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Ameren Illinois Company

Energy Efficiency Plan 3: Summary Evaluation Report

Final
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1. Executive Summary

The Illinois Public Utilities Act (Act), Section 8-103 (f) (7) and Section 8-104 (f) (8) mandates that Ameren Illinois Company (AIC):

“Provide for an annual independent evaluation of the performance of the cost-effectiveness of the utility's portfolio of measures and the Department's portfolio of measures, as well as a full review of the 3-year results of the broader net program impacts and, to the extent practical, for adjustment of the measures on a going-forward basis as a result of the evaluations. The resources dedicated to evaluation shall not exceed 3% of portfolio resources in any given year.”

This report details the performance of AIC's portfolio of energy efficiency programs for residential, and commercial and industrial (C&I) customers during the Plan 3 period that ran from June 1, 2014 to December 31, 2017.¹ This period corresponds with the seventh through ninth electric and gas program years (PY7-PY9) of AIC's program offerings, as well as the seven-month Transition Period² from June 1, 2017 to December 31, 2017.

In providing this report, AIC has met the Act's requirement for a review of 3-year results.

1.1 Program Offerings

The suite of energy efficiency programs offered by AIC has remained relatively consistent across the Plan 3 period. The C&I portfolio consists of three main programs—Standard, Custom, and Retro-Commissioning (RCx)—all of which continued from Plan 1 (PY1-PY3) and Plan 2 (PY4-PY6). Within the residential portfolio, AIC offered eight programs for most of Plan 3:

- The residential programs included Heating and Cooling (HVAC), Behavioral Modification, Appliance Recycling (ARP), Multifamily, Home Efficiency Standard (HES), Home Efficiency Income Qualified (HEIQ), ENERGY STAR New Homes (ES New Homes), and School Kits.³
- After PY9, three residential programs were discontinued and were no longer offered during the Transition Period. Programs discontinued after PY9 include HES, ARP, and the ES New Homes programs
- Additionally, AIC offered a Retail Products program through its portfolio in PY7 and the Transition Period.

Finally, during the Transition Period, AIC offered programs to low income and public sector customers, formerly served by the Illinois Department of Commerce and Economic Opportunity (DCEO). Table 1 summarizes the energy efficiency programs offered by AIC during Plan 3 by year.

¹ This report does not summarize impacts from the standalone energy efficiency programs offered through the Illinois Power Agency (IPA) during PY7-PY9.

² For simplicity, the remainder of this report refers to this period as PYTR.

³ A number of these programs were renamed during Plan 3. We have used their most recent name for simplicity.

Table 1. AIC Plan 3 Energy Efficiency Programs by Program Year

Sector	Program	PY7	PY8	PY9	PYTR
Residential	Retail Products	✓ ^a	*	*	✓
	HVAC	✓	✓	✓	✓
	Behavioral Modification	✓	✓ ^b	✓ ^b	✓
	ARP	✓	✓	✓	
	Multifamily	✓	✓	✓	✓
	HES	✓	✓	✓	
	HEIQ	✓	✓	✓	✓
	ES New Homes	✓	✓	✓	
	School Kits	✓	✓	✓	✓
C&I	Standard	✓	✓	✓	✓
	Custom	✓	✓	✓	✓
	RCx	✓	✓	✓	✓
Public Sector	Public Housing Authority				✓
	Public Sector Central Air Conditioners				✓

* The Residential Lighting Program was offered under the IPA in PY8 and PY9.

^a In PY7, the Retail Products Program was known as the Residential Lighting Program. The AIC portion of this program incented standard lighting products only.

^b In PY8 and PY9, the AIC Behavioral Modification Program was limited to gas energy efficiency only. Electric energy efficiency resulting from this program was considered as part of the IPA Behavioral Modification Program.

1.2 Overall Portfolio Results

Table 2 presents the annual ex post gross and ex post net first year savings for AIC’s energy efficiency portfolio by year, as well as associated compliance goals. During PY7 through PY9, AIC had adjustable energy savings goals that were updated based on changes to the IL-TRM and NTGRs applicable to each program. The final adjustable energy savings goals are presented in AIC’s adjustable goals tracker and replicated in Table 2. AIC’s goals are set at the portfolio level, meaning AIC has the ability to shift resources across all programs to meet the overall goal as it sees fit.

Table 2. AIC Plan 3 Portfolio Achieved Impacts by Program Year

Program Year	Compliance Goal ^{a,b,c,d}		Ex Post Net Impacts		% of Compliance Goal Achieved	
	MWh	Therms	MWh	Therms	MWh	Therms
PY7	244,962	5,066,568	275,565	6,515,201	112%	129%
PY8	189,839	5,369,967	211,414	6,836,449	111%	127%
PY9	174,349	4,948,235	197,694	5,868,915	113%	119%
PYTR	77,329	2,634,576	83,806	2,947,129	108%	112%
Plan 3 Total	686,479	18,019,346	768,479	22,167,694	113%	123%

Note: Impacts presented within this report are first year savings.

^a Compliance goals are set in terms of ex post net program impacts.

^b Compliance goals consist of the Plan 3 compliance goals (referenced below), plus achieved ex post net lighting carryover savings from PY5 and PY6.

^c Source: AIC Compliance Filing Exhibit A, Docket 13-0498 (Filed June 14, 2018).

[Accessed: <https://www.icc.illinois.gov/downloads/public/edocket/476694.pdf>]

^d Source (Transition Period): Joint Verified Petition, Exhibit B, Docket 17-0212 (Filed April 27, 2017).

[Accessed: <https://www.icc.illinois.gov/downloads/public/edocket/445934.pdf>]

As shown in Table 2, AIC met its compliance goals for both electric and gas energy savings in all four periods of Plan 3. Results in Table 2 do not include public sector programs offered during the Transition Period as those savings are not associated with a compliance goal.⁴

As with the second program cycle (Plan 2), some programs have made key contributions to the achievement of AIC's energy savings goals. For the commercial sector, both C&I Standard and Custom programs continued to provide significant and steadily increasing streams of savings to the portfolio from PY7 to PY9. Similarly, for the residential sector, Retail Products (formerly Residential Lighting) and Behavioral Modification continued to be the largest contributors to electric savings goals, while Behavioral Modification and HEIQ were the primary contributors to gas savings. Table 3 and Table 4 provides detail on savings achieved by each program during Plan 3. In addition, the evaluation team provides detailed findings for each program in the subsequent sections of this report.

Table 3. AIC Plan 3 Achieved Electric Impacts by Program

Program	Ex Post Net MWh Savings				
	PY7	PY8	PY9	PYTR	Plan 3 Total
Residential Portfolio					
Retail Products	61,326	16,391	6,386	24,092	108,195
Behavioral Modification	33,194	N/A	N/A	22,140	55,334
Appliance Recycling	4,693	3,844	1,099	N/A	9,636
HVAC	5,062	4,302	3,960	1,943	15,267
Multifamily	8,306	6,173	4,444	3,081	22,004
HES	3,075	1,174	30	N/A	4,280
HEIQ	873	3,047	3,414	2,309	9,643
ES New Homes	457	538	133	N/A	1,128
School Kits	532	782	741	348	2,403
Residential Total	117,519	36,251	20,207	53,913	227,890

⁴ Further detail on these savings can be found in Appendix C.

Program	Ex Post Net MWh Savings				
	PY7	PY8	PY9	PYTR	Plan 3 Total
C&I Portfolio					
Standard	62,828	75,850	97,497	25,259	261,434
Custom	87,017	89,456	70,803	4,268	251,544
RCx	8,201	9,857	9,187	366	27,611
<i>Commercial Total</i>	<i>158,046</i>	<i>175,163</i>	<i>177,487</i>	<i>29,893</i>	<i>540,589</i>
Portfolio Total	275,565	211,414	197,694	83,806	768,479

Table 4. AIC Plan 3 Achieved Gas Impacts by Program

Program	Ex Post Net Therm Savings				
	PY7	PY8	PY9	PYTR	Plan 3 Total
Residential Portfolio					
Retail Products	0	0	0	83,772	83,772
Behavioral Modification	1,754,669	1,389,206	1,838,167	861,531	5,843,573
Appliance Recycling	0	0	0	N/A	0
HVAC	0	0	83,550	71,589	155,139
Multifamily	239,163	279,047	162,233	36,962	717,405
HES	429,412	181,178	8,371	N/A	618,961
HEIQ	210,250	568,483	446,506	387,038	1,612,277
ES New Homes	51,376	113,893	22,455	N/A	187,724
School Kits	63,726	24,518	16,411	6,123	110,778
<i>Residential Total</i>	<i>2,748,596</i>	<i>2,556,325</i>	<i>2,577,693</i>	<i>1,447,015</i>	<i>9,329,629</i>
C&I Portfolio					
Standard	1,368,915	3,058,659	1,980,678	933,198	7,341,450
Custom	2,185,563	807,973	1,078,717	566,916	4,639,169
RCx	212,127	413,492	231,827	0	857,446
<i>Commercial Total</i>	<i>3,766,605</i>	<i>4,280,124</i>	<i>3,291,222</i>	<i>1,500,114</i>	<i>12,838,065</i>
Portfolio Total	6,515,201	6,836,449	5,868,915	2,947,129	22,167,694

2. Overarching Evaluation Approach

Throughout Plan 3, evaluation of AIC’s energy efficiency portfolio involved a wide range of evaluation activities including market actor interviews, participant and non-participant research, and on-site measurement and verification (M&V). The evaluation team implemented a combination of approaches in determining program impacts, which include:

- Application of the Illinois Statewide Technical Reference Manual (IL-TRM) and engineering analysis for prescriptive measures; and
- Onsite M&V, engineering analysis, and analysis of customer energy bills (also referred to as consumption analysis) for custom measures

Table 5 summarizes the completed impact evaluation activities by program year.

Table 5. Summary of Impact Evaluation Approach by Program and Year

Sector	Program	Impact Methodology											
		Engineering Analysis				On-Site M&V				Consumption Analysis			
		PY7	PY8	PY9	PYTR	PY7	PY8	PY9	PYTR	PY7	PY8	PY9	PYTR
Residential	Retail Products	✓	✓	✓	✓								
	HVAC	✓	✓	✓	✓								
	Behavioral Modification									✓	✓	✓	✓
	HES	✓	✓	✓	N/A ^a				N/A ^a				N/A ^a
	HEIQ	✓	✓	✓	✓								
	ARP	✓	✓	✓	N/A ^a				N/A ^a				N/A ^a
	Multifamily	✓	✓	✓	✓								
	ES New Homes ^b	✓	✓	✓	N/A ^a				N/A ^a				N/A ^a
	School Kits	✓	✓	✓	✓								
C&I	Standard	✓	✓	✓	✓								
	Custom	✓	✓	✓	✓	✓	✓	✓	✓				
	RCx	✓	✓	✓	✓	✓	✓	✓	✓				

^a The HES, ARP, and ES New Homes programs were discontinued after PY9; hence there were no program evaluations conducted for these programs in the Transition Period.

^b Engineering analysis for the ES New Homes Program used REM/Rate simulations.

In addition to determining program impacts, the evaluation team gathered process and attribution-related information through participant, non-participant, and market actor interviews as summarized in Table 6.

Table 6. Summary of Process and Prospective Net Impact Evaluation Activities by Program and Year

Evaluation Activity	Program Year	Residential								Business			
		Retail Products	HVAC	Behavioral Modification	HES	HEIQ	ARP	Multifamily	ES New Homes	School Kits	Standard	Custom	RCx
Program Material Review	All	✓ Every year and every program											
Program Manager & Implementer Interviews	All	✓ Every year and every program											
In-Store Intercepts	PY7												
	PY8	✓											
	PY9												
	PYTR												
Market Actor Interviews ^a	PY7	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓
	PY8		✓			✓					✓	✓	
	PY9		✓					✓				✓	✓
	PYTR												
Participant Survey	PY7			✓				✓			✓	✓	✓
	PY8			✓		✓		✓	✓		✓	✓	
	PY9		✓							✓	✓		✓
	PYTR												
Non-Participant Survey ^b	PY7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	PY8	✓	✓	✓	✓	✓	✓	✓	✓	✓			
	PY9	✓	✓	✓	✓	✓	✓	✓	✓	✓			
	PYTR	✓	✓	✓	✓	✓	✓	✓	✓	✓			

^a Program allies, retailers, or other market actors

^b From PY7-PY9, the evaluation team conducted residential non-participant surveys focusing on non-participant residential spillover. As such all programs were touched.

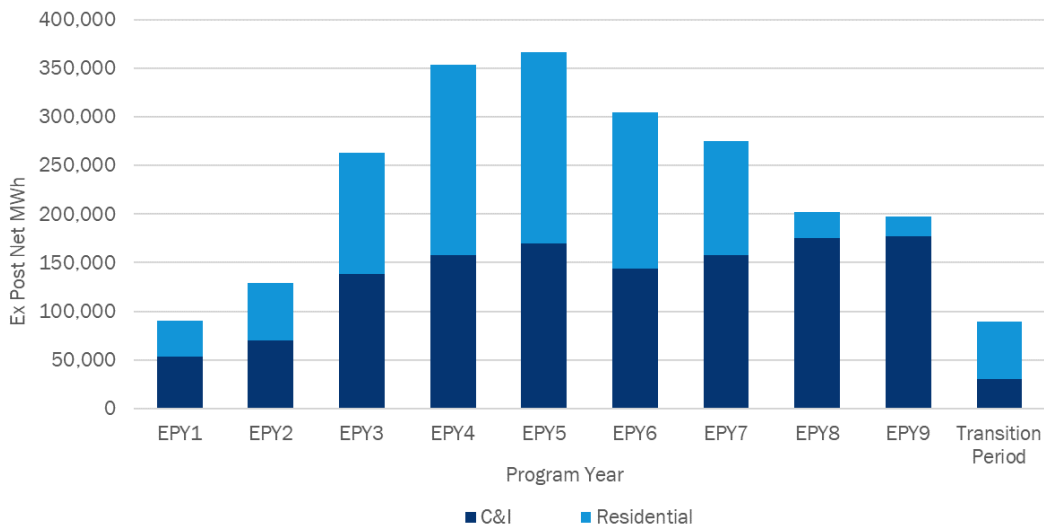
3. High-Level Impact Findings

In the following sections, we present high-level impact findings summarizing the performance of the AIC portfolio. The reader will note that savings achieved during the Transition Period appear consistently lower than savings achieved during other program years due to the Transition Period representing an abbreviated 7-month period as compared to a full 12-month program year.

3.1 Portfolio Performance

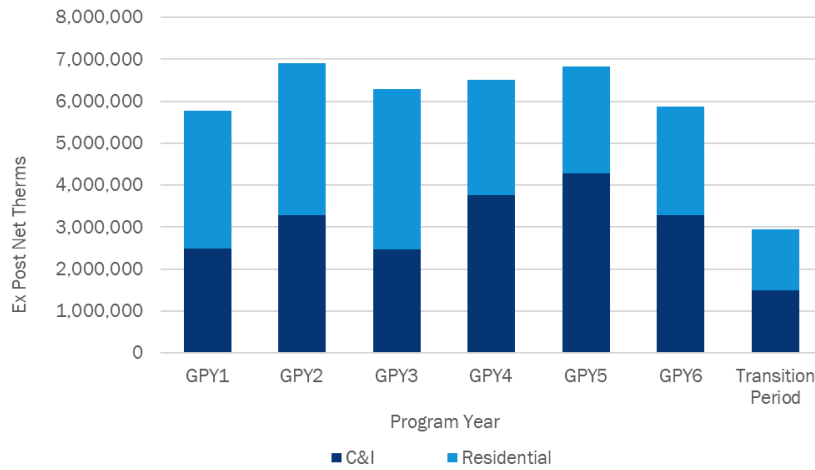
As shown in Figure 1, overall net electric savings decreased in the third program cycle (PY7 – Transition Period) compared with the previous program cycle (PY4 – PY6). The decrease was mainly due to decreases in the residential sector’s net electric savings as the Residential Lighting and Behavioral Modification offerings moved to the IPA beginning in PY8. Net electric savings for the commercial sector remained relatively consistent with the previous program cycle.

Figure 1. First Year Ex Post Net Electric Savings by Sector and Program Year



Overall gas savings remained consistent with the first gas program cycle (GPY1 – GPY3). However, gas savings increased for commercial sector programs in the second gas program cycle (GPY4 – Transition Period), while decreasing for residential sector programs, as shown in Figure 2.

Figure 2. First Year Ex Post Net Gas Savings by Sector and Program Year



The AIC energy efficiency portfolio continued to exceed filed goals for both electric and gas savings throughout Plan 3. As shown in Table 7, the percentage of ex post net electric savings compared with electric savings goals remained consistent with the previous program cycle.

Table 7. Portfolio Electric Savings Goals and Impacts by Program Year

Program Year	Electric Energy Savings Goals (MWh) ^a	Ex Post Net Electric Impacts (MWh)	% Increase in Savings over Prior Year	Percent of Electric Savings Goal Achieved ^b
PY1	62,399	89,955	N/A	144%
PY2	123,483	129,748	44%	105%
PY3	179,013	263,374	103%	147%
PY4	273,534	353,664	34%	129%
PY5	245,871	366,726	4%	149%
PY6	216,495	282,104	-23%	130%
PY7	223,408	275,565	-2%	123%
PY8	180,913	211,414	-23%	117%
PY9	174,349	197,694	-6%	113%
PYTR	77,329	83,806	-58%	108%

Table 8 shows the achievement of gas savings, which ranges from 117% to 159% between PY7 and the Transition Period.

Table 8. Portfolio Gas Savings Goals and Impacts by Program Year

Program Year	Gas Energy Savings Goals (Therms) ^a	Ex Post Net Gas Impacts (Therms)	% Increase in Savings over Prior Year	Percent of Gas Savings Goal Achieved ^b
PY4	3,703,119	5,771,819	N/A	156%
PY5	4,355,658	6,914,780	17%	159%
PY6	4,906,659	6,296,042	-10%	128%
PY7	5,066,568	6,515,201	3%	129%
PY8	5,369,967	6,836,449	5%	127%

Program Year	Gas Energy Savings Goals (Therms) ^a	Ex Post Net Gas Impacts (Therms)	% Increase in Savings over Prior Year	Percent of Gas Savings Goal Achieved ^b
PY9	4,948,235	5,868,915	-14%	119%
PYTR	2,634,576	2,947,129	-50%	112%

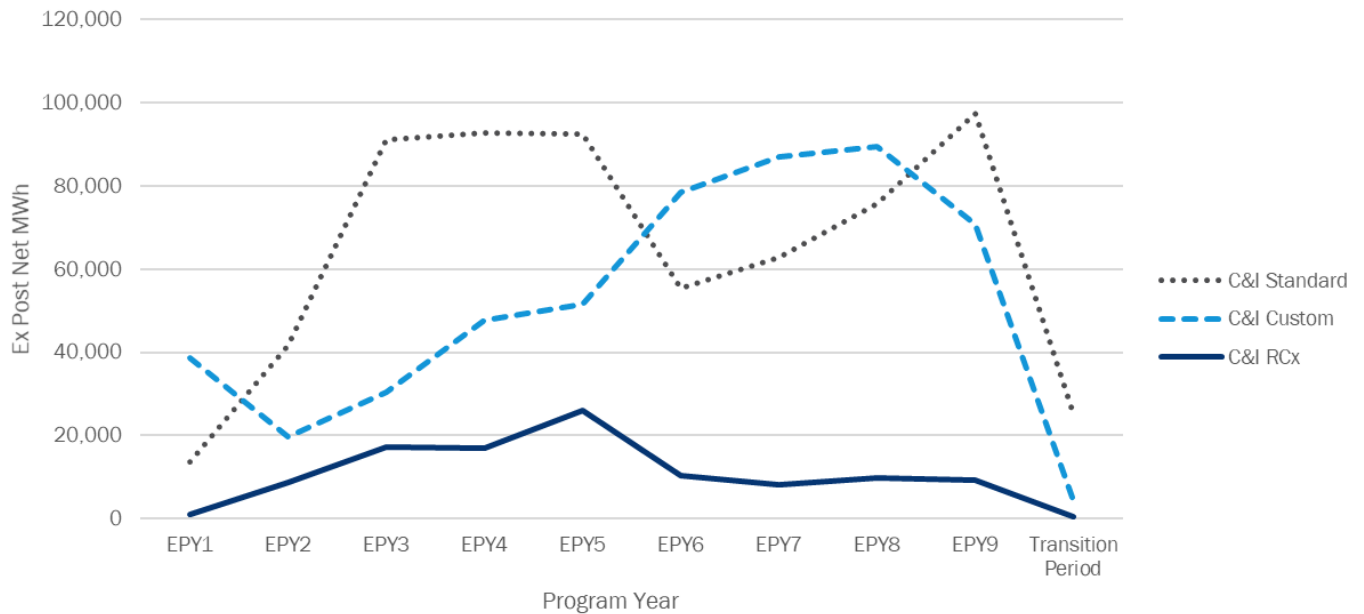
^a Source: PY4 to Transition Period Integrated Reports.

^b Percent of goal=ex post net impacts ÷ goal.

3.2 C&I Program Performance

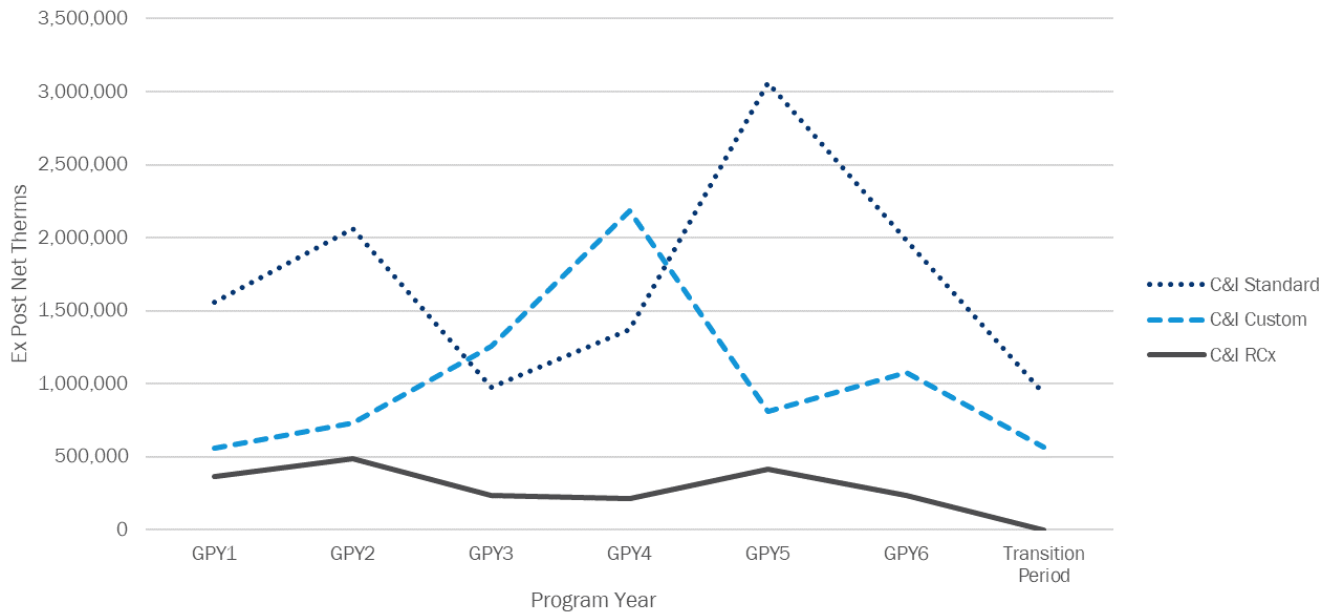
As shown in Figure 3, the Standard and Custom programs remain to be the largest contributors to electric savings with the Custom Program contributing the largest amount of savings between PY7 and PY8 and the Standard program contributing the largest in PY9 and the Transition Period. The Retro-Commissioning (RCx) program remained consistent with PY6 during most of the third program cycle (PY7 – PY9) and decreased in the Transition Period.

Figure 3. Electric Savings by Business Program and Program Year



The pattern of gas savings from C&I programs in Plan 3 is similar to electric savings, and is shown in Figure 4.

Figure 4. Gas Savings by Business Program and Program Year



The following sections provide detailed information on program performance across program years.

3.2.1 Standard

Table 9 and Table 10 summarize Standard Program gross and net energy impacts by program year. Generally, while not shown in the table below, lighting has remained the dominant end use for the Standard Program throughout Plan 1, Plan 2, and Plan 3.

Table 9. Standard Program Electric Impacts by Year

Program Year	Program Component	Ex Ante Gross MWh	Gross RR	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	Program Total	18,706	1.18	22,033	0.62	13,677
PY2	Standard Core	50,288	0.95	47,599	0.76	36,132
	Online Store	2,979	1.00	2,979	0.80	2,383
	Small Bus HVAC	3,092	1.00	3,092	1.00	3,092
	Program Total	56,359	0.95	53,669	0.78	41,607
PY3	Standard Core	84,062	1.09	91,695	0.77	70,127
	Online Store	32,620	1.00	32,620	0.64	20,866
	Direct Install - Faucet Aerators	10	1.00	10	0.76	8
	Program Total	116,693	1.07	124,326	0.75	91,002
PY4	Standard Core	70,621	1.00	70,307	0.73	51,454
	Online Store	61,555	0.90	46,317	0.80	37,053
	Green Nozzle	5,087	0.91	4,629	0.82	3,796
	Direct Install - Multiple Measures	635	1.00	635	0.80	508
	Program Total	137,898	0.88	121,888	0.76	92,811
PY5	Standard Core	98,744	1.00	98,574	0.76	75,130
	Online Store	27,115	0.90	24,309	0.69	16,773
	SBDI Pilot	604	1.00	604	0.80	483
	Green Nozzle	134	1.00	134	0.82	110
	Program Total	126,597	0.98	123,621	0.75	92,496
PY6	Standard Core	64,725	1.00	94,768	0.65	41,737
	Online Store	16,579	1.00	16,584	0.83	13,764
	Green Nozzle	26	1.00	26	0.92	24
	Program Total	81,330	1.00	111,378	0.69	55,525
PY7	Standard Core	78,415	1.00	78,383	0.79	62,167
	Online Store	732	1.01	736	0.83	611
	Instant Incentives	38	1.00	38	1.00	38
	Green Nozzle	14	1.00	14	0.92	13
	Program Total	79,198	1.00	79,170	0.79	62,828
PY8	Standard Core	88,560	1.00	88,638	0.78	69,400
	Instant Incentives	6,207	0.82	5,060	0.77	3,888

Program Year	Program Component	Ex Ante Gross MWh	Gross RR	Ex Post Gross MWh	NTGR	Ex Post Net MWh
	Online Store	2,934	1.05	3,081	0.83	2,557
	Green Nozzle	5	1.00	5	0.92	4
	Program Total	97,706	0.99	96,784	0.78	75,850
PY9	Standard Core	87,141	0.99	86,696	0.78	67,571
	Instant Incentives	32,023	1.02	32,690	0.78	25,490
	Online Store	5,306	1.00	5,306	0.83	4,404
	Green Nozzle	29	1.21	35	0.92	32
	Laminar Flow Restrictor	-	N/A	-	N/A	-
	Program Total	124,499	1.00	124,727	0.78	97,497
PYTR	Standard Core	23,565	0.99	23,287	0.78	18,460
	Instant Incentives	8,039	1.02	8,212	0.78	6,376
	Online Store	479	1.00	479	0.83	397
	Green Nozzle	27	1.00	27	0.92	25
	Laminar Flow Restrictor	-	N/A	-	N/A	-
	Program Total	32,111	1.00	32,246	0.78	25,072

Note: Realization rate = ex post savings ÷ ex ante savings.

Table 10 provides a summary of gas savings achieved by the Standard Program. As shown in the following table, gas savings increased greatly between PY6 and PY8, but decreased slightly in PY9 and significantly in the Transition Period.

Table 10. Standard Program Gas Impacts by Year

Program Year	Program Component	Ex Ante Gross Therm	Gross RR	Ex Post Gross Therm	NTGR	Ex Post Net Therm
PY4	Standard Core	507,492	1.13	572,906	0.73	458,325
	Online Store	0	N/A	0	N/A	0
	Direct Install	363,731	1.00	363,731	0.80	290,985
	Green Nozzle	1,097,600	0.90	988,971	0.82	810,956
	Program Total	1,461,331	0.93	1,352,702	0.76	1,560,266
PY5	Standard Core	2,040,058	1.00	2,040,058	1.00	2,040,058
	Online Store	0	N/A	0	N/A	0
	SBDI Pilot	0	N/A	0	N/A	0
	Green Nozzle	22,923	1.00	22,923	1.00	22,923

High-Level Impact Findings

Program Year	Program Component	Ex Ante Gross Therm	Gross RR	Ex Post Gross Therm	NTGR	Ex Post Net Therm
	Program Total	2,062,981	1.00	2,062,981	1.00	2,062,981
PY6	Standard Core	972,806	1.00	971,133	0.98	954,210
	Online Store	0	N/A	0	N/A	0
	Green Nozzle	9,424	1.00	9,424	0.89	8,387
	Program Total	982,230	1.00	980,557	0.98	962,597
PY7	Standard Core	1,523,095	1.00	1,522,965	0.90	1,364,961
	Instant Incentives	0	N/A	0	N/A	N/A
	Online Store	0	N/A	0	N/A	N/A
	Green Nozzle	4,443	1.00	4,443	0.89	3,954
	Program Total	1,527,538	1.00	1,527,408	0.90	1,368,915
PY8	Standard Core	3,406,745	1.00	3,406,423	0.90	3,058,060
	Instant Incentives	0	N/A	0	N/A	0
	Online Store	0	N/A	0	N/A	0
	Green Nozzle	673	1.00	673	0.89	599
	Program Total	3,407,418	1.00	3,407,096	0.90	3,058,659
PY9	Standard Core	3,256,970	1.00	3,256,319	0.61	1,974,286
	Instant Incentives	0	N/A	0	N/A	N/A
	Online Store	0	N/A	0	N/A	N/A
	Green Nozzle	4,510	0.99	4,481	0.89	3,988
	Laminar Flow Restrictor	3,562	1.00	3,562	0.68	2,404
	Program Total	3,265,042	1.00	3,264,361	0.61	1,980,678
PYTR	Standard Core	1,538,319	1.00	1,538,321	0.61	932,305
	Instant Incentives	0	N/A	0	N/A	0
	Online Store	0	N/A	0	N/A	0
	Green Nozzle	757	1.00	757	0.89	674
	Laminar Flow Restrictor	324	1.00	324	0.68	218
	Program Total	1,539,400	1.00	1,539,402	0.61	933,198

Note: Realization rate = ex post savings ÷ ex ante savings.

3.2.2 Custom

Table 11 presents the program level gross and net energy impacts attributable to the Custom Program from Plan 1 to Plan 3. After an initial decrease in PY2, ex post net electric savings from the Custom Program grew steadily through PY8 but declined in PY9.

Table 11. Custom Program Electric Impacts by Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	51,687	0.99	51,111	0.77	38,596
PY2	33,392	0.86	28,652	0.69	19,770
PY3	50,032	0.81	40,455	0.75	30,341
PY4	69,049	0.88	60,941	0.78	47,837
PY5	74,376	0.85	63,465	0.81	51,674
PY6	99,277	1.05	104,507	0.75	78,380
PY7	122,424	0.93	114,021	0.76	87,017
PY8	111,289	0.99	109,884	0.81	89,456
PY9	107,139	0.88	94,738	0.75	70,803
PYTR	6,734	0.86	5,759	0.74	4,268

Note: Realization rate = ex post savings ÷ ex ante savings.

Overall, gas savings from the Custom Program grew steadily from PY4 to PY7, decreasing in PY8 but again increasing in PY9.

Table 12. Custom Program Gas Impacts by Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	677,297	1.05	707,954	0.78	561,784
PY5	926,702	0.97	898,627	0.81	729,439
PY6	1,836,207	0.91	1,674,147	0.75	1,255,610
PY7	1,937,082	1.51	2,930,082	0.75	2,185,563
PY8	806,747	1.18	948,719	0.85	807,973
PY9	1,233,635	1.06	1,313,061	0.82	1,078,717
PYTR	671,637	1.02	683,031	0.83	566,916

Note: Realization rate = ex post savings ÷ ex ante savings.

3.2.3 Retro-Commissioning

Table 13 presents program level gross and net energy impacts attributable to the RCx Program. Electric savings for the RCx Program continued to decline between PY6 and PY7 but recovered in PY8.

Table 13. Retro-Commissioning Program Electric Impacts by Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	1,022	1.00	1,022	1.00	1,022
PY2	12,640	0.86	10,890	0.80	8,712

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY3	29,819	1.00	29,819	0.58	17,295
PY4	20,219	0.89	17,993	0.95	17,052
PY5	29,257	0.93	27,324	0.95	25,958
PY6	12,091	0.90	10,892	0.95	10,347
PY7	10,175	0.84	8,543	0.96	8,201
PY8	12,139	0.88	10,714	0.92	9,857
PY9	10,741	0.94	10,096	0.91	9,187
PYTR	436	0.92	402	0.91	366

Note: Realization rate = ex post savings ÷ ex ante savings.

Gas savings from the RCx Program decreased slightly in PY7 but nearly doubled in PY8. The RCx Program did not claim any gas savings for the Transition Period as only compressed air (electric) projects were completed during the Transition Period for private sector customers.

Table 14. Retro-Commissioning Program Gas Impacts by Program Year

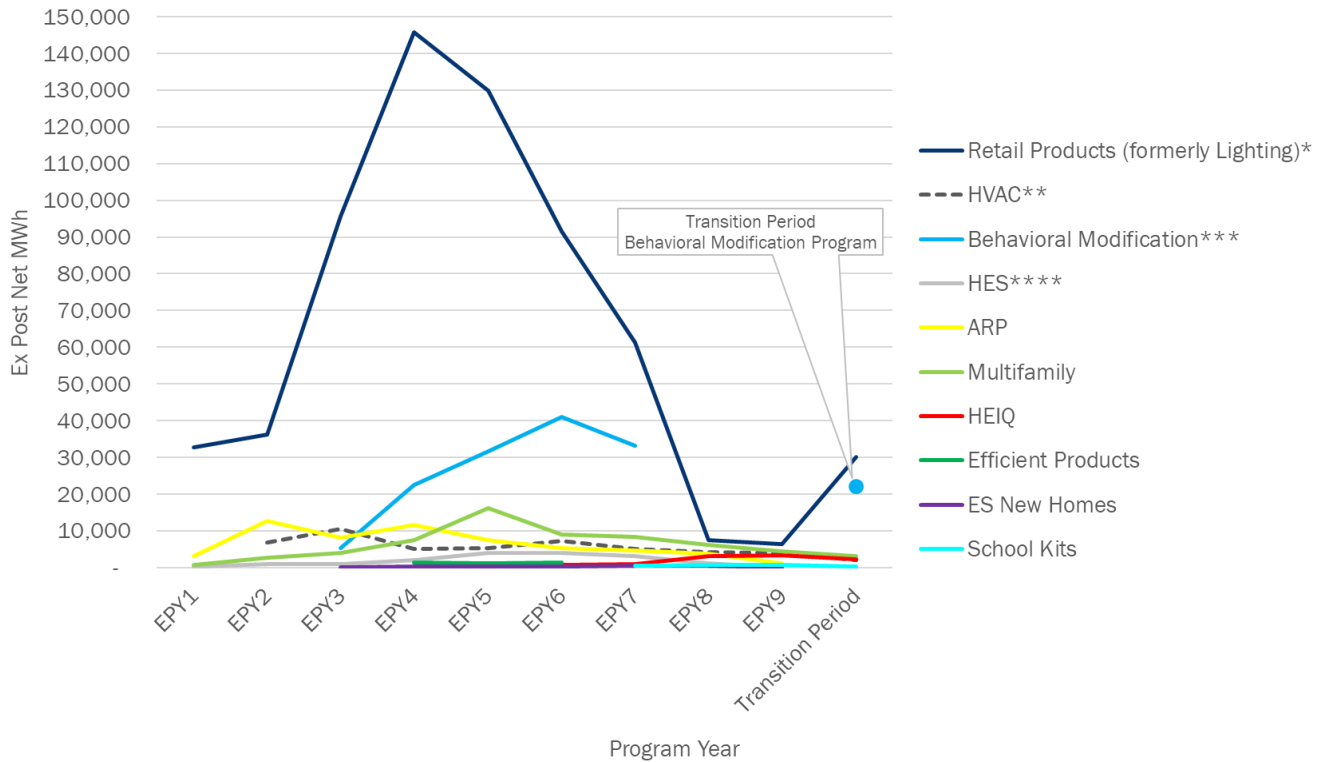
Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	450,866	0.85	383,236	0.95	361,966
PY5	577,834	0.89	512,116	0.95	486,510
PY6	248,851	1.00	248,851	0.95	236,408
PY7	226,171	0.99	223,292	0.95	212,127
PY8	514,070	0.88	454,387	0.91	413,492
PY9	252,564	1.01	254,755	0.91	231,827
PYTR	0	N/A	0	0.91	0

Note: Realization rate = ex post savings ÷ ex ante savings.

3.3 Residential Program Performance

Some residential programs have grown significantly since the first electric program year. Since PY1, the Retail Products and Behavioral Modification programs have grown the most in terms of their electric savings, while other programs have generally grown steadily from PY1 to the Transition Period, as shown in Figure 5.

Figure 5. Electric Savings by Residential Program and Program Year



Note: HES, ARP, and ES New Homes were discontinued after PY9; hence, no energy savings were claimed for these programs in the Transition Period.

* From PY1 through PY3, this program included both lighting and appliances and was referred to as the Lighting and Appliances Program. In PY8, this program moved to the IPA. All savings claimed for this program in PY8 and PY9 are “carryover” savings from delayed installs of measures purchased in PY7. AIC started offering the program again during the Transition Period and started offering smart thermostats in addition to lighting measures. The program is now referred to as Retail Products.

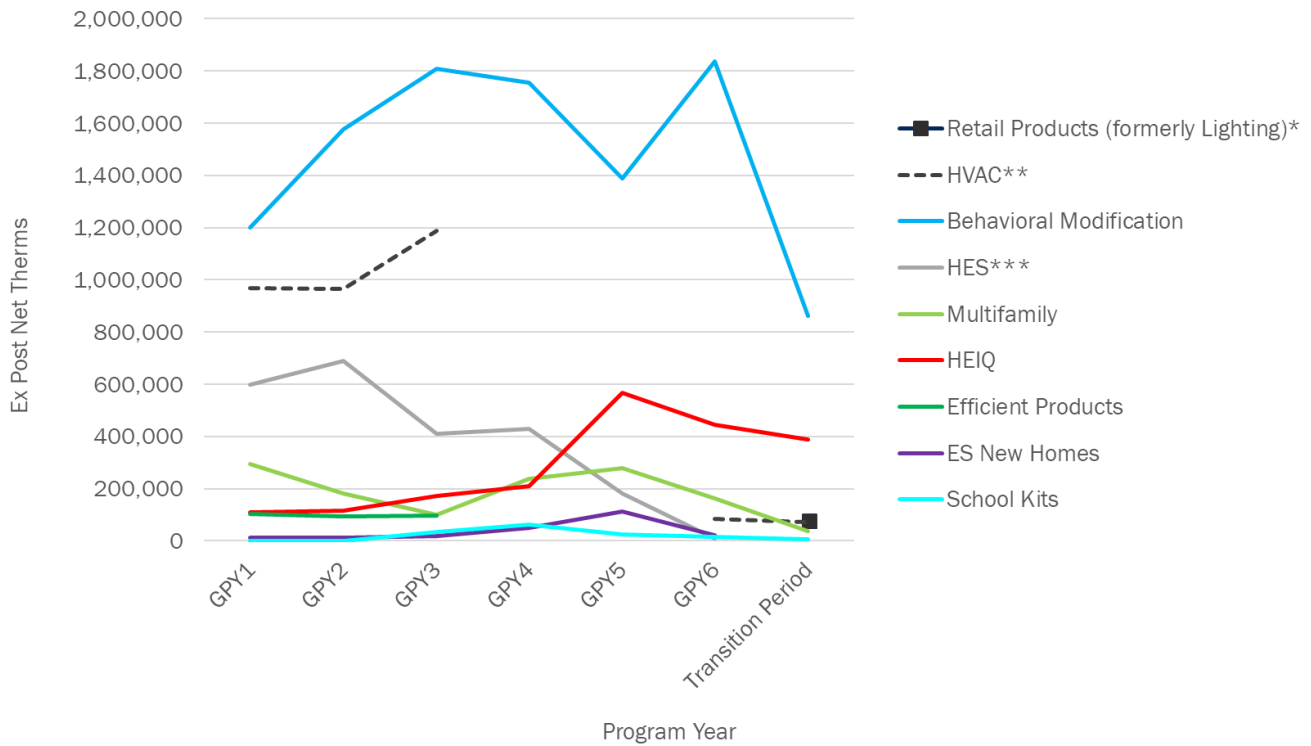
** Moderate income customers were included in the HVAC Program in PY3.

*** The Behavioral Modification Program moved to the IPA in PY8 and returned to the AIC portfolio during the Transition Period.

**** Between PY2 and PY5, the HES Program included the Electric Space Heat Pilot (ESHP). This program has also changed names several times, known alternately as the Home Energy Performance (HEP) and Home Performance with ENERGY STAR (HPwES) at times prior to the Transition Period.

While Behavioral Modification continued to be the largest contributor to gas savings since GPY1, the HEIQ, Multifamily, ES New Homes, and School Kits programs grew significantly in PY7 and PY8, as shown in Figure 6.

Figure 6. Gas Savings by Residential Program and Program Year



Note: HES, ARP, and ES New Homes were discontinued after PY9; hence, no energy savings were claimed for these programs in the transition period.

* Formerly called Lighting, the Retail Products Program started offering smart thermostats to participating customers in the Transition Period and claimed gas savings of 83,772 therms.

** AIC offered gas saving measures for the HVAC program from GPY1 to GPY3, and then again in GPY6 and the Transition Period.

*** This program changed names several times, known alternately as the Home Energy Performance (HEP) and Home Performance with ENERGY STAR (HPwES) at times prior to the Transition Period.

The following sections provide detailed information on residential program performance across program years.

3.3.1 Retail Products

Formerly known as the Residential Lighting Program, the Retail Products Program has been the largest contributor to electric savings since PY1 in the years it has operated. As shown in Table 15, the Retail Products program peaked in PY4 but declined significantly in PY7. AIC stopped offering the program in PY8 and PY9⁵ but started offering the program again during the Transition Period and introduced smart thermostats as part of its measure offerings.

⁵ The Residential Lighting Program was offered under the IPA in those years.

Table 15. Retail Products Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1 ^a	N/A	N/A	32,631	1.00	32,631
PY2 ^a	N/A	N/A	40,350	0.83	36,124
PY3 ^a	N/A	N/A	115,586	0.83	95,695
PY4	170,736	1.03	175,587	0.83	145,737
PY5	130,392	1.20	105,806	0.83	129,839
PY6	187,776	1.04	194,665	0.47	91,493
PY7	74,412	1.62	120,274	0.47	61,326
PY8 ^b	N/A	N/A	34,874	0.47	16,391
PY9 ^b	N/A	N/A	13,587	0.47	6,386
PYTR ^c	44,026	0.93	40,832	0.59	24,092

Note: Realization rate = ex post savings ÷ ex ante savings.

^a During the Plan 1 period, the program contained both lighting and appliances.

^b The Residential Lighting Program was not offered as part of the AIC portfolio in PY8 and PY9. Savings claimed in these years is carryover from delayed installations of measures purchased in PY7.

^c During the Transition Period, this offering included smart thermostats and the offering is referred to as Retail Products.

As shown in Table 16, the Retail Products Program began claiming gas savings in the Transition Period due to the addition of smart thermostats to its measure offerings.

Table 16. Retail Products Gas Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY4	No gas measures offered				
PY5	No gas measures offered				
PY6	No gas measures offered				
PY7	No gas measures offered				
PY8	No gas measures offered				
PY9	No gas measures offered				
PYTR ^a	101,826	0.91	93,080	0.90	83,772

Note: Realization rate = ex post savings ÷ ex ante savings.

^a During the Transition Period, this offering included smart thermostats and the offering is referred to as Retail Products.

3.3.2 Heating and Cooling (HVAC)

During Plan 3, electric savings from the HVAC Program declined (see Table 17). Gross realization rates have remained consistent throughout the life of the program.

Table 17. HVAC Program Electric Savings by Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	Program not offered				
PY2	N/A	N/A	10,490	0.63	6,608
PY3	N/A	N/A	17,783	0.59	10,492

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY4	8,504	1.00	8,504	0.59	5,268
PY5	8,101	1.12	9,106	0.59	5,372
PY6	12,180	1.01	12,373	0.59	7,299
PY7	7,193	1.00	7,176	0.71	5,062
PY8	5,961	0.99	5,928	0.73	4,302
PY9	5,089	1.00	5,070	0.78	3,960
PYTR	2,417	1.00	2,418	0.80	1,943

Note: Realization rate = ex post savings ÷ ex ante savings.

Note: For PY2 - PY3, N/A signifies cases where ex ante savings and realization rates were not available.

Table 18. HVAC Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	950,721	1.00	950,721	1.02	969,563
PY5	950,319	1.00	945,617	1.02	964,664
PY6	1,538,728	1.00	1,540,896	0.77	1,186,946
PY7	No gas savings claimed.				
PY8	No gas savings claimed.				
PY9	102,771	0.90	92,833	0.90	83,550
PYTR	90,682	0.88	79,543	0.90	71,589

Note: Realization rate = ex post savings ÷ ex ante savings.

3.3.3 Behavioral Modification

Given that the Behavioral Modification Program is evaluated using billing/consumption analysis, which yields estimates of net savings, the team does not provide gross energy savings in the tables below. In addition, the Behavioral Modification Program does not have NTGRs associated with it as the randomized controlled trial (RCT) produces savings estimates net of free-ridership.

Table 19. Behavioral Modification Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	N/A - No program offered				
PY2	N/A - No program offered				
PY3	N/A				5,239
PY4	N/A				22,412
PY5	N/A				31,618
PY6	N/A				41,051
PY7	N/A				33,194
PY8 ^a	N/A				N/A
PY9 ^a	N/A				N/A
PYTR	N/A				22,140

^a In PY8 and PY9, the electric component of the Behavioral Modification Program was offered through the IPA.

Since the start of the gas component of the Behavioral Modification program, it has been a crucial contributor to the overall performance of AIC’s gas energy efficiency portfolio. In PY7 through the Transition Period, the program continued to be a key contributor to gas savings.

Table 20. Behavioral Modification Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	N/A				1,199,510
PY5	N/A				1,576,341
PY6	N/A				1,809,293
PY7	N/A				1,754,669
PY8	N/A				1,389,206
PY9	N/A				1,838,167
PYTR	N/A				861,531

3.3.4 Home Efficiency Standard

Formerly referred to as Home Performance with ENERGY STAR® (HPwES), the HES Program has grown significantly since PY1 with electric and gas savings peaking in PY5 (see Table 21 and Table 22). Program savings began declining slightly in PY6 until the HES Program was discontinued in early PY9.

Table 21. HES Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	N/A	N/A	265	0.76	201
PY2	N/A	N/A	1,142	0.78	885
PY3	N/A	N/A	1,014	0.83	841
PY4	1,922	0.99	1,905	0.92	1,753
PY5	4,459	0.97	4,319	0.94	4,042
PY6	4,537	0.94	4,261	0.91	3,883
PY7	3,446	0.99	3,419	0.90	3,075
PY8	1,691	0.91	1,540	0.76	1,174
PY9 ^c	43	0.92	39	0.77	30
PYTR	Program not offered.				

Note: Realization rate = ex post savings ÷ ex ante savings.

Note: For PY1 - PY3, N/A signifies cases where ex ante savings and realization rates were not available.

^a These values are for the HES Program.

^b These values are for ESHP.

^c The HES program was discontinued in early PY9, accounting for low program savings in this period.

Table 22. HES Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	734,950	1.00	734,310	0.92	596,680
PY5	713,735	1.00	714,698	0.97	690,883
PY6	463,638	1.09	503,875	0.82	411,594
PY7	494,797	1.06	524,885	0.82	429,412
PY8	248,735	0.97	241,534	0.75	181,178
PY9 ^c	11,920	0.92	10,997	0.76	8,371

Note: Realization rate = ex post savings ÷ ex ante savings.

Note: For PY1 - PY3, N/A signifies cases where ex ante savings and realization rates were not available.

^a These values are for the HES Program.

^b These values are for ESHP.

^c The HES program was discontinued in early PY9, accounting for low program savings in this period.

3.3.5 Home Efficiency Income Qualified

Formerly known as the Moderate Income Program, the HEIQ Program has grown consistently and significantly since its launch in PY4, with electric savings peaking in PY9.

Table 23. HEIQ Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	Not offered as a distinct program.				
PY2	Not offered as a distinct program.				
PY3	Not offered as a distinct program.				
PY4	288	0.99	285	1.00	286
PY5	568	0.95	541	1.00	541
PY6	652	0.95	617	1.00	617
PY7	881	0.99	873	1.00	873
PY8	3,098	0.98	3,047	1.00	3,047
PY9	2,815	1.21	3,414	1.00	3,414
PYTR	2,097	1.10	2,309	1.00	2,309

Note: Realization rate = ex post savings ÷ ex ante savings.

Similar to the observed growth in electric savings, gas savings for the HEIQ Program has grown consistently and significantly since PY4 with gas savings peaking in PY8.

Table 24. HEIQ Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Ex Post Gross Therms	Gross Realization Rate	NTGR	Ex Post Net Therms
PY4	110,434	110,908	1.00	1.00	110,908
PY5	134,700	116,653	0.87	1.00	116,653
PY6	162,026	173,380	1.07	1.00	173,380
PY7	179,940	210,250	1.17	1.00	210,250
PY8	571,594	568,483	0.99	1.00	568,483

Program Year	Ex Ante Gross Therms	Ex Post Gross Therms	Gross Realization Rate	NTGR	Ex Post Net Therms
PY9	470,762	446,506	0.95	1.00	446,506
PYTR	380,711	387,038	1.02	1.00	387,038

Note: Realization rate = ex post savings ÷ ex ante savings.

3.3.6 Appliance Recycling

The Appliance Recycling Program is an electric-only program that reached peak energy savings in PY4 and began to decline in PY5⁶. Notably, while energy savings have fluctuated between PY5 and PY9, gross realization rates have consistently been 100% or greater.

Table 25. Appliance Recycling Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	N/A	N/A	5,555	0.54	3,011
PY2	N/A	N/A	15,968	0.80	12,757
PY3	N/A	N/A	10,188	0.80	8,121
PY4	20,406	0.89	18,196	0.54	9,779
PY5	7,729	1.22	9,461	0.80	7,542
PY6	7,696	1.10	8,466	0.63	5,326
PY7	8,219	1.00	8,222	0.57	4,693
PY8	7,190	1.02	7,325	0.52	3,844
PY9	1,963	1.04	2,047	0.54	1,099
PYTR	Program no longer offered				

Note: Ex ante savings and realization rates were not available for PY1 - PY3.

Note: Realization rate = ex post savings ÷ ex ante savings.

3.3.7 Multifamily

The Multifamily Program has grown consistently and significantly between PY1 and PY5. Program electric savings started to decline in PY6, while gross realization rates remained close to or greater than 100%.

Table 26. Multifamily Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Ex Post Gross MWh	Gross Realization Rate	NTGR	Ex Post Net MWh
PY1	N/A	1,073	N/A	0.76	817
PY2	N/A	2,806	N/A	0.98	2,742
PY3	N/A	4,139	N/A	0.98	4,062
PY4	6,975	7,609	1.09	0.94	7,126
PY5	15,754	16,754	1.06	0.97	16,219
PY6	9,284	9,286	1.00	0.98	9,075
PY7	9,453	9,232	0.98	0.90	8,306
PY8	6,033	6,306	1.05	0.99	6,173

⁶ AIC anticipated the PY5 decline in participation, which is typically seen in appliance recycling programs elsewhere as the pool of unused or unnecessary secondary refrigerators and freezers is taken out of the market.

Program Year	Ex Ante Gross MWh	Ex Post Gross MWh	Gross Realization Rate	NTGR	Ex Post Net MWh
PY9	4,476	4,601	1.03	0.97	4,444
PYTR	3,107	3,492	1.12	0.77	3,081

Note: Ex ante savings and realization rates were not available for PY1 - PY3.

Note: Realization rate = ex post savings ÷ ex ante savings.

Despite the decline in electric savings, gas savings from the Multifamily Program grew significantly in PY7 and reached a peak in PY8, as shown in Table 27.

Table 27. Multifamily Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	294,333	1.02	299,191	0.92	275,958
PY5	205,110	1.01	207,806	0.88	183,061
PY6	103,314	0.98	100,815	0.99	100,143
PY7	318,372	0.89	282,248	0.85	239,163
PY8	260,432	1.29	335,926	0.84	279,047
PY9	174,043	1.09	189,395	0.86	162,233
PYTR	30,611	1.36	41,677	0.77	36,962

Note: Realization rate = ex post savings ÷ ex ante savings.

3.3.8 ENERGY STAR® New Homes

Electric savings from the ES New Homes Program grew consistently between PY3 and PY8, prior to discontinuation of the program in PY9 (see Table 28).

Table 28. ES New Homes Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	Program not offered.				
PY2	Program not offered.				
PY3	N/A	N/A	127	0.80	101
PY4	236	1.00	236	0.80	189
PY5	379	1.00	379	0.80	303
PY6	777	0.57 ^a	443	0.80	354
PY7	732	0.78	571	0.80	457
PY8	697	0.76	532	1.01	538
PY9 ^b	183	0.73	133	1.00	133
PYTR	Program not offered.				

Note: Ex ante savings and realization rates were not available for PY3.

Note: Realization rate = ex post savings ÷ ex ante savings.

^a The decline in gross realization rates beginning in PY6 result from more robust impact analysis approaches that took code adoption within AIC territory into account. In particular, an area not enforcing an energy code had a lower baseline than an area enforcing International Energy Conservation Code (IECC) 2012.

^b The ES New Homes Program was discontinued in early PY9, leading to lower savings in this period.

As shown in Table 29, gas savings grew significantly in PY7 and PY8 for the ES New Homes program, while gross realization rates were consistently greater than one from PY7 through PY8.

Table 29. ES New Homes Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	16,000	1.00	16,000	0.80	12,800
PY5	14,586	0.99	14,446	0.80	11,557
PY6	33,826	0.69	23,193	0.80	18,554
PY7	52,120	1.23	64,220	0.80	51,376
PY8	62,494	1.81	113,214	1.01	113,893
PY9 ^a	13,423	1.66	22,321	1.01	22,455
PYTR	Program not offered.				

Note: Realization rate = ex post savings ÷ ex ante savings.

^a The ES New Homes Program was discontinued in early PY9, leading to lower savings in this period.

3.3.9 School Energy Efficiency Kits

In PY6, AIC used 8-104 gas funds to provide gas saving measures through the Illinois Power Agency’s Energy Efficiency Kits Program. In PY7, AIC expanded the School Kits program by offering electric saving measures.

Table 30. School Kits Program Electric Savings by Program Year

Program Year	Ex Ante Gross MWh	Gross Realization Rate	Ex Post Gross MWh	NTGR	Ex Post Net MWh
PY1	Program not offered.				
PY2	Program not offered.				
PY3	Program not offered.				
PY4	Program not offered.				
PY5	Program not offered.				
PY6	Program not offered.				
PY7	653	0.91	591	0.90	532
PY8	1,163	0.64	745	0.98	782
PY9	907	0.75	681	0.97	741
PYTR	459	0.80	367	0.95	348

Note: Realization rate = ex post savings ÷ ex ante savings.

Table 31. School Kits Program Gas Savings by Program Year

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY4	Program not offered.				
PY5	Program not offered.				
PY6	104,683	0.60	62,574	0.57	33,832
PY7	86,910	0.76	65,619	0.97	63,726
PY8	40,252	0.59	23,592	1.04	24,518

Program Year	Ex Ante Gross Therms	Gross Realization Rate	Ex Post Gross Therms	NTGR	Ex Post Net Therms
PY9	22,434	0.70	15,784	1.04	16,411
PYTR	8,625	0.68	5,885	1.04	6,123

Appendix A. Detailed Ex Post Savings Results

The following tables provide detailed ex post savings results by program and year. We provide these tables embedded in Excel. Please note that these tables do not include public sector savings for the Transition Period.



Appendix EM&V
Tables Plan 3 Impact

Appendix B. Individual Program Year Integrated Reports

These reports are provided under separate cover and available at <http://www.ilsag.info/>.

Appendix C. Public Sector Transition Period Impact Evaluation Results

During PY7 through PY9 (prior to the Transition Period), public sector nonresidential customers (e.g., schools, government buildings) and public housing facilities were ineligible for AIC energy efficiency programs and instead were served by programs offered through the DCEO. As of June 1, 2017, these customers became eligible for AIC programs and the Transition Period allowed AIC to begin to integrate these customers into its programs.

In addition to offering its existing programs to public sector customers, AIC absorbed a number of programs previously offered by the DCEO into its portfolio for the Transition Period. These programs include the Public Housing Authority (PHA) Program, the Savings through Efficient Products (STEP) Program, and the DCEO's Building Operator Certification (BOC) Program. Because of the planned transition of these customers to AIC programs, AIC did not have specific public sector savings goals for the Transition Period, and savings achieved by these customers do not count toward the goals AIC was required to meet during the Transition Period. Therefore, we report these savings separately below in Table 32 and Table 33.

Table 32. Public Sector Transition Period Portfolio MWh Savings Results

Program	Ex Ante Gross MWh	Gross Realization Rate ^a	Ex Post Gross MWh	NTGR ^b	Ex Post Net MWh
Residential Portfolio					
PHA	583	99%	578	100%	578
Public Sector CAC	247	143%	353	100%	353
<i>Residential Total</i>	830	112%	931	100%	931
C&I Portfolio					
Standard	11,231	96%	10,749	70%	7,574
Custom	7,851	90%	7,056	85%	5,970
RCx	496	130%	646	98%	633
<i>C&I Total</i>	19,578	94%	18,451	77%	14,178
Public Sector Total	20,408	95%	19,382	78%	15,109

Note: Some values may appear inconsistent due to rounding.

a Realization rate = ex post value ÷ ex ante value.

b Please note that these NTGRs are program level and may differ from SAG-approved values applied at the end-use level.

Table 33. Public Sector Transition Period Portfolio Therm Savings Results

Program	Ex Ante Gross Therms	Gross Realization Rate ^a	Ex Post Gross Therms	NTGR ^b	Ex Post Net Therms
Residential Portfolio					
PHA	26,350	70%	18,544	100%	18,544
Public Sector CAC	0	N/A	0	N/A	0
<i>Residential Total</i>	26,350	70%	18,544	100%	18,544
C&I Portfolio					
Standard	104,916	98%	102,893	60%	61,367
Custom	99,096	85%	83,796	74%	62,108

Program	Ex Ante Gross Therms	Gross Realization Rate ^a	Ex Post Gross Therms	NTGR ^b	Ex Post Net Therms
RCx	266,604	70%	185,432	94%	174,306
<i>C&I Total</i>	470,616	79%	372,121	80%	297,780
Public Sector Total	496,966	79%	390,665	81%	316,324

Note: Some values may appear inconsistent due to rounding.

^a The ratio of ex post gross energy savings to ex ante gross energy savings. Residential and portfolio total calculations exclude residential lighting carryover, for which ex ante savings are not available.

^b Please note that these NTGRs are program level and may differ from SAG-approved values applied at the end-use level.

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