

# Appendix D: Natural gas conservation program results

## Abstract

This chapter reviews the most recent verified results (from 2016) of one of Ontario's most important natural gas conservation policy tools: utility-run and natural gas ratepayer-funded conservation programs (also known as demand-side management).

2016 was a significant year for natural gas conservation in Ontario because it was the first full year of a new demand-side management framework, which provided utilities with significantly higher budgets. Natural gas spending in 2016 was about 50% higher than in 2015. Most of this increase in spending was targeted at customers historically underserved by conservation programs: residential customers, small businesses and low-income residents. This led to new programs, greater participation and more energy savings from these sectors.

However, taken as a whole, net natural gas savings (for programs evaluated using this metric) in 2016 were reported to be 30% lower than in 2015. There are two main reasons for this:

- A change in evaluation inputs (based on a new program evaluation) took effect in 2016. This resulted in the net energy savings attributed to the utilities' most cost-effective and fruitful conservation programs (those for large industrial and commercial customers) being reduced by more than half. If the same evaluation inputs were used for both years, overall natural gas savings would have been 7% higher in 2016 than in 2015.
- The increase in conservation spending was primarily directed at smaller, harder-to-reach customer segments. These conservation programs typically require more spending per unit of energy saved, compared with programs for larger customers. It also takes time for new programs to get established and become effective.

Natural gas programs remain highly cost-effective, saving Ontarians almost three dollars for every dollar spent in 2016. Since 2007, natural gas conservation programs have reduced gas use by utility customers to approximately 7% lower than it would otherwise be, and annual greenhouse gas emissions are 3 megatonnes lower (2% of Ontario's overall emissions).

The verification process for energy conservation results is getting more stringent. The energy efficiency baseline is getting higher. And, conservation programs are becoming more accessible to more customers. As a result of these trends, incremental spending on natural gas conservation continues to deliver social, economic and climate benefits.

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## D.1 Introduction

Ontario's two large natural gas utilities, Enbridge Gas Distribution and Union Gas, have offered conservation programs to their customers since the 1990s.<sup>1</sup>

Conservation programs (also known as demand-side management, or DSM) are offered to all segments of the customer base – residential, commercial, industrial and low-income customers. The budget for these conservation programs comes from natural gas customers, and the gas utilities are eligible for performance incentives depending on their results against energy conservation targets.

A six-year policy framework established by the Ontario Energy Board (OEB) covers the period between 2015 and 2020, providing guidance on program mix, budgets, and targets, among other details.<sup>2</sup> This matches the timeframe of the framework for electricity conservation programs, discussed in **Appendix C**. The new framework greatly increased the combined conservation budgets of the gas utilities, from roughly \$65 million per year (combined) in 2015 to \$130 million per year by 2018, still far less than the approximately \$400 million per year spent on electricity conservation.

As was the case for electricity conservation programs, 2015 ended up being a transition year between natural gas conservation frameworks. 2015 was supposed to be the first year of the 2015-2020 Natural Gas DSM Framework. But because the new framework was not finalized until December 2014, the utilities were ordered to continue to run programs and budgets in 2015 according to the previous 2012-2014 Framework.<sup>3</sup>

2016 was therefore the first year for utilities to implement the new framework, including establishing new or expanded programs and accessing the increased conservation budgets.

**2016 was the first year for utilities to implement the new framework, including accessing the increased conservation budgets.**

A program evaluation in 2015 led to significant changes to the free-ridership rates for some utility conservation programs (this is discussed in more detail in section D.3.3). It has been a source of dispute as to how these evaluation findings should be used to adjust reported results and natural gas targets – this issue has been settled by the OEB for 2015, but not yet for 2016.

Unless otherwise stated, in this appendix the ECO reports the following numerical results:

- net energy savings for 2015 results based on old free-ridership values<sup>4</sup>
- net energy savings for 2016 results based on updated free-ridership values, and
- 2016 targets as specified in the OEB's decision on the 2015-2020 DSM Framework and used in the 2016 DSM Evaluation Report (i.e., not adjusted downwards).<sup>5</sup>

This appendix reviews:

- overall energy savings and emissions reductions from utility programs
- details on program spending and cost-effectiveness, including how the additional 2016 budget was spent, and why it did not translate to proportionally more savings
- utility performance against their conservation targets, and
- key developments for specific programs.

## D.2 Natural gas savings from conservation programs

### D.2.1 Savings from 2016 programs

The total amount of avoided natural gas use is the primary metric for measuring the success of most utility-run natural gas conservation programs in Ontario. (A small percentage of conservation programs are dedicated to achieving other important ends, for example bringing about a future market shift or addressing equity issues. These are primarily assessed on other metrics, like number of participants or units built.)<sup>6</sup>

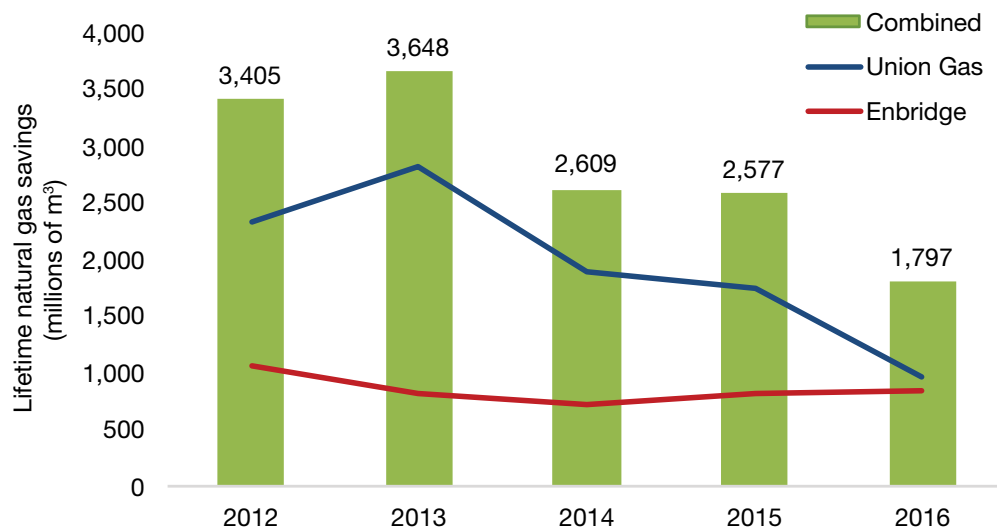
**The total amount of avoided natural gas use is the primary metric for success.**

Gas savings can be reported as **cumulative savings** (natural gas savings over the lifetime of a conservation measure), or **annual savings** (reduced use in the first year of a conservation measure).<sup>7</sup> For example,

a furnace replacement might deliver annual savings of 500 cubic metres (m<sup>3</sup>) of natural gas per year for 15 years, giving cumulative savings of 7,500 m<sup>3</sup>. Utility performance targets are generally based on cumulative savings. The choice of cumulative (lifetime) savings rewards utilities for pursuing longer-lasting conservation measures; for example, building envelope improvements are assumed to deliver 20 to 25 years of savings<sup>8</sup> as compared to low-flow shower heads which are assumed to have a 10-year life.<sup>9</sup>

The net cumulative natural gas savings achieved in each year of conservation program activity from 2012 to 2016 by Enbridge and Union Gas are shown in Figure D.1.

In terms of net cumulative natural gas savings, 2016 saw a 30% drop in reported savings, despite a budget increase, due primarily to an update in evaluation inputs (if the same evaluation inputs were used for both years, overall natural gas savings in 2016 would have been 7% higher than in 2015).<sup>10</sup> The change in evaluation inputs, and the reasons why the budget increase did not lead to more savings, are explored in section D.3.



**Figure D.1.** Net cumulative natural gas savings due to programs implemented in each year for Union Gas, Enbridge, and both combined (2012-2016).

Note: 2015 results do not apply updated net-to-gross adjustments for custom programs, as per OEB decisions EB-2017-0324 and EB-2017-0323.

Source: Enbridge and Union Gas' DSM final annual reports, from 2012-2016.

### D.2.2 Savings impact from multiple years of program activity

The annual net savings from 2016 gas conservation programs represented roughly 0.5% of Enbridge’s gas sales, and 0.4% of Union’s gas sales.<sup>11</sup> This seems quite small, but because conservation projects deliver savings for many years, the impact of conservation program activity adds up over time.

In 2016, natural gas use was roughly 6% lower for Enbridge customers and 8% lower for Union Gas customers than it would have been without conservation programs, based on the combined impact of the last decade of conservation programs (see Table D.1).<sup>12</sup>

**In 2016, natural gas use was roughly 6% lower for Enbridge customers and 8% lower for Union Gas customers than it would have been without conservation.**

**Table D.1.** Net annual gas savings from conservation as a percentage of overall utility gas sales.

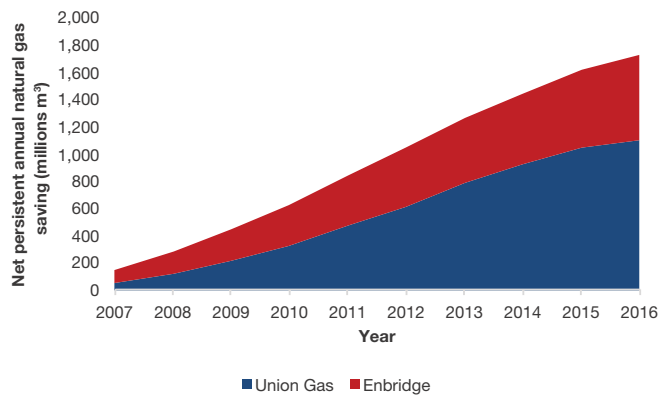
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
<b>Enbridge</b>	0.7	0.7	0.6	0.6	0.7	0.6	0.4	0.4	0.4	0.5	6%
<b>Union</b>	0.4	0.5	0.75	0.95	1.0	1.0	1.3	0.9	0.9	0.4	8%

Note: Percentage of gas sales excludes sales to the small number of utility customers in rate classes not eligible for conservation programs.

Source: Enbridge, 2016 DSM Annual Report (17 November 2018) at table 3.10; Union Gas, 2016 DSM Final Annual Report (30 November 2018) at table 3.10.

Figure D.2 presents an estimate of annual gas savings in 2016, based on the combined savings from the last decade of program activity. Natural gas conservation programs have reduced annual natural gas consumption by close to 1,700 million m<sup>3</sup>. This is enough natural gas to fuel over 700,000 homes.<sup>13</sup>

There is not an exact one-to-one relationship between savings from conservation programs and the overall amount of natural gas used by utility customers, because other factors, such as weather and changes in the number of customers, also affect the amount of gas used. Overall, gas consumption by utility customers has dropped by almost 10% for Enbridge since 2007, and almost 2% for Union Gas.<sup>14</sup>



**Figure D.2.** Persistent net energy savings from natural gas conservation programs 2007-2016.

Source: Enbridge Gas Distribution Inc., 2016 Demand Side Management Annual Report; Union Gas, 2016 Demand Side Management Final Annual Report.

### Greenhouse gas emissions reductions

Avoided natural gas use reduces air and climate pollution. Natural gas combustion emits carbon dioxide, methane and nitrous oxide into the atmosphere.

Based on the most current emissions factors used to calculate Canada's greenhouse gas (GHG) emissions to the United Nations (which itself severely underreports the impact of methane, see ECO's discussion of this issue in the 2018 Annual Energy Conservation Report, Making Connections at Q11), the annual GHG reductions due to the last decade of conservation program activity are roughly 3.2 megatonnes (Mt) carbon dioxide

**Avoided natural gas use reduces air and climate pollution.**

equivalent (CO<sub>2</sub>e).<sup>15</sup> This is roughly 2% of Ontario's overall greenhouse gas emissions. Coincidentally, 3.2 Mt is also the amount of incremental emissions reductions that Ontario's draft Environment Plan intends to deliver due to an expansion of natural gas utility conservation programs.<sup>16</sup> How to deliver this incremental 3.2 Mt of emissions reductions is explored in more detail in **Chapter 2** of this report.

The impact of annual GHG reductions due to conservation programs delivered between 2012 and 2016 is shown in more detail in Table D.2.

**Table D.2.** Greenhouse gas emissions reductions (kt CO<sub>2</sub>e) from gas utility conservation programs (2012-2016).

	2012	2013	2014	2015	2016
Enbridge	114	91	83	93	96
Union	261	342	250	238	106
<b>Total</b>	<b>375</b>	<b>433</b>	<b>333</b>	<b>331</b>	<b>202</b>
Overall Ontario emissions	169,100	168,400	165,400	162,900	160,600
<b>GHG reductions from conservation as a % of overall Ontario emissions</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.1%</b>

Note: Does not include reductions in upstream emissions. The emissions factors used are those from the Intergovernmental Panel on Climate Change's Fourth Assessment Report, which means 25 for methane and 298 for nitrous oxide, with the inclusion of climate-carbon feedbacks. Canada has yet to adopt the emissions factors from the Fifth Assessment report, which are much higher for methane (34).<sup>17</sup>

Source: ECO calculation.<sup>18</sup>

## D.3 Why more spending did not equal more savings

### D.3.1 Program spending

In response to guidance in the new framework, utility spending on natural gas conservation increased from \$68 million in 2015 to \$104 million in 2016 (see Table D.3).<sup>19</sup>

**Table D.3.** Annual natural gas conservation budgets for Enbridge and Union Gas, actual spending (2014-2016) and approved budget (2017-2020).

	Annual conservation budgets (millions of dollars)						
	2014 (actual)	2015 (actual)	2016 (actual)	2017 (approved)	2018 (approved)	2019 (approved)	2020 (approved)
Enbridge	33	36	56	63	68	66	68
Union	34	32	48	59	63	63	64
<b>Total</b>	<b>\$67</b>	<b>\$68</b>	<b>\$104</b>	<b>\$122</b>	<b>\$131</b>	<b>\$130</b>	<b>\$132</b>

Note: Totals may be slightly off due to rounding. Budgets do not include the maximum annual shareholder incentive of \$10.45 million/utility/year.

Source: Actuals from: Enbridge, 2016 DSM Annual Report (17 November 2018) at table 3.2; Union Gas, 2016 DSM Final Annual Report (30 November 2018) at table 3.2. Approved budget from: OEB, Decision and Order EB-2015-0029/EB-2015-0049 (20 January 2016) at 56.

This spending did not translate into proportionally higher natural gas savings, primarily because:

- budget increases were primarily directed at expanded programs for harder-to-reach customers, with higher costs per unit of energy savings, and
- reported net savings from commercial and industrial programs were reduced significantly in 2016 due to an update in savings estimates, based on evaluation results, and specifically an update for free-ridership rates (see section D.3.3).

### D.3.2 Increased conservation spending targeted at harder-to-reach customers

The key drivers of increased conservation spending in 2016 are shown in Table D.4.

**Table D.4.** Key drivers for increased natural gas conservation spending (2015 versus 2016).

	Enbridge		Union Gas	
	2015 Spending	2016 Spending	2015 Spending	2016 Spending
Residential programs	\$9.4 million	\$23.7 million	\$5.5 million	\$11.2 million
Low-income programs	\$7.1 million	\$8.7 million	\$7.7 million	\$10.4 million
Market transformation programs	\$4.7 million	\$6.4 million	Not a major cause of spending increase	
New direct install program for small commercial customers	\$0	\$2.4 million	Not applicable	
Commercial/industrial programs (excluding large-volume)	Not a major cause of spending increase		\$11.4 million	\$16.4 million

Source: Enbridge, 2015 DSM Annual Report (18 December 2017) at table ES-0; Union Gas, 2015 DSM Final Annual Report (15 December 2017) at table 4.1; Enbridge, 2016 DSM Annual Report (17 November 2018) at table ES-0; Union Gas, 2016 DSM Final Annual Report (30 November 2018) at table 4.1.

Most of the categories of increased spending in Table D.4 are focused on harder-to-reach customers: residential customers, low-income customers and small businesses (these developments are discussed on a sector-by-sector basis in section D.5). This was the result of guidance in the new framework which is aimed at making natural gas conservation programs more accessible to more customers, even if they may be more expensive to deliver per unit of savings than programs for larger commercial/industrial customers.<sup>20</sup>

In part this is an issue of fairness. Costs of conservation programs are spread across all customers within a rate class, whether or not they are participating, and historically, smaller customers have participated less than larger customers. While non-participants receive some benefits from conservation programs in terms of avoided greenhouse gas emissions and reduced system costs, most benefits go to participants in the form of lower energy bills. One of the criteria in setting the natural gas conservation

budget for 2015-2020 was the cost impact on non-participants – capped at a \$2 monthly bill impact for residential customers.<sup>21</sup> Increasing access to and participation in conservation programs helps address this concern and ensure more customers benefit from conservation.

The fact that incremental spending directed to harder-to-reach customers will not deliver the same level of savings as previous programs is recognized in the savings targets set for each utility, which did not increase in 2016 at the same rate as budgets.<sup>22</sup>

**The OEB expects utility conservation performance to improve as utilities gain more experience delivering programs.**



As a countervailing trend, however, the OEB expects utility conservation performance to improve as utilities gain more experience delivering programs. For this reason, targets for future years include productivity improvement factors that increase by 2% per year for all conservation programs, and 10% per year for certain categories of programs with more opportunity for improvement. These are stretch factors that are intended to promote continued efficiency in program delivery. The OEB describes this relationship between each year's target and budget as "non-linear."<sup>23</sup>

### **D.3.3 Higher free-ridership estimates (and lower net energy savings) for custom programs for commercial and industrial customers**

Each year, the utilities' claimed conservation program savings are reviewed by a third-party evaluator, and, if necessary, the results are adjusted. The 2015 results were the first year of results subject to a new evaluation process led by OEB staff, who hire an expert evaluator, and receive input from an Evaluation Advisory Committee (the ECO is an observer on this committee).

A major element of the 2015 evaluation was a new study<sup>24</sup> conducted by the evaluator that:

- measured the accuracy of the gross energy savings reported for the utilities' custom commercial, industrial and large volume programs (this was also done in previous years); and
- converted gross energy savings to net savings, including measuring and updating the free-ridership rates (previously last updated in 2008) for these programs (i.e., what percentage of participating customers would have still undertaken the conservation projects supported by these programs, if the programs, and their supporting financial incentives and technical support, were not offered).

**n.b.** Net savings, which include only savings that are directly attributable to a program's influence, are usually lower than gross savings. The free-ridership

rate is the most important adjustment in converting from gross savings to net savings.<sup>25</sup> Program results presented in this chapter are net savings, as this measures program impact, and utility performance incentives are based on net savings.

The study found a high level of accuracy in the reported gross energy savings, assessed through methods including site visits, interviews and desk reviews of project data. Verified gross energy savings for custom programs ranged from 89-135% of the originally reported savings.<sup>26</sup>

However, the study found a higher level of free ridership than had previously been assumed and used in reporting results. Previous values of free-ridership date from a 2008 study – a value of 54% free-ridership was used by Union Gas for all custom programs, while Enbridge's programs used a range between 0-50%, depending on the program and sector. New estimates of free ridership based on the 2015 study range from 50-92%, depending on the program.<sup>27</sup>

Custom programs generally involve a representative from the utility working with commercial and industrial customers to identify and implement energy savings projects, along with related financial incentives to customers.<sup>28</sup> It is not surprising that these custom programs have a relatively high level of free ridership (compared to prescriptive programs for other sectors such as small businesses and low-income customers for example), because the financial incentives that utilities can offer are generally a small portion of overall project costs, customers using custom programs tend to be larger, and some (though not all) companies may have suitable technical expertise on staff to identify conservation projects without utility technical assistance.

Assessing the level of program influence on customer decision-making regarding conservation projects is not an exact science, as most decisions will involve multiple influences. The 2015 study estimated free ridership through a series of interview questions posed to participants in custom conservation programs,

regarding their motivations. An updated study of this nature was long overdue, however utilities have expressed concerns with some of the methodological choices. Utility concerns included the long delay between the timing of projects and the follow-up interviews (up to three years) and the lack of coverage of “secondary attribution” – the longer-term, indirect role of utility-customer interactions and the continued availability of technical assistance and incentives over more than a decade in encouraging companies to identify and act on conservation opportunities.<sup>29</sup> An updated net-to-gross study on custom commercial and institutional programs for 2018 participants is planned, but for now, the values from this 2015 study will be used.

This change in free-ridership rates has major impacts on the reported net savings for natural gas conservation programs. This is because the custom programs for Enbridge and Union’s larger customers represented the lion’s share of their claimed savings and came at the lowest cost per unit saved of any program in their portfolios. The adjustments would reduce overall energy savings (from the full portfolio of utility programs) by roughly 35% (Table D.5). Even with the much higher free-ridership rates (and thus lower net energy savings), the utilities’ custom commercial and industrial programs remain highly cost-effective, delivering roughly three to six dollars in benefits per dollar spent.<sup>30</sup>

**Table D.5.** Potential impact of free-ridership assumptions if they were applied to 2015 net natural gas savings for utility conservation programs.

	<b>Net cumulative natural gas savings (million m<sup>3</sup>) – old free-ridership values</b>	<b>Net cumulative natural gas savings (million m<sup>3</sup>) – updated free-ridership values</b>	<b>% change</b>
Union Gas	1,750.8	1,137.8	-35%
Enbridge	826.2	539.8	-35%

Source: For savings based on old free-ridership assumptions, see: Enbridge, 2015 DSM Annual Report (18 December 2017) at table ES-0; Union Gas, 2015 DSM Final Annual Report (15 December 2017) at table 4.0. For savings based on updated free-ridership assumptions, see: DNV-GL, 2015 DSM Natural Gas Demand Side Management Annual Verification (OEB, 20 December 2017) at tables 1-1 and 1-6.

**This change in free-ridership rates has major impacts on the reported net savings for natural gas conservation programs.**

The change in natural gas savings also has a large impact on the performance incentives that utilities are eligible to receive as a reward for successfully reaching their targets for conservation program performance. For this reason, elements of both the 2015 and 2016 evaluations have been challenged by the utilities as part of OEB clearance applications (see the textbox “Ontario Energy Board approval of financial incentives for 2015 and 2016 results”).

### Ontario Energy Board approval of financial incentives for 2015 and 2016 results

The financial performance incentives natural gas utilities receive (based on performance against energy savings targets) are paid for by natural gas customers and require approval by the OEB. The clearance of these financial incentives for both 2015 and 2016 results has been the subject of dispute at board hearings. The board has issued a final decision approving the utilities 2015 clearance applications (this essentially finalizes its interpretation of 2015 targets and results), but (at the time of writing), not on the 2016 clearance applications.

In the hearing for 2015 results, the utilities disputed the applicability of the net-to-gross study on several grounds, including concerns with the methodology of the study, and whether it was fair to apply the study's findings retroactively to 2015 results, or only on a go-forward basis.

The OEB considered the argument about whether it was fair to apply the evaluation study's findings to the utilities' 2015 program results, and concluded

**The board has issued a final decision approving the utilities 2015 clearance applications (this essentially finalizes its interpretation of 2015 targets and results), but (at the time of writing), not on the 2016 clearance applications.**

that the old free-ridership rates would be used for 2015 results. The OEB's rationale was that 2015 was a transition year, and final approval of the utilities' 2015-2020 DSM plans (this approval included new direction regarding changes to free-ridership rates, based on program evaluations) was not given until after the 2015 program year was complete.<sup>31</sup>

The result preserved roughly \$4 million dollars in incentives for Enbridge and \$0.5 million for Union Gas, as shown in Table D.6.<sup>32</sup>

**Table D.6.** 2015 natural gas utility values for their shareholder incentive (draft, verified, and final OEB decision).

	2015 SHAREHOLDER INCENTIVE (million \$)		
	Using old free-ridership values	Using updated free-ridership values	Final Board decision
Union Gas	\$7.5	\$7.04	\$7.5
Enbridge	\$10.08	\$6.21	\$10.08

Source: DNV-GL, 2015 DSM Natural Gas Annual Verification (OEB, 20 December 2017); OEB, Decision and Order, EB-2017-0324 and EB-2017-0323 (12 July 2018).

In its decision on the 2015 results, the OEB did not address the substantive arguments made by the utilities regarding the methodological concerns with the net-to-gross study, and commented that: “[t]his decision [...] should not be construed as prejudging the treatment of applying the updated free ridership and spillover values to 2016 custom DSM programs.”<sup>33</sup>

However, in filing their 2016 clearance applications, both utilities (while still noting methodological concerns) have used the updated free-ridership values for 2016 results. But the utilities have

now raised another argument, based on their interpretation of previous direction from the OEB – that because the 2016 targets were set based on the old free-ridership assumptions, they are no longer based on the best available information, and should be revised (downwards) to account for the change in free-ridership values arising from the evaluation.<sup>34</sup> As of February 2019, the OEB had not issued a decision on this issue.<sup>35</sup> Pending a decision from the board, the ECO has assumed that the original 2016 targets remain in effect, and reports progress against these targets.

### D.3.4 Program cost-effectiveness

The unit cost of conservation, i.e., the amount of money that utilities must spend for each verified unit of lifetime natural gas savings, increased in 2016 for the reasons described above, to 5-7¢/m<sup>3</sup>. (Table D.7). For comparison, this is still much cheaper than the cost of natural gas. The commodity cost of natural gas (not including delivery costs) was in the range of 10-15¢/m<sup>3</sup> in 2015 and 2016.

**The unit cost of conservation is much cheaper than the cost of natural gas.**

**Table D.7.** Cost (non-discounted) to utility per unit of lifetime natural gas savings versus gas supply cost.

	Utility cost of conservation (non-discounted)	Gas supply cost	Utility cost of conservation (non-discounted)	Gas supply cost
	2015		2016	
Enbridge	4.3¢/m <sup>3</sup>	15.2¢/m <sup>3</sup>	6.6¢/m <sup>3</sup>	10.8¢/m <sup>3</sup>
Union	1.9¢/m <sup>3</sup>	13.1¢/m <sup>3</sup>	5.0¢/m <sup>3</sup>	9.8¢/m <sup>3</sup>

Note: Utility cost of conservation is an approximation, as natural gas savings are not tracked for a small portion of DSM spending.

Source: Enbridge, DSM final annual report (17 November 2018) at tables 3.2 and 3-9; Union Gas, 2016 DSM final annual report (30 November 2018) at tables 3.2 and 3-9; “Historical natural gas rates”, Ontario Energy Board.

The cost and value of conservation programs can also be viewed from a societal perspective, using the total-resource cost plus test (TRC-plus). The benefits include cost savings from avoided natural gas consumption, any potential electricity and water savings associated with the measure, and (from 2015 onwards for Enbridge and 2016 onwards for Union) an additional 15% for non-energy benefits (like health, comfort and climate benefits). Costs include the incremental cost to customers of higher-efficiency equipment, as well as the costs of program administration, promotion, delivery and evaluation. A TRC-plus ratio higher than 1 means that a program is cost-effective for society; the higher the value the more cost-effective the program. Low-income programs are screened using a lower threshold value of 0.70 to recognize important non-energy benefits. Some programs, like market transformation, do not lend themselves to traditional TRC screening, but still provide significant benefits to society.

**Gas conservation programs deliver roughly two to three dollars in benefits for every dollar spent.**

The TRC ratio dipped slightly in 2016 due to the lower volume of gas savings and higher costs, but still indicates that gas conservation programs deliver roughly two to three dollars in benefits for every dollar spent.<sup>36</sup> Thus, utility gas conservation programs remain highly cost-effective.

**Table D.8.** The benefit-cost ratio of each utility natural gas programs as measured by the total resource cost plus test.

	2015	2016
Enbridge	2.95	2.6
Union	3.33	2.80

Source: DNV-GL, 2015 DSM Natural Gas Annual Verification (OEB, 20 December 2017); DNV-GL, 2016 Natural Gas Demand-Side Management Annual Verification (OEB, 30 October 2018).

## D.4. Performance against targets

### D.4.1 How utility performance is measured: scorecards

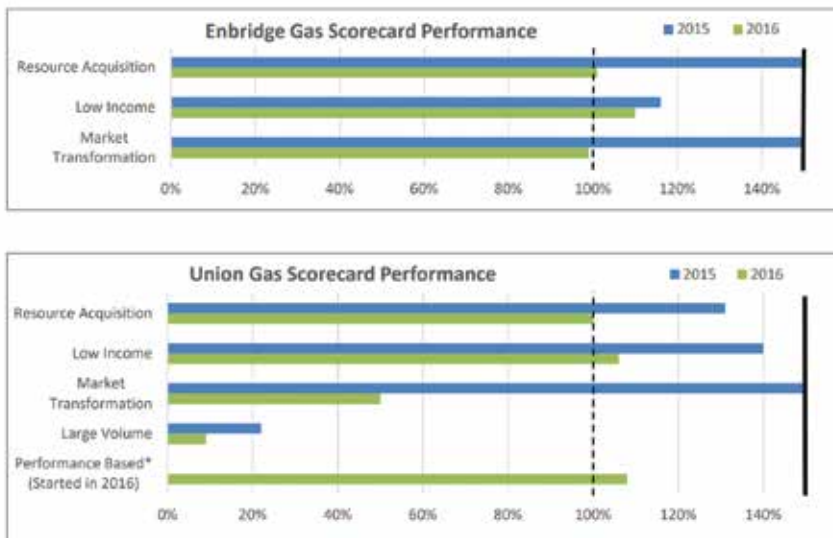
The OEB measures conservation performance based on each utility’s scorecards. Each utility has separate scorecards for different types of programs (e.g., resource acquisition programs, whose primary targets are cumulative natural gas savings, versus market transformation programs, that attempt to cause longer-term changes to increase the role of energy efficiency in the marketplace). The scorecards include targets for each program (or group of programs), and if a scorecard has more than one target, the targets are each assigned a weight, totalling 100.

The utilities design their own scorecards based on guidance outlined in the framework.<sup>37</sup> The scorecards are then approved (and possibly subject to adjustments) by the OEB. The framework stipulates that programs should be varied across rate classes – to encourage broad participation – and that performance should be primarily measured based on lifetime savings and to a lesser, but still important, extent on level of participation (especially for programs designed to transform the market).

Beyond providing an overview of program achievements, the scorecards have significant financial impacts for Enbridge and Union, because their achievements determine how much (if any) of their shareholder incentive they will receive, and if utilities can access additional spending for particularly successful programs.<sup>38</sup>

### D.4.2 2016 Scorecard results

Enbridge and Union’s performance against their conservation program targets are shown at a high level for 2015 and 2016 in Figure D.3. Both utilities saw drops in performance in all scorecards in 2016. Performance on the resource acquisition scorecard (and Union’s Large Volume scorecard) was affected by the change in net-to-gross assumptions discussed above in section D.3.3.



**Figure D.3.** Enbridge and Union performance on conservation scorecards, 2015 and 2016.

Source: OEB, Mid-Term Review of the Demand Side Management (DSM) Framework for Natural Gas Distributors (2015-2020) (29 November 2018) at 10.

Scorecard results for 2016 are shown in more detail for 2016 in Tables D.9 and D.10. The scorecard weighting and metrics help ensure utilities remain focused on different markets and programs and continue to deliver a relatively balanced and diverse portfolio to customers.

The detailed table also provides several additional important facts about programs, such as:

- the total resource plus cost/benefit ratio (a ratio >1 means the program provided more benefits to society than its costs),<sup>39</sup> and
- scorecard weight of each performance metric (which helps indicate how important success in the program is to the utility achieving their maximum incentive).

The detailed table also helps visualize which programs performed below targets. Red highlighting indicates performance was below 75% of the target and orange highlighting indicates performance was below 100%.

**Table D.9.** Summary of 2016 conservation performance metrics against OEB-established targets for Union Gas.

UNION					
Component	Performance metric	TRC	Weight %	Results	% of Target
<b>RESOURCE ACQUISITION (small volume)</b>					
Commercial and industrial (C&I) custom	Cumulative savings (million m <sup>3</sup> gas)	3.0	75%	544.9	67%
C&I prescriptive				159.6	
Home reno rebate				110.3	
	Participants		25%	6,595	200%
<b>LARGE VOLUME</b>					
Direct Access	Cumulative savings (million m <sup>3</sup> gas)	5.0	100%	79.9	9%
<b>LOW-INCOME</b>					
Home weatherization	Cumulative savings (million m <sup>3</sup> gas)	1.5	60%	45.7	121%
Furnace end-of-life				.03	
Multi-family (social and assisted)			35%	10.9	67%
Multi-family (market rate)			5%	8.2	309%
<b>MARKET TRANSFORMATION</b>					
Optimum home	% homes built	n/a	50%	70%	100%
Commercial new construction	Participating builders		50%	0	0%
<b>PERFORMANCE BASED</b>					
Run Smart	Participants	n/a	50%	58%	115%
Strategic Energy Management			50%	50%	100%

**LEGEND:**



Note: Targets, and performance against targets, is shown based on 2016 evaluation results. The utilities interpret the Board's previous decisions as requiring that these 2016 targets require revision, and is seeking clarification/requesting this be applied.

Source: DNV-GL, 2016 Natural Gas Demand-Side Management Annual Verification (OEB, 30 October 2018).

**Table D.10.** Summary of 2016 conservation performance metrics against OEB-established targets for Enbridge.

ENBRIDGE						
Component	Performance metric	TRC	Weight	Results	% of Target	
<b>RESOURCE ACQUISITION</b>						
Small volume customers	Home energy conservation	Participants	2.09 <sup>40</sup>	20%	12,986	157%
					229.7	
	Residential adaptive thermostats	Cumulative savings (million m <sup>3</sup> gas)		40%	45.4	124%
	Commercial and industrial (C&I) custom				15.5	
	C&I direct install				74.5	
	C&I prescriptive				29.6	
Energy leaders initiative	0.3					
Large volume customers	C&I custom	Cumulative savings (million m <sup>3</sup> gas)	3.27 <sup>41</sup>	40%	299.9	49%
	C&I direct				4.7	
	C&I prescriptive				21.8	
	Energy leaders initiative				.4	
	Run it Right				1.9	
	Comprehensive energy management				0	
<b>LOW INCOME</b>						
Single family	Cumulative savings (million m <sup>3</sup> gas)	1.9	45%	28.8	91%	
Multi-residential				45%	84.7	131%
			New construction participants	10%	6	100%
<b>MARKET TRANSFORMATION</b>						
Residential savings by design	Homes built	n/a	15%	2,206	80%	
	Enrolled builders		10%	31	94%	
Commercial savings by design	New developments		25%	43	130%	
School energy competition	Schools		10%	25	45%	
Run-it-right	Participants		20%	84	101%	
Comprehensive energy management	Participants		20%	7	100%	

**LEGEND:**

0-75%	76-99%	100-150%	151% +
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Note: Targets, and performance against targets, is shown based on 2016 evaluation results. The utilities interpret the Board’s previous decisions as requiring that some of these 2016 targets require revision, and is seeking clarification on this.

Source: DNV-GL, 2016 Natural Gas Demand-Side Management Annual Verification (OEB, 30 October 2018).



### D.4.3 Shareholder incentives to utilities

In order to motivate the gas utilities to pursue conservation aggressively, the OEB has approved a shareholder incentive which rewards utilities for conservation performance. Each utility has a maximum incentive of \$10.45 million available, if they achieve an average of 150% overall on their scorecard-weighted targets.<sup>42</sup> If they only achieve 100%, they receive \$4.2 million in incentives.<sup>43</sup>

The incentives earned for 2015 and 2016 are very different (see Table D.11). In 2015 the utilities earned a total of \$17.6 million in shareholder incentives, representing about a 26% return on their spending on conservation programs. Incentives for 2016 have

**A shareholder incentive rewards utilities for conservation performance.**

not yet been approved by the OEB. If the evaluator's findings stand and 2016 targets are not adjusted (see section D.3.3), utilities will earn about \$8.4 million in shareholder incentives, representing about an 8% return on their spending on conservation programs. If the OEB accepts the utilities' interpretation that 2016 targets should be adjusted, 2016 shareholder incentives could instead be roughly \$10.5 million.

**Table D.11.** Shareholder incentive amounts earned and eligible for 2015 and 2016.

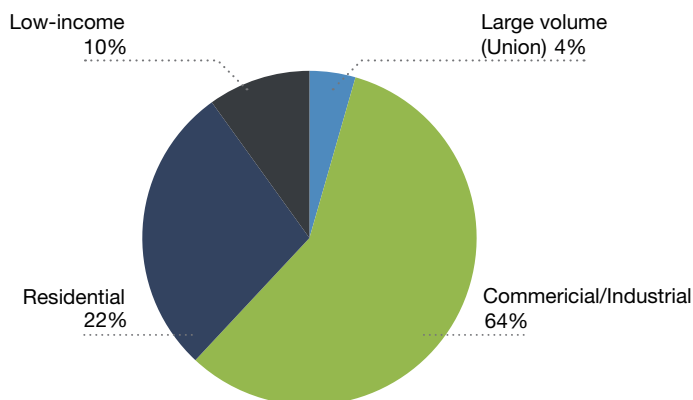
	Incentive earned (million \$)	Maximum incentive (million \$)	Incentive earned as % of maximum	Incentive as a % of conservation spending	Incentive earned (million \$)	Maximum incentive (million \$)	Incentive as % of maximum	Incentive as a % of conservation spending
	2015				2016			
Enbridge	\$10.1	\$11.1	93%	29%	<b>\$4.5*</b>	\$10.45	43%	8%
Union	\$7.5	\$11	69%	23%	<b>\$3.9*</b>	\$10.45	37%	9%

Note: (\*) If the Board approves Enbridge and Union's 2016 Clearance applications, and agrees that 2016 targets should be revised to reflect input assumptions and net-to-gross values determined in the 2015 evaluation, then Enbridge's 2016 incentives could be \$6.4 million, and Union's 2016 incentives could be \$4.1 million.

Source: DNV-GL, 2015 DSM Natural Gas Demand Side Management Annual Verification (OEB, December 2017); OEB, Decision and order, Enbridge, EB-2017-0324 (12 July 2018); OEB, Decision and order, Union Gas, EB-2017-0324 (12 July 2018); Union Gas, Updated 2016 Scorecards, Demand Side Management Draft Annual Report, EB-2015-0245 (30 July 2018) at 3-4; Enbridge, Update to 2016 DSM Program Targets and Results, EB-2015-0245 (1 August 2018) at 3; DNV-GL, 2016 Natural Gas Demand-Side Management Annual Verification (OEB, 15 October 2018); Enbridge, 2016 deferral filing, EB-2018-0301 (30 November 2018) at exhibit A, tab 1, sch.2, p.2; Union Gas, 2016 deferral filing, EB-2018-0300 (10 December 2018) at exhibit A, tab 1, p.3.

## D.5 Program highlights by customer sector

Figure D.4 shows the share of natural gas savings from programs for each major customer segment in 2016 (for both utilities combined). Even with the reduced savings for the commercial/industrial sector due to the updated 2015 net-to-gross evaluation inputs, this sector still delivers the majority of program savings. Some highlights of program delivery in 2016 for each customer segment follow, including market transformation programs, which use performance metrics other than natural gas savings.



**Figure D.4.** Share of 2016 conservation programs savings by program sector (net cumulative).

Source: DNV-GL, 2016 Natural Gas Demand-Side Management Annual Verification (OEB, 30 October 2018) at tables 1 and 6.

**The commercial/industrial sector delivers the majority of program savings.**

### D.5.1 Residential

As noted earlier, both utilities saw large increases in spending on residential conservation programs between 2015 and 2016. The 2015-2020 Framework expected about 40% of conservation program spending to be dedicated to the residential class.<sup>44</sup> The OEB nonetheless approved Union’s plan to spend 15% of their 2016 budget on this customer group. Enbridge did achieve the expected 40% share of overall budget on this segment in 2016, while Union fell short of 40%, but still overachieved its OEB-approved budget at 25%.<sup>45</sup> This increase in spending for the residential sector was needed – in 2015, Enbridge had to suspend its residential program mid-year due to lack of budget.<sup>46</sup> Beginning in 2016 and continuing in 2017 and part of 2018, funding from the Green Investment Fund helped Enbridge and Union deliver residential programs to even more customers. Results attributed to the Green Investment Fund are not shown here and do not count towards utility targets.

**The increase in savings from the residential sector has been quite dramatic.**

The primary residential programs are Enbridge’s Home Energy Conservation and Union’s Home Reno Rebate programs.<sup>47</sup> These involve an initial energy audit to identify potential energy saving measures, then installation of two or more identified measures, with a follow-up visit to verify installation. As discussed in **Chapter 2** of this report, growth in these programs is a positive start in improving the efficiency of Ontario’s existing homes, but to date, only a small share of participating customers have used these programs to implement building envelope improvements that can deliver deeper energy savings.

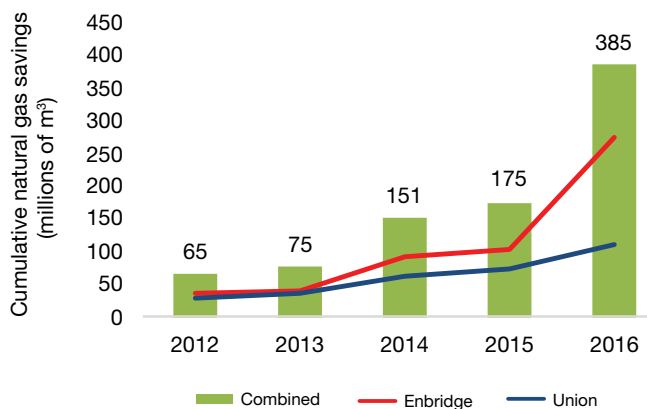
The increase in savings from the residential sector has been quite dramatic, as shown in Figure D.5. The rate of participation has also grown (from 8,175 houses in 2015 to 19,581 in 2016), but is still quite low when assessed as a share of overall Ontario households.

**Table D.12.** Number of residential customers participating in whole home energy conservation programs (2015-2016).

	2015	2016
Enbridge	5,646	12,986
Union	2,529	6,595

Source: OEB, Mid-Term Review of the Demand Side Management (DSM) Framework for Natural Gas Distributors (2015-2020) (29 November 2018) at 11.

### Residential



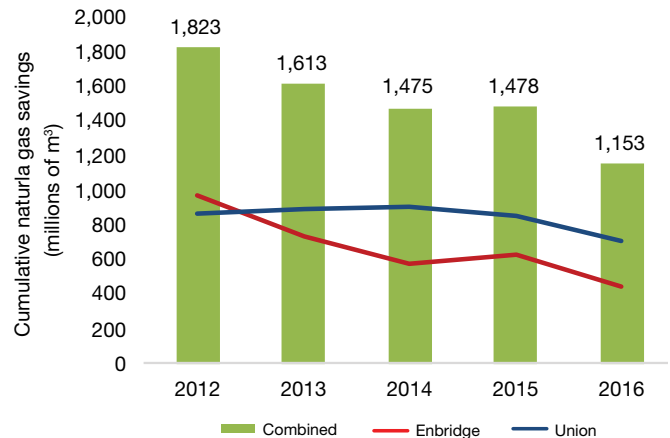
**Figure D.5.** Net cumulative residential program savings for Enbridge, Union Gas and both combined, 2012-2016.

Source: DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (OEB, 20 December 2017) at tables 1-1 and 1-6; DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (OEB, 30 October 2018) at tables 1 and 6; 2012 to 2014 results from: ECO, Every Joule Counts (2017) at figures 5.1 and 5.2.

### D.5.2 Commercial/Industrial

Both utilities saw significantly reduced savings from their commercial/industrial customers, which are due to the net-to-gross adjustment discussed in section D.3.3.

### Commercial/Industrial



**Figure D.6.** Net cumulative commercial/industrial program savings for Enbridge, Union Gas and both combined 2012-2016.

Source: DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (OEB, 20 December 2017) at tables 1-1 and 1-6; DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (OEB, 30 October 2018) at tables 1 and 6; 2012 to 2014 results from: ECO, Every Joule Counts (2017) at figures 5.1 and 5.2.

According to the utilities, the commercial/industrial sector programs are becoming costlier to operate and are delivering less savings per participant.<sup>48</sup> Utilities are trying to serve small business customers better, based on framework guidance. These customers generally have fewer resources (both financial and personnel) to dedicate to energy conservation projects. This means there is a need for higher incentive levels and higher program costs.<sup>49</sup>

**Utilities are trying to serve small business customers better.**

For the first time, in 2016 Enbridge separated its scorecard into smaller and larger volume customers, to give more emphasis on reaching smaller customers.<sup>50</sup> It also launched a new direct install program serving the smaller business market: an air curtain door program suitable for warehouses and industrial facilities, which covers most of the costs and offers a prequalified product and selected contractor, making

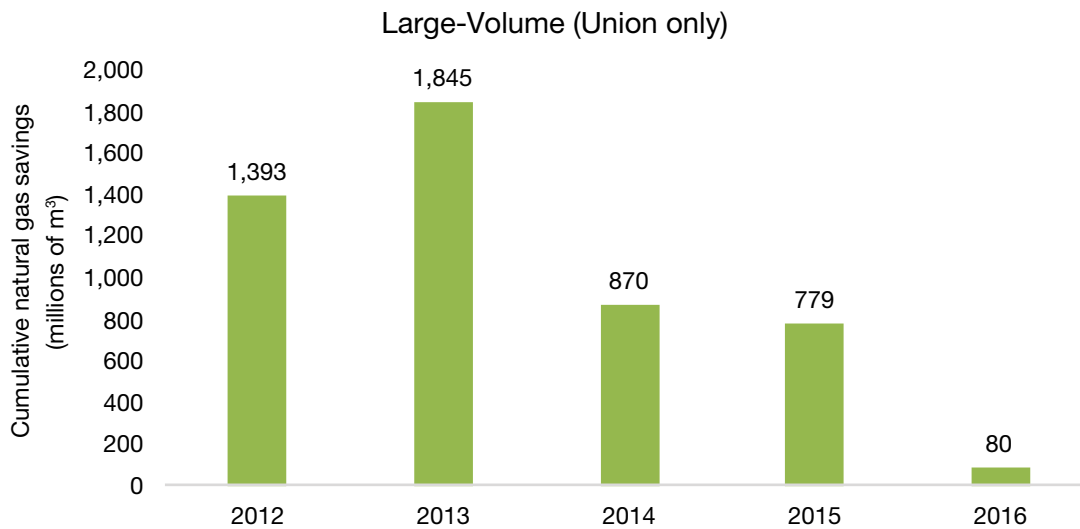
it easier for smaller businesses to participate.<sup>51</sup> This program delivered 79.2 million m<sup>3</sup> of savings in 2016. Union has now launched a similar program but was not in market in 2016.<sup>52</sup>

**D.5.3 Large Volume (Union)**

Union’s service territory has a unique program for very large industrial customers. The conservation programs provided to this small customer class are unique as each customer has first right of access to its share of conservation funds, which it can use for conservation projects of its choice (subject to a few limitations), with technical assistance from Union’s conservation staff. In 2016, 97% of customers in this class submitted energy efficiency plans, with 61% of customers accessing funding for at least one conservation project.<sup>53</sup> If the customer does not make full use of its share of conservation funds, the funds are made available to other customers in this segment.

In 2016, 75% of program savings came from projects undertaken by participants using their assigned share of conservation funds, with the other 25% of savings coming from projects undertaken by a customer using funds provided by other customers (and not used by the original customers).<sup>54</sup>

Despite the relatively high share these savings represented of overall savings in 2016, this share was substantially lower than in 2015 (see figure D.7). This drop was due to the adjustments to the free-ridership rate described in section D.3.3. This program has the lowest net-to-gross ratio (8% – i.e., the highest free-ridership rate, at 92%), as its customers are large industrial customers who may already have energy management professionals on staff, and be suitably motivated and able to complete projects without utility assistance. However, even with such a low net-to-gross ratio, the funds spent on this program still delivered a large net benefit in 2016.



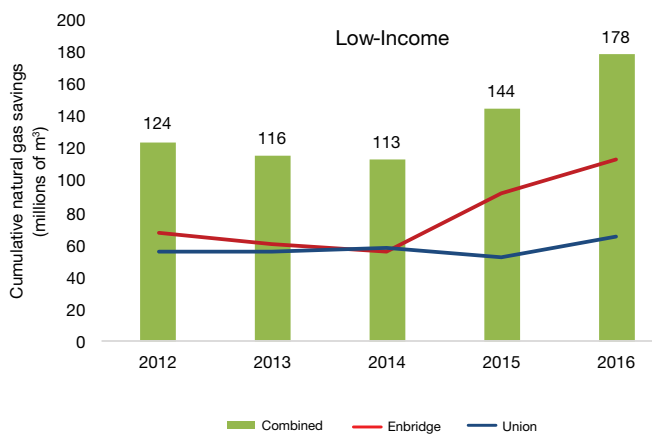
**Figure D.7.** Net cumulative large volume program savings, 2012-2016 (Union Gas).

Source: DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (OEB, 20 December 2017) at tables 1-1 and 1-6; DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (OEB, 30 October 2018) at tables 1 and 6; 2012 to 2014 results from: ECO, Every Joule Counts (2017) at figures 5.1 and 5.2.

### D.5.4 Low-Income

Low-income programs expanded in 2016 because of guidance in the new framework,<sup>55</sup> though overall, they still represent a small share of each utility’s conservation portfolio, both in terms of natural gas savings and spending (see figure D.4).<sup>56</sup> Low-income programs tend to be more expensive to run, because they often include higher incentives, and may cover the entire cost of conservation measures for customers (e.g., the Home Weatherization Program discussed in [Chapter 2](#) of this report).

Enbridge saw a large increase in savings from multi-unit residential projects in 2016. It also launched a new Low-Income New Construction program to assist new housing built through the Federal-Provincial Investment in Affordable Housing Program in reaching energy efficiency levels higher than the Building Code requirements.<sup>57</sup> Union introduced a furnace end-of-life upgrade offering in the social and assisted housing market and secured necessary agreements for the new Low-Income Single Family Indigenous Offering that launched in 2017. Also in 2016, Union expanded its multi-residential program for low-income customers beyond social housing, to private sector buildings with a significant share of low-income tenants, and saw much higher savings than projected for this sector.<sup>58</sup> Enbridge had already done this in previous years.



**Figure D.8.** Cumulative low-income program savings, for Union Gas, Enbridge and both combined, 2012-2016.

Source: DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (OEB, 20 December 2017) at tables 1-1 and 1-6; DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (OEB, 30 October 2018) at tables 1 and 6; 2012 to 2014 results from: ECO, Every Joule Counts (2017) at figures 5.1 and 5.2.

### D.5.5 Market transformation and performance-based programs

Market transformation programs are intended to create a lasting change in market behaviour and customer attitudes, by making energy efficiency standard practice.

Enbridge offered five market transformation programs in 2016, to support energy efficient design in new residential and commercial construction, and to build a culture of energy efficiency in commercial buildings, industrial facilities and schools. Two of these programs were new in 2016.<sup>59</sup>

Union offers a market transformation program for new residential construction and had intended to launch a new program to encourage high-efficiency design in commercial and industrial new construction, but was unable to launch the program in time to enroll any participating builders in 2016.<sup>60</sup> This lack of results accounts for Union’s poor performance on their Market Transformation scorecard.

Union has a separate performance-based program scorecard, which includes its RunSmart and Strategic Energy Management offerings. Together, these programs achieved 108% of their target in 2016. Performance-based conservation benchmarks use a customer’s energy use to evaluate energy saving opportunities and then measures ongoing savings using an evidence-based approach (e.g., comparing before and after metered billing data).

Enbridge also offers similar programs, namely Run-it-Right and Comprehensive Energy Management, which are measured on their Resource Acquisition and Market Transformation scorecards, depending on the metric.

**Endnotes**

1. In addition to Enbridge and Union, Ontario has three, much smaller, natural gas distributors (i.e., EPCOR, Kitchener Utilities and Utilities Kingston), but these do not have any OEB-approved conservation programs.
2. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-1034 (Toronto: OEB, 22 December 2014).
3. Ibid, at 63 (re: targets), at 77 (re: plans); See also, Environmental Commissioner of Ontario, Every joule Counts (Toronto: ECO, 2017) at 58, 62-63.
4. This approach was accepted by the OEB in its decision on both Union and Enbridge’s 2015 Clearance of Deferral and Variance Accounts, EB-2017-0323/EB-2017-0324 (Toronto: OEB, 12 July 2018).
5. The issue of whether or not 2016 targets should be adjusted with the updated net-to-gross values is currently before the Board.
6. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-1034 (Toronto: OEB, 22 December 2014) at 64-65.
7. Inconveniently, Ontario’s electricity utilities currently calculate their conservation savings with different terminology and in a slightly different manner. As Appendix C explains, electricity utilities work towards a ‘persistent savings’ target, a metric which calculates savings based on what savings will remain at the end of their framework (2020). Electricity savings are also measured on an ‘incremental basis’ (i.e., savings in the first year of a program), which is comparable to the annual natural gas savings noted here.
8. According to the most recent study, 25 years is consistent with North American best practices. (DNV-GL, 2016 Verified DSM Results (Toronto: OEB, 30 October 2018) at 9 and 59.
9. Low-flow showerheads are assumed to have a 10-year life. (Ontario Energy Board, Natural Gas Demand Side Management Technical Resource Manual, Version 3.0 (OEB: Toronto, 30 November 2018) at 7.)
10. If the updated net-to-gross assumptions had been used for 2015 results, 2015 overall net savings would have been 1.68 billion m<sup>3</sup> (0.54 billion m<sup>3</sup> for Enbridge and 1.14 billion m<sup>3</sup> for Union Gas, 7% lower than the 2016 overall savings of 1.80 billion m<sup>3</sup>). (DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 20 December, 2017) at 2 and 4.)
11. For context, the American Council for an Energy Efficient Economy estimates that in the U.S. the economic potential for annual gas savings represents about 2% of annual sales, and the achievable potential (i.e., taking into account the fact that not all economic energy efficient opportunities will be adopted) is about 1% annually, without including a cost of carbon. (American Council for an Energy Efficient Economy, Natural Gas Energy Efficiency: Progress and Opportunities (Washington D.C.: ACEEE, July 2017) at 17.)
12. This estimate assumes persistence in 2016 of all savings from 2007 onwards. Annual savings in the years prior to 2007 are not available. If they were included, the impact in 2016 could be higher, because savings from natural gas conservation programs persist on average for 16 years, and conservation programs have been in place since before 2000. (Ibid, at 10).
13. 1.7 billion m<sup>3</sup> of persistent natural gas savings divided by the average natural gas consumption by a home (2400 m<sup>3</sup>).

14. Compares 2016 natural gas sales volumes to 2007 (see each utilities’ 2016 annual reports, section 3, table 3.10). Warmer weather in 2016 likely reduced overall utility sales.

	HDD (Toronto Pearson)	HDD (Timmins)
2014	4,103	6,502
2015	3,766	5,975
2016	3,462	5,693

Source: “Historical weather data”, online: Government of Canada < [climate.weather.gc.ca/climate\\_data/generate\\_chart\\_e.html?StationID=29906&timeframe=2&type=bar&MeasTypeID=heatingdegreedays](http://climate.weather.gc.ca/climate_data/generate_chart_e.html?StationID=29906&timeframe=2&type=bar&MeasTypeID=heatingdegreedays)>. [Accessed 6 March 2019]

15. 1,700 million m<sup>3</sup> reduction in annual natural gas use due to conservation activity, multiplied by an emissions factor of 1,898 tonnes CO<sub>2</sub>e/million m<sup>3</sup>, based on emission factors in Environment and Climate Change Canada, National Inventory Report 1990-2016: Greenhouse Gas Sources and Sinks in Canada, Part 2 (2018) at 210-211 (Ontario CO<sub>2</sub> emission factor for natural gas, and industrial CH<sub>4</sub> and N<sub>2</sub>O emission factors for natural gas).
16. 18% of an overall 18 Mt emissions reduction. (Ministry of the Environment, Conservation and Parks, Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan, Draft (Queen’s Printer for Ontario, 2018) at 24.)
17. Ministry of the Environment and Climate Change, Guideline for Greenhouse Gas Emissions Reporting (Toronto: MOECC, December 2015) at 86 (Appendix 10, Tables 20.3 (for CO<sub>2</sub>) and 20.4 (for CH<sub>4</sub> and N<sub>2</sub>O)).
18. Calculation: volume of net natural gas savings multiplied by the combined global warming potential of the three GHGs associated with natural gas combustion:

Greenhouse Gas	Emission factor (g/m <sup>3</sup> ) x global warming potential =
CO <sub>2</sub>	1,888 x 1 = 1,888
CH <sub>4</sub>	0.037 x 25 = 0.93
N <sub>2</sub> O	0.035 * 298 = 10.43
Total	1,899 g CO <sub>2</sub> e/m <sup>3</sup> natural gas combustion

For example, using Enbridge’s 2016 annual natural gas savings = 50.5 million m<sup>3</sup> x 1,898 tonnes CO<sub>2</sub>e/million m<sup>3</sup> = 95,917.43 tonnes CO<sub>2</sub>e. (Calculation based on net annual natural gas savings from: Enbridge, 2016 DSM Annual Report (17 November 2018) at table 3.10; Union Gas, 2016 DSM Final Annual Report (30 November 2018) at table 3.10.; and Environment and Climate Change Canada, National Inventory Report 1990-2016: Greenhouse Gas Sources and Sinks in Canada, Part 1 (2018) at 11, and Part 2 (2018) at 210-211 (Ontario CO<sub>2</sub> emission factor for natural gas, and industrial CH<sub>4</sub> and N<sub>2</sub>O emission factors for natural gas).

19. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-0134 (22 December 2014) at 17.
20. Ibid, at 8.
21. Ibid, at 17.

22. As compared to 2015, the 2016 DSM plans included an increased focus on mass market/residential programs (i.e. significantly expanded Home Energy Conservation spending and the addition of a new Adaptive Thermostats initiative), which required higher relative spending and incentives per project than commercial/industrial projects, and which drive lower per project m<sup>3</sup> savings. Ontario Energy Board, Decision and Order on 2015-2020 DSM plans, EB-2015-0029/EB-2015-0049 (20 January 2016) at 67-68.
23. Ontario Energy Board, Decision and Order on 2015-2020 DSM plans, EB-2015-0029/EB-2015-0049 (20 January 2016) at 69.
24. Ontario Energy Board, 2015 Natural Gas Demand Side Management Custom Savings Verification and Free-ridership Evaluation by DNV-GL (Toronto: OEB, 12 October 2017).
25. Spillover, which tracks additional conservation actions that a customer takes outside of a conservation program, but influenced (in part or whole) by the program, is the other component. It leads to an increase in net savings, but its impact is usually much less than the free-ridership adjustment.
26. This is the “gross realization rate.” (DNV-GL, 2015 Natural Gas Demand Side Management Custom Savings Verification and Free-ridership Evaluation (Toronto: OEB, 12 October 2017) at 9.)
27. DNV-GL, 2015 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 20 December 2017) at Tables N-1 and N-2.
28. Union also has a self-direct option for their Large Volume customers, where participation allows access to a conservation fund the customer pays into.
29. Enbridge, Application and Supporting Evidence, EB-2018-0301 (Toronto: OEB, 10 December 2018) at Exhibit B Tab 1 Schedule 1, pages 14-17.
30. TRC-plus ratios of 5.8 for Enbridge’s custom industrial programs, and 2.9 for Enbridge’s custom commercial programs (Enbridge, DSM final annual report (North York, ON: Enbridge, 17 November 2018) at Table 4.3); Union’s custom commercial/industrial programs and large-volume programs had TRC-plus ratios of 3.73 and 5.2, respectively (Union Gas, 2016 DSM final annual report (Chatham, ON: Union Gas, 30 November 2018) at Tables 5.10 and 7.3).
31. The specific language used in OEB’s decision on the 2015-2020 plans: “the OEB does not expect the gas utilities to rely on a predetermined free ridership rate for the duration of the 2017 to 2020 term. In 2016, the free rider rates will be updated based on the results of the net-to-gross study and the annual evaluation process. Annually, the evaluation process will continue to inform the free rider rates for custom programs.” (Ontario Energy Board, Union Gas and Enbridge decision and order, EB-2015-0029/EB-2015-0049 (Toronto: OEB, 20 January 2016) at 21)
32. The financial impact on Enbridge’s utility incentives was much larger, due to differences in how the utility performance scorecards were structured, and utility-specific differences between the old and new free-ridership rates.
33. Ontario Energy Board, Decision and Order, EB-2017-0324 (Toronto: OEB, 12 July 2018) at 7.
34. Enbridge, Application and Supporting Evidence, EB-2018-0301 (Toronto: OEB, 10 December 2018) at exhibit B tab 1 Sch.1, p.3.
35. The clearance of 2016 results is being reviewed in cases EB-2018-0301 (Enbridge) and EB-2018-0300 (Union Gas).
36. The benefit-cost ratios of natural gas programs using the TRC-plus test are not proportionally affected as much by the change in net-to-gross ratios as the utility unit cost of savings is. This is because the change removes a significant component of both the numerator (energy savings) and the denominator (incremental customer costs) in the TRC-plus test.
37. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020), EB-2014-0134 (Toronto: OEB, 22 December 2014) at 11-13.
38. “The option to spend 15% above the approved annual DSM budget is meant to allow the natural gas utilities to aggressively pursue programs which prove to be very successful.” (OEB, Filing Guidelines to the 2015-2020 DSM Framework for Natural Gas Distributors, EB-2014-0134 (Toronto: OEB, 22 December 2014) at 38.
39. “The TRC test includes the costs and benefits experienced by the utility system, plus costs and benefits to program participants, and is often considered to measure the net benefits to the region as a whole.” (DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 30 October 2018) at 3).
40. DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 30 October 2018) at Table 256.
41. Ibid, at Table 257.
42. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-0134 (22 December 2014) at 22.
43. Ibid, at 23.  

“More specifically, 40% of the maximum shareholder incentive available (or \$4.2 million) should be provided for performance achieving a scorecard weighted score of 100%, with the remaining 60% (or \$6.3 million) available for performance at 150% and for achievement of targets for priority programs.”
44. Ibid, at 18.
45. DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 30 October 2018).
46. Enbridge, DSM final annual report (North York, ON: Enbridge, 17 November 2018) at 32.
47. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-0134 (22 December 2014) at 26.
48. Enbridge, “DSM mid-term review” (presentation, 6 September 2018) at slide 9.
49. Union Gas, “DSM mid-term review presentation” (presentation, 6 September 2018) at slide 10.
50. The small volume metric includes savings from DSM participants with a three-year average annual consumption of less than 75,000 m<sup>3</sup>/year in the Commercial sector or 340,000 m<sup>3</sup>/year in the Industrial sector, and also includes savings from the Residential sector. (Enbridge, DSM final annual report (North York, ON: Enbridge, 17 November 2018) at 26.)
51. Ibid, at 64-67.
52. Union Gas, 2016 DSM final annual report (Chatham, ON: Union Gas, 30 November 2018) at 58-59.
53. Ibid, at 95.
54. Ibid.

55. Ontario Energy Board, Demand Side Management Framework for Natural Gas Distributors (2015-2020) EB-2014-0134 (Toronto: OEB, 22 December 2014) at 26.
56. DNV-GL, 2016 Natural Gas Demand Side Management Annual Verification (Toronto: OEB, 30 October 2018).
57. Enbridge, DSM annual report (North York, ON: Enbridge, 17 November 2018) at 74-75, 89-92.
58. Union Gas, 2016 DSM final annual report (Chatham, ON: Union Gas, 30 November 2018) at 70-71.
59. Enbridge, DSM annual report (North York, ON: Enbridge, 17 November 2018) at 96.
60. Union Gas, 2016 DSM final annual report (Chatham, ON: Union Gas, 30 November 2018) at 103.