



Anton Kacicnik
Manager
Regulatory Applications

tel 416-495-6087
anton.kacicnik@enbridge.com
EGIRegulatoryProceedings@enbridge.com

Enbridge Gas Inc.
500 Consumers Road
North York, Ontario M2J 1P8
Canada

March 5, 2024

VIA RESS AND EMAIL

Nancy Marconi
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Nancy Marconi:

**Re: Enbridge Gas Inc. (Enbridge Gas or the Company)
Ontario Energy Board (OEB) File No.: EB-2023-0062
2021 Demand Side Management (DSM) Deferral and Variance Account
Disposition Application - Updated 2021 Cumulative Natural Gas Volume Savings
and Shareholder Incentive Amount
Enbridge Gas Submission**

This letter is in response to the OEB's Procedural Order No.2, dated October 18, 2023, requesting that Enbridge Gas file with the OEB and serve on all intervenors the updated 2021 cumulative natural gas volume savings and shareholder incentive amount, upon receipt from the Evaluation Contractor (EC).

The EC provided a Memo to the Evaluation Advisory Committee on February 9, 2024, titled eTools Realization Rate Adjustments to 2021 and 2022 AV Results, which is attached to this letter.

If you have any questions, please contact the undersigned.

Sincerely,

Anton Kacicnik
Manager, Regulatory Applications

cc.: D. O'Leary (Aird & Berlis)
EB-2023-0062 (Intervenors)

Memo to:
Evaluation Advisory Committee

From: Tamara Kuiken, DNV
Date: February 9, 2024
Prep. By: Sam Harms, Ben Jones, Edilson Abreu,
Aaron Schrader, DNV

eTools Realization Rate Adjustments to 2021 and 2022 AV Results

1 EXECUTIVE SUMMARY

A January 2023, Enbridge Gas Inc. study on eTools energy modelling software found that estimated gas savings from the installation of energy-efficient boiler equipment do not align with more empirical results.¹ As part of the OEB's Procedural Order No. 2 in EB-2023-0062, the OEB determined updated calculations for 2021 cumulative natural gas savings volumes, Demand Side Management Shareholder Incentive (DSMSI) amounts, and Lost Revenue Adjustment Mechanism (LRAM) amounts are needed. OEB staff, with advice from the EAC, provided direction to also update 2022 program results as part of the 2022 Annual Verification work, consistent with the OEB's direction to do so for 2021 program results.

The EC calculated 2021 and 2022 program year aggregate realization rates to apply to affected projects. Updated savings, DSMSI, and Lost Revenue amounts are reported in this memo for 2021 and will be reported for 2022 through the standard Annual Verification process.

The result of analysis in this memo is that:

- For 2021, a realization rate of 72.37% should be applied to eTools boiler savings.
- For 2022, a realization rate of 68.63% should be applied to eTools boiler savings.

2 BACKGROUND

In January 2022, the Evaluation Contractor (EC) completed the first phase of an analysis of Enbridge Gas Inc.'s (EGI) eTools energy modelling software.² EGI uses eTools to estimate gas savings from the installation of energy-efficient boiler equipment offered through multiple programs. The study found that savings from the past and present eTools versions do not align with more empirical results from billing analysis, achieving approximately 55% of the reported energy savings.

In January 2023, the EC completed the second phase of the analysis and made a number of recommendations.³ Those relevant to this memo are shown below. The bolded formatting has been added to highlight the portions that are relevant to this memo.

1. Continue using eTools for implementation and evaluation. eTools is a sophisticated engineering-based estimation calculator that exceeds industry standard practice and generates local knowledge of implementation practices. There are no other boiler savings estimation models that are known to be more accurate, nor any known to be in development. Changing tools for evaluation will introduce additional uncertainty as to the causes of differences in verified vs. claimed savings. The continued use of this modelling software is akin to other simulation software which contain known performance gaps across all kinds in jurisdictions around the world. Despite these performance gaps, no jurisdiction has discarded their performance simulation software. EnergyPlus, 3 Plus, Integrated Engineering Software, etc. are all used to provide forecasted savings in building despite rarely being

¹ eTools Boiler Tool Validation Study, DNV for the Ontario Energy Board, January 31, 2023

² eTools Boiler Tool Validation: Phase One, DNV for the Ontario Energy Board, January 2, 2022

³ eTools Boiler Tool Validation Study, DNV for the Ontario Energy Board, January 31, 2023

accurate for an individual building. DNV recommends the following changes to eTools to address the study's findings and provide a more accurate estimate of savings:

- a. **eTools advancement projects should not utilize the current 73% thermal efficiency default value, rather site-specific values (supported by documentation) should be utilized. If documented site-specific values are not available, the efficiency values identified in this study, 80.1% for space heating and 81.8% for domestic hot-water heating, should be utilized by implementers and evaluators.**
 - b. Site-specific documentation verifying any anticipated controls or setpoint changes should be gathered by Enbridge after boiler system commissioning. If documentation verifying controls changes are unavailable, then the installed systems should be assumed to utilize the same controls and setpoints as the existing systems.
 - c. Version e8-00 of eTools was the latest version reviewed during this study and should be utilized by the evaluation team to assess any projects using eTools e8-00 or earlier.
 - d. Projects using a version of eTools more modern than e8-00 should use the modern version of eTools in evaluation. **A “between version” calibration factor that takes the savings from version e8-00 relative to the new version should be employed to ensure that the changes from one version to another are accounted for without restricting the evaluation to using only version e8-00 prior to re-calibrating the billing analysis.** This calibration can be calculated using the sample plus the backup sample of projects in the evaluation (those that the evaluation requests files for as part of the typical evaluation process).
3. **After implementation of list items 1.a. and 1.b., the recommended realization rate from this study (84%) can be applied to evaluate aggregate eTools boiler gross savings.** This recommended realization rate uses that described in 1a) above as well as incorporates the findings from EGI's study of non-participant natural gas consumption trends.
 4. **A correction factor for the double counting between evaluated gross savings and billing analysis should be utilized. As part of this study, it was found that based on past projects, the adjustment factor was 0.97.** An alternative to using this factor is to re-estimate the correction factor based on the sample of projects evaluated in CPSV to apply to that year's CPSV results. The determination of which to use will be made by the evaluation team with input from the EAC and OEB. The primary factor in the decision will be the sample size of boilers evaluated.

As part of the OEB's Procedural Order No. 2 in EB-2023-0062, the OEB determined updated calculations for 2021 cumulative natural gas savings volumes, Demand Side Management Shareholder Incentive (DSMSI) amounts, and Lost Revenue amounts are needed. OEB staff, with advice from the EAC, provided direction to also update 2022 program results as part of the 2022 Annual Verification work, consistent with the OEB's direction to do so for 2021 program results.

Recommendation 1 of the Phase 2 report requires an individual review of every sampled project and was intended to be implemented during future evaluations of eTools-supported projects within a Custom Project Savings Verification (CPSV), which can absorb the necessary cost. To satisfy the OEB Procedural Order for updated results for 2021, a stand-alone analysis must be completed. To satisfy OEB staff and EAC direction for including the eTools study in the 2022 results, an

Page 3 of 9

additional analysis must be added to the annual verification process. Both analyses would require additional funding to accomplish.

The EC reviewed the budget required to implement Recommendation 1 outside of a CPSV study. We also reviewed the sensitivity of the DSMSI and LRAM values to the magnitude of the change in energy savings likely to result from this exercise. Finally, we broadly estimated the anticipated adjustment in energy savings resulting from the eTools realization rate. We concluded that the precision realized through Recommendation 1 doesn't justify the cost of the stand-alone analysis. We subsequently identified a stand-alone analysis approach to estimate a reasonable realization rate at a fraction of the cost. The methodology was reviewed and approved by EGI and OEB Staff.

3 SOLUTION

The EC proposed an interim solution to adjust eTools aggregate results for the 2021 and 2022 program year results.

- A 2021 program year realization rate should be applied to the appropriate projects to determine updated energy savings values for affected programs. The updated savings are used to determine new DSMSI and LRAM and the 2022 program savings targets. The updated DSMSI and LRAM results are reported in this memo. The updated targets will be included in the 2022 Annual Verification report, which is in progress.
- A 2022 program year realization rate should be applied to the appropriate projects to determine updated energy savings values for affected programs. The updated savings are reported through the standard process in the 2022 program year Annual Verification report, which is in progress.

4 METHODOLOGY

To determine the correct eTools study realization rates for 2021 and 2022 year projects, the EC reviewed a sample of eTools files to determine the baseline efficiency values used by EGI. The EC limited the analysis to confirming whether Recommendation 1a was implemented. If a baseline efficiency of the previously-standard 73% was used, the project was considered non-compliant with Recommendation 1a, or $\emptyset R1a$. If any other baseline efficiency was used, the project was considered to be compliant with Recommendation 1a, or $R1a$. Compliant baselines could be site-specific or 80.1% for space heating and 81.8% for domestic hot-water heating. This designation provided a clear, objective metric to assess the status of the project.

To estimate the 2021 and 2022 eTools realization rates, the EC determined where the realization rate fell between the two cases established by the eTools study, the Phase 1 results and the fully $R1a$ compliant results.

- From Phase 1, the mix of $R1a$ and $\emptyset R1a$ projects produced a 58% realization rate.⁴
- A fully $R1a$ -compliant program year would receive an 84% realization rate.

The equations for calculating the 2021 program year realization rate are:

$$\%imp = \frac{\emptyset R1a_{eTools} - \emptyset R1a_{2021}}{\emptyset R1a_{eTools}}$$

$$RR_{2021} = RR_{eTools}(1 - \%imp) + RR_{FC}\%imp$$

Where:

RR_{eTools} = is the realization rate from Phase 1 of the eTools study, 58%

RR_{FC} = is the realization rate for a program year fully compliant with Recommendation 1a, 84%

⁴ The eTools study found a 54% realization rate between billing analysis results and EGI reported savings. After incorporating the natural increase in gas usage by customers, the realization rate is 58%. The natural increase in gas usage was determined by Demand Side Analytics in a study for EGI.

Page 4 of 9

RR_{2021} = is the realization rate for 2021

$\emptyset R1a_{eTools}$ = is the portion of projects that are not Recommendation 1a-compliant from Phase 1 of the eTools study

$\emptyset R1a_{FC}$ = is the portion of projects that are not Recommendation 1a-compliant in a fully compliant program year, or 0%

$\emptyset R1a_{2021}$ = is the portion of projects that are not Recommendation 1a-compliant for the 2021 program year

%imp = is the percentage improvement in non-compliant projects, as defined in the equation for %imp above

The same equations can be used for 2022 by replacing the 2021 values with the appropriate 2022 equivalent.

To create eTools realization rates for 2021 and 2022, the EC undertook the following:

- Design a simple random sample of 2021 and 2022 eTools custom boiler projects,⁵ with an objective to detect a 10% improvement to a precision of +/- 7%.
 - The “percent improvement” is a representation of the percentage change in projects that do not use the recommended baseline (Recommendation 1a) in a given year versus a previous year. For example, for projects in 2021, 25% of sampled projects used the (non-compliant) 73% default efficiency, while Phase 1 eTools sample had 68% of projects with the same. The change in the percentage of projects that used the non-compliant baseline efficiency year-over-year, from 68% in 2020 to 25% in 2021, is an overall improvement of 63%: $(68\% - 25\%) / 68\% = 63\%$.
 - A 10% improvement was chosen as the minimum meaningful improvement to justify an adjustment to the DSMSI and LRAM values.
 - The +/-7% precision is roughly 10% of the 68% of projects with a 73% baseline efficiency assumption in 2020.
 - Using simple sample size formulas for binary pass/fail results, these stipulations required a minimum of 80 units of analysis.⁶
- Request and receive project files from Enbridge.
- Examine the files provided, including the following tasks:
 - Record the baseline efficiency used for each file. The baseline efficiency fell into one of three categories:
 - Standard efficiency that does *not* incorporate Recommendation 1a: These projects used a standard baseline efficiency of 73% and are represented by $\emptyset R1a$ in the equations above
 - Site-specific efficiencies: anything that was not 73%, 80.1% for space heating, or 81.8% for domestic hot-water heating. These projects are included in the $R1a$ group in the equations above.
 - Standard efficiency that *does* incorporate Recommendation 1a: These projects used a standard baseline efficiency of 80.1% for space heating and 81.8% for domestic hot-water heating. These projects are included in the $R1a$ group in the equations above.
 - Calculate the necessary metrics and statistics.
- Conduct quality control checks on the file examination and data tracking.
- Determine the 2021 and 2022 realization rates. For each year, we completed the following:
 - Determine the percentage of compliant and non-compliant projects in each program year.
 - Calculate the realization rates based the percent improvement for that program year (see equations above).

⁵ We are continuing to use “projects” as the unit of analysis described in this memo for readability. Technically the unit of analysis was measure type within a project – space heat boiler(s) or water heat boiler(s) – so one projectID may have either one or two rows in the analysis. As a result, the 80 2021 projects resulted in 91 units of analysis and the 80 2022 projects resulted in 90 units of analysis.

⁶ There were 549 eTools boiler projects in the 2021 Enbridge program participant population and 445 in the 2022 program. In each year, eTools boilers in both legacy Union and legacy Enbridge programs were included in the population and sample.

- Multiply by the CPSV overlap factor (0.97) in Recommendation 4.

5 RESULTS

Table 1 shows the R1a compliant and R1a non-compliant projects for each of the four conditions used for this analysis.

Table 1. R1a compliant and non-compliant projects by study or program year*

Baseline Category	Percent of Projects		
	eTools Phase 1	2021	2022
73% Baseline (not Recommendation 1a compliant), øR1a	68%	25%	36%
Site-specific or 80.1% or 81.8% Baseline (Recommendation 1a compliant), R1a	32%	75%	64%
Total	100%	100%	100%

*Not all values may compute exactly due to rounding.

Table 2 shows the percentage improvement over the eTools Phase 1 project for program years 2021 and 2022.

Table 2. Percent change in non-compliant projects by program year

Program Year	%imp
2021	63%
2022	48%

Using the equations shown in the Methodology section, the realization rates for each program year are below. These results are statistically significant.

- For 2021, a realization rate of 72.37% should be applied to eTools boiler savings.
- For 2022 a realization rate of 68.63% should be applied to eTools boiler savings.

A workbook with the formulas and values used in calculating the results is included with this memo. As part of QC, DNV confirmed agreement on all projects with and without the 73% default assumption through a parallel analysis conducted by EGI and found we were in agreement on all projects.

6 UPDATED 2021 ANNUAL VERIFICATION RESULTS

The subsections below contain tables from the 2021 Annual Verification report, updated to reflect changes to energy savings, DSMSI, and Lost Revenue that were impacted by the eTools realization rate for 2021.

6.1 Energy Savings

6.1.1 Enbridge

Updated, verified program achievements for affected scorecards are provided in the tables below.

Table 3. Enbridge updated 2021 Resource Acquisition verified achievements*

Programs	Metrics	Verified Achievement	
		Program-level Achievements	Metric-level Achievements
Home Energy Conservation	Large Volume Customer – CCM	-	398,563,988
Residential Adaptive Thermostats		-	
C&I Custom**		367,423,463	
C&I Direct Install		6,734,536	
C&I Prescriptive		20,068,154	
Comprehensive Energy Management		3,090,423	
Energy Leaders		908,004	
Run it Right		339,409	
Home Energy Conservation	Small Volume Customer – CCM	203,375,694	313,990,665
Residential Adaptive Thermostats		53,483,128	
C&I Custom**		13,792,359	
C&I Direct Install		25,245,015	
C&I Prescriptive		18,209,452	
Comprehensive Energy Management		-	
Energy Leaders		-	
Run it Right		-114,983	
Home Energy Conservation	Participants	15,321	15,321

*Not all values may compute exactly due to rounding.

**Verified achievements for the C&I Custom program in the 2021 Annual Verification report were 398,994,369 CCM for Large Volume and 17,002,246 CCM for Small Volume.

Table 4. Enbridge updated 2021 Low Income verified achievements*

Programs	Metrics	Verified Achievement	
		Program-level Achievements	Metric-level Achievements
Home Winterproofing	CCM	26,443,935	26,443,935
Low Income Multi-Residential**	CCM	78,419,182	78,419,182
Low Income New Construction	Applications	13	13

*Not all values may compute exactly due to rounding.

**Verified achievement for the Low Income Multi-Residential program in the 2021 Annual Verification report was 88,304,418 CCM.

6.1.2 Union

Updated, verified program achievements for affected scorecards are provided in the tables below.

Table 5. Union updated 2021 Resource Acquisition verified achievements*

Programs	Metrics	Verified Achievement	
		Program-level Achievements	Metric-level Achievements
Home Reno Rebate	CCM	92,340,855	629,199,003
Residential Adaptive Thermostats		23,183,355	
C&I Custom**		465,091,559	
C&I Direct Install		18,403,367	
C&I Prescriptive		30,179,867	
Home Reno Rebate	Participants	5,032	5,032

*Not all values may compute exactly due to rounding.

**Verified achievement for the C&I Custom program in the 2021 Annual Verification report was 470,976,925 CCM.

Table 6. Union updated 2021 Low Income verified achievements*

Programs	Metrics	Verified Achievement	
		Program-level Achievements	Metric-level Achievements
Home Weatherization	CCM	45,903,844	45,903,844
Furnace End-of-Life		-	
Indigenous		-	
Multi-Family Social & Assisted	CCM**	8,833,724	8,833,724
Multi-Family Market Rate	CCM**	6,977,358	6,977,358

*Not all values may compute exactly due to rounding.

**Verified achievements in the 2021 Annual Verification report were 9,535,480 CCM for Multi-Family Social & Assisted and 8,307,799 CCM for Multi-Family Market Rate.

6.2 Shareholder Incentive

6.2.1 Enbridge

Updated DSM shareholder incentive amounts are provided in the tables below.

Table 7. Enbridge's updated 2021 Resource Acquisition targets, achievements, weights, and incentive*

Metric	Target	Verified Achievement	Weight	Metric Score	Weighted Metric Score
LV RA (CCM)	508,307,882	398,563,988	40.00%	78.41%	31.36%
SV RA (CCM)	239,149,677	313,990,665	40.00%	131.29%	52.52%
HEC Participants	10,054	15,321	20.00%	152.39%	30.48%
Verified Total Weighted Scorecard Achieved					114.36%
Maximum Scorecard Incentive					\$7,012,787
Verified Scorecard Incentive Achieved†					\$4,013,496

*Not all values may compute exactly due to rounding.

†Verified Scorecard Incentive Achieved in the 2021 Annual Verification report was \$4,267,746.

Table 8. Enbridge's updated 2021 Low Income scorecard targets, achievements, weights, and incentive*

Metric	Target	Verified Achievement	Weight	Metric Score	Weighted Metric Score
Home Winterproofing CCM	28,769,589	26,443,935	45.00%	91.92%	41.36%
Low Income Multi Residential CCM	92,855,103	78,419,182	45.00%	84.45%	38.00%
Low Income New Construction Applications	13	13	10.00%	100.00%	10.00%
Verified Total Weighted Scorecard Achieved					89.37%
Maximum Scorecard Incentive					\$2,263,561
Verified Scorecard Incentive Achieved†					\$520,304

*Not all values may compute exactly due to rounding.

†Verified Scorecard Incentive Achieved in the 2021 Annual Verification report was \$693,807.

6.2.2 Union

Updated DSM shareholder incentive amounts are provided in the tables below.

Table 9. Union's updated 2021 Resource Acquisition targets, achievements, weights, and incentive*

Metric	Target	Verified Achievement	Weight	Metric Score	Weighted Metric Score
CCM	768,727,712	629,199,003	75.00%	81.85%	61.39%
HRR Participants	6,070	5,032	25.00%	82.89%	20.72%
Verified Total Weighted Scorecard Achieved					82.11%
Maximum Scorecard Incentive					\$6,562,712
Verified Scorecard Incentive Achieved†					\$746,628

*Not all values may compute exactly due to rounding.

†Verified Scorecard Incentive Achieved in the 2021 Annual Verification report was \$806,921.

Table 10. Union's updated 2021 Low Income targets, achievements, weights, and incentive*

Metric	Target	Verified Achievement	Weight	Metric Score	Weighted Metric Score
Single Family CCM	52,751,464	45,903,844	60.00%	87.02%	52.21%
Multi-Family - Social & Assisted CCM	17,447,511	8,833,724	35.00%	50.63%	17.72%
Multi-Family - Market Rate CCM	11,950,032	6,977,358	5.00%	58.39%	2.92%
Verified Total Weighted Scorecard Achieved					72.85%
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.

†Verified Scorecard Incentive Achieved in the 2021 Annual Verification report was \$0.



6.3 Lost Revenue

6.3.1 Enbridge

Updated estimates for lost revenue by rate class are provided in the table below.

Table 11. Enbridge updated lost revenue results*

Rate Class	Verified Lost Revenue
Rate 110	\$19,297
Rate 115	\$2,495
Rate 135	\$30,787
Rate 145	\$3,786
Rate 170	\$605
TOTAL**	\$56,970

*Not all values may compute exactly due to rounding.

**Total verified Lost Revenue reported in the 2021 Annual Verification report was \$57,207.

6.3.2 Union

Updated estimates for lost revenue by rate class are provided in the table below.

Table 12. Union updated lost revenue results*

Rate Class	Verified Lost Revenue
M4 Industrial	\$89,261
M5 Industrial	\$4,200
M7 Industrial	\$31,007
T1 Industrial	\$109
T2 Industrial	\$1,042
20 Industrial	\$1,136
100 Industrial	\$5,948
TOTAL**	\$132,703

*Not all values may compute exactly due to rounding.

**Total verified Lost Revenue reported in the 2021 Annual Verification report was \$133,216.