

Memorandum

To: Randy Opdyke, Nicor Gas
Brady Nemeth, Kegan Daugherty, Ellen Rubinstein, Nicole Karpavich, Resource Innovations

From: Kathryn Collins, Laura Agapay-Read; Guidehouse

Date: August 29, 2024

Re: Nicor Gas Market Transformation Initiative: Residential Gas Heat Pump Theory-based Evaluation Plan

Theory-based Evaluation Plan

The Residential Gas Heat Pump (RGHP, GHP) initiative promotes gas powered residential space and domestic hot water heating through a market transformation initiative (MTI). Nicor Gas's RGHP MTI is intended to cover at least a 10-year duration. This document provides an initial Theory-based Evaluation Plan covering the evaluation activities proposed for the first four years of the MTI. Guidehouse will provide additional evaluation plans (including expanded activities) for the period beyond CY2028 in future documentation.

This evaluation plan includes four sections which cover the proposed evidence-gathering approaches for the RGHP MTI for CY2025-CY2028:

- Market Progress Indicators (MPIs) Assessment
- Determining MTI Energy Savings
- Evaluation of Evidence Gathered
- Market Progress Evaluation Report (MPER)

Overview of Evaluation Activities

The evaluation of the RGHP MTI will include the activities shown in Table 2. Future evaluation activities subject to change based on market data. Guidehouse will also include a detailed overview of the evaluation activities for RGHP MTI each year in the Annual Evaluation Plan, which encompasses all evaluation activities across resource acquisition and market transformation.

Table 1. RGHP MTI Evaluation Activities

Category	Tasks	CY2024	CY2025	CY2026	CY2027	CY2028
General	Nicor Staff Interview	-	X	X	X	X
General	Implementer Interview	-	X	X	X	X
General	Natural Market Baseline Review	X	X	-	-	-
General	Structured Expert Judgment Panel	-	X	-	-	X
Impact	Savings Calculator and Work Paper Review	-	X	X	X	X
Impact	Market Transformation Program Tracking Data Review	-	X	X	X	X
Impact	MPI Assessment	-	X	X	X	X

Source: Guidehouse

MPI Assessment

Guidehouse will report on the RGHP initiative’s progress toward the goals and objectives described in the program logic model (LM) and market progress indicators (MPIs), as provided by Nicor Gas or Nicor Gas’ Program Implementer, to establish the RGHP initiative’s influence on gas powered residential heating sales in Nicor Gas’s territory.¹ Illinois TRM Attachment C provides the following guidance regarding attribution and evaluation of MT initiatives:

Because the unit of analysis is an entire market not a single transaction, MT evaluations tend to require numerous pieces of evidence that 1) change is occurring; and 2) the program is influential in that change. A preponderance of evidence approach, rather than proof, is most often required.²

Assessment of MPIs requires incorporation of multiple judgments of progress based on a preponderance of evidence approach. This information can be qualitative (based on in-depth interviews or observational data collection) or quantitative (based on market share or production data). MPIs which have been classified by the evaluator as “leading,” defined here as having demonstrated some measurable progress in the time period under review³, will be reviewed against the preponderance of evidence standard.

For CY2025-CY2028 Guidehouse will consider evidence from each of the MPIs assessed in the program year against the expected outcomes outlined in the program theory and logic model to assess whether the indicators suggest the program is producing expected outcomes and

¹ RGHP Logic Model and MPI Table, Resource Innovations. November 2023.

² [IL-TRM Effective 010124 v12.0 Vol 4 X-Cutting Measures and Attach 09222023 FINAL.pdf \(ilsag.info\)](#).

³ Typically, the evaluation year (e.g. CY2026)

whether, when considered all together, the indicators show sufficient evidence the program is causing the observed outcomes.

To present a comprehensive case for attribution of observed savings, Guidehouse will combine evidence from the assessments of the following MPIs (Table 2) and the corresponding logic model outcomes for CY2025-CY2028. MPIs IV, VIII, X – XII, XIV – XVII are omitted from Table 2 as these will not be assessed during the first four years of the program.

Table 2. RGHP Initiative Market Progress Indicators

MPI #	Description	Initial Year of Evaluation
MPI I	Unified North American front to market	CY2025
MPI II	One or more HVAC GHP manufacturers offer qualified Res HVAC GHPs	CY2026
MPI III	QPL adopted by utilities and manufacturers	CY2028
MPI V	Installer, distributor, and retailer awareness, knowledge, and comfort with GHPs increases	CY2027
MPI VI	Installers, distributors, and retailers increasingly stock, recommend, sell, and install qualified Res HVAC GHPs	CY2028
MPI VII	Illinois gas utilities have robust and aligned Res HVAC GHP programs	CY2028
MPI IX	Consumer awareness increases	CY2027
MPI XIII	Regional and North American decarbonization efforts recognize Res HVAC GHPs as viable decarbonization strategy	CY2028

Source: Guidehouse

Specific evaluation activities such as surveys, data set analysis, and desk reviews of industry literature will be planned for CY2025-CY2028, as shown in

Table 3. Additional data sources used in review of MPI's IV, VI, VIII, X – XII, XIV – XVII will be incorporated into future evaluation plans. Following the year of the MPI's initial evaluation, the MPI will be considered annually. However, if a given evaluation year does not align with new data sources for the given MPI, the MPI will be considered neutral.

Table 3. RGHP Initiative Proposed Data Sources for MPI Assessments

Data Source	MPI #	CY2025	CY2026	CY2027	CY2028
NAGHPC documentation	I, II				
NAGHPC and Res HVAC GHP Committee member interviews	II				
Manufacturer Interviews	II, III				
Shipment and/or sales data	II, VI, XI				
QPL document	III				
Utility staff interviews	III, VII, XIII				
Installer survey	V, VI, XI				
Distributor survey	V, VI, XI				
Utility program descriptions, rebate forms, financing applications, and other documents	VII				
Utility program tracking data	VII				
Literature review of regional and North American decarbonization plans/strategies/policies	XIII				
Regional and North American decarbonization policy expert interviews	XIII				
Stakeholder publications (e.g., newsletters, conference presentations)	XIII				

* Note: Collection of data for marked data sources will begin in Fall 2024, but associated MPIs will not be assessed until CY2027 or CY2028. See

Source: Guidehouse

Surveys

The proposed MPI assessments for CY2025-CY2028 will require the survey of several stakeholder groups who engage with the RGHP market. Survey targets and specific metrics to be included in the surveys are detailed in Table 4. Nicor Gas will have the opportunity to contribute to and review content prior to survey finalization.

Table 4. RGHP Initiative Survey Targets and Metrics

Target Metric	Installer	Distributor	Retailer	Consumer
Supplier RGHP stocking practices	X	X	X	-
Rate of RGHP recommendations	X	X	X	-
Volume of RGHP sales	X	X	X	-
Number of RGHP installations	X	X	X	-
Measure of RGHP awareness	X	X	X	X
Familiarity/comfort with RGHP equipment	X	X	X	X
Types (and number of types) of RGHP options installers discuss with consumers	X	-	-	-
Frequency of consumer inquiries about RGHPs	X	X	X	X
Consumer satisfaction ratings	X	-	-	X
Commercial inquiries about RGHPs	X	X	X	-

Source: Guidehouse

As indicated in

Table 3, Installer and Distributor surveys would begin in CY2028, while Retailer and Consumer surveys would begin in the following year (CY2029). Then, surveys will likely alternate each year, respectively.

Determining MTI Energy Savings

Reviewing Natural Market Baseline

The evaluation of this MT program will estimate the savings from the sales attributable to the RGHP initiative above the natural market baseline (NMB), as provided by Nicor Gas or its Program Implementer. Guidehouse and Nicor Gas will use best available data to determine if any adjustments need to be made to the natural market baseline as a prospective update, including any external factors that could adjust the baseline forecast. While some external factors may be difficult to quantify, Guidehouse will consider directional impacts (whether likely to increase or decrease expected natural market baseline shares) and reasonable magnitude of changes. All assumptions will be clearly documented, as well as the strengths and limitations of the available evidence. Additionally, any gaps or limitations identified in the available data will be noted with possible remedies for future evaluation years.

While Nicor Gas and the MT program implementer are responsible for any subsequent updates to the NMB and Energy Savings Framework, the NMB review may be initiated and supported by any or all parties. Guidehouse will review available data sources to ensure models are consistently assigned to the appropriate ENERGY STAR regional categories in order to estimate baseline market shares for gas powered residential heating. Guidehouse will also implement data cleaning methodology to ensure that models are treated the same in historical and current program data.

In addition to the initial review of NMB, Guidehouse plans to review the NMB in CY2025. Future NMB reviews beyond CY2025 will be executed in response to key circumstances where it may be appropriate to update the initial Natural Market Baseline forecast, as identified in the IL TRM v12.0.

Measuring the Market

Measurement of the gas powered residential heating market in Nicor Gas service territory is required to calculate market effect savings. Below is a methodology developed by Nicor Gas to measure the market based on existing information. Nicor Gas will share the data and output with Guidehouse for assessment of the reasonableness and appropriateness of the results. The steps are as follows:

1. Determine the total number of single family homes in the service territory.
2. Calculate the number of gas powered residential heating systems sold to homes replacing their residential heating systems (by existing equipment type) using the TRM-defined estimated useful life of 20 years.
3. Calculate the number of gas residential heating systems sold to new construction homes.
4. Combine all sales values.
5. Convert the natural market baseline (NMB) from a percentage of total sales into number of units sold.

6. Calculate the breakdown of NMB RGHP sales (by replacement and new construction).

This modeling can be undertaken using publicly available census data and Nicor Gas data. However, as more data sources come in, variables can be added or updated. Furthermore, it can be loosely corroborated by national sales trends that are scaled back to correspond with Nicor Gas's service territory. Variables can be updated or added on an annual basis, and any updates will be communicated to Guidehouse with the results of Total Market Units.

Evaluation of Evidence Gathered

Following the assessment of the MPIs in a given evaluation year, the evaluation team will review the evidence which purports to establish a link between program activities, as visible through leading MPIs, and effects on the market. Market influence and the natural market baseline in the Energy Savings Framework may be adjusted to account for market impacts due to non-Program causes.

Guidehouse will consider the impacts of all leading MPIs into a final decision on the influence of the MTI for the given year. The assignment of attribution for leading MPIs based on the RGHP MTI impacts for Nicor Gas and its implementer will begin prior to the submission of the annual evaluation plan. The relative influence of each MPI under review in a given evaluation year will be discussed in a planning meeting between Guidehouse, Nicor Gas, and the implementor which will take into consideration the expected impact of each MPI and its associated activities as well as any delays in MPI development. This meeting will translate the relative influence of the MPIs into an initial weighting approach for the given evaluation year. The initial weighting approach will be documented in the annual evaluation plan. The attribution of each MPI will be rolled up into a weighted average that defines the final Attribution Factor.⁴

The positive assignment of attribution will not require consensus among all the MPIs under evaluation, nor will each MPI be required to determine sufficiency regarding the preponderance of evidence. Overall, the assessment will determine whether the savings associated with the MTI, based on the Energy Savings Framework, will be attributed to the MTI as a binary (yes/no) recommendation.

As discussed earlier, attribution is typically in part established qualitatively for MT initiatives, yet under the policy framework in place in Illinois, a "net" savings figure must be determined. Subtracting the Natural Market Baseline from Total Market Units is the mechanism by which the initial forecast of savings is created. Total Market Units will be provided annually by Nicor Gas for assessment. As discussed below, depending on the body of evidence that emerges over time, the initial Natural Market Baseline may be revised periodically.

⁴ Note that this is not actually a statement of causality but rather a measurement by subtraction of Natural Market Baseline. See TRM definition of Attribution, MT Programs (Section 3.2 Appendix B: Glossary of Terms). [IL-TRM Effective 010124 v12.0 Vol 4 X-Cutting Measures and Attach 09222023 FINAL.pdf \(ilsag.info\)](#)

Structured Expert Judgment Panel

Guidehouse will convene an expert judgment panel for the CY2025 MPI assessment and review of the NMB. The expert judgment panel will allow Guidehouse to gather input on the degree of progress the RGHP initiative has made towards expected outcomes. Guidehouse will reconvene a structured expert judgment panel every three to four years, preferably in the evaluation year prior to the creation of a new cycle evaluation plan. This structured expert judgment panel is designed to support the preponderance of evidence required to assess the program's impacts and progress in transforming the market. Specifically, experts in the industry will be able to provide critical insights on the degree to changes in the RGHP market.

The Natural Market Baseline also will be included as a topic for review for the structured expert judgment panel convened for the CY2025 evaluation. The panel will help provide transparency and inform key assumptions about the NMB and assessment of Market Progress Indicators (MPIs). The end goal of each of the panel is to establish an estimate of expected trends during the program period and estimate market shares absent program intervention. All findings by the panel will be considered as supporting evidence and not a final decision maker in attribution for a given year.

Guidehouse will recruit and carefully select experts in the market to participate in the structured judgment panel, including retailers, manufacturers, efficiency experts, and distributors. Anonymous bios of the proposed panel members will be submitted to Nicor Gas for review. Details from the results of the structured expert judgment panel will be included as an attachment to the CY2025 Market Progress Evaluation Report, discussed below. Guidehouse will leverage the panel's feedback on market progress and attribution to estimate savings and impacts throughout the first four-year cycle of the MT program.

Market Progress Evaluation Report (MPER)

For each evaluation year Guidehouse will prepare a Market Progress Evaluation Report (MPER). The MPER will include components of impact and process evaluation, market research, and planning and market assessments to document progress and market change over the initiative's life cycle. The inclusion of the above components and their relative depth will evolve as the initiative and the relative market become more established.