ONTARIO GAS DSM EVALUATION CONTRACTOR

# 2020 Natural Gas Demand-Side Management Annual Verification Report

## Ontario Energy Board

**Date:** December 2, 2021

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# AUDIT OPINION

Enbridge Gas Inc. (formerly Enbridge Gas Distribution Inc. and Union Gas Limited)[1] implemented energy conservation programs designed to reduce natural gas use at participating customer's homes and businesses throughout the 2020 calendar year. The programs were approved by the Ontario Energy Board (OEB) and were available to all types of natural gas customers, including residential, low income, commercial, and industrial.

The energy conservation programs, called demand-side management (DSM) programs, are regulated by the OEB. The OEB establishes policy guidance, holds public hearings to determine the merit of utility proposals, and approves the use of ratepayer funding for the utility to implement the programs. Depending on the level of success in meeting its annual OEB-approved targets, the utility may be eligible for a performance incentive, called the shareholder incentive. The maximum possible shareholder incentive for each legacy utility is $10,450,000, although this amount is only available if performance meets 150% of all OEB-approved targets. The utility may claim lost revenue as a result of the lower natural gas sales.

The Evaluation Contractor team[2] (DNV and Dunsky) provides the following opinion on the achieved natural gas savings, lost revenue, shareholder incentive, and cost effectiveness of the DSM programs offered by Enbridge and Union for the calendar year ending December 31, 2020.

Our opinion stems from our review of the program documentation, utility shareholder incentive calculations, and lost revenue calculations as set forth in the report that follows. It is also based on the information available at the time that this report was published.

In our opinion, the following figures are reasonable, subject to the qualifications given above.

| Definition | Enbridge Results | Union Results |
|---|---|---|
| Shareholder Incentive | $3,586,470 | $2,726,196 |
| Lost Revenue | $30,527 | $153,421 |
| Verified Net Cumulative Energy Savings ($m^3$) | 771,050,466 | 855,405,826[3] |
| Total Dollars Spent (not reviewed) | $64,548,153 | $54,488,582 |
| Benefit Cost Ratio (TRC-plus test)[4] | 2.33 | 1.91 |

[1] Enbridge Gas Distribution Inc. (Enbridge) and Union Gas Limited (Union) amalgamated effective January 1, 2019 to become Enbridge Gas Inc. In 2019, Enbridge Gas Inc. delivered the two legacy utility DSM plans in its different rate zones – EGD rate zone and Union rate zones (North and South). For ease of reference, throughout this report, the EC has referred to the legacy utility DSM plans as Enbridge and Union.

[2] DNV leads the Evaluation Contractor team and led the evaluation of the 2020 DSM programs, with contributions from Dunsky.

[3] The first-year and cumulative energy savings values do not include the -1.52% savings from the RunSmart program or the 2.61% savings from the Strategic Energy Management program, which are part of the Performance Based scorecard. The -1.52% savings from RunSmart are estimated to be -53,159 annual and -265,793 cumulative CCM savings. The 2.61% savings from Strategic Energy Management are estimated to be 1,206,000 annual and 6,030,000 cumulative CCM savings.

[4] The cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness.

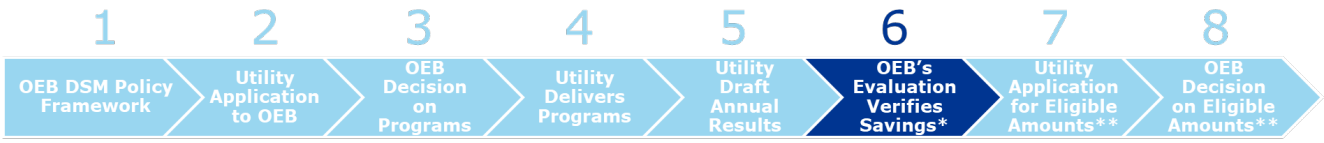
# 1 EXECUTIVE SUMMARY

Enbridge Gas Inc.[5] delivers demand-side management (DSM) programs under the Demand Side Management Framework for Natural Gas Distributors (2015-2020)[6] developed by the Ontario Energy Board (OEB). Through the framework development and approval of DSM plans, the OEB sets budgets, targets, and cost effectiveness thresholds, in addition to establishing a shareholder incentive for the successful delivery of the approved programs.

The OEB verifies, on an annual basis, natural gas savings and other aspects of energy conservation programs provided by Enbridge Gas Inc. and funded by ratepayers. The energy conservation programs are designed to reduce customer demand for gas through increases in energy efficient technologies and equipment using various methods such as financial incentives, building modifications, education, and outreach. These programs attempt to impact customers' energy usage (demand), rather than utility energy capacity (supply), which is why they are referred to as demand-side management programs.

This report provides results of the annual verification of natural gas DSM programs delivered in 2020 and offered by Enbridge Gas Inc. The verification was conducted on behalf of the OEB by its independent, third-party evaluation contractor (EC), the team of DNV and Dunsky.

The graphic below provides a general depiction of the broader process of creating DSM programs and their evaluation that led to this evaluation report.




*The OEB's EC conducts an expert, independent review to verify the program results, including natural gas savings and participants, and provides an opinion on the utility performance related to OEB-approved targets

**Eligible amounts include performance incentives the utility may be eligible to receive due to meeting or exceeding OEB-approved targets, lost revenues related to program-related natural gas savings, and changes to costs previously approved by the OEB

Independently verified program results, such as natural gas savings and the number of participants, provides important information to the OEB on the success and effectiveness of the programs and prudent use of ratepayer funding. Additionally, verified results are required for the utility to seek approval of any performance incentive related to OEB-approved targets. The financial incentive is to Enbridge Gas Inc.'s shareholders. The financial incentive is determined by reviewing the utility's accomplishments against their OEB-set targets, assembled in groupings called scorecards along with associated metrics that are used to determine program achievements. The degree of verified achievement (relative to the metric target) determines the shareholder incentive for each legacy utility DSM plan. The shareholder incentive is paid to the utility shareholders to encourage the utility to deliver DSM programs.

The annual verification uses the findings of any program-specific evaluation study applicable to the 2020 programs and applies them to the natural gas energy savings and achieved scorecard values reported by the utility to the OEB. For programs or metrics where no evaluation studies have been completed during the current evaluation, the EC team conducts a due diligence review of program documentation to verify the savings or metrics reported by the utilities.

[5] Enbridge Gas Distribution Inc. (Enbridge) and Union Gas Limited (Union) amalgamated effective January 1, 2019 to become Enbridge Gas Inc. However, the DSM framework and 2015-2020 DSM Plans were developed and approved by the OEB before amalgamation, and Enbridge Gas Inc. continues to deliver the two legacy utility DSM plans individually in its different rate zones – EGD rate zone and Union rate zones (North and South) through the remainder of the framework. As such, the EC still evaluates each DSM plan separately by legacy utility (Enbridge and Union). For ease of reference, throughout this report, the EC has referred to the legacy utility DSM plans as Enbridge and Union.

[6] EB-2014-0134

The overall objectives are to provide an independent opinion on whether natural gas savings achieved through programs are reasonable, and that the corresponding DSM shareholder incentives and lost revenue amounts have been accurately calculated.

Table 1-1 and Table 1-3 show the verified, comprehensive scorecard results for the Enbridge and Union rate zones, respectively.

The OEB also requires the utility to deliver DSM programs that are cost-effective, which means the benefits produced by the programs outweigh the cost of their implementation (including the benefit of reduced use of natural gas, electricity, and water, the cost of those resources, and carbon emissions). The methods that the EC used to calculate cost effectiveness in 2020 are the same ones used in the 2019 analysis. The cost effectiveness results (in terms of TRC-Plus benefit-cost ratio) for each program are found in Table 1-1 and Table 1-3 in the rightmost column. The bigger the number, the more cost effective the program is. These tables also show the amount of money spent by the utilities to implement the energy efficiency programs.

Table 1-2 and Table 1-4 show the verified revenues that Enbridge and Union lost, respectively, as a result of implementing DSM programs. The lost revenue is shown by rate class and is only the revenue lost during the 2020 calendar year.[7] A rate class is a group of customers that pay the same rate for their gas usage and service.

In summary:

- Enbridge programs offered in 2020 were verified to achieve:
  - Savings in 2020 of 39,750,695 $m^3$ (equal to heating 17,282 homes in Ontario for a year[8])
  - Cumulative savings of 771,050,467 $m^3$ (translating to emissions reductions of 1,507,404 tons of $CO_2$ equivalent[9])
- Union programs offered in 2020 were verified to achieve:[10]
  - Savings in 2020 of 55,334,347 $m^3$ (equal to heating 24,058 homes in Ontario for a year[11])
  - Cumulative savings of 855,405,826 $m^3$ (translating to emissions reductions of 1,672,318 tons of $CO_2$ equivalent[12])

In this report, we made several recommendations for the programs, focusing primarily on issues related to program data and documentation, energy modelling, and cost effectiveness.

At the time this report was published, the EC was conducting a study comparing the savings estimates from Enbridge Gas Inc.'s digital tool (eTools) with those estimated by modelling site-level energy usage from customer bills.[13] Phase 1 found that there was a difference that warrants additional investigation into the reasons and magnitude of the discrepancy, which was being conducted as Phase 2.

[7] The lost revenue shown in these tables are not the entire lost revenue the utility realizes from its DSM programs. A forecast DSM amount, built into natural gas rates, accounts for a large majority of lost revenues.

[8] This calculation uses an average annual natural gas usage of 2,300 $m^3$ per year.

[9] This calculation uses cumulative savings and an emission factor of 0.001955 $tCO^2e/m^3$ (derived based on the federal carbon price of $20 in 2020 and the prescribed charge rate for marketable gas in Ontario).

[10] The first-year and cumulative energy savings values do not include the -1.52% savings from the RunSmart program or the 2.61% savings from the Strategic Energy Management program, which are part of the Performance Based scorecard. The -1.52% savings from RunSmart are estimated to be -53,159 annual and -265,793 cumulative CCM savings. The 2.61% savings from Strategic Energy Management are estimated to be 1,206,000 annual and 6,030,000 cumulative CCM savings.

[11] This calculation uses an average annual natural gas usage of 2,300 $m^3$ per year.

[12] This calculation uses cumulative savings and an emission factor of 0.001955 $tCO^2e/m^3$ (derived based on the federal carbon price of $20 in 2019 and the prescribed charge rate for marketable gas in Ontario).

[13] eTools is a digital Enbridge tool that leverages engineering calculations to estimate energy savings from boiler space and water heating projects.

## 1.1 Enbridge Scorecard Results

**Table 1-1. Enbridge savings, spend, cost effectiveness, and incentive results*†**

| Program | Metric | Verified First-Year Savings ($m^3$) | Verified Cumulative Savings or Other Metric | Percent of Target Achieved | DSM Shareholder Incentive | OEB-Approved Program Budget | Utility Spending** | Budget/ Spending Variance | Benefit Cost Ratio (TRC Plus Test)*** | | Net Present Value (TRC Plus)*** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | O&A Costs | No O&A Costs | |
| **Resource Acquisition** | | **35,206,479** | **676,770,167** | | | **$42,908,517** | **$44,710,224** | **$1,801,707 (4%)** | **2.45** | | **$97,622,000** |
| C&I Custom | CCM Savings | 21,699,876 | 412,351,613 | 89.6% | $2,904,033 | $7,658,968 | $7,324,851 | -$334,117 | 3.98 | 4.57 | $67,581,000 |
| C&I Direct Install | CCM Savings | 1,707,318 | 21,704,175 | | | $4,950,581 | $2,004,811 | -$2,945,770 | 2.35 | 2.51 | $3,295,000 |
| C&I Prescriptive | CCM Savings | 1,559,547 | 21,048,071 | | | $2,323,114 | $1,516,317 | -$806,797 | 1.62 | 1.70 | $2,230,000 |
| Comprehensive Energy Management | CCM Savings | 3,523 | 73,010 | | | $98,838 | $5,141 | -$93,697 | 0.06 | 0.06 | -$233,000 |
| Energy Leaders Initiative | CCM Savings | - | - | | | $0 | $4,475 | $4,475 | - | - | - |
| Residential Adaptive Thermostats | CCM Savings | 3,127,674 | 46,915,108 | | | $2,262,870 | $2,116,192 | -$146,678 | 2.41 | 2.53 | $9,850,000 |
| Run-it-Right | CCM Savings | 151,769 | 758,845 | | | $1,653,979 | $297,486 | -$1,356,493 | 0.61 | 0.62 | -$119,000 |
| Home Energy Conservation | CCM Savings | 6,956,774 | 173,919,345 | | | $18,727,200 | $26,623,413 | $7,896,213 | 1.48 | 1.55 | $15,018,000 |
| | Participants | N/A | 14,013 | 131.0% | | | | | N/A | N/A | N/A |
| Resource Acquisition Overhead | N/A | | N/A | N/A | | $5,232,967 | $4,817,538 | -$415,429 | | | |
| **Low Income** | | **4,544,215** | **94,280,300** | | | **$13,849,850** | **$12,585,321** | **-$1,264,529 (-9%)** | **1.69** | | **$9,207,000** |
| Home Winterproofing | CCM Savings | 1,304,632 | 26,642,997 | 100.3% | $501,162 | $6,736,859 | $6,363,661 | -$373,198 | 1.13 | 1.22 | $809,000 |
| Multi-Residential | CCM Savings | 3,239,584 | 67,637,303 | 61.6% | | $3,967,353 | $2,947,688 | -$1,019,665 | 2.16 | 2.56 | $8,398,000 |
| New Construction | Applications | N/A | 15 | 160.0% | | $1,456,560 | $1,718,984 | $262,424 | N/A | N/A | N/A |
| Low Income Overhead | N/A | | N/A | N/A | | $1,689,078 | $1,554,987 | -$134,091 | | | |
| **Market Transformation** | | **N/A** | **N/A** | | | **$7,181,118** | **$5,842,215** | **-$1,338,903 (19%)** | **N/A** | **N/A** | **N/A** |
| School Energy Competition | Schools | N/A | 7 | 9.7% | $181,276 | $520,200 | $68,748 | -$451,452 | N/A | N/A | N/A |
| Run-it-Right | Participants | | 65 | 112.5% | | $329,209 | $202,106 | -$127,103 | | | |
| Comprehensive Energy Management | Participants | | 7 | 21.9% | | $941,562 | $246,573 | -$694,989 | | | |
| Residential Savings by Design | Builders | | 35 | 100.0% | | $3,392,296 | $3,326,434 | -$65,862 | | | |
| | Homes | | 2,768 | 103.7% | | | | | | | |
| Commercial Savings by Design | Developments | | 36 | 125.0% | | $1,122,068 | $1,192,097 | $70,029 | | | |
| Market Transformation Overhead | N/A | | N/A | N/A | | $875,783 | $806,257 | -$69,526 | | | |
| **Enbridge Program Total** | | **39,750,695** | **771,050,467** | | **$3,586,470** | **$63,939,485** | **$63,137,760** | **-$801,725 (-1%)** | **2.33** | | **$106,829,000** |
| **Portfolio Overhead and Administrative Costs** | | | | | | $3,817,891 | $1,410,393 | -$2,407,498 (-63%) | | | |
| **Enbridge Portfolio Total** | | | | | | **$67,757,376** | **$64,548,153** | **-$3,209,223 (-5%)** | | | |

*Not all values may compute exactly due to rounding.
†CCM are cumulative cubic meters of natural gas.
**The OEB's DSM Framework allows for utility spending to differ from the approved budget. Sections 6.6 and 11.2 of the Filing Guidelines provide details for acceptable spending differences.
***Cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness. Please see Appendix O for a more complete discussion of the application of O&A costs.

**Table 1-2. Enbridge lost revenue results***

| Rate Class | Verified Lost Revenue |
|---|---|
| Rate 110 | $11,463 |
| Rate 115 | $1,832 |
| Rate 135 | $16,455 |
| Rate 145 | $0 |
| Rate 170 | $777 |
| **TOTAL** | **$30,527** |

*Not all values may compute exactly due to rounding.

## 1.2 Union Scorecard Results

**Table 1-3. Union achievement, spend, cost effectiveness, and incentive results*†**

| Program | Metric | Verified First-Year Savings ($m^3$) | Verified Cumulative Savings or Other Metric | Percent of Target Achieved | DSM Shareholder Incentive | OEB-Approved Program Budget | Utility Spending** | Budget/ Spending Variance | Benefit Cost Ratio (TRC Plus Test)*** | | Net Present Value (TRC Plus)*** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | O&A Costs | No O&A Costs | |
| **Resource Acquisition** | | **40,161,038** | **669,887,949** | | | **$37,810,983** | **$33,189,490** | **-$4,621,493 (-12%)** | **1.80** | | **$71,155,000** |
| C&I Custom | CCM Savings | 32,027,704 | 497,922,990 | 92.5% | $2,307,872 | $7,808,000 | $9,042,149 | $1,234,149 | 2.03 | 2.17 | $56,728,000 |
| C&I Direct Install | CCM Savings | 306,379 | 4,464,136 | | | $2,500,000 | $537,480 | -$1,962,520 | 2.47 | 2.63 | $743,000 |
| C&I Prescriptive | CCM Savings | 1,568,749 | 23,544,978 | | | $7,149,000 | $1,590,948 | -$5,558,052 | 1.89 | 1.99 | $3,161,000 |
| Residential Adaptive Thermostats | CCM Savings | 1,249,932 | 18,748,979 | | | $1,500,000 | $893,916 | -$606,084 | 2.37 | 2.57 | $4,062,000 |
| Home Reno Rebate | CCM Savings | 5,008,275 | 125,206,865 | | | $12,226,000 | $15,652,806 | $3,426,806 | 1.24 | 1.32 | $6,461,000 |
| | Homes Built | N/A | 7,619 | 110.5% | | | | | N/A | N/A | N/A |
| Overhead and Administrative Costs | N/A | | N/A | N/A | | $6,627,983 | $5,472,190 | -$1,155,793 | | | |
| **Low Income** | | **2,959,452** | **58,870,411** | | | **$15,005,488** | **$10,645,192** | **-$4,360,296 (-29%)** | **1.19** | | **$2,343,000** |
| Home Weatherization | CCM Savings | 1,771,414 | 38,411,013 | 72.0% | $0 | $8,374,000 | $7,166,389 | -$1,207,611 | 1.36 | 1.47 | $2,786,000 |
| Furnace End-of-Life | CCM Savings | - | - | | | $917,000 | $0 | -$917,000 | - | - | - |
| Indigenous | CCM Savings | - | - | | | $448,000 | $66,900 | -$381,100 | 0.00 | 0.00 | -$67,000 |
| Multi-Family - Social & Assisted | CCM Savings | 727,667 | 12,142,699 | 38.1% | | $3,573,000 | $2,536,384 | -$1,036,616 | 0.92 | 0.98 | -$378,000 |
| Multi-Family - Market Rate | CCM Savings | 460,370 | 8,316,698 | 124.2% | | | | | | | |
| Overhead and Administrative Costs | N/A | N/A | N/A | N/A | | $1,693,488 | $875,519 | -$817,969 | N/A | N/A | N/A |
| **Large Volume** | | **12,213,857** | **126,647,466** | | | **$4,000,000** | **$3,338,499** | **-$661,501 (-17%)** | **5.63** | | **$23,373,000** |
| Large Volume | CCM Savings | 12,213,857 | 126,647,466 | 95.2% | $224,513 | $3,150,000 | $2,921,648 | -$228,352 | 5.63 | 6.13 | $23,373,000 |
| Overhead and Administrative Costs | N/A | N/A | N/A | N/A | | $850,000 | $416,851 | -$433,149 | N/A | N/A | N/A |
| **Market Transformation** | | **N/A** | **N/A** | | | **$2,338,070** | **$2,168,215** | **-$169,855 (-7%)** | **N/A** | | **N/A** |
| Optimum Home | % of Homes Built | N/A | 39.19% | 121.3% | $193,812 | $841,000 | $595,522 | -$245,478 | N/A | N/A | N/A |
| Commercial New Construction | Developments | | 24 | 91.7% | | $1,000,000 | $1,041,572 | $41,572 | | | |
| Overhead and Administrative Costs | N/A | | N/A | N/A | | $497,070 | $531,121 | $34,051 | | | |
| **Performance Based** | | **N/A** | **N/A** | | | **$1,053,000** | **$383,244** | **-$669,756 (-64%)** | **3.79** | | **$967,000** |
| RunSmart**** | Participants | N/A | 0 | 0.0% | $0 | $177,000 | $58,471 | -$118,529 | -2.53 | -2.13 | -$96,000 |
| | % Savings | | -1.52% | 0.0% | | | | | | | |
| Strategic Energy Management | % Savings | | 2.61% | 54.8% | | $625,000 | $232,526 | -$392,474 | 4.32 | 6.21 | $1,063,000 |
| Overhead and Administrative Costs | N/A | | N/A | N/A | | $251,000 | $92,247 | -$158,753 | N/A | N/A | N/A |
| **Union Program Total** | | **55,334,347** | **855,405,826** | | **$2,726,196** | **$60,207,541** | **$49,724,640** | **-$10,482,901 (-17%)** | **1.91** | | **$97,837,000** |
| **Portfolio Overhead and Administrative Costs** | | | | | | $5,642,000 | $4,763,943 | -$878,057 (-16%) | | | |
| **Union Portfolio Total** | | | | | | **$65,849,541** | **$54,488,582** | **-$11,360,959 (-17%)** | | | |

*Not all values may compute exactly due to rounding.
†CCM are cumulative cubic meters of natural gas.
**The OEB's DSM Framework allows for utility spending to differ from the approved budget. Sections 6.6 and 11.2 of the Filing Guidelines provide details for acceptable spending differences.
***Cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness. Please see Appendix O for a more complete discussion of the application of O&A costs.
****First-year and cumulative energy savings do not include the -1.52% savings from RunSmart or the 2.61% savings from Strategic Energy Management, which are part of the Performance Based scorecard. The -1.52% savings from RunSmart are estimated to be -53,159 annual and -265,793 cumulative CCM savings. The 2.61% savings from Strategic Energy Management are estimated to be 1,206,000 annual and 6,030,000 cumulative CCM savings.

**Table 1-4. Union lost revenue results***

| Rate Class | Verified Lost Revenue |
|---|---|
| M4 Industrial | $113,871 |
| M5 Industrial | $1,508 |
| M7 Industrial | $22,919 |
| T1 Industrial | $613 |
| T2 Industrial | $841 |
| 20 Industrial | $1,665 |
| 100 Industrial | $12,005 |
| **TOTAL** | **$153,421** |

*Not all values may compute exactly due to rounding.

## 1.3 Report Structure

The table below provides an overview of the report structure and a link to each major section within the remainder of the report.

| Section | Contents |
|---|---|
| 2. Glossary of Key Terms and Concepts | This section contains a guide for readers to understand the terminology and concepts used throughout the report. |
| 3. Introduction | This section provides the background of the annual verification report. |
| 4. Scorecard: Resource Acquisition | • Scorecard achievements for Enbridge<br>• Scorecard achievements for Union |
| 5. Scorecard: Low Income | • Scorecard achievements for Enbridge<br>• Scorecard achievements for Union |
| 6. Scorecard: Large Volume | • Scorecard achievements for Union |
| 7. Scorecard: Market Transformation | • Scorecard achievements for Enbridge<br>• Scorecard achievements for Union |
| 8. Scorecard: Performance Based | • Scorecard achievements for Union |
| 9. Utility Summary of Shareholder Incentives, Program Spending, Cost Effectiveness, and Lost Revenue | • Enbridge Results<br>• Union Results |
| 10. Findings and Recommendations | Topics in this section include overall findings and recommendations, whole home simulation modelling, and cost effectiveness. |
| 11. Appendices | • Evaluation Background<br>• Metric Verification Activities<br>• Changes from 2019 Evaluation<br>• Summary of Verification Adjustments<br>• Resource Acquisition Scorecards<br>• Low Income Scorecards<br>• Large Volume Scorecard<br>• Market Transformation Scorecards<br>• Performance Based (Union) and Market Transformation (Enbridge) Scorecards<br>• Review of Metric Target Calculations<br>• Review of Lost Revenue and DSM Shareholder Incentive Calculations<br>• Lost Revenue and DSM Shareholder Incentive: Detailed Tables<br>• Prescriptive Savings Verification<br>• Program Spending Tables<br>• Cost Effectiveness Methodology<br>• Findings and Recommendations: Summary Tables |

# 2 GLOSSARY OF KEY TERMS AND CONCEPTS

| | |
|---|---|
| **Adjustment factor** | An adjustment factor is a percentage or ratio that allows evaluation findings from a sample of projects to be applied to and "adjust" the population of projects. An example is an installation rate, which reflects the percentage of participants who installed a prescriptive measure and kept it installed. |
| **Attribution** | The energy savings or other benefits that are the result of a utility energy program's influence, including free ridership and spillover effects (see definitions in this Glossary). |
| **Baseline, base case** | The amount of gas used in the absence of a program offering. This could be the amount of gas the equipment in place is using, or the amount of gas that a standard efficiency piece of equipment would use. |
| **Building envelope** | Exterior surfaces of a building (for example walls, windows, roof, and floors) that separate the conditioned space from the outdoors. |
| **C&I** | Stands for commercial and industrial and can mean building types or customer types. |
| **CCM** | Cumulative cubic meters (cumulative $m^3$), and in this report, represents the volume of natural gas savings verified over the life of the measure. |
| **Code** | An action or standard required by local or federal laws for safety, environmental, or other reasons. For example, a building code that requires a minimum fuel efficiency for furnaces. |
| **Cost effectiveness** | Refers to the analysis that determines whether or not the benefits of a project/measure (see Glossary) are greater than the costs. It is based on the net present value of savings over the equipment life of the measure. |
| **Cost effectiveness test - PAC** | A test that compares the utility's avoided cost benefits with energy efficiency program expenditures (incentives plus administrative costs). |
| **Cost effectiveness test – TRC-Plus** | A test that compares benefits to society as a whole (avoided cost benefits plus non-energy benefits) with the participant's cost of installing the measure plus the cost of incentives and program administration. |
| **Custom project savings verification (CPSV)** | The process by which the cumulative gross savings estimates of the utilities' DSM projects are verified. A custom DSM project is based on customer-specific information and considerations, as opposed to standardized projects, which are called prescriptive. |
| **Customer – Enbridge** | Enbridge identifies unique customers based on the account number and the contact information. A customer may have multiple site addresses, decision makers, account numbers, and utilities. Customers can only be identified for records for which we received contact information. |
| **Customer – Union** | Union identifies unique customers based on the customer identification (ID) number and the contact information. A customer may have multiple site addresses, decision makers, customer IDs, and utilities. Customers can only be identified for records for which we received contact information. |
| **Demand side management (DSM)** | The act of modifying customer demand for gas through utility programs using various methods such as financial incentives (such as rebates), education, and outreach. |
| **Domain** | A grouping of like projects. For example, a domain may be defined as projects within a specific sector (such as residential homes), or it might be a category of measures (see definition in Glossary), end uses, or other categories. |

| | |
|---|---|
| **Dual baseline** | A phrase used to describe the baseline for a measure that replaces working equipment with high efficiency equipment, also known as early replacement. The first baseline is the energy used by the existing equipment and the second baseline is the energy used by a standard efficiency piece of equipment. |
| **Early replacement (ER)** | The act of replacing a piece of equipment that is not past its expected useful life (EUL) and is in good operating condition. |
| **Early replacement period (ER Period)** | Years that the existing equipment would have continued to be in use had it not been replaced early. This is the same as remaining useful life, or RUL. |
| **Effective useful life (EUL)** | The length of time that a measure (see definition in Glossary) is expected to provide its estimated annual gas savings. EUL depends on equipment lifetime and measure persistence (see Glossary definition). |
| **Energy advisors** | People who work for utilities or their programs to provide information to customers about energy saving opportunities and program participation. This term includes, but is not limited to, Enbridge's Energy Solutions Consultants and Union's Account Managers. |
| **Ex ante** | This means "from before" in Latin. Program evaluators use this term to describe claimed or reported inputs, assumptions, savings, etc. for a measure (see definition in Glossary) or program. |
| **Ex post** | This means "from behind" in Latin. Program evaluators use this term to describe inputs, assumptions, savings, etc. that are assessed and verified after savings are reported or claimed. The term does not include assessment and verification of the amount of program influence (see free ridership) on inputs, assumptions, savings, etc. This term is sometimes used to mean verified gross savings. |
| **Free rider** | A customer who would install or perform the same energy-saving measure (see definition in Glossary) without utility influence. |
| **Free ridership** | The portion of a program's verified energy savings that would naturally occur without the utility program. |
| **Free ridership based attribution** | The portion of a program's verified energy savings that the utility influenced if one only considers free ridership and not spillover. Free ridership based attribution is the complement of free ridership.<br>(free ridership based attribution = 100% - free ridership). |
| **Gross savings** | Changes in energy consumption and/or demand from programs or projects included in utility programs, regardless of reasons for participation. |
| **In situ** | This means "on site" or "in position" in Latin. For verification of energy savings, this means the existing measure (see Glossary definition) conditions and/or efficiency. |
| **Incentive** | An incentive is often a payment from the utility to participants of a DSM program. Incentives can be paid to customers, vendors, or other parties. |
| **Incremental cost** | The difference in purchase price (and any differences in related installation or implementation costs), at the time of purchase, between the energy-saving measure (see Glossary definition) and the base case measure. In some early retirements and retrofits, the full cost of the efficient technology is the incremental cost. |
| **Industry standard practice (ISP)** | A common practice used within an industry but not defined by code (see Glossary definition). For example, the agriculture sector is not covered by code, so the "typical" level of insulation used on hot water pipes is considered ISP. |

| | |
|---|---|
| **Input assumptions** | Operating characteristics and associated units of resource savings for DSM technologies and measures (see Glossary definition). These cover a range of typical DSM activities, measures, and technologies with residential, low-income, commercial and industrial applications. |
| **Lifetime cumulative savings** | These are total gas savings (in cumulative cubic meters, or CCM) over the life of a measure (see Glossary definition) and they are sometimes referred to as just "cumulative" or "lifetime" savings. |
| **Maintenance (Maint.)** | This is to repair, maintain, or restore to prior efficiency and/or optimum operation. |
| **Measure** | Equipment, technology, practice, or behavior that, once installed or working, results in a reduction in energy use. |
| **Measure – Enbridge** | For Enbridge, measures are identified in the tracking data as a unique combination of project ID and measure ID. Multiple measures may belong to the same project. |
| **Measure – Union** | For Union, measure refers to a project ID and line ID in the tracking data. Multiple measures may belong to the same project. |
| **Measure persistence** | How long a measure remains installed and performs as originally predicted in relation to its EUL. This considers events like business turnover, early retirement of installed equipment, and other reasons measures might be removed or discontinued. |
| **Measurement and Verification (M&V)** | The verification of energy savings using methods not including attribution/free ridership assessment. |
| **Metric** | This is a term used by the OEB to measure a utility's program achievement. Under the DSM framework, programs are grouped into categories, called scorecards. Each program within a scorecard is assigned at least one metric that is used to measure utility performance. The metric for many programs is CCM savings, or a reduction in natural gas consumption, while other programs have non-savings metrics such as the number of program participants. Within each scorecard, various metrics are combined to produce an overall scorecard achievement. |
| **MF** | Means multifamily (multi-residential) and can be used to describe a building or program. |
| **Net-to-gross** | The ratio of net energy savings to gross savings. The NTG ratio is applied to gross program savings to convert them into net program savings. |
| **New construction (NC)** | New buildings or spaces. |
| **Non-early replacement period (non-ER period)** | The years after the ER period and up to the EUL. |
| **Normal replacement (NR)** | A measure that replaces a piece of equipment that has reached or is past its EUL and not in good operating condition. |
| **Program** | The OEB uses this term to categorize sub-units of Scorecards. For example, a program could be the C&I Custom Program within the Resource Acquisition Scorecard. DNV defines programs consistent with the OEB's Decision and Order approving the 2015-2020 DSM Plans. |
| **Program evaluation** | The activities related to the collection, analysis, and reporting of data for purposes of measuring program impacts (including gas savings and participation) from past, existing, or potential programs. |
| **Program spending** | The amount spent running energy-savings programs, not including the costs of running (called overhead costs) the larger portfolio of programs. This value can be divided into spending for program measures and incentives, as well as program-specific costs. |

| | |
|---|---|
| **Project - Enbridge** | For Enbridge, projects are identified in the tracking data based on the project ID. A project may have multiple measures as indicated by measure IDs in the current data tracking system. |
| **Project – Union** | For Union, projects are identified in the tracking data based on project ID. A project may have multiple measures as indicated by measure IDs in the current data tracking system. |
| **Rate class** | The OEB establishes distribution rate classes for Enbridge and Union. Distribution rate classes group customers with similar energy profiles. |
| **Realization rate** | This is the ratio of gross evaluated savings to gross claimed savings. This is used to provide a comparison of the savings that were achieved to the savings that were predicted. |
| **Remaining useful life (RUL)** | The number of years that the existing equipment would have remained in service and in good operating condition had it not been replaced. This is the same as the ER period. |
| **Replace on burnout (ROB)** | A measure that replaces a failed or failing piece of equipment. |
| **Retrofit add-on (REA)** | A measure that reduces energy use by modifying an existing piece of equipment. |
| **Scorecard** | A scorecard allows for multiple different kinds of metrics such as cumulative natural gas savings and/or participants enrolled to be used simultaneously to measure annual utility performance. Each utility has a scorecard identified for each program year, which can be found in the Ontario Energy Board Decision and Order EB-2015-0029/EB-2015-0049. |
| **Scorecard Achievement** | The verified value for program-specific metric targets (CCM, applications, etc.) of each scorecard identified by the Annual Scorecard. This is the value that is verified as the achieved value by the Annual Verification report and used for calculation of the shareholder incentive. |
| **Shareholder Incentive** | As part of the current DSM Framework, an annual performance incentive is available to the gas utilities in the event program performance is at or above 75% of the OEB-approved targets up to a maximum of 150%. |
| **Site** | Sites are places identified based on unique site addresses provided by Union and Enbridge through the contact information data request. A site may have multiple units of analysis, measures, and projects. Sites can be identified by the evaluation only for records for which we receive contact information – i.e. records associated with account number (Enbridge) or customer ID (Union) that have projects in the sample or backup sample. |
| **Spillover effects** | These are reductions in energy consumption and/or demand that occur as a result of the presence of a utility DSM program, but are beyond program-related savings and are not part of the utility's verified savings. These effects could result from many factors including additional efficiency actions that program participants take outside the program as a result of having participated, changes in store availability of energy-using equipment, and changes in energy use by program non-participants as a result of utility program advertising. |
| **System optimization (OPT)** | To improve system or system settings to exceed prior efficiency. |
| **TRM** | Technical Resource Manual, which is a document that identifies standard methodologies and inputs for calculating energy savings. |
| **TSER** | This means telephone-supported engineering review. This is a method to support the verification of energy savings via telephone. |
| **Unit of analysis – Enbridge** | The level at which data are analyzed, which in 2020 is a "measure" or sub-project level for Enbridge. |

| | |
|---|---|
| **Unit of analysis - Union** | The level at which data are analyzed, which in 2020 is a project for Union. A project is equivalent to a measure for Union as the database did not have a sub-project level. |
| **Vendors** | Program trade allies, business partners, contractors, and suppliers who work with program participants to implement energy saving measures. |

# 3 INTRODUCTION

Enbridge Gas Inc.[14] delivers demand-side management (DSM) programs[15] under the Demand Side Management Framework for Natural Gas Distributors (2015-2020)[16] developed by the Ontario Energy Board (OEB). The 2020 Natural Gas DSM Annual Verification Report has been prepared for the OEB to report the results of the annual verification of the utility's natural gas DSM programs delivered in 2020. These verifications were conducted by the OEB's Evaluation Contractor (EC) team of DNV and Dunsky.

As part of the utility DSM plan, programs are grouped into categories, called scorecards. Each program within a scorecard is assigned at least one metric that is used to measure utility performance. The metric for many programs is cumulative cubic meters (CCM) savings, or a reduction in natural gas consumption, while other programs have non-savings metrics such as the number of program participants. Within each scorecard, various metrics are combined to produce an overall scorecard achievement.

Each scorecard metric is assigned a target.[17] The EC uses sampling, engineering reviews, documentation verification, and other techniques to verify the utilities' performance against the target for each program year. The percentage of target achieved for each metric is combined across the scorecard and used to determine the amount the utility is eligible for as a demand-side management shareholder incentive (DSMSI).[18]

In addition to the shareholder incentive, the OEB compensates the utilities for the reduced revenue taken as a result of delivering these DSM programs, called "lost revenue", which is also verified by the EC.

The OEB requires the utilities to deliver DSM programs that are cost-effective, which means the verified benefits produced by the programs outweigh the cost of their implementation.[19] Cost effectiveness results can be found in Sections 9.1.3, 9.2.3, and 11.15.

The OEB formed an evaluation advisory committee (EAC) to provide input and advice to the OEB and the EC on the evaluation and audit of DSM results. The EAC consists of representatives from OEB staff, the utilities, non-utility stakeholders, independent experts, staff from the Independent Electricity System Operator (IESO), and an observer from the Ministry of Energy, Northern Development and Mines. The EC received feedback and input from the EAC on the results of this annual verification. The content included in this report integrates our responses to their input. We thank them for their involvement.

[14] Enbridge Gas Distribution Inc. (Enbridge) and Union Gas Limited (Union) amalgamated effective January 1, 2019 to become Enbridge Gas Inc. In 2020, Enbridge Gas Inc. delivered the two legacy utility DSM plans in its different rate zones – EGD rate zone and Union rate zones (North and South). For ease of reference, throughout this report, the EC has referred to the legacy utility DSM plans as Enbridge and Union.

[15] Throughout this report, the word "program" is used consistent with the OEB's 2015-2020 DSM Framework and Decision on the utilities' 2015-2020 DSM Plans. See Section 2 for additional detail.

[16] EB-2014-0134

[17] These targets, which were set in part based on 2019 performance, are described in detail in Section 11.10.

[18] A minimum weighted scorecard achievement level of 75% is required to earn a portion of the available shareholder incentive for a scorecard.

[19] The cost-effectiveness methodology is described in detail in Section 11.15.

# 4 SCORECARD RESULTS: RESOURCE ACQUISITION

Programs within the Resource Acquisition scorecard provide customers with financial incentives that reduce the cost of upgrading to more energy efficient technologies and equipment. This scorecard comprises the largest share of both utilities' budgets and shareholder incentive.

## 4.1 Scorecard achievements for Enbridge

The metrics for the Enbridge Resource Acquisition scorecard include:

- Total cumulative large volume customer natural gas savings
- Total cumulative small volume customer natural gas savings
- Number of Home Energy Conservation program participants

A detailed explanation of the verification activities for all Resource Acquisition programs can be found in Section 11.5. Verified program achievements are listed in Table 4-1 with DSM shareholder incentive results in Table 4-2.

**Table 4-1. Enbridge 2020 Resource Acquisition verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Home Energy Conservation | Large Volume Customer - CCM | N/A | 408,463,368 |
| Residential Adaptive Thermostats | | N/A | |
| C&I Custom | | 391,035,327 | |
| C&I Direct Install | | 5,935,557 | |
| C&I Prescriptive | | 10,795,278 | |
| Comprehensive Energy Management | | 73,010 | |
| Run-it-Right | | 624,196 | |
| Home Energy Conservation | Small Volume Customer - CCM | 173,919,345 | 268,306,798 |
| Residential Adaptive Thermostats | | 46,915,108 | |
| C&I Custom | | 21,316,286 | |
| C&I Direct Install | | 15,768,618 | |
| C&I Prescriptive | | 10,252,793 | |
| Comprehensive Energy Management | | - | |
| Run-it-Right | | 134,649 | |
| Home Energy Conservation | Participants | 14,013 | 14,013 |

*Not all values may compute exactly due to rounding.

**Table 4-2. Enbridge's 2020 Resource Acquisition targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Large Volume Customer - CCM | 503,011,875 | 408,463,368 | 40.00% | 81.20% | 32.48% |
| Small Volume Customer - CCM | 252,515,052 | 268,306,798 | 40.00% | 106.25% | 42.50% |
| HEC Participants | 10,700 | 14,013 | 20.00% | 130.96% | 26.19% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 101.18% |
| **Maximum Scorecard Incentive** | | | | | $7,012,787 |
| **Verified Scorecard Incentive Achieved** | | | | | **$2,904,033** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

Table 4-3 shows the net cumulative natural gas savings (CCM) by program, as verified by the EC. Unlike Table 4-1, this table shows overall program totals, not broken out by Large or Small Volume metrics.

**Table 4-3. Enbridge's verified 2020 Resource Acquisition savings***

| Program | Net Cumulative Savings (m3) |
|---|---|
| Home Energy Conservation | 173,919,345 |
| Residential Adaptive Thermostats | 46,915,108 |
| C&I Custom | 412,351,613 |
| C&I Direct Install | 21,704,175 |
| C&I Prescriptive | 21,048,071 |
| Comprehensive Energy Management | 73,010 |
| Run-it-Right | 758,845 |
| **Resource Acquisition Total** | **676,770,167** |

*Not all values may compute exactly due to rounding.

## 4.2 Scorecard achievements for Union

This section summarizes the results of the EC's review of the Union Resource Acquisition scorecard. The metrics for the Union Resource Acquisition scorecard include:

- Total cumulative natural gas savings
- Number of residential deep savings participants

A detailed explanation of the verification activities for all Resource Acquisition programs can be found in Section 11.5. Verified program achievements are listed in Table 4-4 with DSM shareholder incentive results in Table 4-5.

**Table 4-4. Union 2020 Resource Acquisition verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Home Reno Rebate | CCM | 125,206,865 | 669,887,949 |
| Residential Adaptive Thermostats | | 18,748,979 | |
| C&I Custom | | 497,922,990 | |
| C&I Direct Install | | 4,464,136 | |
| C&I Prescriptive | | 23,544,978 | |
| Home Reno Rebate | Participants | 7,619 | 7,619 |

*Not all values may compute exactly due to rounding.

**Table 4-5. Union's 2020 Resource Acquisition targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| CCM | 724,381,376 | 669,887,949 | 75.00% | 92.48% | 69.36% |
| HRR Participants | 6,896 | 7,619 | 25.00% | 110.48% | 27.62% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 96.98% |
| **Maximum Scorecard Incentive** | | | | | $6,562,712 |
| **Verified Scorecard Incentive Achieved** | | | | | **$2,307,872** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

# 5 SCORECARD RESULTS: LOW INCOME

Programs within the Low Income scorecard provide eligible customers with opportunities to improve the energy efficiency of their homes (for residential customers) and buildings (for building owners and multifamily customers) at no cost.

## 5.1 Scorecard achievements for Enbridge

This section summarizes the results of the EC's review of the Enbridge Low Income scorecard. The metrics for the Enbridge Low Income scorecard include:

- Total cumulative natural gas savings for single family homes
- Total cumulative natural gas savings for multi-residential homes
- Total applications for Low Income New Construction

A detailed explanation of the verification activities for all Low Income programs can be found in Section 11.6. Verified program achievements are listed in Table 5-1 with DSM shareholder incentive results in Table 5-2.

**Table 5-1. Enbridge 2020 Low Income verified achievements**

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Home Winterproofing | CCM | 26,642,997 | 26,642,997 |
| Low Income Multi-Residential | CCM | 67,637,303 | 67,637,303 |
| Low Income New Construction | Applications | 15 | 15 |

**Table 5-2. Enbridge's 2020 Low Income scorecard targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Home Winterproofing CCM | 26,573,437 | 26,642,997 | 45.00% | 100.26% | 45.12% |
| Low Income Multi Residential CCM | 109,800,953 | 67,637,303 | 45.00% | 61.60% | 27.72% |
| Low Income New Construction Applications | 9 | 15 | 10.00% | 160.00% | 16.00% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 88.84% |
| **Maximum Scorecard Incentive** | | | | | $2,263,561 |
| **Verified Scorecard Incentive Achieved** | | | | | **$501,162** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

## 5.2 Scorecard achievements for Union

This section summarizes the results of the EC's review of the Union Low Income scorecard. The metrics for the Union Low Income scorecard include:

- Total cumulative natural gas savings for single-family programs
- Total cumulative natural gas savings for "social & assisted" multifamily projects
- Total cumulative natural gas savings for "market rate" multifamily projects

A detailed explanation of the verification activities for all Low Income programs can be found in Section 11.6. Verified program achievements are listed in Table 5-3 with DSM shareholder incentive results in Table 5-4.

**Table 5-3. Union 2020 Low Income verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Home Weatherization | CCM | 38,411,013 | 38,411,013 |
| Furnace End-of-Life | | - | |
| Indigenous | | - | |
| Multi-Family Social & Assisted | CCM | 12,142,699 | 12,142,699 |
| Multi-Family Market Rate | CCM | 8,316,698 | 8,316,698 |

*Not all values may compute exactly due to rounding.

**Table 5-4. Union's 2020 Low Income targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Single Family CCM | 53,363,223 | 38,411,013 | 60.00% | 71.98% | 43.19% |
| Multi-Family - Social & Assisted CCM | 31,862,656 | 12,142,699 | 35.00% | 38.11% | 13.34% |
| Multi-Family - Market Rate CCM | 6,695,369 | 8,316,698 | 5.00% | 124.22% | 6.21% |
| **Verified Total Weighted Scorecard Achieved**** | | | | | 62.74% |
| **Maximum Scorecard Incentive** | | | | | $2,604,447 |
| **Verified Scorecard Incentive Achieved** | | | | | **$0** |

*Not all values may compute exactly due to rounding.
**A minimum total weighted scorecard achievement level of 75% is required to earn a portion of the available shareholder incentive.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

# 6 SCORECARD RESULTS: LARGE VOLUME

Union's Large Volume Program comprises the entire Large Volume scorecard. This program provides large volume customers[20] with training presentations, energy efficiency calculation tools, energy use analysis, and other technical assistance from Union's Technical Account Managers. It uses a self-directed funding model in which eligible customers can access and utilize funds included in their natural gas rates. Funds from customers electing not to participate are dispersed to fund energy efficiency projects for participating Large Volume customers.

Enbridge did not have DSM programs specifically for their large volume customers in 2020.

## 6.1 Scorecard achievements for Union

This section summarizes the results of the EC's review of the Union Large Volume scorecard. The metric for the Large Volume scorecard is total cumulative natural gas savings. A detailed explanation of the verification activities for the Large Volume program, broken out by prescriptive and custom savings, can be found in Section 11.7. Verified program achievements are listed in Table 6-1 with DSM shareholder incentive results in Table 6-2.

**Table 6-1. Union 2020 Large Volume verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Large Volume | CCM | 126,647,466 | 126,647,466 |

*Not all values may compute exactly due to rounding.

**Table 6-2. Union's 2020 Large Volume targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| CCM | 133,017,196 | 126,647,466 | 100.00% | 95.21% | 95.21% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 95.21% |
| **Maximum Scorecard Incentive** | | | | | $694,265 |
| **Verified Scorecard Incentive Achieved** | | | | | **$224,513** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

[20] Large volume customers are those with very high natural gas consumption, typically large industrial and commercial facilities.

# 7 SCORECARD RESULTS: MARKET TRANSFORMATION

Programs within the Market Transformation scorecard focus on changing customer behavior and attitudes related to energy efficiency, intending to cause permanent change in the marketplace over time. Although energy savings may result from these programs, savings are typically not the primary goal.

## 7.1 Scorecard achievements for Enbridge

This section summarizes the results of the EC's review of the Enbridge Market Transformation scorecard. The metrics for the Enbridge Market Transformation scorecard include the number of:

- Builders for Residential Savings by Design
- Homes built for Residential Savings by Design
- New developments for Commercial Savings by Design
- Participating schools for School Energy Competition
- Participants for Run-it-Right
- Participants for Comprehensive Energy Management

As some programs are similar to Union Market Transformation programs, and others similar to Union Performance Based programs, the programs are divided between Section 11.8 (Market Transformation Scorecards) and Section 11.9 (Performance Based (Union) and Market Transformation (Enbridge) Scorecards), as listed in Table 7-1.

**Table 7-1. Enbridge Market Transformation program detailed evaluation, by appendix**

| Enbridge Program | Appendix |
|---|---|
| Commercial Savings by Design | H |
| Residential Savings by Design | |
| School Energy Competition | |
| Run-it-Right | I |
| Comprehensive Energy Management | |

Verified program achievements are listed in Table 7-2 with DSM shareholder incentive results in Table 7-3.

**Table 7-2. Enbridge 2020 Market Transformation verified achievements**

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| School Energy Competition | Schools | 7 | 7 |
| Run-it-Right | Participants | 65 | 65 |
| Comprehensive Energy Management | Participants | 7 | 7 |
| Residential Savings by Design | Builders | 35 | 35 |
| | Homes Built | 2,768 | 2,768 |
| Commercial Savings by Design | New Developments | 36 | 36 |

**Table 7-3. Enbridge's 2020 Market Transformation scorecard targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| School Energy Competition Schools | 72 | 7 | 10.00% | 9.72% | 0.97% |
| Run-it-Right Participants | 58 | 65 | 20.00% | 112.50% | 22.50% |
| Comprehensive Energy Management Participants | 32 | 7 | 20.00% | 21.88% | 4.38% |
| Residential Savings by Design Builders | 35 | 35 | 10.00% | 100.00% | 10.00% |
| Residential Savings by Design Homes | 2,669 | 2,768 | 15.00% | 103.71% | 15.56% |
| Commercial Savings by Design Developments | 29 | 36 | 25.00% | 125.00% | 31.25% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 84.65% |
| **Maximum Scorecard Incentive** | | | | | $1,173,652 |
| **Verified Scorecard Incentive Achieved** | | | | | **$181,276** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

## 7.2 Scorecard achievements for Union

This section summarizes the results of the EC's review of the Union Market Transformation scorecard. The metrics for the Union Market Transformation scorecard include:

- Percentage of homes built by builders enrolled in the Optimum Home program
- Number of new developments enrolled by participating builders for Commercial New Construction

A detailed explanation of the verification activities for all Market Transformation programs can be found in Section 11.8. Verified program achievements are listed in Table 7-4 with DSM shareholder incentive results in Table 7-5.

**Table 7-4. Union 2020 Market Transformation verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| Optimum Home | Percentage of Homes Built | 39.19% | 39.19% |
| Commercial New Construction | New Developments | 24 | 24 |

*Not all values may compute exactly due to rounding.

**Table 7-5. Union's 2020 Market Transformation targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Optimum Home Percentage of Homes Built | 32.32% | 39.19% | 50.00% | 121.27% | 60.63% |
| Commercial New Construction Developments | 26 | 24 | 50.00% | 91.67% | 45.83% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 106.47% |
| **Maximum Scorecard Incentive** | | | | | $405,810 |
| **Verified Scorecard Incentive Achieved** | | | | | **$193,812** |

*Not all values may compute exactly due to rounding.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

# 8 SCORECARD RESULTS: PERFORMANCE BASED

Programs within the Performance Based scorecard focus on helping participating organizations make operational enhancements and improve their energy management practices. Although energy savings may result from these programs, savings are typically not the primary goal.

## 8.1 Scorecard achievements for Union

This section summarizes the results of the EC's review of the Union Performance Based scorecard. The metrics for the Union Performance Based scorecard include:

- Percent savings achieved by participants in the RunSmart program
- Percent savings achieved by participants in the Strategic Energy Management program

A detailed explanation of the verification activities for all Performance programs can be found in Section 11.9. Verified program achievements are listed in Table 8-1 with DSM shareholder incentive results in Table 8-2.

**Table 8-1. Union 2020 Performance Based verified achievements***

| Programs | Metrics | Verified Achievement | |
|---|---|---|---|
| | | Program-level Achievements | Metric-level Achievements |
| RunSmart | Participants | - | - |
| | Savings % | -1.52% | -1.52% |
| Strategic Energy Management | Savings % | 2.61% | 2.61% |

*Not all values may compute exactly due to rounding.

**Table 8-2. Union's 2020 Performance Based targets, achievements, weights, and incentive*†**

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| RunSmart Participants | 69 | - | 10.00% | 0.00% | 0.00% |
| RunSmart Savings % | 0.44% | -1.52% | 40.00% | 0.00% | 0.00% |
| Strategic Energy Management Savings % | 4.75% | 2.61% | 50.00% | 54.84% | 27.42% |
| **Verified Total Weighted Scorecard Achieved**** | | | | | 27.42% |
| **Maximum Scorecard Incentive** | | | | | $182,765 |
| **Verified Scorecard Incentive Achieved** | | | | | **$0** |

*Not all values may compute exactly due to rounding.
**A minimum total weighted scorecard achievement level of 75% is required to earn a portion of the available shareholder incentive.
†See Section 11.11 for a detailed description of the scorecard and incentive calculations.

# 9 UTILTY SUMMARY OF SHAREHOLDER INCENTIVES, PROGRAM SPENDING, COST EFFECTIVENESS, AND LOST REVENUE

This section provides the results of the financial performance of the 2020 DSM programs by utility.

## 9.1 Enbridge Results

### 9.1.1 Scorecard Weights and Shareholder Incentives

Table 9-1 shows Enbridge scorecard weights by metric and shareholder incentives by target for all programs. These were the metrics reviewed as part of the annual verification. The utility achieved a shareholder incentive of $3,586,470 or 34% of the maximum possible DSMSI incentive.

**Table 9-1. Summary of Enbridge's 2020 achievement weights and shareholder incentives**

| Scorecard | Program | Metric | Weight | Utility Incentive |
|---|---|---|---|---|
| Resource Acquisition | Home Energy Conservation<br>Residential Adaptive Thermostats<br>C&I Custom<br>C&I Direct Install<br>C&I Prescriptive<br>Comprehensive Energy Management<br>Run-it-Right | Large Volume (CCM) | 40.0% | $2,904,033 |
| | | Small Volume (CCM) | 40.0% | |
| | Home Energy Conservation | Participants | 20.0% | |
| Low Income | Home Winterproofing | CCM | 45.0% | $501,162 |
| | Low Income Multi-Residential | CCM | 45.0% | |
| | Low Income New Construction | Applications | 10.0% | |
| Market Transformation | School Energy Competition | Schools | 10.0% | $181,276 |
| | Run-it-Right | Participants | 20.0% | |
| | Comprehensive Energy Management | Participants | 20.0% | |
| | Residential Savings by Design | Builders | 10.0% | |
| | | Homes | 15.0% | |
| | Commercial Savings by Design | Developments | 25.0% | |
| **Total Verified Utility Incentive** | | | | **$3,586,470** |
| Incentive if 100% of target achieved | | | | $4,180,000 |
| Maximum possible incentive (if 150% of target achieved) | | | | $10,450,000 |

## 9.1.2 Program Spending Summary

The Enbridge tracking database included reported program spending information. The EC has reported on what was provided by Enbridge but has not verified spending figures or conducted a financial audit. Table 9-2 summarizes the spending across the portfolio. Additional spending detail is in Section 11.14.

**Table 9-2. Enbridge program cost summary***

| Spending Area | OEB-Approved Budget | Utility Spending | Difference ($) | Difference (%) |
|---|---|---|---|---|
| Program Sub-total (no overhead) | $56,141,657 | $55,958,977 | -$182,680 | 0% |
| Program Overhead | $7,797,828 | $7,178,783 | -$619,045 | -8% |
| Process and Program Evaluation | $1,774,228 | $415,840 | -$1,358,388 | -77% |
| Other** | $2,043,663 | $994,554 | -$1,049,109 | -51% |
| **Total DSM Budget** | **$67,757,376** | **$64,548,153** | **-$3,209,223** | **-5%** |

*Not all values may compute exactly due to rounding.
**Other includes DSM IT Chargeback (no utility spending in 2020) and Collaboration and Innovation.

## 9.1.3 Cost Effectiveness Summary

Table 9-3 and Table 9-4 show summary results for the TRC-Plus and PAC tests, respectively, including the benefit cost ratio and the net present value.[21,22] The EC cost effectiveness methodology applied in 2020 is consistent with what was done for the 2019 analysis. Additional detail, including the key inputs used in the TRC-Plus and PAC tests, is provided in Section 11.15.

**Table 9-3. Enbridge summary of cost-effectiveness ratio results, TRC-Plus Test***

| Scorecard | NPV Benefits | NPV Costs | NPV Net Benefits (Benefits – Cost) | TRC-Plus Benefit Cost Ratio |
|---|---|---|---|---|
| Resource Acquisition | $164,828,000 | $67,207,000 | $97,622,000 | 2.45 |
| Low Income | $22,511,000 | $13,304,000 | $9,207,000 | 1.69 |
| **Total** | **$187,339,000** | **$80,510,000** | **$106,829,000** | **2.33** |

*Not all values may compute exactly due to rounding.

**Table 9-4. Enbridge summary of cost effectiveness ratio results, PAC Test***

| Scorecard | NPV Benefits | NPV Costs | NPV Net Benefits (Benefits – Cost) | PAC Benefit Cost Ratio |
|---|---|---|---|---|
| Resource Acquisition | $132,084,000 | $45,154,000 | $86,930,000 | 2.93 |
| Low Income | $18,440,000 | $10,866,000 | $7,573,000 | 1.70 |
| **Total** | **$150,524,000** | **$56,021,000** | **$94,503,000** | **2.69** |

*Not all values may compute exactly due to rounding.

[21] Unlike Table 1-1 in the Executive Summary or the Enbridge-specific tables in Section 11.15, these tables do not include alternative benefit cost ratios that do not apportion the portfolio-level overhead and administration costs. The alternative ratios are only computed at the OEB-defined individual program level, and not the scorecard or overall portfolio level.

[22] The cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness.

### 9.1.4 Lost Revenue by Rate Class

The EC summed the verified net annual savings (prorated by installation month) by rate class and estimated lost revenues. Table 9-5 shows the results for each rate class.

**Table 9-5. Enbridge lost revenue results***

| Rate Class | Verified Lost Revenue |
|---|---|
| Rate 110 | $11,463 |
| Rate 115 | $1,832 |
| Rate 135 | $16,455 |
| Rate 145 | $0 |
| Rate 170 | $777 |
| **TOTAL** | **$30,527** |

*Not all values may compute exactly due to rounding.

## 9.2 Union Results

### 9.2.1 Scorecard Weights and Shareholder Incentives

Table 9-6 shows the Union scorecard weights by metric and shareholder incentives by target for all programs. These were the metrics reviewed as part of the annual verification. The utility achieved a shareholder incentive of $2,726,196 or 26% of the maximum possible DSMSI incentive.

**Table 9-6. Summary of Union's 2020 achievement weights and shareholder incentives***

| Scorecard | Program | Metric | Weight | Utility Incentive |
|---|---|---|---|---|
| Resource Acquisition | C&I Custom<br>C&I Direct Install<br>C&I Prescriptive<br>Home Reno Rebate<br>Residential Adaptive Thermostats | CCM | 75.0% | $2,307,872 |
| | Home Reno Rebate | Participants | 25.0% | |
| Low Income | Indigenous<br>Furnace End-of-Life<br>Home Weatherization | CCM | 60.0% | $0 |
| | Multi-Family (Social & Assisted) | CCM | 35.0% | |
| | Multi-Family (Market Rate) | CCM | 5.0% | |
| Large Volume | Large Volume | CCM | 100.0% | $224,513 |
| Market Transformation | Optimum Home | % of Homes Built | 50.0% | $193,812 |
| | Commercial New Construction | Developments | 50.0% | |
| Performance-Based | RunSmart | Participants | 10.0% | $0 |
| | | Savings % | 40.0% | |
| | Strategic Energy Management | Savings % | 50.0% | |
| **Total Verified Utility Incentive** | | | | **$2,726,196** |
| Incentive if 100% of target achieved | | | | $4,180,000 |
| Maximum possible incentive (if 150% of target achieved) | | | | $10,450,000 |

*Not all values may compute exactly due to rounding.

## 9.2.2 Program Spending Summary

Union's tracking database included program spending by scorecard. The EC has reported on what was provided by Union and has not verified spending figures or conducted a financial audit. Table 9-7 shows the Union budget for the portfolio overall. Additional spending detail is in Section 11.14.

**Table 9-7. Union program cost summary***

| Spending Area | OEB-Approved Budget | Utility Spending | Difference ($) | Difference (%) |
|---|---|---|---|---|
| Programs Sub-total (no overhead) | $50,288,000 | $42,336,711 | -$7,951,289 | -16% |
| Program Overhead | $9,919,541 | $7,387,929 | -$2,531,612 | -26% |
| Research | $1,000,000 | $809,705 | -$190,295 | -19% |
| Evaluation | $1,300,000 | $206,201 | -$1,093,799 | -84% |
| Administration | $2,842,000 | $3,374,634 | $532,634 | 19% |
| Other** | $500,000 | $373,403 | -$126,597 | -25% |
| **Total DSM Budget** | **$65,849,541** | **$54,488,582** | **-$11,360,959** | **-17%** |

*Not all values may compute exactly due to rounding.
**Other includes pilot programs and Open Bill Project.

## 9.2.3 Cost Effectiveness Summary

Table 9-8 and Table 9-9 show summary results for the TRC-Plus and PAC tests, respectively, including the benefit cost ratio and net present value.[23,24] The EC cost effectiveness methodology applied in 2020 is consistent with what was done for the 2019 analysis. Additional detail, including the key inputs used in the TRC-Plus and PAC tests, is shown in Section 11.15.

**Table 9-8. Union summary of cost-effectiveness ratio results, TRC-Plus Test***

| Scorecard | NPV Benefits | NPV Costs | NPV Net Benefits (Benefits – Cost) | TRC-Plus Benefit Cost Ratio |
|---|---|---|---|---|
| Resource Acquisition | $160,211,000 | $89,056,000 | $71,155,000 | 1.80 |
| Low Income | $14,978,000 | $12,635,000 | $2,343,000 | 1.19 |
| Large Volume | $28,425,000 | $5,053,000 | $23,373,000 | 5.63 |
| Performance Based | $1,314,000 | $347,000 | $967,000 | 3.79 |
| **Total** | **$204,927,000** | **$107,090,000** | **$97,837,000** | **1.91** |

*Not all values may compute exactly due to rounding.

**Table 9-9. Union summary of cost effectiveness ratio results, PAC Test***

| Scorecard | NPV Benefits | NPV Costs | NPV Net Benefits (Benefits – Cost) | PAC Benefit Cost Ratio |
|---|---|---|---|---|
| Resource Acquisition | $136,154,000 | $33,189,000 | $102,965,000 | 4.10 |
| Low Income | $12,435,000 | $10,645,000 | $1,789,000 | 1.17 |
| Large Volume | $25,208,000 | $3,338,000 | $21,869,000 | 7.55 |
| Performance Based | $1,200,000 | $383,000 | $817,000 | 3.13 |
| **Total** | **$174,997,000** | **$47,556,000** | **$127,440,000** | **3.68** |

*Not all values may compute exactly due to rounding.

[23] Unlike Table 1-3 in the Executive Summary or the Union-specific tables in Section 11.15, these tables do not include alternative benefit cost ratios that do not apportion the portfolio-level overhead and administration costs. The alternative ratios are only computed at the OEB-defined individual program level, and not the scorecard or overall portfolio level.

[24] The cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness.

### 9.2.4 Lost Revenue by Rate Class

The EC summed the verified net annual savings (prorated by installation month) by rate class and estimated lost revenues. Table 9-10 shows the results.

**Table 9-10. Union lost revenue results***

| Rate Class | Verified Lost Revenue |
|---|---|
| M4 Industrial | $113,871 |
| M5 Industrial | $1,508 |
| M7 Industrial | $22,919 |
| T1 Industrial | $613 |
| T2 Industrial | $841 |
| 20 Industrial | $1,665 |
| 100 Industrial | $12,005 |
| **TOTAL** | **$153,421** |

*Not all values may compute exactly due to rounding.

# 10 FINDINGS AND RECOMMENDATIONS

This section contains the findings and recommendations from all studies completed by the EC on the 2020 programs and recommendations from the previous annual verification report that are still relevant and remain outstanding, are in progress, or have been completed.

For 2020, recommendations relate only to the annual verification as no other studies were completed this year. As noted in the EC's 2021-2022 EM&V Plan, there is also an ongoing verification of eTools, a digital Enbridge tool that leverages engineering calculations to estimate energy savings from boiler space and water heating projects. DNV is conducting the study comparing the eTools savings estimates with those estimated by modelling site-level energy usage from customer bills, a methodology that leverages actual natural gas data. Phase 1, now complete, was an analysis to determine whether a first-level model would indicate differences between the eTools estimate and the analysis estimate. Phase 1 found that there was a difference that warrants additional investigation into the reasons and magnitude of the discrepancy, which is being conducted as Phase 2. It is expected that recommendations will be made following the completion of this final phase.

The 2020 annual verification identified several recommendations, some of which were previously identified in annual verification processes. Table 10-1, Table 10-2, and Table 10-3 show the findings and recommendations applying to the annual verification overall, whole home simulation modelling, and cost effectiveness, respectively. In the tables, primary outcomes of each finding and recommendation are classified into three categories: reduce costs (evaluation or program or both), improve savings accuracy, and decrease risk (multiple types of risk are in this category including risk of adjusted savings, risk to budgets or project schedules, and others). Further details of the findings, recommendations, and outcomes follow the tables.

**Table 10-1. Overall annual verification - summary of recommendations**

| # | Status | Finding | Recommendation | Previously Recommended | Applies to 2020 | | Primary Outcome | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Utility | OEB | Reduce Costs | Improve Accuracy | Decrease Risk |
| O1 | New | The potential exists for key differences between the original OEB-approved program eligibility/qualification criteria and ongoing program delivery decisions by the utility as well as knowledge gaps between Enbridge and the EC. | A: Provide more explicit documentation of program criteria changes occurring as well as the timing of those changes. | | ✓ | | | ✓ | ✓ |
| O2 | New | Enbridge may act as the "participant" in Market Transformation programs. | A: Documentation requirements should be higher for these cases, such that the EC can confirm that the spirit of the program is maintained. In the future, these cases should be | | ✓ | | | ✓ | ✓ |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | highlighted by Enbridge for the EC to review. | | | | | | |
| O3 | In Progress | Neither Union nor Enbridge tracking databases currently use prescriptive measure descriptions that map directly to the approved energy savings spreadsheet (TRM). | A: Develop, maintain, and use an electronic summary spreadsheet of the TRM. | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | | | B: Once the electronic TRM spreadsheet is developed, track prescriptive savings using unique measure descriptions that map to electronic TRM. | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | | | C: Once the electronic TRM spreadsheet is developed, utilize the same electronic TRM for both utilities. | ✓ | ✓ | | ✓ | ✓ | ✓ |
| | | | D: Develop means for consistent system. | ✓ | | ✓ | ✓ | ✓ | ✓ |
| O4 | In Progress | Explicit third-party documentation was available for some, but not all, program qualification and participation requirements for all programs. | A: Third-party documentation for each required element for all non-savings metrics should be collected and delivered. | ✓ | ✓ | | ✓ | ✓ | ✓ |
| O5 | Completed | The Enbridge tracking file now includes information that allows the evaluator to identify all projects installed by a single customer. | A: Enbridge should include site-level information for all measures installed through the program. | ✓ | ✓ | | | ✓ | ✓ |
| O6 | Completed | Documentation redaction procedures improved to allow for greater review of program materials and reduce burden on utility. | A: Data, information, and documentation is overly redacted | ✓ | ✓ | | ✓ | | ✓ |

**Table 10-2. Whole home simulation modelling - summary of recommendations**

| # | Status | Finding | Recommendation | Previously Recommended | Applies to 2020 | | Primary Outcome | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Utility | OEB | Reduce Costs | Improve Accuracy | Decrease Risk |
| SM1 | In Progress | The energy savings from the home retrofit programs rely exclusively on the simulations provided by the delivery agents. | A: Should the program continue to use current modelling software, consider funding a study to verify the models produced by the utility agents. | ✓ | | ✓ | | ✓ | |
| SM2 | In Progress | Air sealing as a savings measure is present in a high percentage of single-family home retrofit projects. | A: For all whole home programs, provide the EC with air sealing percent improvement and energy savings attributable to air sealing. | ✓ | ✓ | | | ✓ | ✓ |

**Table 10-3. Cost-effectiveness - summary of recommendations**

| # | Status | Finding | Recommendation | Previously Recommended | Applies to 2020 | | Primary Outcome | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Utility | OEB | Reduce Costs | Improve Accuracy | Decrease Risk |
| CE1 | In Progress | All overhead is still applied at the sector level rather than the program level. | A: Allocate “sector”-level administrative cost and overhead to each individual program. | ✓ | ✓ | ✓ | | ✓ | ✓ |
| CE2 | In Progress | It is not clear how incremental cost of dual baseline measures in the tracking database is calculated. | A: Increase transparency in how incremental costs of dual baseline measures are calculated. | | ✓ | | | ✓ | |

### 10.1.1 Overall Annual Verification Recommendations

**O1. Finding:** In 2020, Enbridge added an internal program requirement for the home retrofit programs. Beginning in 2020, if a new furnace is claimed, participation requires two additional measures to be completed (previously, any two approved measures qualified). While this change was mentioned in Enbridge's draft annual report, it was only after consulting with Enbridge that the EC learned that the start date for this rule change applied to participants specifically having a pre-install assessment after January 1, 2020. This change highlighted the potential across all programs for key differences between the original OEB-approved program eligibility/qualification criteria and ongoing program delivery decisions by the utility as well as knowledge gaps between Enbridge and the EC.

**Recommendation A:** Provide more explicit documentation of program criteria changes occurring as well as the timing of those changes.

**Previously Recommended:** No.

**Outcome:** Ensure greater transparency and increase confidence in verification.

**Utility Response:** At the launch of each verification process, Enbridge provides the EC with an annual report. Within this report, details and timing of program changes are documented. Enbridge confirms that its 2020 annual report included the change and timing described in the finding. This change was also described in the OEB's decision on Enbridge's application for approval of natural gas demand side management plans for 2021 (EB-2019-0271, OEB Decision and Order, July 16, 2021). Providing any additional clarity needed regarding program details and changes to the EC upon request should be an expected step in the verification process.

**EC Response:** The EC considers this recommendation as not addressed because, in this instance, the level of detail needed to determine eligibility and savings was not included in the annual report or the Decision and Order. More broadly, we are also asking Enbridge to proactively inform the evaluation team of the program administrative details (such as tracking dates and savings assignments) related to program changes.

**O2. Finding:** Claimed projects for the Commercial Savings by Design program in 2020 included an Enbridge-owned building (i.e., Enbridge was the "participant"). The EC investigated the particulars of this case and determined that, because the CSBD program is a Market Transformation program that intends to benefit both the participant and the builder, and the builder had not participated prior to this project, it did not violate the intent of the program.

**Recommendation A:** Documentation requirements should be higher for cases in which Enbridge is involved in its programs in this way, such that the EC can confirm that the spirit of the program is maintained. In the future, these cases should be highlighted by Enbridge for the EC to review.

**Previously Recommended:** No.

**Outcome:** Ensure greater transparency and increase confidence in verification.

**Utility Response:** Moving forward, Enbridge will highlight to the EC any instance of participation in its own programs and provide sufficient documentation.

In this instance, Enbridge participated in the Commercial Savings by Design offering. Commercial Savings by Design is a market transformation program that benefits both the builder and the participant. During the CSBD workshop, the builder and the other participating third parties (designers, HVAC, contractors etc.) benefit by gaining learnings that are meant to be applied to the current and other future projects. The participant benefits by creating a forum for all parties to brainstorm ideas, and ultimately get plans for improved building designs.

This Enbridge project was consistent with the objectives of this program; it created an opportunity for the participating builder and third parties to learn from this building design with the intention of enabling the builder to apply these learnings to other projects. This remains true regardless of who the participant might be.

Enbridge also did not claim the financial pre- and post-construction incentives that are available to CSBD participants.

**EC Response:** This is a new recommendation. If Enbridge implements the practice outlined above, the EC will consider this recommendation as completed.

**O3. Finding:** Both Union and Enbridge tracking databases currently use prescriptive measure descriptions that map directly to *internally* consistent measure names. However, there is not a universally accessible (i.e., public) dataset that is fully transparent and comprehensive for all prescriptive and quasi-prescriptive measures. New versions of the Technical Resource Manual (TRM) provide full documentation for new or updated measures; this limited update does not provide a comprehensive resource for all currently accepted measures nor does it provide a concise location for all items that can impact gross or net savings such as detailed accounting of free ridership.

**Recommendation A:** Develop, maintain, and use an electronic summary of the TRM, such as an Excel file. Each measure (identified as a unique savings value) should have an assigned measure ID number, and new ID numbers should be assigned when a measure is updated with a new savings value. This allows for a historical record of the changes in the TRM and allows the evaluation to identify outdated values. For simplification and transparency, this system should be utilized for both utilities.

**Recommendation B:** Once the electronic TRM is developed, track prescriptive savings using unique measure descriptions that clearly map to the electronic TRM.

**Recommendation C:** Once the electronic TRM is developed, utilize the same electronic summary file for both utilities.

**Recommendation D:** As the entity with primary ownership of the TRM, the OEB should develop the references for parties to directly refer to specific measures in a consistent way which accounts for variations in energy savings due to capacity or other characteristics.

**Previously Recommended:** Yes – since the 2015 AV Report.

**Outcome:** Reduced burden on utility staff and reduced evaluation costs. Fewer errors in the tracking data.

**Utility Response:** As per Recommendation D, the OEB has primary ownership of the TRM including the development of a complete electronic TRM and unique measure IDs. Enbridge proposes that Board Staff address the EC's finding.

**OEB Response:** As noted in the 2019 Annual Verification report, the OEB agrees with this recommendation and its implementation is in-progress. DNV has been assigned the role to develop this resource and an expected electronic TRM will be in place in early 2022, after which point Enbridge can track prescriptive savings using the established unique measure descriptions for both rate zones.

**EC Response:** The EC agrees with the OEB that this recommendation is in progress.

**O4. Finding:** Explicit third-party documentation was not available for all program qualification and participation requirements for all programs. The EC found the following:

- Based on Enbridge's plan, the EC defines a participant in Enbridge's School Energy Competition program as having registered and 'logged in' to the EMIS system. While Enbridge's spreadsheet identifies a list of program IDs and a date stamp for each, it does not provide direct evidence that the any of the schools have actually logged into the EMIS system.

- Union's Optimum Home program has a metric of percent of homes built, which is a function of the number of Optimum Homes built and the total number of natural gas housing starts for each builder. Enbridge provided the total number of natural gas housing starts in an Excel file created by an Enbridge employee, but no independent proof (such as a screen shot of a monitoring program) to support the requirement.

Enbridge did provide explicit documentation for program qualification and participation requirements for some programs that the EC has similarly flagged in the past. These include:

- Enbridge's Run it Right program has four steps for participation, with monitoring as the final step. Enbridge has historically provided third-party documentation for the first three stages, such as invoices, signed applications, and other items, but the fourth step had not been supported with independent proof. For the 2020 verification, Enbridge forwarded an email from the third party that includes the monitoring start date spreadsheet as indication that the information came directly from an external source.
- Union's RunSmart program is limited to participants who have not installed any energy efficiency measures through Union's programs in the previous two years. In the past, Enbridge provided an Excel workbook created by an Enbridge employee with "yes" or "no" for each RunSmart participant to indicate previous program participation, but no independent proof to support the requirement. For the 2020 verification, Enbridge provided the EC with Premises IDs from all 2018 and 2019 participants so the EC could confirm that sites participating in the 2020 RunSmart offering had not participated in Union programs.

**Recommendation A:** Third-party documentation for each required element for all non-savings metrics should be collected and delivered to the EC to prove program qualification and participation.

**Previously Recommended:** Yes – since the 2016 AV report.

**Outcome:** Reduced burden on utility staff and reduced evaluation costs.

**Utility Response:** Enbridge provides the EC with a date stamp for the School Energy Competition that indicates when each school has registered online for the EMIS system, but Enbridge does not track schools' login activity. Due to circumstances surrounding the ongoing COVID-19 pandemic into 2021, the offering will not be operational in 2021 and Enbridge has no plans to deliver it in the future.

The data provided on total number of natural gas housing starts does not come from a third party. It is output generated directly into Excel from an internal Enbridge database. No meaningful screenshot of the data within the database is possible. As noted in its response to 2019 verification recommendations, Enbridge requests that the EC clarify what additional steps can be taken to address this recommendation.

**EC Response:** The EC considers this recommendation as in-progress, and will follow up with Enbridge to further discuss the types of documentation that Enbridge may be able to provide during the second data request for the 2021 Annual Verification.

**O5. Finding:** In the past, the EC has recommended that Enbridge include a unique site-level or customer-level identifier for every measure installed in the program to allow the evaluator to identify all projects installed at a single customer, regardless of program or program year.

**Recommendation A:** Enbridge should include site-level information for all measures installed through the program.

**Previously Recommended:** Yes – since the 2015 AV Report.

**Outcome:** Confirmation that each installation is unique as well as the potential for assessment of interactive effects.

**Utility Response:** Enbridge will continue to provide unique site-level or customer-level identifiers moving forward.

**EC Response:** Beginning in the 2020 program year, Enbridge began to provide this information for both legacy utilities, so this recommendation from previous reports has been completed.

**O6. Finding:** In the past, utility-provided documentation was sometimes overly redacted, particularly in program application PDF files delivered to the EC. This included account numbers for non-residential customers, which are generally included in tracking data provided to the EC.

**Recommendation A:** Data, information, and documentation is overly redacted.

**Previously Recommended:** Yes – since the 2017 AV Report.

**Outcome:** Reduced burden on utility staff, increased confidence in verification, reduced evaluation costs.

**Utility Response:** Enbridge will continue to follow the updated redaction practices established for the 2020 verification moving forward.

**EC Response:** For the 2020 verification, Enbridge and the EC worked together to update the redaction practices for non-residential customers, so this recommendation from previous reports has been completed.

### 10.1.2 Whole Home Simulation Modelling Recommendations

**SM1. Finding:** The energy savings from the home retrofit programs rely exclusively on the simulations provided by the delivery agents. Those simulations likely rely on a number of assumptions or standard modelling practices which may or may not follow industry standards. Although these assumptions and practices may follow NRCan protocols, those protocols were not specifically designed for the delivery of a DSM program and may not be appropriate in this situation. A detailed review of the models was outside the scope of the annual audit.

**Recommendation A:** Consider funding a study to verify the models produced by the utility agents to ensure they conform to standard industry practice.

**Previously Recommended:** Yes – since the 2015 AV report.

**Outcome:** Greater certainty around savings estimates.

**Utility Response:** This recommendation is not directed to the utility. For clarity, HOT2000 is the modelling software within Enbridge's OEB-approved DSM Plans for use in whole home modelling offerings.[25] These offerings are delivered by registered Energy Advisors affiliated with NRCan-licensed Service Organizations, with the expectation that NRCan HOT2000 protocols/standards are being followed given that this is a licencing requirement. Failure to follow these protocols/standards could result in suspension or loss of licence by NRCan, which would in turn render Energy Advisors ineligible to participate in Enbridge's program. Enbridge considers NRCan protocol to be appropriate for delivery of its whole home DSM offerings.

**OEB Response:** As noted in the 2019 Annual Verification report, the OEB agrees it is important to conduct an evaluation of the home retrofit programs, including how HOT2000 is being used, and is currently considering a study as directed by the EC. However, the OEB will determine the appropriate timing and scope of any study of the residential program once there is greater clarity and certainty given the on-going OEB adjudicative proceeding to determine the

[25] See for example EB-2015-0029, 2015-2020 DSM Plan Union Gas Limited, Exhibit A Tab 2 Page 13 of 38

merits of Enbridge Gas Inc.'s application for approval of 2022-2027 DSM programs and the recently introduced Greener Homes Grants program offered by the federal government.

**EC Response:** The EC considers this recommendation as on-hold, as the OEB-referenced study has been suspended subject to OEB findings in the on-going adjudication process to determine Enbridge's next multi-year DSM plan. Should the residential home retrofit program be approved to continue and have continued use of the same or similar modelling software, the EC's recommendation stands. It is important to verify that the Energy Advisors using the modelling software are doing so consistently with industry best practice for natural gas efficiency programs.

**SM2.** **Finding:** Air sealing as a savings measure is present in a high percentage of single-family home retrofits (over 90% of homes in some programs). With such a high percentage of projects relying on a single measure type, particularly one with such wide variance in savings per household, it is important to ensure the savings validity of that measure. Enbridge has provided air sealing percent improvement for each household for the Home Energy Conservation and (in 2020 for the first time) Home Reno Rebate programs, but not the Low Income whole home programs (Home Winterproofing and Home Weatherization). Further, the energy savings attributable to air sealing for each household has not been provided.

**Recommendation A:** If possible, Enbridge should provide the EC with air sealing percent improvement and energy savings attributable to air sealing for each household participating in all whole home programs.

**Previously Recommended:** Yes – since the 2016 AV report.

**Outcome:** Greater certainty around savings estimates.

**Utility Response:** Air sealing is a measure within the EGD and Union Rate Zones' respective Home Efficiency Retrofit offerings.[26] Enbridge provided the EC with air sealing percent improvements for every participant in the EGD Rate Zone HER offering and for the participants in the Union Rate Zones HER offering that claimed air sealing as a measure. The Union Rate Zones HER offering does not always track air sealing percent improvements for participants that did not claim air sealing as a measure.

Due to interactive effects between all measures installed in a home, energy savings cannot be attributed to any one measure, including air sealing. Enbridge claims and reports energy savings on a whole home basis and will continue to do so moving forward.

**EC Response:** The EC considers this recommendation as in-progress. Enbridge-provided data for the 2020 program year included air sealing percent improvement for more whole home programs than in previous years, but not all. The EC understands that Enbridge claims and reports energy savings for these programs on a whole home basis. However, Enbridge could ask the energy advisors implementing the programs to estimate energy savings attributable to air sealing by running the simulations with and without the air sealing measure.

### 10.1.3 Cost Effectiveness Recommendations

**CE1.** **Finding:** For 2020, like previous years, administrative and overhead costs are allocated differently by each legacy utility. For example, legacy Union Gas identifies administration and evaluation costs at the scorecard level whereas Enbridge details spending as direct and indirect at the OEB-defined program level and then has an explicit 'overhead' spend at the scorecard level. Differences between each legacy utility's rate zones and how cost effectiveness is reported reflects the approved DSM plans developed in 2015 by separate organizations. In the absence of clear

[26] Known in prior years as the Home Reno Rebate offering for the Union Rate Zones and the Home Energy Conservation offering for the EGD Rate Zone.

alignment of administrative and overhead costs, the EC apportioned Enbridge 'overhead' costs based on the distribution of savings. In 2019, Enbridge and OEB agreed that it is not appropriate to make fundamental changes in the middle of the DSM Framework, and full alignment should occur as part of the next DSM Framework and Plan.

**Recommendation A:** Under the next framework, Enbridge and the OEB should agree on a plan that calculates cost effectiveness at the appropriate level, allocates administrative costs and overhead to each component at the appropriate level, and ensure that cost-effectiveness results properly reflect true program costs and benefits.

**Previously Recommended:** Yes – since the 2015 AV Report.

**Outcome:** Ensure all costs are properly accounted for and allocated at the appropriate level so cost effectiveness results better reflect the true program costs.

**Utility Response:** Enbridge's approach reflects the definition of program as per the OEB-approved DSM Plans for the EGD and Union Rate Zones. It is differences between each rate zone's approved plans that result in differences in how cost effectiveness is reported.

Enbridge Gas agrees with the EC that this issue is best dealt with as part of the next comprehensive DSM Framework, Guidelines and Plan where full alignment between rate zones should occur.

**OEB Response:** The approach to calculating cost-effectiveness and allocating overhead and administrative costs are issues that will be considered by the panel of OEB Commissioners hearing Enbridge Gas Inc.'s application for approval of its proposed 2022-2027 DSM framework and plan.

**EC Response:** The EC considers this recommendation as in-progress as the OEB is currently considering Enbridge's application for a 2022-2027 DSM Framework and Plan.

**CE2.** **Finding**: The EC recognizes that Enbridge has made significant progress to report and calculate dual baseline measure benefits following the 2017 and 2018 program year recommendations. To accurately calculate the cost-effectiveness of dual baseline measures we must also consider all costs. For replace on burnout measures, the incremental cost is the difference between the full cost of the efficient measure and the full cost of the baseline measure. Calculating the incremental cost for dual baseline measures is more involved as it is the difference between the full cost of the efficient measure and the present value of the full cost of the baseline measure using the utility discount rate over the existing equipment remaining useful life. The EC assumes that the incremental cost provided by Enbridge in the tracking database is the difference between the full cost of the efficient measure and the present value full cost of the baseline measure, however, it is not clear.

**Recommendation A**: Increase transparency in how incremental costs of dual baseline measures are calculated.

**Previously Recommended**: No.

**Outcome:** Ensure accurate cost effectiveness results.

**Utility Response:** Enbridge agrees with the EC that calculating the incremental cost for dual baseline measures is more involved. Dual baseline measure incremental costs claimed in 2020 do not consider the present value of the full cost of the baseline measure using the utility discount rate over the existing equipment remaining useful life. The calculation of a project's incremental costs is included in the project documentation provided to the EC.

Dual baseline measure projects contribute only approximately 2% to EGD and Union Rate Zones' combined 2020 CI custom offering incremental costs. Making slight adjustments in how their incremental costs are calculated would not meaningfully impact program cost effectiveness. Enbridge confirms that dual baseline measure TRC benefits and

natural gas savings consider the impact of both baselines and are calculated correctly for cost effectiveness and net cumulative program savings results.

**EC Response:** This is a new recommendation. The EC agrees with Enbridge about the small magnitude at issue and believes Enbridge's position to be reasonable for this program year. However, this could present more of an issue in future years if dual baseline measures become more prominent. The EC considers this recommendation as in-progress will continue to monitor in future evaluations.

# 11 APPENDICES

## 11.1 Appendix A: Evaluation Background

Enbridge and Union deliver energy efficiency programs under the Demand Side Management Framework for Natural Gas Distributors (2015-2020) developed by the OEB. For the 2015 program year, both utilities "rolled-over" their 2014 plans into 2015 to allow them a smooth evolution into the new DSM framework. For the 2016 program year (and continuing through 2020), the new framework was implemented, resulting in changes to the programs offered, as shown in Table 11-1. Programs included in the plan and offered by the utilities are marked with a check, those in the plan but not offered by the utilities are marked with an X.

**Table 11-1. DSM programs offered – 2015 through 2020**

| Scorecard | Program Name | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| **Enbridge** | | | | | | | |
| Resource Acquisition | C&I Custom | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | C&I Direct Install | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | C&I Prescriptive | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Comprehensive Energy Management | | ✗ | ✗ | ✗ | ✗ | ✓ |
| | Energy Leaders Initiative | | ✓ | ✓ | ✓ | | |
| | Home Energy Conservation | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Residential Adaptive Thermostats | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Run-it-Right (CCM) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Small Commercial New Construction | | ✗ | ✗ | ✗ | | |
| Low Income | Low Income Multi-Residential | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Low Income New Construction | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Home Winterproofing | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market Transformation | Commercial Savings by Design | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Residential Savings by Design | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | School Energy Competition | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Run-it-Right (Participants) | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Comprehensive Energy Management | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Home Labelling | Home Labelling | ✓ | | | | | |
| **Union** | | | | | | | |
| Resource Acquisition | C&I Custom | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | C&I Direct Install | | | ✓ | ✓ | ✓ | ✓ |
| | C&I Prescriptive | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Energy Savings Kit | ✓ | | | | | |
| | Home Reno Rebate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Residential Adaptive Thermostats | | | | | ✓ | ✓ |
| Low Income | Home Weatherization | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Furnace End-of-Life | | ✓ | ✓ | ✗ | ✓ | ✗ |
| | Multifamily (Social and Assisted) | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Multifamily (Market Rate) | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Indigenous | | | ✓ | ✓ | ✓ | ✗ |
| | Affordable Housing Conservation | ✓ | | | | | |
| Large Volume | Large Volume | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market Transformation | Optimum Home | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Commercial New Construction | | ✗ | ✓ | ✓ | ✓ | ✓ |
| Performance Based | RunSmart | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Strategic Energy Management | | ✓ | ✗ | ✓ | ✗ | ✓ |

✓=Offered and reported ✗=Offered but no metrics reported

Table 11-2 shows how the metrics under each scorecard have changed over time.

**Table 11-2. Energy efficiency metrics – 2016 through 2020**

| Scorecard | Metric | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **Enbridge** | | | | | | |
| Resource Acquisition | Large Volume Customer Savings (CCM) | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Small Volume Customer Savings (CCM) | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Home Energy Conservation - Participants | ✓ | ✓ | ✓ | ✓ | ✓ |
| Low Income | Home Winterproofing (CCM) | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Low Income Multi-Residential (CCM) | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Low Income New Construction – Project Applications | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market Transformation | Commercial Savings by Design – New Developments | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Comprehensive Energy Management – Participants | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Residential Savings by Design – Builders | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Residential Savings by Design – Homes Built | | | ✓ | ✓ | ✓ |
| | Run-it-Right – Participants | ✓ | ✓ | ✓ | ✓ | ✓ |
| | School Energy Competition - Schools | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Union** | | | | | | |
| Resource Acquisition | CCM | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Home Reno Rebate - Participants | ✓ | ✓ | ✓ | ✓ | ✓ |
| Large Volume | CCM | ✓ | ✓ | ✓ | ✓ | ✓ |
| Low Income | Single Family CCM | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Multifamily Social & Assisted CCM | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Multifamily Market Rate CCM | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market Transformation | Commercial New Construction - New Enrolled Developments | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Optimum Home - % of Homes Built | ✓ | | ✓ | ✓ | ✓ |
| | Optimum Home - Participating Builders | | ✓ | ✓ | ✓ | |
| | Optimum Home - Homes | | ✓ | ✓ | ✓ | |
| Performance Based | RunSmart - Participants | ✓ | ✓ | ✓ | ✓ | ✓ |
| | RunSmart - Savings % | | ✓ | ✓ | ✓ | ✓ |
| | Strategic Energy Management - Participants | ✓ | ✓ | ✓ | | |
| | Strategic Energy - Savings % | | | ✓ | ✓ | ✓ |

The OEB hired the EC team to develop an overall evaluation, measurement, and verification (EM&V) plan and lead an annual verification of the reported utility DSM savings and scorecard achievements. This report is a result of that annual verification.

This report applies the results of several, previously completed studies:

- A study measuring the free ridership within the custom projects[27] implemented in the 2018 program year[28]
- A study verifying the custom project savings (CPSV) during the 2017 and 2018 program years[29,30]
- A study verifying the prescriptive project savings from prescriptive projects implemented in the 2017 program year[31]
- A study of custom measure lives, completed in May 2018.[32]
- A study of the spillover resulting from the implementation of custom projects during the 2013-2014 program years, completed in May 2018.[33]

[27] Low Income custom projects were not included in the NTG study.

[28] 2018 Natural Gas Demand Side Management Free-ridership Evaluation, DNV for the Ontario Energy Board, December 27, 2019

[29] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[30] Due to complications from the COVID-19 pandemic, the EC was unable to complete a planned study verifying the custom project savings (CPSV) during the 2019 and 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2019 and 2020.

[31] 2017 C&I Prescriptive Verification: Final Report – Measurement of NTG Factors and Gross Savings Verification, Itron for the Ontario Energy Board, June 7, 2019

[32] Final Report: Custom Measure Life Review, Michaels Energy for the Ontario Energy Board, May 10, 2018

[33] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018

## 11.2 Appendix B: Metric Verification Activities

To verify the metric achievements, the EC conducted the activities outlined in Table 11-3 and Table 11-4. The utilization of each activity depends on the "type" of measure being reviewed. DNV defined four different types of measures, listed below. A single program or scorecard metric may have more than one type of measure.

**Prescriptive (P):** Prescriptive gas savings measures are those where all savings inputs can be identified in the technical resource manual (TRM). This includes not only the prescribed savings but also additional prescribed inputs such as expected useful life (EUL) and free ridership rates.

**Custom (C):** Custom gas savings measures are those gas measures of equipment or actions (tune up, process) which are not prescribed by the TRM. Examples include measures verified as part of the CPSV process as well as non-prescribed programs like Run-it-Right or Run Smart.

**Whole Home (W):** Whole home savings are savings calculated using home modelling software (HOT2000).

**Other (O):** In addition to direct gas savings measures, the scorecards recognize additional metrics, such as the number of enrolled participants, new developments, or schools in a program or the percentage of homes built by a participating builder achieving certain efficiency levels.

Activities to verify the measures fall into three general categories. As previously stated, the utilization of each method is determined by the measure type.

- **Confirm Tracking:** Confirmation that the entries and calculations within the submitted tracking data accurately contribute to scorecard metrics.
  - *Prescriptive measures:* The EC confirmed that measure-level inputs were appropriately applied from the TRM where appropriate (such as free ridership ratio and savings per unit), then recalculated gross and net savings based on those inputs to verify the tracked net savings for a census of measures.
  - *Custom measures:* The EC used the results of the custom project savings verification, free ridership, and spillover studies conducted through separate processes.
  - *Whole Home and Other measures:* The EC confirmed that tracking records matched utility-reported achievement. Additional verification took place in other activities.
- **Apply Factors:** Application of relevant factors that are not otherwise applied in the TRM, such as gross savings adjustments, free ridership adjustments, and spillover ratios.
  - *Prescriptive measures*: The EC used the results of the C&I Prescriptive Verification and installation rate studies conducted through separate processes.
  - *Custom measures*: The EC used the results of the CPSV, free ridership, and spillover studies conducted through separate processes.
- **Desk Review:** File review of utility-provided documentation to verify whether the achievements in the tracking data were actually realized. Unless specifically mentioned otherwise, desk review methods were similar to those used in the prior verification.
  - *Whole Home:* Desk review included tasks such as review of energy software (HOT2000) modelling records for whole home programs.
  - *Other:* For scorecards with Other metrics, program achievements such as customer participation, eligibility for participation, and developer homes were evaluated using program records specific to each scorecard, program, and metric.

Table 11-3 and Table 11-4 identify the measure types within each scorecard and program as well as the method used to evaluate that program, corresponding with the measure type.

**Table 11-3. 2020 Annual verification activities by program: Enbridge**

| Scorecard | Program | Measure Types | Confirm Tracking | Apply Factors | Desk Review |
|---|---|---|---|---|---|
| Resource Acquisition | C&I Custom | C | | ✓ | |
| | C&I Direct Install | P | ✓ | ✓ | |
| | C&I Prescriptive | P | ✓ | ✓ | |
| | Comprehensive Energy Management | C | | ✓ | |
| | Home Energy Conservation | W O | ✓ | ✓ | ✓ |
| | Residential Adaptive Thermostats | P | ✓ | ✓ | |
| | Run-it-Right | C | ✓ | ✓ | ✓ |
| Low Income | Home Winterproofing | P W | ✓ | ✓ | ✓ |
| | Multi-Residential | P C | ✓ | ✓ | |
| | New Construction | O | ✓ | | ✓ |
| Market Transformation | Commercial Savings by Design | O | ✓ | | ✓ |
| | Comprehensive Energy Management | O | ✓ | | ✓ |
| | Residential Savings by Design | O | ✓ | | ✓ |
| | Run-it-Right | O | ✓ | | ✓ |
| | School Energy Competition | O | ✓ | | ✓ |

**Table 11-4. 2020 Annual verification activities by program: Union**

| Scorecard | Program | Measure Types | Confirm Tracking | Apply Factors | Desk Review |
|---|---|---|---|---|---|
| Resource Acquisition | C&I Custom | C | | ✓ | |
| | C&I Direct Install | P | ✓ | ✓ | |
| | C&I Prescriptive | P | ✓ | ✓ | |
| | Home Reno Rebate | W O | ✓ | ✓ | ✓ |
| Large Volume | Large Volume | C | ✓ | ✓ | |
| Low Income | Indigenous | No 2020 activity reported | | | |
| | Furnace End-of-Life | No 2020 activity reported | | | |
| | Home Weatherization | P W | ✓ | ✓ | ✓ |
| | Multifamily Social & Assisted | P C | ✓ | ✓ | |
| | Multifamily Market Rate | P | ✓ | ✓ | |
| Market Transformation | Commercial New Construction | O | ✓ | | ✓ |
| | Optimum Home | O | ✓ | | ✓ |
| Performance Based | RunSmart | O | ✓ | | ✓ |
| | Strategic Energy Management | O | ✓ | | ✓ |

Desk reviews of Whole Home and Other measures require additional information beyond what is provided in the tracking data. For example, the EC requested HOT2000 files and other documentation to confirm participation and eligibility for a sample of relevant participants in the Home Energy Conservation, Home Reno Rebate, Winterproofing, and Home Weatherization programs. Table 11-5 and Table 11-6 show the number of projects for which the EC requested additional documentation.

**Table 11-5. Desk Review Sample: Enbridge**

| Scorecard | Program | Sample Requested |
|---|---|---|
| **Resource Acquisition** | Home Energy Conservation | 30 Randomly Selected Homes |
| | Run-it-Right | 10 Randomly Selected Projects |
| **Low Income** | Home Winterproofing | 30 Randomly Selected Homes |
| | New Construction | Census |
| **Market Transformation** | Commercial Savings by Design | 10 Randomly Selected Sites |
| | Comprehensive Energy Management | Census |
| | Residential Savings by Design | 10 Randomly Selected Builders |
| | | 5 Randomly Selected Homes |
| | Run-it-Right | 30 Randomly Selected Participants |
| | School's Energy Competition | Census |

**Table 11-6. Desk Review Sample: Union**

| Scorecard | Program | Sample Requested |
|---|---|---|
| **Resource Acquisition** | Home Reno Rebate | 30 Randomly Selected Homes |
| **Low Income** | Home Weatherization | 60 Randomly Selected Homes |
| | Indigenous | No Activity |
| **Market Transformation** | Optimum Home | 5 Randomly Selected Homes |
| | Commercial New Construction | Census |
| **Performance-Based** | RunSmart | Census |
| | Strategic Energy Management | Census |

## 11.3 Appendix C: Changes from 2019 Annual Verification

There were no major changes between the 2019 and 2020 program year evaluations, but several small changes did occur. These included:

- **Programs not previously executed**: Union's Strategic Energy Management program was implemented/executed in 2020 but had not been in 2019.
- **Programs previously executed**: Union's Furnace End-of-Life and Indigenous programs were implemented/executed in 2019 but had no activity in 2020 despite being offered.
- **Changed scorecard metrics:** Two metrics, Participating Builders and Prototype Homes Built, were eliminated from Union's Optimum Home program as a part of the 2020 Scorecards (Figure 11-1).

**Figure 11-1. Union 2019 and 2020 Market Transformation Scorecards**

| Union Gas Limited - 2019 Market Transformation Scorecard | | Metric Target | | | |
|---|---|---|---|---|---|
| Programs | Metrics | Lower Band | Target | Upper Band | Weight |
| Optimum Home | Participating Builders (Regional Top 10) | 3 | 4 | 6 | 10% |
| | Prototype Homes Built | 68% | 90% | 100% | 10% |
| | Homes Built (>15% above OBC 2017) by Participating Builders | 75% of Target | 2018 metric achievement / 2018 actual program spend without overheads x 2019 program budget without overheads x 1.1 | 150% of Target | 30% |
| Commercial New Construction | New Developments Enrolled by Participating Builders | 75% of Target | 2018 metric achievement / 2018 actual program spend without overheads x 2019 program budget without overheads x 1.1 | 150% of Target | 50% |

| Union Gas Limited - 2020 Market Transformation Scorecard | | Metric Target | | | |
|---|---|---|---|---|---|
| Programs | Metrics | Lower Band | Target | Upper Band | Weight |
| Optimum Home | Homes Built (>15% above OBC 2017) by Participating Builders | 75% of Target | 2019 metric achievement / 2019 actual program spend without overheads x 2020 program budget without overheads x 1.1 | 150% of Target | 50% |
| Commercial New Construction | New Developments Enrolled by Participating Builders | 75% of Target | 2019 metric achievement / 2019 actual program spend without overheads x 2020 program budget without overheads x 1.1 | 150% of Target | 50% |

## 11.4 Appendix D: Summary of Verification Adjustments

Table 11-7 and Table 11-8 provide a combined summary of metrics for Enbridge programs and Union programs, respectively. These tables show where the EC made adjustments of greater than 1% from the values identified in *tracking data*.

**Table 11-7. Enbridge Metrics with Verified Value Greater than 1% Different from Tracked**

| Programs | Metrics | >1% Difference? |
|---|---|---|
| **Resource Acquisition** | | |
| C&I Custom | Large Volume Customers CCM | ✓ |
| C&I Direct Install | | |
| C&I Prescriptive | | |
| Comprehensive Energy Management | | ✓ |
| Run-it-Right | | |
| Home Energy Conservation (HEC) | Small Volume Customers CCM | |
| Residential Adaptive Thermostats | | |
| C&I Custom | | ✓ |
| C&I Direct Install | | |
| C&I Prescriptive | | |
| Comprehensive Energy Management | | |
| Home Energy Conservation (HEC) | HEC Participants | |
| **Low Income** | | |
| Home Winterproofing | LISF (CCM) | |
| Low Income Multi-Residential | LIMR (CCM) | ✓ |
| Low Income New Construction | LINC Applications | |
| **Market Transformation** | | |
| School Energy Competition | SEC Schools | |
| Run-it-Right | RiR Participants | |
| Comprehensive Energy Management | CEM Participants | |
| Residential Building by Design | RSBD Builders | |
| | RSBD Homes | ✓ |
| Commercial Building by Design | CSBD Developments | |

**Table 11-8. Union Metrics with Verified Value Greater than 1% Different from Tracked**

| Programs | Metrics | >1% Difference? |
|---|---|---|
| **Resource Acquisition** | | |
| Home Reno Rebate | RA (CCM) | |
| Residential Adaptive Thermostats | | |
| C&I Custom | | ✓ |
| C&I Direct Install | | |
| C&I Prescriptive | | |
| Home Reno Rebate | HRR Participants | |
| **Low Income** | | |
| Home Weatherization | LISF (CCM) | |
| Furnace End-of-Life | | |
| Indigenous | | |
| Multi-Family | LIMF-SA (CCM) | ✓ |
| | LIMF-MR (CCM) | ✓ |
| **Large Volume** | | |
| Large Volume | LV (CCM) | ✓ |
| **Market Transformation** | | |
| Optimum Home | Percentage of Homes Built | |
| Commercial New Construction | CNC Developments | |
| **Performance Based** | | |
| RunSmart | RS Participants | |
| | RS Savings % | ✓ |
| Strategic Energy Management | SEM Savings % | |

## 11.5 Appendix E: Resource Acquisition Scorecards

This appendix describes the detailed process used to verify the metrics for the Resource Acquisition Scorecard programs for Enbridge (Table 11-9) and Union (Table 11-10). The programs addressed in this appendix are:

- Residential Home Retrofit – Home Energy Conservation – Enbridge
- Residential Home Retrofit – Home Reno Rebate – Union
- Residential Adaptive Thermostats – Enbridge
- Residential Adaptive Thermostats – Union
- C&I – Prescriptive – Enbridge
- C&I – Prescriptive – Union
- C&I – Direct Install – Enbridge
- C&I – Direct Install – Union
- C&I – Custom – Enbridge
- C&I – Custom – Union
- Comprehensive Energy Management – Enbridge
- Run-it-Right – Enbridge

**Table 11-9. Enbridge 2020 Resource Acquisition scorecard*[34]**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Home Energy Conservation | Large Volume Customer - CCM | N/A | 408,463,368 | 377,258,906 | 503,011,875 | 754,517,813 | 40.00% |
| Residential Adaptive Thermostats | | N/A | | | | | |
| C&I Custom | | 391,035,327 | | | | | |
| C&I Direct Install | | 5,935,557 | | | | | |
| C&I Prescriptive | | 10,795,278 | | | | | |
| Comprehensive Energy Management | | 73,010 | | | | | |
| Run-it-Right | | 624,196 | | | | | |
| Home Energy Conservation | Small Volume Customer - CCM | 173,919,345 | 268,306,798 | 189,386,289 | 252,515,052 | 378,772,578 | 40.00% |
| Residential Adaptive Thermostats | | 46,915,108 | | | | | |
| C&I Custom | | 21,316,286 | | | | | |
| C&I Direct Install | | 15,768,618 | | | | | |
| C&I Prescriptive | | 10,252,793 | | | | | |
| Comprehensive Energy Management | | - | | | | | |
| Run-it-Right | | 134,649 | | | | | |
| Home Energy Conservation | Participants | 14,013 | 14,013 | 8,025 | 10,700 | 16,050 | 20.00% |

*Not all values may compute exactly due to rounding.

[34] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Schedule C

**Table 11-10. Union 2020 Resource Acquisition scorecard*[35]**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Home Reno Rebate | CCM | 125,206,865 | 669,887,949 | 543,286,032 | 724,381,376 | 1,086,572,065 | 75.00% |
| Residential Adaptive Thermostats | | 18,748,979 | | | | | |
| C&I Custom | | 497,922,990 | | | | | |
| C&I Direct Install | | 4,464,136 | | | | | |
| C&I Prescriptive | | 23,544,978 | | | | | |
| Home Reno Rebate | Participants | 7,619 | 7,619 | 5,172 | 6,896 | 10,344 | 25.00% |

*Not all values may compute exactly due to rounding.

[35] Ibid.

## 11.5.1 Residential Home Retrofit - Home Energy Conservation – Enbridge

### Overview

Table 11-11 shows the tracked and verified scorecard achievements for the 2020 Enbridge Home Energy Conservation (HEC) Program, with the metrics of CCM savings and participants (homes). As a result of this review, the EC verifies 173,919,345 CCM (100.00% of tracked) and 14,013 participants (99.94% of tracked). Each metric is discussed separately in this section, starting with the participants metric. Table 11-11 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-11. Enbridge Resource Acquisition achievement: Home Energy Conservation metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | - | - | - |
| Small Volume Customer - CCM | 173,919,345 | 173,919,345 | 100.00% |
| Participants (Homes) | 14,021 | 14,013 | 99.94% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-12 to verify the metrics for the Home Energy Conservation program.

**Table 11-12. Documentation used to verify the Home Energy Conservation program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Enbridge provided the Tracking File listing 14,021 individual participants in the HEC program. To certify the scorecard metrics, the EC randomly selected 30 participants for review, requested additional documentation, confirmed receipt of the correct files, and reviewed documents to verify participation and eligibility.

#### Received Files

The typical file folder had the following information:

- Photographs of pre- and post-installation conditions
- Invoice information (PDF scans or photo of receipts)
- HOT2000 Model input or “Simulation” Files (.h2k)
- HOT2000 Model Output Files (.xls)

## Participants Metric

Table 11-13 shows the tracked and verified scorecard achievements for the 2020 Enbridge HEC program with the metric of participant homes.

**Table 11-13. Enbridge Resource Acquisition achievement: HEC Program participants metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participants (Homes) | 14,021 | 14,013 | 99.94% |

*Not all values may compute exactly due to rounding.

### Verify Participation and Eligibility

The Resource Acquisition Scorecard identifies one metric for the program as "Residential Deep Savings Participants (Homes)". To determine the definition of "participants," the EC looked first to the OEB Decision, which identified approval of the Enbridge Home Energy Conservation program.[36] The EC next looked to Enbridge's plan, which identified the following criteria:[37,38]

1. Be a residential homeowner in the EGD franchise area
2. Have a valid Enbridge Gas account in good standing
3. Use an approved Certified Energy Evaluator ("CEE")
4. Install at least two measures
5. Complete a pre- and post-energy audit
6. Achieve an average of at least 15% gas savings across all participants[39]

The EC evaluated the sampled participant files against the criteria above and determined:

- **Criterion 1:** Enbridge appropriately redacted Personally Identifiable Information (PII) in all of the project files, including customer name and address. However, each file contained an Enbridge account number, providing confirmation that the records were for Enbridge customers and thus within the service territory.
- **Criterion 2:** Each file contained an Enbridge account number, providing confirmation that the records were for Enbridge customers in good standing at the time of the project.
- **Criterion 3:** At the conclusion of the 2019 evaluation, Enbridge confirmed that their administrative process for contracting with Service Organizations includes a requirement to be NRCan-licensed and for the Service Organizations to ensure that all Energy Advisors remain certified, registered, and in good standing. While the EC does not have 100% certainty about certification status at the time of audit, we accept Enbridge's process as sufficient for this criterion.
- **Criterion 4:** The tracking data for all 14,021 records (including the 30 sampled) indicated that at least two measure types were installed at each location, with 13 homes receiving as many as seven.
- **Criterion 5:** Each project contained pre- and post- project photos. Photo documentation was not comprehensive for all measures, but did partially exist for each sampled project, confirming inspections did occur. In combination with submitted modelling files, the EC found that all projects satisfied this requirement.
- **Criterion 6:** As decided by the EAC in 2016, the EC uses the same criterion applied to the equivalent Union program, which is a 15% *average* savings across all homes. Tracking data, corroborated by HOT2000 model files, showed an average of 14.48% for the 30 sample projects reviewed, which was identical to the percentage predicted by the

[36] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 13

[37] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 2, Page 19 of 55

[38] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 1, Page 25 of 100

[39] Enbridge's plan is internally inconsistent on this point. In some areas, each house must achieve at least 15% savings. In others, the program must achieve 15% average across all homes. The EAC has chosen to use the second (average) criteria for evaluation.

Tracking File for those 30 homes. This gave the EC confidence in the average natural gas savings of 16.06% across all participants in the Tracking File. Therefore, the EC verified that the homes meeting this criterion.

In addition to these six criteria, the EAC identified one additional criterion for homes that installed air sealing. The EC also identified baseline adjustments occurring on some installed furnaces measures in addition to updating eligibility for participants who installed furnace measures.

- **Criterion 7:** For air sealing to qualify as a measure, the EAC determined that a reduction of at least 10% of the cubic feet per minute of air leakage (as measured by a documented blower-door test) must occur. Tracking data for all projects that claimed air sealing as an installed measure identified a reduction of 10% or more. Therefore, the air sealing measure qualified for all air sealing measures that were claimed.
- **Criterion 8:** As part of an effort to achieve deeper savings, starting January 1, 2020, Enbridge required participants who installed a furnace to install 2 additional measures. At the same time, governmental regulations came into force requiring all new furnaces to have at least 95% AFUE. Enbridge provided documentation and additional explanation to show adjusted furnace baselines based on pre- and post-audit dates. If a participant installed a furnace plus one measure and had a pre audit date before January 2020, they were determined to be eligible as a program participant. Upon reviewing this data, the evaluator determined 8 homes did not met this criterion.

Table 11-14 shows the measure types installed by the verified participants in the program, broken out by the number of total measure types installed per customer. The most common measure type was a furnace upgrade, with 14,508 total installations. Air sealing was most common in homes with only two measures; of the 7,528 homes with only two measures, 7,063 participants (94%) installed air sealing.

**Table 11-14. Count of individual measure types among verified projects and types per home***

| Measure Type | Number of Measure Types by Customer | | | | | | Total | % of Total Homes |
|---|---|---|---|---|---|---|---|---|
| | Two | Three | Four | Five | Six | Seven | | |
| Air Sealing Rebate | 7,063 | 4,763 | 1,162 | 273 | 88 | 13 | 13,362 | 95% |
| Attic Rebate | 4,211 | 3,803 | 1,007 | 244 | 81 | 13 | 9,359 | 67% |
| Furnace Rebate | 3,270 | 4,186 | 1,002 | 230 | 76 | 13 | 8,777 | 63% |
| Water Heater Rebate | 136 | 1,032 | 721 | 157 | 64 | 13 | 2,123 | 15% |
| Window Door Rebate | 154 | 583 | 467 | 228 | 90 | 13 | 1,535 | 11% |
| Basement Rebate | 56 | 232 | 277 | 196 | 85 | 13 | 859 | 6% |
| Wall Rebate | 20 | 72 | 88 | 92 | 59 | 13 | 344 | 2% |
| Boiler Rebate | 146 | 68 | 28 | 15 | 9 | - | 266 | 2% |
| **Total Measure Types** | **15,056** | **14,739** | **4,752** | **1,435** | **552** | **91** | **36,625** | **N/A** |
| **Total Homes** | **7,528** | **4,913** | **1,188** | **287** | **92** | **13** | **14,021** | **N/A** |

*Not all values may compute exactly due to rounding.

**Verification Result**

As a result of this review, the EC verifies that 14,013 homes satisfy the requirements of participation (99.94% of tracked).

## CCM Savings Metric

Table 11-15 shows the tracked and verified scorecard achievements for the 2020 Enbridge HEC program with the metric of CCM savings.

**Table 11-15. Enbridge Resource Acquisition scorecard achievements: HEC Program CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | - | - | - |
| Small Volume Customer - CCM | 173,919,345 | 173,919,345 | 100.00% |
| **TOTAL** | **173,919,345** | **173,919,345** | **100.00%** |

*Not all values may compute exactly due to rounding.

### Verify Tracked Savings

In calculating Net Cumulative Cubic Meters (CCM) savings, the EC first utilized Enbridge tracking data to identify the savings for each of the tracked projects. The EC confirmed that the measure life and free ridership multipliers were correctly applied and reviewed the documentation for the sample of 30 program participants to identify whether the gross energy savings in the project files matched the gross energy savings in the tracking data. If any of the 30 projects did not match, an average savings-weighted realization rate was calculated and applied to the tracking savings to produce verified savings.

### Calculate Realization Rate

The EC used a multi-step process to verify tracked energy savings for the 30 sampled homes, shown in Figure 11-2 for the 2020 HEC verification. The process was necessary because the simulation mode (EnerGuide or Expert[40]) used by program delivery agents is not available to non-certified professionals. While the EC can attempt to run the Expert simulations in General mode, the runs may produce error warnings or result in a savings differential between the Expert result and General result. Therefore, this multi-step process was developed to verify savings:

- EC requested simulation (H2K) and output (XLS) files from the program
- Where possible, the simulation file was re-run and the results used to verify the tracking savings. If different simulation versions or modes were used, the savings could be slightly different; therefore, simulation savings were considered "verified" if they were within 2% of the tracking savings; in this case, the tracked savings value was accepted as the verified savings.
- If a simulation file was not provided, the file inputs were incompatible with General mode and would not run, the file ran but produced an error due to version or mode differences, or the file produced a difference in savings greater than 2%, the output file was used to verify the tracking savings. As with the simulation file, the EC accepted tracking savings values within 2% of the output file value as the verified savings.
- If the EC was unable to verify the tracking savings against the output file, the EC requested additional documentation from the program (utility) to explain the discrepancy. This documentation explained the adjustments used to calculate approved furnace baselines for accurate reported savings values.
- If no additional documentation or explanation was available, the EC compared the output file values to the project documentation to determine whether they were consistent. If they were not consistent, the output file value was used as the verified value.

[40] "Expert" is the mode listed in the output files. This mode is also labelled as "EnerGuide" in simulation files. The EC uses both terms.

**Figure 11-2. Overview of Gross Savings Verification for 2020 HEC Verification**

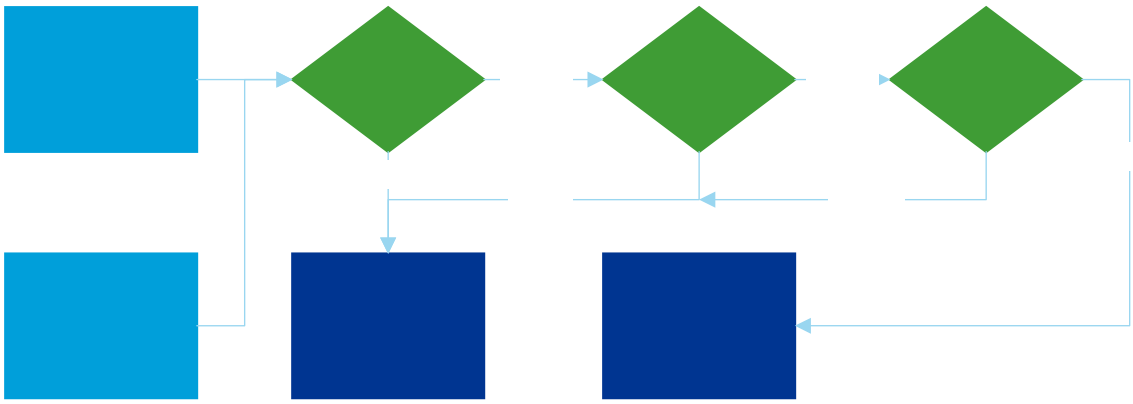


Table 11-16 shows how many customers were verified in each evaluation step.

**Table 11-16. Overview of gross savings verification**

| Evaluation Step | # Verified |
|---|---|
| Simulation re-run (H2K) and compared to tracking, verified if ± 2% | 17 |
| Output files for (XLS) compared to tracking, verified if ± 2% | 2 |
| Additional Explanation request | 11 |
| Comparison to output file values | 0 |
| **Total Verified** | 30 |

The gross savings realization rate (RR) is 100.00%, shown in Table 11-17.

**Table 11-17. Enbridge HEC Realization Rate***

| Numbers of Houses | Realization Rate | 90% Confidence Interval | | | |
|---|---|---|---|---|---|
| | | Absolute Precision | Lower Bound | Upper Bound | Relative Precision |
| 30 | 100% | 0.00% | 100.00% | 100.00% | 0.00% |

*Not all values may compute exactly due to rounding.

### Verification Result

As a result of this review, the EC confirms total savings of 173,919,345 CCM for Enbridge's Home Energy Conservation CCM savings metric (100.00% of tracked).

## 11.5.2 Residential Home Retrofit - Home Reno Rebate – Union

### Overview

Table 11-18 shows the tracked and verified scorecard achievements for the 2020 Union Home Reno Rebate (HRR) program, with the metrics of CCM savings and homes built. As a result of this review, the EC verifies 125,206,865 CCM (100.00% of tracked) and 7,619 participants (100.00% of tracked). Each metric is discussed separately in this section, starting with the participants metric. Table 11-18 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-18. Union Resource Acquisition achievement: Home Reno Rebate metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 125,206,865 | 125,206,865 | 100.00% |
| Participants (Homes) | 7,619 | 7,619 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-19 to verify the metrics for the Home Reno Rebate program.

**Table 11-19. Documentation used to verify the Home Reno Rebate program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |

#### Participant Selection

Union provided the Tracking File listing 7,619 individual participants in the HRR program. To certify the scorecard metric, the EC randomly selected 30 participants for review, requested additional documentation, confirmed receipt of the correct files, and reviewed documents to verify participation and eligibility.

#### Received Files

The typical file folder had the following information:

- Photographs of pre- and post-installation conditions
- Invoice information (PDF scans or photo of receipts)
- HOT2000 Model simulation or "Simulation" Files (.h2k)
- HOT2000 Model Output Files (.xls)

## Participants Metric

Table 11-20 shows the tracked and verified scorecard achievements for the 2020 Union HRR program with the metric of participant homes.

**Table 11-20. Union Resource Acquisition achievement: HRR Program participants metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participants (Homes) | 7,619 | 7,619 | 100.00% |

*Not all values may compute exactly due to rounding.

### Verify Participation and Eligibility

The Resource Acquisition Scorecard identifies one metric for the program as "Home Reno Rebate Participants (Homes)". To determine the definition of "participants," the EC looked first to the OEB Decision, which approved the Union HRR program[41]. The EC looked next to Union's plan, which identified the following criteria:[42]

> *Homes that count as a participant towards the Home Reno Rebate ("HRR") Participant (Homes) metric must meet the following two requirements:*
>
> > *1. A homeowner must complete at least two eligible renovations as outlined at Exhibit A, Tab 3, Appendix A, Section 1.0, Table 1.*
> >
> > *2. The aggregate of all of the homes counted towards the metric must achieve, on average, at least a 15% reduction in annual natural gas use as determined through comparing a pre and post energy assessment.*

The EC evaluated the sampled participant files against the criteria above and determined:

- **Criterion 1:** The EC confirmed that the project files documented at least two eligible measures for all homes, not only those sampled. Upon review, all participants met this requirement. Table 11-21 shows the measure types and number of measures in the homes that met this requirement.
- **Criterion 2:** Of the 30 homes randomly sampled, tracking files allowed the EC to calculate average savings of 22.14%. The EC further calculated from tracking data that the population of homes satisfied the 15% requirement.

Table 11-21 shows the measure types installed by the program, broken out by the number of total measure types installed per customer. The most common measure type was air sealing, with 7,125 total measures performed. The air sealing rebate was most common in homes with only two measures; of the 6,600 homes with only two measures, 2,981 (45%) performed air sealing.

[41] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 13
[42] Union's Proposed 2015-2020 DSM Plan, EB-2015-0029, Exhibit A, Tab 3, Page 24 of 73

**Table 11-21. Count of individual measure types among verified projects and types per home***

| Measure Type | Number of Measure Types by Customer | | | | | | Total | % of Total Homes |
|---|---|---|---|---|---|---|---|---|
| | Two | Three | Four | Five | Six | Seven | | |
| Air Sealing Rebate | 2,981 | 2,501 | 1,028 | 425 | 159 | 31 | 7,125 | 94% |
| Attic Measure | 1,627 | 1,698 | 872 | 382 | 154 | 31 | 4,764 | 63% |
| Furnace Measure | 1,497 | 1,819 | 703 | 261 | 140 | 31 | 4,451 | 58% |
| Window Door Measure | 189 | 827 | 681 | 370 | 150 | 31 | 2,248 | 30% |
| Basement Measure | 107 | 363 | 417 | 337 | 145 | 31 | 1,400 | 18% |
| Water Heater Measure | 107 | 445 | 315 | 127 | 76 | 31 | 1,101 | 14% |
| Wall Measure | 27 | 171 | 264 | 256 | 138 | 31 | 887 | 12% |
| Boiler Measure | 65 | 33 | 16 | 12 | 4 | - | 130 | 2% |
| **Total Measure Types** | **6,600** | **7,857** | **4,296** | **2,170** | **966** | **217** | **22,106** | **N/A** |
| **Total Homes** | **3,300** | **2,619** | **1,074** | **434** | **161** | **31** | **7,619** | **N/A** |

*Not all values may compute exactly due to rounding.

### Verification Result

As a result of this review, the EC verifies that all 7,619 homes (100.00%) satisfy the requirements for participation.

## CCM Savings Metric

Table 11-22 shows the tracked and verified scorecard achievements for the 2020 Union HRR program with the metric of CCM savings.

**Table 11-22. Union Resource Acquisition scorecard achievements: HRR Program savings metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 125,206,865 | 125,206,865 | 100.00% |

*Not all values may compute exactly due to rounding.

### Verify Tracked Savings

In calculating Net Cumulative Cubic Meters (CCM) savings, the EC first utilized Union Tracking Data to identify the savings for each of the tracked projects, confirming that the measure life and free ridership multipliers were correctly applied. Union Tracking data includes all projects as individual records within the tracking data, allowing for a simple summing of tracked savings. The EC reviewed the documentation for the sample of 30 program participants to identify whether the gross energy savings in the project files matched the gross energy savings in the tracking data. If any of the 30 projects did not match, an average savings-weighted realization rate was calculated and applied to the tracking savings to produce verified savings.

### Calculate Realization Rate

For the 2020 HRR verification, the EC used a multi-step process to verify tracked energy savings for the sampled homes, shown in Figure 11-3. The process was necessary because the simulation mode (EnerGuide or Expert[43]) used by program delivery agents is not available to non-certified professionals. While the EC can attempt to run the Expert simulations in

[43] "Expert" is the mode listed in the output files. This mode is also labelled as "EnerGuide" in simulation files. The EC uses both terms.

General mode, the runs may produce error warnings or result in a savings differential between the Expert result and General result. Therefore, this multi-step process was developed to verify savings:

- EC requested simulation (HSE) and output (TSV) files from the program
- Where possible, the simulation file was re-run and the results used to verify the tracking savings. If different simulation versions or modes were used, the savings could be slightly different; therefore, simulation savings were considered "verified" if they were within 2% of the tracking savings; in this case, the tracked savings value was accepted as the verified savings.
- If a simulation file was not provided, the file inputs were incompatible with General mode and would not run, the file ran but produced an error due to version or mode differences, or the file produced a difference in savings greater than 2%, the output file was used to verify the tracking savings. As with the simulation file, the EC accepted tracking savings values within 2% of the output file value as the verified savings.
- If the EC was unable to verify the tracking savings against the output file, the EC requested additional documentation from the program (utility) to explain the discrepancy. This documentation explained the adjustments used to calculate approved furnace baselines for accurate reported savings values.
- If no additional documentation or explanation was available, the EC compared the output file values to the project documentation to determine whether they were consistent.

**Figure 11-3. Overview of gross savings verification for 2020 HRR verification**

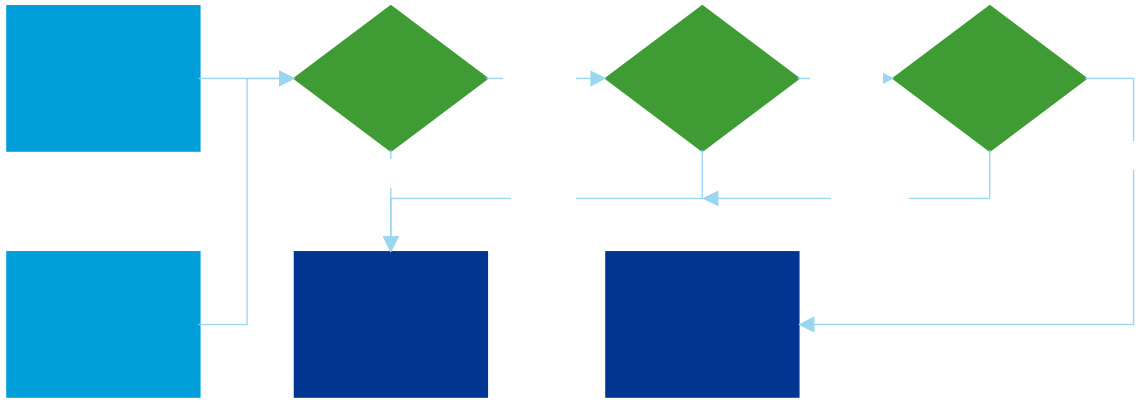


Table 11-23 shows how many customers were verified in each evaluation step.

**Table 11-23. Overview of gross savings verification**

| Evaluation Step | # Verified |
|---|---|
| Simulation re-run (H2K) and compared to tracking, verified if ± 2% | 14 |
| Output files for (XLS) compared to tracking, verified if ± 2% | 0 |
| Additional Explanation request | 16 |
| Comparison to output file values | 0 |
| **Total Verified** | 30 |

The EC produced verified savings for all 30 homes in the sample. The gross savings realization rate (RR) is 100.00%, shown in Table 11-24.

**Table 11-24. Union HRR realization rate***

| Numbers of Houses | Realization Rate | 90% Confidence Interval | | | |
|---|---|---|---|---|---|
| | | Absolute Precision | Lower Bound | Upper Bound | Relative Precision |
| 30 | 100.00% | 0.00% | 100.00% | 100.00% | 0.00% |

*Not all values may compute exactly due to rounding.

### Verification Result

As a result of this review, the EC confirms the total savings of 125,206,865 CCM for Union's Home Reno Rebate CCM savings metric (100.00% of tracked).

## 11.5.3 Residential Adaptive Thermostats - Enbridge

### Overview

Table 11-25 shows the tracked and verified scorecard achievements for the 2020 Enbridge Residential Adaptive Thermostat Program, with the metric of CCM savings. As a result of this review, the EC verifies 46,915,108 CCM (100.00% of tracked). Table 11-25 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-25. Enbridge Resource Acquisition achievement: Residential Adaptive Thermostats CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | - | - | - |
| Small Volume Customer - CCM | 46,915,108 | 46,915,108 | 100.00% |
| **TOTAL** | **46,915,108** | **46,915,108** | **100.00%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used documentation shown in Table 11-26 to verify the metrics for the Residential Adaptive Thermostat program.

**Table 11-26. Documentation used to verify the Residential Adaptive Thermostats program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| Adaptive Thermostat Ping Report | LEG and LUG 2020 Thermostat Ping Data, February 26, 2021 |

### Verify Cumulative Natural Gas Savings

The EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. In calculating gas savings, the EC used:

- Tracking File data, which reported 21,553 units
- TRM 4.0
- Adaptive Thermostat Ping Report, which reported 81.03% installation rate[44]

[44] The Residential Adaptive Thermostat Offering provides participants with a point-of-sale instant discount for the purchase of an adaptive thermostat. Ecobee supported Enbridge by "pinging" its devices that claimed the offering's discount, allowing Ecobee to identify which purchased adaptive thermostats have been installed and connected to the internet.
In February of 2021, Ecobee conducted 3 pings for all Ecobee adaptive thermostats purchased online through the 2020 point-of-sale instant discount offer. Three pings were used to mitigate inaccurate reporting that could be caused by connectivity issues at the time of one ping. If a device was determined to be online during any of the 3 pings, it was considered an installed device, and an installation verification adjustment factor was determined using this information (installed devices / all devices pinged). The adjustment factor was applied to all adaptive thermostats purchased through the 2020 point-of-sale instant discount offer (including in-store Ecobee purchased devices and non-Ecobee devices).
For legacy Enbridge, 2,491 devices were determined to be installed out of 3,074 total devices pinged (81.03% installation rate).

The EC certified the tracked savings, for a savings ratio of 100.00%.[45]

## Verification Result

As a result of this review, the EC confirms the savings of 46,915,108 CCM (100.00% of tracked) for Enbridge's Residential Adaptive Thermostat small volume customer CCM metric.

[45] The savings ratio is 100% because the program used the same 81.03% installation rate as the EC, so the EC verifies 100% of the savings reported by the program.

## 11.5.4 Residential Adaptive Thermostats - Union

### Overview

Table 11-27 shows the tracked and verified scorecard achievements for the 2020 Union Residential Adaptive Thermostat Program, with the metric of CCM savings. As a result of this review, the EC verifies 18,748,979 CCM (100.00% of tracked). Table 11-27 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-27. Union Resource Acquisition achievement: Residential Adaptive Thermostats CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 18,748,979 | 18,748,979 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used documentation shown in Table 11-28 to verify the metrics for the Residential Adaptive Thermostat program.

**Table 11-28. Documentation used to verify the Residential Adaptive Thermostats program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016, and OEB Mid-Term Review, EB-2017-0127/EB-2017-0128 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| Adaptive Thermostat Ping Report | LEG and LUG 2020 Thermostat Ping Data, February 26, 2021 |

### Verify Cumulative Natural Gas Savings

The EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. In calculating gas savings, the EC used:

- Tracking File data, which reported 8,587 units
- TRM 4.0
- Adaptive Thermostat Ping Report, which reported 81.9% installation rate[46]

[46] The Residential Adaptive Thermostat Offering provides participants with a point-of-sale instant discount for the purchase of an adaptive thermostat. Ecobee supported Enbridge by "pinging" its devices that claimed the offering's discount, allowing Ecobee to identify which purchased adaptive thermostats have been installed and connected to the internet.
In February of 2021, Ecobee conducted 3 pings for all Ecobee adaptive thermostats purchased online through the 2020 point-of-sale instant discount offer. Three pings were used to mitigate inaccurate reporting that could be caused by connectivity issues at the time of one ping. If a device was determined to be online during any of the 3 pings, it was considered an installed device, and an installation verification adjustment factor was determined using this information (installed devices / all devices pinged). The adjustment factor was applied to all adaptive thermostats purchased through the 2020 point-of-sale instant discount offer (including in-store Ecobee purchased devices and non-Ecobee devices).
For legacy Union, 804 devices were determined to be installed out of 981 total devices pinged (81.96% installation rate).

The EC certified the tracked savings, for a savings ratio of 100.00%.[47]

## Verification Result

As a result of this review, the EC confirms the savings of 18,748,979 CCM (100.00% of tracked) for Union's Residential Adaptive Thermostat CCM metric.

[47] The savings ratio is 100% because the program used the same 81.9% installation rate as the EC, so the EC verifies 100% of the savings reported by the program.

## 11.5.5 C&I - Prescriptive – Enbridge

### Overview

Table 11-29 shows the tracked and verified scorecard achievements for the 2020 Enbridge C&I Prescriptive program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 21,048,071 CCM for large and small volume customers (100.00% of tracked). Table 11-29 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documents section.
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values.

**Table 11-29. Enbridge Resource Acquisition achievement: C&I Prescriptive CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | 10,795,278 | 10,795,278 | 100.00% |
| Small Volume Customer - CCM | 10,252,793 | 10,252,793 | 100.00% |
| **TOTAL** | **21,048,071** | **21,048,071** | **100.00%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-30 to verify the metrics for the C&I Prescriptive program.

**Table 11-30. Documentation used to verify the C&I Prescriptive program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| C&I Prescriptive Verification Study | 2017 C&I Prescriptive Study – Measure of NTG Factors and Gross Savings Verification, Itron, June 2019 |
| Commercial ENERGY STAR Rack Oven Sub Doc | PDF detailing prescriptive savings and costs for double rack ovens |

### Verify Cumulative Natural Gas Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. Table 11-31 and Table 11-32 show the results of the analysis.

**Table 11-31. Enbridge Resource Acquisition achievement by measure group: small volume customers***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 9 | 273,686 | 273,686 | 100.00% |
| Demand Control Kitchen Ventilation | 37 | 2,458,656 | 2,458,656 | 100.00% |
| Demand Control Ventilation | 228 | 792,916 | 792,916 | 100.00% |
| Destratification Fan | 3 | 94,230 | 94,230 | 100.00% |
| Energy Recovery Ventilation | 2 | 11,967 | 11,967 | 100.00% |
| Fryer | 187 | 2,527,642 | 2,527,642 | 100.00% |
| Furnace | 2 | 3,429 | 3,429 | 100.00% |
| Make-Up Air Unit | 1 | 125,172 | 125,172 | 100.00% |
| Ozone Washer Extractor | 1 | 300,951 | 300,951 | 100.00% |
| Oven | 13 | 114,528 | 114,528 | 100.00% |
| Dock Door Seal | 43 | 1,090,534 | 1,090,534 | 100.00% |
| Steam Cooker | 2 | 170,669 | 170,669 | 100.00% |
| Unit Heater | 15 | 536,836 | 536,836 | 100.00% |
| Water Heater | 276 | 1,751,581 | 1,751,581 | 100.00% |
| **Total** | **819** | **10,252,793** | **10,252,793** | **100.00%** |

*Not all values may compute exactly due to rounding.

**Table 11-32. Enbridge Resource Acquisition achievement by measure group: large volume customers***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 14 | 507,101 | 507,101 | 100.00% |
| Demand Control Kitchen Ventilation | 24 | 2,076,797 | 2,076,797 | 100.00% |
| Demand Control Ventilation | 52 | 405,650 | 405,650 | 100.00% |
| Destratification Fan | 13 | 440,478 | 440,478 | 100.00% |
| Energy Recovery Ventilation | 71 | 2,889,746 | 2,889,746 | 100.00% |
| Fryer | 38 | 513,638 | 513,638 | 100.00% |
| Make-Up Air Unit | 2 | 59,544 | 59,544 | 100.00% |
| Ozone Washer Extractor | 2 | 437,922 | 437,922 | 100.00% |
| Oven | 4 | 34,531 | 34,531 | 100.00% |
| Ozone Tunnel Washer | 4 | 279,604 | 279,604 | 100.00% |
| Dock Door Seal | 105 | 1,952,507 | 1,952,507 | 100.00% |
| Steam Cooker | 2 | 170,669 | 170,669 | 100.00% |
| Unit Heater | 1 | 44,026 | 44,026 | 100.00% |
| Water Heater | 133 | 983,064 | 983,064 | 100.00% |
| **Total** | **465** | **10,795,278** | **10,795,278** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms the savings of 10,252,793 CCM for small volume customers (100.00% of tracked) and 10,795,278 CCM for large volume customers (100.00% of tracked) for Enbridge's C&I Prescriptive Program.

## 11.5.6 C&I - Prescriptive – Union

### Overview

Table 11-33 shows the shows the tracked and verified scorecard achievements for the 2020 Union C&I Prescriptive program, with the metric of CCM savings. As a result of this review, the EC verifies 23,544,978 CCM (100.00% of tracked). Table 11-33 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-33. Union Resource Acquisition achievement: C&I Prescriptive CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 23,544,978 | 23,544,978 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-34 to verify the metrics for the C&I Prescriptive program.

**Table 11-34. Documentation used to verify the C&I Prescriptive program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| C&I Prescriptive Verification Study | 2017 C&I Prescriptive Study – Measure of NTG Factors and Gross Savings Verification, Itron, June 2019 |
| Commercial ENERGY STAR Rack Oven Sub Doc | PDF detailing prescriptive savings and costs for double rack ovens |

### Verify Cumulative Natural Gas Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. Table 11-35 shows the results of the analysis.

**Table 11-35. Union Resource Acquisition Achievement by measure group***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 39 | 981,773 | 981,773 | 100.00% |
| Dock Door Seal | 66 | 787,360 | 787,360 | 100.00% |
| Oven | 24 | 208,502 | 208,502 | 100.00% |
| Demand Control Kitchen Ventilation | 32 | 3,936,591 | 3,936,591 | 100.00% |
| Demand Control Ventilation | 170 | 5,415,483 | 5,415,482 | 100.00% |
| Destratification Fan | 39 | 1,069,997 | 1,069,997 | 100.00% |
| Energy Recovery Ventilation | 229 | 2,643,568 | 2,643,568 | 100.00% |
| Fryer | 115 | 1,554,432 | 1,554,432 | 100.00% |
| Heat Recovery Ventilation | 43 | 824,390 | 824,390 | 100.00% |
| Make-Up Air Unit | 17 | 4,054,482 | 4,054,482 | 100.00% |
| Ozone Washer Extractor | 3 | 319,931 | 319,931 | 100.00% |
| Water Heater | 264 | 1,748,470 | 1,748,471 | 100.00% |
| **Total** | **1,041** | **23,544,978** | **23,544,978** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms the savings of 23,544,978 CCM savings (100.00% of tracked) for Union's C&I Prescriptive Program.

## 11.5.7 C&I – Direct Install – Enbridge

### Overview

Table 11-36 shows the tracked and verified scorecard achievements for the 2020 Enbridge C&I Direct Install Program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 21,704,175 CCM for large and small volume customers (100.00% of tracked). Table 11-36 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-36. Enbridge Resource Acquisition achievement: C&I Direct Install CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | 5,935,557 | 5,935,557 | 100.00% |
| Small Volume Customer - CCM | 15,768,618 | 15,768,618 | 100.00% |
| **TOTAL** | **21,704,175** | **21,704,175** | **100.00%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-37 to verify the metrics for the C&I Direct Install program.

**Table 11-37. Documentation used to verify the C&I Direct Install program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |

### Verify Cumulative Natural Gas Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. Three measures were installed, with 135 individual installations with large volume customers and 362 with small volume customers. The EC verified the tracked savings which resulted in a savings ratio of 100.00%.

**Table 11-38. Enbridge C&I Direct Installation measure groups: large volume customers**

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 27 | 2,270,096 | 2,270,096 | 100.00% |
| Dock Door Seal | 96 | 2,286,631 | 2,286,631 | 100.00% |
| Demand Control Kitchen Ventilation | 12 | 1,378,830 | 1,378,830 | 100.00% |
| **TOTAL** | **135** | **5,935,557** | **5,935,557** | **100.00%** |

**Table 11-39. Enbridge C&I Direct Installation measure groups: small volume customers**

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 118 | 9,334,847 | 9,334,847 | 100.00% |
| Dock Door Seal | 238 | 5,524,564 | 5,524,564 | 100.00% |
| Demand Control Kitchen Ventilation | 6 | 909,207 | 909,207 | 100.00% |
| **TOTAL** | **362** | **15,768,618** | **15,768,618** | **100.00%** |

## Verification Result

As a result of this review, the EC confirms the savings of 5,935,557 CCM for large volume customers (100.00% of tracked) and 15,768,618 CCM for small volume customers (100.00% of tracked) for Enbridge's C&I Direct Install Program.

## 11.5.8 C&I – Direct Install – Union

### Overview

Table 11-40 shows the tracked and verified scorecard achievements for the 2020 Union C&I Direct Install Program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 4,464,136 CCM (100.00% of tracked). Table 11-40 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-40. Union Resource Acquisition achievement: C&I Direct Install CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 4,464,136 | 4,464,136 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-41 to verify the metrics for the C&I Direct Install program.

**Table 11-41. Documentation used to verify the C&I Direct Install program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |

### Verify Cumulative Natural Gas Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. Three measures were installed, with 69 individual installations. The EC verified the tracked savings which resulted in a savings ratio of 100.00%.

**Table 11-42. Union C&I Direct Installation measure groups**

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Curtain | 44 | 3,361,760 | 3,361,760 | 100.00% |
| Demand Control Kitchen Ventilation | 11 | 839,282 | 839,282 | 100.00% |
| Dock Door Seal | 14 | 263,093 | 263,093 | 100.00% |
| **TOTAL** | **69** | **4,464,136** | **4,464,136** | **100.00%** |

*Not all values may compute exactly due to rounding.

### Verification Result

As a result of this review, the EC confirms the savings of 4,464,136 (100.00% of tracked) for Union's C&I Direct Install Program.

## 11.5.9 C&I - Custom – Enbridge

### Overview

Table 11-43 shows the shows the tracked and verified scorecard achievements for the 2020 Enbridge C&I Custom program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 412,351,613 CCM (111.38% of tracked). Table 11-43 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-43. Enbridge Resource Acquisition achievement: C&I Custom CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | 350,273,221 | 391,035,327 | 111.64% |
| Small Volume Customer - CCM | 19,942,946 | 21,316,286 | 106.89% |
| **TOTAL** | **370,216,166** | **412,351,613** | **111.38%** |

*Not all values may compute exactly due to rounding.

Table 11-44 includes these variables:

- Tracking Gross Savings: Gross cumulative tracking savings for all customers in the Enbridge C&I Custom program. This is the amount of savings before any adjustments (including free ridership and spillover) are applied.
- RR: Gross realization rate from the 2017-2018 CSPV report.
- Att: Attribution ratio (the complement of free ridership) from the 2018 NTG report.
- Spillover: Spillover ratio from the 2013-2014 Spillover Study.
- Adj: Adjustment Ratio, the product of the RR and the sum of the Att ratio and Spillover ratio

**Equation 1: Adjustment Ratio**

$$\boldsymbol{Adjustment\ Ratio = RR * (Att + Spillover)}$$

- Verified Net Savings: Cumulative gross savings multiplied by the Adjustment Ratio

**Equation 2: Verified Net Savings**

$$Verified\ Net\ Savings = Adjustment\ Ratio * (Cumulative\ Gross)$$

**Table 11-44. Adjustment factors applied to Enbridge C&I Custom Program cumulative gross savings***

| Attribution Group | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Commercial - Other | 16,816,423 | 94.99% | 25.65% | 1.36% | 25.66% | 4,314,556 |
| Commercial - Ventilation | 61,395,510 | 94.99% | 14.12% | 1.36% | 14.70% | 9,027,873 |
| Commercial - Boilers | 94,061,357 | 94.99% | 42.37% | 1.36% | 41.54% | 39,072,267 |
| Multi-Residential - Heating | 106,514,579 | 121.09% | 57.67% | 8.24% | 79.81% | 85,009,732 |
| Multi-Residential - Other | 45,778,675 | 121.09% | 69.73% | 8.24% | 94.41% | 43,221,421 |
| Industrial | 401,650,858 | 110.79% | 50.62% | 1.45% | 57.69% | 231,705,765 |
| **TOTAL** | **726,217,403** | | | | **56.78%** | **412,351,613** |

*Not all values may compute exactly due to rounding.

## Documentation

The EC used the documentation shown in Table 11-45 to verify the metrics for the C&I Custom program.

**Table 11-45. Documentation used to verify the C&I Custom program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[48,49] |
| 2018 NTG Report | 2018 Natural Gas Demand Side Management Free-ridership Evaluation[50] |
| 2013-2014 Spillover Study | CPSV Participant Spillover Results[51] |

## Verify Savings

### Adjustment Values – Realization Rate

The 2017-2018 CPSV Report conveyed gross realization rate by sector, as shown in Table 11-46. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-46. Verified gross savings rates for the Enbridge Custom C&I program**

| Sector | RR (%) |
|---|---|
| Commercial | 94.99% |
| Low Income & Multi Residential | 121.09% |
| Industrial | 110.79% |

### Adjustment Values – Attribution Ratios

The 2018 NTG Report conveyed attribution ratios using a combination of sector and measure group, as shown in Table 11-47.

**Table 11-47. Attribution ratios for the Enbridge Custom C&I program**

| Attribution Group | Att (%) |
|---|---|
| Commercial - Other | 25.65% |
| Commercial - Ventilation | 14.12% |
| Commercial - Boilers | 42.37% |
| Multi-Residential - Heating | 57.67% |
| Multi-Residential - Other | 69.73% |
| Industrial | 50.62% |

[48] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[49] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

[50] 2018 Natural Gas Demand Side Management Free-ridership Evaluation, DNV for the Ontario Energy Board, December 27, 2019

[51] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018

### Adjustment Values – Spillover Ratios

The 2013-2014 Spillover Study conveyed spillover ratios at the sector level, as shown in Table 11-48. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-48. Spillover ratios for the Enbridge Custom C&I program**

| Sector | Spillover (%) |
|---|---|
| Custom Commercial | 1.36% |
| Multi-Residential | 8.24% |
| Custom Industrial | 1.45% |

### Verify Cumulative Natural Gas Savings

The program-level adjustment factors shown in Table 11-44 were built up from a measure-level application of the RR, Attribution, and Spillover ratios. Each measure was assigned a RR or Spillover ratio based on its sector, and an Attribution ratio based on the combination of sector and measure group. The EC calculated the measure-level net savings using Equation 1 and Equation 2, then summed the measure-level savings to produce program-level savings. The EC calculated the program-level adjustment ratio by dividing the program-level net savings by the program-level gross savings.

## Verification Result

As a result of this review, the EC confirms the savings of 412,351,613 CCM (111.38% of tracked) for Enbridge's C&I Custom Program.

## 11.5.10 C&I - Custom – Union

### Overview

Table 11-49 shows the shows the tracked and verified scorecard achievements for the 2020 Union C&I Custom program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 497,922,990 CCM (89.70% of tracked). Table 11-49 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-49. Union Resource Acquisition achievement: C&I Custom CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM | 555,079,269 | 497,922,990 | 89.70% |

*Not all values may compute exactly due to rounding.

Table 11-50 includes these variables:

- Tracking Gross Savings: Gross cumulative tracking savings for all customers in the Enbridge C&I Custom program. This is the amount of savings before any adjustments (including free ridership and spillover) are applied.
- RR: Gross realization rate from the 2017-2018 CSPV report
- Att: Attribution ratio (the complement of free ridership) from the 2018 NTG Report
- Spillover: Spillover ratio from 2013-2014 Spillover Study
- Adj: Adjustment Ratio, the product of the RR and the sum of the Att ratio and Spillover ratio

**Equation 3: Adjustment Ratio**

$$\boldsymbol{Adjustment\ Ratio = RR * (Att + Spillover)}$$

- Verified Net Savings: Cumulative gross savings multiplied by the Adjustment Ratio

**Equation 4: Verified Net Savings**

$$Verified\ Net\ Savings = Adjustment\ Ratio * (Cumulative\ Gross)$$

**Table 11-50.Adjustment factors applied to Union C&I Custom Program cumulative gross savings***

| Attribution Group | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Agricultural | 785,214,411 | 91.17% | 50.16% | 0.89% | 46.54% | 365,456,729 |
| Commercial and Multi-Family | 205,556,334 | 90.57% | 28.62% | 0.00% | 25.92% | 53,282,533 |
| Industrial - Steam or Hot Water System | 66,087,250 | 91.17% | 4.11% | 0.89% | 4.56% | 3,012,587 |
| Industrial - HVAC | 101,352,483 | 91.17% | 39.88% | 0.89% | 37.17% | 37,672,727 |
| Industrial - Steam or Hot Water System | 141,369,481 | 91.17% | 28.98% | 0.89% | 27.23% | 38,498,414 |
| **TOTAL** | **1,299,579,959** | | | | **38.31%** | **497,922,990** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-51 to verify the metrics for the C&I Custom program.

**Table 11-51. Documentation used to verify the C&I Custom program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[52,53] |
| 2018 NTG Report | 2018 Natural Gas Demand Side Management Free-ridership Evaluation[54] |
| 2013-2014 Spillover Study | CPSV Participant Spillover Results[55] |

## Verify Savings

### Adjustment Values – Realization Rate

The 2017-2018 CPSV Report conveyed gross realization rate by sector, as shown in Table 11-52. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-52. Verified gross savings rates for the Union Custom C&I program**

| Sector | RR (%) |
|---|---|
| Agricultural & Industrial | 91.17% |
| Commercial and Multi-Family | 90.57% |

### Adjustment Values – Attribution Ratios

The 2018 NTG Report conveyed attribution ratios using a combination of sector and measure group, as shown in Table 11-53.

**Table 11-53. Attribution ratios for the Union Custom C&I program**

| Attribution Group | Att (%) |
|---|---|
| Agricultural | 50.16% |
| Commercial and Multi-Family | 28.62% |
| Industrial - Steam or Hot Water System | 4.11% |
| Industrial - HVAC | 39.88% |
| Industrial - Steam or Hot Water System | 28.98% |

[52] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[53] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

[54] 2018 Natural Gas Demand Side Management Free-ridership Evaluation, DNV for the Ontario Energy Board, December 27, 2019

[55] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018

### Adjustment Values – Spillover Ratios

The 2013-2014 Spillover Study conveyed spillover ratios at the sector level, as shown in Table 11-54. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-54. Spillover ratios for the Union Custom C&I program**

| Sector | Spillover (%) |
|---|---|
| Industrial | 0.89% |
| Commercial and Multi-Family | 0.00% |

### Verify Cumulative Natural Gas Savings

The program-level adjustment factors shown in Table 11-50 were built up from a measure-level application of the RR, Attribution, and Spillover ratios. Each measure was assigned a RR or Spillover ratio based on its sector, and an Attribution ratio based on the combination of sector and measure group. The EC calculated the measure-level net savings using Equation 3 and Equation 4, then summed the measure-level savings to produce program-level savings. The EC calculated the program-level adjustment ratio by dividing the program-level net savings by the program-level gross savings.

## Verification Result

As a result of this review, the EC verifies total savings of 497,922,990 CCM (89.70% of tracked) for Union's C&I Custom Program.

## 11.5.11 Comprehensive Energy Management – Enbridge

### Overview

Table 11-55 shows the shows the tracked and verified scorecard achievements for the 2020 Enbridge Comprehensive Energy Management program, with the metric of CCM savings. As a result of this review, the EC verifies total savings of 73,010 CCM (110.79% of tracked). Table 11-55 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-55. Enbridge Resource Acquisition achievement: Comprehensive Energy Management CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | 65,900 | 73,010 | 110.79% |
| Small Volume Customer - CCM | - | - | - |
| **TOTAL** | **65,900** | **73,010** | **110.79%** |

*Not all values may compute exactly due to rounding.

Table 11-56 includes these variables:

- Tracking Gross Savings: Gross cumulative tracking savings for all customers in the Enbridge CEM program. This is the amount of savings before any adjustments (including free ridership and spillover) are applied.
- RR: Gross realization rate from the 2017-2018 CSPV report.
- Att: Attribution ratio (the complement of free ridership) from the 2018 NTG report.
- Spillover: Spillover ratio from the 2013-2014 Spillover Study.
- Adj: Adjustment Ratio, the product of the RR and the sum of the Att ratio and Spillover ratio

**Equation 5: Adjustment Ratio**

$$\boldsymbol{Adjustment\ Ratio = RR * (Att + Spillover)}$$

- Verified Net Savings: Cumulative gross savings multiplied by the Adjustment Ratio

**Equation 6: Verified Net Savings**

$$Verified\ Net\ Savings = Adjustment\ Ratio * (Cumulative\ Gross)$$

**Table 11-56. Adjustment factors applied to Enbridge CEM Program cumulative gross savings***

| Attribution Group | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Industrial | 1,317,996 | 110.79% | 50.62% | 1.45% | 5.54% | 73,010 |
| **TOTAL** | **1,317,996** | | | | **5.54%** | **73,010** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-57 to verify the metrics for the Comprehensive Energy Management program.

**Table 11-57. Documentation used to verify the Comprehensive Energy Management program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[56,57] |
| 2018 NTG Report | 2018 Natural Gas Demand Side Management Free-ridership Evaluation[58] |
| 2013-2014 Spillover Study | CPSV Participant Spillover Results[59] |

## Verify Savings

The CPSV, NTG, and Spillover reports that were the source of the following adjustment values did not include projects installed as a part of the Comprehensive Energy Management program. However, DNV has assumed that the Industrial measures included in those studies are also representative of the Comprehensive Energy Management Program and therefore the adjustment values are applicable.

### Adjustment Values – Realization Rate

The 2017-2018 CPSV Report conveyed gross realization rate by sector, as shown in Table 11-58. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-58. Verified gross savings rates for the Enbridge CEM program**

| Sector | RR (%) |
|---|---|
| Industrial | 110.79% |

### Adjustment Values – Attribution Ratios

The 2018 NTG Report conveyed attribution ratios using a combination of sector and measure group, as shown in Table 11-59.

**Table 11-59. Attribution ratios for the Enbridge CEM program**

| Attribution Group | Att (%) |
|---|---|
| Industrial | 50.62% |

[56] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[57] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

[58] 2018 Natural Gas Demand Side Management Free-ridership Evaluation, DNV for the Ontario Energy Board, December 27, 2019

[59] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018

### Adjustment Values – Spillover Ratios

The 2013-2014 Spillover Study conveyed spillover ratios at the sector level, as shown in Table 11-60. The EC used the same sectors to apply the relevant rates at the measure level.

**Table 11-60. Spillover ratios for the Enbridge CEM program**

| Sector | Spillover (%) |
|---|---|
| Custom Industrial | 1.45% |

### Verify Cumulative Natural Gas Savings

The program-level adjustment factors shown in Table 11-56 were built up from a measure-level application of the RR, Attribution, and Spillover ratios. Each measure was assigned a RR or Spillover ratio based on its sector, and an Attribution ratio based on the combination of sector and measure group. The EC calculated the measure-level net savings using Equation 5 and Equation 6, then summed the measure-level savings to produce program-level savings. The EC calculated the program-level adjustment ratio by dividing the program-level net savings by the program-level gross savings.

## Verification Result

As a result of this review, the EC confirms the savings of 73,010 CCM (110.79% of tracked) for Enbridge's Comprehensive Energy Management Program.

## 11.5.12 Run-it-Right – Enbridge

### Overview

Table 11-61 shows the tracked and verified scorecard achievements for the 2020 Enbridge Run-it-Right (RIR) Program, with the metric of CCM savings. The RIR Program has two metrics under separate scorecards, CCM Savings (Resource Acquisition) and Participants (Market Transformation). CCM Savings are discussed here, while the Participants metric is discussed in Section 11.9. As a result of this review, the EC verifies total savings of 758,845 CCM (100.00% of tracked) for large volume customers of the 2020 Run-it-Right program. Table 11-61 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-61. Enbridge Resource Acquisition achievement: Run-it-Right CCM metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Large Volume Customer - CCM | 624,196 | 624,196 | 100.00% |
| Small Volume Customer - CCM | 134,649 | 134,649 | 100.00% |
| **TOTAL** | **758,845** | **758,845** | **100.00%** |

*Not all values may compute exactly due to rounding.

Table 11-62 includes the following variables:

- Tracking Gross Savings: Gross cumulative tracking savings for all customers in the Enbridge 2020 Run-it-Right program.
- RR: Gross realization rate based on engineering reviews.
- Att: Attribution ratio (the complement of free ridership) from the 2015 CPSV report.
- Spillover: Spillover ratio from 2013-2014 Spillover Study.
- Adj: Adjustment Ratio, the product of the RR and the sum of the Att ratio and Spillover ratio

**Equation 7: Adjustment Ratio**

$$\boldsymbol{Adjustment\ Ratio = RR * (Att + Spillover)}$$

- Verified Net Savings: Cumulative gross savings multiplied by the Adjustment Ratio

**Equation 8: Verified Net Savings**

$$Verified\ Net\ Savings = Adjustment\ Ratio * (Cumulative\ Gross)$$

**Table 11-62. Adjustment Factors Applied to Run-it-Right Program cumulative gross savings***

| Measure Type | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj* (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Large Volume Customers CCM | 1,246,895 | 100.00% | 50.06% | 0.00% | 50.06% | 624,196 |
| Small Volume Customers CCM | 268,975 | 100.00% | 50.06% | 0.00% | 50.06% | 134,649 |

*Not all values may compute exactly due to rounding.

## Documentation

The EC used the documentation shown in Table 11-63 to verify the metrics for the Run-it-Right program.

**Table 11-63. Documentation used to verify the Run-it-Right program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | PDF document for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| 2015 CPSV Report | 2015 Natural Gas Demand Side Management Custom Savings Verification and Free-ridership Evaluation[60] |
| 2013-2014 Spillover Study | CPSV Participant Spillover Results[61] |

### Participant Selection

Enbridge first provided the Tracking File listing RIR participants with customer and site IDs, listing 33 individual participants. The EC randomly selected 10 participants, requesting full documentation by Project ID.

## Methodology Review

The program methodology did not change for the 2020 program year. For the certification, a senior engineer reviewed the calculation methods for each selected site. The following conclusion from the 2015 certification[62] remains valid:

> *The methodology used by the RIR program to estimate savings is appropriate for the application. No significant concerns were identified by the team; however, the RIR tool does not allow observation of all of the calculations performed.*

## Verify Gross Savings

For 2020, evaluation engineers reviewed the supporting documentation provided in the Project Files (pdf) for the sample of sites to identify the answers to the following questions:

- Is the building type correctly identified?
- How many months were used in the baseline, improvement, and reference periods?
- What type of model was used?
- What independent variables were used?
- What R-squared values were used for the baseline and reference models?
- What is the estimated savings during the reference period?
- Were capital project savings deducted?
- What percentage of consumption do the savings represent?
- What is driving the positive or negative savings claimed?
- Should a new baseline model be created?

[60] 2016 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, June 31, 2018
[61] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018
[62] 2015 Natural Gas Demand Side Management Annual Verification, DNV for the Ontario Energy Board, December 20, 2018, Appendix F

The EC senior engineer used these questions (above) to review the calculations completed, the consumption pattern at the facility, and the baseline model. The EC senior engineer then asked three primary questions to assess the risk of savings accuracy as Low, Normal, or High. Three key questions were:

- Based on experience, is the baseline model specification reasonable?
- Based on experience, is the baseline time period definition reasonable?
- What is the assessed level of risk for achieving savings?

The baseline model specifications and time period definitions were reasonable for all projects examined. Overall, the savings claimed are reasonable, especially because both positive and negative savings are included in the program Tracking File and Project Files.

The EC assigned seven sites as low-risk, two normal-risk, and one high-risk. Based on our experience, this distribution is favorable compared to similar programs. The one high-risk participant had a higher projected gas usage from the reference period than both the baseline and improvement periods.

Across the participants, all savings claims were supported by actions taken at the facilities. Clear changes in consumption patterns occurred. The EC's review supports the savings claim for all sites.

## Adjustment Values – Attribution and Spillover Ratios

The 2015 CPSV Report conveyed a single attribution ratio for the Run-it-Right program of 50.06%. The 2013-2014 Spillover study did not find any spillover savings for the program.[63] The two ratios (attribution and spillover) were combined with the RR to produce a program-level adjustment factor of 50.06%.

## Verification Result

As a result of this review, the EC confirms the savings of 758,845 CCM (100.00% of tracked) for large volume customers of the Run-it-Right program.

[63] Neither the attribution ratio nor the spillover value have been updated in more recent iterations of these reports.

## 11.6 Appendix F: Low Income Scorecards

This appendix describes the detailed process used to verify the metrics for the Low Income Scorecard programs for Enbridge (Table 11-64) and Union (Table 11-65). The programs addressed in this appendix are:

- Winter Retrofit - Furnace End-of-Life – Union
- Winter Retrofit - Home Winterproofing – Enbridge
- Winter Retrofit - Home Weatherization – Union
- Winter Retrofit - Indigenous Program – Union
- Low Income New Construction – Enbridge
- Low Income Multi-Residential – Affordable Housing Program – Enbridge
- Low Income Multi-Residential – Multifamily Program (Social Assisted) – Union
- Low Income Multi-Residential – Multifamily Program (Market Rate) – Union

**Table 11-64. Enbridge 2020 Low Income scorecard*[64]**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Home Winterproofing | CCM | 26,642,997 | 26,642,997 | 19,930,077 | 26,573,437 | 39,860,155 | 45.00% |
| Low Income Multi-Residential | CCM | 67,637,303 | 67,637,303 | 82,350,715 | 109,800,953 | 164,701,430 | 45.00% |
| Low Income New Construction | Applications | 15 | 15 | 7 | 9 | 14 | 10.00% |

*Not all values may compute exactly due to rounding.

**Table 11-65. Union 2020 Low Income scorecard*[65]**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Home Weatherization | CCM | 38,411,013 | 38,411,013 | 40,022,417 | 53,363,223 | 80,044,835 | 60.00% |
| Furnace End-of-Life | | - | | | | | |
| Indigenous | | - | | | | | |
| Multi-Family Social & Assisted | CCM | 12,142,699 | 12,142,699 | 23,896,992 | 31,862,656 | 47,793,984 | 35.00% |
| Multi-Family Market Rate | CCM | 8,316,698 | 8,316,698 | 5,021,527 | 6,695,369 | 10,043,054 | 5.00% |

*Not all values may compute exactly due to rounding.

[64] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, FINAL REVISED February 24, 2016, Schedule C
[65] Ibid

### 11.6.1 Winter Retrofit - Furnace End-of-Life Program – Union

No activity was reported for this program in 2020.

## 11.6.2 Winter Retrofit – Home Winterproofing – Enbridge

### Overview

Table 11-66 shows the tracked and verified scorecard achievements for the 2020 Enbridge Home Winterproofing program, with the metric of CCM savings. As a result of this review, the EC verifies 26,642,997 CCM (99.79% of tracked). Table 11-66 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-66. Enbridge Low Income achievements: Home Winterproofing CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM - Prescriptive | 8,849,553 | 8,849,553 | 100.00% |
| CCM - Whole Home | 17,849,646 | 17,793,443 | 99.69% |
| **TOTAL** | **26,699,199** | **26,642,997** | **99.79%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-67 to verify the metrics for the Home Winterproofing program.

**Table 11-67. Documentation used to verify the Home Winterproofing program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| TAPS Report | TAPS Verification Program 2012 Year End Research Report, Quadra Research. April 2013[66] |

### Simulation-based Savings

#### Participant Selection

Enbridge provided the tracking file listing 912 individual participant homes in the Winterproofing program. To certify the scorecard metric, the EC randomly selected 30 participants for review, requested additional documentation, confirmed receipt of the correct files, and reviewed documents to verify participation and eligibility.

[66] TAPS Verification Program 2012 Year End Research Report, Study CR-604, Quadra Research, April 3, 2013

### Received Files

The typical file folder had the following information:

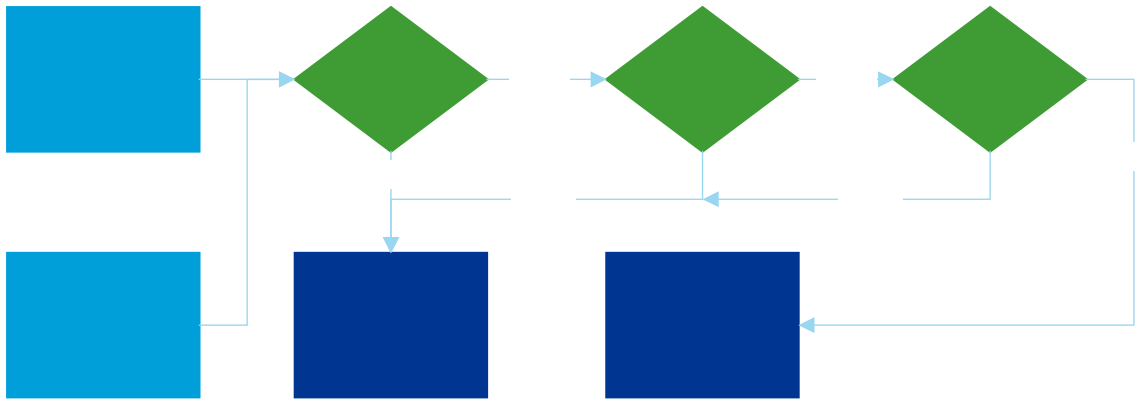
- Photographs of pre- and post-installation conditions
- Invoice information (PDF scans or photo of receipts)
- HOT2000 Model simulation Files (.h2k)
- HOT2000 Model Output Files (.xls)

### Calculate Realization Rate

The EC used a multi-step process to verify tracked energy savings for the 30 sampled homes, shown in Figure 11-4 for the 2020 Winterproofing verification. The process was necessary because the simulation mode (EnerGuide or Expert[67]) used by program delivery agents is not available to non-certified professionals. While the EC can attempt to run the Expert simulations in General mode, the runs may produce error warnings or result in a savings differential between the Expert result and General result. Therefore, this multi-step process was developed to verify savings:

- EC requested simulation (H2K) and output (XLS) files from the program
- Where possible, the simulation file was re-run and the results used to verify the tracking savings. If different simulation versions or modes were used, the savings could be slightly different; therefore, simulation savings were considered "verified" if they were within 2% of the tracking savings; in this case, the tracked savings value was accepted as the verified savings.
- If a simulation file was not provided, the file inputs were incompatible with General mode and would not run, the file ran but produced an error due to version or mode differences, or the file produced a difference in savings greater than 2%, the output file was used to verify the tracking savings. As with the simulation file, the EC accepted tracking savings values within 2% of the output file value as the verified savings.
- If the EC was unable to verify the tracking savings against the output file, the EC requested additional documentation from the program (utility) to explain the discrepancy.
- If no additional documentation or explanation was available, the EC compared the output file values to the project documentation summary to determine whether they were consistent. If they were not consistent, the output file value was used as the verified value.

**Figure 11-4. Overview of gross simulation savings verification for 2020 Winterproofing**



[67] "Expert" is the mode listed in the output files. This mode is also labelled as "EnerGuide" in simulation files. The EC uses both terms.

Table 11-68 shows how many customers were verified in each evaluation step.

**Table 11-68. Overview of gross simulation savings verification**

| Evaluation Step | # Verified |
|---|---|
| Simulation re-run (H2K) and compared to tracking, verified if ± 2% | 28 |
| Output files for (XLS) compared to tracking, verified if ± 2% | 0 |
| Additional Explanation request | 0 |
| Comparison to output file values | 2 |
| **Total Verified** | **30** |

The gross savings realization rate is 99.69%, shown in Table 11-69.

**Table 11-69. Enbridge Home Winterproofing realization rate***

| Numbers of Houses | Realization Rate | 90% Confidence Interval | | | |
|---|---|---|---|---|---|
| | | Absolute Precision | Lower Bound | Upper Bound | Relative Precision |
| 30 | 99.69% | 0.51% | 99.17% | 100.20% | 0.85% |

*Not all values may compute exactly due to rounding.

## Prescriptive Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. The EC certified the tracked savings which resulted in a savings ratio of 100.00%, as shown in Table 11-70.

**Table 11-70. Enbridge scorecard achievements (cumulative savings) by measure group***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Faucet Aerator | 546 | 13,020 | 13,020 | 100.00% |
| Showerhead | 302 | 74,689 | 74,689 | 100.00% |
| Thermostat | 3043 | 8,761,845 | 8,761,845 | 100.00% |
| **TOTAL** | **3,891** | **8,849,553** | **8,849,553** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms the savings of 26,642,997 CCM (99.79% of tracked) for Enbridge's Home Winterproofing program.

## 11.6.3 Winter Retrofit – Home Weatherization – Union

### Overview

Table 11-71 shows the tracked and verified scorecard achievements for the 2020 Union Home Weatherization Program, with the metric of CCM savings. As a result of this review, the EC verifies 38,411,013 CCM (99.81% of tracked). Table 11-71 includes the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-71. Union Low Income achievements: Home Weatherization CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM - Prescriptive | 8,665,521 | 8,665,521 | 100.00% |
| CCM - Whole Home | 29,819,183 | 29,745,492 | 99.75% |
| **TOTAL** | **38,484,704** | **38,411,013** | **99.81%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-72 to verify the metrics for the Home Weatherization program.

**Table 11-72. Documentation used to verify the Home Weatherization program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| Low Income Kits Verification Study | Final Report Following an Audit of the Union Gas ESK - Helping Homes Conserve – HHC – Program, Beslin Communication Group, March 15, 2013 |

### Simulation-based Savings

#### Participant Selection

Union provided the tracking file, listing 1,316 individual participant homes in the Home Winterproofing program. To certify the scorecard metric, the EC identified individual sites within Private and Social Housing and randomly selected 60 participants for review, requested additional documentation, confirmed receipt of the correct files, and reviewed documents to verify participation and eligibility.

**Received Files**

The typical file folder had the following information:

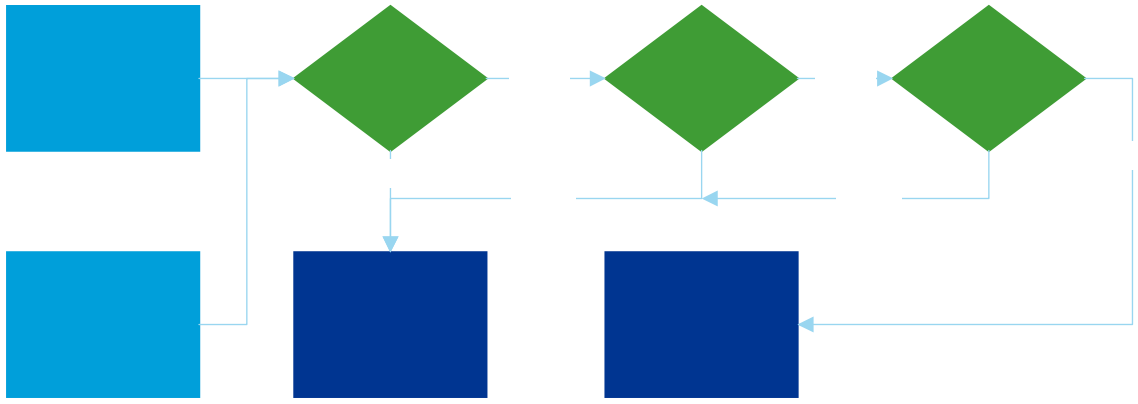
- Photographs of pre- and post-installation conditions
- Invoice information (PDF scans or photo of receipts)
- HOT2000 Model simulation Files (.h2k)
- HOT2000 Model Output Files (.xls)

**Calculate Realization Rate**

The EC used a multi-step process to verify tracked energy savings for the 60 sampled homes, shown in Figure 11-5 for the Home Weatherization program. The process was necessary because the simulation mode (EnerGuide or Expert[68]) used by program delivery agents is not available to non-certified professionals. While the EC can attempt to run the Expert simulations in General mode, the runs may produce error warnings or result in a savings differential between the Expert result and General result. Therefore, this multi-step process was developed to verify savings:

- EC requested simulation (H2K) and output (XLS) files from the program
- Where possible, the simulation file was re-run and the results used to verify the tracking savings. If different simulation versions or modes were used, the savings could be slightly different; therefore, simulation savings were considered "verified" if they were within 2% of the tracking savings; in this case, the tracked savings value was accepted as the verified savings.
- If a simulation file was not provided, the file inputs were incompatible with General mode and would not run, the file ran but produced an error due to version or mode differences, or the file produced a difference in savings greater than 2%, the output file was used to verify the tracking savings. As with the simulation file, the EC accepted tracking savings values within 2% of the output file value as the verified savings.
- If the EC was unable to verify the tracking savings against the output file, the EC requested additional documentation from the program (utility) to explain the discrepancy.
- If no additional documentation or explanation was available, the EC compared output file values to project documentation to determine if the calculated model values were consistent with documentation. If they were not consistent, the output file value was used as the verified value.

**Figure 11-5. Overview of gross savings verification for 2020 Home Weatherization program**



[68] "Expert" is the mode listed in the output files. This mode is also labelled as "EnerGuide" in simulation files. The EC uses both terms.

Table 11-73 shows how many customers were verified in each evaluation step. Savings for 58 homes were verified with comparison of tracking data against either simulation (H2K) or output (XLS) files.

**Table 11-73. Overview of gross simulation savings verification**

| Evaluation Step | # Verified |
|---|---|
| Simulation re-run (H2K) and compared to tracking, verified if ± 2% | 58 |
| Output files for (XLS) compared to tracking, verified if ± 2% | 0 |
| Additional Explanation request | 0 |
| Comparison to output file values | 2 |
| **Total Verified** | 60 |

The gross savings realization rate (RR) is 99.75%, shown in Table 11-74.

**Table 11-74. Union Home Weatherization realization rate***

| Numbers of Houses | Realization Rate | 90% Confidence Interval | | | |
|---|---|---|---|---|---|
| | | Absolute Precision | Lower Bound | Upper Bound | Relative Precision |
| 60 | 99.75% | 0.35% | 99.41% | 100.10% | 0.57% |

*Not all values may compute exactly due to rounding.

## Prescriptive Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. The EC certified the tracked savings which resulted in a savings ratio of 100.00%, as shown in Table 11-75.

**Table 11-75. Union scorecard achievements by measure group***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Faucet Aerator | 636 | 49,432 | 49,432 | 100.00% |
| Pipe Insulation | 488 | 162,528 | 162,528 | 100.00% |
| Showerhead | 302 | 67,366 | 67,366 | 100.00% |
| Thermostat | 3099 | 8,386,196 | 8,386,196 | 100.00% |
| **TOTAL** | **4,525** | **8,665,521** | **8,665,521** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms the savings of 38,411,013 CCM (99.81% of tracked) for Union's Home Weatherization program.

### 11.6.4 Winter Retrofit – Indigenous Program – Union

No activity was reported for this program in 2020.

## 11.6.5 Low Income New Construction – Enbridge

### Overview

Table 11-76 shows the tracked and verified scorecard achievements for the 2020 Enbridge Low Income New Construction Program, with the metric of participants. As a result of this review, the EC verifies 15 participants (100.00% of tracked). Table 11-76 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-76. Enbridge Low Income achievement: New Construction participants metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participants | 15 | 15 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-77 to verify the metrics for the Low Income New Construction (LINC) program.

**Table 11-77. Documentation used to verify the Low Income New Construction program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | PDF document for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| Enbridge's Draft 2020 Report | Enbridge Gas Inc. DRAFT 2020 Demand Side Management Annual Report |

#### Participant Selection

Enbridge first provided the Tracking file listing Program Year, Project Code (unique ID), Participant Status, Application Date, Charrette Date, and IDP Report Receipt. The spreadsheet listed fifteen individual participants. The EC requested full documentation for all participants.

#### Received Files

Enbridge provided the EC with document folders identified by LINC Project number and containing project PDF documents. The EC first confirmed the folders received matched the IDs requested from the Tracking file. The EC confirmed that documents for all participants had been received.

## Verify Participation

The metric for the program is participants. To determine the definition of participant, the EC looked first to the OEB Decision, which identified a participant as someone who submits a Project Application.[69]

The OEB Decision also includes the Enbridge proposed metric of "New Construction Program Participants."[70] This label differs slightly from "Number of Project Applications," and implies a second or additional definition for the metric. To identify if a record with a submitted a project application qualifies as a participant, the EC also reviewed the program description:[71]

> *"Enbridge's proposed low-income new construction program will provide home builders with workshops, energy efficiency modelling tools, design options, energy efficiency education and financial incentives related to new affordable housing new construction developments."*

From this, the EC determined that to demonstrate *participation*, Project Files should also provide documentation for *any* of the following:

- Workshop participation
- Energy efficiency modelling tools
- Design options
- Energy efficiency education
- Financial incentives

The EC evaluated the sampled participant files against the criteria above and determined that all fifteen projects qualify as participants.

## Verify Eligibility

The OEB Decision does not provide a clear definition for participant eligibility, instead pointing to approval of Enbridge's Plan. From the Plan, the EC found the following eligibility requirements:

- Submitted project application
- New affordable housing qualified by a municipal, provincial and/or federal housing program.
- Application identifies the project is specifically directed to affordable building developments, either single family (Part 9) or multi-residential (Part 3)

These criteria were based on an examination of the 2016-2020 offer descriptions and Enbridge's Plan (Table 11-78).

[69] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, p. 64-65, 67, 78, and Schedule C
[70] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Schedule B
[71] Ibid, p. 30

**Table 11-78. Eligibility requirements documentation**

| Document | Relevant Contents |
|---|---|
| 2016-2020 OFFER DESCRIPTIONS[72] | *"The offer is specifically directed to residential and multi-residential affordable building developments and efforts will focus on working with and through municipal governments, private and non-profit local housing corporations."* |
| EVALUATION PLAN[73] | • *Developers and builders of new "affordable housing" as qualified by a municipal, provincial and/or federal housing program.*<br>• *Developers and builders of both singe (sic) family Part 9 houses and multi-residential Part 3 buildings are eligible to participate.* |
| Draft 2020 Report[74] | *Eligibility criteria consists of the following:*<br>• *New construction project must be located within the EGD rate zone; and,*<br>• *The project proponent must have been recognized as a builder or provider of affordable housing by a municipal, provincial, and/or federal body, by virtue of receiving financial assistance, in the present or at any time in the past, from a government program aimed at affordable housing.* |

To confirm eligibility, the EC looked for documentation that indicates the development or project is specifically directed to affordable building developments, either single family (Part 9) or multi-residential (Part 3). Project Files did contain identification of projects as Part 3 or Part 9 projects. Additionally, project files for all participants indicated that each development qualified as affordable housing.

## Verification Result

As a result of this review, the EC confirms that all projects meet the definition and eligibility requirements, resulting in a scorecard achievement of 15 participants (100.00% of tracked) for Enbridge's Low Income New Construction program.

[72] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 1, page 45 of 100
[73] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 2, page 31 of 55
[74] Enbridge Gas Inc. Draft 2020 Demand Side Management Annual Report, April 1, 2021, page 98

## 11.6.6 Low Income Multi-Residential – Affordable Housing Program – Enbridge

### Overview

Table 11-79 shows the tracked and verified scorecard achievements for the 2020 Enbridge Affordable Housing Program, with the metric of CCM savings. As a result of this review, the EC verifies 67,637,303 CCM for all program measures (119.57% of tracked). Table 11-79 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-79. Enbridge Low Income achievements: Low Income Multi-Residential CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Prescriptive CCM | 4,083,899 | 4,083,899 | 100.00% |
| Custom CCM | 52,484,437 | 63,553,404 | 121.09% |
| **TOTAL** | **56,568,335** | **67,637,303** | **119.57%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-80 to verify the metrics for the Affordable Housing program.

**Table 11-80. Documentation used to verify the Low Income Multi-Residential Program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| Multi-Residential Low-Income Showerhead Verification | Multi-Residential Low-Income Showerhead Verification, Ipsos Research[75] |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[76,77] |

### Verify Prescriptive Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in Section 11.13. The EC made some minor changes to the tracked savings which resulted in a savings ratio of 100.00%, as shown in Table 11-81.

[75] Multi-Residential Low-Income Showerhead Verification, Ipsos Research, March 28, 2013

[76] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[77] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

**Table 11-81. Enbridge - prescriptive measures - scorecard achievements by measure group***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Showerhead | 100 | 25,857 | 25,857 | 100.00% |
| Make-Up Air Unit | 4 | 2,160,000 | 2,160,000 | 100.00% |
| Heat Recovery Ventilation | 2 | 1,827,427 | 1,827,427 | 100.00% |
| Water Heater | 7 | 70,615 | 70,615 | 100.00% |
| **TOTAL** | **113** | **4,083,899** | **4,083,899** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verify Custom Savings

The EC identified the custom savings totals from Enbridge Tracking Files shown in Table 11-82. The EC applied a realization rate from the 2017-2018 CPSV report for Multi-Residential of 121.09%.

**Table 11-82. Enbridge - custom measures - scorecard achievements***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Air Handling Unit | 1 | 318,420 | 385,575 | 121.09% |
| Boiler - Hydronic Condensing - Space Heating | 28 | 24,655,825 | 29,855,738 | 121.09% |
| Boiler - Hydronic Condensing - Water Heating | 20 | 5,161,862 | 6,250,498 | 121.09% |
| Boiler - Hydronic High Efficiency - Space Heating | 8 | 6,533,875 | 7,911,869 | 121.09% |
| Boiler - Hydronic High Efficiency - Water Heating | 6 | 1,886,025 | 2,283,788 | 121.09% |
| Controls - Space Heating | 11 | 1,685,715 | 2,041,232 | 121.09% |
| Controls - Ventilation | 25 | 10,809,960 | 13,089,781 | 121.09% |
| Controls - Water Heating | 3 | 74,805 | 90,581 | 121.09% |
| Solar Wall - Ventilation | 1 | 693,630 | 839,917 | 121.09% |
| Tank Type Water Heater | 5 | 664,320 | 804,425 | 121.09% |
| **TOTAL** | **108** | **52,484,437** | **63,553,404** | **121.09%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms the total savings of 67,637,303 CCM (119.57% of tracked) for Enbridge's Affordable Housing Program.

## 11.6.7 Low Income Multi-Residential – Multifamily Program (SA) – Union

### Overview

Table 11-83 shows the tracked and verified scorecard achievements for the 2020 Union Multifamily (Social and Assisted) Program, with the metric of CCM savings. As a result of this review, the EC verifies 12,142,699 CCM (96.32% of tracked). Table 11-83 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-83. Union Low Income achievements: Multifamily Program (SA) CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM - Prescriptive | 7,689,934 | 7,689,934 | 100.00% |
| CCM - Custom | 4,916,380 | 4,452,765 | 90.57% |
| **TOTAL** | **12,606,314** | **12,142,699** | **96.32%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-84 to verify the metrics for the Multifamily (Social and Assisted) program.

**Table 11-84. Documentation used to verify the Multifamily (Social and Assisted) program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[78,79] |

### Verify Prescriptive Savings

In calculating net CCM, the EC reviewed natural gas savings for prescriptive measures from the Tracking File, using the procedures identified in 11.13. The EC certified the tracked savings which resulted in a savings ratio of 100.00%, as shown in Table 11-85.

[78] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[79] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

**Table 11-85. Union - prescriptive measures - scorecard achievements by measure group***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Energy Recovery Ventilation | 11 | 5,632,809 | 5,632,809 | 100.00% |
| Make-Up Air Unit | 7 | 2,006,400 | 2,006,400 | 100.00% |
| Water Heater | 6 | 50,725 | 50,725 | 100.00% |
| **TOTAL** | **24** | **7,689,934** | **7,689,934** | **100.00%** |

*Not all values may compute exactly due to rounding.

## Verify Custom Savings

The EC identified the custom savings totals from Union Tracking, which included the application of a 95.00% attribution factor, which is the deemed attribution for Low Income Multi-Residential programs. The EC applied a realization rate (gross savings adjustment) of 90.57%, identifying verified net cumulative savings of 4,452,765 CCM (90.57% of tracked).

## Verification Result

As a result of this review, the EC confirms total savings of 12,142,699 CCM (96.32% of tracked) for Union's Multifamily (Social and Assisted) Program.

## 11.6.8 Low Income Multi-Residential – Multifamily Program (MR) – Union

### Overview

Table 11-86 shows the tracked and verified scorecard achievements for the 2020 Union Multifamily (Market Rate) Program, with the metric of CCM savings. As a result of this review, the EC verifies 8,316,698 CCM for all program measures (90.57% of tracked). Table 11-86 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-86. Union Low Income achievements: Multifamily (MR) Program CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM - Prescriptive | - | - | - |
| CCM - Custom | 9,182,619 | 8,316,698 | 90.57% |
| **TOTAL** | **9,182,619** | **8,316,698** | **90.57%** |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-87 to verify the metrics for the Multifamily (Market Rate) program.

**Table 11-87. Documentation used to verify the Multifamily (Market Rate) program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| TRM 4.0 | Natural Gas Demand Side Management Technical Resource Manual, Version 4.0 |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[80,81] |

### Verify Prescriptive Savings

Union reported no prescriptive projects under the Low Income Multifamily (Market Rate) Program in 2020

### Verify Custom Savings

The EC identified the custom savings totals from Union Tracking, which included the application of a 95.00% attribution factor, which is the deemed attribution for Low Income Multi-Residential programs. The EC applied a realization rate (gross savings adjustment) of 90.57%, identifying net cumulative savings of 8,316,698 CCM (90.57% of tracked).

[80] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[81] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

The EC identified the custom savings totals from Union Tracking Files shown in Table 11-88. The EC applied a realization rate from the 2017-2018 CPSV report for Multi-Residential of 90.57%.

**Table 11-88. Union - custom measures - scorecard achievements***

| Measure Group | Installed Measures | Tracked Achievement (CCM) | Verified Achievement (CCM) | Savings Ratio |
|---|---|---|---|---|
| Boiler (Condensing - Heating) | 4 | 2,328,255 | 2,108,701 | 90.57% |
| Boiler (Condensing - DHW) | 2 | 418,302 | 378,856 | 90.57% |
| Boiler (Condensing - Heating, Less than 300MBH) | 1 | 21,446 | 19,424 | 90.57% |
| Boiler (Condensing - Combo) | 1 | 138,109 | 125,085 | 90.57% |
| Boiler (High Efficiency - Heating) | 1 | 1,535,611 | 1,390,803 | 90.57% |
| Boiler (High Efficiency - DHW) | 1 | 349,973 | 316,970 | 90.57% |
| Reflective Panel | 10 | 4,390,924 | 3,976,860 | 90.57% |
| **TOTAL** | 20 | 9,182,619 | 8,316,698 | **90.57%** |

*Not all values may compute exactly due to rounding.

## Verification Result

As a result of this review, the EC confirms total savings of 8,316,698 CCM (90.57% of tracked) for Union's Multifamily (Market Rate) Program.

## 11.7 Appendix G: Large Volume Scorecard

This appendix describes the detailed process used to verify the metrics for the Large Volume Scorecard programs for Union, shown in Table 11-89. The program addressed in this appendix is the Large Volume program.

**Table 11-89. Union 2020 Large Volume (Rate T2/Rate 100) program scorecard***

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Large Volume | CCM | 126,647,466 | 126,647,466 | 99,762,897 | 133,017,196 | 199,525,794 | 100.00% |

*Not all values may compute exactly due to rounding.

### Overview

Table 11-90 shows the tracked and verified scorecard achievements for the 2020 Union Large Volume program, with the metric of CCM savings. As a result of this review, the EC verifies 126,647,466 CCM for all program measures (90.46% of tracked). Table 11-90 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-90. Union Large Volume achievement: Large Volume CCM metrics***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| CCM - Prescriptive | - | - | - |
| CCM - Custom | 140,003,832 | 126,647,466 | 90.46% |
| **Total** | **140,003,832** | **126,647,466** | **90.46%** |

*Not all values may compute exactly due to rounding.

Table 11-91 includes these variables:

- Tracking Gross Savings: Gross cumulative tracking savings for all customers in the Union Large Volume program.
- RR: Gross realization rate from the 2017-2018 CSPV report.
- Att: Attribution ratio (the complement of free ridership) from the 2018 NTG report.
- Spillover: Spillover ratio from 2013-2014 Spillover Study.
- Adj: Adjustment Ratio, the product of the RR and the sum of the Att ratio and Spillover ratio

**Equation 9: Adjustment Ratio**

$$\boldsymbol{Adjustment\ Ratio = RR * (Att + Spillover)}$$

- Verified Net Savings: Cumulative gross savings multiplied by the Adjustment Ratio

**Equation 10: Verified Net Savings**

$$Verified\ Net\ Savings = Adjustment\ Ratio * (Cumulative\ Gross)$$

**Table 11-91. Adjustment factors applied to Large Volume Program cumulative gross savings***

| Measure Type | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj* (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Prescriptive | - | - | - | - | - | - |
| Custom | 914,460,037 | 90.46% | 14.49% | 0.82% | 13.85% | 126,647,466 |
| **TOTAL** | **914,460,037** | | | | **13.85%** | **126,647,466** |

*Not all values may compute exactly due to rounding.

## Documentation

The EC used the documentation shown in Table 11-92 to verify the metrics for the Large Volume program.

**Table 11-92. Documentation used to verify the Large Volume program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| Union's Draft 2020 Report | Union Gas 2020 Demand Side Management Draft Annual Report[82] |
| 2017-2018 CPSV Report | 2018 Natural Gas Demand Side Management Custom Savings Verification[83] |
| 2018 NTG Report | 2018 Natural Gas Demand Side Management Free-ridership Evaluation[84,85] |
| 2013-2014 Spillover Study | CPSV Participant Spillover Results[86] |

## Custom Savings

The EC identified 57 tracked custom measures with tracked cumulative gross savings of 914,460,037 CCM. These projects are grouped by measure in Table 11-93.

**Table 11-93. Union - custom measures – verified cumulative gross savings by measure group***

| Measure Group | Installed Measures | Tracking Gross Savings (CCM) |
|---|---|---|
| Furnace or Dryer | 17 | 180,493,571 |
| HVAC | 5 | 78,057,397 |
| Productivity Improvement | 2 | 24,009,540 |
| Steam or Hot Water System | 33 | 631,899,530 |
| **TOTAL** | **57** | **914,460,037** |

*Not all values may compute exactly due to rounding.

[82] While the EC recognizes that the draft report will be updated and finalized, the final was not available at the time of this evaluation, thus the draft is cited for reference.

[83] 2017-2018 Natural Gas Demand Side Management Custom Savings Verification, DNV for the Ontario Energy Board, December 26, 2019

[84] 2018 Natural Gas Demand Side Management Free-ridership Evaluation, DNV for the Ontario Energy Board, December 27, 2019

[85] The EC did not complete studies verifying the custom project savings (CPSV) during the 2019 or 2020 program years. Instead, the EC used the same adjustment factors resulting from custom projects implemented in the 2017 and 2018 program years, adjusted for the mix of projects installed in 2020.

[86] CPSV Participant Spillover Results, DNV for the Ontario Energy Board, May 23, 2018

**Adjustment Values – RR**

The 2017-2018 CPSV Report conveyed one gross realization rate for the program, 90.46%.

**Adjustment Values – Att Ratios**

The 2017-2018 CPSV Report conveyed one attribution ratio for the program, 14.49%.

**Adjustment Values – Spillover Ratios**

The 2013-2014 Spillover Study conveyed one spillover ratios for the program, 0.82%.

**Verify Cumulative Natural Gas Savings**

The EC calculated the measure-level net savings using Equation 9 and Equation 10, then summed the measure-level savings to produce program-level savings. The EC calculated the program-level adjustment ratio by dividing the program-level net savings by the program-level gross savings.

**Table 11-94. 2020 Large Volume measure groups adjustment values and cumulative net savings***

| Measure Type | Tracking Gross Savings (CCM) | RR (%) | Att (%) | Spillover (%) | Adj* (%) | Verified Net Savings (CCM) |
|---|---|---|---|---|---|---|
| Custom | 914,460,037 | 90.46% | 14.49% | 0.82% | 13.85% | 126,647,466 |

*Not all values may compute exactly due to rounding.
†Adjustment value displayed is truncated (2 digit) average based on sum of all individual adjustments by measure. Individual adjustment factors (RR, ATT, Spillover) are utilized for calculations at the two-digit level, as displayed.

## Verification Result

As a result of this review, the EC confirms total savings of 126,647,466 CCM (90.46% of net tracked) for Union's Large Volume (Rate T2/Rate 100) Program.

## 11.8 Appendix H: Market Transformation Scorecards

This appendix describes the detailed process used to verify the metrics for the Market Transformation Scorecard programs for Enbridge (Table 11-95) and Union (Table 11-96). The programs addressed in this appendix are:

- Commercial New Construction – Commercial Savings by Design – Enbridge
- Commercial New Construction – Union
- Residential New Construction – Residential Savings by Design – Enbridge
- Residential New Construction – Optimum Home Program – Union
- School Energy Competition – Enbridge

**Table 11-95. Enbridge 2020 market transformation scorecard[87]*†**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| School Energy Competition | Schools | 7 | 7 | 54 | 72 | 108 | 10.00% |
| Run-it-Right | Participants | 65 | 65 | 43 | 58 | 86 | 20.00% |
| Comprehensive Energy Management | Participants | 7 | 7 | 24 | 32 | 49 | 20.00% |
| Residential Savings by Design | Builders | 35 | 35 | 26 | 35 | 52 | 10.00% |
| Residential Savings by Design | Homes Built | 2,768 | 2,768 | 2,002 | 2,669 | 4,004 | 15.00% |
| Commercial Savings by Design | New Developments | 36 | 36 | 22 | 29 | 43 | 25.00% |

*Not all values may compute exactly due to rounding.
†Programs in grey text are not similar to Union programs under the Market Transformation Scorecard, and not discussed in this Appendix. For these programs, please refer to Section 11.9.

**Table 11-96. Union 2020 market transformation scorecard*[88]**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| Optimum Home | Percentage of Homes Built | 39.19% | 39.19% | 24.24% | 32.32% | 48.48% | 50.00% |
| Commercial New Construction | New Developments | 24 | 24 | 20 | 26 | 39 | 50.00% |

*Not all values may compute exactly due to rounding.

[87] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Schedule C
[88] Ibid

## 11.8.1 Commercial New Construction – Commercial Savings by Design – Enbridge

### Overview

Table 11-97 shows the tracked and verified scorecard achievements for the 2020 Enbridge Commercial Savings by Design (SBD) Program, with the metric of New Developments. As a result of this review, the EC verifies 36 New Developments (100.00% of tracked). Table 11-97 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-97. Enbridge Market Transformation achievement: Commercial Savings by Design developments metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| New Developments | 36 | 36 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-98 to verify the metrics for the Commercial Savings by Design program.

**Table 11-98. Documentation used to verify the Commercial Savings by Design program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | PDF documents |
| Confirmation Emails | PDF copies of email correspondence with builders verifying aspects of their housing developments |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Enbridge provided the Tracking File listing Project Number (unique ID), program year, commitment date and IDP date. As tracking data indicated that all 36 listed participants were equally qualified, the EC randomly selected 10 records from the full list for document review. The EC requested all supporting documentation, including documentation that supports eligibility and participation criteria.

#### Received Files

The EC received three types of documents in response to this request:

- Commitment form, including terms and conditions
- IDP report
- Letters from participants supporting participation criteria

The EC first confirmed that the documentation received matched the IDs requested. The EC confirmed that the signature dates on the commitment form matched the commitment date in the tracking file, and that the date on the IDP report matched the date recorded in the IDP date field of the tracking file.

## Verify Participation

To determine the definition of New Developments, the EC looked first to the OEB Decision, which approved the Enbridge ESC Plan:[89]

*Decisions*
*The OEB approves Enbridge's Commercial Savings by Design program. This program is similar to Enbridge's Residential Savings by Design, with the difference being the target market is commercial and industrial buildings as opposed to residential new construction. For the same reasons as the Residential Savings by Design program, the OEB finds that this program is consistent with guiding principles of the DSM Framework and drives integrated conservation savings prior to building construction.*

Relevant criteria for "new development" are described in Enbridge's Plan "Budgets, Metrics and Targets,"[90] paragraph 46:

- For the purpose of assessing the "new developments enrolled" metric for SBD Commercial:

  i. *Only builders and developers who have "enrolled" in the program and completed the IDP process are eligible to be counted towards the target.*

  *ii. "Enrolment" is defined as a signed MOU with a builder or developer containing a commitment to participate in the Enbridge Commercial Savings by Design offer for a 5-year period which will include undertaking an IDP adhering to an Enbridge approved IDP process (such as IEA Task 23 or the iiSBE developed IDP Tool) which also includes the requisite energy model, demonstrating how to achieve at least 15% total energy savings relative to the yet to be completed 2017 Ontario Building Code. The builder must also commit to constructing buildings or a building to the IDP standard within 5 years.*

  *iii. The metric in the Commercial Savings by Design scorecard is based on the number of projects to which a developer commits, i.e., the same developer with different clients and different kinds of projects may be counted multiple times. A minimum 50,000 square feet requirement applies to each project. A project is defined as either a single building or multiples of the same building by the same company that add up to 50,000 square feet.*

From these definitions, the EC observed the following criteria:

- Only projects from enrolled builders/developers count towards the metric. Enrollment is defined as:
  - A builder or developer committed to the CSBD offer for five years via an MOU
  - And undertaking the Enbridge approved IDP process for each development, which requires:
    - Energy model
    - Demonstration of how to achieve 15% energy savings over 2017 building code
    - A project which is a single building or multiples of the same building which sum to at least 50,000 $ft^2$

The EC noted that the IDPs submitted for the 10 developments cited an average savings of 34% improvement against the 2017 OBC code, with a range of 15.9% to 56.8% savings. IDP forms for four of the ten developments showed that they were less than 50,000 $ft^2$, meaning they would not meet the participation criteria. However, a supporting letter from each of these developers was included in the project files, which confirmed that the development would in fact exceed 50,000 $ft^2$. The average square footage was 177,963 $ft^2$ and a range of 50,000 $ft^2$ to 542,193 $ft^2$.

[89] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 39
[90] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 1, Schedule 4, 37 of 41

**Table 11-99. Enbridge Commercial Savings by Design participation criteria, project satisfaction, and explanation**

| Identified Criteria | Satisfied? | Explanation |
|---|---|---|
| Only projects from enrolled builders/developers count towards the metric | Yes | Following criteria meet definition for enrolment |
| Enrolment is defined as builder or developer committed to the CSBD offer for five years | Yes | Terms and Conditions establishes that project must be completed within 5 years |
| Undertaking Enbridge approved IDP process for each development | Yes | IDP Reports included in documentation |
| IDP includes energy model | Yes | IDP Reports identifies eQuest v3.65[91] |
| Sufficient energy savings achieved | Yes | See below |
| -IDP demonstrates how to achieve 15% energy savings over 2017 building code | N/A | All IDP reports states savings 15% over 2017 OBC |
| Project must be at least 50,000 $ft^2$ | Yes | Applications and IDP Reports included in documentation |
| Project is a single building or multiples of same building which sum to at least 50,000 $ft^2$ | Yes | Projects of one or multiple buildings all greater than 50,000 $ft^2$ |

As a result, the EC confirms that the submitted projects met the criteria for participation as a New Development for the Enbridge Commercial Savings by Design program.

## Verify Eligibility

Enbridge's Plan, approved by the OEB, further identifies eligibility criteria. As stated in Enbridge's Plan:[92]

> *The SBD Commercial offer is direct-to-builder/developer delivered by an internal sales team. Eligibility criteria include the following:*
> - *Commercial, multi-residential or industrial buildings covered under the Ontario Building Code Part 3;*
> - *A minimum threshold of 50,000 square feet per project (including aggregate multi-location projects);*
> - *Building(s) must be within Enbridge's franchise area, or for aggregate projects 75% of the project square footage must be in the franchise area;*
> - *Building(s) must be in the design phase or earlier in the process;*
> - *Building construction must be completed within five years of signing the agreement, and commissioning must be completed no more than one year after that; and,*
> - *Builders will be eligible to participate in the offer multiple times for different projects*

These defined eligibility requirements overlap with the criteria Enbridge laid out for assessing enrolments. The EC used the Commitment Forms and IDP Reports to determine if the projects met these criteria.

[91] ASHRAE 90.1-2013 section 11 as modified by Supplementary Standard SB10-2017 Division 3, Chapter 2, were followed in generating reference and baseline models

[92] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 1, 61 of 100

**Table 11-100. Enbridge Commercial Savings by Design eligibility criteria, project satisfaction, and explanation**

| Identified Criteria | Satisfied? | Explanation |
|---|---|---|
| Commercial, multi-residential or industrial buildings | Yes | IDP Reports |
| 50,000 $ft^2$ minimum project size | Yes | Commitment Form |
| Within Enbridge territory | Yes | Application terms and conditions |
| Design phase or earlier | Yes | IDPs performed to prior to construction. |
| Construction within 5 years | N/A | Eligibility for fuller program participation, not applicable for new enrolment. |
| Commissioning within 1 year of construction | N/A | |

One of the ten sampled developments is an Enbridge-owned building. After receiving more information about the project from Enbridge, DNV conferred with the EAC as to the eligibility of this development. In part because the builder had not participated in the CSBD program prior to this development, all parties agreed that the development should count towards the verified achievement.

After reviewing the stated eligibility criteria and Project Files, the EC confirms the 10 sampled projects all meet the eligibility criteria.

## Verification Result

As a result of this review:

- The EC confirms proper documentation for the requested projects
- Project files for the submitted projects meet all requirements for a participant
- Project files for the submitted projects meet further criteria for eligibility

As a result of this review, the EC confirms the scorecard metric of 36 new developments (100.00% of tracked) for the Enbridge Commercial Savings by Design program.

## 11.8.2 Commercial New Construction – Union

### Overview

Table 11-101 shows the tracked and verified scorecard achievements for the 2020 Union Commercial New Construction Program (also referred to as the Commercial Savings by Design Program), with the metric of New Developments. As a result of this review, the EC verifies 24 New Developments enrolled by participating builders (100.00% of tracked). Table 11-101 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-101. Union Market Transformation achievement: Commercial New Construction developments metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| New Developments | 24 | 24 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-102 to verify the metrics for the Commercial New Construction program.

**Table 11-102. Documentation used to verify the Commercial New Construction program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| Confirmation Emails | PDF copies of email correspondence with builders verifying aspects of their housing developments |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |

#### Participant Selection

Union provided the Tracking File listing Project Code (unique ID), program year, application date, Visioning Date and IDP date. The spreadsheet identified 24 participants, all with 2020 dates. As tracking data indicated that all the 24 listed participants were equally qualified, the EC requested all supporting documentation for a census, including documentation that supports eligibility and participation criteria.

#### Received Files

The EC received four types of documents in response to this request:

- Commitment form
- Terms and Conditions
- IDP report
- Supporting Letter

The EC first confirmed that the documents received matched the IDs requested. The EC confirmed that the signature dates on the commitment form matched the commitment date in the tracking file, and that the date on the IDP report matched the date recorded in the IDP date field of the tracking file.

## Verify Participation

To determine the definition of New Developments, the EC looked first to the OEB Decision, which approved Union's Plan:[93]

*Decisions*
*The OEB approves Enbridge's Commercial Savings by Design program. This program is similar to Enbridge's Residential Savings by Design, with the difference being the target market is commercial and industrial buildings as opposed to residential new construction. For the same reasons as the Residential Savings by Design program, the OEB finds that this program is consistent with guiding principles of the DSM Framework and drives integrated conservation savings prior to building construction.*
*The OEB directs Union to establish a similar program targeting commercial and industrial buildings in its service area. The OEB finds commercial and industrial customers would expect consistency in the market, especially for province-wide chains, franchises and companies.*

Relevant criteria for "new development" are described in Union's Draft report:[94]

*To be eligible for an incentive, the submitted projects must fulfill the following criteria:*

- *Construction projects must have a minimum threshold of 50,000 square feet per project (including aggregate multi-location projects)*
- *Building(s) must be in the design phase or earlier*
- *Building construction must be completed within 5 years of completion of the IDP, and building must be commissioned within 1 year of construction completion*
- *Builders are eligible to participate in the offering multiple times for different projects*

From these definitions, the EC observed the following criteria:

- Only projects from enrolled builders/developers count towards the metric. Enrolment is defined as:
  - A builder or developer committed to the program offer for five years via an MOU
  - And undertaking the Union approved IDP process for each development, which requires:
    - Energy model
    - Demonstration of how to achieve 15% energy savings over 2017 building code
    - A project is a building or multiples of same building which sum to at least 50,000 $ft^2$

The EC noted that the IDPs submitted for all 24 participants cited an average savings of 24.85% improvement against the 2017 OBC code, with a range of 16% to 62% in savings. Upon initial review, IDPs for 23 of the 24 developments showed at least 50,000 $ft^2$ with an average of 172,813 $ft^2$ and a range of 36,061 $ft^2$ to 629,581 $ft^2$. Therefore, one development initially did not qualify on the basis of being smaller than 50,000 $ft^2$. However, Union provided the EC with a supporting letter from the builders of the remaining one development confirming the developments would in fact exceed 50,000 $ft^2$.

[93] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 39
[94] Union's DRAFT 2020 Demand Side Management Evaluation Report, Page 110

**Table 11-103. Union Commercial New Construction participation criteria, project satisfaction, and explanation**

| Identified Criteria | Satisfied? | Explanation |
|---|---|---|
| Only projects from enrolled builders/developers count towards the metric | Yes | Following criteria meet definition for enrolment |
| Enrolment is defined as builder or developer committed to the CSBD offer for five years: | Yes | Terms and Conditions establishes that project must be completed within 5 years |
| Undertaking IDP process for each development | Yes | IDP Reports included in documentation |
| IDP includes energy model | Yes | IDP Reports identify eQuest v3.65[95] |
| Sufficient energy savings achieved | Yes | See below |
| - IDP demonstrates how to achieve 15% energy savings over 2017 code | N/A | All IDP reports state savings 15% over 2017 OBC |
| Project must be at least 50,000 $ft^2$ | Yes | Commitment Forms and supporting letters |
| Project is a single building or multiples of same building which sum to at least 50,000 $ft^2$ | Yes | Projects of one or multiple buildings all greater than 50,000 $ft^2$ |

As a result, the EC confirms that all 24 submitted projects met the criteria for participation as a New Development for the Union Commercial New Construction program.

## Verify Eligibility

Since Union's plan was submitted before the Decision and Order that instructed Union to create a similar program to Enbridge's, the earlier referenced draft report served as the primary reference for eligibility. The EC used the Commitment Forms and IDP Reports to determine if the projects met these criteria.

**Table 11-104. Union Commercial New Construction eligibility criteria, project satisfaction, and explanation**

| Identified Criteria | Satisfied? | Explanation |
|---|---|---|
| Commercial, multi-residential or industrial buildings | Yes | IDP Reports |
| 50,000 $ft^2$ minimum project size | Yes | Commitment Forms and supporting letters |
| Design phase or earlier | Yes | IDPs performed to prior to construction. |
| Construction within 5 years | N/A | Eligibility for fuller program participation, not applicable for new enrolment. |
| Commissioning within 1 year of construction | N/A | |

After reviewing these stated eligibility criteria and Project Files, the EC confirms that all 24 projects meet the eligibility criteria.

## Verification Result

As a result of this review:

- The EC confirms proper documentation for the requested projects
- Project files for all 24 of the submitted projects meet all requirements for a participant
- Project files for all 24 of those projects meet further criteria for eligibility

The EC verifies the achievement of 24 projects (100.00% of tracked) for the Union Commercial New Construction program.

[95] ASHRAE 90.1-2013 section 11 as modified by Supplementary Standard SB10-2017 Division 3, Chapter 2, were followed in generating reference and baseline models

## 11.8.3 Residential New Construction – Residential Savings by Design – Enbridge

### Overview

Table 11-105 shows the tracked and verified scorecard achievements for the 2020 Enbridge Residential Savings by Design (SBD) Program, with the metrics of enrolled builders and number of homes built. As a result of this review, the EC verifies 35 builders (100.00% of tracked) and 2,768 homes built (98.89% of tracked). Each metric is discussed separately in this section, starting with the builders metric. Table 11-105 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-105. Enbridge Market Transformation achievement: Residential Savings by Design metrics***

| Program | Metric | Achievement | | Ratio |
|---|---|---|---|---|
| | | Tracked | Verified | |
| Residential Savings by Design | Builders | 35 | 35 | 100.00% |
| | Homes Built | 2,799 | 2,768 | 98.89% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-106 to verify the metrics for the Residential Savings by Design program.

**Table 11-106. Documentation used to verify the Residential Savings by Design program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Files documenting participation and eligibility for selected builder/project |
| Confirmation Emails | PDF copies of email correspondence with builders verifying aspects of their housing developments |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

### Builders Metric

#### Participant Selection

Enbridge first provided the Tracking File listing Project Number (unique ID), Enrolment Year, Signed Commitment (date), and IDP date. The spreadsheet identified 35 builders, all with 2020 IDP dates. As tracking data indicated that all the 35 listed builders were equally qualified, the EC randomly selected ten from the full list for document review. The EC requested all supporting documentation, including documentation that supports eligibility and participation criteria.

#### Received Files

Enbridge provided three types of files to support participation:

- “Project Application”
- “IDP Report”
- Letters from participants supporting participation criteria

## Verify Participation

To determine the definition of Enrolled Builders, the EC looked first to the OEB Decision, which approved the Enbridge ESC Plan[96] stating: "*The OEB approves Enbridge's Residential Savings by Design program as proposed."* For further detail on criteria, the EC looked to Enbridge's Plan which identified:[97]

> *"For the purpose of assessing whether a builder is "enrolled" in SBD Residential:*
>
> *i. The builder must have signed a Memorandum of Understanding ("MOU") containing a commitment to participate in the Residential SBD program for a 3-year period*
>
> *ii. The builder must have completed a program-approved Integrated Design Process ("IDP"), such as IEA Task 23 or the iiSBE developed IDP tool, including requisite energy modelling for homes the builder plans to construct in a new development. Homes to be completed in 2016 must demonstrate at least 25% total energy savings relative to the 2012 Ontario Building Code. Homes to be completed in 2018 and beyond must demonstrate total energy savings of at least 15% relative to the yet to be developed 2018 Ontario Building Code.*
>
> *iii. Builders will be permitted to enroll in Enbridge's Residential SBD offer more than once to avoid lost opportunities. In order to increase the scale of energy efficiency amongst participating builders, repeat builders will be offered progressively smaller incentives per home, but shall be permitted to collect these reduced incentives for a larger number of units.*
>
> *iv. In order for a builder's development to qualify as significant enough in size to participate in Enbridge's SBD Residential offer, the development must include no less than 50 homes."*

The EC evaluated the sampled participant files against the criteria above and determined:

- Requirement i:
  - Section 2c. of the Enbridge-provided Terms & Conditions included in the application contains the following: "…Applicant must design and construct the residential homes…by no later than three (3) calendar years from the date of the IDP."
  - This identifies an agreement to complete a project within three years but does not indicate the commitment of a builder to participate in the Residential SBD program for three years.
- Requirement ii:
  - Section 2c. of the Enbridge-provided Terms & Conditions includes the following: "In order to apply for the Program and be eligible for financial incentives, the Applicant must design and construct the residential homes…in Enbridge franchise areas which meet or exceed the Target Energy Performance", which is established in Section 1.ii as exceeding "the 2017 Ontario Building Code's ("OBC") energy performance requirements by at least 15% or greater."
  - The five submitted IDP Reports identified at least 15% energy savings above 2017 OBC using the HOT2000 simulation program.
- Requirement iii:
  - The EC does not find that this requirement is applicable to validating participation, only that it permits further participation.
- Requirement iv:
  - The Project Applications of eight of the ten randomly selected builders identified the total development size of 50 homes or more, satisfying the requirement for no less than 50. Two applications indicated that the development would include fewer than 50 homes, which did not meet the requirement.

[96] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 34

[97] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 1, Schedule 4, Page 35-36 of 41

**Initial Verification**

The initial verification review determined that eight of the ten randomly selected homes met the participation and eligibility criteria.

**Second Verification**

The program application states that the applicant must complete the components of the program within three years of the application date (see above). As a result, the EC determined that the two builders that did not pass the initial verification could meet the 50 homes threshold by confirming that at least 50 homes will be constructed in the development by the end of 2022.

Enbridge provided DNV copies of email correspondence with the two builders that did not pass the initial verification, both of which confirmed at least 50 homes would be constructed within three years.

### Verification Result

As a result, the EC confirms:

- Builders do not have MOUs identifying agreement to participate "in the Residential SBD program for three years," only that projects would be completed before three years are over
- All selected builders meet the participation criteria for IDP submission with sufficient savings
- All submitted builders meet the participation criteria for project size

As a result of this review, the EC confirms the scorecard metric of 35 enrolled builders (100.00% of tracked) for the Enbridge Residential Savings by Design program.

## Homes Built Metric

**Participant Selection**

Enbridge first provided the Tracking File listing Project Code (unique ID), Builder, and Savings Percent over OBC for program homes. The spreadsheet identified 1,251 program-rebated homes, separate from the 1,548 additional homes built to program requirements but not receiving program rebates. The EC randomly selected five homes from the 1,251 program-rebated homes for document review. The EC requested all supporting documentation, including documentation that supports eligibility and participation criteria.

**Received Files**

Enbridge provided the following files to support the sampled homes:

- "Application Form" – PDF document outlining initial plans
- "IDP Workshop Report" – PDF document outlining qualification documentation
- "H2K Results" – JPG showing the Total Annual Fuel Consumption in megajoules (MJ) of the sampled house
- REM-Rate Compliance Certificate – PDF document confirming energy performance over code
- "Summary Sheet" – Excel file which outlines the calculations that were made summarizing the HOT2000 calculation of energy savings and indicates the NRCan credits

In addition to these documents to support program homes, Enbridge also confirmed that supporting letters were received for additional non-rebated homes, verifying that they were built to the same IDP standard as program homes.

## Verify Participation

To determine the definition criteria for Homes Built, the EC looked first to the OEB Decision, which approved the Enbridge ESC Plan stating[98] "*The OEB approves Enbridge's Residential Savings by Design program as proposed."* For further detail on criteria, the EC looked to Enbridge's Plan which identified:[99]

> *For the purpose of assessing the "homes built" metric for SBD Residential:*
>
> *i. A home must be completed by a participating builder who has completed the IDP process for the development.*
>
> *ii. A home which, as constructed, has features consistent with the builder's IDP and that make it 25% more efficient than a new home built to the 2012 Ontario Building Code if constructed in 2016, and 15% more efficient than a new home built to the yet to be completed 2018 Ontario Building Code.*
>
> *iii. Builders may apply the outcomes of the IDP to additional developments if the outcomes are applicable. The homes built in additional developments may be counted as homes built. However, the maximum number of homes for which a builder may receive incentives shall not increase.*
>
> *iv. All homes constructed to the standard in a builder's development shall count towards the "homes built" metric even if rebates were not paid for all of them. Non-rebated units will be verified by a confirmation letter from the builder acknowledging that the homes were built to the IDP standard. Enbridge rebated units will be verified using the blower door test.*

From this definition and submitted documentation, the EC determined participation for the randomly selected homes:

- Requirement i:
  - The EC did not evaluate whether the homes selected were completed by participating builders who had completed the IDP process for this development. Evaluation of the builders was done through verifying the Enrolled Builders metric (see above). The EC assumed that this portion of the requirements was met because the previous section confirmed builder participation.
- Requirement ii:
  - The Summary documentation as well as the Savings Summary worksheets, HOT2000 screenshots, and REM-Rate documents for all five randomly selected homes demonstrated modelled as-built energy consumption 15% or greater above 2017 OBC.
- Requirement iii:
  - The EC does not find that this requirement applies to validating participation, only that it permits further participation.
- Requirement iv:
  - Enbridge confirmed that supporting letters were received for all developments that included additional homes beyond those incented. The EC finds that this satisfies the requirement for non-rebated units.

The EC finds that all five randomly selected homes meet the eligibility and efficiency qualifications.

Additionally, the Tracking File provided to the EC showed that 31 homes had modelled as-built energy consumption between 14.51% and 14.98% better than the 2017 OBC, not meeting the requirement for 15% more efficient than OBC.

## Verification Result

As a result of this review, the EC confirms 1,220 rebated program homes and 1,548 non-rebated homes, for an achievement of 2,768 Homes Built (98.89% of tracked) for the Enbridge Residential Savings by Design program.

[98] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 34

[99] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 1, Schedule 4, Page 36-37 of 41

## 11.8.4 Residential New Construction – Optimum Home Program – Union

### Overview

Table 11-107 shows the tracked and verified scorecard achievements for the 2020 Union Optimum Home Program, with the metric of percentage of homes built (>15% above OBC 2017) by participating builders. As a result of this review, the EC verifies 39.19% of homes built (100.00% of tracked). Table 11-107 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-107. Union Market Transformation achievement: Optimum Home percentage of homes built metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Percentage of Homes Built | 39.19% | 39.19% | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-108 to verify the metrics for the Optimum Home program.

**Table 11-108. Documentation used to verify the Optimum Home program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| Optimum Home Top 10 and Homes Built List | Excel spreadsheet listing builders in each region by housing starts and all participating homes |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| Union's Draft 2017 Report | Union Gas 2017 Demand Side Management Draft Annual Report |

#### Participant Selection

Union first provided the Tracking File listing anonymized builders with the year each builder enrolled, the number of total new gas attachments in 2020, the number of program homes, and a percentage of homes built calculation. This file demonstrated the claimed metric achievement, identifying 1,389 of 3,544 total homes built by the 22 enrolled builders, as demonstrated in Table 11-109.

**Table 11-109. Optimum Home claimed total and program homes built, by builder***

| Builder | Total Homes Built | Optimum Homes Built | % of Homes Built |
|---|---|---|---|
| Builder 1 | 116 | 1 | 0.9% |
| Builder 2 | 107 | 60 | 56.1% |
| Builder 3 | 63 | 6 | 9.5% |
| Builder 4 | 83 | 43 | 51.8% |
| Builder 5 | 242 | 118 | 48.8% |
| Builder 6 | 65 | 14 | 21.5% |
| Builder 7 | 225 | 44 | 19.6% |
| Builder 8 | 1,478 | 833 | 56.4% |
| Builder 9 | 139 | 111 | 79.9% |
| Builder 10 | 0 | 0 | 0.0% |
| Builder 11 | 44 | 3 | 6.8% |
| Builder 12 | 184 | 17 | 9.2% |
| Builder 13 | 55 | 0 | 0.0% |
| Builder 14 | 212 | 0 | 0.0% |
| Builder 15 | 54 | 36 | 66.7% |
| Builder 16 | 202 | 58 | 28.7% |
| Builder 17 | 0 | 0 | 0.0% |
| Builder 18 | 21 | 21 | 100.0% |
| Builder 19 | 76 | 23 | 30.3% |
| Builder 20 | 3 | 0 | 0.0% |
| Builder 21 | 65 | 1 | 1.5% |
| Builder 22 | 110 | 0 | 0.0% |
| **Total** | **3,544** | **1,389** | **39.19%** |

*Not all values may compute exactly due to rounding.

In addition, Union provided a list of Optimum Homes built in 2020 with individual listings for the 1,389 program homes, identifying builder, file number, and enrolment type (e.g., ES BOP Version 17). From these, the EC randomly selected five program homes for review and verification.

Union provided the following documentation to support verification of each of the selected program homes:

- Energy Star for New Homes Compliance Report – PDF
- Balance-of-Plant summary verifying building energy performance to ESNH v17

## Verify Participation

This metric includes the percentage of homes built to Optimum Home energy performance standards "by participating builders." To fully verify the metric, the EC examined the five builders of the randomly selected homes. The EC confirmed these builders enrolled in the program, satisfying the requirement.

## Verify Eligibility

Union relaunched the Optimum Home program in 2017 in response to the introduction of the new Ontario Building Code (OBC) in 2017. To determine the definition of participating homes, the EC looked to the Union 2017 Draft Annual Report.

The report makes clear that qualifying homes constructed in 2017 and thereafter must "achieve ENERGY STAR® for New Homes v17 ("ESNH v17").[100]

The EC requested documentation for verification of five sites, randomly selected from the 2020 Optimum Homes Built spreadsheet. Files provided by Union confirmed the eligibility of the homes. The ESNH v17 Compliance Report demonstrated both qualifying inspection dates (all 2020) and that the sites met the ESNH v17 energy performance threshold.

As a result, the EC confirms that the submitted projects meet the criteria for eligibility for the Union Optimum Homes program.

## Verification Result

As a result of this review:

- The EC confirms proper documentation for the requested sites and builders
- Project files for the randomly selected sites meet energy savings compliance criteria

The EC verifies the scorecard metric of 1,389 out of 3,544 (39.19%) total participating builder homes (100.00% of tracked) for the Optimum Home program.

[100] Union's Draft 2017 Demand Side Management Evaluation Report, Page 89

## 11.8.5 School Energy Competition – Enbridge

### Overview

Table 11-110 shows the tracked and verified scorecard achievements for the 2020 Enbridge School Energy Competition Program, with the metric of Participating Schools. As a result of this review, the EC verifies 7 Participating Schools (100.00% of tracked). Table 11-110 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-110. Enbridge Market Transformation achievement: School Energy Competition Schools metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participating Schools | 7 | 7 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-111 to verify the metrics for the School Energy Competition program.

**Table 11-111. Documentation used to verify the School Energy Competition program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Enbridge first provided the Tracking File listing the Enbridge Account (number) and Project Code (unique ID). The spreadsheet identified 7 participants. The EC requested full documentation for all participants.

#### Received Files

The EC received four individual files:

- One “SEC Activity Tracker” spreadsheet marking participation of all schools in various program elements and offerings
- Three application forms confirming registration with participating school boards

The EC first confirmed the documents received matched the IDs requested. The EC confirmed that documents were received that addressed all participants.

## Verify Participation

To determine the definition of Participating Schools, the EC looked first to the OEB Decision which approved the Enbridge Plan:[101]

*Decision*
*The OEB approves Enbridge's School Energy Competition program. The OEB finds this program provides both educational and energy conservation benefits. Further, this program is designed to engage a wide group of participants through a competition, which is innovative. The OEB also finds the involvement of students, potential future customers, to be consistent with the intent of the DSM Framework.*

For more specific participation criteria, the EC then looked to Enbridge's Plan which identifies:[102]

*"For the purpose of measuring the success of the Company's School Energy Competition, a school will be considered "enrolled" at the time that energy monitoring begins using the Energy Management Information System ("EMIS") provided via the offer. At a high level, monitoring is the third of the four steps which comprise the School Energy Competition."*

Further, Enbridge's Plan identifies "Key Offer Evaluation Metrics:[103]"

*"A participant is a school that registers, implements, and has access to an EMIS system to log competition activities"*

From this, the EC has identified that a "Participating School" is defined as a school that has:

- Registered and 'logged in' to the EMIS system.

School application hardcopy images (PDF) do not provide evidence of having registered with or logged into any information system, including the EMIS system. The Online Registration spreadsheet identifies a list of program IDs and a date stamp for each. Neither registration provides evidence that the any of the 7 IDs have logged into the EMIS system. However, during the previous round of evaluation, the EC requested confirmation that ESC Activities as tracked in the spreadsheet represent EMIS registration. In previous evaluations, Enbridge staff responded with confirmation:[104]

*"In order to provide the schools with their EMIS data, a website was created that contained a link to a dashboard, which showed each school their EMIS data. Enbridge was then able to track that all participating schools accessed the website."*

The ESC Activity Tracker is a program tracking spreadsheet, identifying program elements completed by each school. For each ID, the spreadsheet identifies activities which that ID participated in, summarized in Table 11-112.

**Table 11-112. Enbridge ESC activities and participant counts***

| Program Activity | High School | Elementary School | Total Activities |
|---|---|---|---|
| Team to Support & Lead SEC | 2 | 4 | 6 |
| Conduct a Home Energy Audit | 2 | 4 | 6 |
| Natural Gas Education | 1 | 5 | 6 |
| Bonus Activity | 2 | 4 | 6 |
| Programmable or Smart Thermostats | 1 | 4 | 5 |
| Art Poster Contest | 2 | 3 | 5 |
| Ugly Sweater Day | 2 | 3 | 5 |
| Access Energy Use | 2 | 2 | 4 |
| Conduct a Classroom Energy Audit | 0 | 3 | 3 |

[101] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, Page 43
[102] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 1, Schedule 4, 34 of 41
[103] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 2, Page 48 of 55
[104] Enbridge Employee "RE: Follow up request - LI New Construction and MT School Energy Competition" Message to DNV Employee, 2/1/2018, Email

As a result, the EC confirms participation for all 7 schools.

## Verify Eligibility

The EC first looked to the OEB Decision to determine specific criteria for participant eligibility, then to Enbridge's Plan, which identifies:[105]

*"Participating schools must be part of a board within one of the publicly funded systems (English/French/Public/Catholic) in Ontario within the Enbridge franchise area."*

Within the provided files, the application forms contained the listing of publicly funded school boards within the Enbridge area. The spreadsheet provided the name of each school under the jurisdiction of one of the three school boards. Through publicly available resources, the EAC confirmed each school met this criterion. As a result, the EC confirms eligibility for all 7 schools.

## Verification Result

As a result of this review, the EC confirms:

- Participants meet the participation criteria
- Any participants meet the eligibility requirements

The EC verifies the scorecard metric of 7 schools (100.00% of tracked) in the Enbridge School Energy Competition program.

[105] Enbridge's Proposed 2015-2020 DSM Plan, EB-2015-0049, Exhibit B, Tab 2, Schedule 2, Page 47 of 55

## 11.9 Appendix I: Performance Based (Union) and Market Transformation (Enbridge) Scorecards

This appendix describes the detailed process used to verify the metrics for the Performance-Based Scorecard programs for Union (Table 11-114) and the similar programs for Enbridge that are contained under the Market Transformation Scorecard (Table 11-113). As noted in the OEB Decision and Order, the programs listed below are similar and thus included together. The programs addressed in this appendix are:

- C&I Operational Efficiency Improvement – Run-it-Right – Enbridge
- C&I Operational Efficiency Improvement – RunSmart – Union
- C&I Energy Management – Comprehensive Energy Management – Enbridge
- C&I Energy Management – Strategic Energy Management – Union

**Table 11-113. Enbridge 2020 market transformation & energy management scorecard*†**

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| School Energy Competition | Schools | 7 | 7 | 54 | 72 | 108 | 10.00% |
| Run-it-Right | Participants | 65 | 65 | 43 | 58 | 86 | 20.00% |
| Comprehensive Energy Management | Participants | 7 | 7 | 24 | 32 | 49 | 20.00% |
| Residential Savings by Design | Builders | 35 | 35 | 26 | 35 | 52 | 10.00% |
| Residential Savings by Design | Homes Built | 2,768 | 2,768 | 2,002 | 2,669 | 4,004 | 15.00% |
| Commercial Savings by Design | New Developments | 36 | 36 | 22 | 29 | 43 | 25.00% |

*Not all values may compute exactly due to rounding.
†Programs in grey text are not similar to Union programs under the Performance Based Scorecard, and not discussed in this Appendix. For these programs, please refer to Section 11.8.

**Table 11-114. Union 2020 performance-based scorecard***

| Programs | Metrics | Verified Achievement | | Metric Target | | | Weight |
|---|---|---|---|---|---|---|---|
| | | Program-level Achievement | Metric-level Achievement | Lower Band | Target | Upper Band | |
| RunSmart | Participants | - | - | 52 | 69 | 104 | 10.00% |
| | Savings % | -1.52% | -1.52% | 0.33% | 0.44% | 0.67% | 40.00% |
| Strategic Energy Management | Savings % | 2.61% | 2.61% | 3.56% | 4.75% | 7.13% | 50.00% |

*Not all values may compute exactly due to rounding.

## 11.9.1 C&I Operational Efficiency Improvement – Run-it-Right – Enbridge

### Overview

Table 11-115 shows the tracked and verified scorecard achievements for the 2020 Enbridge Run-it-Right (RIR) Program, with the metric of Participants. The RIR Program has two metrics under separate scorecards, CCM Savings (Resource Acquisition) and Participants (Performance Based). Participants are discussed here, while the CCM Savings metric is discussed in Section 11.5. As a result of this review, the EC verifies 65 participants (100.00% of tracked). Table 11-115 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-115. Enbridge Market Transformation achievement: Run-it-Right participants metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participants | 65 | 65 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-116 to verify the metrics for the Run-it-Right program.

**Table 11-116. Documentation used to verify the Run-it-Right program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | PDF scans of program participant documentation |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Enbridge first provided the Tracking File listing RIR Project Codes, Account Numbers, and Confirmation Date. The spreadsheet listed 65 individual accounts. The EC requested full documentation for a sample of 30 projects.

#### Received Files

The EC received a combined PDF document for each project:

- One program application,
- One investigation report, and
- Either one implementation time record or work orders for the recommended measures.

The EC also received an Excel file detailing the monitoring start date for each project.

The EC first confirmed the document IDs received matched the IDs requested and that documents for all participants had been received.

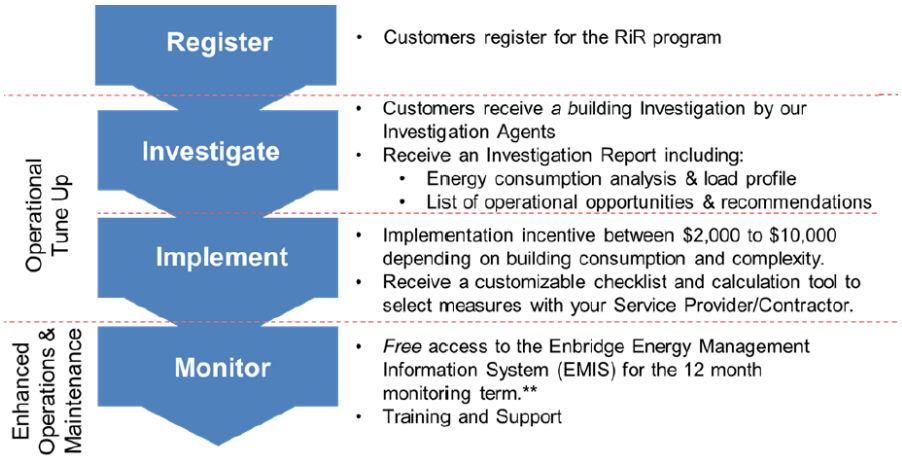
## Verify Participation

Enbridge's Plan[106] states that:

> *Customers shall be deemed a "participant" in Enbridge's RiR offer for the purpose of the MTEM scorecard once they have entered the monitoring stage of the offer, which is the fourth of four steps inherent to this offer*.

Enbridge's plan further documents the four steps inherent to the offer to be: Register, Investigate, Implement, and Monitor (Figure 11-6.). Combining the definition from Enbridge's plan with the figure, the EC interprets "participation" to require evidence of completing all four steps, including site energy use or savings monitoring produced by the fourth step.

**Figure 11-6. Image of RIR Process Elements from Enbridge Plan[107]**




Enbridge provided redacted program applications for 30 sites, satisfying intentional enrolment – the "register" step identified in Figure 11-6.

Enbridge provided investigation reports for the 30 sampled sites. Investigation reports provided estimated savings (analysis) for a site, as well as estimated savings by recommended measure. This document satisfies the second step identified in Figure 11-6.

For the 30 sampled sites, Enbridge provided either an implementation time record document or copies of work orders, either of which documented the execution of recommended work from the investigation reports. The EC considered either of these forms of documentation sufficient to satisfy the third step identified in Figure 11-6. for all projects submitted.

Enbridge provided an Excel file that listed the starting date for monitoring of the 30 sampled sites after project implementation, satisfying the fourth step identified in Figure 11-6.

## Verification Result

As a result of this review, the EC verifies the scorecard metric of 65 participants (100.00% of tracked) for the Enbridge Run-it-Right program.

[106] Enbridge Gas Program Plan: DSM Plan Overview and Guiding Principles, EB-2015-0049, Tab 1, Schedule 4, Page 34 of 41
[107] Enbridge Gas Program Plan: DSM Plan Overview and Guiding Principles, EB-2015-0049, Tab 2, Schedule 1, Page 87 of 100

## 11.9.2 C&I Operational Efficiency Improvement –RunSmart – Union

### Overview

Table 11-117 shows the tracked and verified scorecard achievements for the 2020 Union RunSmart program, with the metrics of Participants and Percent Savings. No activity was reported for the participants metric in 2020. As a result of this review, the EC verifies -1.52% savings (108.25% of tracked). Table 11-117 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-117. Union 2019 Performance Based achievement: RunSmart metrics***

| Program | Metric | Achievement | | Ratio |
|---|---|---|---|---|
| | | Tracked | Verified | |
| RunSmart | Participants | - | - | - |
| | Savings % | -1.66% | -1.52% | 108.25% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-118 to verify the metrics for the RunSmart program.

**Table 11-118. Documentation used to verify the RunSmart program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Union DSM programs |
| Project Files | PDF scans of program participant documentation |
| Consumption/ Participation Documentation | Excel spreadsheets documenting participant qualifying consumption and prior DSM activity |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Union Plan | Union's 2015-2020 DSM Plan, EB-2015-0029 |
| Enbridge's Draft 2020 Report | Enbridge Gas Inc. DRAFT 2020 Demand Side Management Annual Report |

### Participants Metric

No activity was reported for this metric in 2020.

### Savings Percent Metric

#### Participant Selection

Union first provided the Tracking File containing a table listing 58 RunSmart participants from the previous program year with Customer ID, Site ID, Existing Consumption (Baseline), Consumption Predicted from Baseline, and Actual Consumption (during participation). The EC requested documentation supporting the consumption values and supporting a lack of participation in other Union programs for a full census of these participants.

**Received Files**

The EC received Operational Improvements Checklists and documentation cross-checking the 58 participants with participants in all Union programs in 2018 and 2019.

### Verify Eligibility

Union's Plan[108] dictates that participants must not have had prior DSM participation history, and Union's 2020 Draft Annual Report[109] further clarifies that customers must not have participated in DSM programs in the previous two years. The utility-provided spreadsheet documenting DSM activity indicated that one of the 58 participants did have DSM program activity in the previous two years. Therefore, this participant was ineligible and was not factored into the calculations below.

### Verify Consumption

The EC examined the provided documentation to verify the consumption values in the Tracking File spreadsheet. The EC confirmed the documentation supported the consumption values for all participants.

### Verify Savings Calculation

Union's plan defines savings percent[110] as "the aggregate percentage of savings achieved by the program participants within a program year."

Union used the following equation, agreed upon with the EAC in previous years, for each individual participant's percentage savings:

$$Participant\ Savings\ \% = \frac{Predicted\ -\ Actual}{Predicted}$$

Where:

- "Predicted" = A prediction of consumption during the participation period, based on the customer's baseline (qualifying) consumption and heating degree days during participation
- "Actual" = Consumption during the one-year participation period

Union's tracked calculation then took the individual savings percent values for each participant and used the following equation to arrive at a program-level Savings Percent value:

$$\frac{\sum Participant\ Savings\ \%}{Count\ of\ Participants}$$

The EC agrees and confirms this methodology.

### Verification Result

As a result of this review, the EC confirms a Savings Percent value of -1.52% (108.25% of tracked) for the RunSmart Savings Percent metric.

[108] Description of RunSmart Savings Percent from Overview of Union's Proposed 2015-2020 DSM Plan, 2015EB-2015-0029, Exhibit A, Tab 3, Page 35 of 73
[109] Enbridge Gas Inc. Draft 2020 Demand Side Management Annual Report, April 1, 2021, page 111
[110] Description of RunSmart Savings Percent from Overview of Union's Proposed 2015-2020 DSM Plan, 2015EB-2015-0029, Exhibit A, Tab 3, Page 35 of 73

## 11.9.3 C&I Energy Management – Comprehensive Energy Management – Enbridge

### Overview

Table 11-119 shows the tracked and verified scorecard achievements for the 2020 Enbridge Comprehensive Energy Management (CEM) program, with the metric of Participants. As a result of this review, the EC verifies seven participants (100.00% of tracked). Table 11-119 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-119. Enbridge Market Transformation achievement: Comprehensive Energy Management participants metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Participants | 7 | 7 | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-120 to verify the metrics for the Comprehensive Energy Management program.

**Table 11-120. Documentation used to verify the Comprehensive Energy Management program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Enbridge first provided the Tracking File listing CEM Project Codes, Account Numbers, Enrolment Date, and Energy Model Date. The spreadsheet listed seven individual participants. The EC requested full documentation for all participants.

#### Received Files

The EC received seven PDF application form documents, identified by CEM Project number. The EC first confirmed the documents received matched the IDs requested, and that documents for all participants had been received.

### Verify Participation

Clear and specific criteria for participation in the CEM program were not readily available; rather documentation indicates that the CEM program is intended to be a multi-year, 'holistic' process with ongoing engagement resulting in energy savings. As a result, the EC understands that evidence of initial engagement and a specific agreement to participate are sufficient to verify participants for the purposes of the Market Transformation Scorecard metric of 'participants'.

The provided Project Files demonstrated that each participant applied for participation in the CEM program, signed by an applicant representative. In addition, the applications include declarations that the applicant:

- Acknowledges and confirms that they will commit resources to participate and identify energy efficiency opportunities
- Will create internal energy awareness
- Will share energy data with Enbridge
- Will allow continued communication with Enbridge

The EC confirmed documentation supports participation of all seven participants.

## Verify Eligibility

The EC also used the Project File to confirm the eligibility of each participant,[111,112] namely to verify that customers had annual gas consumption between 340,000 $m^3$ and 5,000,000 $m^3$.

In checking whether the Account Number listed in the Project Files matched Account Numbers listed in the Tracking File, the EC found that this was not the case for two of the seven applications. Enbridge explained that the two customers in question each have more than one natural gas meter at their premises, and each meter has its own account number. The CEM applicants filled out their applications using an account number associated with less than the minimum 340,000$m^3$ annual consumption (see the 'Verify Eligibility' section below). Therefore, in the tracking data, Enbridge changed the entry to reflect one of the account numbers at each site that exceeded 340,000$m^3$ annual usage. The EC verified and permitted this change.

Project Files identified previous year gas consumption for the seven customers:

- Four customers with consumption between 340,000 $m^3$ and 5,000,000 $m^3$
- Three customers with consumption greater than 5,000,000 $m^3$

The three participants with the largest consumption are significantly outside of the range, with 14 million, 24 million, and 27 million $m^3$. However, language in other parts of the plan make it clear that the target is large and complex commercial and industrial customers; therefore, the EC feels that participants with consumption larger than the stated guideline are reasonably close to the expectations set by the plan, while participants with consumption significantly lower would not be. Since the participants are significantly larger, the EC verifies the eligibility of these participants.

## Verification Result

As a result of this review, the EC confirms that:

- Documentation confirmed all participants met the participation definition
- Documentation confirmed four of seven participants met the eligibility definition
- Further review by the EC verified the remaining participants

The EC confirms the scorecard metric of 7 participants (100.00% of tracked) for the Enbridge Comprehensive Energy Management Program.

[111] Ontario Energy Board Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, page 47
[112] Enbridge Gas Program Plan: DSM Plan Overview and Guiding Principles, EB-2015-0049, Exhibit B, Tab 2, Schedule 1, Page 53 of 100

## 11.9.4 C&I Energy Management – Strategic Energy Management – Union

### Overview

Table 11-121 shows the tracked and verified scorecard achievements for the 2020 Union Strategic Energy Management (SEM) program, with the metric of Percent Savings. As a result of this review, the EC verifies 2.61% savings (100.00% of tracked). Table 11-121 contains the following variables:

- Tracked: Metric value from original Tracking File sent by Enbridge upon first data request
- Verified: Metric value verified from review of Tracking File, Project Files, and other relevant documents identified in the Documentation section
- Ratio: Ratio of verified to tracked achievement. A value of 100.00% indicates that verified values match tracked values

**Table 11-121. Union Performance Based achievement: Strategic Energy Management percent savings metric***

| Metric | Achievement | | Ratio |
|---|---|---|---|
| | Tracked | Verified | |
| Savings % | 2.61% | 2.61% | 100.00% |

*Not all values may compute exactly due to rounding.

### Documentation

The EC used the documentation shown in Table 11-122 to verify the metrics for the Strategic Energy Management program.

**Table 11-122. Documentation used to verify the Comprehensive Energy Management program**

| Report Language | Description or Citation |
|---|---|
| **Enbridge-Provided Documentation** | |
| Tracking File | Excel spreadsheet tracking metrics for all 2020 Enbridge DSM programs |
| Project Files | Various documents for each requested participant, supporting program metrics |
| **Documents Used by EC** | |
| OEB Decision | OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016 and OEB Revised Decision and Order, EB-2015-0029/EB-2015-0049, February 24, 2016 |
| Enbridge Plan | Enbridge Gas Multi-Year DSM Plan (2015-2020), EB-2015-0049 |

#### Participant Selection

Union first provided the Tracking File listing Year, SEM Project Codes, Savings, Reference Consumption, and Percent Saved. The spreadsheet listed five individual participants, but only one participant had energy savings in 2020. The EC requested full documentation for this participant.

#### Received Files

The EC received one PDF document – a Savings Report that detailed the energy efficiency measures taken by the active participant and the resulting energy savings. The EC confirmed that the participant details in this documentation matched the details listed in the Tracking File.

### Verify Savings Calculation

Union's plan defines savings percent[113] as "the aggregate percentage of savings achieved by the program participants within a program year." The savings report utilized on-site meter data and baseline consumption to model consumption and

[113] Description of Strategic Energy Management Savings Percent from Overview of Union's Proposed 2015-2020 DSM Plan, 2015EB-2015-0029, Exhibit A, Tab 3, Page 35 of 73

reductions in gas usage resulting from the implementation of the SEM Program. Union used the following equation for the participant's percentage savings:

$$Participant\ Savings\ \% = \frac{Pre\ Consumption\ Change}{Listed\ PY\ Consumption}$$

Union's tracked calculation then took the individual savings percent values for each participant and used the following equation to arrive at a program-level Savings Percent value:

$$\frac{\sum Participant\ Savings\ \%}{Count\ of\ Participants}$$

The EC agrees and confirms this methodology.

## Verification Result

As a result of this review, the EC confirms a Savings Percent value of 2.61% (100.00% of tracked) for the Strategic Energy Management Savings Percent metric.

## 11.10 Appendix J: Review of Metric Target Calculations

### Overview

For 2020 (and through the rest of this framework), targets for metrics that existed in the previous year are defined based on the previous year's (PY) achievement[114] and spend,[115] the current year (CY) budget, and a multiplier.[116] In general, metric targets follow this generic formula:

$$Metric\ Target = \frac{PY\ Achievement}{PY\ Spend} \times CY\ Budget \times Multiplier$$

The exception to the generic formula above is the Union Large Volume Program, which uses the 3 Year cost effectiveness (CE),[117] the current year (CY) budget, and a multiplier of 2% (1.02):

$$Union\ Large\ Volume\ Target = 3\ Year\ CE \times CY\ Budget \times 1.02$$

### Calculation Inputs

Table 11-123 and Table 11-124 provide the specific values used to calculate the 2020 metric targets.

Table 11-125 provides annual cost effectiveness (CE) ratios for the previous 3-years of the Union Large Volume Program and the average of those years, rounded to two digits past the decimal. The annual ratio is calculated via the final verified metric achievement divided by final actual program spend for that year. This rounded 3-year average value is what DNV used for target calculations.

Table 11-126 and Table 11-127 provide the targets for all 2020 metrics, calculation-based and prescribed.

**Table 11-123. Enbridge Metric Target Calculation Inputs – 2020**

| Scorecard | Metric | 2019 Achievement | 2019 Spend | 2020 Budget | Multiplier |
|---|---|---|---|---|---|
| Resource Acquisition | LV RA (CCM) | 477,360,883 | $9,605,202 | $9,922,880 | 1.02 |
| | SV RA (CCM) | 303,137,027 | $33,982,604 | $27,752,670 | |
| | HEC Participants* | 16,480 | $29,420,859 | $18,727,200 | |
| Low Income | LISF (CCM) | 27,618,723 | $7,141,896 | $6,736,859 | |
| | LIMR (CCM) | 88,957,000 | $3,278,499 | $3,967,353 | |
| | LINC Applications | 11 | $1,722,304 | $1,456,560 | |
| Market Transformation | CSBD Developments | 35 | $1,492,392 | $1,122,068 | 1.10 |
| | CEM Participants | 7 | $223,818 | $941,562 | |
| | RSBD Builders | 39 | $4,178,404 | $3,392,296 | |
| | RSBD Homes | 2,989 | | | |
| | RiR Participants | 84 | $528,343 | $329,209 | |
| | SEC Schools | 32 | $255,413 | $520,200 | |

*HEC budget is a subset of, and not a separate line item from, the Resource Acquisition budget.

[114] Gas savings values used in calculating targets for 2020 are slightly different than the final savings values reported in the 2019 Annual Verification report because achievements for the target calculations use the more updated TRM 4.0 assumptions, compared to the final 2019 achievements which use the TRM 3.0 assumptions.

[115] Program spending used in calculating targets do not include overheads. They are also slightly different than spending values included in the 2019 Annual Verification report, as some of the program-specific spending in the 2019 reports includes program-specific overheads. Budget values used in calculating targets also exclude overhead costs.

[116] 1.02 or 1.10 depending on the scorecard

[117] Three-year rolling average (2017-2019) Rate T2/T100 cost effectiveness where cost-effectiveness here is defined as "Final verified metric achievement used for MRAMVA purposes divided by final actual program spend for that year."

**Table 11-124. Union Metric Target Calculation Inputs – 2020**

| Scorecard | Metric | 2019 Achievement | 2019 Spend | 2020 Budget | Multiplier |
|---|---|---|---|---|---|
| **Resource Acquisition** | RA (CCM) | 785,429,827 | $34,487,219 | $31,183,000 | 1.02 |
| | HRR Participants* | 10,958 | $19,815,812 | $12,226,000 | |
| **Large Volume** | LV (CCM)† | 41.40 (see Table 11-125) | | $3,150,000 | |
| **Low Income** | LISF (CCM) | 51,670,922 | $9,618,751 | $9,739,000 | |
| | LIMF-SA (CCM) | 22,719,954 | $2,188,395 | $3,008,847 | |
| | LIMF-MR (CCM) | 4,774,193 | $410,320 | $564,153 | |
| **Market Transformation** | CNC Developments | 22 | $924,147 | $1,000,000 | 1.10 |
| | OH % Built | 28.55% | $817,193 | $841,000 | |
| **Performance Based** | RS Participants | 58 | $163,084 | $177,000 | |
| | RS Savings % | 0.35% | $153,632 | | |
| | SEM Savings % | 0.00% | $309,007 | $625,000 | |

*HRR budget is a subset of, and not a separate line item from, the Resource Acquisition budget.
†Union's Large Volume program metric target is based on different inputs; instead of the 2019 CCM achievement, the formula is based off the three-year rolling average (2017-2019) Rate T2/Rate 100 cost effectiveness. This average value (41.40) is what is listed for the 2019 achievement.

**Table 11-125. Union Large Volume Cost Effectiveness* Ratios**

| Year | CE Ratio* |
|---|---|
| 2017 | 59.14 |
| 2018 | 38.10 |
| 2019 | 26.96 |
| **3-Year Average** | **41.40** |

*Cost effectiveness here is defined as "Final verified metric achievement used for MRAMVA purposes divided by final actual program spend for that year." Annual CE Ratios and the 3-year average are rounded to 2 digits past the decimal.

**Table 11-126. Enbridge Metric Targets – 2020**

| Scorecard | Metric | 2020 Target |
|---|---|---|
| **Resource Acquisition** | LV RA (CCM) | 503,011,875 |
| | SV RA (CCM) | 252,515,052 |
| | HEC Participants | 10,700 |
| **Low Income** | LISF (CCM) | 26,573,437 |
| | LIMR (CCM) | 109,800,953 |
| | LINC Applications | 9 |
| **Market Transformation** | CSBD Developments | 29 |
| | CEM Participants | 32 |
| | RSBD Builders | 35 |
| | RSBD Homes | 2,669 |
| | RiR Participants | 58 |
| | SEC Schools | 72 |

**Table 11-127. Union Metric Targets – 2020**

| Scorecard | Metric | 2020 Target |
|---|---|---|
| **Resource Acquisition** | RA (CCM) | 724,381,376 |
| | HRR Participants | 6,896 |
| **Large Volume** | LV (CCM) | 133,017,196 |
| **Low Income** | LISF (CCM) | 53,363,223 |
| | LIMF-SA (CCM) | 31,862,656 |
| | LIMF-MR (CCM) | 6,695,369 |
| **Market Transformation** | CNC Developments | 26 |
| | OH % Built | 32.32% |
| **Performance Based** | RS Participants | 69 |
| | RS Savings % | 0.44% |
| | SEM Savings % | 4.75% |

# 11.11 Appendix K: Review of Lost Revenue and DSM Shareholder Incentive Calculations

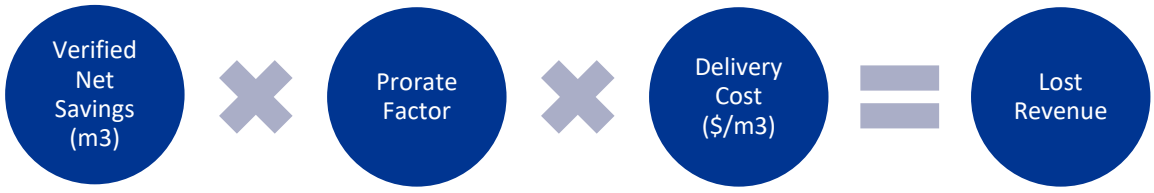
This appendix describes the EC team's review of the lost revenue and demand side management shareholder incentive calculations.

## 11.11.1 Lost Revenue Calculations

The basic approach to the lost revenue calculation is illustrated in Figure 11-7. The calculation is based on the following factors:

- The verified net natural gas savings (in annual cubic meters) by applicable rate class using the best available information at the time of the verification
- The delivery cost of the natural gas by rate class
- The month in which the measure was installed, represented in the equation below as a prorate factor

**Figure 11-7. Lost revenue calculation**




Lost revenues are summed across all measures in a rate class. Then the lost revenues for all applicable rate classes are summed to calculate total lost revenues per utility.

The applicable rate classes for Enbridge and Union are shown in Table 11-128. Values specific to these rates for the evaluated year are included in Section 11.12.

**Table 11-128. Rate classes for lost revenue calculation**

| Enbridge | Union |
|---|---|
| Rate 110 | M4 Industrial |
| Rate 115 | M5 Industrial |
| Rate 135 | M7 Industrial |
| Rate 145 | T1 Industrial |
| Rate 170 | T2 Industrial |
| | 20 Industrial |
| | 100 Industrial |

The methods to compute each of the components shown in Figure 11-7. are described in the following sections.

### Lost revenue: Verified Net Savings

The lost revenue calculation first utilizes verified net savings, calculated using best available inputs and assumptions at the time of the verification. For prescriptive program savings, this is currently the January 2021 update to the TRM. This differs from the savings used for the DSM shareholder incentive calculation, which uses the energy savings at the time of program planning.

## Lost revenue: Prorate Factor Calculation

The prorate factor is simply the proportion of the annual net savings that will be included in the lost revenue calculation, based on the number of months the gas-saving measure was installed. Table 11-129 shows the prorate factors for each installation month. Prorated savings are calculated by multiplying the measure's annual savings by the ratio for the month it was installed.

**Table 11-129. Lost revenue installation month savings ratio***

| Month | Ratio (12-Month+1)/12 |
|---|---|
| January | 1.0000 |
| February | 0.9167 |
| March | 0.8333 |
| April | 0.7500 |
| May | 0.6667 |
| June | 0.5833 |
| July | 0.5000 |
| August | 0.4167 |
| September | 0.3333 |
| October | 0.2500 |
| November | 0.1667 |
| December | 0.0833 |

*Not all values may compute exactly due to rounding.

For example, the calculation assigns 12 months of savings to measures installed in January and one month of savings to measures installed in December.

## Lost revenue: Delivery Cost Calculation

Delivery rates are expressed as cost per 1,000 cubic meters. Prorated energy savings are divided by 1,000 to convert savings in cubic meters to savings in thousands of cubic meters, which are then multiplied by the delivery rate for the respective rate class to determine lost revenue by rate class. The delivery rate is not verified as part of this evaluation.

## Lost revenue: Summing lost revenue Savings

Lost revenue for each rate class is calculated by summing the lost revenue for all measures within the rate class. Total lost revenue for each utility is calculated by summing the lost revenue across all applicable rate classes:

$$Total\ Lost\ Revenue = \sum_{Rate\ Class}^{Utility} \sum_{Measure}^{Rate\ Class} Lost\ Revenue$$

# 11.11.2 DSM shareholder incentive calculations

The DSM shareholder incentive calculations are more complex than the lost revenue calculations. DSM shareholder incentive calculations are based on:

- The verified program achievements compared to the target metrics for that scorecard
- The weight placed on each metric within each scorecard
- The maximum incentive achievable for that scorecard

Because all three of these factors vary by utility and scorecard, a simple diagram is not possible.

DNV independently calculated DSM shareholder incentive values for both legacy utilities. The following sections lay out the calculation methodology, as well as inputs used for each utility.

The EC confirmed the lower band, upper band, target metric, weights, maximum incentives, rate classes, and rates for both utilities with the EAC.

## DSM shareholder incentive: verification savings values

Where the verified net savings used in the lost revenue calculation represent the best available information at the time of the verification, the verified net savings used in the DSM shareholder incentive are calculated using the savings values leveraged during the program planning process.

## DSM shareholder incentive: metric score

DSM shareholder incentive calculations are based on the verified metric achievement identified within each scorecard compared to the target value. For each metric, DNV first determines the percent of metric achieved.

$$\%\ Metric\ Achieved = \frac{achieved\ metric}{target\ metric}$$

If the achieved metric is less than or equal to the 2020 Target, the Metric Score is then calculated as:

$$Metric\ Score = 1 - \frac{0.25 * (target\ metric - achieved\ metric)}{(target\ metric - lower\ band)}$$

If the achieved metric is greater than the 2020 Target, the Metric Score is then calculated as:

$$Metric\ Score = 1 + \frac{0.5 * (achieved\ metric - target\ metric)}{(upper\ band - target\ metric)}$$

## DSM shareholder incentive: weighted metric score

The weighted metric score is determined by multiplying the metric score by its corresponding weight. Each metric within the scorecard is weighted, with all weights within each scorecard summing to 100.00%. Per the OEB Decision and Order, the OEB approved maximum and minimum achievement limits per metric of 200% and 0%, respectively.[118] As a result, all Metric Scores are capped at 200%, thereby limiting the influence of any one metric within the weighted scorecard achievement calculation to twice its weight.

## DSM shareholder incentive: weighted scorecard achievement

The weighted metrics within each scorecard are summed to calculate the weighted scorecard achievement:

$$weighted\ scorecard\ achievement = \sum_{Scorecard} (weight * Metric\ Score)$$

## DSM shareholder incentive: incentive calculation

The weighted scorecard achievement (WSA) is then used to calculate the Shareholder Incentive for that Scorecard. The appropriate calculation is dependent on the WSA value, as demonstrated in Table 11-130.

[118] OEB Decision and Order, EB-2015-0029/EB-2015-0049, January 20, 2016, page 80

**Table 11-130. Calculation to determine shareholder incentive**

| WSA Value | Incentive |
|---|---|
| <.75 | 0 |
| .75≤WSA<1 | $(40\%\ x\ Max\ Incentive)\frac{(WSA-0.75)}{.25}$ |
| 1≤WSA<1.5 | $(40\%\ Max\ Incentive)+(60\%\ Max\ Incentive)*\frac{(WSA-1)}{0.5}$ |
| 1.5≤WSA | Max Incentive |

The shareholder incentives for each scorecard are summed to calculate each utility's total incentive:

$$Total\ Incentive = \sum_{Utility} Scorecard\ Incentive$$

## 11.11.3 Example Calculations

### Lost revenue

As an example, a widget carries an annual lost revenue verified savings value of 500 $m^3$ (annual, net savings). If that unit was installed in January, 500 $m^3$ (500 x 1.000) would be verified for lost revenue. If that same unit were installed in July, 250 $m^3$ (500 x 0.500) would be verified and if installed in November, 83.33 $m^3$ (500 x .1667). Table 11-131 shows the prorated total savings for all widgets with one installed per month, in 1000 $m^3$.

**Table 11-131. Example lost revenue savings total for single rate class with monthly widget installation***

| Month | Ratio (12-Month+1)/12 | Units Installed | Lost Revenue Net Annual Gas Savings ($m^3$) | Prorated Energy Savings ($m^3$) | Lost Revenue Energy Savings (1000 $m^3$) |
|---|---|---|---|---|---|
| January | 1.00 | 1 | 500 | 500.00 | 0.50 |
| February | 0.92 | 1 | 500 | 458.33 | 0.46 |
| March | 0.83 | 1 | 500 | 416.67 | 0.42 |
| April | 0.75 | 1 | 500 | 375.00 | 0.38 |
| May | 0.67 | 1 | 500 | 333.33 | 0.33 |
| June | 0.58 | 1 | 500 | 291.67 | 0.29 |
| July | 0.50 | 1 | 500 | 250.00 | 0.25 |
| August | 0.42 | 1 | 500 | 208.33 | 0.21 |
| September | 0.33 | 1 | 500 | 166.67 | 0.17 |
| October | 0.25 | 1 | 500 | 125.00 | 0.13 |
| November | 0.17 | 1 | 500 | 83.33 | 0.08 |
| December | 0.08 | 1 | 500 | 41.67 | 0.04 |
| **Total** | | | | | **3.25** |

*Not all values may compute exactly due to rounding.

In Table 11-132, the above example savings total is represented by Rate Class II – one widget per month was the sum of all measures performed within customers in that rate class. The verified lost revenue energy savings for the class are multiplied by the rate for that class to determine the lost revenue for that rate class; lost revenue for Rate Class II totalling $48.75 from energy savings of 3.25 at a rate of $15.00 per 1,000 $m^3$. All applicable rate class lost revenue are then summed for total lost revenue.

**Table 11-132. Example total lost revenue***

| Rate Class | Lost Revenue Energy Savings (1000 $m^3$) | Rate ($/1000 $m^3$) | Lost Revenue |
|---|---|---|---|
| I | 25.00 | $5.55 | $138.75 |
| **II** | **3.25** | **$15.00** | **$48.75** |
| III | 150.00 | $1.50 | $225.00 |
| IV | 100.00 | $4.00 | $400.00 |
| V | 5.10 | $25.50 | $130.05 |
| VI | 1.26 | $10.00 | $12.60 |
| Total Lost Revenue | | | $955.15 |

*Not all values may compute exactly due to rounding.

## DSM shareholder incentive

The first step in calculating the DSM shareholder incentive is to calculate the percent of the target metric that was achieved, which is a simple ratio of the achieved metric divided by the target metric. The second step is to determine the correct formula based on whether the verified achievement for the scorecard metric was at, above, or below the annual target. In the example in Table 11-133, the verified achievement for Scorecard A CCM was below the 2020 Target, so the formula for achievement below target is used to determine the metric score. The Verified Achievement for participants was above the 2020 Target, so the alternative calculation is used. Both formulas are illustrated below.

**Table 11-133. Example metric score***

| Scorecard | Metric | Verified Achievement | Lower Band | 2020 Target | Upper Band | Metric Score |
|---|---|---|---|---|---|---|
| Scorecard A | CCM | 9,000,000 | 7,500,000 | 10,000,000 | 15,000,000 | 0.9 |
| | Participants | 250 | 150 | 200 | 300 | 1.25 |

*Not all values may compute exactly due to rounding.

$$CCM\ Metric\ Score = 1 - \frac{.25 * (10{,}000{,}000 - 9{,}000{,}000)}{(10{,}000{,}000 - 7{,}500{,}000)} = 1 - 0.1 = 0.9$$

$$Participant\ Metric\ Score = 1 + \frac{0.5 * (250 - 200)}{(300 - 200)} = 1 + .25 = 1.25$$

The metric score for each metric is then multiplied by the applicable weight. In this example, CCM savings is weighted at 75% and participants at 25%. The weighted metric scores are summed for the weighted scorecard achievement.

**Table 11-134. Example scorecard weighted score (WSA)***

| Scorecard | Metric | Metric Score | Weight | Weighted Metric Score | Weighted Scorecard Achievement |
|---|---|---|---|---|---|
| Scorecard A | CCM | 0.9 | 75% | 0.675 | 0.9875 |
| | Participants | 1.25 | 25% | 0.3125 | |

*Not all values may compute exactly due to rounding.

For Scorecard A, if we assume a maximum incentive value of $100,000, a weighted scorecard achievement of 0.9875 would result in an incentive of $38,000, as demonstrated below.

$$(40\%\ x\ \$100{,}000)\frac{(0.9875 - .75)}{.25} = \$40{,}000\ x\ \frac{(0.2375)}{.25} = \$40{,}000\ x\ 0.95 = \$38{,}000$$

# 11.12 Appendix L: Lost Revenue and DSM Shareholder Incentive: Detailed Tables

## 11.12.1 Enbridge DSM shareholder incentive

**Table 11-135. Enbridge's 2020 Resource Acquisition targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Large Volume Customer - CCM | 503,011,875 | 408,463,368 | 40.00% | 81.20% | 32.48% |
| Small Volume Customer - CCM | 252,515,052 | 268,306,798 | 40.00% | 106.25% | 42.50% |
| Home Energy Conservation Participants | 10,700 | 14,013 | 20.00% | 130.96% | 26.19% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 101.18% |
| **Maximum Scorecard Incentive** | | | | | $7,012,787 |
| **Verified Scorecard Incentive Achieved** | | | | | **$2,904,033** |

*Not all values may compute exactly due to rounding.

**Table 11-136. Enbridge's 2020 Low Income scorecard targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Home Winterproofing CCM | 26,573,437 | 26,642,997 | 45.00% | 100.26% | 45.12% |
| Low Income Multi Residential CCM | 109,800,953 | 67,637,303 | 45.00% | 61.60% | 27.72% |
| Low Income New Construction Applications | 9 | 15 | 10.00% | 160.00% | 16.00% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 88.84% |
| **Maximum Scorecard Incentive** | | | | | $2,263,561 |
| **Verified Scorecard Incentive Achieved** | | | | | **$501,162** |

*Not all values may compute exactly due to rounding.

**Table 11-137. Enbridge's 2020 Market Transformation scorecard targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| School Energy Competition Schools | 72 | 7 | 10.00% | 9.72% | 0.97% |
| Run-it-Right Participants | 58 | 65 | 20.00% | 112.50% | 22.50% |
| Comprehensive Energy Management Participants | 32 | 7 | 20.00% | 21.88% | 4.38% |
| Residential Savings by Design Builders | 35 | 35 | 10.00% | 100.00% | 10.00% |
| Residential Savings by Design Homes | 2,669 | 2,768 | 15.00% | 103.71% | 15.56% |
| Commercial Savings by Design Developments | 29 | 36 | 25.00% | 125.00% | 31.25% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 84.65% |
| **Maximum Scorecard Incentive** | | | | | $1,173,652 |
| **Verified Scorecard Incentive Achieved** | | | | | **$181,276** |

*Not all values may compute exactly due to rounding.

## 11.12.2 Union DSM shareholder incentive

**Table 11-138. Union's 2020 Resource Acquisition targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| CCM | 724,381,376 | 669,887,949 | 75.00% | 92.48% | 69.36% |
| Home Reno Rebate Participants | 6,896 | 7,619 | 25.00% | 110.48% | 27.62% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 96.98% |
| **Maximum Scorecard Incentive** | | | | | $6,562,712 |
| **Verified Scorecard Incentive Achieved** | | | | | **$2,307,872** |

*Not all values may compute exactly due to rounding.

**Table 11-139. Union's 2020 Low Income targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Single Family CCM | 53,363,223 | 38,411,013 | 60.00% | 71.98% | 43.19% |
| Multi-Family - Social & Assisted CCM | 31,862,656 | 12,142,699 | 35.00% | 38.11% | 13.34% |
| Multi-Family - Market Rate CCM | 6,695,369 | 8,316,698 | 5.00% | 124.22% | 6.21% |
| **Verified Total Weighted Scorecard Achieved**** | | | | | 62.74% |
| **Maximum Scorecard Incentive** | | | | | $2,604,447 |
| **Verified Scorecard Incentive Achieved** | | | | | **$0** |

*Not all values may compute exactly due to rounding.
**A minimum total weighted scorecard achievement level of 75% is required to earn a portion of the available shareholder incentive.

**Table 11-140. Union's 2020 Large Volume targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| CCM | 133,017,196 | 126,647,466 | 100.00% | 95.21% | 95.21% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 95.21% |
| **Maximum Scorecard Incentive** | | | | | $694,265 |
| **Verified Scorecard Incentive Achieved** | | | | | **$224,513** |

*Not all values may compute exactly due to rounding.

**Table 11-141. Union's 2020 Market Transformation targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| Optimum Home Percentage of Homes Built | 32.32% | 39.19% | 50.00% | 121.27% | 60.63% |
| Commercial New Construction Developments | 26 | 24 | 50.00% | 91.67% | 45.83% |
| **Verified Total Weighted Scorecard Achieved** | | | | | 106.47% |
| **Maximum Scorecard Incentive** | | | | | $405,810 |
| **Verified Scorecard Incentive Achieved** | | | | | **$193,812** |

*Not all values may compute exactly due to rounding.

**Table 11-142. Union's 2020 Performance Based targets, achievements, and incentive***

| Metric | Target | Verified Achievement | Weight | Metric Score | Weighted Metric Score |
|---|---|---|---|---|---|
| RunSmart Participants | 69 | - | 10.00% | 0.00% | 0.00% |
| RunSmart Savings % | 0.44% | -1.52% | 40.00% | 0.00% | 0.00% |
| Strategic Energy Management Savings % | 4.75% | 2.61% | 50.00% | 54.84% | 27.42% |
| **Verified Total Weighted Scorecard Achieved**** | | | | | 27.42% |
| **Maximum Scorecard Incentive** | | | | | $182,765 |
| **Verified Scorecard Incentive Achieved** | | | | | **$0** |

*Not all values may compute exactly due to rounding.
**A minimum total weighted scorecard achievement level of 75% is required to earn a portion of the available shareholder incentive.

## 11.12.3 Enbridge Lost Revenue

**Table 11-143. Enbridge lost revenue volumes ($10^3$ $m^3$) by rate class, prorated by month***

| Rate Class | Savings Volume by Month (1,000 m3) | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| Rate 110 | 878 | - | 72 | 12 | 56 | - | - | 11 | 188 | 50 | 649 | - | 1,916 |
| Rate 115 | - | 498 | - | 31 | - | - | - | - | 16 | 14 | 242 | - | 801 |
| Rate 135 | 435 | - | - | 64 | - | - | - | - | - | 97 | 286 | - | 883 |
| Rate 145 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Rate 170 | - | - | - | 211 | - | - | - | - | - | 7 | 54 | - | 272 |
| **TOTAL** | **1,313** | **498** | **72** | **318** | **56** | **-** | **-** | **11** | **205** | **168** | **1,231** | **-** | **3,872** |

*Not all values may compute exactly due to rounding.

**Table 11-144. Enbridge lost revenue volumes ($10^3$ $m^3$) total volume, delivery rates, and revenue impact by rate class***

| Rate Class | Savings Volume (1,000 m3) | Delivery Rate ($/1,000 m3) | Revenue Impact ($) |
|---|---|---|---|
| Rate 110 | 1,916 | $5.98 | $11,463 |
| Rate 115 | 801 | $2.29 | $1,832 |
| Rate 135 | 883 | $18.63 | $16,455 |
| Rate 145 | - | $16.94 | $0 |
| Rate 170 | 272 | $2.86 | $777 |
| **TOTAL** | **3,872** | | **$30,527** |

*Not all values may compute exactly due to rounding.

## 11.12.4 Union Lost Revenue

**Table 11-145. Union lost revenue volumes ($10^3$ $m^3$) by rate class, prorated by month***

| Rate Class | Savings Volume by Month (1,000 m3) | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| M4 Industrial | 4,606 | 474 | 17 | 130 | 389 | 333 | 630 | 135 | 776 | 63 | 345 | - | 7,898 |
| M5 Industrial | 37 | - | - | - | 13 | - | 2 | - | - | 3 | 3 | - | 58 |
| M7 Industrial | 5,317 | 361 | 1,870 | - | 148 | 701 | 106 | 9 | 805 | 237 | 432 | 43 | 10,029 |
| T1 Industrial | 343 | - | - | - | - | - | - | 15 | 44 | 179 | - | - | 581 |
| T2 Industrial | 1,716 | - | 128 | 598 | 762 | 149 | 28 | 380 | 14 | 264 | 185 | - | 4,224 |
| 20 Industrial | 80 | - | 12 | - | 48 | 43 | 17 | 31 | - | 5 | - | - | 238 |
| 100 Industrial | 2,616 | 1,591 | 4 | 2 | - | 181 | 4 | - | 18 | 61 | - | - | 4,477 |
| **TOTAL** | **14,716** | **2,426** | **2,031** | **731** | **1,361** | **1,408** | **786** | **570** | **1,657** | **812** | **964** | **43** | **27,505** |

*Not all values may compute exactly due to rounding.

**Table 11-146. Union lost revenue volumes ($10^3$ $m^3$) total volume, delivery rates, and revenue impact by rate class***

| Rate Class | Savings Volume (1,000 m3) | Delivery Rate ($/1,000 m3) | Revenue Impact ($) |
|---|---|---|---|
| M4 Industrial | 7,898 | $14.42 | $113,871 |
| M5 Industrial | 58 | $26.21 | $1,508 |
| M7 Industrial | 10,029 | $2.29 | $22,919 |
| T1 Industrial | 581 | $1.05 | $613 |
| T2 Industrial | 4,224 | $0.20 | $841 |
| 20 Industrial | 238 | $7.00 | $1,665 |
| 100 Industrial | 4,477 | $2.68 | $12,005 |
| **TOTAL** | **27,505** | | **$153,421** |

*Not all values may compute exactly due to rounding.

## 11.13 Appendix M: Prescriptive Savings Verification

This appendix describes the detailed process used to verify the reported (tracked) prescriptive and quasi-prescriptive savings for Enbridge and Union programs.

### 11.13.1 Data Sources

Verification of prescriptive measures relies on several data sources provided by Enbridge and Union.

#### Tracking Files

The EC received one tracking file each from Enbridge and Union. Both tracking files are Excel files, and include prescriptive measures and additional information for measures from non-prescriptive programs.

#### TRM - Joint Submissions

The EC utilized documents titled "New and Updated DSM Measures - Joint Submission from Union Gas Ltd. and Enbridge Gas Distribution," referred to in this report as TRMs. The EC used the January 2020 TRM (TRM 4.0) as the primary source for identifying prescribed values, such as energy savings and measure life, for prescriptive measures. In addition to that primary TRM, the EC also used TRM 5.0[119].

#### Other Supporting Documentation

The Joint Submission documents did not contain all of the necessary detail to verify the savings for all measures. For example, savings for commercial ENERGY STAR double rack ovens were not included in TRM 4.0. All prescriptive measures and corresponding verification sources are listed in the tables at the end of this appendix.

In addition to the TRMs, the EC also used the following for verification of savings for prescriptive measures, as cited in the tables at the end of this appendix.

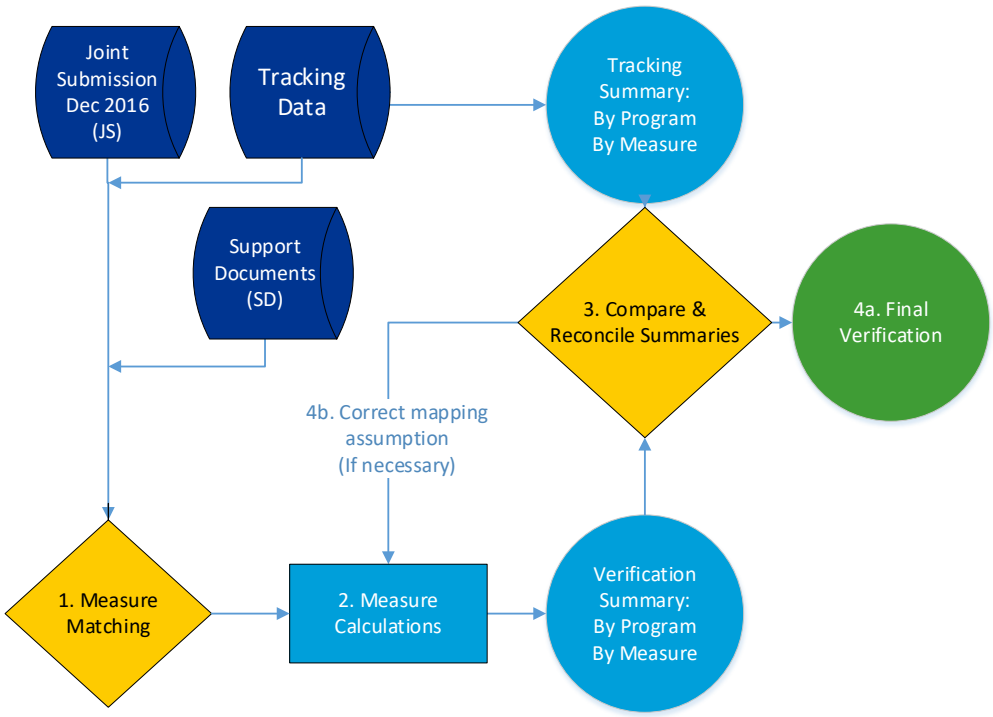
- C&I Prescriptive Showerheads, Enbridge, "Showerhead Verification Among Rental Buildings", Ipsos Research, March 2012
- C&I Prescriptive Verification Study, "2017 C&I Prescriptive Study – Measure of NTG Factors and Gross Savings Verification", Itron, June 7, 2019
- Commercial ENERGY STAR Rack Oven Sub Doc, "00 Commercial ENERGY STAR Rack Oven 2020-06-09", June 6, 2020
- "Low Income Kits Verification Study": Final Report Following an Audit of the Union Gas ESK - Helping Homes Conserve – HHC – Program, Beslin Communication Group, March 15, 2013
- Low Income Multi-Residential Showerheads, Enbridge, "Multi-Residential Low Income Showerhead Verification": 2012 Multi-Residential Low Income Showerhead Verification for Enbridge Gas, Ipsos Research, March 2013
- "TAPS Report", TAPS Verification Program 2012 Year End Research Report, Study CR-604, Quadra Research, April 3, 2013
- "Adaptive Thermostat Ping Report", LEG and LUG 2020 Thermostat Ping Data, February 26, 2021

[119] Natural Gas Demand Side Management Technical Resource Manual Version 5.0

## 11.13.2 Overall Methodology

The EC used a straightforward process to consistently verify savings for both utilities, summarized in Figure 11-8.

**Figure 11-8. Savings verification process**




The process includes the following high-level steps. Additional detail is presented below.

1. Manually match individual project measure savings against Joint Submission (JS) and Support Documents (SD) values, based first on measure name and then on other attributes, to calculate savings.
2. Calculate gross and net annual and lifetime savings for all measures.
3. Compare the summarized calculated savings and the tracked savings to identify discrepancies or disagreements.
4. When the EC determined that a discrepancy was due to an error in assigning the correct savings value, the EC assigned a new savings value to the measure and re-compared totals (4b). Once the EC resolved the correct savings value (through continued investigation of measure or clarification with utility) the record was verified (4a).

Table 11-147 shows the variables used from the utility tracking data to verify, summarize, and reconcile savings values. While variables such as measure life or free ridership were present in the tracking data, these were not used by the EC to calculate verified savings, but to identify discrepancies between verification and tracking summaries when comparing and reconciling savings totals. The EC used TRM or SD values for the verified savings calculations.

**Table 11-147. Tracking variables used for prescriptive savings verification**

| Tracking Variable | Used In | | |
|---|---|---|---|
| | Verification/ Summary | Tracking Summary | Compare & Reconcile Summaries |
| Scorecard | X | | X |
| Program | X | | X |
| Decision Type (Early Replace, Retrofit, etc.) | X | | X |
| Measure Name | X | | X |
| Building Type | X | | X |
| Equipment Type | X | | X |
| Install Type | X | | X |
| Number of Units | X | | X |
| Capacity | X | | X |
| Measure Life | | | X |
| Free Rider | | | X |
| Adjustment Factor | | | X |
| Gross Annual Natural Gas Savings (m3) | | X | X |
| Net Annual Natural Gas Savings (m3) | | X | X |
| Gross Cumulative Natural Gas Savings (m3) | | X | X |
| Net Cumulative Natural Gas Savings (m3) | | X | X |

## 1. Measure Matching

The EC manually mapped measures into groups. Measures were filtered by name to assign them to a group, then matched against the TRM and SD measures to identify the correct savings values. For each project, the EC confirmed that the savings value listed for the measure matched the value listed for that measure type in the TRM and SD. The tables at the end of this appendix list all tracked measure groups and their corresponding savings values and JS or SD source for Enbridge and Union, respectively.

## 2. Measure Calculations

There are two types of prescriptive measure calculations: Pure-Prescriptive and Quasi-Prescriptive. Quasi-Prescriptive measure savings require more than the per unit savings and the number of units to determine annual gross savings. For example, some boiler measures require the capacity of the boiler. Table 11-148 summarizes the differences between the two types.

**Table 11-148. Explanation of calculation inputs for two types of prescriptive measures**

| Savings Type | Purely Prescriptive | Quasi-Prescriptive |
|---|---|---|
| **Annual Gross** | Per Unit Savings * # of Units | Unit Capacity Savings * Unit Capacity * # of Units |
| **Annual Net** | Annual Gross * (1 - Free Ridership) * Adjustment | |
| **Lifetime Gross** | Annual Gross * Measure Life | |
| **Lifetime Net (CCM)** | Annual Net * Measure Life | |

The EC used Excel macros to identity savings inputs and apply savings calculations. The use of macros ensured consistent application of savings calculations and allowed for quick and accurate savings updates. The tables at the end of this appendix list all calculated measure totals, as verified by the EC.

## 3. Compare & Reconcile Summaries

The EC summed savings values from utility tracking and from EC verification calculations by program and measure type, and tabulated by Annual Gross, Annual Net, Lifetime Gross, Lifetime Net, and project measure counts. The EC did this with the Pivot Table function in Excel, creating Tracking (utility tracking data) and Verification (EC calculated) Summaries, which provided two benefits. First, the EC was able to identify discrepancies between listed measure names, because any differences would result in a different number of summary rows between the two tables. Second, the pivot tables allowed for quick and accurate updates when the EC performed adjustments to our original matches.

By reviewing differences between the two summaries, the EC identified errors in the EC matches and differences between the EC matches and the original utility tracking data, allowing us to investigate the discrepancies. The tables at the end of this appendix lists all verification discrepancies where:

- **The tracking data did not contain sufficient information to identify savings:** In general, these measures were resolved with additional documentation and resulted in no change to savings. They are listed in this appendix to document the evaluation process and communication between the evaluator and the utility.
- **The tracking data was incorrect:** This may have been because different savings factors were identified through the verification process. The tables include the details for each measure.

## 4. Final Verification

Once all tracked measures were matched to TRM values, the savings calculated, and all discrepancies reconciled or explained, verified savings summaries were finalized. Final savings totals for each program are available within the appropriate appendix in this report.

## 11.13.3 Savings Calculation Values

Savings tables in this section utilize measure names and units from the TRM wherever possible. Utilities utilized different units (BTU vs kBTU) or name variations, those are not used here.

**Table 11-149. Enbridge measure savings calculation values***

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Direct Install | [BONUS] DI DCKV 10,001 - 15,000 CFM [Existing] | Pure | TRM 4.0 | 17,529.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | [BONUS] DI DCKV 5,001 - 10,000 CFM [Existing] | Pure | TRM 4.0 | 10,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | [BONUS] DI DCKV up to 5000 CFM [Existing] | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain 10 x 10 S&R [New/Existing] | Pure | TRM 4.0 | 5,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain 8 x 10 S&R [New/Existing] | Pure | TRM 4.0 | 4,941.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain 8 x 8 S&R [New/Existing] | Pure | TRM 4.0 | 4,713.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 10 x 10 [New/Existing] | Pure | TRM 4.0 | 4,844.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | Pure | TRM 4.0 | 5,753.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | Pure | TRM 4.0 | 6,504.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 16 x 16 [New/Existing] | Pure | TRM 4.0 | 7,081.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 20 x 20 [New/Existing] | Pure | TRM 4.0 | 7,605.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,736.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 10 x 10 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 4,501.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 5,087.00 | unit | 10 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Direct Install | Direct Install Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,897.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 8 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 4,853.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,977.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 9 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 4,988.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain 10 x 10 S&R | Pure | TRM 4.0 | 5,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain 8 x 10 S&R | Pure | TRM 4.0 | 4,941.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain 8 x 8 S&R | Pure | TRM 4.0 | 4,713.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 10 x 10 [New/Existing] | Pure | TRM 4.0 | 4,844.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | Pure | TRM 4.0 | 5,753.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | Pure | TRM 4.0 | 6,504.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 16 x 16 [New/Existing] | Pure | TRM 4.0 | 7,081.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,736.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 5,087.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,897.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,977.00 | unit | 10 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 9 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 4,988.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | [BONUS] MS Energy Star Fryer | Pure | TRM 4.0 | 1,408.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Air Curtain Pedestrian Single Door with Vestibule 7x6 - Ambient Air Curtain | Pure | TRM 4.0 | 1,082.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Air Curtain Pedestrian Single Door with Vestibule 8x6 - Ambient Air Curtain | Pure | TRM 4.0 | 1,208.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Air Curtain Shipping Drive-In Door 12' x 12' [New/Existing] | Pure | TRM 4.0 | 5,753.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | Pure | TRM 4.0 | 6,504.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star convection Oven | Pure | TRM 4.0 | 865.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star Double Rack Oven | Pure | ENERGY STAR Rack Oven Substantiation Document | 1,002.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Cond MUA Two Speed up to 14,000 CFM - Other/Commercial [New/Existing] | Quasi | TRM 4.0 | 1.22 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Furnace High Efficiency 75-149 KBtu/hr Cx [Existing] | Quasi | TRM 4.0 | 1.18 | kBTU/hr | 18 | 100.00% | 17.50% | 100.00% |
| C&I Prescriptive | Condensing MUA Single Speed up to 14,000 CFM - Other/Commercial [New/Existing] | Quasi | TRM 4.0 | 0.40700 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater High Utilization >75 and <=250 Kbtu/Hr Cx [New Construction] | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV 10,001 - 15,000 CFM [Existing] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 17,529.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV 10,001 - 15,000 CFM Cx [Retrofit] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 17,529.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM [Existing] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 10,517.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM [New] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 10,517.00 | unit | 15 | 102.74% | 38.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM Cx [Retrofit] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 10,517.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV up to 5,000 CFM [New] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,207.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV up to 5,000 CFM Cx [New] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,207.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV up to 5000 CFM [Existing] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,207.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCKV up to 5000 CFM Cx [Retrofit] | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,207.00 | unit | 15 | 102.74% | 38.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone - Community Center [Retrofit] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.44100 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone Office with Maintenance [Retrofit] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.11200 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone Office with Maintenance Cx [Retrofit] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.11200 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance [Retrofit] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.39200 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance Cx [New] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.39200 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance Cx [Retrofit] | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.39200 | sq ft | 15 | 104.14% | 92.00% | 100.00% |
| C&I Prescriptive | Destratification Fan 20 ft [Existing] | Pure | TRM 4.0 | 2,029.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Destratification Fan 24 ft [Existing] | Pure | TRM 4.0 | 2,922.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,736.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals 8' x 10' (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 5,087.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,897.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,977.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV High Use 65% (55% Code Baseline) [New/Existing] | Quasi | TRM 4.0 | 0.85000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV High Use 65% (55% Code Baseline) [New/Existing] | Quasi | TRM 4.0 | 0.85000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV In-suite Vent High Int Multi Res 65% Cx [New] | Quasi | TRM 4.0 | 5.37 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Low Use 75% (55% Code Baseline) [New/Existing] | Quasi | TRM 4.0 | 0.61000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Low Use 75% (55% Code Baseline) [New/Existing] | Quasi | TRM 4.0 | 0.61000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Vent Low Integrated Office 65% (No Baseline) [New] | Quasi | TRM 4.0 | 1.91 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Vent Low Integrated Office 75% (No Baseline) [New] | Quasi | TRM 4.0 | 2.21 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Vent Med Integrated Retail Res 65% (No Baseline) [New] | Quasi | TRM 4.0 | 2.98 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Vent Med Integrated Retail Res 75% (No Baseline) [New] | Quasi | TRM 4.0 | 3.45 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ERV Vent Med Standalone Retail 75% (No Baseline) [New] | Quasi | TRM 4.0 | 3.45 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | ES Fryer Cx | Pure | TRM 4.0 | 1,408.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Ind Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | Pure | TRM 4.0 | 5,753.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Ind Destratification Fan 20 ft [Existing] | Pure | TRM 4.0 | 2,029.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Ind Destratification Fan 24 ft [Existing] | Pure | TRM 4.0 | 2,922.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Ind Destratification Fan 24 ft [Retrofit] | Pure | TRM 4.0 | 2,922.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Ind Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Ind Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | Pure | TRM 4.0 | 5,087.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Ind Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | Pure | TRM 4.0 | 1,977.00 | unit | 10 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | MS Condensing Storage Water Heater High Utilization >250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater High Utilization >75 and <=250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 1.36 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >75 and <=250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 1.36 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >75 and <=250 Kbtu/Hr Cx [New Construction] | Quasi | TRM 4.0 | 1.36 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater Medium Utilization >250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 2.22 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Storage Water Heater Medium Utilization >75 and <=250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 2.22 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | MS Condensing Tankless High Usage <200 kBTU - Water Heating | Mixed | TRM 4.0 | 212+1.79 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |
| C&I Prescriptive | MS Condensing Tankless Low Usage <200 kBTU - Water Heating | Mixed | TRM 4.0 | 212+0.79 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |
| C&I Prescriptive | MS Condensing Tankless Med Usage <200 kBTU - Water Heating | Mixed | TRM 4.0 | 212+1.29 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |
| C&I Prescriptive | MS Condensing Unit Heater 125-200 kBTU/hr [Existing] | Quasi | TRM 4.0 | 7.89 | kBTU/hr input capacity | 18 | 100.00% | 0.00% | 100.00% |
| C&I Prescriptive | MS Condensing Unit Heater 225-300 kBTU/hr [Existing] | Quasi | TRM 4.0 | 7.89 | kBTU/hr input capacity | 18 | 100.00% | 0.00% | 100.00% |
| C&I Prescriptive | MS Condensing Unit Heater 30-100 kBTU/hr [Existing] | Quasi | TRM 4.0 | 7.89 | kBTU/hr input capacity | 18 | 100.00% | 0.00% | 100.00% |
| C&I Prescriptive | MS Energy Star Fryer | Pure | TRM 4.0 | 1,408.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | MS Energy Star Steam Cooker [New/Existing] | Pure | TRM 4.0 | 8,889.00 | unit | 12 | 100.00% | 20.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | MS Ind Condensing Storage Water Heater Medium Utilization >75 and <=250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 2.22 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Ozone Laundry Tunnel Washer =/< 120 lbs [New/Existing] | Quasi | TRM 4.0 | 0.03050 | lbs/yr | 15 | 100.00% | 8.00% | 100.00% |
| C&I Prescriptive | Ozone Washer Extractor =/<60lbs [New] | Quasi | TRM 4.0 | 0.03830 | lbs/yr | 15 | 100.00% | 8.00% | 100.00% |
| Home Winterproofing | Bathroom Aerator | Pure | TRM 4.0, TAPS Report | 6.40 | unit | 10 | 100.00% | 0.00% | 22.50% |
| Home Winterproofing | Kitchen Aerator | Pure | TRM 4.0, TAPS Report | 11.56 | unit | 10 | 100.00% | 0.00% | 33.50% |
| Home Winterproofing | Showerhead Replacement 1.25 GPM | Pure | TRM 4.0, Showerhead Verification Study Among Rental Buildings | 28.20 | unit | 10 | 100.00% | 0.00% | 87.70% |
| Home Winterproofing | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 0.00% | 100.00% |
| Home Winterproofing | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 0.00% | 100.00% |
| Home Winterproofing | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 0.00% | 100.00% |
| Home Winterproofing | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income Condensing MUA VFD up to 14,000 CFM - Multi-Residential/Long Term Care [New/Existing] | Quasi | TRM 4.0 | 3.00 | CFM | 20 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income Condensing Storage Water Heater High Utilization >250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income Condensing Storage Water Heater High Utilization >75 and <=250 kBTU/Hr [New Construction] | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income Condensing Tankless High Usage <200 kBTU - Water Heating | Mixed | TRM 4.0 | 212+1.79 | unit + kBTU/hr input capacity | 20 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income HRV Vent High Integrated Multi Res 85% (No Baseline) [New] | Quasi | TRM 4.0 | 5.93 | CFM | 14 | 100.00% | 0.00% | 100.00% |
| Low-Income Multi-Residential | Low Income HRV Vent High Standalone Multi Res 75% (No Baseline) [New] | Quasi | TRM 4.0 | 5.24 | CFM | 14 | 100.00% | 0.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| Low-Income Multi-Residential | Low Income Multi-Res Showerhead [Existing] - Water Heating | Pure | TRM 4.0, Multi-Residential Low Income Showerhead Verification | 30.60 | unit | 10 | 100.00% | 0.00% | 84.50% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | Adaptive Thermostat Ping Report | 185.00 | unit | 15 | 100.00% | 4.00% | 81.03% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 4.00% | 100.00% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 4.00% | 100.00% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 4.00% | 100.00% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 4.00% | 100.00% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | TRM 4.0 | 185.00 | unit | 15 | 100.00% | 4.00% | 100.00% |

*Not all values may compute exactly due to rounding.

**Table 11-150. Union measures savings calculation values***

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Direct Install | Air Curtain - Dock-In - 8 x 10 | Pure | TRM 4.0 | 4,941.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Air Curtain - Dock-In - 8 x 8 | Pure | TRM 4.0 | 4,713.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Air Curtain - Dock-In - 8 x 9 | Pure | TRM 4.0 | 4,845.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Air Curtain - Drive-In - 10 x 10 | Pure | TRM 4.0 | 4,844.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Air Curtain - Drive-In - 12 x 12 | Pure | TRM 4.0 | 5,753.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Air Curtain - Drive-In - 14 x 14 | Pure | TRM 4.0 | 6,504.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | DCKV- RF - Up to 5,000 cfm | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | DCKV- TNR - 5,001 to 10,000 cfm | Pure | TRM 4.0 | 10,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Direct Install | DCKV- TNR - Up to 5,000 cfm | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0 | 1,977.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0 | 1,897.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Direct Install | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0 | 2,041.00 | unit | 10 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Air Curtain - (2) 8 x 6 Door | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 3,774.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - 7 x 3 Door | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 845.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Dock-In - 10 x 10 with LTO BONUS | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5,517.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Dock-In - 8 x 10 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,941.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Dock-In - 8 x 8 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,713.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Drive-In - 10 x 10 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,844.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Drive-In - 12 x 12 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5,753.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Drive-In - 14 x 14 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 6,504.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain - Drive-In - 18 x 18 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 7,459.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - (2)7x6 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2,164.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - (2)8x6 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2,416.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 7x3 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 541.00 | unit | 15 | 100.00% | 50.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 7x6 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1,082.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 8x6 | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1,208.00 | unit | 15 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star Convection Oven | Pure | TRM 4.0 | 865.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star Double Rack Oven | Pure | ENERGY STAR Rack Oven Substantiation Document | 1,002.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star Fryer | Pure | TRM 4.0 | 1,408.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Commercial Energy Star Fryer | Pure | TRM 4.0 | 1,408.00 | unit | 12 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 250 kBTU/hr | Quasi | TRM 4.0 | 2.22 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 250 kBTU/hr | Quasi | TRM 4.0 | 1.36 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 250 kBTU/hr | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | Quasi | TRM 4.0 | 2.22 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | Quasi | TRM 4.0 | 1.36 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Condensing Tankless Water Heater - GT 75 & LT 200 kBTU/hr | Mixed | TRM 4.0 | 212+0.79 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |
| C&I Prescriptive | Condensing Tankless Water Heater - GT 75 & LT 200 kBTU/hr | Mixed | TRM 4.0 | 212+1.29 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |
| C&I Prescriptive | Condensing Tankless Water Heater - GT 75 & LT 200 kBTU/hr | Mixed | TRM 4.0 | 212+1.79 | unit + kBTU/hr input capacity | 20 | 100.00% | 2.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | DCKV- NC - 5,001 to 10,000 cfm | Pure | TRM 4.0 | 10,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- NC - 5,001 to 10,000 cfm | Pure | TRM 4.0 | 10,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- NC - Up to 5,000 cfm | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- NC - Up to 5,000 cfm - | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- RF - 10,001 to 15,000 cfm | Pure | TRM 4.0 | 17,529.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- RF - 5,001 to 10,000 cfm | Pure | TRM 4.0 | 10,517.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCKV- RF - Up to 5,000 cfm | Pure | TRM 4.0 | 4,207.00 | unit | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 1.69 | sq ft | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 0.11200 | sq ft | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 0.39200 | sq ft | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 1.48 | sq ft | 15 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 1.48 | sq ft | 15 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 0.43500 | sq ft | 15 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | DCV | Quasi | TRM 4.0 | 0.39200 | sq ft | 15 | 100.00% | 20.00% | 100.00% |
| C&I Prescriptive | Destratification Fan - 20ft | Pure | TRM 4.0 | 1,472.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Destratification Fan - 20ft | Pure | TRM 4.0 | 2,029.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Destratification Fan - 24ft | Pure | TRM 4.0 | 2,120.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Destratification Fan - 24ft | Pure | TRM 4.0 | 2,922.00 | unit | 15 | 100.00% | 10.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2,041.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1,977.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5,087.00 | unit | 10 | 100.00% | 50.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Dock Door Seals - Compression (8x8 - 8x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,988.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Shelter (10x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1,736.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Shelter (10x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5,087.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Dock Door Seals - Shelter (10x10) | Pure | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4,501.00 | unit | 10 | 100.00% | 50.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 4.52 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1.60 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1.91 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5.37 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2.98 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1.91 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% SHR - In-Suite | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5.37 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% SHR - In-Suite | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 5.37 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2.21 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 6.22 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 6.22 | CFM | 14 | 99.55% | 70.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 85% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 2.51 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.85000 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.47000 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.30000 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 0.61000 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0, 2017 C&I Prescriptive Verification Study | 1.70 | CFM | 14 | 99.55% | 70.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0 | 3.84 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0 | 1.36 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0 | 1.36 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 55% Sensible Heat Recovery | Quasi | TRM 4.0 | 2.13 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0 | 2.52 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0 | 1.61 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0 | 5.24 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0 | 5.24 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0 | 1.86 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 85% Sensible Heat Recovery | Quasi | TRM 4.0 | 2.11 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 65% Sensible Heat Recovery | Quasi | TRM 4.0 | 0.25000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 75% Sensible Heat Recovery | Quasi | TRM 4.0 | 0.50000 | CFM | 14 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 85% Sensible Heat Recovery | Quasi | TRM 4.0 | 0.74000 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Make-Up Air Unit (MUA) - Constant Speed | Quasi | TRM 4.0 | 0.40700 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Make-Up Air Unit (MUA) - VFD | Quasi | TRM 4.0 | 3.00 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Make-Up Air Unit (MUA) - VFD | Quasi | TRM 4.0 | 2.03 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| C&I Prescriptive | Ozone Laundry - Washer Extractor | Quasi | TRM 4.0 | 0.03830 | lbs/yr | 15 | 100.00% | 8.00% | 100.00% |
| C&I Prescriptive | Ozone Laundry - Washer Extractor | Quasi | TRM 4.0 | 0.03830 | lbs/yr | 15 | 100.00% | 8.00% | 100.00% |
| Home Weatherization | Bathroom Aerator | Pure | TRM 4.0, Low Income Kits Verification Study | 6.40 | unit | 10 | 100.00% | 1.00% | 86.10% |
| Home Weatherization | Kitchen Aerator | Pure | TRM 4.0, Low Income Kits Verification Study | 11.56 | unit | 10 | 100.00% | 1.00% | 81.20% |
| Home Weatherization | Pipe Insulation | Pure | TRM 4.0, Low Income Kits Verification Study | 3.64 | ft | 15 | 100.00% | 1.00% | 93.90% |
| Home Weatherization | Showerhead Replacement 1.25 GPM | Pure | TRM 4.0, Low Income Kits Verification Study | 28.20 | unit | 10 | 100.00% | 1.00% | 79.90% |
| Home Weatherization | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 1.00% | 100.00% |
| Home Weatherization | Smart Thermostats | Pure | TRM 4.0 | 217.00 | unit | 15 | 100.00% | 1.00% | 100.00% |
| Home Weatherization | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 1.00% | 100.00% |
| Home Weatherization | Smart Thermostats | Pure | TRM 4.0 | 173.00 | unit | 15 | 100.00% | 1.00% | 100.00% |
| Multi-family | Condensing Storage Water Heater - GT 250 kBTU/hr | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| Multi-family | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | Quasi | TRM 4.0 | 3.09 | kBTU/hr input capacity | 15 | 100.00% | 5.00% | 100.00% |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 55% Sensible Heat Recovery-LI | Quasi | TRM 4.0 | 4.52 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery-LI | Quasi | TRM 4.0 | 5.37 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery-LI | Quasi | TRM 4.0 | 6.22 | CFM | 14 | 100.00% | 5.00% | 100.00% |

| Program | Measure | Pure or Quasi | Source | Savings Factor ($m^3$) | Unit | EUL | Gross Realization Rate | Free Ridership | Adjustment Factor |
|---|---|---|---|---|---|---|---|---|---|
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 85% Sensible Heat Recovery-LI | Quasi | TRM 4.0 | 7.07 | CFM | 14 | 100.00% | 5.00% | 100.00% |
| Multi-family | Make-Up Air Unit (MUA) - VFD | Quasi | TRM 4.0 | 3.00 | CFM | 20 | 100.00% | 5.00% | 100.00% |
| Residential Adaptive Thermostats | Smart Thermostats | Pure | Adaptive Thermostat Ping Report | 185.00 | unit | 15 | 100.00% | 4.00% | 81.96% |

*Not all values may compute exactly due to rounding.

## 11.13.4 Savings Calculation Measure Totals

**Table 11-151. Enbridge Measure Savings, Tracked and Verified, by Annual and Cumulative, Gross and Net***

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Direct Install | [BONUS] DI DCKV 10,001 - 15,000 CFM [Existing] | 70,116 | 66,610 | 1,051,740 | 999,153 | 70,116 | 66,610 | 1,051,740 | 999,153 |
| C&I Direct Install | [BONUS] DI DCKV 5,001 - 10,000 CFM [Existing] | 52,585 | 49,956 | 788,775 | 749,336 | 52,585 | 49,956 | 788,775 | 749,336 |
| C&I Direct Install | [BONUS] DI DCKV up to 5000 CFM [Existing] | 37,863 | 35,970 | 567,945 | 539,548 | 37,863 | 35,970 | 567,945 | 539,548 |
| C&I Direct Install | Direct Install Air Curtain 10 x 10 S&R [New/Existing] | 38,619 | 36,688 | 579,285 | 550,321 | 38,619 | 36,688 | 579,285 | 550,321 |
| C&I Direct Install | Direct Install Air Curtain 8 x 10 S&R [New/Existing] | 103,761 | 98,573 | 1,556,415 | 1,478,594 | 103,761 | 98,573 | 1,556,415 | 1,478,594 |
| C&I Direct Install | Direct Install Air Curtain 8 x 8 S&R [New/Existing] | 37,704 | 35,819 | 565,560 | 537,282 | 37,704 | 35,819 | 565,560 | 537,282 |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 10 x 10 [New/Existing] | 48,440 | 46,018 | 726,600 | 690,270 | 48,440 | 46,018 | 726,600 | 690,270 |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | 195,602 | 185,822 | 2,934,030 | 2,787,329 | 195,602 | 185,822 | 2,934,030 | 2,787,329 |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | 130,080 | 123,576 | 1,951,200 | 1,853,640 | 130,080 | 123,576 | 1,951,200 | 1,853,640 |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 16 x 16 [New/Existing] | 49,567 | 47,089 | 743,505 | 706,330 | 49,567 | 47,089 | 743,505 | 706,330 |
| C&I Direct Install | Direct Install Air Curtain Shipping Drive-In Door 20 x 20 [New/Existing] | 7,605 | 7,225 | 114,075 | 108,371 | 7,605 | 7,225 | 114,075 | 108,371 |
| C&I Direct Install | Direct Install Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 12,152 | 11,544 | 121,520 | 115,444 | 12,152 | 11,544 | 121,520 | 115,444 |
| C&I Direct Install | Direct Install Dock Door Seals 10 x 10 (Baseline w/o Seals) [Existing] | 22,505 | 21,380 | 225,050 | 213,798 | 22,505 | 21,380 | 225,050 | 213,798 |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 318,396 | 302,476 | 3,183,960 | 3,024,762 | 318,396 | 302,476 | 3,183,960 | 3,024,762 |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | 137,349 | 130,482 | 1,373,490 | 1,304,816 | 137,349 | 130,482 | 1,373,490 | 1,304,816 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | 20,867 | 19,824 | 208,670 | 198,237 | 20,867 | 19,824 | 208,670 | 198,237 |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 8 (Baseline w/o Seals) [Existing] | 24,265 | 23,052 | 242,650 | 230,518 | 24,265 | 23,052 | 242,650 | 230,518 |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | 79,080 | 75,126 | 790,800 | 751,260 | 79,080 | 75,126 | 790,800 | 751,260 |
| C&I Direct Install | Direct Install Dock Door Seals 8 x 9 (Baseline w/o Seals) [Existing] | 24,940 | 23,693 | 249,400 | 236,930 | 24,940 | 23,693 | 249,400 | 236,930 |
| C&I Direct Install | Direct Install Ind Air Curtain 10 x 10 S&R | 27,585 | 26,206 | 413,775 | 393,086 | 27,585 | 26,206 | 413,775 | 393,086 |
| C&I Direct Install | Direct Install Ind Air Curtain 8 x 10 S&R | 44,469 | 42,246 | 667,035 | 633,683 | 44,469 | 42,246 | 667,035 | 633,683 |
| C&I Direct Install | Direct Install Ind Air Curtain 8 x 8 S&R | 18,852 | 17,909 | 282,780 | 268,641 | 18,852 | 17,909 | 282,780 | 268,641 |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 10 x 10 [New/Existing] | 24,220 | 23,009 | 363,300 | 345,135 | 24,220 | 23,009 | 363,300 | 345,135 |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | 28,765 | 27,327 | 431,475 | 409,901 | 28,765 | 27,327 | 431,475 | 409,901 |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | 52,032 | 49,430 | 780,480 | 741,456 | 52,032 | 49,430 | 780,480 | 741,456 |
| C&I Direct Install | Direct Install Ind Air Curtain Shipping Drive-In Door 16 x 16 [New/Existing] | 7,081 | 6,727 | 106,215 | 100,904 | 7,081 | 6,727 | 106,215 | 100,904 |
| C&I Direct Install | Direct Install Ind Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 15,624 | 14,843 | 156,240 | 148,428 | 15,624 | 14,843 | 156,240 | 148,428 |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 106,132 | 100,825 | 1,061,320 | 1,008,254 | 106,132 | 100,825 | 1,061,320 | 1,008,254 |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | 35,609 | 33,829 | 356,090 | 338,286 | 35,609 | 33,829 | 356,090 | 338,286 |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | 11,382 | 10,813 | 113,820 | 108,129 | 11,382 | 10,813 | 113,820 | 108,129 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | 3,954 | 3,756 | 39,540 | 37,563 | 3,954 | 3,756 | 39,540 | 37,563 |
| C&I Direct Install | Direct Install Ind Dock Door Seals 8 x 9 (Baseline w/o Seals) [Existing] | 9,976 | 9,477 | 99,760 | 94,772 | 9,976 | 9,477 | 99,760 | 94,772 |
| C&I Prescriptive | [BONUS] MS Energy Star Fryer | 204,160 | 163,328 | 2,449,920 | 1,959,936 | 204,160 | 163,328 | 2,449,920 | 1,959,936 |
| C&I Prescriptive | Air Curtain Pedestrian Single Door with Vestibule 7x6 - Ambient Air Curtain | 15,148 | 14,391 | 227,220 | 215,859 | 15,148 | 14,391 | 227,220 | 215,859 |
| C&I Prescriptive | Air Curtain Pedestrian Single Door with Vestibule 8x6 - Ambient Air Curtain | 3,624 | 3,443 | 54,360 | 51,642 | 3,624 | 3,443 | 54,360 | 51,642 |
| C&I Prescriptive | Air Curtain Shipping Drive-In Door 12' x 12' [New/Existing] | 5,753 | 5,465 | 86,295 | 81,980 | 5,753 | 5,465 | 86,295 | 81,980 |
| C&I Prescriptive | Air Curtain Shipping Drive-In Door 14 x 14 [New/Existing] | 13,008 | 12,358 | 195,120 | 185,364 | 13,008 | 12,358 | 195,120 | 185,364 |
| C&I Prescriptive | Commercial Energy Star Convection Oven | 9,515 | 7,612 | 114,180 | 91,344 | 9,515 | 7,612 | 114,180 | 91,344 |
| C&I Prescriptive | Commercial Energy Star Double Rack Oven | 6,012 | 4,810 | 72,144 | 57,715 | 6,012 | 4,810 | 72,144 | 57,715 |
| C&I Prescriptive | Cond MUA Two Speed up to 14,000 CFM - Other/Commercial [New/Existing] | 6,588 | 6,259 | 131,760 | 125,172 | 6,588 | 6,259 | 131,760 | 125,172 |
| C&I Prescriptive | Condensing Furnace High Efficiency 75-149 KBtu/hr Cx [Existing] | 231 | 190 | 4,156 | 3,429 | 231 | 190 | 4,156 | 3,429 |
| C&I Prescriptive | Condensing MUA Single Speed up to 14,000 CFM - Other/Commercial [New/Existing] | 3,134 | 2,977 | 62,678 | 59,544 | 3,134 | 2,977 | 62,678 | 59,544 |
| C&I Prescriptive | Condensing Storage Water Heater High Utilization >75 and <=250 Kbtu/Hr Cx [New Construction] | 2,460 | 2,337 | 36,895 | 35,050 | 2,460 | 2,337 | 36,895 | 35,050 |
| C&I Prescriptive | DCKV 10,001 - 15,000 CFM [Existing] | 54,028 | 33,497 | 810,418 | 502,459 | 54,028 | 33,497 | 810,418 | 502,459 |
| C&I Prescriptive | DCKV 10,001 - 15,000 CFM Cx [Retrofit] | 36,019 | 22,332 | 540,279 | 334,973 | 36,019 | 22,332 | 540,279 | 334,973 |
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM [Existing] | 129,662 | 80,390 | 1,944,930 | 1,205,857 | 129,662 | 80,390 | 1,944,930 | 1,205,857 |
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM [New] | 54,026 | 33,496 | 810,387 | 502,440 | 54,026 | 33,496 | 810,387 | 502,440 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | DCKV 5,001 - 10,000 CFM Cx [Retrofit] | 75,636 | 46,894 | 1,134,542 | 703,416 | 75,636 | 46,894 | 1,134,542 | 703,416 |
| C&I Prescriptive | DCKV up to 5,000 CFM [New] | 17,289 | 10,719 | 259,336 | 160,789 | 17,289 | 10,719 | 259,336 | 160,789 |
| C&I Prescriptive | DCKV up to 5,000 CFM Cx [New] | 12,967 | 8,039 | 194,502 | 120,591 | 12,967 | 8,039 | 194,502 | 120,591 |
| C&I Prescriptive | DCKV up to 5000 CFM [Existing] | 103,735 | 64,315 | 1,556,018 | 964,731 | 103,735 | 64,315 | 1,556,018 | 964,731 |
| C&I Prescriptive | DCKV up to 5000 CFM Cx [Retrofit] | 4,322 | 2,680 | 64,834 | 40,197 | 4,322 | 2,680 | 64,834 | 40,197 |
| C&I Prescriptive | DCV Single Zone - Community Center [Retrofit] | 8,336 | 667 | 125,033 | 10,003 | 8,336 | 667 | 125,033 | 10,003 |
| C&I Prescriptive | DCV Single Zone Office with Maintenance [Retrofit] | 525 | 42 | 7,878 | 630 | 525 | 42 | 7,878 | 630 |
| C&I Prescriptive | DCV Single Zone Office with Maintenance Cx [Retrofit] | 6,609 | 529 | 99,137 | 7,931 | 6,609 | 529 | 99,137 | 7,931 |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance [Retrofit] | 395,002 | 31,600 | 5,925,027 | 474,002 | 395,002 | 31,600 | 5,925,027 | 474,002 |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance Cx [New] | 8,165 | 653 | 122,469 | 9,797 | 8,165 | 653 | 122,469 | 9,797 |
| C&I Prescriptive | DCV Single Zone Retail with Maintenance Cx [Retrofit] | 580,169 | 46,413 | 8,702,530 | 696,202 | 580,169 | 46,413 | 8,702,530 | 696,202 |
| C&I Prescriptive | Destratification Fan 20 ft [Existing] | 4,058 | 3,652 | 60,870 | 54,783 | 4,058 | 3,652 | 60,870 | 54,783 |
| C&I Prescriptive | Destratification Fan 24 ft [Existing] | 14,610 | 13,149 | 219,150 | 197,235 | 14,610 | 13,149 | 219,150 | 197,235 |
| C&I Prescriptive | Dock Door Seals 10 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 45,136 | 42,879 | 451,360 | 428,792 | 45,136 | 42,879 | 451,360 | 428,792 |
| C&I Prescriptive | Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 146,952 | 139,604 | 1,469,520 | 1,396,044 | 146,952 | 139,604 | 1,469,520 | 1,396,044 |
| C&I Prescriptive | Dock Door Seals 8' x 10' (Baseline w/ Deteriorated Seals) [Existing] | 36,738 | 34,901 | 367,380 | 349,011 | 36,738 | 34,901 | 367,380 | 349,011 |
| C&I Prescriptive | Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | 35,609 | 33,829 | 356,090 | 338,286 | 35,609 | 33,829 | 356,090 | 338,286 |
| C&I Prescriptive | Dock Door Seals 8 x 8 (Baseline w/ Deteriorated Seals) [Existing] | 9,485 | 9,011 | 94,850 | 90,108 | 9,485 | 9,011 | 94,850 | 90,108 |
| C&I Prescriptive | Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | 11,862 | 11,269 | 118,620 | 112,689 | 11,862 | 11,269 | 118,620 | 112,689 |
| C&I Prescriptive | ERV High Use 65% (55% Code Baseline) [New/Existing] | 4,845 | 4,603 | 67,830 | 64,439 | 4,845 | 4,603 | 67,830 | 64,439 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | ERV High Use 65% (55% Code Baseline) [New/Existing] | 7,348 | 6,981 | 102,876 | 97,732 | 7,348 | 6,981 | 102,876 | 97,732 |
| C&I Prescriptive | ERV In-suite Vent High Int Multi Res 65% Cx [New] | 162,281 | 154,167 | 2,271,940 | 2,158,343 | 162,281 | 154,167 | 2,271,940 | 2,158,343 |
| C&I Prescriptive | ERV Low Use 75% (55% Code Baseline) [New/Existing] | 488 | 464 | 6,832 | 6,490 | 488 | 464 | 6,832 | 6,490 |
| C&I Prescriptive | ERV Low Use 75% (55% Code Baseline) [New/Existing] | 412 | 391 | 5,765 | 5,476 | 412 | 391 | 5,765 | 5,476 |
| C&I Prescriptive | ERV Vent Low Integrated Office 65% (No Baseline) [New] | 9,550 | 9,073 | 133,700 | 127,015 | 9,550 | 9,073 | 133,700 | 127,015 |
| C&I Prescriptive | ERV Vent Low Integrated Office 75% (No Baseline) [New] | 774 | 735 | 10,829 | 10,288 | 774 | 735 | 10,829 | 10,288 |
| C&I Prescriptive | ERV Vent Med Integrated Retail Res 65% (No Baseline) [New] | 13,708 | 13,023 | 191,912 | 182,316 | 13,708 | 13,023 | 191,912 | 182,316 |
| C&I Prescriptive | ERV Vent Med Integrated Retail Res 75% (No Baseline) [New] | 4,140 | 3,933 | 57,960 | 55,062 | 4,140 | 3,933 | 57,960 | 55,062 |
| C&I Prescriptive | ERV Vent Med Standalone Retail 75% (No Baseline) [New] | 14,628 | 13,897 | 204,792 | 194,552 | 14,628 | 13,897 | 204,792 | 194,552 |
| C&I Prescriptive | ES Fryer Cx | 14,080 | 11,264 | 168,960 | 135,168 | 14,080 | 11,264 | 168,960 | 135,168 |
| C&I Prescriptive | Ind Air Curtain Shipping Drive-In Door 12 x 12 [New/Existing] | 17,259 | 16,396 | 258,885 | 245,941 | 17,259 | 16,396 | 258,885 | 245,941 |
| C&I Prescriptive | Ind Destratification Fan 20 ft [Existing] | 12,174 | 10,957 | 182,610 | 164,349 | 12,174 | 10,957 | 182,610 | 164,349 |
| C&I Prescriptive | Ind Destratification Fan 24 ft [Existing] | 5,844 | 5,260 | 87,660 | 78,894 | 5,844 | 5,260 | 87,660 | 78,894 |
| C&I Prescriptive | Ind Destratification Fan 24 ft [Retrofit] | 2,922 | 2,630 | 43,830 | 39,447 | 2,922 | 2,630 | 43,830 | 39,447 |
| C&I Prescriptive | Ind Dock Door Seals 8 x 10 (Baseline w/ Deteriorated Seals) [Existing] | 20,410 | 19,390 | 204,100 | 193,895 | 20,410 | 19,390 | 204,100 | 193,895 |
| C&I Prescriptive | Ind Dock Door Seals 8 x 10 (Baseline w/o Seals) [Existing] | 10,174 | 9,665 | 101,740 | 96,653 | 10,174 | 9,665 | 101,740 | 96,653 |
| C&I Prescriptive | Ind Dock Door Seals 8 x 9 (Baseline w/ Deteriorated Seals) [Existing] | 3,954 | 3,756 | 39,540 | 37,563 | 3,954 | 3,756 | 39,540 | 37,563 |
| C&I Prescriptive | MS Condensing Storage Water Heater High Utilization >250 kBTU/Hr [New Construction] | 14,831 | 14,089 | 222,461 | 211,338 | 14,831 | 14,089 | 222,461 | 211,338 |
| C&I Prescriptive | MS Condensing Storage Water Heater High Utilization >75 and <=250 kBTU/Hr [New Construction] | 58,052 | 55,149 | 870,777 | 827,239 | 58,052 | 55,149 | 870,777 | 827,239 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >250 kBTU/Hr [New Construction] | 17,677 | 16,793 | 265,159 | 251,901 | 17,677 | 16,793 | 265,159 | 251,901 |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >75 and <=250 kBTU/Hr [New Construction] | 28,133 | 26,726 | 421,992 | 400,893 | 28,133 | 26,726 | 421,992 | 400,893 |
| C&I Prescriptive | MS Condensing Storage Water Heater Low Utilization >75 and <=250 Kbtu/Hr Cx [New Construction] | 408 | 388 | 6,120 | 5,814 | 408 | 388 | 6,120 | 5,814 |
| C&I Prescriptive | MS Condensing Storage Water Heater Medium Utilization >250 kBTU/Hr [New Construction] | 3,552 | 3,374 | 53,277 | 50,613 | 3,552 | 3,374 | 53,277 | 50,613 |
| C&I Prescriptive | MS Condensing Storage Water Heater Medium Utilization >75 and <=250 kBTU/Hr [New Construction] | 30,707 | 29,172 | 460,612 | 437,582 | 30,707 | 29,172 | 460,612 | 437,582 |
| C&I Prescriptive | MS Condensing Tankless High Usage <200 kBTU - Water Heating | 5,698 | 5,584 | 113,964 | 111,685 | 5,698 | 5,584 | 113,964 | 111,685 |
| C&I Prescriptive | MS Condensing Tankless Low Usage <200 kBTU - Water Heating | 11,042 | 10,822 | 220,850 | 216,433 | 11,042 | 10,822 | 220,850 | 216,433 |
| C&I Prescriptive | MS Condensing Tankless Med Usage <200 kBTU - Water Heating | 8,365 | 8,198 | 167,306 | 163,960 | 8,365 | 8,198 | 167,306 | 163,960 |
| C&I Prescriptive | MS Condensing Unit Heater 125-200 kBTU/hr [Existing] | 3,906 | 3,906 | 70,300 | 70,300 | 3,906 | 3,906 | 70,300 | 70,300 |
| C&I Prescriptive | MS Condensing Unit Heater 225-300 kBTU/hr [Existing] | 26,905 | 26,905 | 484,288 | 484,288 | 26,905 | 26,905 | 484,288 | 484,288 |
| C&I Prescriptive | MS Condensing Unit Heater 30-100 kBTU/hr [Existing] | 1,460 | 1,460 | 26,274 | 26,274 | 1,460 | 1,460 | 26,274 | 26,274 |
| C&I Prescriptive | MS Energy Star Fryer | 98,560 | 78,848 | 1,182,720 | 946,176 | 98,560 | 78,848 | 1,182,720 | 946,176 |
| C&I Prescriptive | MS Energy Star Steam Cooker [New/Existing] | 35,556 | 28,445 | 426,672 | 341,338 | 35,556 | 28,445 | 426,672 | 341,338 |
| C&I Prescriptive | MS Ind Condensing Storage Water Heater Medium Utilization >75 and <=250 kBTU/Hr [New Construction] | 1,554 | 1,476 | 23,303 | 22,138 | 1,554 | 1,476 | 23,303 | 22,138 |
| C&I Prescriptive | Ozone Laundry Tunnel Washer =/< 120 lbs [New/Existing] | 20,261 | 18,640 | 303,917 | 279,604 | 20,261 | 18,640 | 303,917 | 279,604 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | Ozone Washer Extractor =/<60lbs [New] | 53,541 | 49,258 | 803,122 | 738,872 | 53,541 | 49,258 | 803,122 | 738,872 |
| Home Winterproofing | Bathroom Aerator | 481 | 481 | 4,810 | 4,810 | 481 | 481 | 4,810 | 4,810 |
| Home Winterproofing | Kitchen Aerator | 821 | 821 | 8,210 | 8,210 | 821 | 821 | 8,210 | 8,210 |
| Home Winterproofing | Showerhead Replacement 1.25 GPM | 7,469 | 7,469 | 74,689 | 74,689 | 7,469 | 7,469 | 74,689 | 74,689 |
| Home Winterproofing | Smart Thermostats | 584,123 | 584,123 | 8,761,845 | 8,761,845 | 584,123 | 584,123 | 8,761,845 | 8,761,845 |
| Low-Income Multi-Residential | Low Income Condensing MUA VFD up to 14,000 CFM - Multi-Residential/Long Term Care [New/Existing] | 108,000 | 108,000 | 2,160,000 | 2,160,000 | 108,000 | 108,000 | 2,160,000 | 2,160,000 |
| Low-Income Multi-Residential | Low Income Condensing Storage Water Heater High Utilization >250 kBTU/Hr [New Construction] | 927 | 927 | 13,905 | 13,905 | 927 | 927 | 13,905 | 13,905 |
| Low-Income Multi-Residential | Low Income Condensing Storage Water Heater High Utilization >75 and <=250 kBTU/Hr [New Construction] | 742 | 742 | 11,124 | 11,124 | 742 | 742 | 11,124 | 11,124 |
| Low-Income Multi-Residential | Low Income Condensing Tankless High Usage <200 kBTU - Water Heating | 2,279 | 2,279 | 45,586 | 45,586 | 2,279 | 2,279 | 45,586 | 45,586 |
| Low-Income Multi-Residential | Low Income HRV Vent High Integrated Multi Res 85% (No Baseline) [New] | 110,891 | 110,891 | 1,552,474 | 1,552,474 | 110,891 | 110,891 | 1,552,474 | 1,552,474 |
| Low-Income Multi-Residential | Low Income HRV Vent High Standalone Multi Res 75% (No Baseline) [New] | 19,640 | 19,640 | 274,953 | 274,953 | 19,640 | 19,640 | 274,953 | 274,953 |
| Low-Income Multi-Residential | Low Income Multi-Res Showerhead [Existing] - Water Heating | 2,586 | 2,586 | 25,857 | 25,857 | 2,586 | 2,586 | 25,857 | 25,857 |
| Residential Adaptive Thermostats | Smart Thermostats | 3,257,994 | 3,127,674 | 48,869,904 | 46,915,108 | 3,257,994 | 3,127,674 | 48,869,904 | 46,915,108 |

*Not all values may compute exactly due to rounding.

**Table 11-152. Union Measure Savings, Tracked and Verified, by Annual and Cumulative, Gross and Net***

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Direct Install | Air Curtain - Dock-In - 8 x 10 | 59,292 | 56,327 | 889,380 | 844,911 | 59,292 | 56,327 | 889,380 | 844,911 |
| C&I Direct Install | Air Curtain - Dock-In - 8 x 8 | 32,991 | 31,341 | 494,865 | 470,122 | 32,991 | 31,341 | 494,865 | 470,122 |
| C&I Direct Install | Air Curtain - Dock-In - 8 x 9 | 9,690 | 9,206 | 145,350 | 138,083 | 9,690 | 9,206 | 145,350 | 138,083 |
| C&I Direct Install | Air Curtain - Drive-In - 10 x 10 | 19,376 | 18,407 | 290,640 | 276,108 | 19,376 | 18,407 | 290,640 | 276,108 |
| C&I Direct Install | Air Curtain - Drive-In - 12 x 12 | 69,036 | 65,584 | 1,035,540 | 983,763 | 69,036 | 65,584 | 1,035,540 | 983,763 |
| C&I Direct Install | Air Curtain - Drive-In - 14 x 14 | 45,528 | 43,252 | 682,920 | 648,774 | 45,528 | 43,252 | 682,920 | 648,774 |
| C&I Direct Install | DCKV- RF - Up to 5,000 cfm | 4,207 | 3,997 | 63,105 | 59,950 | 4,207 | 3,997 | 63,105 | 59,950 |
| C&I Direct Install | DCKV- TNR - 5,001 to 10,000 cfm | 21,034 | 19,982 | 315,510 | 299,735 | 21,034 | 19,982 | 315,510 | 299,735 |
| C&I Direct Install | DCKV- TNR - Up to 5,000 cfm | 33,656 | 31,973 | 504,840 | 479,598 | 33,656 | 31,973 | 504,840 | 479,598 |
| C&I Direct Install | Dock Door Seals - Compression (8x8 - 8x10) | 27,694 | 26,309 | 276,940 | 263,093 | 27,694 | 26,309 | 276,940 | 263,093 |
| C&I Prescriptive | Air Curtain - (2) 8 x 6 Door | 7,548 | 3,774 | 113,220 | 56,610 | 7,548 | 3,774 | 113,220 | 56,610 |
| C&I Prescriptive | Air Curtain - 7 x 3 Door | 2,535 | 1,268 | 38,025 | 19,013 | 2,535 | 1,268 | 38,025 | 19,013 |
| C&I Prescriptive | Air Curtain - Dock-In - 10 x 10 with LTO BONUS | 11,034 | 5,517 | 165,510 | 82,755 | 11,034 | 5,517 | 165,510 | 82,755 |
| C&I Prescriptive | Air Curtain - Dock-In - 8 x 10 | 44,469 | 22,235 | 667,035 | 333,518 | 44,469 | 22,235 | 667,035 | 333,518 |
| C&I Prescriptive | Air Curtain - Dock-In - 8 x 8 | 9,426 | 4,713 | 141,390 | 70,695 | 9,426 | 4,713 | 141,390 | 70,695 |
| C&I Prescriptive | Air Curtain - Drive-In - 10 x 10 | 9,688 | 4,844 | 145,320 | 72,660 | 9,688 | 4,844 | 145,320 | 72,660 |
| C&I Prescriptive | Air Curtain - Drive-In - 12 x 12 | 5,753 | 2,877 | 86,295 | 43,148 | 5,753 | 2,877 | 86,295 | 43,148 |
| C&I Prescriptive | Air Curtain - Drive-In - 14 x 14 | 6,504 | 3,252 | 97,560 | 48,780 | 6,504 | 3,252 | 97,560 | 48,780 |
| C&I Prescriptive | Air Curtain - Drive-In - 18 x 18 | 7,459 | 3,730 | 111,885 | 55,943 | 7,459 | 3,730 | 111,885 | 55,943 |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - (2)7x6 | 2,164 | 1,082 | 32,460 | 16,230 | 2,164 | 1,082 | 32,460 | 16,230 |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - (2)8x6 | 19,328 | 9,664 | 289,920 | 144,960 | 19,328 | 9,664 | 289,920 | 144,960 |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 7x3 | 2,705 | 1,353 | 40,575 | 20,288 | 2,705 | 1,353 | 40,575 | 20,288 |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 7x6 | 1,082 | 541 | 16,230 | 8,115 | 1,082 | 541 | 16,230 | 8,115 |
| C&I Prescriptive | Air Curtain Ambient - w/ Vestibule - 8x6 | 1,208 | 604 | 18,120 | 9,060 | 1,208 | 604 | 18,120 | 9,060 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | Commercial Energy Star Convection Oven | 14,705 | 11,764 | 176,460 | 141,168 | 14,705 | 11,764 | 176,460 | 141,168 |
| C&I Prescriptive | Commercial Energy Star Double Rack Oven | 7,014 | 5,611 | 84,168 | 67,334 | 7,014 | 5,611 | 84,168 | 67,334 |
| C&I Prescriptive | Commercial Energy Star Fryer | 107,008 | 85,606 | 1,284,096 | 1,027,277 | 107,008 | 85,606 | 1,284,096 | 1,027,277 |
| C&I Prescriptive | Commercial Energy Star Fryer | 54,912 | 43,930 | 658,944 | 527,155 | 54,912 | 43,930 | 658,944 | 527,155 |
| C&I Prescriptive | Condensing Storage Water Heater - GT 250 kBTU/hr | 33,522 | 31,846 | 502,831 | 477,690 | 33,522 | 31,846 | 502,831 | 477,690 |
| C&I Prescriptive | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | 66,091 | 62,786 | 991,359 | 941,791 | 66,091 | 62,786 | 991,360 | 941,792 |
| C&I Prescriptive | Condensing Tankless Water Heater - GT 75 & LT 200 kBTU/hr | 16,785 | 16,449 | 335,703 | 328,989 | 16,785 | 16,449 | 335,703 | 328,989 |
| C&I Prescriptive | DCKV- NC - 5,001 to 10,000 cfm | 21,034 | 19,982 | 315,510 | 299,735 | 21,034 | 19,982 | 315,510 | 299,735 |
| C&I Prescriptive | DCKV- NC - 5,001 to 10,000 cfm | 21,034 | 19,982 | 315,510 | 299,735 | 21,034 | 19,982 | 315,510 | 299,735 |
| C&I Prescriptive | DCKV- NC - Up to 5,000 cfm | 4,207 | 3,997 | 63,105 | 59,950 | 4,207 | 3,997 | 63,105 | 59,950 |
| C&I Prescriptive | DCKV- NC - Up to 5,000 cfm - | 4,207 | 3,997 | 63,105 | 59,950 | 4,207 | 3,997 | 63,105 | 59,950 |
| C&I Prescriptive | DCKV- RF - 10,001 to 15,000 cfm | 70,116 | 66,610 | 1,051,740 | 999,153 | 70,116 | 66,610 | 1,051,740 | 999,153 |
| C&I Prescriptive | DCKV- RF - 5,001 to 10,000 cfm | 105,170 | 99,912 | 1,577,550 | 1,498,673 | 105,170 | 99,912 | 1,577,550 | 1,498,673 |
| C&I Prescriptive | DCKV- RF - Up to 5,000 cfm | 50,484 | 47,960 | 757,260 | 719,397 | 50,484 | 47,960 | 757,260 | 719,397 |
| C&I Prescriptive | DCV | 396,317 | 361,032 | 5,944,757 | 5,415,483 | 396,317 | 361,032 | 5,944,756 | 5,415,482 |
| C&I Prescriptive | Destratification Fan - 20ft | 56,971 | 51,274 | 854,565 | 769,109 | 56,971 | 51,274 | 854,565 | 769,109 |
| C&I Prescriptive | Destratification Fan - 24ft | 22,288 | 20,059 | 334,320 | 300,888 | 22,288 | 20,059 | 334,320 | 300,888 |
| C&I Prescriptive | Dock Door Seals - Compression (8x8 - 8x10) | 126,851 | 63,426 | 1,268,510 | 634,255 | 126,851 | 63,426 | 1,268,510 | 634,255 |
| C&I Prescriptive | Dock Door Seals - Shelter (10x10) | 30,621 | 15,311 | 306,210 | 153,105 | 30,621 | 15,311 | 306,210 | 153,105 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 55% Sensible Heat Recovery | 33,579 | 10,074 | 470,109 | 141,033 | 33,579 | 10,074 | 470,109 | 141,033 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery | 210,662 | 63,199 | 2,949,267 | 884,780 | 210,662 | 63,199 | 2,949,267 | 884,780 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 65% SHR - In-Suite | 69,282 | 20,785 | 969,948 | 290,984 | 69,282 | 20,785 | 969,948 | 290,984 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery | 266,555 | 79,966 | 3,731,767 | 1,119,530 | 266,555 | 79,966 | 3,731,767 | 1,119,530 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-GTE 85% Sensible Heat Recovery | 17,141 | 5,142 | 239,976 | 71,993 | 17,141 | 5,142 | 239,976 | 71,993 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 65% Sensible Heat Recovery | 22,349 | 6,705 | 312,892 | 93,868 | 22,349 | 6,705 | 312,892 | 93,868 |
| C&I Prescriptive | Energy Recovery Ventilator (ERV)-Incremental-GTE 75% Sensible Heat Recovery | 9,852 | 2,956 | 137,934 | 41,380 | 9,852 | 2,956 | 137,934 | 41,380 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 55% Sensible Heat Recovery | 29,763 | 28,275 | 416,684 | 395,850 | 29,763 | 28,275 | 416,684 | 395,850 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 65% Sensible Heat Recovery | 2,170 | 2,061 | 30,376 | 28,857 | 2,170 | 2,061 | 30,376 | 28,857 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 75% Sensible Heat Recovery | 7,884 | 7,490 | 110,373 | 104,855 | 7,884 | 7,490 | 110,373 | 104,855 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-GTE 85% Sensible Heat Recovery | 18,990 | 18,041 | 265,860 | 252,567 | 18,990 | 18,041 | 265,860 | 252,567 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 65% Sensible Heat Recovery | 2,506 | 2,381 | 35,088 | 33,333 | 2,506 | 2,381 | 35,088 | 33,333 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 75% Sensible Heat Recovery | 325 | 309 | 4,550 | 4,323 | 325 | 309 | 4,550 | 4,323 |
| C&I Prescriptive | Heat Recovery Ventilator (HRV)-Incremental-GTE 85% Sensible Heat Recovery | 346 | 329 | 4,848 | 4,606 | 346 | 329 | 4,848 | 4,606 |
| C&I Prescriptive | Make-Up Air Unit (MUA) - Constant Speed | 6,105 | 5,800 | 122,100 | 115,995 | 6,105 | 5,800 | 122,100 | 115,995 |
| C&I Prescriptive | Make-Up Air Unit (MUA) - VFD | 207,289 | 196,924 | 4,145,776 | 3,938,487 | 207,289 | 196,924 | 4,145,776 | 3,938,487 |
| C&I Prescriptive | Ozone Laundry - Washer Extractor | 19,926 | 18,332 | 298,889 | 274,978 | 19,926 | 18,332 | 298,889 | 274,978 |
| C&I Prescriptive | Ozone Laundry - Washer Extractor | 3,257 | 2,997 | 48,861 | 44,952 | 3,257 | 2,997 | 48,861 | 44,952 |

| Program | Measure | Tracked | | | | Verified | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Annual | | Cumulative | | Annual | | Cumulative | |
| | | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| Home Weatherization | Bathroom Aerator | 1,389 | 1,375 | 13,886 | 13,747 | 1,389 | 1,375 | 13,886 | 13,747 |
| Home Weatherization | Kitchen Aerator | 3,605 | 3,568 | 36,045 | 35,685 | 3,605 | 3,568 | 36,045 | 35,685 |
| Home Weatherization | Pipe Insulation | 10,945 | 10,835 | 164,170 | 162,528 | 10,945 | 10,835 | 164,170 | 162,528 |
| Home Weatherization | Showerhead Replacement 1.25 GPM | 6,805 | 6,737 | 68,046 | 67,366 | 6,805 | 6,737 | 68,046 | 67,366 |
| Home Weatherization | Smart Thermostats | 564,727 | 559,080 | 8,470,905 | 8,386,196 | 564,727 | 559,080 | 8,470,905 | 8,386,196 |
| Multi-family | Condensing Storage Water Heater - GT 250 kBTU/hr | 881 | 837 | 13,210 | 12,549 | 881 | 837 | 13,210 | 12,549 |
| Multi-family | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | 2,679 | 2,545 | 40,185 | 38,176 | 2,679 | 2,545 | 40,185 | 38,176 |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 55% Sensible Heat Recovery-LI | 1,216 | 1,155 | 17,022 | 16,171 | 1,216 | 1,155 | 17,022 | 16,171 |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 65% Sensible Heat Recovery-LI | 28,998 | 27,548 | 405,972 | 385,673 | 28,998 | 27,548 | 405,972 | 385,673 |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 75% Sensible Heat Recovery-LI | 921 | 875 | 12,888 | 12,243 | 921 | 875 | 12,888 | 12,243 |
| Multi-family | Energy Recovery Ventilator (ERV)-GTE 85% Sensible Heat Recovery-LI | 392,385 | 372,766 | 5,493,390 | 5,218,721 | 392,385 | 372,766 | 5,493,390 | 5,218,721 |
| Multi-family | Make-Up Air Unit (MUA) - VFD | 105,600 | 100,320 | 2,112,000 | 2,006,400 | 105,600 | 100,320 | 2,112,000 | 2,006,400 |
| Residential Adaptive Thermostats | Smart Thermostats | 1,302,012 | 1,249,932 | 19,530,187 | 18,748,979 | 1,302,012 | 1,249,932 | 19,530,187 | 18,748,979 |

*Not all values may compute exactly due to rounding.

## 11.13.5 Savings Verification Discrepancies

The EC found no discrepancies for Enbridge measure verification in 2020.

**Table 11-153. Union measure verification discrepancies**

| Program | Measure | Issue | Resolution | Tracked Cumulative Gross Savings | Tracked Cumulative Net Savings | Verified Cumulative Gross Savings | Verified Cumulative Net Savings |
|---|---|---|---|---|---|---|---|
| C&I Prescriptive | Condensing Storage Water Heater - GT 75 & LTE 250 kBTU/Hr | Rounding. | - | 991,359 | 941,791 | 991,360 | 941,792 |
| C&I Prescriptive | Condensing Tankless Water Heater - GT 75 & LT 200 kBTU/hr | Rounding. | - | 335,703 | 328,989 | 335,703 | 328,989 |
| C&I Prescriptive | DCV | Rounding. | - | 5,944,757 | 5,415,483 | 5,944,756 | 5,415,482 |

## 11.14 Appendix N: Program Spending Tables

**Table 11-154. Enbridge 2020 approved and spent budget***

| Scorecard/Program | OEB-Approved Budget | Utility Spending | Difference | |
|---|---|---|---|---|
| | | | $ | % |
| **Resource Acquisition Total** | **$42,908,517** | **$44,710,224** | **$1,801,707** | **4%** |
| Home Energy Conservation | $18,727,200 | $26,623,413 | $7,896,213 | 42% |
| Residential Adaptive Thermostats | $2,262,870 | $2,116,192 | -$146,678 | -6% |
| C&I Custom | $7,658,968 | $7,324,851 | -$334,117 | -4% |
| C&I Direct Install | $4,950,581 | $2,004,811 | -$2,945,770 | -60% |
| C&I Prescriptive | $2,323,114 | $1,516,317 | -$806,797 | -35% |
| Energy Leaders Initiative | $0 | $4,475 | $4,475 | - |
| Run it Right (RA Portion) | $1,653,979 | $297,486 | -$1,356,493 | -82% |
| Comprehensive Energy Management (RA portion) | $98,838 | $5,141 | -$93,697 | -95% |
| Resource Acquisition Overhead | $5,232,967 | $4,817,538 | -$415,429 | -8% |
| **Low Income Total** | **$13,849,850** | **$12,585,321** | **-$1,264,529** | **-9%** |
| Home Winterproofing | $6,736,859 | $6,363,661 | -$373,198 | -6% |
| Low Income Multi Residential | $3,967,353 | $2,947,688 | -$1,019,665 | -26% |
| Low Income New Construction | $1,456,560 | $1,718,984 | $262,424 | 18% |
| Low Income Overhead | $1,689,078 | $1,554,987 | -$134,091 | -8% |
| **Market Transformation Total** | **$7,181,118** | **$5,842,215** | **-$1,338,903** | **-19%** |
| Residential Savings by Design | $3,392,296 | $3,326,434 | -$65,862 | -2% |
| Commercial Savings by Design | $1,122,068 | $1,192,097 | $70,029 | 6% |
| Run it Right (MTEM portion) | $329,209 | $202,106 | -$127,103 | -39% |
| Comprehensive Energy Management (MTEM portion) | $941,562 | $246,573 | -$694,989 | -74% |
| School Energy Competition | $520,200 | $68,748 | -$451,452 | -87% |
| Market Transformation Overhead | $875,783 | $806,257 | -$69,526 | -8% |
| **Portfolio Overhead** | **$3,817,891** | **$1,410,393** | **-$2,407,498** | **-63%** |
| Process and Program Evaluation | $1,774,228 | $415,840 | -$1,358,388 | -77% |
| DSM IT Chargeback** | $1,000,000 | $0 | -$1,000,000 | -100% |
| Collaboration and Innovation** | $1,043,663 | $994,554 | -$49,109 | -5% |
| **Enbridge Total** | $67,757,376 | $64,548,153 | -$3,209,223 | -5% |

*Not all values may compute exactly due to rounding.
**These line items are collapsed into the Other category in Table 9-2.

**Table 11-155. Union 2020 approved and spent budget***

| Scorecard/Program | OEB-Approved Budget | Utility Spending | Difference | |
|---|---|---|---|---|
| | | | $ | % |
| **Resource Acquisition Total** | **$37,810,983** | **$33,189,490** | **-$4,621,493** | **-12%** |
| Resource Acquisition - Residential | $15,407,697 | $18,310,853 | $2,903,156 | 19% |
| Home Reno Rebate | $12,226,000 | $15,652,806 | $3,426,806 | 28% |
| Residential Adaptive Thermostats | $1,500,000 | $893,916 | -$606,084 | -40% |
| Residential Overhead | $1,681,697 | $1,764,130 | $82,433 | 5% |
| Resource Acquisition - C&I | $22,403,286 | $14,878,637 | -$7,524,649 | -34% |
| C&I Custom | $7,808,000 | $9,042,149 | $1,234,149 | 16% |
| C&I Direct Install | $2,500,000 | $537,480 | -$1,962,520 | -79% |
| C&I Prescriptive | $7,149,000 | $1,590,948 | -$5,558,052 | -78% |
| C&I Overhead | $4,946,286 | $3,708,060 | -$1,238,226 | -25% |
| **Low Income Total** | **$15,005,488** | **$10,645,192** | **-$4,360,296** | **-29%** |
| Home Weatherization | $8,374,000 | $7,166,389 | -$1,207,611 | -14% |
| Furnace End-of-Life | $917,000 | $0 | -$917,000 | -100% |
| Indigenous | $448,000 | $66,900 | -$381,100 | -85% |
| Multi-Family | $3,573,000 | $2,536,384 | -$1,036,616 | -29% |
| Low Income Overhead | $1,693,488 | $875,519 | -$817,969 | -48% |
| **Large Volume Total** | **$4,000,000** | **$3,338,499** | **-$661,501** | **-17%** |
| Large Volume | $3,150,000 | $2,921,648 | -$228,352 | -7% |
| Large Volume Overhead | $850,000 | $416,851 | -$433,149 | -51% |
| **Market Transformation Total** | **$2,338,070** | **$2,168,215** | **-$169,855** | **-7%** |
| Optimum Home | $841,000 | $595,522 | -$245,478 | -29% |
| Commercial New Construction | $1,000,000 | $1,041,572 | $41,572 | 4% |
| Market Transformation Overhead | $497,070 | $531,121 | $34,051 | 7% |
| **Performance Based Total** | **$1,053,000** | **$383,244** | **-$669,756** | **-64%** |
| RunSmart | $177,000 | $58,471 | -$118,529 | -67% |
| Strategic Energy Management | $625,000 | $232,526 | -$392,474 | -63% |
| Performance-Based Overhead | $251,000 | $92,247 | -$158,753 | -63% |
| **Portfolio Overhead** | **$5,642,000** | **$4,763,943** | **-$878,057** | **-16%** |
| Research | $1,000,000 | $809,705 | -$190,295 | -19% |
| Evaluation | $1,300,000 | $206,201 | -$1,093,799 | -84% |
| Administration | $2,842,000 | $3,374,634 | $532,634 | 19% |
| Pilots** | $500,000 | $367,178 | -$132,822 | -27% |
| Open Bill Project** | $0 | $6,225 | $6,225 | - |
| **Union Total** | **$65,849,541** | **$54,488,582** | **-$11,360,959** | **-17%** |

*Not all values may compute exactly due to rounding.
**These line items are collapsed into the Other category in Table 9-7.

# 11.15 Appendix O: Cost Effectiveness Methodology

## 11.15.1 Cost Effectiveness Overview

The OEB requires the utilities to deliver portfolios that are cost effective at the "program" level. Each utility defines "program" differently, and both utilities define "program" differently from the OEB, as shown in Table 11-156. Throughout this report, the EC has used the OEB-defined Programs. The relevant cost effectiveness results are based on the utilities' definition of program.

**Table 11-156: 2019 "Programs" as defined by the OEB, Enbridge, and Union**

| Utility-Defined Programs | OEB-Defined Programs |
|---|---|
| **Enbridge** | |
| Resource Acquisition | Home Energy Conservation |
| | Residential Adaptive Thermostats |
| | Commercial and Industrial Custom |
| | Commercial and Industrial Direct Install |
| | Commercial and Industrial Prescriptive |
| | Comprehensive Energy Management |
| | Run it Right |
| Low Income | Home Winterproofing |
| | Multi-Residential |
| Market Transformation | Residential Savings by Design |
| | Commercial Savings by Design |
| | School Energy Competition |
| | Run it Right |
| | Comprehensive Energy Management |
| **Union** | |
| Residential Resource Acquisition | Home Reno Rebate |
| | Residential Adaptive Thermostats |
| C&I Resource Acquisition | Commercial and Industrial Custom |
| | Commercial and Industrial Direct Install |
| | Commercial and Industrial Prescriptive |
| Low Income | Home Weatherization |
| | Indigenous |
| | Furnace End of Life |
| | Low Income Multi-Family |
| Large Volume | Large Volume |
| Market Transformation | Optimum Home |
| | Commercial New Construction |
| Performance Based | RunSmart |
| | Strategic Energy Management |

To calculate cost effectiveness, the EC used the cost effectiveness model that has been applied in previous years using the utilities' verified savings. The key inputs used to calculate the TRC-Plus and PAC tests are shown in Table 11-157

**Table 11-157: Key inputs used in the TRC-Plus and PAC tests**

| Input | Description | TRC | PAC |
|---|---|---|---|
| Overhead & Administration Costs | Fixed costs, including overhead & administration, program management, program support, enabling strategies (communications, marketing, and outreach) done by utilities, costs and fees for service (e.g., data management, contractor management). | ✓ | ✓ |
| Utility Incentives | Utility provided incentives to encourage adoption of efficiency measures. | ✓ | ✓ |
| Promotion Costs | Variable expenditures to deliver and promote programs. | ✓ | ✓ |
| Evaluation Costs | Expenditures associated with evaluation of programs at the scorecard level. | | |
| Participant Cost | The incremental cost of program-driven measures. | ✓ | |
| Discount Rate | Discount rate used to weight long-term versus short-term benefits provided by the utilities (real discount rate of 4%). | ✓ | ✓ |
| Net Savings | Share of net savings driven by programs | ✓ | ✓ |
| Avoided Costs | Utility-avoided costs related to generation and distribution of energy from natural gas lines. Avoided Costs were provided by the utilities (see Section 11.15.3). | ✓ | ✓ |
| Measure EUL | See glossary. | ✓ | ✓ |
| Non-Energy Benefits | A 15% non-energy benefit (NEB) adder is applied to gas, electricity and water avoided costs representing environmental, economic, and health-related externalities. | ✓ | |
| Cost of Carbon | The avoided costs of carbon expressed as dollars per $m^3$. | ✓ | ✓ |

The cost effectiveness model had two main goals, including:

- Using a comprehensive model that can be easily modified to assess the impact of changing assumptions and methodology to calculate the TRC-Plus and PAC tests
- Ensuring consistent cost effectiveness calculations by regrouping both utilities in the same model

The EC model was then modified to adjust gross savings using realization rates and free ridership and spillover from the annual savings verification activities. Because the realization rates for other savings (e.g. electricity, water) were generally either not available or much less precise, the gas realization rates were used for all savings.

The EC cost effectiveness methodology applied in 2020 is consistent with what was done since 2015. This includes the cost of carbon, which was first included in 2017.

As part of the OEB's DSM Mid-Term Report, the OEB advised that carbon costs will be added to the cost-effectiveness test. Following the approach used to complete the 2019 Achievable Potential Study[120] and per the OEB's direction, the EC used the utility's avoided costs with the full carbon costs applied to all customers. The 15% non-energy benefit (NEB) adder was applied to gas, electricity and water avoided costs before adding carbon costs. The cost of carbon and NEB adder is applied to the TRC-Plus. The PAC test includes carbon and natural gas resources only (i.e., there are no electricity and water benefits), but it does not include the NEB adder. In tables later in this section, the EC has reported on what was provided by Enbridge and has not verified avoided figures.

In 2019, the EC began reporting program level cost effectiveness results with and without overhead & administration costs**.** A variety of costs are incurred by utilities to deliver programs, and how they are allocated at various levels (measure, program, sector, scorecard, and portfolio) can impact their perceived economic benefits. Consistent with previous years, the EC did not apply the utilities' portfolio overhead costs for research, evaluation, and administration. However, in past years,

[120] Navigant, 2019. Integrated Ontario Electricity and Natural Gas Achievable Potential Study.

the EC has apportioned Enbridge's explicit 'overhead' spend at the scorecard level to individual programs based on the distribution of savings. In 2019, EAC members debated whether this was appropriate. The National Standards Practice Manual[121] provides guidance on how to properly allocate overhead & administrative (O&A) costs (see text box below), however some believe that all O&A costs should be fully accounted for at the program level, and it is not clear what the utilities include in the "overhead & admin costs" and what is truly variable and fixed. The OEB agreed to show program level cost effectiveness results with and without O&A costs. The O&A costs are still applied at the scorecard and portfolio levels.

**Allocating Costs to Assess Cost Effectiveness**

The National Standards Practice Manual (NSPM) for Benefit-Cost Analysis of Distributed Energy Resources recommends that only truly variable costs (i.e., costs that can be avoided) be included at the appropriate levels (e.g., measure, program, sector, portfolio) and costs that are largely fixed at a particular level be excluded. Including fixed costs at the wrong level may results in removal of programs that do not appear cost effective, reducing the economic benefits of efficiency resource acquisition. Fixed costs at one level should not, however, be excluded altogether and should be included at higher levels where they are variable and thus avoidable. The NSPM provides examples of the costs to include at various levels when assessing cost effectiveness and shown below:

- **Measure level**: Include only costs that increase or decrease in proportion to the number of measures installed. This includes the measure incremental cost and could include some variable program delivery costs such as rebate processing costs (e.g., vendor costs for every rebate processed).
- **Program level**: Costs of administering and evaluating the program should be included at the program level and, in some cases, where marketing is variable. Marketing is often treated as a fixed cost; it can play an important role in raising awareness and driving program participation, but costs do not typically change with participation.
- **Portfolio level**: Portfolio level costs that are largely fixed and do not change in proportion to the number of programs or participation levels (e.g., portfolio level marketing, management, and evaluation costs) should be included at portfolio level analysis.

**One new activity was included in 2020: Enbridge's Commercial Energy Management program was screened for cost-effectiveness**. Similar to how the Run-It-Right program costs-effectiveness is calculated based on a 2019 decision, the cost-effectiveness calculation includes resource acquisition and market transformation costs. While the EC does not typically conduct cost effectiveness analysis on market transformation programs (because there are no claimed savings), Enbridge did claim savings this year. Thus, all program costs (recourse acquisition and market transformation) are included because savings are claimed for this program.

[121] https://www.nationalenergyscreeningproject.org/the-national-standard-practice-manual-for-energy-efficiency/

## 11.15.2 Summary of Results

Table 11-158 shows summary results for Enbridge TRC-Plus and PAC tests. Table 11-159 shows the same information for Union. The end of this section contains more tables with detailed results.[122]

All of the utility-defined programs pass the OEB-defined cost effectiveness threshold of 0.7 for Low Income programs and 1.0 for all other programs using the TRC-Plus test.

**Table 11-158. Enbridge summary of cost effectiveness ratio results***

| Scorecard | Final Verified Ratio | | Final Verified Net Present Value (M$) | |
|---|---|---|---|---|
| | TRC-Plus | PAC | TRC-Plus | PAC |
| Resource Acquisition | 2.45 | 2.93 | 97.62 | 86.93 |
| Low Income | 1.69 | 1.70 | 9.21 | 7.57 |
| **Total** | **2.33** | **2.69** | **106.83** | **94.50** |

*Not all values may compute exactly due to rounding.

**Table 11-159. Union summary of cost effectiveness ratio results***

| Scorecard | Final Verified Ratio | | Final Verified Net Present Value (M$) | |
|---|---|---|---|---|
| | TRC-Plus | PAC | TRC-Plus | PAC |
| Resource Acquisition | 1.80 | 4.10 | 71.16 | 102.96 |
| Large Volume | 5.63 | 7.55 | 23.37 | 21.87 |
| Low Income | 1.19 | 1.17 | 2.34 | 1.79 |
| Performance Based | 3.79 | 3.13 | 0.97 | 0.82 |
| **Total** | **1.91** | **3.68** | **97.84** | **127.44** |

*Not all values may compute exactly due to rounding.

Several OEB-defined programs did not meet the OEB-defined TRC-Plus cost effectiveness threshold with and without overhead & administrative (O&A) costs. Ratios without O&A costs are shown in brackets:

- **Enbridge's Resource Acquisition Run-It-Right program** fell significantly short of 1.0 in the TRC-Plus and PAC tests with a cost effectiveness ratio of 0.61 (0.62) and 0.34 (0.34) respectively.
- **Enbridge's Comprehensive Energy Management (CEM) program** fell significantly short of 1.0 in the TRC-Plus and PAC tests with a cost effectiveness ratio of 0.06 (0.06) and 0.05 (0.05) respectively.
- **Union's Performance Based RunSmart program** had a negative TRC-Plus and PACT cost effectiveness ratio of -2.53 (-2.13) and -1.17 (-1.07) respectively. This is a result of negative net gas savings.

[122] The cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness.

## 11.15.3 Cost Effectiveness Inputs

### Avoided Costs

**Table 11-160: Enbridge Gas Avoided Costs**

| Year | Water Heating (W) | | Space Heating (S) | | Industrial (I) | |
|---|---|---|---|---|---|---|
| | Baseload ($/m³) | | Baseload ($/m³) | | Baseload ($/m³) | |
| | Rate | NPV | Rate | NPV | Rate | NPV |
| 1 | 0.124 | 0.124 | 0.146 | 0.146 | 0.125 | 0.125 |
| 2 | 0.134 | 0.250 | 0.165 | 0.302 | 0.141 | 0.258 |
| 3 | 0.134 | 0.370 | 0.163 | 0.448 | 0.143 | 0.387 |
| 4 | 0.144 | 0.492 | 0.174 | 0.596 | 0.153 | 0.517 |
| 5 | 0.150 | 0.613 | 0.181 | 0.741 | 0.160 | 0.645 |
| 6 | 0.159 | 0.733 | 0.190 | 0.885 | 0.169 | 0.773 |
| 7 | 0.168 | 0.854 | 0.200 | 1.029 | 0.178 | 0.901 |
| 8 | 0.174 | 0.973 | 0.206 | 1.169 | 0.184 | 1.026 |
| 9 | 0.183 | 1.090 | 0.216 | 1.308 | 0.194 | 1.151 |
| 10 | 0.202 | 1.213 | 0.235 | 1.451 | 0.212 | 1.280 |
| 11 | 0.220 | 1.340 | 0.254 | 1.597 | 0.231 | 1.413 |
| 12 | 0.234 | 1.467 | 0.268 | 1.743 | 0.245 | 1.546 |
| 13 | 0.242 | 1.592 | 0.277 | 1.886 | 0.253 | 1.677 |
| 14 | 0.254 | 1.716 | 0.290 | 2.027 | 0.265 | 1.806 |
| 15 | 0.268 | 1.840 | 0.304 | 2.168 | 0.279 | 1.935 |
| 16 | 0.264 | 1.955 | 0.301 | 2.299 | 0.275 | 2.055 |
| 17 | 0.261 | 2.063 | 0.299 | 2.423 | 0.273 | 2.168 |
| 18 | 0.267 | 2.168 | 0.306 | 2.542 | 0.279 | 2.277 |
| 19 | 0.273 | 2.269 | 0.312 | 2.658 | 0.285 | 2.383 |
| 20 | 0.279 | 2.367 | 0.319 | 2.770 | 0.292 | 2.485 |
| 21 | 0.286 | 2.461 | 0.326 | 2.878 | 0.298 | 2.584 |
| 22 | 0.292 | 2.553 | 0.333 | 2.982 | 0.305 | 2.680 |
| 23 | 0.299 | 2.642 | 0.340 | 3.084 | 0.312 | 2.772 |
| 24 | 0.305 | 2.727 | 0.348 | 3.181 | 0.318 | 2.862 |
| 25 | 0.312 | 2.810 | 0.356 | 3.276 | 0.326 | 2.948 |
| 26 | 0.319 | 2.891 | 0.363 | 3.367 | 0.333 | 3.032 |
| 27 | 0.326 | 2.969 | 0.371 | 3.456 | 0.340 | 3.113 |
| 28 | 0.334 | 3.044 | 0.379 | 3.541 | 0.348 | 3.192 |
| 29 | 0.341 | 3.116 | 0.388 | 3.624 | 0.355 | 3.267 |
| 30 | 0.349 | 3.187 | 0.396 | 3.704 | 0.363 | 3.341 |

**Table 11-161: Enbridge Water and Electricity Avoided Costs**

| Year | Res/Com/Ind | | | |
|---|---|---|---|---|
| | Water ($/1000 litres) | | Electricity ($/KWh) | |
| | Rate | NPV | Rate | NPV |
| 1 | 0.967 | 0.967 | 0.144 | 0.144 |
| 2 | 0.982 | 1.896 | 0.146 | 0.282 |
| 3 | 0.998 | 2.789 | 0.148 | 0.415 |
| 4 | 1.014 | 3.649 | 0.151 | 0.542 |
| 5 | 1.030 | 4.475 | 0.153 | 0.665 |
| 6 | 1.047 | 5.269 | 0.156 | 0.783 |
| 7 | 1.064 | 6.033 | 0.158 | 0.897 |
| 8 | 1.081 | 6.768 | 0.161 | 1.006 |
| 9 | 1.098 | 7.474 | 0.163 | 1.111 |
| 10 | 1.116 | 8.153 | 0.166 | 1.212 |
| 11 | 1.134 | 8.806 | 0.168 | 1.309 |
| 12 | 1.152 | 9.434 | 0.171 | 1.402 |
| 13 | 1.171 | 10.037 | 0.174 | 1.492 |
| 14 | 1.190 | 10.618 | 0.177 | 1.578 |
| 15 | 1.209 | 11.176 | 0.180 | 1.661 |
| 16 | 1.228 | 11.713 | 0.183 | 1.741 |
| 17 | 1.248 | 12.229 | 0.185 | 1.817 |
| 18 | 1.268 | 12.725 | 0.188 | 1.891 |
| 19 | 1.288 | 13.202 | 0.191 | 1.962 |
| 20 | 1.309 | 13.661 | 0.195 | 2.030 |
| 21 | 1.330 | 14.102 | 0.198 | 2.096 |
| 22 | 1.352 | 14.526 | 0.201 | 2.159 |
| 23 | 1.373 | 14.934 | 0.204 | 2.219 |
| 24 | 1.396 | 15.326 | 0.207 | 2.277 |
| 25 | 1.418 | 15.703 | 0.211 | 2.333 |
| 26 | 1.441 | 16.066 | 0.214 | 2.387 |
| 27 | 1.464 | 16.414 | 0.218 | 2.439 |
| 28 | 1.488 | 16.749 | 0.221 | 2.489 |
| 29 | 1.512 | 17.072 | 0.225 | 2.537 |
| 30 | 1.536 | 17.382 | 0.228 | 2.583 |

**Table 11-162: Enbridge Carbon Avoided Costs**

| Year | Res/Com/Ind ($/m³) | |
|---|---|---|
| | Rate | NPV |
| 1 | 0.059 | 0.059 |
| 2 | 0.078 | 0.133 |
| 3 | 0.098 | 0.220 |
| 4 | 0.099 | 0.305 |
| 5 | 0.101 | 0.386 |
| 6 | 0.103 | 0.464 |
| 7 | 0.104 | 0.539 |
| 8 | 0.106 | 0.611 |
| 9 | 0.108 | 0.680 |
| 10 | 0.109 | 0.747 |
| 11 | 0.111 | 0.811 |
| 12 | 0.113 | 0.872 |
| 13 | 0.115 | 0.932 |
| 14 | 0.117 | 0.988 |
| 15 | 0.119 | 1.043 |
| 16 | 0.120 | 1.096 |
| 17 | 0.122 | 1.147 |
| 18 | 0.124 | 1.195 |
| 19 | 0.126 | 1.242 |
| 20 | 0.128 | 1.287 |
| 21 | 0.131 | 1.330 |
| 22 | 0.133 | 1.372 |
| 23 | 0.135 | 1.412 |
| 24 | 0.137 | 1.450 |
| 25 | 0.139 | 1.487 |
| 26 | 0.141 | 1.523 |
| 27 | 0.144 | 1.557 |
| 28 | 0.146 | 1.590 |
| 29 | 0.148 | 1.622 |
| 30 | 0.151 | 1.652 |

**Table 11-163: Union Gas Avoided Costs**

| Year | Residential/Commercial | | | | Industrial | |
|---|---|---|---|---|---|---|
| | Baseload (m3) | | Weather Sensitive (m3) | | Baseload (m3) | |
| | Rate | NPV | Rate | NPV | Rate | NPV |
| 1 | 0.146 | 0.146 | 0.177 | 0.177 | 0.143 | 0.143 |
| 2 | 0.140 | 0.278 | 0.163 | 0.331 | 0.137 | 0.273 |
| 3 | 0.140 | 0.403 | 0.177 | 0.489 | 0.142 | 0.400 |
| 4 | 0.151 | 0.532 | 0.189 | 0.649 | 0.154 | 0.531 |
| 5 | 0.160 | 0.660 | 0.198 | 0.808 | 0.163 | 0.661 |
| 6 | 0.171 | 0.790 | 0.210 | 0.968 | 0.174 | 0.793 |
| 7 | 0.181 | 0.920 | 0.221 | 1.126 | 0.184 | 0.925 |
| 8 | 0.188 | 1.048 | 0.228 | 1.282 | 0.191 | 1.055 |
| 9 | 0.200 | 1.177 | 0.242 | 1.437 | 0.203 | 1.185 |
| 10 | 0.219 | 1.310 | 0.261 | 1.596 | 0.222 | 1.321 |
| 11 | 0.238 | 1.447 | 0.281 | 1.758 | 0.241 | 1.459 |
| 12 | 0.255 | 1.586 | 0.298 | 1.920 | 0.257 | 1.599 |
| 13 | 0.266 | 1.723 | 0.311 | 2.081 | 0.269 | 1.738 |
| 14 | 0.277 | 1.858 | 0.323 | 2.238 | 0.280 | 1.875 |
| 15 | 0.290 | 1.992 | 0.336 | 2.394 | 0.293 | 2.010 |
| 16 | 0.289 | 2.118 | 0.337 | 2.541 | 0.292 | 2.138 |
| 17 | 0.286 | 2.237 | 0.335 | 2.679 | 0.289 | 2.258 |
| 18 | 0.293 | 2.351 | 0.343 | 2.813 | 0.296 | 2.374 |
| 19 | 0.300 | 2.462 | 0.351 | 2.943 | 0.303 | 2.486 |
| 20 | 0.307 | 2.570 | 0.359 | 3.069 | 0.311 | 2.595 |
| 21 | 0.315 | 2.674 | 0.367 | 3.190 | 0.318 | 2.700 |
| 22 | 0.322 | 2.775 | 0.376 | 3.308 | 0.325 | 2.802 |
| 23 | 0.330 | 2.873 | 0.384 | 3.422 | 0.333 | 2.901 |
| 24 | 0.337 | 2.968 | 0.393 | 3.533 | 0.341 | 2.997 |
| 25 | 0.346 | 3.060 | 0.402 | 3.640 | 0.349 | 3.090 |
| 26 | 0.354 | 3.149 | 0.412 | 3.743 | 0.357 | 3.180 |
| 27 | 0.362 | 3.235 | 0.421 | 3.844 | 0.366 | 3.267 |
| 28 | 0.371 | 3.319 | 0.431 | 3.941 | 0.375 | 3.351 |
| 29 | 0.380 | 3.400 | 0.441 | 4.035 | 0.383 | 3.433 |
| 30 | 0.389 | 3.478 | 0.451 | 4.126 | 0.393 | 3.512 |

**Table 11-164: Union Carbon Avoided Costs**

| Year | Res/Com/Ind | |
|---|---|---|
| | Baseload/Weather Sensitive | |
| | Rate | NPV |
| 1 | 0.059 | 0.059 |
| 2 | 0.078 | 0.133 |
| 3 | 0.098 | 0.220 |
| 4 | 0.099 | 0.305 |
| 5 | 0.101 | 0.386 |
| 6 | 0.103 | 0.464 |
| 7 | 0.104 | 0.539 |
| 8 | 0.106 | 0.611 |
| 9 | 0.108 | 0.680 |
| 10 | 0.109 | 0.747 |
| 11 | 0.111 | 0.811 |
| 12 | 0.113 | 0.872 |
| 13 | 0.115 | 0.932 |
| 14 | 0.117 | 0.988 |
| 15 | 0.119 | 1.043 |
| 16 | 0.120 | 1.096 |
| 17 | 0.122 | 1.147 |
| 18 | 0.124 | 1.195 |
| 19 | 0.126 | 1.242 |
| 20 | 0.128 | 1.287 |
| 21 | 0.131 | 1.330 |
| 22 | 0.133 | 1.372 |
| 23 | 0.135 | 1.412 |
| 24 | 0.137 | 1.450 |
| 25 | 0.139 | 1.487 |
| 26 | 0.141 | 1.523 |
| 27 | 0.144 | 1.557 |
| 28 | 0.146 | 1.590 |
| 29 | 0.148 | 1.622 |
| 30 | 0.151 | 1.652 |

**Table 11-165: Union Water Avoided Costs**

| Year | Res/Com/Ind | |
|---|---|---|
| | Water ($/1000 litres) | |
| | Rate | NPV |
| 1 | 0.858 | 0.858 |
| 2 | 0.872 | 1.683 |
| 3 | 0.886 | 2.476 |
| 4 | 0.900 | 3.239 |
| 5 | 0.915 | 3.972 |
| 6 | 0.929 | 4.677 |
| 7 | 0.944 | 5.355 |
| 8 | 0.959 | 6.007 |
| 9 | 0.975 | 6.634 |
| 10 | 0.991 | 7.237 |
| 11 | 1.007 | 7.817 |
| 12 | 1.023 | 8.374 |
| 13 | 1.039 | 8.910 |
| 14 | 1.056 | 9.425 |
| 15 | 1.073 | 9.920 |
| 16 | 1.090 | 10.397 |
| 17 | 1.108 | 10.855 |
| 18 | 1.126 | 11.295 |
| 19 | 1.144 | 11.719 |
| 20 | 1.162 | 12.126 |
| 21 | 1.181 | 12.518 |
| 22 | 1.200 | 12.894 |
| 23 | 1.219 | 13.256 |
| 24 | 1.239 | 13.604 |
| 25 | 1.259 | 13.939 |
| 26 | 1.279 | 14.261 |
| 27 | 1.300 | 14.570 |
| 28 | 1.320 | 14.868 |
| 29 | 1.342 | 15.154 |
| 30 | 1.363 | 15.429 |

**Table 11-166: Union Electricity Avoided Costs**

| Year | Res/Com/Ind | |
|---|---|---|
| | Electricity ($/KWh) | |
| | Rate | NPV |
| 1 | 0.144 | 0.144 |
| 2 | 0.146 | 0.282 |
| 3 | 0.148 | 0.415 |
| 4 | 0.151 | 0.542 |
| 5 | 0.153 | 0.665 |
| 6 | 0.156 | 0.783 |
| 7 | 0.158 | 0.897 |
| 8 | 0.161 | 1.006 |
| 9 | 0.163 | 1.111 |
| 10 | 0.166 | 1.212 |
| 11 | 0.168 | 1.309 |
| 12 | 0.171 | 1.402 |
| 13 | 0.174 | 1.492 |
| 14 | 0.177 | 1.578 |
| 15 | 0.180 | 1.661 |
| 16 | 0.183 | 1.741 |
| 17 | 0.185 | 1.817 |
| 18 | 0.188 | 1.891 |
| 19 | 0.191 | 1.962 |
| 20 | 0.195 | 2.030 |
| 21 | 0.198 | 2.096 |
| 22 | 0.201 | 2.159 |
| 23 | 0.204 | 2.219 |
| 24 | 0.207 | 2.277 |
| 25 | 0.211 | 2.333 |
| 26 | 0.214 | 2.387 |
| 27 | 0.218 | 2.439 |
| 28 | 0.221 | 2.489 |
| 29 | 0.225 | 2.537 |
| 30 | 0.228 | 2.583 |

## 11.15.4 Results Tables[123]

### Enbridge Results

**Table 11-167: Enbridge overall PAC results*†**

| Program | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio |
|---|---|---|---|---|
| Resource Acquisition | 132,084,000 | 45,154,000 | 86,930,000 | 2.93 |
| Low Income | 18,440,000 | 10,866,000 | 7,573,000 | 1.70 |
| **Total** | **150,524,000** | **56,021,000** | **94,503,000** | **2.69** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.

**Table 11-168: Enbridge Residential PAC results*†**

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A Costs | PAC Ratio w/o O&A Costs |
|---|---|---|---|---|---|---|---|---|---|
| Residential Adaptive Thermostat | 3,128,000 | 1,681,000 | 770,000 | 86,000 | 10,043,000 | 2,450,000 | 7,593,000 | 4.10 | 4.75 |
| Home Energy Conservation | 6,957,000 | 25,547,000 | 2,315,000 | 318,000 | 33,136,000 | 27,861,000 | 5,275,000 | 1.19 | 1.24 |
| **Verified Final Results** | **10,084,000** | **27,227,000** | **3,084,000** | **404,000** | **43,179,000** | **30,312,000** | **12,867,000** | **1.42** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.

[123] The cost-effectiveness results are based on 2019 carbon tax rates. Proposed increases in federal carbon taxes would increase the cost effectiveness.

**Table 11-169: Enbridge Commercial & Industrial PAC results*†**

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A Costs | PAC Ratio w/o O&A Costs |
|---|---|---|---|---|---|---|---|---|---|
| Run-it-Right‡ | 152,000 | 291,000 | 214,000 | 1,000 | 171,000 | 505,000 | -334,000 | 0.34 | 0.34 |
| C&I Prescriptive | 1,560,000 | 1,121,000 | 545,000 | 39,000 | 4,353,000 | 1,666,000 | 2,687,000 | 2.61 | 2.87 |
| C&I Direct Install | 1,707,000 | 1,815,000 | 344,000 | 40,000 | 4,616,000 | 2,159,000 | 2,456,000 | 2.14 | 2.30 |
| C&I Custom | 21,700,000 | 6,694,000 | 3,566,000 | 754,000 | 79,752,000 | 10,260,000 | 69,492,000 | 7.77 | 10.89 |
| Comprehensive Energy Management | 4,000 | 5,000 | 247,000 | 0 | 14,000 | 252,000 | -238,000 | 0.05 | 0.05 |
| **Verified Final Results** | **25,122,000** | **9,926,000** | **4,917,000** | **834,000** | **88,905,000** | **14,843,000** | **74,063,000** | **5.99** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.
‡Run-it-Right costs include costs attributable to both the Resource Acquisition and Market Transformation scorecards.

**Table 11-170: Enbridge Low Income PAC results*†**

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A Costs | PAC Ratio w/o O&A Costs |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Residential | 3,240,000 | 2,923,000 | 1,140,000 | 124,000 | 13,157,000 | 4,063,000 | 9,093,000 | 3.24 | 4.46 |
| Home Winterproofing | 1,305,000 | 3,841,000 | 2,963,000 | 49,000 | 5,283,000 | 6,803,000 | -1,520,000 | 0.78 | 0.83 |
| **Verified Final Results** | **4,544,000** | **6,764,000** | **4,102,000** | **172,000** | **18,440,000** | **10,866,000** | **7,573,000** | **1.70** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.

**Table 11-171: Enbridge overall TRC-Plus results*†**

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | Program Costs ($) | Overhead ($) ‡ | TRC Plus Costs ($) | TRC Plus Value ($) | TRC Plus Ratio w/ O&A costs |
|---|---|---|---|---|---|---|---|---|
| Resource Acquisition | 35,206,000 | 59,205,000 | 164,828,000 | 3,184,000 | 4,818,000 | 67,207,000 | 97,622,000 | 2.45 |
| Low Income | 4,544,000 | 9,201,000 | 22,511,000 | 2,547,000 | 1,555,000 | 13,304,000 | 9,207,000 | 1.69 |
| **Total** | **39,751,000** | **68,406,000** | **187,339,000** | **5,731,000** | **6,373,000** | **80,510,000** | **106,829,000** | **2.33** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.
‡Portfolio overhead costs for research, evaluation, and administration are not being applied at the program level. Consistent with what was done in 2015, the EC calculated costs as the sum of all OEB-defined program costs, including program admin and overhead costs and spread these costs across all programs based on their weighted savings contribution. Costs do not include market transformation or portfolio overhead costs, with the exception of Run-it-Right, which includes Market Transformation costs.

**Table 11-172: Enbridge Residential TRC-Plus results*†**

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Residential Adaptive Thermostat | 3,128,000 | 6,207,000 | 16,827,000 | 6,207,000 | 10,620,000 | 2.71 | 770,000 | 2.41 | 2.53 |
| Home Energy Conservation | 6,957,000 | 28,667,000 | 46,000,000 | 28,667,000 | 17,333,000 | 1.60 | 2,315,000 | 1.48 | 1.55 |
| **Verified Final Results** | **10,084,000** | **34,875,000** | **62,828,000** | **34,875,000** | **27,953,000** | **1.80** | **3,084,000** | **1.66** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.

**Table 11-173: Enbridge Commercial/Industrial TRC-Plus results*†**

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Run-it-Right‡ | 152,000 | 93,000 | 188,000 | 93,000 | 95,000 | 2.03 | 214,000 | 0.61 | 0.62 |
| C&I Prescriptive | 1,560,000 | 3,025,000 | 5,800,000 | 3,025,000 | 2,775,000 | 1.92 | 545,000 | 1.62 | 1.70 |
| C&I Direct Install | 1,707,000 | 2,089,000 | 5,728,000 | 2,089,000 | 3,639,000 | 2.74 | 344,000 | 2.35 | 2.51 |
| C&I Custom | 21,700,000 | 19,123,000 | 90,270,000 | 19,123,000 | 71,147,000 | 4.72 | 3,566,000 | 3.98 | 4.57 |
| Comprehensive Energy Management | 4,000 | 1,000 | 15,000 | 1,000 | 14,000 | 10.50 | 247,000 | 0.06 | 0.06 |
| **Verified Final Results** | **25,122,000** | **24,331,000** | **102,001,000** | **24,331,000** | **77,670,000** | **4.19** | **4,917,000** | **3.49** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.
‡Run-it-Right costs include costs attributable to both the Resource Acquisition and Market Transformation scorecards.

**Table 11-174: Enbridge Low Income TRC-Plus results*†**

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Multi-Residential | 3,240,000 | 6,074,000 | 15,612,000 | 6,074,000 | 9,538,000 | 2.57 | 1,140,000 | 2.16 | 2.56 |
| Home Winterproofing | 1,305,000 | 3,127,000 | 6,899,000 | 3,127,000 | 3,772,000 | 2.21 | 2,963,000 | 1.13 | 1.22 |
| **Verified Final Results** | **4,544,000** | **9,201,000** | **22,511,000** | **9,201,000** | **13,310,000** | **2.45** | **4,102,000** | **1.69** | **-** |

*Not all values may compute exactly due to rounding.
†All dollar values are rounded to the nearest thousand.

## Union Results

**Table 11-175: Union Resource Acquisition PAC results***

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A costs | PAC Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Home Reno Rebate | 5,008,000 | 14,532,000 | 2,655,000 | 892,000 | 25,678,000 | 17,187,000 | 8,491,000 | 1.49 | 1.64 |
| Residential Thermostats | 1,250,000 | 642,000 | 481,000 | 58,000 | 4,296,000 | 1,124,000 | 3,172,000 | 3.82 | 4.81 |
| C&I Prescriptive | 1,569,000 | 1,119,000 | 638,000 | 91,000 | 5,226,000 | 1,757,000 | 3,469,000 | 2.97 | 3.28 |
| C&I Direct Install | 306,000 | 475,000 | 94,000 | 30,000 | 1,024,000 | 569,000 | 455,000 | 1.80 | 1.91 |
| Commercial & Institutional Custom | 32,028,000 | 8,800,000 | 3,753,000 | 651,000 | 99,930,000 | 12,553,000 | 87,377,000 | 7.96 | 11.05 |
| **Verified Final Results** | **40,161,000** | **25,569,000** | **7,621,000** | **1,722,000** | **136,154,000** | **33,189,000** | **102,965,000** | **4.10** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-176: Union Low Income PAC results***

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A costs | PAC Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Furnace End-of-Life | 0 | 0 | 0 | 0 | 0 | 0 | 0 | — | — |
| Indigenous | 0 | 0 | 67,000 | 3,000 | 0 | 67,000 | -67,000 | 0 | 0 |
| Home Weatherization | 1,771,000 | 4,307,000 | 3,431,000 | 401,000 | 8,079,000 | 7,738,000 | 341,000 | 1.04 | 1.13 |
| Multi Family | 1,188,000 | 2,113,000 | 728,000 | 147,000 | 4,356,000 | 2,841,000 | 1,515,000 | 1.53 | 1.72 |
| **Verified Final Results** | **2,959,000** | **6,420,000** | **4,225,000** | **552,000** | **12,435,000** | **10,645,000** | **1,789,000** | **1.17** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-177: Union Large Volume PAC results***

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A costs | PAC Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Large Volume | 12,214,000 | 2,887,000 | 451,000 | 173,000 | 25,208,000 | 3,338,000 | 21,869,000 | 7.55 | 8.63 |
| **Verified Final Results** | **12,214,000** | **2,887,000** | **451,000** | **173,000** | **25,208,000** | **3,338,000** | **21,869,000** | **7.55** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-178: Union Performance Based PAC results***

| Program | Annual net savings (m3) | Program-level Incentives ($) | Program-level general admin costs ($) | Portfolio Budget ($) | PAC Benefits ($) | PAC Costs ($) | PAC Value ($) | PAC Ratio w/ O&A costs | PAC Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| RunSmart | -52,000 | 26,000 | 27,000 | 3,000 | -63,000 | 53,000 | -116,000 | -1.17 | -1.07 |
| Strategic Energy Management | 1,206,000 | 10,000 | 320,000 | 17,000 | 1,263,000 | 330,000 | 933,000 | 3.83 | 5.43 |
| **Verified Final Results** | **1,154,000** | **36,000** | **347,000** | **20,000** | **1,200,000** | **383,000** | **817,000** | **3.13** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-179: Union Resource Acquisition TRC-Plus results***

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Home Reno Rebate | 5,008,000 | 24,239,000 | 33,355,000 | 24,239,000 | 9,116,000 | 1.38 | 2,655,000 | 1.24 | 1.32 |
| Residential Thermostats | 1,250,000 | 2,473,000 | 7,016,000 | 2,473,000 | 4,543,000 | 2.84 | 481,000 | 2.37 | 2.57 |
| C&I Prescriptive | 1,569,000 | 2,898,000 | 6,697,000 | 2,898,000 | 3,799,000 | 2.31 | 638,000 | 1.89 | 1.99 |
| C&I Direct Install | 306,000 | 413,000 | 1,250,000 | 413,000 | 837,000 | 3.03 | 94,000 | 2.47 | 2.63 |
| Commercial & Institutional Custom | 32,028,000 | 51,412,000 | 111,893,000 | 51,412,000 | 60,481,000 | 2.18 | 3,753,000 | 2.03 | 2.17 |
| **Verified Final Results** | **40,161,000** | **81,435,000** | **160,211,000** | **81,435,000** | **78,775,000** | **1.97** | **7,621,000** | **1.80** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-180: Union Low Income TRC-Plus results***

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Furnace End-of-Life | 0 | 0 | 0 | 0 | 0 | — | 0 | — | — |
| Indigenous | 0 | 0 | 0 | 0 | 0 | — | 67,000 | 0.00 | 0.00 |
| Home Weatherization | 1,771,000 | 4,237,000 | 10,454,000 | 4,237,000 | 6,218,000 | 2.47 | 3,431,000 | 1.36 | 1.47 |
| Multi Family | 1,188,000 | 4,173,000 | 4,523,000 | 4,173,000 | 350,000 | 1.08 | 728,000 | 0.92 | 0.98 |
| **Verified Final Results** | **2,959,000** | **8,410,000** | **14,978,000** | **8,410,000** | **6,568,000** | 1.78 | **4,225,000** | **1.19** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-181: Union Large Volume TRC-Plus results***

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&A costs | TRC Plus Ratio w/o O&A costs |
|---|---|---|---|---|---|---|---|---|---|
| Large Volume | 12,214,000 | 4,601,000 | 28,425,000 | 4,601,000 | 23,824,000 | 6.18 | 451,000 | 5.63 | 6.13 |
| **Verified Final Results** | **12,214,000** | **4,601,000** | **28,425,000** | **4,601,000** | **23,824,000** | **6.18** | **451,000** | **5.63** | **-** |

*Not all values may compute exactly due to rounding.

**Table 11-182: Union Performance Based TRC-Plus results***

| Program | Annual net savings (m3) | Measure Incremental Costs ($) | TRC Plus Benefits ($) | TRC Plus Costs (equipment) ($) | TRC Plus Value (equipment) ($) | TRC Plus Ratio (equipment) | Program Admin Costs ($) | TRC Plus Ratio w/ O&M costs | TRC Plus Ratio w/o O&M costs |
|---|---|---|---|---|---|---|---|---|---|
| Run Smart | -52,000 | 0 | -69,000 | 0 | -69,000 | — | 27,000 | -2.53 | -2.13 |
| Strategic Energy Management | 1,206,000 | 0 | 1,383,000 | 0 | 1,383,000 | — | 320,000 | 4.32 | 6.21 |
| **Verified Final Results** | **1,154,000** | **0** | **1,314,000** | **0** | **1,314,000** | **—** | **347,000** | **3.79** | **-** |

*Not all values may compute exactly due to rounding.

## About DNV

DNV is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.