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Re: 2019 Verified Energy Savings and Cost Effectiveness Summary for PGL and NSG

This memo¹ 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 2019². 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 four tabs for each utility:

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

Key background information on each attachment tab follows.

Tab 1: TRC Cost Effectiveness Results

Tab 1 provides TRC cost-effectiveness results for the 2019 PGL and NSG portfolios. Results are provided by program and sector (Residential, Business, Public Sector, and Income Eligible). The portfolio-level TRC is provided with and without the Income Eligible programs included. A brief methodology and data discussion is presented below.

Tab 2: UCT Cost Effectiveness Results

Tab 2 provides UCT cost-effectiveness results for the 2019 portfolios. A brief methodology and data discussion is presented below.

Tab 3: Verified Program Energy Savings and Cost Summary

Tab 3 provides a summary of the components of verified therm savings and utility program costs for the 2019 program portfolios. Results for Residential, Business, Public Sector, and Income Eligible are subtotaled separately. For all joint and coordinated programs with ComEd, the interactive energy effects

¹ The February 7, 2022 version replaces the November 20, 2020 version and reflects minor updates to incremental costs for some measures, slightly increased water savings, and combining of C&I and Public Sector in reporting to be consistent with 2018 and 2020. The impact on portfolio TRCs was slight, changing from 1.7 to 1.6 for PGL and 1.9 to 1.8 for NSG. Verified savings and program costs were not affected by the updates.

² Gas Program Year 2019 began January 1, 2019 and ended December 31, 2019.

(resulting in negative gas savings) due to ComEd's electric saving measures are not included in the reported verified natural gas savings.

Tab 4: High Impact Measures

Tab 4 provides energy savings results for High Impact Measures (HIM) for the 2019 portfolios. Please note:

- Savings shown are verified gross therms.
- The Illinois TRM places some common-area multifamily measures in the C&I sector. For 2019, 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 PGL and NSG energy efficiency programs for gas program year 2019, we performed benefit-cost calculations based upon a combination of assumptions made by PGL and NSG, 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)³ 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 typically are 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, rather than incremental or participant costs.

³ Public Utilities Act, Illinois Compiled Statutes maintained by the Legislative Reference Bureau, <http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=022000050K8-104>.

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.

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 and are divided into generic and program-specific categories. The program-specific data points are further subdivided into those provided by the utilities, 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	PGL and NSG	
	• Avoided Electricity Costs		
	• Loss Factor (Unaccounted-for-Gas Factor)		
	• Non-Energy Benefits (NEBs) Adder		
Generic	• Weighted Average Cost of Capital	Illinois TRM ⁴ and Energy Efficiency Stakeholders Advisory Group	
	• Societal Discount Rate		
Program Specific	• Greenhouse Gas (GHG) Adder	Final Evaluation Reports ⁵	
	• Verified Participants / Measure Count		
	• Verified Gross and Net Energy Savings		
	• Realization Rate		
	• Net-to-Gross Ratio		
	• Non-Incentive Costs		PGL and NSG
	• Utility Incentive Costs		
Program Specific	• Incremental Measure Costs	PGL and NSG / 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 7.0.
- For the UCT, the discount rate was a weighted average cost of capital (WACC) for PGL (5.85%) and NSG (5.88%).
- Natural gas avoided costs are based on values provided by PGL and NSG:
 - For the years 2018 and beyond, avoided costs were forecast values from PGL and NSG for EEPS Plan 3. A GHG adder of \$0.13 per therm (based on a carbon adder of \$25/metric ton) is included starting in 2020 for the TRC analysis, and escalating at 1.91 percent. A Non-Energy Benefits adder of 7.5% is included and the GHG adder is zero prior to 2020. The loss factor was 1.0358 for PGL and 1.0214 for NSG.

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

⁴ Illinois Statewide Technical Reference Manual (Illinois TRM). Available at: <https://www.ilsag.info/technical-reference-manual/>

⁵ Evaluation documents are available at: <https://www.ilsag.info/evaluation-documents/final-evaluation-reports/>

- Energy saving benefits represent natural gas only taken from final evaluation verified results from 2019.
- 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 water and sewer rates for the City of Chicago⁶. The escalation rate for water costs is 1.91 percent, based on the Illinois TRM version 7.0.
- 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. We present results at the path level by allocating bundled costs on the basis of weighting by ex ante annual gross therm savings. Although this 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 gas utilities' reported share of full incremental costs. Incentives and non-incentive costs are the gas utilities' reported share of costs.
- 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 TRC calculation is small, less than one percent for PGL and 3.7% for NSG. Most electric benefits for the gas utilities are generated from non-joint weatherization projects.
- For incremental measure costs, in cases where PGL and NSG do not provide the installation costs or the data is not tracked, we use the TRM and other sources. Professional judgement was used for reviewing and identifying the appropriate incremental measure costs (IMC).
- 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 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 impact on the PGL and NSG TRCs.
- Excess incentives are the amount that incentives are greater than estimated incremental measure costs, and if present, should be added to non-incentive costs. For Business and Public Sector programs, rolled-up incentive totals for multiple-programs are allocated to individual programs by gross therms and some programs appear to have excess incentives, however sector total IMCs are greater than sector total incentives.
- 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 2019 EEP portfolio include:

⁶ Available at https://www.cityofchicago.org/city/en/depts/fin/supp_info/utility-billing/water-and-sewer-rates.html.

Table 2. Summary of Coordinated or Jointly Implemented EEP Programs

Program	ComEd	Nicor Gas	PGL/NSG
Income Eligible 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	X

Source: Guidehouse analysis