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From: Kevin Grabner, Guidehouse

Cc: Stu Slote, Guidehouse

Date: January 31, 2022

Re: 2020 Verified Energy Savings and Cost Effectiveness Summary for Nicor Gas

This memo¹ 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 2020². 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 spreadsheet attachment with six tabs:

- Tab 1: Verified Program Energy Savings, Other Impacts, and Cost Summary
- Tab 2: High Impact Measures
- Tab 3: Total Resource Cost Test (TRC) Cost-Effectiveness Results – Plan 3 Avoided Costs³
- Tab 4: Total Resource Cost Test (TRC) Cost-Effectiveness Results – Plan 4 Avoided Costs⁴
- Tab 5: Program Administrator Test (PACT) Cost-Effectiveness Results – Plan 3 Avoided Costs
- Tab 6: Program Administrator Test (PACT) Cost-Effectiveness Results – Plan 4 Avoided Costs

Key background information on each attachment tab follows.

Tab 1: Verified Program Energy Savings, Other Impacts, and Cost Summary

Tab 1 provides a summary of the components of verified therm savings and utility program costs for the 2020 program portfolio. Results for Residential, Business and Public Sector, Income Qualified, and Market Transformation 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 are not included in the reported verified natural gas savings. Tab 1 also reports water savings and greenhouse gas (GHG) reductions⁵.

¹ The January 31, 2022 version replaces the September 21, 2021 version and reflects revised data from Nicor Gas received October 15, 2021 and January 11, 2022, updates to incremental costs for some programs including IHWAP, slightly increased water savings for EEE bath aerators, and redefined incentive and incremental costs for Home Energy Reports. The impact on portfolio TRCs from all changes since September 21, 2021 was slight, changing from 2.4 to 2.3 for Plan 3 avoided costs, and 2.5 to 2.3 for Plan 4 avoided costs. Verified gross and net therms did not change from September 21, 2021 to January 31, 2022.

² Gas Program Year 2020 began January 1, 2020 and ended December 31, 2020.

³ Application pursuant to Section 8-104 of the Public Utilities Act for Consent to and Approval of an Energy Efficiency Plan, Case Details for ICC Docket P2017-0310 available at <https://www.icc.illinois.gov/docket/P2017-0310>.

⁴ Application pursuant to Section 8-104 of the Public Utilities Act for Consent to and Approval of an Energy Efficiency Plan, Case Details for ICC Docket P2021-0154 available at <https://www.icc.illinois.gov/docket/P2021-0154>.

⁵ GHG reductions reported in metric tons CO₂, based on EPA calculators available at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

Tab 2: High Impact Measures

Tab 2 provides energy savings results for High Impact Measures (HIM) for the 2020 portfolio. Please note:

- Savings shown are verified gross therms.
- The Illinois TRM places some common-area multifamily measures in the C&I sector. For 2020, 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, to show the importance of individual measure technologies to the overall portfolio.

Tab 3 and Tab 4: TRC Cost-Effectiveness Results

Tab 3 and Tab 4 provide TRC cost-effectiveness results for the 2020 Nicor Gas portfolio. Results are provided by program and sector (Residential, Business and Public Sector, Income Qualified, and Market Transformation). The portfolio-level TRC is provided with and without the Income Qualified programs included. Two sets of avoided costs were used to calculate the TRC benefits and are reported separately: Tab 3 uses the avoided costs from the Nicor Gas Plan 3 filing, and Tab 4 uses avoided costs from the Plan 4 filing. A brief methodology and data discussion is presented below.

Tab 5 and Tab 6: PACT Cost-Effectiveness Results

Tab 5 and Tab 6 provide PACT cost-effectiveness results for the 2020 Nicor Gas portfolio. Two sets of avoided costs were used to calculate the PACT benefits and are reported separately: Tab 5 uses the avoided costs from the Nicor Gas Plan 3 filing, and Tab 6 uses avoided costs from the Plan 4 filing. A brief methodology and data discussion is presented below.

Cost-Effectiveness Methodology

As part of Guidehouse's evaluation of Nicor Gas energy efficiency programs for gas program year 2020, we performed benefit-cost calculations based upon a combination of data provided by Nicor Gas, evaluated program results, 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)⁶ 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

⁶ Public Utilities Act, Illinois Compiled Statutes maintained by the Legislative Reference Bureau, <http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=022000050K8-104>.

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 and water savings. This difference adds an additional benefit to investments in efficiency programs that typically are included in the Societal Test in other jurisdictions.

The results of the Program Administrator Cost Test (PACT) are also presented. The PACT approaches cost-effectiveness from the perspective of the utility as program administrator. 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 PACT is primarily focused on utility outlays, incentives paid by the utility to either participants or third-party implementers are included in the calculation, rather than 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 PACT formula.

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. The Illinois Energy Efficiency Policy Manual⁷ instructs that 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 and are divided into generic and program-specific categories. The program-specific data points are further subdivided into those provided by the utility, those that are a result of evaluation activities, and those from multiple sources.

⁷ Illinois Energy Efficiency Policy Manual, Version 1.1, available at: <https://www.ilsag.info/policy/>

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

Category	Data Point	Source
Generic	• Avoided Natural Gas Costs: Plan 3 and Plan 4	Nicor Gas / ComEd
	• Avoided Electricity Costs	
	• Loss Factor (Unaccounted-for-Gas Factor)	
	• Plan 3 Non-Energy Benefits (NEBs) Adder	
	• Plan 4 Non-Energy Impacts Additional Quantifiable Benefit	
	• Weighted Average Cost of Capital	
Generic	• Societal Discount Rate	Illinois TRM ⁸ and Energy Efficiency Stakeholders Advisory Group
	• Greenhouse Gas (GHG) Adder	
Program Specific	• Verified Participants / Measure Count	Final Evaluation Reports ⁹
	• 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

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 8.0.
- For the PACT, the discount rate was a weighted average cost of capital (WACC) for Nicor Gas (8.09%).
- Natural gas avoided costs are based on two sets of values provided by Nicor Gas:
 - **Plan 3:** 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.
 - **Plan 4:** Actual avoided costs were used in 2020. For the years 2021 and beyond, avoided costs were forecast values from Nicor Gas. A GHG adder of \$0.253 per therm is included starting in 2020 and escalating thereafter. Additional Quantifiable Benefits (Non-Energy) are included based on research conducted by Guidehouse¹⁰.

⁸ Illinois Statewide Technical Reference Manual (Illinois TRM). Available at: <https://www.ilsag.info/technical-reference-manual/>

⁹ Evaluation documents are available at: <https://www.ilsag.info/evaluation-documents/final-evaluation-reports/>

¹⁰ Guidehouse, *Recommended Non-Energy Impacts for Nicor Gas' Cost-Effectiveness Tests*, February 19, 2021, available at <https://www.ilsag.info/evaluation-documents/evaluation-research/>

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

Benefits

- Energy saving benefits represent natural gas only taken from final evaluation verified results from 2020.
- For all joint and coordinated programs with ComEd or Ameren Illinois, the interactive energy effects (resulting in negative gas savings) and costs due to 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 2020 EEP portfolio include:

Table 2. Summary of Coordinated or Jointly Implemented EEP Programs

Program	ComEd	Ameren IL	Nicor Gas
Income Eligible Programs	X	X	X
Home Energy Assessment / Home Energy Savings / Home Energy Jumpstart	X		X
Multi-Family Retrofit	X		X
Elementary Energy Education	X		X
Coordinated Retro-Commissioning	X		X
Coordinated Non-Residential New Construction	X		X
Strategic Energy Management	X		X
Market Transformation (Commercial Food Service)	X		X

Source: Guidehouse analysis

- For programs that are not joint with ComEd, some measures implemented by Nicor Gas have electricity savings that are not claimed by ComEd. In addition, Nicor Gas provides gas service to some municipalities that do not have ComEd as their electricity provider. These electricity savings are credited to the gas company in the TRC cost-effectiveness calculation as an “Other Benefit”. The impact of this benefit in the 2020 TRC calculation result is small, increasing total benefits by 4%. Most electric benefits for Nicor Gas are generated from advanced thermostats rebated or installed through non-joint offerings, demand-controlled ventilation, non-joint weatherization projects, and the contractor channel income qualified programs.
- 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 dual baseline 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. Dual baseline adjustments have a negligible impact on the Nicor Gas portfolio TRC.
- 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. Water savings account for 5% of TRC benefits, and have a substantial impact to increase the benefits and TRC for programs that include water saving measures prominently, such as kit and direct installation programs.

Costs

- Incentives and 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.

- Guidehouse reviewed the IMC values provided by Nicor Gas. After analyzing the tracking data measure costs, the measure specific IMC deemed by the TRM, and other IMC data, Guidehouse was confident that Nicor Gas assigned an appropriate IMC value to measures in most cases. We used the TRM or Guidehouse research in cases where Guidehouse disagreed a Nicor Gas IMC value or Nicor Gas did not provide an IMC.
- Where we changed Nicor Gas incremental measure costs, the most common reason was that Nicor Gas tracking data had applied a per unit incremental cost to the wrong participation unit. For example, boiler tune-up costs in the TRM are \$0.83 per MBH (MBH is a measure of a boiler's heating capacity). An 800 MBH boiler would have an incremental measure cost of \$664 per project. We found instances where Nicor Gas applied the \$0.83 value to the number of projects rather than total MBH, resulting in greatly underestimated cost.
- Since some IMCs are estimated using TRM, planning, and secondary research, the IMC estimates may not include all relevant and up-to-date installation and equipment costs for some programs. We set program incremental measure costs equal to incentives for income eligible programs when incentives paid were greater than the initial IMC estimate, except for the IHWAP programs. For IHWAP, incremental measure costs are twice the amount that Nicor Gas records as incentive costs, to account for the 50% contribution to total measure cost from non-utility IHWAP funding sources. This adjustment resulted in a minor increase to portfolio incremental costs.
- Future avoided replacement costs reduce net incremental costs for retrofit measures by a total of \$2.3 million for the portfolio.
- Guidehouse planned to report all costs related to the Nicor Gas Home Energy Reports program as non-incentive program costs, consistent with our approach for ComEd and Peoples Gas and North Shore Gas. Nicor Gas records about one-quarter of Home Energy Reports program costs as non-incentive costs, and about three quarters as incentives. Nicor Gas considers the Home Energy Report to be a site-specific energy assessment, and records the cost of producing reports as an incremental measure costs 100 percent paid for by the program as an incentive. Guidehouse has no objection to the Nicor Gas cost accounting approach, and notes that the TRC and PACT results using the Nicor Gas approach are identical to accounting for all costs as non-incentives.