Home Energy Reports Program Impact Evaluation Report

Energy Efficiency Plan: Program Year 2025

(01/01/2025-12/31/2025)

Prepared for:

Nicor Gas Company

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Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2025 Home Energy Report (HER) program. It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details. The appendices present the impact analysis methodology and the inputs for cost effectiveness analysis. Program year 2025 covers January 1 to December 31, 2025.

Program Description

The program was designed to generate energy savings by providing residential customers with information about energy use and conservation strategies. Program participants receive information from regularly mailed and emailed home energy reports, including:

- Assessment of how their recent energy use compares to their past energy use
- Tips on how to reduce energy consumption, some of which are tailored to the customer's circumstances
- Information on how their energy use compares to that of neighbors with similar homes

An important feature of the Nicor Gas HER program is that it is designed as a randomized controlled trial (RCT). To estimate changes in energy use due to the program, customers in each target group of residential customers were randomly assigned to either the recipient group or the control (non-recipient) group. Customers may opt *out* of the program at any time but cannot opt *in* due to the RCT design. An implication of the RCT design is that the savings estimates are intrinsically net of free-ridership and most spillover bias but not non-participant spillover.

The Nicor Gas HER program had one active wave in 2025[1]. Wave 4 was launched in February 2024. Table 1 shows active accounts at the beginning of the evaluation period, January 2025, for Wave 4.

The program had 74,065 total participants in 2025.

Table 1. 2025 Volumetric Findings Detail

Wave	Participant Count	Control Count
Wave 4 (202402)	74,065	23,501
Total	**74,065**	**23,501**

Source: Guidehouse analysis of Nicor Gas program tracking and customer billing data.

[1] Waves 1-3 were not active (i.e., did not receive HERs) in CY2025 and therefore do not contribute to CY2025 savings.

Program Savings Detail

Table 2 summarizes the energy savings the HER Program achieved in 2025. These savings reflect adjustments for uplift[2] and for removing savings persisting from 2024, per the Illinois Statewide Technical Reference Manual (IL-TRM).[3] As the RCT design inherently estimates savings that are net of participant spillover and free ridership, neither the evaluation team nor the implementer estimated gross savings, and there is no gross realization rate and no net-to-gross (NTG) ratio. Guidehouse added non-participant spillover (NPSO) to its initial savings estimate using the deemed factor of 1.048; to ensure an apples-to-apples comparison for the net realization rate, this same deemed factor was applied to the ex-ante savings. The realization rate is 88%.

Table 2. 2025 Annual Energy Savings Summary

Wave	Ex-Ante Net Savings (therms)*	Verified Unadjusted Savings (therms)	Total Uplift and Persistence Adjustment (therms)	Verified Adjusted Savings (therms)	NPSO (therms)‡	Final Verified Net Savings (therms)	Verified Realization Rate*
Wave 4 (202402)	349,654	427,255	133,242	294,013	14,113	308,126	88%
Total	**349,654**	**427,255**	**133,242**	**294,013**	**14,113**	**308,126**	**88%**

** Realization Rate (RR) is the ratio of final verified net savings to ex ante net savings, based on evaluation research findings.*
‡ The market rate net savings were multiplied by a residential non-participant spillover (NPSO) factor of 1.048.
Source: Evaluation team analysis.

Program Savings by Measure

The HER Program includes a single measure, behavioral savings, thus the program savings and measure savings are the same. Detailed savings are presented in Appendix A. Impact Analysis Methodology

Impact Analysis Findings and Recommendations

1.1 Findings and Recommendations

Finding 1. Overall, Guidehouse found an energy savings realization rate of 88% compared with the program implementer ex ante savings estimate.

Finding 2. Energy savings for Wave 4 (202402) increased from 0.17% in CY2024 to 0.31% in CY2025, indicating that savings are ramping up for this relatively new wave.

[2] See Appendix Accounting for Uplift in Other Energy Efficiency Programs.
[3] See IL-TRM, Measure 6.1.1, Volume 4, Version 13.0 and Appendix Accounting for Savings Persistence and Participant Retention.

Appendix A. Impact Analysis Methodology

Savings Methodology

This section details the methodology employed for developing custom savings estimates for 2025. These estimates were used for verifying savings for all waves.

Data Cleaning

The evaluation team removed customers and data points from the analysis in several steps:

- Excluded data from outside of the period of examination and relevant pre-period for each wave
- Removed exact duplicate observations
- Aggregated bills that ended in the same month
- Excluded observations with a bill length greater than 90 days
- Excluded outlier observations, defined as observations with average daily usage outside plus or minus one order of magnitude from the median
- For the lagged dependent variable (LDV) model, removed observations that did not have a usage value in the same month of the pre-period

Across all waves, these cleaning steps removed no entire customers and less than 2% of observations (after subsetting to the relevant analysis period), evenly distributed across participants and controls. This result suggests that the evaluation team's cleaning steps did not introduce non-random biases into the data.

Modeling Methodology

The evaluation team used LDV and linear fixed effects regression (LFER) models to estimate program savings.[4] Both approaches should, in principle, produce unbiased estimates of program savings under a wide range of conditions, but Guidehouse prefers the LDV results for two reasons. First, savings estimates produced by the LDV model tend to be more accurate and more precisely estimated than those from the LFER model[5] based on experience analyzing similar HER programs' impacts and findings from the academic literature.[6] Second, the implementer uses a similar model for its evaluation, which makes the two sets of results more comparable. Although the LDV and LFER models are structurally very different, these should generate similar program savings estimates, assuming the RCT is well balanced with respect to the drivers

[4] Across the two models, the parameter estimates were not statistically different for either wave; that is, the estimates for each model are within the 90% confidence bounds for the other model. This result supports the methodological approach, and indicates the results are robust.

[5] One likely reason for this situation is that the LDV model embodies more flexibility than the LFER model, in that the former allows the individual customer control variable to vary seasonally while the latter does not – a particularly attractive feature given the highly seasonal nature of natural gas usage. The LFER model treats all unobserved inter-household heterogeneity affecting households' energy usage as time-invariant, while the LDV model uses lagged individual controls that can vary over time.

[6] Allcott, Hunt and Todd Rogers, 2014. "The Short-Run and Long-Run Effects of Behavioral Intervention: Experimental Evidence from Energy Conservation." *American Economic Review*, 104(10): 3003-37.

of energy use. Guidehouse used the LDV results for reporting total program savings for 2025, while the LFER provided a robustness check.

Lagged Dependent Variable Model

The LDV model controls non-treatment differences in energy use between treatment and control customers using lagged energy use as an explanatory variable. The model frames energy use in calendar month *t* of the post-program period as a function of both the treatment variable and energy use in the same calendar month of the pre-program period. The underlying logic is that systematic differences between control and treatment customers will be reflected in differences in their past energy use, which is highly correlated with their current energy use. Formally, the model is shown in Equation 1.

Equation 1. Lagged Dependent Variable Regression Model

$$ADU_{kt} = \beta_1 Treatment_k + \sum_J \beta_2 Month_{jt} + \sum_J \beta_3 Month_{jt} \cdot ADUlag_{kt} + \varepsilon_{kt}$$

Where:

ADU_{kt}	is average daily consumption of therms by household *k* in bill period *t*
$Treatment_k$	is a binary variable taking a value of 0 if household k is assigned to the control group, and 1 if assigned to the treatment group
$Month_{jt}$	is a binary variable taking a value of 1 when j = t and 0 otherwise[7]
$ADUlag_{kt}$	is household *k*'s energy use in the same calendar month of the pre-program year as the calendar month of month *t*
ε_{kt}	is the cluster-robust error term for household *k* during billing cycle *t;* cluster-robust errors account for heteroskedasticity and autocorrelation at the household level

The coefficient β_1 is the estimate of average daily therms energy savings due to the program.

Linear Fixed Effects Regression Model

The LFER model used by the evaluation team is one in which the average daily consumption of therms by household *k* in bill period *t*, denoted by ADU_{kt} is a function of the following three terms:

1. The binary variable $Treatment_{k.}$
2. The binary variable $Post_t$, taking a value of 0 if month *t* is in the pre-treatment period, and 1 if in the post-treatment period
3. The interaction between these variables, $Treatment_k \cdot Post_t$

[7] In other words, if there are *T* post-program months, there are *T* monthly binary variables in the model, with the binary variable $Month_{tt}$ the only one to take a value of 1 at time t. These are, in other words, monthly fixed effects.

Formally, the LFER model is shown in Equation 2.

Equation 2. Linear Fixed Effects Regression Model

$$ADU_{kt} = \alpha_{0k} + \alpha_1 Post_t + \alpha_2 Treatment_k \cdot Post_t + \varepsilon_{kt}$$

Coefficient α_{0k} captures all household-specific effects on energy use that do not change over time, including those that are unobservable. Coefficient α_1 captures the average effect across all households of being in the post-treatment period. The effect of being both in the treatment group and in the post period, i.e., the effect directly attributable to the program, is captured by the coefficient α_2. In other words, whereas the coefficient α_1 captures the change in average daily therms use across the pre- and post-treatment for the control group, the sum $\alpha_1+\alpha_2$ captures this change for the treatment group and so α_2 is the estimate of average daily therms energy savings due to the program.

Statistical Significance

Guidehouse considered the program level, rather than wave level, statistical significance in claiming savings for this program. The program level standard error is calculated as shown in Equation 3.

Equation 3. Program Level Standard Error

$$ProgramSE = \sqrt{SE(Wave1)^2 + SE(Wave2)^2 + SE(Wave3)^2}$$

Guidehouse claims savings for all waves in the program if the program level standard error indicates that the program savings are statistically different from zero at the 90% confidence level.

Accounting for Uplift in Other Energy Efficiency Programs

Accounting for Uplift in 2025

The home energy reports sent to participating households included energy-saving tips, some of which encouraged participants to enroll in other Nicor Gas energy efficiency (EE) programs. If participation rates in other EE programs were the same for HER participant and control groups, the savings estimates from the regression analysis are already "net" of savings from the other programs, as this indicates the HER Program had no net effect on participation in the other EE programs. However, if the receipt of reports increased participation rates of recipients relative to controls in other EE programs, then the combined savings across all programs would be lower than indicated by the simple summation of savings in the HER and the other EE programs. For instance, if the HER Program increases participation in another EE program, the resulting increase ("uplift") in savings may be allocated to either the HER Program or the EE program, but cannot be

allocated to both programs simultaneously.[8] When the HER Program decreases participation in other programs, there is no issue of double counting, and no adjustment to the savings total is made.

As data permitted, Guidehouse used a difference-in-difference (DID) statistic to estimate uplift in other EE programs. To calculate the DID statistic, Guidehouse calculated the difference between the HER treatment and control groups in average EE program savings per customer in the post period,[9] and subtracted the same difference from the pre-period.[10] For instance, if the EE program savings during 2025 is five therms for the treatment group and three therms for the control group, and the savings during the year before the start of the HER Program is two therms for the treatment group and one therm for the control group, then the DID statistic is one therm, as reflected in Equation 4.

Equation 4. Current Year Uplift Calculation

(2025 treatment group savings – 2025 control group savings) – (pre-year treatment group savings - pre-year control group savings) = DID statistic

$$(5 - 3) - (2 - 1) = 1$$

The DID statistic generates an unbiased estimate of uplift when the baseline average savings is the same for the treatment and control groups, or when these values are different due only to differences between the two groups in time-invariant factors, such as the square footage of the residence.

An alternative statistic that generates an unbiased estimate of uplift when the baseline average savings in the EE program is the same for the treatment and control groups, is a simple difference in savings during 2025. Guidehouse uses this alternative statistic –the "post-only difference" (POD) statistic – in cases where the EE program did not exist for the entire pre-program year.

Guidehouse examined the uplift associated with four other Nicor Gas programs: Energy Savings Kits (ESK), Home Energy Efficiency Rebates (HEER), Home Energy Savings (HES), and Income Eligible (IE)[11].

Accounting for Legacy Uplift

The uplift adjustment methodology above only accounts for uplift which occurs in the current program year because EE program tracking files in any given program year only capture the new measures installed in that year, regardless of the expected measure life.[12] However, for other EE programs that include measures with

[8] It is not possible to avoid double-counting of the savings generated by programs for which tracking data are not available, such as upstream programs.
[9] Where the averages are calculated over all treatment and control group customers, not just those who participated in other EE programs.
[10] Other EE program savings were pro-rated to the program participation date assuming a flat load shape.
[11] Including single family, multifamily, and public housing authority.
[12] Tracking data files are set up this way because, in conformity with the IL-TRM, Section 3.2, savings are first-year savings, not lifetime savings.

multiyear measure lives, the HER Program savings capture the portion of savings due to uplift in each year of that program's measure life. For instance, a measure with a 10-year measure life that was installed in 2019 would generate savings captured in the HER Program savings not just in 2019, but in 2020 through 2028 as well.

Consider the following example. A household receiving home energy reports through the HER Program enrolls in the HES Program in CY2022. The uplift adjustment subtracts HES CY2022 Program savings to avoid double counting. In 2025, this household still receives savings from the HES Program because it has a 13-year measure life. However, the 2025 HER uplift adjustment does not remove these savings because the 2025 adjustment only accounts for measures installed in 2025, the initial year the household entered a program. When only relying on the uplift adjustment, HES second-year savings would be included in the 2025 HER Program's savings, which is inconsistent with Illinois' practices of only crediting utilities with first-year EE program savings. Legacy uplift removes double counted energy savings from programs that include measures with multiple-year measure life.

The evaluation team accounts for legacy uplift by subtracting the double counted savings from previous years, adjusted for the average annual move out rate,[13] from 2025 HER savings through the measure lives of measures from other EE programs. The legacy uplift adjustment is shown in Equation 5.

Equation 5. Legacy Uplift Calculation

$$\text{HER Savings}_{\text{PY}}^{\text{Adjusted}} = \text{HER Savings}_{\text{PY}}^{\text{Unadjusted}} - \text{Uplift Savings}_{\text{PY}} - \sum_{i=1}^{\text{PY-1}} \text{"Live" Legacy Uplift Savings}_{i} \cdot (1 - \text{MOR})^{\text{PY - i}}$$

Where, "Live" Legacy Uplift Savings refers to uplift savings where the other EE programs' measure lives have not yet run out (i.e., where measure life exceeds the difference between *PY* and *i*) and MOR refers to the move out rate. To streamline the analysis, instead of using individual measure lives in developing legacy uplift savings, and subsequently removing measures one-by-one once these reach the end of their EULs, the evaluation team calculated EULs at the program level by weighting measure-specific EULs by savings. Once the program reaches its weighted average measure life (WAML), it is removed from the legacy uplift calculation.

The legacy uplift adjustment removes double counted savings from the CY2020 to CY2024 evaluations for the ESK, HEER, HES, MF, and IE programs.

[13] Because HER Program participants are dropped from that program when they move, other EE programs' savings are no longer captured in the HER Program savings from that point forward.

Accounting for Savings Persistence and Participant Retention

Continued implementation of HER programs in Illinois and across the country has demonstrated persistence of savings beyond the first year, leading Illinois to adopt a measure persistence framework in Version 13.0 of the IL-TRM. This framework assumes that savings persist over seven years, but the persistence decays in each year. The IL-TRM recommends using the persistence factors presented in Table 3 over the seven-year life to estimate lifetime gas savings for the program.

Table 3. Gas Savings Persistence Factors

Year	Gas Persistence Factor
Year 1	100%
Year 2	70%
Year 3	49%
Year 4	34%
Year 5	24%
Year 6	17%
Year 7	12%

Source: IL-TRM, Measure 6.1.1, Volume 4, Version 13.0.

The persistence factors above apply for the forward-looking cost-effectiveness calculations. However, in removing persistence from prior years, Guidehouse used the persistence factors in effect from those years per IL-TRM v13.0:

> ...when persistence factors are changed, the evaluation will utilize the persistence factors that were used to calculate claimed savings in previous years to subtract persistence savings from those years. For example, persistence factors changed between CY2021 and 2022; in CY2021 the earlier persistence factors (based on a 5-year measure life) were used to claim savings from CY2021-CY2025, therefore in 2022-CY2025 persisting savings from CY2021 should be subtracted based on those same persistence factors.

In 2025, Wave 4 is in year 2. Using the applicable persistence, Guidehouse used persistence factors of 70% for savings from 2024. Per the IL-TRM, the adjustment for persistence also accounts for the program retention rate using a wave-specific prospective retention rate based on the age of the wave. In CY2025, Guidehouse applied a 95% retention rate.[14]

Table 4 provides a breakdown of the persistence factors and savings attributed to prior years for Wave 4. The total persistence adjustment (Section E) is calculated as the sum of all savings attributed to prior years

[14] Documentation on this retention rate was shared with Nicor Gas, the program implementer, and Illinois Commerce Commission staff in June 2023 in *Retention Rates- Behavior Savings_2023-06-16.pptx*.

(Section D). Each row of section D is calculated by multiplying the corresponding rows of Section A (actual savings), Section B (persistence adjustment factors) and Section C (retention rates) (e.g., A1*B1*C1=D1).

Table 4. 2025 Program Persistence Summary

Section	Row	Value	Wave 4 (202402)
A	1	Actual Savings CY2024	166,715
B	1	1-Year Persistence Adjustment Factor	0.7
C	1	Retention Rate – 1 Year	0.95
D	1	Savings Attributed to 2024	110,865
E	1	Total Persistence Adjustment	110,865

Source: Guidehouse analysis of Nicor Gas program tracking and customer billing data.

Appendix B. Detailed Impact Analysis Results

This appendix presents detailed savings and aggregated uplift analysis results. Tables with the regression outputs and detailed uplift results are available upon request.

Savings

This appendix presents detailed savings and aggregated uplift analysis results. Tables with the regression outputs and detailed uplift results are available upon request.

Table 5 summarizes estimated program savings including uplift adjustments. Table 5 also includes the number of participants, controls, and average savings rates. Both modeled savings and average savings rates include standard error figures.

Table 5. 2025 Savings Results

Savings Category	Wave 4 (202402)
Treatment Customer Count*	74,065
Control Customer Count*	23,501
Percent Savings	0.31%
Percent Savings Std. Err.	0.12%
Annualized Customer Savings, therms†	5.92
Annualized Customer Savings Std. Err.	2.17
Net Savings Prior to Uplift, therms	427,255
Net Savings Std. Err.	156,736
2025 Uplift, therms‡	5,784
Legacy Uplift, therms‡	16,592
2025 Custom Savings Calculation	404,878
Savings Attributed to Prior Years§	110,865
Verified Adjusted Savings, therms||	294,013

** These counts are for active customers at the beginning of the evaluation period.*

† Annualized savings are average daily savings multiplied by 365, however, total savings are pro-rated for participants that closed their accounts during the evaluation period.

‡ No adjustment was made to total savings for negative uplift, (i.e., cases where the HER Program decreased participation in other programs).

§ Savings attributed to prior years are those deducted for persistence from 2024 within the IL-TRM framework.

|| Verified Net Savings are equal to Net Savings, Prior to Uplift less 2025 Uplift, Legacy Uplift, and Savings Attributed to Prior Years.

Source: Guidehouse analysis of Nicor Gas program tracking and customer billing data.

Uplift Analysis Results

This section summarizes 2025 uplift results. The uplift of savings in other EE programs was 22,377 therms, or approximately 5% of total savings. The uplift can be broken down into uplift in 2025 and legacy uplift from previous program years. The 2025 uplift was 5,784 therms or 1% of total program savings, and the legacy uplift was 16,592 therms or 4% of total program savings. The relatively small portion of savings double counted with other Nicor Gas EE programs suggests that the home energy reports may still need more time to fully ramp up in effectiveness for the 2024 wave.

Table 6 presents program savings due to participation in other EE programs in 2025 for each of the HER program waves. Each column provides information on one of four EE Programs for which estimates for deemed savings are available. While these tables show estimates of both positive and negative uplift, only positive values were used to adjust program savings for double counting. For all cases where the EE program did not exist in the pre-program year, the estimate is based on a probability of detection (POD) statistic; otherwise, it is based on a DID statistic.[15]

Table 6. 2025 Uplift Adjustment Details, Wave 4 (202402)

Program Parameters	ESK	HEER	HES	IE
Median program savings, annual therms per EE participant	63.75	212.95	99.04	58.24
Number of treatment customers	74,065	74,065	74,065	74,065
Number of control customer	23,501	23,501	23,501	23,501
Avg. savings per HER treatment customer, 2024	0.10	0.74	0.23	0.26
Avg. savings per HER control customer, 2024	0.10	0.66	0.23	0.27
2024 savings difference	0.00	0.08	0.00	-0.01
Avg. savings per HER treatment customer, pre	0.24	1.26	0.25	0.40
Avg. savings per HER control customer, pre	0.26	1.19	0.29	0.26
Pre savings difference	-0.03	0.07	-0.04	0.14
DID or POD statistic	0.02	0.01	0.04	-0.15
Savings attributable to other programs, therms	1,884	411	3,490	-11,703
Implied change in participation	29.6	1.9	35.2	-201.0

Source: Guidehouse analysis of Nicor Gas program tracking and customer billing data.

[15] See Appendix A. Impact Analysis Methodology for more information on POD and DID statistics.

Appendix C. Program Specific Inputs for the Illinois TRC

Table 7 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

Table 7. Verified Cost Effectiveness Inputs

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Private	Direct Install	Behavioral Savings	FALSE	Unit	74,065	7.0	NO	N/A	N/A	N/A	308,126
Total or Weighted Average						**7.0**		-	-	-	**308,126**

Source: Evaluation team analysis