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Date: November 27, 2023

Re: Final 2022 Verified Energy Savings and Cost Effectiveness Summary for PGL and NSG

This memo provides background material to support Guidehouse's summary reporting of verified energy savings and cost-effectiveness results for the Peoples Gas (PGL) and North Shore Gas (NSG) energy efficiency program portfolios for Gas Program Year 2022[1]. Guidehouse is providing brief annual summary reporting for each program year, 2022 through 2025, and will produce a final report summarizing the combined results for the four program years after final 2025 summary reporting.

The summary reporting is presented in two spreadsheet attachments with six tabs for each utility:

- Tab 1: Verified Program Energy Savings, Other Impacts, and Cost Summary
- Tab 2: High Impact Measures
- Tab 3 and Tab 4: Total Resource Cost Test (TRC) Cost-Effectiveness Results – Plan 4 Avoided Costs[2]
- Tab 5 and Tab 6: Program Administrator Cost 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 2022 program portfolio. Results for Residential, Business and Public Sector, and Income Eligible are subtotaled separately. For all joint and coordinated programs with ComEd, the interactive energy effects (resulting in negative gas savings) due to ComEd's electricity saving measures are not included in the reported verified natural gas savings. Tab 1 also reports water savings and greenhouse gas (GHG) reductions[3].

[1] Gas Program Year 2022 began January 1, 2022 and ended December 31, 2022.
[2] 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 P2021-0159 available at https://www.icc.illinois.gov/docket/P2021-0159.
[3] 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 2022 portfolio.

- Savings shown are verified gross therms.
- The Illinois TRM places some common-area multifamily measures in the C&I sector. For 2022 Guidehouse 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 2022 PGL and NSG portfolios. Results are provided by program and sector (Residential, Business and Public Sector, and Income Eligible). The portfolio-level TRC is provided with and without the Income Eligible programs included. Tab 3 provides program and portfolio-level TRC with all non-energy impacts ("NEIs") included. The NEI benefits account water, electricity savings, additional quantifiable benefits (AQB), and carbon adders. Tab 4 provides program and portfolio-level TRC without the AQB and carbon benefits, and with the measure level water and electricity benefits defined in the Illinois Technical Reference Manual (IL-TRM). Portfolio-level TRC is provided with and without the Income Eligible programs included. The TRC benefits leverage the avoided costs from the Plan 4 filing updated with actual costs through 2022. A brief methodology and data discussion follow.

Tab 5 and Tab 6: PACT Cost-Effectiveness Results

Tab 5 and Tab 6 provide PACT cost-effectiveness results for the 2022 PGL and NSG portfolios. Tab 5 provides program and portfolio-level PACT with measure-specific NEIs (i.e., water and electricity benefits) defined in the IL-TRM included in the calculations. The PACT does not include other societal benefits (i.e., AQB and carbon adders). Tab 6 provides program and portfolio-level PACT without NEIs included. Portfolio-level PACT is provided with and without the Income Eligible programs included. The PACT benefits leverage the avoided costs from the Plan 4 filing updated with actual costs through 2022. A brief methodology and data discussion follow.

Cost-Effectiveness Methodology

As part of the evaluation of PGL and NSG energy efficiency programs for gas program year 2022, Guidehouse performed benefit-cost calculations based upon a combination of data provided by PGL and NSG, evaluated program results, referencing the IL-TRM or Guidehouse research. 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)[4] 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*

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

> *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 a 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 Cost Test in other jurisdictions.

The results of the Program Administrator Cost Test (PACT) also are presented. The PACT approaches cost-effectiveness from the perspective of the utility as program administrator and 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, measure-specific non-energy benefits (i.e., water and electricity benefits) defined in the IL-TRM are 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 Manual[5] 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 (1) provided by the utility, (2) are a result of evaluation activities, and (3) from multiple sources.

[5] Illinois Energy Efficiency Policy Manual, 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 4 • Avoided Electricity Costs • Loss Factor (Unaccounted-for-Gas Factor) • Plan 4 Non-Energy Impacts Additional Quantifiable Benefit • Weighted Average Cost of Capital	PGL and NSG / ComEd
Generic	• Societal Discount Rate • Greenhouse Gas (GHG) Adder	Illinois TRM[6] and Energy Efficiency Stakeholders Advisory Group
Program Specific	• Verified Participants / Measure Count • Verified Gross and Net Energy Savings • Realization Rate • Net-to-Gross Ratio	Final Evaluation Reports[7]
	• Non-Incentive Costs • Utility Incentive Costs	PGL and NSG
	• Incremental Measure Costs • Measure Life • Water Savings in Gallons and Avoided Water Costs	PGL and NSG / Guidehouse Evaluation / Illinois TRM / Other

Source: Evaluation Research

Following is a summary of the values for the generic data points used in the cost-effectiveness calculations for all programs and the portfolio.

- For the TRC, a discount rate of 2.40% was applied, based on guidance in TRM version 10.0.
- For the PACT, the discount rate was a weighted average cost of capital (WACC) for PGL (6.31%) and NSG (6.70%).
- Natural gas avoided costs are based on Plan 4 values provided by PGL and NSG. Actual avoided costs were used in 2022. A GHG adder of $0.266 per therm is included starting in 2022 and escalating thereafter. Additional Quantifiable Benefits (Non-Energy) are included based on research conducted by Guidehouse[8]. The loss factor was 1.0276 for PGL and 1.0080 for NSG.

[6] Illinois Statewide Technical Reference Manual (Illinois TRM). Available at: https://www.ilsag.info/technical-reference-manual/
[7] Evaluation documents are available at: https://www.ilsag.info/evaluation-documents/final-evaluation-reports/
[8] Guidehouse, *Recommended Non-Energy Impacts for Peoples Gas' Cost-Effectiveness Tests*, and *Recommended Non-Energy Impacts for North Shore Gas' Cost-Effectiveness Tests,* December 17, 2020, 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, from final evaluation verified results from 2022.

- For all joint and coordinated programs with ComEd, the interactive energy effects (resulting in negative gas savings) and costs due to electricity saving measures were not included in the 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 2022 Energy Efficiency Portfolio (EEP) include:

Table 2. Summary of Coordinated or Jointly Implemented 2022 EEP Programs

Program	ComEd	PGL and NSG
Income Eligible Programs, except LIHEAP Kits	√	√
Home Energy Assessment / Home Energy Jumpstart	√	√
Multi-Family Retrofit	√	√
Elementary Energy Education	√	√
Coordinated Retro-Commissioning	√	√
Coordinated Non-Residential New Construction	√	√
Strategic Energy Management	√	√
Commercial Food Service	√	√

Source: Guidehouse analysis

- For programs that are not joint with ComEd, some measures implemented by PGL and NSG have electricity savings that are not claimed by ComEd. 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 2022 TRC calculation result is small, increasing total benefits by 2% for PGL and 5% for NSG. Most electric benefits are generated from thermostats rebated or installed through non-joint offerings, demand-controlled ventilation, and non-joint kits and weatherization measures.

- 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, and the future avoided replacement costs. This analysis is not included in the evaluation reports as these only list the first-year savings value for each measure. The dual baseline adjustment has a minor positive impact on the PGL and NSG TRCs[9].

- Guidehouse also included secondary benefits from water saving measures. Water saving benefits from water saving measures rely upon the Illinois TRM to estimate gallons of water saved per device. Water avoided costs were estimated using evaluator assumptions developed for PGL and NSG based on secondary research. Water savings account for 6% (NSG) and 10% (PGL) of TRC benefits and increase the benefits and TRC for programs that include water saving measures prominently, such as kit and direct installation programs for the residential sector, and steam traps for the non-residential sector.

[9] Future avoided costs result in lower net incremental costs, thus improving the TRC score.

Costs

- Incentives and non-incentive program costs were provided by PGL and NSG. For some programs, incentive amounts are tracked by program path, while non-incentive costs are tracked and bundled to include multiple paths. The analysis presents results at the program path level by allocating bundled costs based on weighting by ex ante annual gross therm savings. While this approach may distort the costs and TRCs for individual program paths, the sector level costs and TRCs will be accurately represented.

- For joint programs with ComEd, the measure costs are the PGL and NSG share of full incremental costs. Incentives and non-incentive costs are the PGL and NSG share of costs.

- For incremental measure costs, in cases where PGL and NSG do not provide the installation costs or the data is not tracked, the analysis uses the TRM and other sources. Professional judgment was used for reviewing and identifying the appropriate incremental measure costs (IMC). For IHWAP programs, incremental measure costs are twice the utility incentive.

- For coordinated kit, new construction, and retrocommissioning programs, Guidehouse leveraged measure or project level IMCs from ComEd and PGL and NSG project information to determine actual costs for 2022 measures or projects.

- Excess incentives are the amount that incentives are greater than estimated incremental measure costs, and if present, should be added to non-incentive costs. Since 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. Guidehouse set IMC to be not less than incentives for programs (twice the incentive for IHWAP) if incentives were greater than the initial IMC estimate. Incentives are allocated to C&I and Public Sector programs by gross therms. Some programs appear to have excess incentives, however, overall IMCs are greater than overall incentives for C&I and PS programs prior to allocating.

- For early replacement measures, Guidehouse used the full measure installation cost for the first year IMC, and calculated future avoided costs per the TRM. Future avoided replacement costs reduce net incremental costs for retrofit measures by a total of $0.3[10] million for the PGL portfolio, and $0.1 million for NSG.

[10] Value in 2022 dollars. Deferred replacement costs were discounted using the societal discount rate.