.	For Direct Access Budget Funding: \$5,000 annual for spent up to \$100,000 For Large Volume Aggregate Pool Funding: \$5,000 annual for spent up to \$400,000 Maximum pool amount: \$2M, 4/1/2018 only For full description see table.

2016 ENERGY EFFICIENCY FIXED INCENTIVES AND ENGINEERING PROJECTS

uniongas.com/business

 **uniongas**
A Spectra Energy Company

Figure 7.0 - EnerSmart Large Volume Brochure

All custom projects undergo an internal project review for Quality Assurance/Quality Control ("QA/QC") conducted by engineers within Union's Commercial/Industrial Energy Efficiency Programs team. Refer to *Internal QA/QC* under section 5.2.3 for further details.

7.1.1 Education and Awareness

To coordinate efforts and optimize program spending, education and awareness activities for the CI program extend to large volume customers with topics and information tailored to this customer group. This includes use of the EnerSmart website, a GasWorks newsletter, EnerCase reports, workshops, and participation in independent professional development groups, trade organizations, and government workshops. Refer to [section 5.2.4 Education and Awareness](#) for further details.

7.1.2 Lessons Learned

- **DA Offering Observations**

The following outlines some key observations of the DA offering in 2016:

- o 97 percent of Rate T2/Rate 100 customers (35 out of 36) participated by submitting energy efficiency plans
- o 61 percent of Rate T2/Rate 100 customers (22 out of 36) submitted energy efficiency plans and completed at least one project
- o 44 percent of Rate T2/Rate 100 customers (16 out of 36) used all of their budget
- o 42 percent of Rate T2/Rate 100 customers (15 out of 36) received additional funding from the Aggregate Pool; and
- o Approximately 25 percent of the total Rate T2/Rate 100 program savings were funded by the Aggregate Pool.

- **EEP Template Modification**

Extending Union's focus on continuous improvement in custom project documentation, modifications were also made to the EEP template. Union wanted to more clearly demonstrate involvement and influence on projects as well as prior support and expertise provided to facilitate the implementation of a project. These influence types include such activities as studies, meters, participation on Energy Teams, training and past incentives. Projects marked as "No Influence" were not eligible for incentives through the large volume direct access offering.

- **Decrease in Natural Gas Savings Achieved**

Union's 2016 large volume cumulative natural gas savings achievement was smaller relative to the prior three years. This can be attributed to a few main drivers, including: changes in the contracts of the power producers from base load to peaking plants, lack of funding for capital projects due to economic constraints, and modifying the eligibility requirements for routine maintenance projects in 2016.

The Large Volume Direct Access Program offering assisted Union's largest volume customers in reducing gas consumption in their facilities by installing or upgrading energy efficiency equipment and implementing process improvements. This program will continue to be offered to Union's large volume customers (Rate T2 and Rate 100) in 2017.

8. Market Transformation Scorecard

Market transformation programs are intended to create a lasting change in market behavior by removing barriers and accelerating the adoption of specific energy efficiency technologies or concepts to the point that they become standard practice. They are designed to make a permanent change in the market place over a long period of time.

Union's market transformation program is captured on a distinct market transformation scorecard. Table 8.0 presents the results of the market transformation scorecard. While Union was able achieve the 100 percent target for Optimum Home, the new CSBD offering was not launched early enough in the year to meet the Board-set targets. This resulted in Union only achieving 50 percent of the overall weighted scorecard, which does not meet the threshold to earn DSM Shareholder Incentive.

Table 8.0 - 2016 Market Transformation Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Optimum Home: Homes Built (>20% above OBC 2012) by Participating Builders	53%	70%	100%	50%	70.09%	100%	50%
Commercial New Construction: New Developments Enrolled by Participating Builders	6	8	12	50%	0	0%	0%
Total Scorecard Target Achieved							50%
Scorecard Utility Incentive Achieved							\$0

8.1 Market Transformation Program

In Union's 2015–2020 DSM Plan (EB-2015-0029), Optimum Home was the sole market transformation offering and was intended to conclude at the end of 2016 until the timing and efficiency requirements of the pending 2017 Ontario Building Code ("OBC") were clearly

known. The Board, in its Decision,²⁶ approved the Optimum Home offering as proposed in 2016; while also finding that the offering should continue from 2017 to 2020.

Additionally, the Board directed Union to establish a new market transformation offering, similar to Enbridge's Commercial Savings By Design ("CSBD"), targeting the commercial and industrial new construction market.

The resulting 2016 market transformation scorecard consists of two metrics:

1. The Optimum Home Metric measures the percentage of homes built by enrolled builders to a 20% higher energy efficiency standard than the 2012 OBC in relation to the total number of homes built in 2016 by builders who remain enrolled in the program. Only homes that have an activated gas service are included in this metric
2. The CSBD Metric sets a targeted number of participants to enroll in the offering.

Table 8.1 breaks down the total spend for the market transformation program into its components.

Table 8.1 - 2016 Market Transformation Program Spend

Item	Total
Incentives	\$ 167,641
Administration	\$ 302,149
Evaluation	\$ 7,933
Program Costs	\$ 526,970
Total Market Transformation Spend	\$ 1,004,693

8.1.1 Optimum Home Offering

The Optimum Home offering addresses barriers to the wider adoption of high efficiency homes in residential new construction; avoiding lost opportunities and setting the stage for long-term energy savings in the residential market. Optimum Home examines all aspects of the builder's business in an attempt to create fundamental change toward energy efficient building practices using a whole-home approach.

²⁶ Decision and Order on 2015-2020 DSM Plans (EB-2015-0029 / EB-2015-0049), January 20, 2016

Envisioned to run from 2012-2016, the first three years of the Optimum Home offering focused on recruiting participants from the fifty largest builders in Union's franchise area and teaching them, through a three phase consulting process, to build homes to the Optimum Home standard (the "OH standard"), which is at least 20 percent above 2012 OBC. The last years of the offering concentrated on supporting enrolled builders in completing the three phases and increasing both the demand and the market penetration of homes that are built to the OH standard.

Participating builders entered into a multi-year, three phase consulting process partnering them with leading building science experts who provide cutting edge advice on how to build residential homes to the OH standard as well as integrate these new best practices and designs into their daily business functions and new housing starts. The consulting process is comprehensive, tailored to each builder's individual needs and considers every aspect of their business including marketing, sales, contracts, construction, services and trades. In doing so, the offering works to identify and address barriers to energy efficient construction, develop capacity within builder organizations to build to this higher efficiency and to help builders realize cost efficiencies to reduce incremental costs of building to the higher efficiency standard.

Between 2012 and 2014 twenty-two of the top fifty builders in Union's franchise area were successfully enrolled into the offering. By the end of 2015, nineteen builders had completed Phases Two and Three. In concluding the original version of Optimum Home in 2016, all builders have now successfully completed all of the offering's phases and Union met its 2016 target of having 70 percent of all homes built by participating builders constructed to 20 percent above 2012 OBC.

The Optimum Home phases are:²⁷

Phase	Activities
Phase One: Discovery	- Builders are paired with a building science expert to begin the consultative process along with a cross-functional team from the builder's organization. - An on-site assessment and analysis establishes a baseline by benchmarking current construction and business practices. - New technologies, building practices and other options are assessed and extensively modelled using NRCan's HOT2000 software. This produces a new Builder Option Package; a customized handbook of building specifications to achieve the OH standard. - At least one prototype home (Discovery Home) is built and must be verified to achieve the OH standard, as determined by a third-party Certified Energy Advisor.
Phase Two: Production	- The design team tests the Builder Option package, identifies efficiencies in the builder's internal business processes, examines lessons learned, and establishes training requirements. - High performance housing stock is being built and verified to the OH standard.
Phase Three: Transformation	- A sustainability plan is developed to maintain momentum of building to the new level of efficiency. - A wrap up session is held to discuss program accomplishments, lessons learned and to identify and address any remaining internal barriers to incorporating the OH standard across the majority of the builder's housing starts. - The builder is encouraged to embrace the new philosophy into company culture and to fully implement and expand rollout of the OH specifications.
Incremental Engagement (after Phase 3 is complete)	Incremental consulting support was available in 2015 and 2016 to support: - Working through unanticipated technical and quality issues resulting from the increased tightness of the home or use of new and previously untested energy efficient technologies/building materials; - Conducting production related trades training; - Next Generation planning; and, - Sales and marketing support in "selling" higher efficiency homes. While sales support was available throughout the phases, many builders were initially more focused on learning to build higher efficiency homes. Once this was accomplished, there was a need to shift attention to selling them.

²⁷ Up to 30 Consultant days are available to each builder over the three phases of the program.

Target Market

Optimum Home targets stakeholders who influence the market and drive demand for high performance homes, including:

- **Participating builders**
The primary target market is the 22 existing Optimum Home participants enrolled throughout 2012-2014; who are among the fifty largest builders in Union's franchise area based on the previous year's housing starts at time of enrollment.
- **Consumers / new home buyers**
In order for builders to fully embrace the program and build a significant number of housing starts to the OH standard, home buyers need to be willing and wanting to purchase them.
- **Non-participating builders**
Union engages builders that are not participating in the Optimum Home offering, but build homes in Union's franchise area, to encourage spillover by demonstrating the success of participating builders.

Market Incentive

The builder incentive for the original three offering phases and new incremental engagement phase is outlined below in Table 8.2. The incentives come in the form of consulting services, education and training.

Table 8.2 - 2016 Optimum Incentives

Phase	Incentive
Phase One: Discovery	Up to \$30,000 value per builder
Phase Two: Production	Up to \$30,000 value per builder
Phase Three: Transformation	Up to \$15,000 value per builder
Incremental Engagement (after the completion of Phase 3)	Up to \$17,500 value per builder over the 2015-2016 period

- Union also provided an incentive of \$2,500 per builder in Phase One towards the cost of the prototype Discovery Home.

Market Delivery

Optimum Home is implemented through two main channels:

1. Supply-side. These are all activities that drive participants to successfully complete the original offering phases. The cornerstone of this approach, and the offering as a whole, is partnering enrolled builders with building science experts who provide customized, one-on-one support throughout the term of the Optimum Home commitment.

Union's residential sales team also plays a role by monitoring builder engagement, helping to troubleshoot issues as needed, and leveraging manufacturing and channel partner relationships to provide product knowledge and education.

2. Demand-side. These efforts help builders to increase their effectiveness in selling higher efficiency homes to new home buyers as well as creating demand for these new homes by creating awareness amongst new home buyers about the benefits of higher efficiency homes. It also includes broader market initiatives aimed at builder sales centres and non-participating builders to encourage the adoption of higher efficiency homes as standard market practice.

8.1.2 *Commercial/Industrial Savings by Design ("CSBD") Offering*

CSBD is a new market transformation offering added to Union's portfolio and market transformation scorecard by the Board in its 2015-2020 DSM Plan Decision. Union's CSBD offering has adopted the same structure and name as Enbridge's offering to satisfy the Board's direction to expand the geographical reach of the offering and provide consistency in the market, especially for province-wide chains, franchises and companies.

The offering encourages commercial developers and builders to design and build new construction developments to a level that is above current building code through an integrated design process ("IDP") and financial incentives. IDP follows the internationally recognized IDP principles and takes a holistic approach to high performance building design and construction. Through detailed analysis and modelling of various building elements and alternatives, such as equipment sizing and design, building envelope characteristics, and

optimization of systems, participants can achieve the offering target of building to 15% above the 2017 Ontario Building Code ("OBC") Part Three requirements.²⁸

As a completely new offering not contemplated as part of Union's 2015-2020 DSM Plan (EB-2015-0029), efforts in 2016 focused on determining an effective and appropriate offering design as well as developing a delivery strategy. Union was unable to fully launch the offering in time to achieve the Board-set target of enrolling participating builders in 2016.

Target Market

CSBD targets builders and developers of new commercial, industrial, institutional, or multi-residential buildings. Builders and developers are eligible to participate in the offering multiple times for different projects assuming the eligibility criteria are met.

Eligibility criteria include the following:

- Construction projects must have a minimum threshold of 50,000 square feet. A project is defined as either a single building or multiples of the same building by the same company, i.e. "same construction", that add up to 50,000 square feet or more.
- Building(s) must be in the design phase or earlier in the process; and,
- Building construction must be completed within five years of the IDP session, and commissioning must be completed no more than one year after that.

Market Incentive

CSBD is a multi-phase offering; beginning early in the design planning stage to post-commissioning of the site.

In committing to CSBD for a five year period, participants are eligible to receive design and performance incentives, as described below in Table 8.3, to cover the cost of the IDP and design phase as well as pre and post construction phase incentives when deliverables are met.

²⁸ 25% above the 2012 OBC for building permits dated prior to January 1, 2017.

Table 8. 3 - CBSD Incentive Structure

Project Phase	Incentive	Conditions
Planning/Design: Integrated Design Process ("IDP")	Up to \$30,000 value	Includes visioning session and report, preliminary energy model and IDP energy model, IDP session (including logistics, catering, facilitation, and design expert fees), and final IDP session report.
Energy Performance Incentive	\$15,000	Available if the pre-construction energy model meets the specified energy performance targets and the participant submits the final design stage plans and specifications.
Commissioning Incentive	\$15,000	Provided upon completion of a final as-constructed energy model that demonstrates the building meets the specified energy performance target, along with the final Commissioning Report.

Market Delivery

Union uses a direct sales approach and expert sales team to promote and deliver commercial, industrial, and multi-residential DSM offerings. CSBD will be delivered through the same successful model and can be integrated into existing account management activities. Through regular customer outreach efforts, account managers can promote and educate builders and developers on this new offering and discuss eligibility of any potential upcoming projects.

Account managers can also leverage existing, long-term relationships with municipalities and government entities to create awareness and explore prospective projects these customers are considering or engaged in.

8.1.3 Education and Awareness

Optimum Home

To sustain market transformation, there was significant focus on demand-side efforts in 2015 and 2016 to increase awareness and drive demand for high efficiency homes in the market. This was facilitated through mass-media promotions, industry partnerships and builder forums.

Mass-media promotions

In 2016, mass-media campaigns were launched targeting builders and consumers (new home buyers) in the franchise area to communicate the benefits of high performance / ENERGY STAR® homes.

- Builder Marketing Campaign

A new section was created on the Union Gas website²⁹ to provide all builders (including those who were not enrolled in the offering) with information on the upcoming Code changes in 2017, the business advantages of building stock to a higher energy standard, key insights into why customers want these homes, and the technologies and construction processes involved in achieving this standard. Part of the content was direct feedback from Optimum Home participants.

To drive builders to the website, Union used traditional and digital media. Full page, colour ads were placed in trade publications, such as Home Builder Magazine and Ontario Home Builder. Animated digital ads (figure 8.0) appeared in the electronic versions of these magazines, available online.



Figure 8.0 - Digital Ad from Online Trade Publication

²⁹ uniongas.com/highperformancehomes

- Consumer Marketing Campaign

There is a lack of awareness among new homebuyers of the differentiation between a new home built to current Code versus a new home built to a higher standard. To address this gap, Union launched a campaign centered on the message, "All homes are not created equal."

A new section was added to Union's website³⁰ to create a repository of information where residential customers could find benefits, features and other considerations (i.e. environmental impacts) of choosing a new build high performance home prior to making the purchase decision. Customers could also access additional resources or find a certified ENERGY STAR® New Homes builder.

A highly impactful, animated 'behind the walls' video tour was added on the website to highlight the difference between new homes built to the current OBC and new homes built to a higher energy efficiency standard. It demonstrated how unseen features such as better insulation, heating and cooling, and ventilation, translate into a whole home approach to save energy, lower energy bills, increase comfort, and improve air quality, to name a few benefits.

Online digital media ads, 30 second radio spots, bill inserts, digital ads on e-bills, and a customer brochure (figure 8.1) for builders to include in their marketing packages were all used to drive customers to the new website.

³⁰ uniongas.com/energystar



Figure 8.1 – Optimum Home Customer Brochure

Industry Partnerships

Union has partnered with the Ontario Home Builders' Association ("OHBA") for several years as part of an ongoing commitment to the builder community. Support from the OHBA provided Union with the ability to enhance market intelligence related to energy efficiency, sustainability and better building in the new housing market. Since 2013, Union has been participating in the OHBA Builder Forums, and has attended various events throughout the year with the OHBA's local chapters.

Builder Forums

An integral part of influencing continued market transformation is disseminating lessons learned and best practices to the entire builder community. Union's outreach program, i.e. builder forums, targeted all builders in the Union building community to educate and inspire them to build high efficiency homes.

In March 2016, four free builder forums were held in Hamilton, Ingersoll, Huntsville and Kingston. More than 50 builders attended that were not part of the Optimum Home offering. Attendees were provided with networking opportunities to meet and learn from other

builders who participated in the Optimum Home offering about advanced technology, best building practices and navigating challenges through the process.

Optimum Home building science experts were also present to help attendees:

- Understand pending Code changes;
- Learn how voluntary programs like ENERGY STAR® helps builders exceed Code in a cost-effective manner; and,
- Learn how to build and market the higher standard / ENERGY STAR® home.

The Builder Forums were promoted by Union account managers contacting and meeting with builders in their territories, through direct mail brochures to all builders (figure 8.2), and through the partnership with OHBA and OHBA's local chapters in the communities where the forums were hosted.

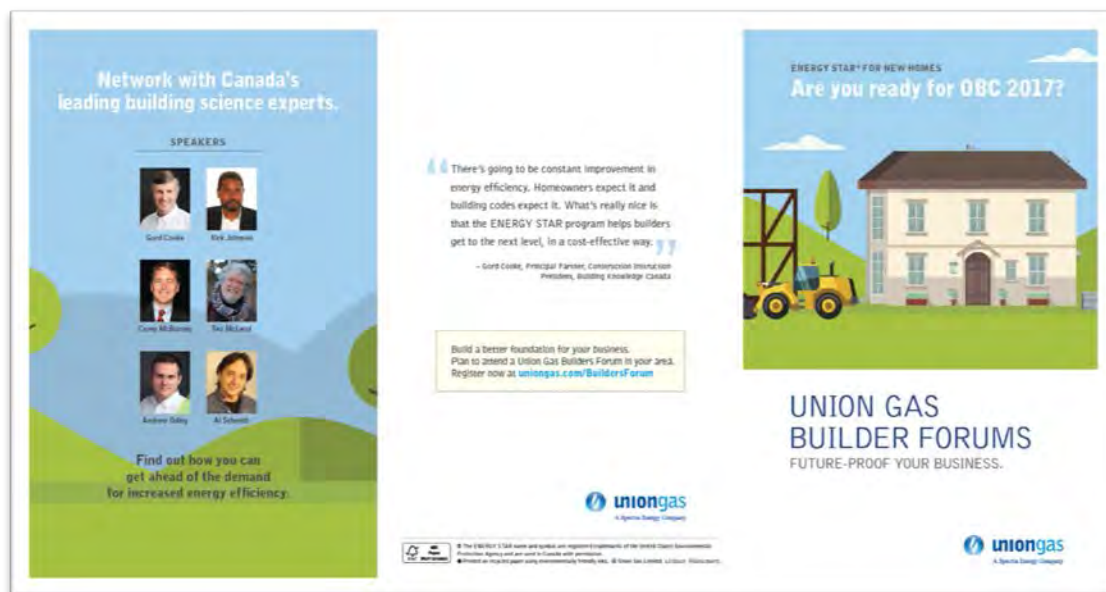


Figure 8.2 - Builder Forum Brochure

CSBD Offering

Since CSBD is a new offering in Union's DSM portfolio and is underpinned by a direct sales approach, initial education and awareness efforts were internally focused on Union's account management teams. A sales training and Q&A session was developed and delivered, with participation from Sustainable Buildings Canada, early in the Fall of 2016.

Along with generating internal awareness, a Savings By Design section was added to Union's website so commercial/industrial customers searching for ways to save on energy or who may have been directed to the website through other mass media campaigns, could learn about the offering and how to apply.

8.1.4 *Lessons Learned*

Optimum Home

- **Builders value the offering**

The participating builders found tremendous value from the Optimum Home offering and are very supportive of cascading their learning and experience to other builders in the province. Union recognizes that sharing knowledge and builder experience gained from the offering across the larger builder community is critical in maintaining momentum in transforming the Ontario residential new build market. The builder forums hosted across Union's franchise area were an effective step in achieving this goal. There is an opportunity to further influence the adoption and sustainability of high performance homes by increasing efforts in "telling the builder story"; highlighting the builder journey, key successes and lesson learned to motivate other builders in the franchise area.

- **Strong supply side impact could be enhanced further by increasing demand-side impact**

Optimum Home results showed that Union has had a tremendous impact on the supply side of the home builder market. Union learned that most participating builders would like more support on the sales and marketing side to drive awareness, interest and demand from home buyers. Enhancing the marketing support and training provided to the builders would help them promote their high performance homes and pursue

strategies to convert the technical improvements into “common speak”, making the unseen values apparent and developing advocates for high performance homes.

- **Compliance paths**

In an attempt to remain label-neutral, the original offering allowed for multiple compliance paths for builders to verify that their homes were built to 20 percent above 2012 OBC. The majority (95 percent) of participating builders chose to build to the ENERGY STAR® New Homes Version 12 requirements. ENERGY STAR® labelling is the most recognizable consumer brand and the preferred compliance path of builders. The future iteration of Optimum Home will simplify the compliance pathways and focus on ENERGY STAR® only.

CSBD

- **To achieve consistency in the market, as envisioned by the Board, Union will need to reach provincial builders/developers**

Promotion, education, and awareness efforts will need to be extended to reach builders and developers that may be located outside of Union’s franchise area but operate province-wide.

Since Enbridge has been delivering this offering in the market for several years, there may be the opportunity to exploit the familiarity that Toronto-area commercial builders and developers may have of the CSBD offering to identify province-wide project opportunities.

This is consistent and integrates well into Union’s national account management strategy for commercial, industrial and multi-residential customers.

- **CSBD provides the opportunity to increase green building practice awareness and education across the commercial new construction market**

One of the hallmarks of CSBD is its ability to educate builders, developers and design teams about green building practices. Participants get exclusive access to Canadian green build experts through Sustainable Buildings Canada, a collaborative of industry practitioners committed to actively achieving market transformation outcomes. By

capitalizing on this expertise and knowledge base, leading edge green building options can be considered during the early planning phase of a project, before purchase and design decisions have been finalized. This is the optimal time to influence adoption of building practices and equipment that not only achieve sustainability goals but also improve energy efficiency well above the current OBC standards.

Optimum Home has made great strides both in increasing the number of high efficiency homes built and the consumer demand for these products. Building on the success and lessons learned from the original offering, Optimum Home will be re-launched in 2017 and focus exclusively on building ENERGY STAR® high performance homes. These homes are built 20 percent above 2017 OBC.

With the experience and lessons learned from delivering a market transformation offering for residential new construction, Union is optimistic that it can drive similar success in the commercial new construction market. CSBD launched in December 2016 and will be energetically promoted and supported by Union's expert sales team.

The market transformation offerings are designed with multi-year structures and will continue for the duration of the 2015 - 2020 DSM plan period.

9. Performance-Based Scorecard

The final scorecard used to measure Union's DSM performance is the performance-based scorecard. Performance-based conservation benchmarks a customer's energy use to evaluate energy saving opportunities and then measures on-going savings using an evidence-based approach (e.g. comparing before and after metered billing data).

Union's 2016 performance-based scorecard focused on Participant Metrics from the two offerings, RunSmart and Strategic Energy Management ("SEM").

Table 9.0 presents the results of the performance-based scorecard. Union successfully enrolled the target participants in both offerings and achieved 108 percent of the overall scorecard target. This results in a DSM Shareholder Incentive of \$61,844.

Table 9.0 - 2016 Performance-Based Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
RunSmart Participants	21	28	41	50%	32	115%	58%
Strategic Energy Management Participants	2	3	5	50%	3	100%	50%
Total Scorecard Target Achieved							108%
Scorecard Utility Incentive Achieved							\$61,844

9.1 Performance-Based Program

Union proposed a distinct performance-based program as part of the 2015-2020 DSM Plan (EB-2015-0029) that included two offerings: RunSmart and SEM. The program was to be measured on a separate scorecard with a dedicated shareholder incentive amount to encourage focus on the success of the program and ensure it was not overshadowed by larger resource acquisition programs. The performance-based program and scorecard were approved in the 2015-2020 DSM Plan Decision for 2016 to 2018.

Table 9.1 breaks down the total program spend into its components.

Table 9.1 - 2016 Performance-Based Spend

Item	Total
Incentives	\$ -
Administration	\$ 140,948
Evaluation	\$ 401
Program Costs	\$ 133,255
Total Performance-Based Spend	\$ 274,604

9.1.1 RunSmart Offering

Union's RunSmart offering is focused on optimizing commercial building equipment to operate as efficiently as possible by accelerating energy efficiency practices and identifying low-cost or no cost measures and operational efficiency opportunities.

The enhanced 2016 RunSmart offering is intended to:

- Reach previously untapped commercial markets
- Bring building energy performance back to original design intent
- Increase operational efficiency with a systematic process of identifying and implementing tune-up measures
- Increase customer's awareness and knowledge of energy efficient practices and provide education on how to operate in an energy efficient manner; and
- Generate long term energy savings in commercial facilities.

RunSmart participant savings are evaluated using an evidence-based approach, comparing before and after measured billing data. Upon enrolment into the offering, baseline consumption analysis is conducted. A site walk through is administered by a third party expert at no cost to the customer to identify opportunities to more efficiently use heating equipment and systems in place. Customers must then complete recommended RunSmart actions outlined on a checklist and monitor and maintain these actions over a 12-month time period. Energy savings are based on the new annual consumption for the site compared to the customer's baseline consumption as related to operational improvements outlined in the checklist.

By following the RunSmart checklist and completing recommended actions, customers can receive financial incentives for achieving consumption reductions of five to fifteen percent from the previous year.

Target Market

This offering is directed towards Union's general service mid-size commercial customers, such as offices, multi-family buildings, schools, and hospitals, with an annual consumption in excess of 50,000 m³.

Additionally, RunSmart specifically targets customers that have not recently implemented energy conservation measures at their site (e.g. non-DSM participants and/or customers who have not participated in the last two years).

Market Incentive

Through this offering, customers gain access, at no charge, to a technical expert who can help identify ways to optimize their facility's energy use. Customers qualify for financial incentives when energy efficient measures are implemented and energy savings are achieved.

The incentive structure, based on measured energy performance improvement, is as follows:

- Between five - ten percent demonstrated savings from baseline consumption → \$0.20 per annual m³ saved.
- Between 10 percent -15 percent demonstrated savings from baseline consumption → \$0.25 per annual m³ saved.
- Over 15 percent demonstrated savings from baseline consumption → \$0.30 per annual m³ saved.

Market Delivery

All of Union's custom project offerings use a direct sales, customer relationship focused approach to market. Union identifies and targets eligible customer participants through account management outreach and direct marketing efforts. A number of promotional tools were used in 2016, such as providing sell sheets/brochures to potential participants (Figure 9.0).



Figure 9.0 - RunSmart Sell Sheet

RunSmart also relies on a third-party expert to complete the site evaluation at each participating customer facility and assist in educating customers on energy efficiency practices.

An essential component of the offering is the RunSmart checklist that helps identify building and operational changes to reduce energy consumption. The technical expert has an electronic fillable form version of the checklist to use during facility walk-throughs with the

customer. Additional resources with detailed instructions for the implementation of each of the recommendations/actions are also provided.

9.1.2 Strategic Energy Management Offering

The second performance-based offering is Strategic Energy Management ("SEM"). SEM is the successor to Union's Integrated Energy Management System offering targeting industrial customers.

SEM participants establish a baseline for existing operations by analyzing current energy performance and then track performance over time while identifying and measuring continuous improvement efforts. Through this offering, Union has the opportunity to actively influence customers to adopt and nurture a culture of conservation and continuous energy improvement.

Customers use their own energy data to analyze historic and current energy performance. This analysis allows participants to set energy baselines and targets with the goal of improving energy efficiency of existing operating procedures. Through SEM customers are able to:

- Recognize energy efficiency opportunities that would otherwise go unnoticed;
- Establish and sustain energy team(s) to champion continuous energy efficiency improvements
- Proactively manage natural gas consumption through real-time measurement and analytical tools
- Systematically track baselines, report energy intensity and establish targets
- Quantify, implement, and validate behaviour and process and/or equipment based energy efficiency improvements; and
- Foster a culture of continuous energy improvement consistent with the principles of ISO 50001.³¹

³¹ ISO 50001 is the International Standard's Organization's Energy Management system standard – a framework of requirements for an organization to track, report, and improve the way it uses energy on a continuous improvement cycle.

Similar to RunSmart, energy savings for SEM is based on actual metered data, normalized for weather and production, compared against a baseline energy use. However, SEM is structured as a multi-year program that measures results and progressive savings over five years. Incentives and in-kind technical support are available to customers for start-up evaluation and implementation of a monitoring system. Further incentives are provided for demonstrated energy performance improvements over time.

Reporting is a key requirement of SEM to assess effectiveness of continuous improvement actions. To support this, SEM participants receive incentives to install sub-metering to gather comprehensive energy data. Participating customers are also required to submit annual performance reports detailing continuous improvement opportunities and energy usage for the prior 12-month operating period.

SEM participants receive significant support by Union and a third-party consultant throughout the start-up and implementation phase. All reporting commitments are managed by the third-party technical consultant, at no cost to the customer. This encourages commitment to the program by reducing the administrative burden to the customer and reinforces the continued focus on energy efficiency through regular performance reviews with Union and the third-party expert.

Target Market

Eligible participants:

- Have a minimum annual natural gas usage of 1,000,000 m³
- Do not currently have an Energy Management System³² in place; and
- Have not previously participated in Union's integrated energy management system offering.

³² A system used to track, report and plan continuous improvement energy efficiency activities.

Market Incentive

Incentives are structured to support initial start-up costs in baseline and energy plan development, and provide incentives for measured energy efficiency improvements over a 5-year participation period.

- Year One start-up incentives:
 - o Up to \$25,000 to support the purchase and installation of sub-metering and data management equipment; and
 - o In-kind technical support from Union and a third party expert.
- Year Two baseline incentive:
 - o Participants continue to receive technical support as baseline data is being collected and analyzed.
- Years Three to Five fixed performance incentives:
 - o Year Three: ≥ 5 percent savings from baseline $\rightarrow$ \$10,000
 - o Year Four: ≥ 10 percent savings from base line $\rightarrow$ \$15,000
 - o Year Five: ≥ 15 percent savings from base line $\rightarrow$ \$20,000

A minimum of five percent savings from baseline is required to qualify for the performance incentive.

Market Delivery

Union identified eligible participants and delivered the offering directly to industrial customers through account management outreach by Union account managers and Project Managers. A promotional brochure, shown below, was used to introduce the program to customers.

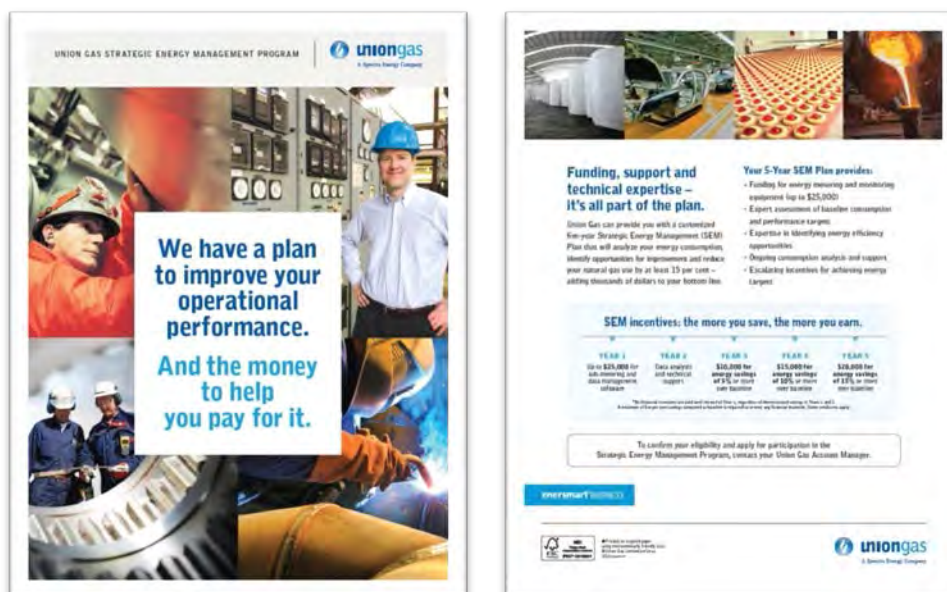


Figure 9.1 - SEM Brochure

After signing a Memorandum-of-Understanding outlining their commitment to the program, participating customers gained access to ongoing energy management expertise through dedicated time with technical experts. A third-party expert works with the customer, along with Union, to provide the following services and benefits:

- Conduct site evaluations
- Define energy metrics and metering requirements
- Aid in the development of a continuous improvement energy management plan
- Complete annual reports to identify demonstrated savings, including details on the customer's improvement opportunities implemented and those planned in the future
- Educate and influence energy saving best practices with customers
- Develop customers' capacity to make energy efficiency decisions; and,
- Promote the investigation and implementation of energy monitoring and tracking.

9.1.3 *Education and Awareness*

Both RunSmart and SEM strive to change energy efficiency awareness and practices. They encourage customers to look at the energy intensity and use of their facilities and to identify and implement opportunities to ensure that equipment is operating optimally and efficiently.

To achieve this, Union relies on the long-term relationships developed and maintained with commercial and industrial customers through account managers and Project Managers as well as the expertise of the third-party consultants. These technical professionals advocate for the use of best practices and work with customers to actualize these practices based on the unique operating conditions of each customer as demonstrated through the site evaluations.

In addition to account management outreach, Union leverages education and awareness activities undertaken for all CI customers to promote RunSmart and SEM. Information on CI education and awareness activities can be found in [Section 5.2.4](#).

9.1.4 *Lessons Learned*

RunSmart Offering

- ***Increased awareness is needed***

Since this is the first year of the enhanced RunSmart offering, there is low awareness of the benefits of the offering and incentives available. To address this, Union is rolling out additional promotions in markets where the offering has not been received.

- ***Baseline eligibility and rules were unclear***

The definition of static baseline was initially being interpreted as either “no Union DSM activities” or “no energy savings project implemented” in the past two years. This was confusing and deterring potential participants. Union has clarified that static baseline is only “no Union funded DSM in the last two years” and is communicating this to CI customers.

- ***Process improvements will improve program delivery and customer experience***

In 2016, account managers, project managers, technical consultants and members of the Commercial/Industrial Energy Efficiency Programs team were all interacting with customers. This was inefficient and becoming burdensome to customers. Union is

working on streamlining the delivery model to simplify administration and communication channels.

Strategic Energy Management Offering

- ***Customer capital restraints are a barrier for participation***

Some customers do not have the capital to invest in an energy management offering where the return on investment is not tangible upfront. The long-term nature of performance-based programs and commitment to a continuous improvement philosophy can deter customer participation. Union is actively addressing this barrier by using historical data, gate meter and statistical analysis to quantify the potential savings and help customers build the business case for the investment. Union will continue to monitor the impact of this barrier and propose modifications, as required.

- ***Technical consultants need to be knowledgeable and flexible***

Consultants must be knowledgeable and adaptive when determining energy use measuring requirements in a wide variety of facilities. Identifying recommended actions, adjustments or projects to implement from the results of a site evaluation requires a high degree of expertise. Flexibility to accommodate scheduling with the customer is also essential. These qualities will be of utmost importance when considering consultants and service providers for RunSmart and SEM going forward.

- ***Customer facility size is a challenge***

The size of a customer's facility can be a challenge due to the possible number of natural gas end uses. Measuring all of the end uses of energy in a facility can be difficult, time consuming and costly. Union will also continue to monitor the impact of this issue and propose modifications, as required.

Union looks forward to seeing actions undertaken by participants in the first year of these offerings translate into measurable savings and successes for customers. Through RunSmart and SEM, Union will continue to encourage customers to adopt a continuous improvement philosophy and to foster an organization-wide energy efficiency culture. The performance-based offerings are designed with multi-year structures and will continue for the duration of the 2015 - 2020 DSM plan period.

10. DSM Shareholder Incentive

Union earns a shareholder incentive based on its performance against targets outlined on the resource acquisition, low-income, large volume, market transformation, and performance-based scorecards.

The DSM shareholder incentive is intended to *"effectively motivate the gas utilities to both actively and efficiently pursue DSM savings and to recognize exemplary performance."*³³

The total annual maximum incentive available is \$10.45M and is allocated based on the combined program budgets for each scorecard.

The 2016 scorecard results and corresponding DSM Shareholder Incentive earned are presented in Tables 10.0, 10.1, 10.2, and 10.3 below.

Table 10.0 - 2016 Results - Resource Acquisition Scorecard

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Cumulative Natural Gas Savings (m3)	840,194,699	1,120,259,599	1,680,389,398	75%	814,757,886	73%	55%
Home Reno Rebate Participants (Homes)	2,475	3,300	4,950	25%	6,595	200%	50%
Total Scorecard Target Achieved							105%
Scorecard Utility Incentive Achieved							\$2,907,230

³³ Report of the Board: DSM Framework for Natural Gas Distributors (2015-2020), EB-2014-0134, p. 20.

Table 10. 1 - 2016 Results - Low-Income Scorecard

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Single Family Cumulative Natural Gas Savings (m ³)	28,339,761	37,786,348	56,679,522	60%	45,783,307	121%	73%
Social and Assisted Multi-Family Cumulative Natural Gas Savings (m ³)	13,836,358	18,448,477	27,672,716	35%	10,894,573	59%	21%
Market Rate Multi-Family Cumulative Natural Gas Savings (m ³)	2,252,430	3,003,240	4,504,860	5%	8,151,190	200%	10%
Total Scorecard Target Achieved							103%
Scorecard Utility Incentive Achieved							\$1,151,656

Table 10. 2 - 2016 Results - Large Volume Scorecard

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Cumulative Natural Gas Savings (m ³)	668,168,041	890,890,721	1,336,336,082	100%	79,848,302	9%	9%
Total Scorecard Target Achieved							9%
Scorecard Utility Incentive Achieved							\$0

Table 10. 3 - 2016 Results - Market Transformation Scorecard

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
Optimum Home: Homes Built (>20% above OBC 2012) by Participating Builders	53%	70%	100%	50%	70.09%	100%	50%
Commercial New Construction: New Developments Enrolled by Participating Builders	6	8	12	50%	0	0%	0%
Total Scorecard Target Achieved							50%
Scorecard Utility Incentive Achieved							\$0

Table 10. 4 - 2016 Performance-Based Scorecard Results

Metrics	Metric Target Levels			Weight	Achievement	% of Metric Achieved	Weighted % of Scorecard Achieved
	Lower Band	Target	Upper Band				
RunSmart Participants	21	28	41	50%	32	115%	58%
Strategic Energy Management Participants	2	3	5	50%	3	100%	50%
Total Scorecard Target Achieved							108%
Scorecard Utility Incentive Achieved							\$61,844

Union achieved a total of \$4.121M in DSM Shareholder Incentive as a result of its program performance results in 2016, as shown in Table 10.4.

Table 10. 5 - Summary of 2016 DSM Shareholder Incentive Achieved

Scorecard	DSM Shareholder Incentive Achieved
Resource Acquisition	\$ 2,907,230
Low-Income	\$ 1,151,656
Large Volume	\$ -
Market Transformation	\$ -
Performance-Based	\$ 61,844
Total	\$ 4,120,731

11. 2016 Budget and Program Spend

Union's total approved 2016 DSM Budget was \$56.821M, with a program budget of \$45.586M. As outlined in Table 11.0, total DSM portfolio spending in 2016 was \$47.844M with program spending amounting to \$42.255M.

11.1 Demand Side Management Variance Account ("DSMVA")

Union is able to spend and recover up to an additional 15 percent of the approved annual DSM budget on incremental program expenses once a 100 percent weighted scorecard target is achieved on a pre-audited basis.

The DSMVA tracks the difference between actual DSM spending versus the budgeted amount included in rates. If spending is less than what was built into rates, ratepayers will be reimbursed. If more is spent than was built into rates, Union will recover the excess through the deferral disposition proceeding following the completion of the annual audit.

As shown in Table 11.0, the 2016 DSMVA amount to be refunded to rate payers is \$6.156 M.

DSMVA Adjustment - DSM Tracking & Reporting System Upgrades

As part of Union's 2015-2020 DSM Plan (EB-2015-0029), Union requested a total of six million dollars for DSM tracking & reporting system upgrades (one million in 2015 and five million in 2016). In the Board's 2015-2020 DSM Plan Decision, the six million dollars was approved as requested for the system upgrade.

In 2016, Union spent approximately two million towards system upgrades compared to five million included in 2016 rates, resulting in an underspend of three million. Union proposes not to return the 2016 underspend of three million to ratepayers through the DSMVA since the balance of these funds has been spent in proceeding years. Rather, Union has adjusted the 2016 DSMVA balance to reflect the best information available at the conclusion of the 2016 audit (i.e. October 2018), including costs incurred in 2017 and 2018. The tracking system upgrades were completed in early 2018 and Union spent \$4.863M from 2016 to 2018 to do so. This results in a refund of \$0.137M to ratepayers.

Table 11.0 - Summary of 2016 Budget and Spending

	2016 Spend	2016 Budget	Variance	Budget Transfers	DSMVA
	A	B	C=A-B	D	E=C-D
Program Budget					
Resource Acquisition Scorecard					
Residential Program	\$10,199,498	\$ 8,052,657	\$ 2,146,841		\$ 2,146,841
Residential Evaluation	\$ 1,001,900	\$ 559,000	\$ 442,900	\$ 442,900	\$ 0
Commercial/Industrial Program	\$ 16,263,967	\$ 19,127,176	\$ (2,863,209)	\$ 222,246	\$ (2,863,209)
Commercial/Industrial Evaluation	\$ 120,578	\$ 189,000	\$ (68,422)	\$ (68,422)	\$ 0
Low-Income Scorecard					
Low-Income Program	\$10,238,880	\$ 11,187,342	\$ (948,462)		\$ (948,462)
Low-Income Evaluation	\$ 161,733	\$ 220,128	\$ (58,395)	\$ (58,395)	\$ 0
Large Volume Scorecard					
Large Volume Program	\$2,951,494	\$ 3,937,000	\$ (985,506)		\$ (985,506)
Large Volume Evaluation	\$ 37,682	\$ 63,000	\$ (25,318)	\$ (25,318)	\$ 0
Market Transformation Scorecard					
Market Transformation Program	\$ 996,760	\$ 1,676,250	\$ (679,490)	\$ 59,717	\$ (739,207)
Market Transformation Evaluation	\$ 7,933	\$ 26,820	\$ (18,887)	\$ (78,604)	\$ 59,717
Performance-Based Scorecard					
Performance- Based Program	\$ 274,203	\$ 513,000	\$ (238,797)		\$ (238,797)
Performance-Based Evaluation	\$ 401	\$ 35,000	\$ (34,599)	\$ (34,599)	\$ (0)
Programs Sub-total	\$42,255,026	\$ 45,586,373	\$ (3,331,347)	\$ 237,279	\$ (3,568,626)
Portfolio Budget					
Research	\$ 517,567	\$ 1,500,000	\$ (982,433)		\$ (982,433)
Evaluation	\$ 168,121	\$ 1,300,000	\$ (1,131,879)	\$ (237,279)	\$ (894,600)
Administration	\$2,364,580	\$ 2,935,000	\$ (570,420)		\$ (570,420)
Pilots	\$ 183,200	\$ 500,000	\$ (316,800)		\$ (316,800)
DSM Tracking and Reporting System Upgrades	\$2,041,209	\$ 5,000,000	\$ (2,958,791)		\$ (2,958,791)
Portfolio Sub-total	\$5,274,676	\$ 11,235,000	\$ (5,960,324)	\$ (237,279)	\$ (5,723,045)
Incremental DSM Projects 2016 Budget Spend					
Achievable Potential Study	\$ 267,199		\$ 267,199		\$ 267,199
Future Infrastructure Planning Study	\$ 46,946		\$ 46,946		\$ 46,946
Total 2016 DSM Budget (before Adjustments)	\$47,843,847	\$ 56,821,373	\$ (8,977,526)	\$ 0	\$ (8,977,526)
Adjustments¹					
DSM Tracking and Reporting System Upgrades 2016 Variance – to be spent in 2017 and 2018	\$ (2,041,209)	\$ (5,000,000)	\$ (2,958,791)		\$ (2,958,791)
Remaining DSM Tracking and Reporting System Upgrades spend in 2017 and 2018	\$ (2,821,803)	\$ (2,958,791)	\$ 136,988		\$ 136,988
Total 2016 DSMVA					\$ (6,155,723)

¹ Given the timing of the finalization of 2016 audit, the DSMVA has been adjusted to reflect best available information with regards to tracking and reporting system upgrades.

11.2 Cost-Efficiency Initiative

The DSM guidelines established a Cost-Efficiency Incentive that allows budget amounts to be carried over and used in the following year if the total aggregate annual lifetime natural gas savings targets are met in a given year based on evaluated results. The Cost-Efficiency Incentive Deferral Account tracks the differences between the annual approved DSM budget and the actual amount spent to achieve the 100 percent targets across all programs.

Union did not meet the eligibility requirements to use this incentive in 2016.

12. Lost Revenue Adjustment Mechanism (“LRAM”)

The Board-approved Lost Revenue Adjustment Mechanism Variance allows Union to recover the lost distribution revenues associated with DSM activity.

The LRAM Variance Account (“LRAMVA”) is used to track, at the rate class level, the actual impact of DSM activities compared to the forecasted impact included in distribution rates.

Union’s LRAMVA captures lost volumes for the contract rate classes only, as established in the 2014-2018 Incentive Regulation Application, Evidence and Settlement Agreement (EB-2013-0202).

For 2016, the LRAMVA amount of \$0.182M is based on 2016 delivery rates, the Joint Input Assumption Filing EB-2016-0246, filed December 21, 2016, and net annual natural gas savings of 16.797 million 10^3m^3 . The 2016 LRAMVA statement is detailed in Table 12.0 on the following page.

Table 12. 0 - 2016 LRAMVA Statement

Rate class	DSM Volumes (10 ³ m ³)												Total Volumes (10 ³ m ³)	2016 Delivery Rates (\$/10 ³ m ³)	Revenue Impact
	Jan	Feb	March	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	(a)	(b)	(a) x (b)
South															
M4 Industrial	1,547	104	647	602	17	46	314	70	75	220	130	98	3,870	11.571	\$44,781
M5 Industrial	1,013	338	1,426	1,269	78	79	186	-	20	-	185	17	4,611	25.638	\$118,225
M7 Industrial	294	654	837	84	2	281	196	355	741	190	7	282	3,923	3.525	\$13,830
T1 Industrial	53	-	64	142	161	-	0	-	237	176	57	77	968	0.760	\$736
T2 Industrial	31	-	89	256	320	1,002	-	183	30	608	151	2	2,669	0.082	\$219
South Total	2,938	1,096	3,063	2,354	579	1,408	697	608	1,103	1,194	529	476	16,043		\$177,791
North															
20 Industrial	556	-	15	-	-	-	-	18	19	52	6	0	665	5.548	\$3,691
100 Industrial	6	-	19	14	10	2	14	-	-	13	11	-	89	2.235	\$199
North Total	561	-	34	14	10	2	14	18	19	65	17	0	754		\$ 3,890
Total	3,499	1,096	3,097	2,368	588	1,410	711	626	1,121	1,258	546	476	16,797		\$181,681

13. Conclusions and Next Steps

Union provides balanced energy solutions that help customers save money and create a sustainable energy future through innovation, partnerships, energy savings programs and actions.

In 2016, DSM programs generated 959 million m³ of cumulative natural gas savings with solid program performance noted particularly within the resource acquisition and low-income scorecards. Several enhancements were made to existing offerings and new offerings were launched or in the design phase based on the direction of the Board in its 2015-2020 DSM Plan Decision. This section presents a breakdown of 2016 DSM impacts by rate class and highlights major modifications to programming for 2017, as well as showing the methodology to be followed in setting 2017 scorecard targets.

13.1 DSM Rate Class Allocation from 2016 Results

Table 13.0 illustrates the allocation to rate classes of the DSM Variance Account amounts resulting from 2016 DSM programming.

Table 13.0 - Rate Class Allocation of 2016 DSM Variance Account Amounts

Line No.	Rate Class	DSMIDA	DSMVA	LRAMVA
South				
1	M1	\$ 2,020,574	\$ 2,594,963	NA
2	M2	\$ 706,006	\$ (2,875,780)	NA
3	M4	\$ 306,562	\$ 338,131	\$ 44,781
4	M5	\$ 187,060	\$ (99,876)	\$ 118,225
5	M7	\$ 313,361	\$ 1,405,607	\$ 13,830
6	T1	\$ 105,541	\$ (284,262)	\$ 736
7	T2	\$ -	\$ (14,123)	\$ 219
8		\$ 3,639,104	\$ 1,064,660	\$ 177,791
North				
9	Rate 01	\$ 336,435	\$ (3,223,146)	NA
10	Rate 10	\$ 96,305	\$ (1,377,623)	NA
11	Rate 20	\$ 48,887	\$ (1,096,374)	\$ 3,691
12	Rate 100	\$ -	\$ (1,523,240)	\$ 199
13		\$ 481,627	\$ (7,220,383)	\$ 3,890
14	Total	\$ 4,120,731	\$ (6,155,723)	\$ 181,681

13.2 Next Steps - DSM in 2017

Union will continue offering DSM programming in 2017 based on its Board-approved 2015-2020 DSM Plan (EB-2015-0029), with adjustments and refinements resulting from lessons learned in 2016. The enhanced DSM portfolio going into 2017 provides a comprehensive set of programs and offerings to meet the needs of customers while fulfilling the Board's key priorities and guiding principles outlined in the framework.

Major planned modifications for each offering are outlined in Table 13.1.

Table 13.1 - Planned activities and modifications in 2017

Program / Program Offerings	Planned Modifications in 2017
Residential Program	
Home Reno Rebate Offering	Offering will be enhanced further by IESO's whole home pilot program collaboration.
Commercial/Industrial Program	
- Commercial/Industrial Prescriptive Offering - Commercial/Industrial Direct Install Offering - Commercial/Industrial Custom Offering	- Continue as planned with refinements resulting from 2016 lessons learned. - Direct Install Offering will be launched in 2017. - Continue as planned with refinements resulting from 2016 lessons learned.
Low-Income Program	
- Home Weatherization Offering - Furnace End-of-Life Upgrade Offering - Indigenous Offering - Multi-Family Offering	- Continue as planned with refinements resulting from 2016 lessons learned. - Offering will be expanded to the private market. - Indigenous Offering will be launched in 2017. - Installation of in-suite basic measures has been discontinued as of the end of 2016.
Large Volume Program	
Large Volume Direct Access Offering	Continue as planned with refinements resulting from 2016 lessons learned.
Market Transformation Program	
- Optimum Home Offering - Commercial Savings By Design Offering	- New Optimum Home offering to be launched in 2017. - Launched at the end of 2016, continue roll out.
Performance-Based Program	
- RunSmart Offering - Strategic Energy Management Offering	Continue as planned with refinements resulting from 2016 lessons learned.

In addition to offering modifications, 2017 market transformation and performance-based scorecards will have new performance metrics. The 2017 scorecards are discussed below.

13.3 2017 Scorecards

The 2017 scorecard targets are established formulaically based on the previous year's final DSM audit. Table 13.2 to Table 13.6 presents the 2017 scorecards that have been calculated based on the audited 2016 performance and updated input assumptions and net-to-gross factors resulting from that annual evaluation process. The calculation methodology of scorecards can be found in Schedule C of the Board's 2015-2020 DSM Plan Decision.

Table 13. 2 - 2017 Resource Acquisition Scorecard

Metrics	Metric Target Levels			Weight
	Lower Band	Target	Upper Band	
Cumulative Natural Gas Savings (m3)	754,211,082	1,005,614,776	1,508,422,163	75%
Home Reno Rebate Participants (Homes)	5,145	6,859	10,289	25%

Table 13. 3 - 2017 Low-Income Scorecard

Metrics	Metric Target Levels			Weight
	Lower Band	Target	Upper Band	
Single Family Cumulative Natural Gas Savings (m ³)	33,776,883	45,035,844	67,553,765	60%
Social and Assisted Multi-Family Cumulative Natural Gas Savings (m ³)	15,839,979	21,119,972	31,679,958	35%
Market Rate Multi-Family Cumulative Natural Gas Savings (m ³)	11,851,284	15,801,711	23,702,567	5%

The 2017 large volume and market transformation scorecard methodology were outlined in Schedule C of the revised 2015-2020 DSM Plan Decision, dated February 24, 2016.

Table 13. 4 - 2017 Large Volume Scorecard

Metrics	Metric Target Levels			Weight
	Lower Band	Target	Upper Band	
Cumulative Natural Gas Savings (m3)	347,662,404	463,549,872	695,324,808	100%

Table 13. 5 - 2017 Market Transformation Scorecard

Metrics	Metric Target Levels			Weight
	Lower Band	Target	Upper Band	
Optimum Home: Participating Builders (Regional Top 10)	8	10	15	20%
Optimum Home: Prototype Homes Built	22.5%	30%	45%	30%
Commercial New Construction: New Developments Enrolled by Participating Builders	6	8	12	50%

Table 13. 6 - 2017 Performance-Based Scorecard

Metrics	Metric Target Levels			Weight
	Lower Band	Target	Upper Band	
RunSmart Participants	57	76	113	20%
RunSmart Savings	7.5%	10%	15%	60%
Strategic Energy Management (SEM) Participants	24	32	48	20%

Appendix A Input Assumptions

The prescriptive input assumptions used to calculate the 2016 DSM scorecard targets and results can be found under Technical Reference Manual / Application and Decisions – Union Gas Limited & Enbridge Gas Distribution Inc. (Joint Filing) – Input Assumptions, Measures & Assumptions Updates, EB-2015-0344, on the OEB website. Prescriptive input assumptions used for LRAM are EB-2016-0246.

<https://www.oeb.ca/industry/policy-initiatives-and-consultations/natural-gas-demand-side-management-dsm>

Custom NTG factors and results of the 2015 EM&V process can be found on a dedicated DSM Evaluation webpage, also on the OEB site.

<https://www.oeb.ca/industry/policy-initiatives-and-consultations/natural-gas-demand-side-management-dsm-evaluation>

Appendix B 2016 Avoided Costs

The avoided costs used for the determination of 2016 TRC results are included below for reference.

The inflation rate used is 1.68 percent. The discount factor is 5.75 percent.

Gas Avoided Costs							Water and Electricity Avoided Costs				
	Residential and Commercial				Industrial		Residential/Commercial/Industrial				
	Baseload (\$/m ³)		Weather Sensitive (\$/m ³)		Baseload (\$/m ³)		Water (\$/m ³)		Electricity (\$/kWh)		
	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	Rate	NPV	
1	0.20358	0.20358	0.24572	0.24572	0.20311	0.20311	1	0.57778	0.57778	0.11470	0.11470
2	0.20317	0.39571	0.24484	0.47725	0.19992	0.39217	2	0.58749	1.13334	0.11663	0.22499
3	0.21426	0.58732	0.25674	0.70685	0.21116	0.58100	3	0.59736	1.66753	0.11859	0.33103
4	0.23844	0.78896	0.28175	0.94511	0.23587	0.78047	4	0.60739	2.18118	0.12058	0.43300
5	0.25692	0.99442	0.30107	1.18587	0.25469	0.98415	5	0.61760	2.67507	0.12260	0.53104
6	0.25546	1.18761	0.30047	1.41310	0.25299	1.17547	6	0.62797	3.14997	0.12466	0.62532
7	0.25857	1.37252	0.30447	1.63083	0.25599	1.35853	7	0.63852	3.60660	0.12676	0.71597
8	0.27615	1.55927	0.32294	1.84922	0.27388	1.54375	8	0.64925	4.04566	0.12889	0.80313
9	0.26598	1.72937	0.31368	2.04983	0.26318	1.71205	9	0.66016	4.46784	0.13105	0.88694
10	0.28164	1.89969	0.33028	2.24956	0.27910	1.88084	10	0.67125	4.87379	0.13325	0.96752
11	0.28364	2.06190	0.33322	2.44012	0.28092	2.04149	11	0.68253	5.26411	0.13549	1.04501
12	0.30588	2.22733	0.35642	2.63288	0.30360	2.20568	12	0.69399	5.63943	0.13777	1.11952
13	0.30919	2.38545	0.36073	2.81736	0.30677	2.36257	13	0.70565	6.00031	0.14008	1.19116
14	0.33200	2.54602	0.38453	3.00333	0.33003	2.52218	14	0.71751	6.34731	0.14244	1.26004
15	0.33500	2.69922	0.38856	3.18103	0.33287	2.67441	15	0.72956	6.68097	0.14483	1.32628
16	0.34032	2.84640	0.39493	3.35183	0.33810	2.82064	16	0.74182	7.00179	0.14726	1.38997
17	0.34716	2.98838	0.40284	3.51659	0.34489	2.96169	17	0.75428	7.31027	0.14974	1.45120
18	0.36100	3.12800	0.41776	3.67816	0.35888	3.10048	18	0.76695	7.60689	0.15225	1.51009
19	0.37068	3.26357	0.42855	3.83489	0.36859	3.23529	19	0.77984	7.89210	0.15481	1.56671
20	0.38563	3.39694	0.44463	3.98867	0.38371	3.36799	20	0.79294	8.16634	0.15741	1.62115
21	0.39665	3.52666	0.45681	4.13807	0.39479	3.49711	21	0.80626	8.43003	0.16006	1.67349
22	0.40800	3.65285	0.46933	4.28323	0.40620	3.62274	22	0.81980	8.68358	0.16274	1.72383
23	0.41968	3.77559	0.48221	4.42426	0.41794	3.74498	23	0.83358	8.92738	0.16548	1.77223
24	0.43170	3.89499	0.49546	4.56129	0.43003	3.86391	24	0.84758	9.16180	0.16826	1.81876
25	0.44408	4.01114	0.50908	4.69444	0.44247	3.97964	25	0.86182	9.38721	0.17109	1.86351
26	0.45681	4.12412	0.52308	4.82381	0.45528	4.09224	26	0.87630	9.60394	0.17396	1.90653
27	0.46992	4.23403	0.53748	4.94952	0.46846	4.20181	27	0.89102	9.81234	0.17688	1.94790
28	0.48341	4.34095	0.55229	5.07168	0.48204	4.30843	28	0.90599	10.01273	0.17985	1.98768
29	0.49729	4.44496	0.56752	5.19038	0.49601	4.41217	29	0.92121	10.20541	0.18287	2.02593
30	0.51158	4.54615	0.58319	5.30573	0.51040	4.51312	30	0.93669	10.39067	0.18595	2.06271