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From: Kevin Grabner, Karen Maoz, Sagar Deo, Palak Thakur, Guidehouse

Cc: Randy Gunn, Laura Agapay-Read, Guidehouse

Date: August 4, 2020

Re: 2018 Verified Energy Savings and Cost Effectiveness Summary for Nicor Gas

This memo provides background material to support Guidehouse's summary reporting of verified energy savings and cost effectiveness results for the Nicor Gas energy efficiency program portfolio for Gas Program Year 2018¹. Guidehouse is providing brief annual summary reporting for each program year, 2018 through 2021, and will produce a final report summarizing the combined results for the four program years after the conclusion of 2021.

The summary reporting is presented in one attachment with four tabs:

- Tab 1: Total Resource Cost Test (TRC) Cost-Effectiveness Results
- Tab 2: Utility Cost Test (UCT) Cost-Effectiveness Results
- Tab 3: Verified Program Energy Savings and Cost Summary
- Tab 4: High Impact Measures

Key background information on each attachment tab follows.

Tab 1: TRC Cost Effectiveness Results

Tab 1 provides our spreadsheet of TRC cost effectiveness results for the 2018 Nicor Gas portfolio. Results are provided by program and sector (Residential, Business and Public Sector, and Income Qualified). The portfolio-level TRC is provided with and without the Income Qualified programs included. A brief methodology and data discussion is presented below.

Tab 2: UCT Cost Effectiveness Results

Tab 2 provides our spreadsheet of UCT cost effectiveness results for the 2018 Nicor Gas portfolio. A brief methodology and data discussion is presented below.

Tab 3: Verified Program Energy Savings and Cost Summary

Tab 3 provides our spreadsheet summary of the components of verified therm savings and utility program costs for the 2018 Nicor Gas program portfolio. Results for Residential, Business and Public Sector, and Income Qualified are subtotaled separately. For all joint and coordinated programs with ComEd, the interactive energy effects (resulting in negative gas savings) due to ComEd's electric saving measures were not included in our reported verified natural gas savings.

¹ Gas Program Year 2018 began January 1, 2018 and ended December 31, 2018.

Tab 4: High Impact Measures

Tab 4 provides our spreadsheet of energy savings results for High Impact Measures (HIM) for the 2018 Nicor Gas portfolio. Please note:

- Savings shown are verified gross therms.
- The Illinois TRM places some common-area multifamily measures in the C&I sector. For 2018, we grouped common-area measures for Multi-Family, Public Housing, and Affordable Housing New Construction with the residential sector.
- The HIM savings summary is rolled up by measure and sector, without reference to program.

Cost Effectiveness Methodology

As part of Guidehouse's evaluation of Nicor Gas energy efficiency programs for gas program year 2018, we performed cost-benefit calculations based upon a combination of assumptions made by Nicor Gas, program tracking data, and other available resources. The focus of this review is on the basis and calculations used to conduct the Illinois TRC test. The Illinois TRC test is defined in 220 ILCS 5/8-104(b)² as follows:

“Cost-effective” means that the measures satisfy the total resource cost test which, for purposes of this Section, means a standard that is met if, for an investment in energy efficiency, the benefit-cost ratio is greater than one. The benefit-cost ratio is the ratio of the net present value of the total benefits of the measures to the net present value of the total costs as calculated over the lifetime of the measures. The total resource cost test compares the sum of avoided natural gas utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures, as well as other quantifiable societal benefits, including avoided electric utility costs, to the sum of all incremental costs of end use measures (including both utility and participant contributions), plus costs to administer, deliver, and evaluate each demand-side measure, to quantify the net savings obtained by substituting demand-side measures for supply resources. In calculating avoided costs, reasonable estimates shall be included for financial costs likely to be imposed by future regulation of emissions of greenhouse gases. The low-income programs described in item (4) of subsection (f) of this Section shall not be required to meet the total resource cost test.

The Illinois TRC test differs from traditional TRC tests in its requirement to include a reasonable estimate of the financial costs associated with future regulations and legislation on the emissions of greenhouse gases (GHG). Additional benefits included in the calculation are the non-energy benefits with a multiplier applied to the energy avoided costs, and water savings. This difference adds an additional benefit to investments in efficiency programs that are typically included in the Societal Test in other jurisdictions.

The results of the Utility Cost Test (UCT) are also presented. The UCT approaches cost effectiveness from the perspective of the utility. It determines whether the energy supply costs avoided by the utility exceed the overhead and cost outlays that the utility incurred to implement energy efficiency programs. Since the UCT is primarily focused on utility outlays, incentives paid by the utility to either participants or third-party implementers are included in the calculation in place of incremental or participant costs. Additionally, since non-energy benefits accrue to society rather than to the utility implementing energy efficiency programs, these benefits are not included in the UCT formula.

² Public Utilities Act, Illinois Compiled Statutes maintained by the Legislative Reference Bureau, <http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=022000050K8-104>.

Incremental Measure Cost Approach

Incremental cost means the difference between the cost of the efficient measure and the cost of the most relevant baseline measure that would have been installed (if any) in the absence of the efficiency program. Installation costs (material and labor) and Operations and Maintenance (O&M) costs shall be included if there is a difference between the efficient measure and the baseline measure. In cases where the efficient measure has a significantly shorter or longer life than the relevant baseline measure, the avoided baseline replacement measure costs should be accounted for in the TRC analysis. The incremental cost input in the TRC analysis is not reduced by the amount of any incentives.

Data Assumptions in the Cost Effectiveness Calculations

The data points needed to conduct the Illinois TRC test are identified in Table 1 below and are divided into generic and program-specific categories. The program-specific data points are further subdivided into those that are provided by Nicor Gas, those that are a result of evaluation activities, and those from multiple sources.

Table 1. Data Points Needed to Conduct the Illinois TRC Test

Category	Data Point	Source
Generic	• Avoided Natural Gas Costs	Nicor Gas
	• Line Losses (Unaccounted-for-Gas Factor)	
	• Non-Energy Benefits (NEBs) Adder	
	• Weighted Average Cost of Capital	
Generic	• Societal Discount Rate	Illinois TRM ³ and Energy Efficiency Stakeholders Advisory Group
	• Greenhouse Gas (GHG) Adder	
Program Specific	• Verified Participants / Measure Count	Final Evaluation Reports ⁴
	• Verified Gross and Net Energy Savings	
	• Realization Rate	
	• Net-to-Gross Ratio	
	• Non-Incentive Costs	Nicor Gas
	• Utility Incentive Costs	
	• Incremental Measure Costs	Nicor Gas / Evaluation / Illinois TRM / Other
• Measure Life		
• Water Gallon Savings and Avoided Costs		

Source: Evaluation Research

³ Illinois Statewide Technical Reference Manual (Illinois TRM). Available at: <https://www.ilsag.info/technical-reference-manual/>

⁴ Evaluation documents are available at: <https://www.ilsag.info/evaluation-documents/final-evaluation-reports/>

The values for the generic data points used in the cost-effectiveness calculations for all programs and the portfolio are summarized below.

- For the TRC, a discount rate of 2.38 percent was applied, based on guidance in TRM version 6.0.
- For the UCT, the discount rate was a weighted average cost of capital (WACC) for Nicor Gas (8.09%).
- Natural gas avoided costs are based on values provided by Nicor Gas: provided by Bruce Liu, December 19, 2018, file name: *Avoided Cost - To Share 2015-2017 Actual_Updated.xlsx*
 - For the years 2018 and beyond, avoided costs were forecast values from Nicor Gas. A GHG adder of \$0.134 per therm (based on a carbon adder of \$25/metric ton) agreed to by the Illinois SAG is included starting in 2020 for the TRC analysis and escalating at 5 percent. A Non-Energy Benefits adder of 7.5% is included and the GHG adder is zero prior to 2020. The line loss factor was 1.000.

The following points are noted for the program-specific data used in the cost-benefit calculations.

- Energy saving benefits represent natural gas only taken from final evaluation verified results from 2018.
- Incentive amounts were obtained from Nicor Gas.
- Non-incentive program costs were provided by Nicor Gas.
- For joint programs with ComEd, the measure costs are the Nicor Gas share of full incremental costs. Incentives and non-incentive costs are the Nicor Gas share of costs.
- For incremental measure costs, in cases where Nicor Gas does not provide the direct installation costs or the data is not tracked, we use the TRM. Professional judgement was used for reviewing and identifying the appropriate incremental measure costs (IMC). Guidehouse reviewed the data Nicor Gas provided for incremental measure costs. After analyzing the tracking data measure costs, the measure specific IMC deemed by the TRM, and the IMC data provided by Nicor Gas, Guidehouse was confident that the appropriate IMC values were assigned to each measure implemented. A similar analysis with reference to the TRM was done for future avoided costs (early replacement measures), measure life, and remaining life values.
- Guidehouse did not receive estimated incremental measure cost from Nicor Gas for the Strategic Energy Management (SEM) Program. For SEM, Guidehouse made the assumption that incremental measure costs were equal to incentives.
- Water saving benefits from water saving measures rely upon the Illinois TRM and Nicor Gas analysis to estimate gallons of water saved per device. Water avoided costs were estimated using assumptions developed by Nicor Gas.
- For early replacement measures, Guidehouse calculated the savings for the remaining life of the existing equipment and the savings for the remaining measure life per the algorithms deemed in the TRM. This analysis is not included in the evaluation reports as they only list the first-year savings value for each measure.
- For all joint and coordinated programs with ComEd, the interactive energy effects (resulting in negative gas savings) and costs due to ComEd's electric saving measures were not included in our analysis. The impact of electric interactive savings effects and costs are analyzed separately and presented in a joint electric-gas TRC memo. Coordinated or joint programs in the 2018 EEP portfolio include:

Table 2. Summary of Coordinated or Jointly Implemented EEP Programs

Program	ComEd	Nicor Gas	PGL/NSG
Income Qualified Programs	X	X	X
Home Energy Assessment / Home Energy Savings / Home Energy Jumpstart	X	X	X
Multi-Family Retrofit	X	X	X
Elementary Energy Education	X	X	X
Residential New Construction	X	X	
Coordinated Retro-Commissioning	X	X	X
Coordinated Non-Residential New Construction	X	X	X
Strategic Energy Management	X	X	

Source: Guidehouse analysis