



Opinion **Dynamics**

2020 INTEGRATED IMPACT EVALUATION REPORT

APRIL 30, 2021



AMEREN
ILLINOIS



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1. EXECUTIVE SUMMARY

This report presents impact evaluation results from Ameren Illinois Company's (AIC) portfolio of energy efficiency programs implemented during the 2020 calendar year. The overarching objective of the 2020 impact evaluation is to determine the gross and net electric energy, electric demand, and natural gas impacts associated with the AIC energy efficiency portfolio. The purpose of this report is to aggregate results from AIC's Residential, Business, and Voltage Optimization Programs and present the utility's performance relative to electric energy savings metrics codified in the Future Energy Jobs Act (FEJA).

Key performance metrics for the portfolio include:

- **Cumulative Persisting Annual Savings (CPAS):** Electric energy savings goals for Illinois utilities are defined based on persisting savings as a percentage of sales. As such, annual evaluations of AIC's programs, including this one, present both first-year savings, as well as persisting savings over the life of delivered measures.
- **Weighted Average Measure Life (WAML):** FEJA allows AIC to create a regulatory asset and amortize and recover the total expenditures of that regulatory asset "over a period that is equal to the weighted average of the measure lives implemented for that year that are reflected in the regulatory asset."¹ Therefore, we present WAML for AIC's electric energy efficiency programs within this report in accordance with the guidelines for calculation presented in the Illinois Stakeholder Advisory Group's (SAG) WAML Report.²
- **Applicable Annual Incremental Goal (AAIG):** The AAIG is defined as the difference between the cumulative persisting electric savings goal for the year being evaluated and the cumulative persisting electric savings goal for the previous year. The utility must achieve sufficient savings through its programs to replace savings from measures at the end of their measure life before progress can be counted towards the AAIG.

1.1 OVERVIEW OF THE AIC PORTFOLIO

AIC's 2020 portfolio is made up of three programs: the Residential Program, the Business Program, and the Voltage Optimization Program. The Residential and Business Programs are split into a number of initiatives, as detailed below:

- **Residential Program**
 - Retail Products Initiative
 - Income Qualified Initiative
 - Public Housing Initiative
 - Multifamily Initiative
 - Heating and Cooling (HVAC) Initiative
 - Appliance Recycling Initiative
 - Direct Distribution of Efficient Products (Direct Distribution) Initiative
- **Business Program**
 - Standard Initiative
 - Custom Initiative
 - Retro-Commissioning (RCx) Initiative
 - Streetlighting Initiative
 - Building Operator Certification (BOC)³
- **Voltage Optimization Program**

¹ Weighted Average Measure Life Report. Illinois Energy Efficiency Stakeholder Advisory Group. February 20, 2018.

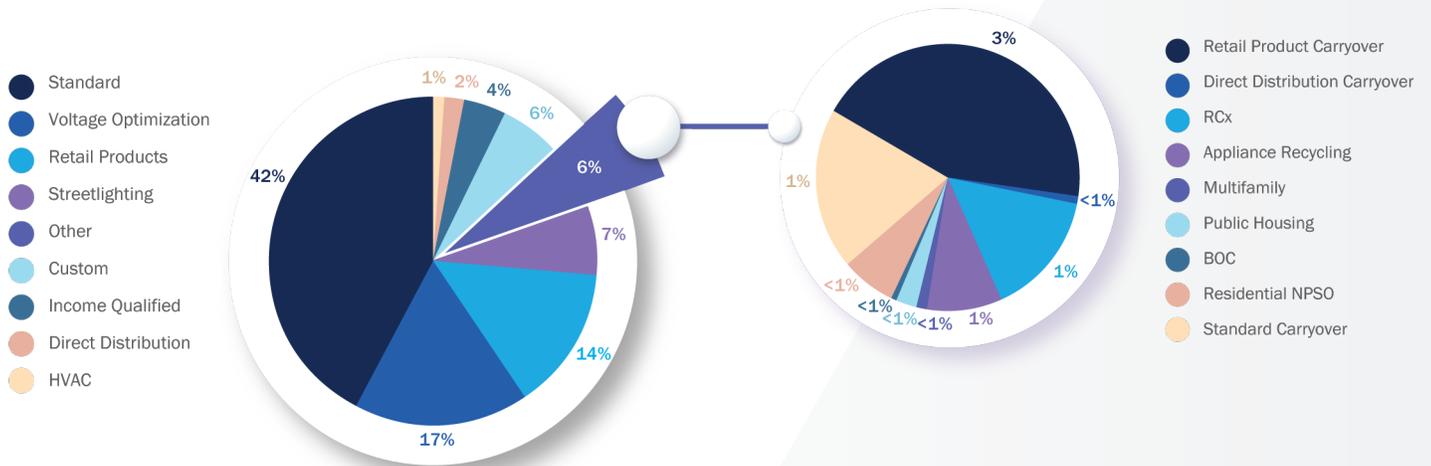
² Ibid.

³ BOC is not technically an initiative but is listed here for simplicity. BOC provides education and training to customers to encourage more energy-efficient operation of facilities and can lead to energy-efficient actions being taken by customers without further AIC support. We evaluate this offering to estimate energy savings that directly result from it, but AIC does not claim ex ante BOC savings.

Individual Residential and Business Program initiatives may themselves be further split into channels. For more details on the Residential and Business Programs, please see the *2020 AIC Residential Program Annual Impact Evaluation Report* and *2020 AIC Business Program Annual Impact Evaluation Report*.

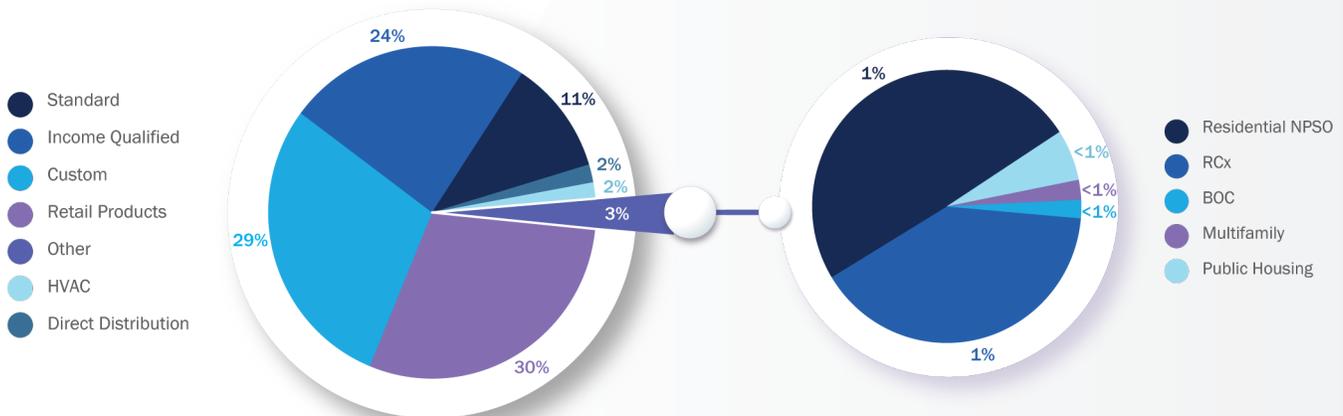
Overall, the portfolio's savings are driven heavily by a small number of initiatives. The Business Program's Standard Initiative, the Residential Program's Retail Products Initiative, and the Voltage Optimization Program together provide nearly three-quarters (73%) of portfolio verified net electric energy savings.⁴ Figure 1 shows portfolio verified net electric energy savings by initiative.

Figure 1. 2020 AIC Portfolio Verified Net Electric Energy Savings by Initiative



Gas savings are somewhat more diversified across initiatives. Four initiatives (Business Standard and Custom, as well as Residential Retail Products and Income Qualified) each provide over 10% of portfolio gas savings. Figure 2 shows portfolio verified net gas savings by initiative.⁵

Figure 2. 2020 AIC Portfolio Verified Net Gas Savings by Initiative



^{4,5} Excluding the conversion of alternate fuels to MWh for goal attainment.

1.2 2020 PORTFOLIO SAVINGS

In the following sections, the evaluation team presents annual savings (annualized 2020 energy savings), achievement of AAIG, CPAS, and WAML for the 2020 portfolio.

Overall, AIC's portfolio substantially outperformed its 2020 goal, driven by an increased rollout of Voltage Optimization, and strong performance across the Residential and Business Programs. The portfolio achieved 142% of its AAIG, its strongest annual performance to date in the 2018–2021 Plan period. The portfolio also continued to increase its WAML; the 2020 portfolio achieved a WAML of 12.6 years, continuing its consistent year-over-year increase from 2019 (12.2 years), 2018 (11.8 years), and the Transition Period (8.94 years).

1.2.1 ANNUAL SAVINGS

Table 1 presents annual savings achieved by the 2020 AIC portfolio. The conversion of some gas savings to electric energy savings for goal attainment purposes is discussed further in Section 3.1.

Table 1. 2020 AIC Portfolio Annual Savings

	Energy Savings (MWh)	Peak Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	461,634	64.55	5,073,828
Gross Realization Rate ^a	104%	117%	106%
Verified Gross Savings	479,941	75.39	5,364,649
NTGR	0.882	0.878	0.897
Verified Net Savings Before Conversion, NPSO, BOC	423,348	66.17	4,813,178
Verified Net Savings with NPSO Adder and BOC	425,316	66.55	4,883,613
Converted Savings	17,201	N/A	-587,068
Verified Net Savings After Conversion	442,517	66.55	4,296,545

^a The gross realization rate for demand does not consider peak demand savings for the Voltage Optimization Program, which does not report ex ante demand savings. Therefore, the gross realization rate for peak demand cannot be directly calculated from values presented in this table.

1.2.2 APPLICABLE ANNUAL INCREMENTAL GOAL ACHIEVEMENT

AIC achieved 142% of its 2020 AAIG for electric savings. 2020 AAIG achievement is presented in Table 2.

Table 2. 2020 AIC Portfolio AAIG Achievement

Metric	MWh
2020 Annual Net Savings	442,517
2020 Expiring CPAS from Legislation	195,375
2020 Expiring CPAS from 2019 Portfolio	213
2020 Expiring CPAS from 2018 Portfolio	3,120
2020 Annual Incremental Savings Achieved	243,809
2020 AAIG	172,011
% of 2020 AAIG Achieved	142%

1.2.3 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 3 summarizes overall CPAS and WAML for the 2020 AIC Portfolio. The overall WAML for the portfolio is 12.6 years.

Table 3. 2020 AIC Portfolio CPAS and WAML

Initiative	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2018	2019	2020	2021	...	2030	...	
Retail Products	9.7	78,572	0.774			60,846	60,846	...	15,185	...	506,858
Retail Products Carryover	9.7	16,929	0.693			11,739	11,739	...	0	...	84,386
Income Qualified - Single Family	11.3	9,760	1.000			9,760	9,760	...	2,177	...	101,524
Income Qualified - CAA	15.6	574	1.000			574	574	...	288	...	8,279
Smart Savers	11.0	5,923	1.000			5,923	5,923	...	5,923	...	65,150
Income Qualified - Multifamily	11.5	1,158	1.000			1,158	1,158	...	652	...	13,190
Public Housing	12.6	680	1.000			680	680	...	368	...	8,186
Multifamily	10.4	354	0.989			350	350	...	235	...	3,374
HVAC	17.0	7,867	0.748			5,884	5,884	...	3,147	...	67,050
Appliance Recycling	6.5	3,543	0.695			2,461	2,461	...	0	...	15,943
School Kits	8.7	1,955	1.000			1,955	1,955	...	107	...	15,978
School Kits Carryover	10.0	274	0.836			229	229	...	0	...	1,464
AR Kits	8.9	98	1.000			98	98	...	0	...	820
AR Kits Carryover	10.0	11	1.000			11	11	...	0	...	98
Community Kits	9.5	5,762	1.000			5,762	5,762	...	0	...	48,810
Smart Home Kits	8.9	169	1.000			169	169	...	0	...	1,365
Residential NPSO	10.3	2,372	0.754			1,788	1,788	...	555	...	14,837
Retail Products (gas conversion)	11.0	5,934	1.000			5,934	5,934	...	5,934	...	65,270
Smart Savers (gas conversion)	11.0	9,572	1.000			9,572	9,572	...	9,572	...	105,294
Standard	13.5	200,341	0.884			177,037	177,000	...	153,447	...	2,190,614
Standard Carryover	13.7	6,197	0.845			5,234	5,234	...	4,383	...	69,514
Custom	12.8	30,951	0.822			25,442	25,442	...	20,228	...	326,024
RCx	6.4	4,522	0.898			4,062	4,062	...	0	...	26,204
Streetlighting	12.0	31,633	0.990			31,306	31,306	...	29,494	...	361,175
BOC	8.9	180	N/A			180	180	...	13	...	1,597
Standard (gas conversion)	20.0	1,867	0.908			1,695	1,695	...	1,695	...	33,904
Voltage Optimization	15.0	72,669	N/A			72,669	72,669	...	72,669	...	1,090,030
2020 CPAS		499,865	0.885			442,517	442,480	...	326,073	...	5,226,939
Expiring 2020 CPAS						0	37	...	36,837	...	
Expired 2020 CPAS						0	37	...	116,444	...	
WAML	12.6										

I.24 CUMULATIVE PERSISTING ANNUAL SAVINGS GOAL ACHIEVEMENT

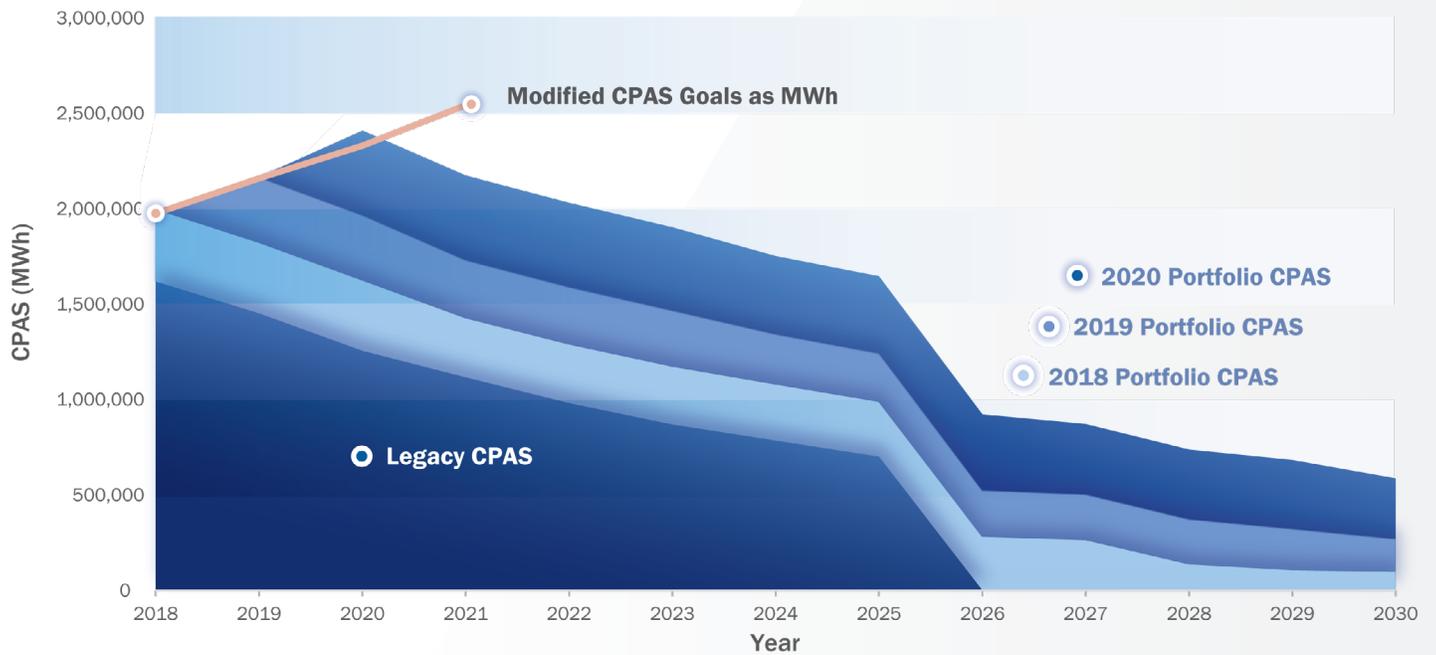
AIC achieved 103% of its 2020 CPAS goal for electric savings. 2020 CPAS goal achievement is presented in Table 4.

Table 4. 2020 AIC Portfolio AAIG Achievement

Metric	MWh
2020 CPAS from 2020 Portfolio	442,517
2020 CPAS from 2019 Portfolio	344,234
2020 CPAS from 2018 Portfolio	367,672
2020 CPAS from Legislation	1,255,982
2020 CPAS Achieved	2,410,405
2020 CPAS Goal	2,331,191
% of 2020 CPAS Achieved	103%

Figure 3 presents a visualization of AIC's progress towards its CPAS goals during the 2018-2021 period.

Figure 3. Visual Progress Toward CPAS Goals



2. EVALUATION APPROACH

This section of the report describes the evaluation approach taken for the impact evaluation of the 2020 AIC portfolio. As part of the evaluation process, the evaluation team applied versions of the Illinois Energy Efficiency Policy Manual and the Illinois Technical Reference Manual (IL-TRM) applicable to the 2020 program year (generally Version 1.1⁶ and Version 8.0, respectively) wherever relevant.⁷

2.1 RESEARCH OBJECTIVES AND EVALUATION ACTIVITIES

The overarching research objectives for the impact evaluation of AIC's 2020 energy efficiency programs are as follows:

- What were the estimated gross energy and demand impacts from the portfolio?
- What were the estimated net energy and demand impacts from the portfolio?

The evaluation team met these objectives by conducting the impact evaluation activities outlined in Table 5. As shown, for most initiatives, the impact evaluation primarily consisted of applying savings algorithms from the Illinois Technical Reference Manual (IL-TRM) V8.0 to final initiative-tracking databases to estimate verified gross savings. In addition, we reviewed initiative materials and interviewed all initiative managers.

Table 5. 2020 Impact Evaluation Activities

Program	Initiative	Gross Impacts				Net Impacts
		IL-TRM Application Review	Engineering Desk Reviews	On-Site M&V	Statistical Analysis	Application of SAG-Approved NTGRs
Residential Program	Retail Products	✓				✓
	Income Qualified	✓				✓
	Public Housing	✓				✓
	Multifamily	✓				✓
	HVAC	✓				✓
	Appliance Recycling	✓				✓
	Direct Distribution	✓				✓
Business Program	Standard	✓	✓			✓
	Custom		✓	✓	✓	✓
	RCx		✓		✓	✓
	Streetlighting	✓				✓
	BOC	✓	✓			
Voltage Optimization Program		✓			✓	

The following sections provide further detail on the verified gross and net impact evaluation activities.

⁶ Broadly speaking, Version 1.1 of the Policy Manual was in effect during this evaluation. However, a number of individual policies from Version 2.0 of the Policy Manual were also in effect during this evaluation; those individual policies (e.g., Section 11.1) were applied in this evaluation as well.

⁷ In future years, the evaluation team will apply updated versions of these manuals to the evaluation of this Program as required by law, Illinois Commerce Commission orders, and changes to the manuals themselves.

2.2 VERIFIED GROSS IMPACT ANALYSIS APPROACH

2.2.1 APPLICATION OF IL-TRM V8.0

To determine verified gross impacts associated with the majority of the measures delivered through the 2020 AIC portfolio, we reviewed the content of the initiative-tracking database to identify database errors and duplicate records, and to ensure that the implementer correctly applied savings algorithms and assumptions stated in the IL-TRM V8.0 and the IL-TRM V8.0 errata document. In particular, we applied the algorithms and assumptions provided in the IL-TRM V8.0, while using project-specific data from the initiative-tracking databases as inputs where appropriate. As part of this process, we also verified measure installations through analysis of initiative-tracking databases, as well as through the review of supporting project documentation. We resolved any discrepancies found in the databases and provide details related to any gross savings adjustments in the initiative-specific sections of this report.

2.2.2 CARRYOVER SAVINGS

In addition to savings achieved by AIC's portfolio through measures delivered during the 2020 program year, AIC also claimed savings in 2020 from lighting measures distributed by the portfolio in prior years but not installed until 2020. The relevant initiatives include:

- **Residential Program**
 - 2018 and 2019 Retail Products Initiatives
 - 2018 and 2019 Direct Distribution of Efficient Products: School Kits Initiative
 - 2019 Direct Distribution of Efficient Products: Appliance Recycling Kits Initiative
- **Business Program**
 - 2018 and 2019 Standard Initiative (Instant Incentives offering)

Carryover savings are evaluated using the applicable net-to-gross ratio (NTGR) from the year in which the product was sold, the applicable in-service rate (ISR) trajectory assumption based on the year in which the product was sold, and IL-TRM V8.0 and IL-TRM V8.0 errata assumptions for all other relevant impact parameters.

We reported previously on AIC's 2020 carryover savings as part of an earlier memo.^a

2.2.3 APPLICATION OF CUSTOM IMPACT METHODS

The Custom and RCx initiatives, as well as a small number of Standard Initiative measures and savings achieved through BOC, are not suitable for gross impact analysis using the IL-TRM. These initiatives require custom energy savings calculations to determine some or all gross impacts.⁹ Further details on the custom impact methods applied for these initiatives are presented in the *2020 AIC Business Program Annual Impact Evaluation Report*.

Custom impact evaluation methods as applied to these programs often involve some degree of direct measurement of either energy savings or relevant impact parameters. As a result of the COVID-19 pandemic, which affected program implementation and operation for the majority of the 2020 program year, customer behavior and energy usage may have changed, potentially affecting custom project evaluation.¹⁰ Per SAG agreement, the evaluation team normalized 2020 energy savings estimated through custom evaluation methods to reflect a typical evaluation year,¹¹ obviating this concern around effects on annual and persisting savings.

^a Opinion Dynamics. Ameren Illinois Company Lighting Carryover Savings Claimable in 2020. 2021. Accessed at: <https://ilsag.s3.amazonaws.com/AIC-2020-Lighting-Carryover-Savings-Memo-FINAL-2021-02-20.pdf>.

⁹ Note that, where possible, we applied IL-TRM assumptions and measure characterizations for evaluation of these initiatives in accordance with evaluation best practice.

¹⁰ Note that because relevant impact parameters for prescriptive measures were deemed in the IL-TRM V8.0 before the program year began, no such effect exists for prescriptive measures.

¹¹ Illinois Energy Efficiency Stakeholder Advisory Group. Policy Resolution – 2020 Program Year. 2020. Accessed at: https://ilsag.s3.amazonaws.com/SAG-Policy-Resolution_Normalization_Final_12-21-2020.pdf

2.3 VERIFIED NET IMPACT ANALYSIS APPROACH

To determine verified net savings for the 2020 AIC portfolio, we primarily applied SAG-approved NTGRs to verified gross savings. There are two exceptions to this approach.

First, the evaluation team did not apply an NTGR to savings achieved from the installation of advanced thermostats. By SAG agreement, savings achieved by these measures in the 2020 program year are considered net and, therefore, not subject to adjustment with an NTGR.

Second, for BOC training, we treated the savings as participant spillover per IL-TRM guidance.¹² As a result, we did not apply a SAG-approved NTGR to evaluated savings—all savings claimed were already determined to have been influenced by BOC.

2.3.1 NON-PARTICIPANT SPILLOVER

Net impact evaluation of AIC's Residential Program includes a non-participant spillover (NPSO) adder on net savings for non-income qualified efforts.¹³ This adder is 3.1% for non-income-qualified electric savings (energy and demand) and 4.4% for non-income qualified gas savings. Table 6 summarizes verified, non-IQ net savings for AIC's Residential Program by channel and computes the NPSO adder as defined above.

Table 6. 2020 Residential Program Verified Net Savings Summary for Non-IQ Programs

Channel	Verified Net MWh	Verified Net MW	Verified Net Therms
Retail Products (non-income qualified)	41,065	7.33	1,456,548
Retail Products Carryover (non-income qualified)	7,909	0.95	0
HVAC	5,884	3.41	73,773
Appliance Recycling	2,461	0.31	0
Multifamily	350	0.05	3,214
<i>Non-Income Qualified Residential Program Subtotal</i>	<i>57,669</i>	<i>12.05</i>	<i>1,533,534</i>
Residential NPSO Adder	1,788	0.37	67,476

¹² 2020 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 9.0, Attachment A: Illinois Statewide Net-to-Gross Methodologies. Table 2-1. 2020.

¹³ Opinion Dynamics. Ameren Illinois Company Energy Efficiency Portfolio 2020 Net-to-Gross Ratios. 2019. Accessed at: https://ilsag.s3.amazonaws.com/AIC_2020_NTGR_Recommendations_Summary_FINAL_2019-09-27.pdf.

2.4 SOURCES AND MITIGATION OF ERROR

The evaluation team took steps to mitigate potential sources of error throughout the planning and implementation of the 2020 evaluation. Specifically, we took the following actions to address potential sources of error:

Analysis Error

- **Prescriptive Gross Impact Calculations:** For prescriptive gross impact calculations, we applied IL-TRM V8.0 calculations to the participant data in the tracking database to calculate gross impacts. To minimize data analysis error, a separate team member reviewed all calculations to verify their accuracy.
- **Custom Gross Impact Calculations:** We determined custom gross impacts using desk reviews and data collected during remote and on-site measurement and verification (M&V). To minimize data analysis errors, the evaluation team had all calculations reviewed by a separate team member to verify that calculations were performed accurately.
- **Net Impact Calculations:** For net impact calculations, we applied SAG-approved NTGRs to estimated gross impacts to derive net impacts. To minimize analytical errors, all calculations were reviewed by a separate team member to verify their accuracy.

Sampling Error

- **Custom Impact Sample:** The evaluation team completed an impact review for 54 of 154 Custom projects achieving savings in 2020, drawing three waves of stratified samples separately for projects claiming electric and gas savings. For gross impact results, at the 90% confidence level, we achieved a relative precision of 11.9% for electric energy savings, 27.9% for electric demand savings, and 15.6% for gas savings.
- **Retro-Commissioning Impact Sample:** The evaluation team completed desk reviews for a census (9) of Retro-Commissioning projects. There is therefore no sampling error around our impact results.

Non-Sampling Error:

- **Measurement Error:** To minimize data collection error during remote and on-site M&V, the evaluation team used trained engineers and technicians familiar with the equipment covered by the Custom Initiative, the Retro-Commissioning Initiative, and BOC training and the methods used to calculate the gross impacts.

For the Virtual Commissioning™ pilot specifically,¹⁴ we also addressed the following types of error:

- **Presence of Non-Routine Events:** Non-routine events refer to changes in facility energy consumption resulting from facility-related changes not related to the interventions recommended through the pilot. Non-routine events can make it difficult to accurately measure savings using meter-based approaches, including the approach used for the Virtual Commissioning™ pilot. Non-routine events were of particular concern in 2020 as facility schedules tended to be irregular and difficult to monitor due to COVID-19 restrictions and building shutdowns during protests. The team accounted for non-routine events in our modeling approach by removing data for the affected period and extending the baseline back in time accordingly, consistent with International Performance Measurement and Verification Protocol (IPMVP) Non-Routine Adjustment Option 1.¹⁵
- **Model Specification Error:** In this type of error, variables that predict model outcomes are included when they should not be or are left out when they should be included, possibly producing biased estimates. The team addressed this type of error by recommending that the program implementer consider additional model specifications in the future.
- **Measurement Error:** In the context of the Virtual Commissioning™ pilot, measurement error occurs when electric meters do not accurately record the true energy consumption of the facility. In practice, little can be done in an evaluation context to address this error; however, it is expected to be small.
- **Prediction Error:** Prediction error occurs when the model does not perfectly predict future energy consumption. This issue is exacerbated for the Virtual Commissioning™ pilot in 2020 because the team only had access to three to five months of post-period data for each site. This limitation introduces bias because the model was not able to train on a full range of temperature data after the intervention was initiated. This may increase the prediction error for temperatures that are outside the range of the training data. The team addressed this by carefully examining model fit diagnostics.
- **Multi-Collinearity:** This type of modeling error can both bias the model results and produce very large variance in the results. The team addressed this issue by carefully considering the model specification and data to ensure that there were no multi-collinearity issues.
- **Heteroskedasticity:** This type of modeling error can result in imprecise model results because the variance of the error term might be different across time. The team addressed this type of error by using Newey-West robust standard errors, which adjust for both autocorrelation and heteroskedasticity.
- **Serial Correlation:** This type of modeling error, also known as autocorrelation, can result in imprecise model results because the error term in one time period might be correlated with the error term in another time period. The team addressed this type of error by using Newey-West robust standard errors, which adjust for both autocorrelation and heteroskedasticity.

Finally, note that the calculations in some of the tables in this report cannot be exactly reproduced due to rounding.

¹⁴ Virtual Commissioning™ is a registered trademark of Power TakeOff.

¹⁵ Webster, Lia. (2020). IPMVP Application Guide on Non-Routine Events and Adjustments. Energy Valuation Organization (EVO).

3. 2020 PORTFOLIO VERIFIED SAVINGS

Within the following sections, the evaluation team presents initiative-level detail on verified Annual Savings (annualized 2020 energy savings).

3.1 SAVINGS CONVERSION

FEJA allows electric utilities, in certain cases, to “convert” non-electric energy savings achieved through efficiency measures or programs funded with electric dollars to electric savings for the purposes of goal attainment.¹⁶ The total amount of savings allowed to be converted is capped at a maximum of 10% of the utility’s AAIG.

AIC met the above criteria in 2020 and chose to convert savings from the Residential Program’s Retail Products Initiative, the Smart Savers channel of the Income Qualified Initiative, and the Small Business Energy Performance (SBEP) channel of the Business Program’s Standard Initiative. Per FEJA, AIC was capped at a total conversion of no more than 17,201.1 MWh (10% of AIC’s 2020 AAIG of 172,011 MWh). Using the SAG-approved conversion factor of 29.3 kWh per therm, this equals 587,068 therms that could be converted to electric savings.

AIC identified specific measures in Retail Products and Smart Savers, as well as specific projects in SBEP to the evaluation team for conversion. We determined that verified net savings for these measures exceeded AIC’s allowable conversion cap and therefore prioritized measures delivered through these channels to align with Illinois guidance around the conversion. All gas savings eligible for conversion were converted for Smart Savers and SBEP, and some Retail Products savings eligible for conversion were converted (Retail Products savings in income qualified ZIP codes were prioritized). These converted savings are included as a line item in Table 8, Table 10, Table 11, and Table 13 below. Table 7 summarizes AIC’s 2020 gas conversion.

Table 7. 2020 AIC Gas Conversion

Initiative	Channel	Therms Converted	MWh Equivalent
Income Qualified	Smart Savers	326,697	9,572
Standard	SBEP	57,857	1,695
Retail Products	Retail Products (IQ ZIP codes)	202,514	5,934
Retail Products	Retail Products (non-IQ ZIP codes)	0	0
Total		587,068	17,201
<i>Conversion Cap</i>		587,068	17,201
<i>% of Cap</i>		100%	100%

¹⁶ 220 ILCS 5/8-103B(b-25).

3.2 2020 RESIDENTIAL PROGRAM ANNUAL SAVINGS

The 2020 Residential Program achieved 124,892 MWh, 19.82 MW, and 2,339,137 therms in verified net savings. These savings include a NPSO adder on net savings.^{17,18} These savings are also reported after accounting for the FEJA-allowed “conversion” of natural gas savings to electric energy savings for the purpose of goal attainment. Table 7, Table 8, and Table 9 present ex ante gross, verified gross, and verified net electric energy, electric demand, and gas savings by initiative and channel for the 2020 Residential Program.

Table 8. 2020 Residential Program Electric Energy Annual Savings Summary

Initiative	Channel	Ex Ante Gross MWh	Gross Realization Rate	Verified Gross MWh	Net-to-Gross Ratio (NTGR)	Verified Net MWh
Retail Products	Retail Products	78,543	100%	78,572	0.774	60,846
	Retail Products Carryover ^a	16,929	100%	16,929	0.693	11,739
Income Qualified	Single Family	9,253	105%	9,760	1.000	9,760
	CAA	565	102%	574	1.000	574
	Smart Savers	5,826	102%	5,923	1.000	5,923
	Multifamily	1,224	95%	1,158	1.000	1,158
Public Housing	Public Housing	735	92%	680	1.000	680
Multifamily	Multifamily	398	89%	354	0.989	350
HVAC	HVAC	6,103	129%	7,867	0.748	5,884
Appliance Recycling	Appliance Recycling	3,517	101%	3,543	0.695	2,461
Direct Distribution	School Kits	2,075	94%	1,955	1.000	1,955
	School Kits Carryover ^a	274	100%	274	0.836	229
	AR Kits	98	100%	98	1.000	98
	AR Kits Carryover ^a	11	100%	11	1.000	11
	Community Kits	5,728	101%	5,762	1.000	5,762
	Smart Home Kits	140	121%	169	1.000	169
<i>Residential Program Subtotal</i>		<i>131,417</i>	<i>102%</i>	<i>133,629</i>	<i>0.805</i>	<i>107,599</i>
Residential NPSO Adder						1,788
Retail Products (gas conversion)						5,934
Smart Savers (gas conversion)						9,572
Residential Program Total						124,892

^a Carryover savings are those achieved through installation of measures during 2020 that were distributed or rebated in prior program years. We break out carryover separately throughout this report for clarity.

¹⁷ Ameren Illinois Company Energy Efficiency Portfolio 2020 Net-to-Gross Ratios. Accessed at: https://ilsag.s3.amazonaws.com/AIC_2020_NTGR_Recommendations_Summary_FINAL_2019-09-27.pdf

¹⁸ The process of computing savings from the residential NPSO adder is complex and described in Section 3.3.1.

Table 9. 2020 Residential Program Electric Demand Annual Savings Summary

Initiative	Channel	Ex Ante Gross MW	Gross Realization Rate	Verified Gross MW	NTGR	Verified Net MW
Retail Products	Retail Products	11.86	102%	12.06	0.803	9.68
	Retail Products Carryover	2.03	100%	2.03	0.693	1.41
Income Qualified	Single Family	1.82	95%	1.73	1.000	1.73
	CAA	0.16	102%	0.17	1.000	0.17
	Smart Savers	1.19	106%	1.26	1.000	1.26
	Multifamily	0.18	99%	0.17	1.000	0.17
Public Housing	Public Housing	0.11	115%	0.13	1.000	0.13
Multifamily	Multifamily	0.05	100%	0.05	0.986	0.05
HVAC	HVAC	4.12	112%	4.63	0.736	3.41
Appliance Recycling	Appliance Recycling	0.46	100%	0.46	0.684	0.31
Direct Distribution	School Kits	0.31	92%	0.28	1.000	0.28
	School Kits Carryover	0.03	100%	0.03	1.000	0.03
	AR Kits	0.01	101%	0.01	1.000	0.01
	AR Kits Carryover	0.00	100%	0.00	1.000	0.00
	Community Kits	0.78	99%	0.78	1.000	0.78
	Smart Home Kits	0.02	122%	0.02	1.000	0.02
<i>Residential Program Subtotal</i>		23.13	103%	23.82	0.816	19.44
Residential NPSO Adder						0.37
Residential Program Total						19.82

Table 10. 2020 Residential Program Gas Annual Savings Summary

Initiative	Channel	Ex Ante Gross Therms	Gross Realization Rate	Verified Gross Therms	NTGR	Verified Net Therms
Retail Products	Retail Products	1,503,202	97%	1,457,318	0.999	1,456,548
	Retail Products Carryover	0	N/A	0	N/A	0
Income Qualified	Single Family	594,194	115%	682,068	1.000	682,068
	CAA	45,361	100%	45,435	1.000	45,435
	Smart Savers	434,093	102%	440,873	1.000	440,873
	Multifamily	5,267	95%	4,996	1.000	4,996
Public Housing	Public Housing	8,232	100%	8,254	1.000	8,254
Multifamily	Multifamily	3,214	100%	3,214	1.000	3,214
HVAC	HVAC	71,996	104%	75,185	0.981	73,773
Appliance Recycling	Appliance Recycling	0	N/A	0	N/A	0
Direct Distribution	School Kits	66,574	90%	60,128	1.000	60,128
	School Kits Carryover	0	N/A	0	N/A	0
	AR Kits	4,059	101%	4,100	1.000	4,100
	AR Kits Carryover	0	N/A	0	N/A	0
	Community Kits	21,959	98%	21,486	1.000	21,486
	Smart Home Kits	0	N/A	0	N/A	0
<i>Residential Program Subtotal</i>		<i>2,758,150</i>	<i>102%</i>	<i>2,803,055</i>	<i>0.999</i>	<i>2,800,872</i>
Residential NPSO Adder						67,476
Retail Products (gas conversion)						-202,514
Smart Savers (gas conversion)						-326,697
Residential Program Total						2,339,137

3.3 2020 BUSINESS PROGRAM ANNUAL SAVINGS

The 2020 Business Program achieved 244,956 MWh, 35.23 MW, and 1,957,408 therms in verified net savings. These savings are also reported after accounting for the FEJA-allowed “conversion” of natural gas savings to electric energy savings for the purpose of goal attainment. Table 11, Table 12, and Table 13 present ex ante gross, verified gross, and verified net electric energy, electric demand, and gas savings by initiative for the 2020 Business Program.

Table 11. 2020 Business Program Electric Energy Annual Savings Summary

Initiative	Ex Ante Gross MWh	Gross Realization Rate	Verified Gross MWh	NTGR	Verified Net MWh
Standard	201,979	99%	200,341	0.884	177,037
Standard Carryover	6,197	100%	6,197	0.845	5,234
Custom	32,018	97%	30,951	0.822	25,442
RCx	5,529	82%	4,522	0.898	4,062
Streetlighting	31,633	100%	31,633	0.990	31,306
<i>Business Program Subtotal</i>	<i>277,355</i>	<i>99%</i>	<i>273,643</i>	<i>0.888</i>	<i>243,081</i>
BOC					180
Standard (gas conversion)					1,695
Business Program Total					244,956

Table 12. 2020 Business Program Electric Demand Annual Savings Summary

Initiative	Ex Ante Gross MW	Gross Realization Rate	Verified Gross MW	NTGR	Verified Net MW
Standard	34.59	101%	34.89	0.886	30.91
Standard Carryover	1.46	100%	1.46	0.849	1.24
Custom	4.93	70%	3.44	0.822	2.83
RCx	0.44	64%	0.28	0.890	0.25
Streetlighting	0.00	N/A	0.00	N/A	0.00
<i>Business Program Subtotal</i>	<i>41.42</i>	<i>97%</i>	<i>40.07</i>	<i>0.879</i>	<i>35.23</i>
BOC					0.00
Business Program Total					35.23

Table 13. 2020 Business Program Gas Annual Savings Summary

Initiative	Ex Ante Gross Therms	Gross Realization Rate	Verified Gross Therms	NTGR	Verified Net Therms
Standard	938,480	106%	993,317	0.546	542,690
Standard Carryover	0	N/A	0	N/A	0
Custom	1,302,727	116%	1,507,107	0.939	1,415,174
RCx	74,471	82%	61,170	0.890	54,441
Streetlighting	0	N/A	0	N/A	0
<i>Business Program Subtotal</i>	<i>2,315,678</i>	<i>111%</i>	<i>2,561,594</i>	<i>0.786</i>	<i>2,012,306</i>
BOC					2,960
Standard (gas conversion)					-57,857
Business Program Total					1,957,408

3.4 2020 VOLTAGE OPTIMIZATION PROGRAM ANNUAL SAVINGS

The 2020 Voltage Optimization Program achieved 72,669 MWh and 11.50 MW in verified net savings. Table 14 presents ex ante gross, verified gross, and verified net savings for the 2020 Voltage Optimization Program.

Table 14. 2020 Voltage Optimization Program Annual Savings Summary

	Electric Energy Savings (MWh)	Electric Peak Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	52,861 ^a	N/A ^b	0
Gross Realization Rate	137%	N/A	N/A
Verified Gross Savings	72,669	11.50	0
NTGR ^c	N/A	N/A	N/A
Verified Net Savings	72,669	11.50	0

^a Ex ante gross savings sourced from AIC. Ex ante gross savings assume 0.80 CVR factor and 3% voltage reduction across the 125 measured circuits.

^b There are no ex ante demand savings estimates for this program.

^c NTGR is assumed to be 1.0, since absent the VO Program, deliberate changes to distribution voltage would not have been made.

APPENDIX A. 2020 DETAILED VERIFIED SAVINGS RESULTS

Table 15 and Table 16 provide detailed 2020 verified savings results for electric and gas respectively.

Table 15. 2020 Detailed Verified Savings Results - Electric

Initiative	Channel	Ex Ante Gross	Realization Rate	Verified Gross			Deemed / Used	Verified Net					Actual	Evaluation Estimate (Where Available)	Participation		Weighted Average Measure Life
		First Year Annual Energy Savings	"Energy Savings (Ex Ante Gross / Verified Gross)"	First Year Annual Energy Savings	First Year Peak Demand Savings	Lifetime Savings	"Net-to-Gross Ratio"	First Year Annual Savings	First Year Peak Demand Savings	Lifetime Savings	First Year Cost per First Year Annual Savings	First Year Cost per Lifetime Savings	Program Costs	Net-to-Gross Ratio	# Units	Units Definition	Years
		MWh	%	MWh	MW	MWh	%	MWh	MW	MWh	\$/MWh	\$/MWh	\$	%			
Residential Program																	
Retail Products	Retail Products	78,543	100%	78,572	12.06	654,518	0.774	60,846	9.68	506,858	\$132.35	\$15.89	\$8,053,009	Various	1,671,912	Products rebated	9.7
Retail Products	Retail Products Carryover	16,929	100%	16,929	2.03	121,693	0.693	11,739	1.41	84,386	N.A.	N.A.	N.A.	Various	N/A	Products rebated	9.7
Income Qualified	Income Qualified - Single Family	9,253	105%	9,760	1.73	101,524	1.000	9,760	1.73	101,524	\$891.21	\$85.68	\$8,698,214	N/A - Income Qualified Pop.	2,113,080	Measures	11.3
Income Qualified	Income Qualified - CAA	565	102%	574	0.17	8,279	1.000	574	0.17	8,279	\$3,497.82	\$242.73	\$2,009,448	N/A - Income Qualified Pop.	964,068	Measures	15.6
Income Qualified	Smart Savers	5,826	102%	5,923	1.26	65,150	1.000	5,923	1.26	65,150	\$371.38	\$33.76	\$2,199,590	N/A - Income Qualified Pop.	10,402	Advanced thermostats	11.0
Income Qualified	Income Qualified - Multifamily	1,224	95%	1,158	0.17	13,190	1.000	1,158	0.17	13,190	\$1,057.07	\$92.77	\$1,223,568	N/A - Income Qualified Pop.	1,801	Tenant units	11.5
Public Housing	Public Housing	735	92%	680	0.13	8,186	1.000	680	0.13	8,186	\$1,705.74	\$141.67	\$1,159,734	N/A - Income Qualified Pop.	1,273	Tenant units	12.6
Multifamily	Multifamily	398	89%	354	0.05	3,413	0.989	350	0.05	3,374	\$2,843.11	\$295.18	\$996,083	No 2020 research	923	Tenant units	10.4
HVAC	HVAC	6,103	129%	7,867	4.63	89,646	0.748	5,884	3.41	67,050	\$797.88	\$70.02	\$4,694,558	No 2020 research	122,713	Measures rebated	17.0
Appliance Recycling	Appliance Recycling	3,517	101%	3,543	0.46	22,954	0.695	2,461	0.31	15,943	\$705.04	\$108.83	\$1,735,079	Various	4,587	Measures recycled	6.5
Direct Distribution of Efficient Products	School Kits	2,075	94%	1,955	0.28	15,978	1.000	1,955	0.28	15,978	\$82.33	\$9.87	\$663,194	N/A - Income Qualified Pop.	90,036	Measures distributed	8.7
Direct Distribution of Efficient Products	School Kits Carryover	274	100%	274	0.03	1,751	0.836	229	0.03	1,464	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	N/A	Measures distributed	10.0
Direct Distribution of Efficient Products	Appliance Recycling Kits	98	100%	98	0.01	820	1.000	98	0.01	820	\$0.79	\$0.09	\$6,212	N/A - Income Qualified Pop.	3,348	Measures distributed	8.9
Direct Distribution of Efficient Products	Appliance Recycling Kits Carryover	11	100%	11	0.00	98	1.000	11	0.00	98	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	N/A	Measures distributed	10.0
Direct Distribution of Efficient Products	Community Kits	5,728	101%	5,762	0.78	48,810	1.000	5,762	0.78	48,810	\$66.06	\$7.84	\$509,858	N/A - Income Qualified Pop.	20,609	Measures distributed	9.5
Direct Distribution of Efficient Products	Smart Home Kits	140	121%	169	0.02	1,365	1.000	169	0.02	1,365	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	3,285	Measures distributed	8.9
Residential NPSO Adder	Residential NPSO Adder	N/A	N/A	N/A	N/A	N/A	N/A	1,788	0.37	14,837	N/A	N/A	N.A.	N/A	N/A	N/A	10.3
Business Program																	
Standard	Standard	201,979	99%	200,341	34.89	2,478,969	0.884	177,037	30.91	2,190,614	\$215.86	\$17.44	\$38,215,234	Various	1,287,162	Measures	13.5
Standard	Standard Carryover	6,197	100%	6,197	1.46	82,294	0.845	5,234	1.24	69,514	N.A.	N.A.	N.A.	Various	N/A	Projects	13.7
Custom	Custom	32,018	97%	30,951	3.44	396,622	0.822	25,442	2.83	326,024	\$399.70	\$31.19	\$10,169,127	No 2020 research	140	Projects	12.8
Retro-Commissioning	Retro-Commissioning	5,529	82%	4,522	0.28	29,174	0.898	4,062	0.25	26,204	\$190.78	\$29.57	\$774,885	No 2020 research	9	Projects	6.4
Streetlighting	Streetlighting	31,633	100%	31,633	0.00	364,946	0.990	31,306	0.00	361,175	\$53.94	\$4.68	\$1,688,668	No 2020 research	64	Projects	12.0
Building Operator Certification	Building Operator Certification	N/A	N/A	NA	NA	NA	N/A	180	0.00	1,597	N/A	N/A	N.A.	N/A	10	Customers trained	8.9
Voltage Optimization Program																	
Voltage Optimization	Voltage Optimization	52,861	137%	72,669	11.50	1,090,030	N/A	72,669	11.50	1,090,030	\$198.58	\$13.24	\$14,430,650	N/A	125	Circuits	15.0
Portfolio Total	Portfolio Total	461,634	104%	479,941	75.39	5,599,413	0.886	425,316	66.55	5,022,470	\$264.83	\$22.43	\$112,636,075				12.6

NOTES:

- Savings presented reflect actual savings achieved by the programs and do not reflect the Future Energy Jobs Act-allowed conversion of alternate fuels to MWh.
- If the conversion had been included, it would add an additional 1,695 in verified net MWh to the Standard Initiative, 5,934 MWh to the Retail Products Initiative, and 9,572 MWh to the Income Qualified - Smart Savers Initiative as compared to the totals presented here.
- Program costs presented in the "Portfolio Total" row include unallocated portfolio-level administrative costs and therefore are in excess of the sums of the individual rows.

APPENDIX A. 2020 DETAILED VERIFIED SAVINGS RESULTS

Table 16. 2020 Detailed Verified Savings Results - Gas

Initiative	Channel	Ex Ante Gross	Realization Rate	Verified Gross		Deemed / Used	Verified Net				Actual	Evaluation Estimate (Where Available)	Participation		Weighted Average Measure Life
		First Year Annual Energy Savings	"Energy Savings (Ex Ante Gross / Verified Gross)"	First Year Annual Energy Savings	Lifetime Savings	"Net-to-Gross Ratio"	First Year Annual Savings	Lifetime Savings	First Year Cost per First Year Annual Savings	First Year Cost per Lifetime Savings	Program Costs	Net-to-Gross Ratio	# Units	Units Definition	Years
		Therms	%	Therms	Therms	%	Therms	Therms	\$/Therm	\$/Therm	\$	%			
Residential Program															
Retail Products	Retail Products	1,503,202	97%	1,457,318	16,034,428	0.999	1,456,548	16,025,959	\$1.47	\$0.13	\$2,136,274	Various	35,660	Products rebated	11.0
Retail Products	Retail Products Carryover	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	Various	N/A	Products rebated	N/A
Income Qualified	Income Qualified - Single Family	594,194	115%	682,068	11,638,596	1.000	682,068	11,638,596	\$6.49	\$0.38	\$4,427,015	N/A - Income Qualified Pop.	1,994,943	Measures	17.1
Income Qualified	Income Qualified - CAA	45,361	100%	45,435	896,534	1.000	45,435	896,534	\$14.49	\$0.73	\$658,214	N/A - Income Qualified Pop.	771,819	Measures	19.7
Income Qualified	Smart Savers	434,093	102%	440,873	4,849,599	1.000	440,873	4,849,599	\$0.86	\$0.08	\$379,428	N/A - Income Qualified Pop.	10,402	Advanced thermostats	11.0
Income Qualified	Income Qualified - Multifamily	5,267	95%	4,996	58,998	1.000	4,996	58,998	\$21.66	\$1.83	\$108,203	N/A - Income Qualified Pop.	1,801	Units treated	11.8
Public Housing	Public Housing	8,232	100%	8,254	103,075	1.000	8,254	103,075	\$18.46	\$1.48	\$152,370	N/A - Income Qualified Pop.	1,273	Properties treated	12.5
Multifamily	Multifamily	3,214	100%	3,214	35,351	1.000	3,214	35,351	\$51.15	\$4.65	\$164,397	No 2020 research	923	Tenant units	11.0
HVAC	HVAC	71,996	104%	75,185	878,865	0.981	73,773	862,353	\$5.19	\$0.44	\$383,081	No 2020 research	97,971	Measures rebated	11.7
Appliance Recycling	Appliance Recycling	0	N.A.	0	-	N.A.	0	N/A	N.A.	N.A.	\$-	Various	N/A	Measures recycled	N/A
Direct Distribution of Efficient Products	School Kits	66,574	90%	60,128	740,704	1.000	60,128	740,704	\$1.62	\$0.14	\$138,781	N/A - Income Qualified Pop.	52,521	Measures distributed	12.3
Direct Distribution of Efficient Products	School Kits Carryover	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	N/A	Measures distributed	N/A
Direct Distribution of Efficient Products	Appliance Recycling Kits	4,059	101%	4,100	40,095	1.000	4,100	40,095	\$0.04	\$0.00	\$3,333	N/A - Income Qualified Pop.	1,488	Measures distributed	9.8
Direct Distribution of Efficient Products	Appliance Recycling Kits Carryover	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	N/A	Measures distributed	N/A
Direct Distribution of Efficient Products	Community Kits	21,959	98%	21,486	201,974	1.000	21,486	201,974	\$1.10	\$0.11	\$97,973	N/A - Income Qualified Pop.	8,352	Measures distributed	9.4
Direct Distribution of Efficient Products	Smart Home Kits	0	N.A.	0	-	N.A.	0	N/A	N.A.	N.A.	N.A.	N/A - Income Qualified Pop.	N/A	Measures distributed	N/A
Residential NPSO Adder	Residential NPSO Adder	N/A	N/A	N/A	N/A	N/A	67,476	660,013	N/A	N/A	N.A.	N/A	N/A	N/A	9.8
Business Program															
Standard	Standard	938,480	106%	993,317	14,241,742	0.546	542,690	7,780,858	\$3.70	\$0.26	\$2,010,021	Various	459,465	Measures	14.3
Standard	Standard Carryover	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	Various	0	Projects	N/A
Custom	Custom	1,302,727	116%	1,507,107	25,502,752	0.939	1,415,174	23,947,084	\$1.66	\$0.10	\$2,344,776	No 2020 research	43	Projects	16.9
Retro-Commissioning	Retro-Commissioning	74,471	82%	61,170	526,063	0.890	54,441	468,196	\$4.79	\$0.56	\$260,526	No 2020 research	2	Projects	8.6
Streetlighting	Streetlighting	0	N.A.	0	-	N.A.	0	N/A	N.A.	N.A.	N.A.	No 2020 research	N/A	Projects	N/A
Building Operator Certification	Building Operator Certification	N/A	N/A	NA	N/A	N/A	2,960	56,523	N/A	N/A	N.A.	N/A	1	Customers trained	19.1
Voltage Optimization Program															
Voltage Optimization	Voltage Optimization	0	N.A.	0	-	N/A	0	-	N.A.	N.A.	N.A.	N/A	N/A	Circuits	N/A
Portfolio Total	Portfolio Total	5,073,828	106%	5,364,649	75,748,776	0.910	4,883,613	68,365,912	\$3.05	\$0.22	\$14,901,196				14.1

NOTES:

- Savings presented reflect actual savings achieved by the programs and do not reflect the Future Energy Jobs Act-allowed conversion of alternate fuels to MWh.
- If the conversion had been included, it would subtract 57,857 in verified net therms from the Standard Initiative, 326,697 in verified net therms from the Income Qualified - Smart Savers Initiative, and 202,514 in verified net therms from the Retail Products Initiative, for a total of -587,068 in verified net therm savings as compared to the totals presented here.
- Program costs presented in the "Portfolio Total" row include unallocated portfolio-level administrative costs and therefore are in excess of the sums of the individual rows.

APPENDIX B. 2020 HIGH IMPACT MEASURE LIST

These results will be provided separately.

APPENDIX C. 2020 PROGRAM EVALUATION REPORTS

The 2020 Residential Program, Business Program, and Voltage Optimization Program Impact Evaluation Reports, as well as the 2020 AIC Carryover Savings Memo are available under separate cover on the Illinois Stakeholder Advisory Group website: (http://www.ilsag.info/draft_evaluation_reports.html).

APPENDIX D. CUMULATIVE PERSISTING ANNUAL SAVINGS

This appendix presents detailed CPAS for the AIC portfolio by initiative and channel. Due to many years of CPAS, tables are challenging to read; please reference the separately provided CPAS spreadsheet for additional detail as needed.

Table 17 provides CPAS for the 2020 AIC portfolio through 2077 at the initiative/channel level. Lifetime savings for the 2020 AIC portfolio are 5,226,939 MWh.

Table 17. 2020 AIC Portfolio CPAS and WAML

Initiative	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)														
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Retail Products	9.7	78,572	0.774			60,846	60,846	60,846	60,846	48,024	47,066	46,814	33,686	33,686	33,348	15,185	1,684	1,265
Retail Products Carryover	9.7	16,929	0.693			11,739	11,739	11,739	11,739	7,284	7,150	7,048	5,316	5,316	5,316	0	0	0
Income Qualified - Single Family	11.3	9,760	1.000			9,760	9,760	9,760	9,760	9,760	9,760	9,210	5,961	5,946	5,375	2,177	1,993	1,993
Income Qualified - CAA	15.6	574	1.000			574	574	574	574	574	574	574	478	478	478	288	286	286
Smart Savers	11.0	5,923	1.000			5,923	5,923	5,923	5,923	5,923	5,923	5,923	5,923	5,923	5,923	5,923	0	0
Income Qualified - Multifamily	11.5	1,158	1.000			1,158	1,158	1,158	1,149	1,123	1,123	1,123	1,042	1,042	1,042	652	333	312
Public Housing	12.6	680	1.000			680	680	680	680	652	652	652	551	551	551	368	322	277
Multifamily	10.4	354	0.989			350	350	350	350	303	303	303	275	275	275	235	0	0
HVAC	17.0	7,867	0.748			5,884	5,884	5,884	5,884	5,884	5,884	3,151	3,151	3,151	3,151	3,147	2,664	2,664
Appliance Recycling	6.5	3,543	0.695			2,461	2,461	2,461	2,461	2,440	2,440	1,220	0	0	0	0	0	0
School Kits	8.7	1,955	1.000			1,955	1,955	1,662	1,658	1,658	1,658	1,658	1,028	1,028	1,028	107	107	107
School Kits Carryover	10.0	274	0.836			229	229	229	229	91	91	91	91	91	91	0	0	0
AR Kits	8.9	98	1.000			98	98	98	98	98	98	98	45	45	45	0	0	0
AR Kits Carryover	10.0	11	1.000			11	11	11	11	11	11	11	6	6	6	0	0	0
Community Kits	9.5	5,762	1.000			5,762	5,762	5,760	5,760	5,760	5,760	5,760	2,830	2,830	2,830	0	0	0
Smart Home Kits	8.9	169	1.000			169	169	169	169	169	169	169	61	61	61	0	0	0
Residential NPSO	10.3	2,372	0.754			1,788	1,788	1,788	1,788	1,250	1,216	1,083	1,002	1,002	992	555	114	101
Retail Products (gas conversion)	11.0	5,934	1.000			5,934	5,934	5,934	5,934	5,934	5,934	5,934	5,934	5,934	5,934	5,934	0	0
Smart Savers (gas conversion)	11.0	9,572	1.000			9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	9,572	0	0
Standard	13.5	200,341	0.884			177,037	177,000	175,837	171,178	167,468	163,903	162,299	160,741	158,888	156,668	153,447	127,613	85,929
Standard Carryover	13.7	6,197	0.845			5,234	5,234	5,234	5,234	4,827	4,801	4,753	4,395	4,386	4,386	4,383	4,383	4,383
Custom	12.8	30,951	0.822			25,442	25,442	25,442	25,442	25,441	25,437	25,123	22,777	22,671	21,967	20,228	18,518	13,628
RCx	6.4	4,522	0.898			4,062	4,062	4,062	3,885	3,133	2,066	2,066	1,831	1,038	0	0	0	0
Streetlighting	12.0	31,633	0.990			31,306	31,306	31,306	31,306	29,494	29,494	29,494	29,494	29,494	29,494	29,494	29,494	0
BOC	8.9	180	1.000			180	180	180	180	180	179	179	179	113	14	13	5	5
Standard (gas conversion)	20.0	1,867	0.908			1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695	1,695
Voltage Optimization	15.0	72,669	1.000			72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669	72,669
2020 CPAS		499,865	0.885			442,517	442,480	441,021	436,173	411,418	405,627	398,671	370,733	367,891	362,910	326,073	261,880	185,314
Expiring 2020 CPAS						0	37	1,458	4,849	24,755	5,791	6,956	27,939	2,841	4,982	36,837	64,192	76,566
Expired 2020 CPAS						0	37	1,496	6,344	31,099	36,890	43,846	71,784	74,626	79,607	116,444	180,637	257,203
WAML	12.6																	

Table 17. 2020 AIC Portfolio CPAS and WAML (Continued)

Initiative	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)														
				2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Retail Products	9.7	78,572	0.774	1,265	1,054	233	87	34	34	2	2	2	0	0	0	0	0	0
Retail Products Carryover	9.7	16,929	0.693	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Single Family	11.3	9,760	1.000	1,993	1,993	1,522	1,311	1,311	1,162	1,015	0	0	0	0	0	0	0	0
Income Qualified - CAA	15.6	574	1.000	286	286	286	286	286	286	243	0	0	0	0	0	0	0	0
Smart Savers	11.0	5,923	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Multifamily	11.5	1,158	1.000	312	312	30	30	30	30	30	0	0	0	0	0	0	0	0
Public Housing	12.6	680	1.000	277	277	67	67	67	67	67	0	0	0	0	0	0	0	0
Multifamily	10.4	354	0.989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HVAC	17.0	7,867	0.748	2,664	2,664	2,463	1,405	1,405	37	32	0	0	0	0	0	0	0	0
Appliance Recycling	6.5	3,543	0.695	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Kits	8.7	1,955	1.000	107	107	31	31	31	31	31	0	0	0	0	0	0	0	0
School Kits Carryover	10.0	274	0.836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits	8.9	98	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits Carryover	10.0	11	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Community Kits	9.5	5,762	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Home Kits	8.9	169	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential NPSO	10.3	2,372	0.754	101	94	84	46	45	2	1	0	0	0	0	0	0	0	0
Retail Products (gas conversion)	11.0	5,934	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Savers (gas conversion)	11.0	9,572	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard	13.5	200,341	0.884	79,176	69,898	624	575	526	526	526	252	252	252	0	0	0	0	0
Standard Carryover	13.7	6,197	0.845	4,383	3,495	0	0	0	0	0	0	0	0	0	0	0	0	0
Custom	12.8	30,951	0.822	10,059	5,335	4,085	1,690	1,161	1,161	1,161	1,098	501	379	59	59	59	59	59
RCx	6.4	4,522	0.898	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streetlighting	12.0	31,633	0.990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOC	8.9	180	1.000	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard (gas conversion)	20.0	1,867	0.908	1,695	1,695	1,695	1,695	1,695	1,695	1,695	0	0	0	0	0	0	0	0
Voltage Optimization	15.0	72,669	1.000	72,669	72,669	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 CPAS		499,865	0.885	174,993	159,886	11,121	7,225	6,592	5,033	4,805	1,352	755	631	59	59	59	59	59
Expiring 2020 CPAS				10,321	15,107	148,765	3,896	633	1,559	228	3,453	597	125	572	0	0	0	0
Expired 2020 CPAS				267,524	282,631	431,396	435,292	435,925	437,484	437,712	441,165	441,761	441,886	442,458	442,458	442,458	442,458	0
WAML	12.6																	

APPENDIX D. CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 17. 2020 AIC Portfolio CPAS and WAML (Continued)

Initiative	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)														
				2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062
Retail Products	9.7	78,572	0.774	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail Products Carryover	9.7	16,929	0.693	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Single Family	11.3	9,760	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - CAA	15.6	574	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Savers	11.0	5,923	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Multifamily	11.5	1,158	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Housing	12.6	680	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Multifamily	10.4	354	0.989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HVAC	17.0	7,867	0.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Appliance Recycling	6.5	3,543	0.695	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Kits	8.7	1,955	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Kits Carryover	10.0	274	0.836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits	8.9	98	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits Carryover	10.0	11	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Community Kits	9.5	5,762	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Home Kits	8.9	169	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential NPSO	10.3	2,372	0.754	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail Products (gas conversion)	11.0	5,934	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Savers (gas conversion)	11.0	9,572	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard	13.5	200,341	0.884	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Carryover	13.7	6,197	0.845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Custom	12.8	30,951	0.822	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
RCx	6.4	4,522	0.898	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streetlighting	12.0	31,633	0.990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOC	8.9	180	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard (gas conversion)	20.0	1,867	0.908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Voltage Optimization	15.0	72,669	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 CPAS		499,865	0.885	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Expiring 2020 CPAS				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expired 2020 CPAS				442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458
WAML	12.6																	

APPENDIX D. CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 17. 2020 AIC Portfolio CPAS and WAML (Continued)

Initiative	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)														
				2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077
Retail Products	9.7	78,572	0.774	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail Products Carryover	9.7	16,929	0.693	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Single Family	11.3	9,760	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - CAA	15.6	574	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Savers	11.0	5,923	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income Qualified - Multifamily	11.5	1,158	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Housing	12.6	680	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Multifamily	10.4	354	0.989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HVAC	17.0	7,867	0.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Appliance Recycling	6.5	3,543	0.695	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Kits	8.7	1,955	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Kits Carryover	10.0	274	0.836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits	8.9	98	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR Kits Carryover	10.0	11	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Community Kits	9.5	5,762	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Home Kits	8.9	169	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential NPSO	10.3	2,372	0.754	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail Products (gas conversion)	11.0	5,934	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smart Savers (gas conversion)	11.0	9,572	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard	13.5	200,341	0.884	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Carryover	13.7	6,197	0.845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Custom	12.8	30,951	0.822	59	59	59	59	59	59	59	59	59	59	59	59	8	0	0
RCx	6.4	4,522	0.898	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streetlighting	12.0	31,633	0.990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOC	8.9	180	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard (gas conversion)	20.0	1,867	0.908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Voltage Optimization	15.0	72,669	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 CPAS		499,865	0.885	59	59	59	59	59	59	59	59	59	59	59	59	8	0	0
Expiring 2020 CPAS				0	0	0	0	0	0	0	0	0	0	0	0	51	59	0
Expired 2020 CPAS				442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,458	442,509	442,517	442,152	442,152
WAML	12.6																	



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