Opinion Dynamics

AMEREN ILLINOIS COMPANY

2022 ENERGY EFFICIENCY COST-EFFECTIVENESS RESULTS

FINAL

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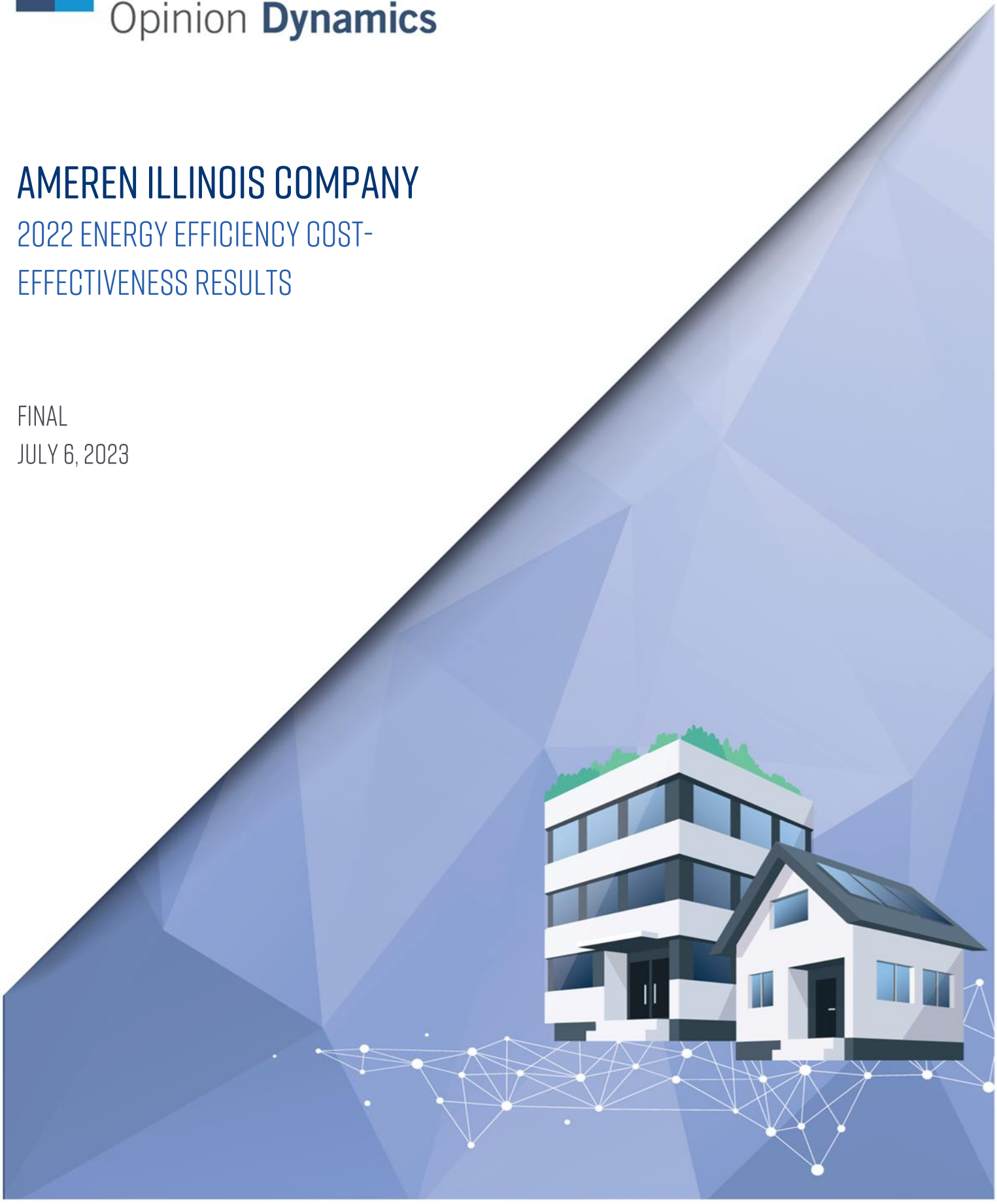

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I. EXECUTIVE SUMMARY

This report presents the results of cost-effectiveness testing conducted for Ameren Illinois Company (AIC)'s portfolio of energy efficiency programs implemented during 2022.

I.1 BACKGROUND

Illinois state law directs utilities to operate cost-effective energy efficiency programs, and to demonstrate that their energy efficiency portfolios are cost-effective using the Illinois Total Resource Cost (TRC) test.[1] In accordance with law, relevant Illinois Commerce Commission (ICC) orders, and policy developed by the Illinois Stakeholder Advisory Group (SAG), Opinion Dynamics conducted cost-effectiveness testing for AIC's 2022 portfolio of energy efficiency programs. Cost-effectiveness testing for the Illinois TRC presented in this report aligns with national standard practice, as well as directives presented in the Illinois Energy Efficiency Policy Manual Version 2.1, and incorporates information from AIC program tracking data, Opinion Dynamics' 2022 evaluations of AIC's portfolio and supporting information from the Illinois TRM (IL-TRM).

I.2 2022 COST-EFFECTIVENESS RESULTS

Opinion Dynamics used two separate tests to establish benefit-cost ratios for AIC's 2022 portfolio: the Illinois TRC test and the Program Administrator Cost (PAC) test. The tests are similar in most respects but consider slightly different benefits and costs in determining a benefit-cost ratio.

Illinois state legislation directs that cost-effectiveness testing for investment in energy efficiency or demand response should be conducted using the Illinois TRC test. The Illinois TRC considers the net present value of the total benefits of energy efficiency programs as compared to the total costs of energy efficiency programs. The Illinois TRC takes a broad perspective, considering the net benefits that accrue to utilities, program participants, and society from operation of the programs, and uses a societal discount rate to account for the time value of money.

Additionally, Illinois stakeholders have requested that cost-effectiveness testing also use the PAC test to provide additional context for directing future energy efficiency investments. The PAC analyzes the costs and benefits of energy efficiency investment from the perspective of AIC and does not consider benefits or costs that accrue to other entities in energy efficiency programs.

We report cost-effectiveness results separately for AIC's 2022 Residential and Business Programs and for AIC's 2022 Voltage Optimization Program. The programs are funded through separate mechanisms and track spending separately, and therefore separate cost-effectiveness results were deemed appropriate by the evaluation team. For clarity, throughout this report, when we refer to "AIC's 2022 energy efficiency portfolio," we are referencing AIC's 2022 portfolio less Voltage Optimization.[2]

Overall, AIC's 2022 energy efficiency portfolio was cost-effective as defined by the Illinois TRC test and the PAC test. Table 1 provides the Illinois TRC and PAC test benefit-cost ratios, calculated for the energy efficiency portfolio, the Residential and Business Programs, and the initiatives and channels that compose them.

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[1] 220 ILCS 5/8-103B (Section 8-103B) and 220 ILCS 5/8-104 (Section 8-104)

[2] We note that this terminology is not exactly accurate; the Illinois Policy Manual defines voltage optimization as energy efficiency. Nevertheless, we use this terminology for convenience.

Table 1. Illinois TRC and PAC Test Results for the 2022 AIC Energy Efficiency Portfolio

Program	Initiative	Channel	Illinois TRC Benefit-Cost Ratio	PAC Benefit-Cost Ratio
Residential	Retail Products	Retail Products	7.06	2.71
		Efficient Choice Tool	1.30	1.92
	Income Qualified	Retail Products	7.74	4.11
		Single Family	0.78	0.33
		CAA	0.54[a]	0.34[a]
		Multifamily	1.71	0.48
		Smart Savers	3.82	3.31
		Community Kits	6.76	2.71
		Healthier Homes	0.00	0.00
		Manufactured Homes	0.45	0.14
		Electrification	0.00[b]	0.00[b]
	Public Housing	Public Housing	1.50	0.33
	Multifamily	Multifamily	4.02	0.83
	Market Rate Single Family	Midstream HVAC	2.48	1.83
		Home Efficiency		
	Direct Distribution	School Kits	8.32	3.12
	Market Transformation	Market Transformation	0.00[c]	0.00[c]
Residential Program Total[d]			3.21	1.37
Business	Standard	Core	3.95[e]	2.23[e]
		Building Operator Certification (BOC)	6.84	16.83
	Custom[f]	Custom Incentives	0.98	1.99
		New Construction Lighting		
	Midstream	Lighting	3.00	4.86
		HVAC		
		Food Service		
	Small Business	Direct Install	3.09	1.89
		Energy Performance	1.63	0.93
	Retro-Commissioning	Retro-Commissioning	1.80	0.97
		Virtual Commissioning		
	Streetlighting	Municipality Owned	6.67	9.26
		Utility Owned		
	Market Transformation	Market Transformation	0.00[g]	0.00[g]
Business Program Total			2.35	2.36
2022 AIC Energy Efficiency Portfolio			**2.37**	**1.61**
2022 AIC Energy Efficiency Portfolio (not including IQ)[h]			**2.37**	**1.92**

[a] The Income-Qualified – CAA channel is co-funded by AIC and the Illinois Department of Commerce and Economic Opportunity's Home Weatherization Assistance Program. These results only include the costs associated with the AIC portion of the project.
[b] The Electrification channel did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs. The gas costs were due to a miscategorization during the closing of the Program Year and will be corrected in 2023.
[c] The Residential Program MT offerings did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs.
[d] The Residential Program benefit-cost ratios also include non-participant spillover benefits.
[e] Includes the Online Store channel.
[f] The Custom Initiative includes a number of channels through which services are provided to customers that later complete projects for which savings are claimed through the Standard Initiative.

[g] The Business Program MT offerings did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs, as well as electric incentive costs.
[h] IQ includes all the channels in the Income Qualified Initiative, the Public Housing Initiative, and the Income Qualified channel of the Retail Products Initiative.

AIC's 2022 Voltage Optimization Program was also cost-effective as defined by the Illinois TRC test and the PAC test. Table 2 provides the Illinois TRC and PAC test benefit-cost ratios calculated for the Program.

Table 2. Illinois TRC and PAC Test Results for the 2022 AIC Voltage Optimization Program

Program	Illinois TRC Benefit-Cost Ratio	PAC Benefit-Cost Ratio
Voltage Optimization	2.85	1.78

2. BACKGROUND

Opinion Dynamics analyzed the cost-effectiveness of Ameren Illinois Company (AIC)'s 2022 energy efficiency portfolio and Voltage Optimization Program using the Illinois Total Resource Cost (TRC) test and the Program Administrator Cost (PAC) test. Illinois state legislation directs that cost-effectiveness testing for investment in energy efficiency or demand response should be conducted using the Illinois TRC test. Additionally, Illinois stakeholders have requested that cost-effectiveness testing also use the PAC test to provide additional context for directing future energy efficiency investments. The combination of the TRC and PAC test values provides useful context to direct future investments.

As defined by Illinois state law (220 ILCS 5/8-103B [Section 8-103B]) and presented in the Illinois Energy Efficiency Policy Manual Version 2.1 (the Illinois Policy Manual), the definition of the Illinois TRC test for electric energy efficiency is as follows:

> *"Total resource cost test" or "TRC test" means a standard that is met if, for an investment in energy efficiency or demand-response measures, 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 program to the net present value of the total costs as calculated over the lifetime of the measures. A total resource cost test compares the sum of avoided electric utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures and including avoided costs associated with reduced use of natural gas or other fuels, avoided costs associated with reduced water consumption, and avoided costs associated with reduced operation and maintenance costs, as well as other quantifiable societal benefits, to the sum of all incremental costs of end-use measures that are implemented due to the program (including both utility and participant contributions), plus costs to administer, deliver, and evaluate each demand-side program, to quantify the net savings obtained by substituting the demand-side program for supply resources. In calculating avoided costs of power and energy that an electric utility would otherwise have had to acquire, reasonable estimates shall be included of financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases. In discounting future societal costs and benefits for the purpose of calculating net present values, a societal discount rate based on actual, long-term Treasury bond yields should be used. Notwithstanding anything to the contrary, the TRC test shall not include or take into account a calculation of market price suppression effects or demand reduction induced price effects.*[3]

Illinois state law (220 ILCS 5/8-104 [Section 8-104]) also defines the Illinois TRC for natural gas energy efficiency:

> *"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.*

[3] 20 ILCS 3855/1-10.

As directed by state law, our analysis includes reasonable estimates of the avoided costs associated with the portfolio that relate to future regulation of greenhouse gas emissions. Additionally, as directed by the legislation, we utilized a societal discount rate to calculate the future societal costs and benefits delivered by the programs.

It is valuable for readers to note that the Illinois TRC test exhibits differences from tests referred to as "TRC" conducted in other jurisdictions. In particular, the Illinois TRC's directive to use a societal discount rate differs from the specification of the test in many other jurisdictions. The Illinois TRC also includes non-energy impacts, such as avoided operation and maintenance (O&M) costs, avoided water costs, and avoided costs associated with greenhouse gas emissions.

3. COST-EFFECTIVENESS EVALUATION METHODS

Opinion Dynamics used program data provided by AIC along with the 2022 impact evaluation results to develop the cost-effectiveness analyses at the measure level, using a proprietary Opinion Dynamics tool. These results were then rolled up to produce Illinois TRC and PAC benefit-cost ratios at the channel, initiative, program, and energy efficiency portfolio level. A detailed summary of the benefits and costs associated with each channel/initiative and the broader energy efficiency portfolio is provided in the appendices to this report.

Illinois state law requires AIC's portfolio to be cost-effective at the portfolio level (not including income qualified initiatives) but individual programs, initiatives, channels, or measures are not required to be cost-effective. Nevertheless, our analysis provides program-, initiative-, and channel-level benefit-cost ratios where possible to provide further insight for program planning. In addition, our analysis complies with all Illinois-specific guidance, including the Illinois TRC provisions and definitions of costs included in the Illinois Policy Manual. Table 3 provides high-level detail on the inputs used in the cost-effectiveness analysis, as well as the sources of these inputs.

Table 3. Inputs and Sources for Cost-Effectiveness Analysis

Category	Input	Source
Program-specific inputs	▪ Net electric energy savings (including heating penalties and not including secondary savings from water supply and wastewater treatment)[a,b] ▪ Net electric demand savings[a] ▪ Net natural gas energy savings (including heating penalties)[a] ▪ Net propane savings[a] ▪ Measure counts	Opinion Dynamics evaluation of the 2022 AIC portfolio
	▪ Incremental measure costs ▪ Operations and maintenance costs ▪ Water savings (gallons)	Opinion Dynamics analysis using IL-TRM V10.0
	▪ Incentive costs ▪ Non-incentive costs	AIC
Portfolio inputs	▪ Portfolio administrative, Market Development Initiative, marketing, and evaluation, measurement, and verification costs	AIC
	▪ Net electric energy savings (including heating penalties and secondary savings) from residential nonparticipant spillover (NPSO) ▪ Net electric demand savings from residential NPSO ▪ Net natural gas energy savings (including heating penalties) from residential NPSO	Opinion Dynamics evaluation of the 2022 AIC portfolio
Assumptions	▪ Avoided costs of electric production ▪ Avoided costs of electric capacity ▪ Avoided costs of natural gas production ▪ Avoided costs of propane ▪ Avoided costs of water ▪ Avoided costs of greenhouse gas emissions ▪ Avoided costs of public health impacts ▪ Line losses ▪ Discount rate	AIC

[a] All net savings include temporal elements (including measure lives, baseline shifts, etc.) per the Illinois persisting savings framework.

[b] Secondary savings from water supply and wastewater treatment are not included in the Illinois TRC because monetized benefits from water savings inherently include these benefits.

To assess cost-effectiveness, the team began with a valuation of each program's and the portfolio's net total benefits and costs, discussed in more detail in Sections 3.1 and 3.2.

3.1 PORTFOLIO BENEFITS CONSIDERED

As directed in Illinois state law, our analysis included benefits associated with the 2022 AIC portfolio. These benefits are made up of a number of avoided costs, which are costs no longer incurred due to the energy efficiency programs under evaluation. Our analysis included avoided costs as defined in Table 4.

Table 4. Portfolio Benefits Considered

Benefit	Definition	Included In	
		Illinois TRC	PAC
Avoided cost of electric energy (electric production)	Dollars per net kWh saved	✓	✓
Avoided cost of demand for electricity (electric capacity)	Dollars per net kW saved	✓	✓
Avoided cost of natural gas (gas production)	Dollars per net therm saved	✓	✓
Avoided cost of propane (propane production)	Dollars per net gallon saved	✓	✓
Avoided line losses (transmission and distribution [T&D] costs)	Percentage of energy lost during T&D applied to net savings	✓	✓
Avoided O&M costs	Net dollars saved	✓	
Avoided cost of water	Dollars per net gallon of water saved	✓	
Avoided costs of greenhouse gas emissions	Dollars per net kWh, therm, and/or gallon saved	✓	
Avoided costs of public health impacts	Dollars per net kWh, therm, and/or gallon saved	✓	

Opinion Dynamics developed estimates of units of energy and water saved over time, as well as dollar estimates of avoided O&M costs. AIC provided avoided cost schedules, line loss factors, and a societal discount rate assumption, which were used to convert units of energy and water saved over time to a net present value (NPV) of total avoided costs in dollars.[4]

All benefits listed above are included in the Illinois TRC test. The avoided cost of water, the avoided cost of propane, and the avoided O&M costs are participant benefits only and are excluded from calculation of the PAC test. Avoided costs of greenhouse gas emissions and public health impacts are societal benefits explicitly defined for consideration in the Illinois TRC and are also excluded from calculation of the PAC test.

3.2 PORTFOLIO COSTS CONSIDERED

Our analysis also considered costs associated with the operation of the portfolio. The costs considered fall into four categories as defined in Table 5, and are in alignment with cost definitions from the Illinois Policy Manual.

[4] The assumptions used within this report align with the assumptions AIC used in their 2022-2025 Energy Efficiency Plan filing, except the discount rate which we updated to match the value presented in the IL-TRM V10.0, which is required to be used by the Illinois Policy Manual V2.1.

Table 5. Portfolio Costs Considered

Cost	Definition	Included In	
		Illinois TRC	PAC
Net incremental measure costs	▪ Incremental expenses associated with the installation of energy efficiency measures, including both customer- and utility- side costs ▪ For cost-effectiveness analysis, net-to-gross ratios (NTGRs) are applied to incremental costs to ensure that only net incremental costs are considered in the analysis	✓	✓[a]
Administrative costs associated with individual initiatives	AIC incurs administrative costs to operate energy efficiency programs; this category includes non-incentive costs associated with operation of individual initiatives	✓	✓
Administrative costs associated with the portfolio	AIC incurs administrative costs to operate energy efficiency programs; this category includes non-incentive costs associated with operation of the portfolio overall, including marketing and education, Market Development Initiative (MDI), and evaluation, measurement, and verification (EM&V)	✓	✓
Incentive costs	Financial incentives paid to customers and incentives paid to third parties (as defined by the Illinois Policy Manual)		✓

[a] Incremental measure costs are not typically included in the PAC test. However, the ongoing O&M costs associated with the Voltage Optimization Program are considered to be the incremental costs. Since these costs are incurred by the utility, we include them in the PAC.

All costs listed above are included in the PAC test. Incentive costs are not included in calculation of the Illinois TRC test to prevent double counting.[5]

3.2.1 INCREMENTAL COSTS

As defined in the Illinois Policy Manual, "incremental costs" are the difference between the cost of the efficient measure and the cost of the most relevant baseline measure that would have been installed in the absence of an energy efficiency program. The Illinois Policy Manual directs those conducting cost-effectiveness testing to consider installation costs and O&M costs in calculation of incremental costs if there is a difference between the baseline and efficient measures. In accordance with further Policy Manual guidance to consider avoided O&M costs as a benefit in some cases, however, we do not include avoided O&M costs in incremental costs as part of this analysis but break them out separately for consideration.

Opinion Dynamics generally used the IL-TRM to define gross incremental costs in the 2022 cost-effectiveness analysis. In some cases, prescriptive incremental costs are not provided in the IL-TRM or the IL-TRM recommends using actual installation costs (e.g., retrofit measures where the assumed baseline expenditure is $0). In those cases, we sourced measure cost information from the program tracking database.

As directed by the Illinois Policy Manual, we then applied net-to-gross ratios (NTGRs) to ensure that only net incremental costs were considered in our analysis. Table 6 provides additional detail on the source of incremental costs used in our analysis by initiative.

Table 6. Incremental Cost Source Detail

Program	Initiative	Incremental Cost Source
Residential Program	Retail Products	Measure costs or measure cost assumptions were sourced from a combination of the IL-TRM V10.0 and program tracking data.

[5] Illinois Policy Manual for Energy Efficiency Version 2.1, Page 39, footnote 58.

	Income Qualified	Measure costs for most measures were sourced from the program tracking data. In cases where using IL-TRM assumptions was necessary (e.g., early replacements), we used cost assumptions from IL-TRM V10.0.
	Public Housing	Measure costs were sourced from the program tracking data.
	Multifamily	Measure costs for most measures were sourced from the program tracking data. In cases where using TRM assumptions was necessary (e.g., early replacements) we used cost assumptions from IL-TRM V10.0.
	Market Rate Single Family	Measure costs or measure cost assumptions were sourced from a combination of the IL-TRM V10.0 and program tracking data.
	Direct Distribution	Measure costs were sourced from the program tracking data.
Business Program	Standard	For almost all measures, measure costs or measure cost guidance (e.g., incremental costs for some measures are defined as a function of measure size or another measure parameter) were sourced from the IL-TRM V10.0.
	Custom	In most cases, the evaluation team considered projects to be retrofits and used the total project costs provided by AIC as the incremental cost. In some cases (e.g. New Construction Lighting), projects are considered incremental and AIC provided applicable incremental costs.
	Small Business	For almost all measures, measure costs or measure cost guidance (e.g., incremental costs for some measures are defined as a function of measure size or another measure parameter) were sourced from the IL-TRM V10.0.
	Midstream	For almost all measures, measure costs or measure cost guidance (e.g., incremental costs for some measures are defined as a function of measure size or another measure parameter) were sourced from the IL-TRM V10.0.
	Retro-Commissioning	The evaluation team considered projects to be retrofits and used the reported project costs provided by AIC (including the cost of retro-commissioning studies) as the incremental cost.
	Streetlighting	Per IL-TRM V10.0 guidance, we assumed that the total project cost was the incremental cost.
Voltage Optimization		AIC's ongoing O&M costs for Voltage Optimization over the life of the circuits are considered to be the incremental costs for the Program. To determine these costs for our analysis, we took AIC's annual O&M cost estimates for circuits evaluated in 2022, extended them over the life of the circuits, and discounted costs to present value.

3.3 OTHER ASSUMPTIONS

As directed by legislation, Opinion Dynamics used a societal discount rate to conduct the 2022 cost-effectiveness analysis. Opinion Dynamics used a nominal discount rate of 2.40% in the analysis (real discount rate of 0.42%) as presented in the IL-TRM V10.0 and required by the Illinois Policy Manual V2.1.

4. RESULTS, FINDINGS, AND RECOMMENDATIONS

Overall, AIC's 2022 energy efficiency portfolio was cost-effective as defined by the Illinois TRC test and the PAC test. Table 7 provides the Illinois TRC and PAC test benefit-cost ratios, calculated for the energy efficiency portfolio, the Residential and Business Programs, and the initiatives and channels that compose them.

Table 7. Illinois TRC and PAC Test Results for the 2022 AIC Energy Efficiency Portfolio

Program	Initiative	Channel	Illinois TRC Benefit-Cost Ratio	PAC Benefit-Cost Ratio
Residential	Retail Products	Retail Products	7.06	2.71
		Efficient Choice Tool	1.30	1.92
	Income Qualified	Retail Products	7.74	4.11
		Single Family	0.78	0.33
		CAA	0.54[a]	0.34[a]
		Multifamily	1.71	0.48
		Smart Savers	3.82	3.31
		Community Kits	6.76	2.71
		Healthier Homes	0.00	0.00
		Manufactured Homes	0.45	0.14
		Electrification	0.00[b]	0.00[b]
	Public Housing	Public Housing	1.50	0.33
	Multifamily	Multifamily	4.02	0.83
	Market Rate Single Family	Midstream HVAC	2.48	1.83
		Home Efficiency		
	Direct Distribution	School Kits	8.32	3.12
	Market Transformation	Market Transformation	0.00[c]	0.00[c]
Residential Program Total[d]			3.21	1.37
Business	Standard	Core	3.95[e]	2.23[e]
		Building Operator Certification (BOC)	6.84	16.83
	Custom[f]	Custom Incentives	0.98	1.99
		New Construction Lighting		
	Midstream	Lighting	3.00	4.86
		HVAC		
		Food Service		
	Small Business	Direct Install	3.09	1.89
		Energy Performance	1.63	0.93
	Retro-Commissioning	Retro-Commissioning	1.80	0.97
		Virtual Commissioning		
	Streetlighting	Municipality Owned	6.67	9.26
		Utility Owned		
	Market Transformation	Market Transformation	0.00[g]	0.00[g]

Program	Initiative	Channel	Illinois TRC Benefit-Cost Ratio	PAC Benefit-Cost Ratio
Business Program Total			2.35	2.36
2022 AIC Energy Efficiency Portfolio			**2.37**	**1.61**
2022 AIC Energy Efficiency Portfolio (not including IQ)[h]			**2.37**	**1.92**

[a] The Income-Qualified – CAA channel is co-funded by AIC and the Illinois Department of Commerce and Economic Opportunity's Home Weatherization Assistance Program. These results only include the costs incurred by AIC to deliver the channel.
[b] The Electrification channel did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs. The gas costs were due to a miscategorization during the closing of the Program Year and will be corrected in 2023.
[c] The Residential Program MT offerings did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs.
[d] The Residential Program benefit-cost ratios also include non-participant spillover benefits.
[e] Includes the Online Store channel.
[f] The Custom Initiative includes a number of channels through which services are provided to customers that later complete projects for which savings are claimed through the Standard Initiative.
[g] The Business Program MT offerings did not produce quantifiable benefits in 2022 but did incur both electric and gas non-incentive costs, as well as electric incentive costs.
[h] IQ includes all the channels in the Income Qualified Initiative, the Public Housing Initiative, and the Income Qualified channel of the Retail Products Initiative.

AIC's 2022 Voltage Optimization Program was also cost-effective as defined by the Illinois TRC test and the PAC test. Table 10 provides the Illinois TRC and PAC test benefit-cost ratios calculated for the Program.

Table 8. Illinois TRC and PAC Test Results for the 2022 AIC Voltage Optimization Program

Program	Illinois TRC Benefit-Cost Ratio	PAC Benefit-Cost Ratio
Voltage Optimization	2.85	1.78

4.1 KEY FINDINGS

Key findings from the 2022 cost-effectiveness analysis are presented below.

- **Key Finding #1**: Overall, AIC's 2022 energy efficiency portfolio was cost-effective based on the Illinois TRC test.
- **Key Finding #2**: The 2022 Residential, Business, and Voltage Optimization Programs were cost-effective based on the Illinois TRC.[6]
- **Key Finding #3**: Five channels operated by AIC in 2022 (the Income Qualified Initiative's -- CAA, Single Family, Manufactured Homes, and Healthier Homes channels, and the Custom Initiative) were not cost-effective in 2022 based on the Illinois TRC.[7]
  - The Income Qualified Initiative – CAA channel had an Illinois TRC benefit-cost ratio of 0.54.
  - The Income Qualified Initiative – Single Family channel had an Illinois TRC benefit-cost ratio of 0.78.
  - The Income Qualified Initiative – Manufactured Homes channel had an Illinois TRC benefit-cost ratio of 0.45.
  - The Income Qualified Initiative – Healthier Homes channel had an Illinois TRC benefit-cost ratio of 0.00.

[6] Portfolio-level administrative costs were not considered as part of the benefit-cost ratios presented for individual programs or initiatives, and therefore, individual program and initiative benefit-cost ratios are inflated as compared to the portfolio-level benefit-cost ratio.
[7] The Residential Market Transformation Initiative, Business Market Transformation Initiative, and Income Qualified – Electrification channel also did not screen as cost-effective but are not called out here because they did not claim any energy savings.

- As discussed in the AIC 2022 Residential Program Impact Evaluation Report, the Healthier Homes channel did not fully launch in 2022, and this finding should not be interpreted to reflect a fully functioning program.

- The Custom Initiative had an Illinois TRC benefit-cost ratio of 0.98.

APPENDIX A. ENERGY EFFICIENCY PORTFOLIO COST-EFFECTIVENESS TABLES

Detailed cost-effectiveness results for the AIC energy efficiency portfolio, aligning with the SA template for cost-effectiveness reporting and including initiative-level benefits, costs, and benefit-cost ratios, are provided in Table 9, Table 10, Table 11, and [a] This row excludes the benefits and costs from all of the Income Qualified channels, as well as the Public Housing Initiative.

Table 12 below. The results are also attached as a spreadsheet.

Table 9. 2022 AIC Energy Efficiency Portfolio Cost-Effectiveness Benefits

Program	Avoided Electric Production	Avoided Electric Capacity	Avoided Gas Production	Avoided Propane Costs	Avoided Water Costs	Avoided T&D Costs	Avoided O&M Costs	Societal NEIs	Avoided GHG Emissions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Residential Program	$38,777,566	$25,033,179	$4,837,049	$44,435	$7,564,386	$4,626,665	$26,093,346	$7,620,641	$36,594,531
Retail Products	$11,990,358	$8,445,110	$1,941,127	$30,517	$314,453	$1,571,197	$11,168,908	$2,494,811	$11,467,034
Retail Products - Efficient Choice Tool	$380,118	$139,718	$206,509	$0	$101,783	$25,647	$26,952	$78,560	$493,196
Income Qualified - Retail Products	$16,770,889	$9,202,474	-$2,008,136	$13,918	$515,413	$1,698,201	$12,289,489	$3,047,405	$12,499,780
Income Qualified - Single Family	$2,183,938	$1,807,136	$1,990,134	$0	$1,440,627	$332,279	$955,800	$521,041	$3,513,279
Income Qualified - CAA	$369,051	$402,219	$549,240	$0	$62,095	$73,446	$60,943	$92,385	$787,841
Income Qualified - Multifamily	$1,697,956	$791,378	$197,079	$0	$1,286,701	$146,260	$579,980	$311,747	$1,616,480
Income Qualified - Smart Savers	$373,810	$473,356	$560,047	$0	$0	$87,162	$0	$105,913	$756,529
Income Qualified - Community Kits	$322,061	$151,431	$230,990	$0	$1,613,822	$28,031	$155,599	$75,949	$455,165
Income Qualified - Healthier Homes	$158	$90	-$18	$0	$0	$17	$104	$29	$118
Income Qualified - Manufactured Homes	$32,317	$41,753	$126,063	$0	$19,520	$7,660	$4,651	$13,554	$131,544
Income Qualified - Electrification	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Housing	$305,189	$143,075	$22,366	$0	$231,355	$26,459	$18,130	$54,343	$281,504
Multifamily	$396,138	$198,615	$14,132	$0	$125,210	$36,904	$65,500	$71,118	$351,482
Market Rate Single Family	$2,105,005	$2,251,641	$276,858	$0	$100,633	$410,229	$19,058	$359,609	$2,078,836
School Kits	$1,389,026	$663,592	$579,453	$0	$1,752,775	$123,433	$748,231	$295,666	$1,655,664

Program	Avoided Electric Production	Avoided Electric Capacity	Avoided Gas Production	Avoided Propane Costs	Avoided Water Costs	Avoided T&D Costs	Avoided O&M Costs	Societal NEIs	Avoided GHG Emissions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Market Transformation	$0	$0	$0	$0	$0	$0	$0	$0	$0
NPSO	$461,550	$321,591	$151,206	$0	$0	$59,740	$0	$98,512	$506,081
Business Program	$71,178,809	$36,197,085	$5,187,953	$19,504	$962,297	$6,636,398	$26,877,426	$12,428,125	$66,285,007
Standard	$13,416,645	$8,875,231	$1,398,438	$0	$818,942	$1,628,523	$4,184,836	$2,445,180	$12,757,673
Standard - Building Operator Certification	$425,698	$185,921	$61,556	$0	$0	$34,445	$0	$83,713	$408,695
Custom	$10,374,411	$5,606,572	$7,584,957	$7,541	$0	$1,024,469	$0	$2,223,403	$15,270,982
Midstream	$11,077,062	$8,108,556	-$1,366,711	$0	$143,355	$1,482,842	$9,930,402	$1,781,306	$8,543,262
Small Business - Direct Install	$22,447,354	$13,184,664	-$2,800,792	$0	$0	$2,422,889	$9,480,174	$3,830,576	$16,977,225
Small Business - Energy Performance	$71,460	$155,783	$139,631	$11,963	$0	$28,305	$0	$18,967	$185,733
Retro-Commissioning	$1,403,975	$80,360	$170,873	$0	$0	$14,924	$0	$301,867	$1,273,379
Streetlighting	$11,962,204	$0	$0	$0	$0	$0	$3,282,014	$1,743,113	$10,868,058
Market Transformation	$0	$0	$0	$0	$0	$0	$0	$0	$0
Portfolio Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0
Market Development Initiative	$0	$0	$0	$0	$0	$0	$0	$0	$0
EM&V	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marketing & Education	$0	$0	$0	$0	$0	$0	$0	$0	$0
Administrative Expenses	$0	$0	$0	$0	$0	$0	$0	$0	$0
Program Implementation	$0	$0	$0	$0	$0	$0	$0	$0	$0
AIC 2022 Portfolio	**$109,956,375**	**$61,230,264**	**$10,025,002**	**$63,939**	**$8,526,684**	**$11,263,063**	**$52,970,772**	**$20,048,766**	**$102,879,539**

Table 10. 2022 AIC Energy Efficiency Portfolio Cost-Effectiveness Costs

Program	Non-Incentive Costs (Electric)	Non-Incentive Costs (Gas)	Incentive Costs (Electric)	Incentive Costs (Gas)	Incremental Costs (Net)
(a)	(k)	(l)	(m)	(n)	(o)
Residential Program	$18,140,972	$2,385,793	$26,919,262	$5,974,969	$26,578,277

Program	Non-Incentive Costs (Electric)	Non-Incentive Costs (Gas)	Incentive Costs (Electric)	Incentive Costs (Gas)	Incremental Costs (Net)
(a)	(k)	(l)	(m)	(n)	(o)
Retail Products	$2,063,005	$173,602	$5,100,064	$1,510,317	$4,760,949
Retail Products - Efficient Choice Tool	$342,391	$50,245	$0	$0	$724,250
Income Qualified - Retail Products	$887,868	$66,205	$4,660,459	$634,008	$6,025,622
Income Qualified - Single Family	$6,950,353	$1,042,106	$9,005,507	$2,271,698	$8,367,697
Income Qualified - CAA	$1,715,598	$399,849	$1,211,037	$771,297	$2,326,876
Income Qualified - Multifamily	$2,440,719	$141,087	$3,237,655	$110,791	$1,292,163
Income Qualified - Smart Savers	$235,114	$29,590	$177,238	$9,328	$351,875
Income Qualified - Community Kits	$238,149	$32,310	$0	$0	$177,966
Income Qualified - Healthier Homes	$134,316	$18,316	$1,171	$113	$85
Income Qualified - Manufactured Homes	$509,757	$180,742	$373,705	$443,661	$142,467
Income Qualified - Electrification	$195,162	$55,653[a]	$0	$0	$0
Public Housing	$558,430	$46,930	$906,080	$7,824	$118,369
Multifamily	$212,739	$8,904	$539,215	$19,103	$91,868
Market Rate Single Family	$1,342,712	$98,133	$1,187,707	$125,999	$1,625,926
School Kits	$259,163	$34,653	$519,425	$70,831	$572,165
Market Transformation	$55,495	$7,470	$0	$0	$0
NPSO	$0	$0	$0	$0	$0
Business Program	$15,668,714	$2,135,663	$29,121,504	$3,503,645	$78,467,570
Standard	$3,082,730	$382,637	$6,263,479	$1,644,322	$8,065,132
Standard - Building Operator Certification	$37,008	$5,033	$0	$0	$133,465
Custom	$3,778,033	$1,200,619	$5,793,915	$1,597,033	$38,167,925
Midstream	$1,375,962	$79,494	$2,467,398	$51,813	$11,773,928
Small Business - Direct Install	$5,487,970	$0	$13,120,944	$0	$15,755,365
Small Business - Energy Performance	$80,075	$102,220	$84,691	$157,707	$192,335
Retro-Commissioning	$1,226,086	$294,992	$149,739	$52,770	$282,794
Streetlighting	$81,410	$0	$1,210,072	$0	$4,096,626
Market Transformation	$519,439	$70,669	$31,265	$0	$0
Portfolio Costs	$14,147,374	$1,503,756	$0	$0	$0
Market Development Initiative	$3,605,097	$4,012	$0	$0	$0
EM&V	$2,926,033	$458,144	$0	$0	$0

Program	Non-Incentive Costs (Electric)	Non-Incentive Costs (Gas)	Incentive Costs (Electric)	Incentive Costs (Gas)	Incremental Costs (Net)
(a)	(k)	(l)	(m)	(n)	(o)
Marketing & Education	$1,956,690	$291,951	$0	$0	$0
Administrative Expenses	$5,421,505	$754,800	$0	$0	$0
Program Implementation	$238,049	-$5,151	$0	$0	$0
AIC 2022 Portfolio	**$47,957,060**	**$6,025,212**	**$56,040,766**	**$9,478,614**	**$105,045,847**

[a] These costs are due to a mis-categorization that occurred during the closing of the Program Year and will be corrected in 2023.

Table 11. 2022 AIC Energy Efficiency Portfolio Illinois Total Resource Cost Test

Program	IL TRC Benefits	IL TRC Costs	IL TRC Test Net Benefits	IL TRC Test Ratio – with NEIs	IL TRC Test Ratio – without NEIs
(a)	(p) =(b+c+d+e+f+g+h+i+j)	(q) =(k+l+o)	(r)=(p-q)	(s)=(p/q)	(w)=[(p-i)/q]
Residential Program	$151,191,798	$47,105,042	$104,086,757	3.21	3.05
Retail Products	$49,423,516	*$6,997,555*	*$42,425,961*	*7.06*	*6.71*
Retail Products - Efficient Choice Tool	$1,452,484	*$1,116,886*	*$335,598*	*1.30*	*1.23*
Income Qualified - Retail Products	$54,029,433	*$6,979,696*	*$47,049,737*	*7.74*	*7.30*
Income Qualified - Single Family	$12,744,235	*$16,360,155*	*-$3,615,921*	*0.78*	*0.75*
Income Qualified - CAA	$2,397,221	*$4,442,323*	*-$2,045,102*	*0.54*	*0.52*
Income Qualified - Multifamily	$6,627,580	*$3,873,969*	*$2,753,612*	*1.71*	*1.63*
Income Qualified - Smart Savers	$2,356,817	*$616,579*	*$1,740,238*	*3.82*	*3.65*
Income Qualified - Community Kits	$3,033,048	*$448,425*	*$2,584,623*	*6.76*	*6.59*
Income Qualified - Healthier Homes	$497	*$152,717*	*-$152,220*	*0.00*	*0.00*
Income Qualified - Manufactured Homes	$377,062	*$832,966*	*-$455,904*	*0.45*	*0.44*
Income Qualified - Electrification	$0	*$250,815*	*-$250,815*	*0.00*	*0.00*
Public Housing	$1,082,421	*$723,728*	*$358,693*	*1.50*	*1.42*
Multifamily	$1,259,099	*$313,511*	*$945,588*	*4.02*	*3.79*
Market Rate Single Family	$7,601,868	*$3,066,771*	*$4,535,097*	*2.48*	*2.36*
School Kits	$7,207,840	*$865,982*	*$6,341,858*	*8.32*	*7.98*

Program	IL TRC Benefits	IL TRC Costs	IL TRC Test Net Benefits	IL TRC Test Ratio – with NEIs	IL TRC Test Ratio – without NEIs
(a)	(p) =(b+c+d+e+f+g+h+i+j)	(q) =(k+l+o)	(r)=(p-q)	(s)=(p/q)	(w)=[(p-i)/q]
Market Transformation	$0	*$62,965*	*-$62,965*	*0.00*	*0.00*
NPSO	*$1,598,678*	*$0*	*$1,598,678*	*N/A*	*N/A*
Business Program	$225,772,605	$96,271,947	$129,500,658	2.35	2.22
Standard	*$45,525,468*	*$11,530,499*	*$33,994,969*	*3.95*	*3.74*
Standard - Building Operator Certification	*$1,200,029*	*$175,506*	*$1,024,523*	*6.84*	*6.36*
Custom	*$42,092,336*	*$43,146,577*	*-$1,054,241*	*0.98*	*0.92*
Midstream	*$39,700,074*	*$13,229,384*	*$26,470,690*	*3.00*	*2.87*
Small Business - Direct Install	*$65,542,091*	*$21,243,335*	*$44,298,756*	*3.09*	*2.90*
Small Business - Energy Performance	*$611,841*	*$374,630*	*$237,211*	*1.63*	*1.58*
Retro-Commissioning	*$3,245,377*	*$1,803,872*	*$1,441,505*	*1.80*	*1.63*
Streetlighting	*$27,855,388*	*$4,178,036*	*$23,677,353*	*6.67*	*6.25*
Market Transformation	*$0*	*$590,107*	*-$590,107*	*0.00*	*0.00*
Portfolio Costs	$0	$15,651,130	-$15,651,130	N/A	N/A
Market Development Initiative	*$0*	*$3,609,108*	*-$3,609,108*	*N/A*	*N/A*
EM&V	*$0*	*$3,384,177*	*-$3,384,177*	*N/A*	*N/A*
Marketing & Education	*$0*	*$2,248,642*	*-$2,248,642*	*N/A*	*N/A*
Administrative Expenses	*$0*	*$6,176,306*	*-$6,176,306*	*N/A*	*N/A*
Program Implementation	*$0*	*$232,897*	*-$232,897*	*N/A*	*N/A*
AIC 2022 Portfolio	**$376,964,403**	**$159,028,119**	**$217,936,285**	**2.37**	**2.24**
AIC 2022 Portfolio (not including IQ)[a]	**$294,316,091**	**$124,346,747**	**$169,969,344**	**2.37**	**2.24**

[a] This row excludes the benefits and costs from all of the Income Qualified channels, as well as the Public Housing Initiative.

Table 12. 2022 AIC Energy Efficiency Portfolio Utility Cost Test/Program Administrator Cost Test

Program	PAC Benefits	PAC Costs	PAC Test Net Benefits	PAC Test Ratio
(a)	(x) =(b+c+d+g)	(y) =(k+l+m+n)	(z)=(x-y)	(aa)=(x/y)
Residential Program	$73,274,459	$53,420,996	$19,853,463	1.37
Retail Products	$23,947,792	*$8,846,987*	*$15,100,805*	*2.71*

Program	PAC Benefits	PAC Costs	PAC Test Net Benefits	PAC Test Ratio
(a)	(x) =(b+c+d+g)	(y) =(k+l+m+n)	(z)=(x-y)	(aa)=(x/y)
Retail Products - Efficient Choice Tool	$751,992	*$392,636*	*$359,357*	*1.92*
Income Qualified - Retail Products	$25,663,429	*$6,248,541*	*$19,414,888*	*4.11*
Income Qualified - Single Family	$6,313,487	*$19,269,663*	*-$12,956,176*	*0.33*
Income Qualified - CAA	$1,393,957	*$4,097,781*	*-$2,703,824*	*0.34*
Income Qualified - Multifamily	$2,832,673	*$5,930,252*	*-$3,097,579*	*0.48*
Income Qualified - Smart Savers	$1,494,375	*$451,270*	*$1,043,105*	*3.31*
Income Qualified - Community Kits	$732,514	*$270,459*	*$462,055*	*2.71*
Income Qualified - Healthier Homes	$246	*$153,916*	*-$153,670*	*0.00*
Income Qualified - Manufactured Homes	$207,793	*$1,507,864*	*-$1,300,071*	*0.14*
Income Qualified - Electrification	$0	*$250,815*	*-$250,815*	*0.00*
Public Housing	$497,089	*$1,519,263*	*-$1,022,174*	*0.33*
Multifamily	$645,790	*$779,961*	*-$134,171*	*0.83*
Market Rate Single Family	$5,043,732	*$2,754,551*	*$2,289,181*	*1.83*
School Kits	$2,755,504	*$884,072*	*$1,871,433*	*3.12*
Market Transformation	$0	*$62,965*	*-$62,965*	*0.00*
NPSO	$994,086	*$0*	*$994,086*	*N/A*
Business Program	$119,200,245	$50,429,527	$68,770,718	2.36
Standard	*$25,318,837*	*$11,373,168*	*$13,945,669*	*2.23*
Standard - Building Operator Certification	*$707,621*	*$42,041*	*$665,580*	*16.83*
Custom	*$24,590,409*	*$12,369,601*	*$12,220,809*	*1.99*
Midstream	*$19,301,749*	*$3,974,666*	*$15,327,082*	*4.86*
Small Business - Direct Install	*$35,254,115*	*$18,608,914*	*$16,645,201*	*1.89*
Small Business - Energy Performance	*$395,179*	*$424,694*	*-$29,515*	*0.93*
Retro-Commissioning	*$1,670,131*	*$1,723,587*	*-$53,456*	*0.97*
Streetlighting	*$11,962,204*	*$1,291,482*	*$10,670,721*	*9.26*
Market Transformation	*$0*	*$621,372*	*-$621,372*	*0.00*
Portfolio Costs	$0	$15,651,130	-$15,651,130	*N/A*
Market Development Initiative	*$0*	*$3,609,108*	*-$3,609,108*	*N/A*
EM&V	*$0*	*$3,384,177*	*-$3,384,177*	*N/A*
Marketing & Education	*$0*	*$2,248,642*	*-$2,248,642*	*N/A*

Program	PAC Benefits	PAC Costs	PAC Test Net Benefits	PAC Test Ratio
(a)	(x) =(b+c+d+g)	(y) =(k+l+m+n)	(z)=(x-y)	(aa)=(x/y)
Administrative Expenses	*$0*	*$6,176,306*	*-$6,176,306*	*N/A*
Program Implementation	*$0*	*$232,897*	*-$232,897*	*N/A*
AIC 2022 Portfolio	**$192,474,704**	**$119,501,653**	**$72,973,051**	**1.61**
AIC 2022 Portfolio (not including IQ)	**$153,339,141**	**$79,801,830**	**$73,537,312**	**1.92**

APPENDIX B. VOLTAGE OPTIMIZATION PROGRAM COST-EFFECTIVENESS TABLES

Detailed cost-effectiveness results for the Voltage Optimization Program, aligning with the SAG template for cost-effectiveness reporting and including program-level benefits, costs, and benefit-cost ratios, are provided in Table 13, Table 14, Table 15, and Table 16 below. The results are also attached as a spreadsheet.

Table 13. 2022 AIC Voltage Optimization Program Cost-Effectiveness Benefits

Program	Avoided Electric Production	Avoided Electric Capacity	Avoided Gas Production	Avoided Water Costs	Avoided T&D Costs	Avoided O&M Costs	Societal NEIs	Avoided GHG Emissions
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Voltage Optimization	$36,251,427	$22,251,392	$0	$0	$4,064,391	$0	$6,029,335	$31,740,968

Table 14. 2022 AIC Voltage Optimization Program Cost-Effectiveness Costs

Program	Non-Incentive Costs (Electric)	Non-Incentive Costs (Gas)	Incentive Costs (Electric)	Incentive Costs (Gas)	Incremental Costs (Net)
(a)	(j)	(k)	(l)	(m)	(n)
Voltage Optimization	$25,606,991	$0	$0	$0	$9,580,979

Table 15. 2022 AIC Voltage Optimization Program Illinois Total Resource Cost Test

Program	IL TRC Benefits	IL TRC Costs	IL TRC Test Net Benefits	IL TRC Test Ratio – with NEIs	IL TRC Test Ratio – without NEIs
(a)	(o) =(b+c+d+e+f+g+h+i)	(p) =(j+k+n)	(q)=(o-p)	(r)=(o/p)	(v)=[(o-h)/p]
Voltage Optimization	$100,337,513	$35,187,970	$65,149,543	2.85	2.68

Table 16. 2022 AIC Voltage Optimization Program Utility Cost Test/Program Administrator Cost Test

Program	PAC Benefits	PAC Costs	PAC Test Net Benefits	PAC Test Ratio
(a)	(w) =(b+c+d+f)	(x) =(j+k+l+m)	(y)=(w-x)	(z)=(w/x)
Voltage Optimization	$62,567,210	$35,187,970	$27,379,240	1.78

Note: For the purposes of the PAC, the evaluation team adjusted the costs to include incremental measure costs because these costs are borne by the utility.