

Boston | Headquarters

617 492 1400 tel 617 497 7944 fax 800 966 1254 toll free

1000 Winter St Waltham, MA 02451



# Ameren Illinois Company 2022 Residential Program Impact Evaluation Report

Final April 28, 2023

## **Table of Contents**

1.	Execu	utive Summary	1
	1.1	Program Overview	1
	1.2	Policy Background	2
	1.3	Program Savings	3
2.	Evalu	uation Approach	8
	2.1	Research Objectives and Evaluation Activities	8
	2.2	Verified Gross Impact Analysis Approach	8
	2.3	Verified Net Impact Analysis Approach	10
	2.4	Sources and Mitigation of Error	10
3.	Initia	tive-Level Results	12
	3.1	Retail Products Initiative	12
	3.2	Income Qualified Initiative - Single Family Offerings	32
	3.3	Multifamily Initiatives	75
	3.4	Market Rate Single Family Initiative	
	3.5	Kits Initiatives	101
Арр	pendix	A. Impact Analysis Methodology	116
	Reta	ail Products Initiative	116
	Inco	me Qualified Initiative – Single Family Offerings	123
	Mult	tifamily Initiatives	125
	Marl	ket Rate Single Family Initiative	126
	Kits	Initiatives	127
Арр	pendix	B. Additional Impacts	129
	Intro	pduction	129
	Reta	ail Products Initiative	130
	Inco	me Qualified Initiative – Single Family Offerings	132
	Mult	tifamily Initiatives	133
	Marl	ket Rate Single Family Initiative	135
	Kits	Initiatives	136
Арр	pendix	C. Cumulative Persisting Annual Savings	138
	Reta	ail Products Initiative	139
	Inco	me Qualified Initiative – Single Family Offerings	140

Multifamily	Initiatives	
Market Rate	e Single Family Initiative	
Kits Initiativ	es	
Carryover		
Appendix D.	Income Qualified Initiative Participation Summary	
Appendix E.	Alternative Savings Estimates	

### **Table of Tables**

Table 1. 2022 Residential Program Electric Energy Annual Savings Summary	4
Table 2. 2022 Residential Program Electric Demand Annual Savings Summary	5
Table 3. 2022 Residential Program Gas Annual Savings Summary	6
Table 4. 2022 Residential Program CPAS and WAML	7
Table 5. 2022 Residential Program Impact Evaluation Activities	8
Table 6. 2022 Residential Program Verified Net Savings Summary for Non-Income Qualified Initiatives	10
Table 7. 2022 Retail Products Initiative Annual Savings	12
Table 8. 2022 Incentive-Based Channels Participation Summary	14
Table 9. 2022 Incentive-Based Channels Historical Non-Lighting Sales	15
Table 10. 2022 Incentive-Based Sales by Delivery Channel and Measure	16
Table 11. 2022 Incentive-Based Channels Lighting Sales by Retail Store Type	17
Table 12. 2022 Incentive-Based Channels Income Qualified Allocations by Measure	17
Table 13. 2022 Incentive-Based Channels Participation Summary by Measure	18
Table 14. 2022 Incentive-Based Channels Electric Energy Savings by Measure	19
Table 15. 2022 Incentive-Based Channels Electric Demand Savings by Measure	20
Table 16. 2022 Incentive-Based Channels Gas Savings by Measure	21
Table 17. 2022 ECT Channel Survey Sample and Fielding Summary	26
Table 18. 2022 ECT Channel Electric Energy Savings by Measure	26
Table 19. 2022 ECT Channel Electric Demand Savings by Measure	26
Table 20. 2022 ECT Channel Verified Gas Savings by Measure	27
Table 21. 2022 Retail Products Initiative CPAS and WAML	28
Table 22. 2022 Incentive-Based Channels CPAS and WAML	28
Table 23. 2022 ECT Channel CPAS and WAML	31
Table 24. 2022 Income Qualified Initiative - Single Family Offerings Annual Savings	33
Table 25. 2022 Single Family Channel – Core Participation Summary	34
Table 26. 2022 Single Family Channel – Core Participation Summary by Measure	34
Table 27. 2022 Single Family Channel - Core Electric Energy Savings by Measure	36
Table 28. 2022 Single Family Channel - Core Electric Demand Savings by Measure	37
Table 29. 2022 Single Family Channel - Core Gas Savings by Measure	38
Table 30. 2022 Single Family Channel - SAVE Kits Participation Summary	41
Table 31. 2022 Single Family Channel - SAVE Kits Participation Summary by Measure	41

Table 32. 2022 Single Family Channel - SAVE Kits Energy Savings by Measure	43
Table 33. 2022 Single Family Channel - SAVE Kits Electric Demand Savings by Measure	43
Table 34. 2022 Single Family Channel - SAVE Kits Gas Savings by Measure	44
Table 35. 2022 Healthier Homes Channel Participation Summary by Measure	46
Table 36. 2022 Healthier Homes Channel Electric Energy Savings by Measure	46
Table 37. 2022 Healthier Homes Channel Electric Demand Savings by Measure	47
Table 38. 2022 CAA Channel Participation Summary	48
Table 39. 2022 CAA Channel Participation Summary by Measure	48
Table 40. 2022 CAA Channel Electric Energy Savings by Measure	49
Table 41. 2022 CAA Channel Electric Demand Savings by Measure	50
Table 42. 2022 CAA Channel Gas Savings by Measure	50
Table 43. 2022 Smart Savers Channel Participation Summary	53
Table 44. 2022 Smart Savers Channel Participation Summary by Measure	53
Table 45. 2022 Smart Savers Channel Electric Energy Savings by Measure	53
Table 46. 2022 Smart Savers Channel Electric Demand Savings by Measure	54
Table 47. 2022 Smart Savers Channel Gas Savings by Measure	54
Table 48. 2022 MHAS Channel Participation Summary	55
Table 49. 2022 MHAS Channel Participation Summary by Measure	56
Table 50. 2022 MHAS Channel Electric Energy Savings by Measure	56
Table 51. 2022 MHAS Channel Electric Demand Savings by Measure	57
Table 52. 2022 MHAS Channel Gas Savings by Measure	57
Table 53. 2022 Joint Utility Channel Participation Summary	60
Table 54. 2022 Joint Utility Channel Participation Summary by Measure	60
Table 55. 2022 Joint Utility Channel Electric Energy Savings by Measure	61
Table 56. 2022 Joint Utility Channel Electric Demand Savings by Measure	61
Table 57. 2022 Income Qualified Initiative Single Family Offerings CPAS and WAML by Channel	64
Table 58. 2022 Single Family Channel – Core CPAS and WAML	65
Table 59. 2022 Single Family Channel – SAVE Kits CPAS and WAML	66
Table 60. 2022 Healthier Homes Channel CPAS and WAML	67
Table 61. 2022 CAA Channel CPAS and WAML	68
Table 62. 2022 Smart Savers Channel CPAS and WAML	69
Table 63. 2022 MHAS Channel CPAS and WAML	69
Table 64. 2022 Joint Utility Channel CPAS and WAML	70

Table 65. 2022 Single Family Channel - Core (Gas Conversion) CPAS and WAML	71
Table 66. 2022 Smart Savers Channel (Gas Conversion) CPAS and WAML	72
Table 67. 2022 Multifamily Initiatives Annual Savings	75
Table 68. 2022 IQ Multifamily Channel Participation Summary	76
Table 69. 2022 Market Rate Multifamily Initiative Participation Summary	76
Table 70. 2022 Public Housing Initiative Participation Summary	76
Table 71. 2022 IQ Multifamily Channel Participation Summary by Measure	76
Table 72. 2022 IQ Multifamily Channel Electric Energy Savings by Measure	77
Table 73. 2022 IQ Multifamily Channel Electric Demand Savings by Measure	78
Table 74. 2022 IQ Multifamily Channel Gas Savings by Measure	78
Table 75. 2022 Market Rate Multifamily Initiative Participation Summary by Measure	80
Table 76. 2022 Market Rate Multifamily Initiative Electric Energy Savings by Measure	80
Table 77. 2022 Market Rate Multifamily Channel Electric Demand Savings by Measure	81
Table 78. 2022 Market Rate Multifamily Initiative Gas Savings by Measure	81
Table 79. 2022 Public Housing Initiative Participation Summary by Measure	82
Table 80. 2022 Public Housing Initiative Electric Energy Savings by Measure	83
Table 81. 2022 Public Housing Initiative Electric Demand Savings by Measure	84
Table 82. 2022 Public Housing Initiative Gas Savings by Measure	84
Table 83. 2022 Multifamily Initiatives CPAS and WAML Summary	85
Table 84. 2022 IQ Multifamily Channel CPAS and WAML	85
Table 85. 2022 Market Rate Multifamily Initiative CPAS and WAML	87
Table 86. 2022 Public Housing Initiative CPAS and WAML	
Table 87. 2022 Market Rate Single Family Initiative Annual Savings	
Table 88. 2022 Midstream HVAC Channel Participation Summary by Measure Category	91
Table 89. 2022 Midstream HVAC Initiative Ex Ante Gross Energy Savings by Measure	91
Table 90. 2022 Midstream HVAC Initiative Electric Energy Savings by Measure	92
Table 91. 2022 Midstream HVAC Initiative Electric Demand Savings by Measure	92
Table 92. 2022 Midstream HVAC Initiative Gas Savings by Measure	92
Table 93. 2022 Home Efficiency Channel Incentives	93
Table 94. 2022 Home Efficiency Channel Participation Summary	94
Table 95. 2022 Home Efficiency Channel Ex Ante Gross Energy Savings by Measure	95
Table 96. 2022 Home Efficiency Channel Electric Energy Savings by Measure	96
Table 97. 2022 Home Efficiency Channel Electric Demand Savings by Measure	96

Table 98. 2022 Home Efficiency Channel Gas Savings by Measure	97
Table 99. 2022 Market Rate Single Family Initiative CPAS and WAML	99
Table 100. 2022 Midstream HVAC Channel CPAS and WAML	99
Table 101. 2022 Home Efficiency Channel CPAS and WAML	
Table 102. 2022 Kits Initiatives Annual Savings	102
Table 103. 2022 School Kits Channel Participation Summary by Measure	103
Table 104. 2022 School Kits Channel Electric Energy Savings by Measure	103
Table 105. 2022 School Kits Channel Electric Demand Savings by Measure	104
Table 106. 2022 School Kits Channel Gas Savings by Measure	104
Table 107. 2022 High School Innovation Channel Participation Summary by Measure	105
Table 108. 2022 High School Innovation Channel Electric Energy Savings by Measure	106
Table 109. 2022 High School Innovation Channel Electric Demand Savings by Measure	106
Table 110. 2022 High School Innovation Channel Gas Savings by Measure	106
Table 111. 2022 Community Kits Channel Participation Summary by Measure	107
Table 112. 2022 Community Kits Channel Electric Energy Savings by Measure	108
Table 113. 2022 Community Kits Channel Electric Demand Savings by Measure	108
Table 114. 2022 Community Kits Channel Gas Savings by Measure	108
Table 115. 2022 Ad Hoc Measure Distribution Participation Summary	109
Table 116. 2022 Ad Hoc Measure Distribution Electric Energy Savings by Measure	110
Table 117. 2022 Ad Hoc Measure Distribution Electric Demand Savings by Measure	110
Table 118. 2022 Ad Hoc Measure Distribution Gas Savings by Measure	110
Table 119. 2022 Kits Initiatives CPAS and WAML Summary	112
Table 120. 2022 School Kits Channel CPAS and WAML	113
Table 121. 2022 High School Innovation Channel CPAS and WAML	113
Table 122. 2022 Community Kits Channel CPAS and WAML	114
Table 123. 2022 Ad Hoc Measure Distribution CPAS and WAML	114
Table 124. 2022 Retail Products Initiative Measures Evaluated	116
Table 125. 2022 ECT Channel Survey Sample and Fielding Summary	117
Table 126. 2022 ECT Channel Counts of Respondent Purchases by Product Category	119
Table 127. 2022 Efficient Choice Tool Channel Measures Evaluated and Per Unit Savings Summa	ry121
Table 128. 2022 SAG-Approved Retail Products Initiative NTGRs	122
Table 129. 2022 Income Qualified Initiative Measures Evaluated	123
Table 130. Minimum Federal Standard Efficiencies for Split Systems vs. Space Constrained Produ	cts124

Table 131. 2022 Multifamily Initiatives Measures Evaluated	125
Table 132. 2022 SAG-Approved Multifamily Initiatives NTGRs	126
Table 133. 2022 Market Rate Single Family Initiative Measures Evaluated	126
Table 134. 2022 SAG-Approved Market Rate Single Family Initiative NTGRs	127
Table 135. 2022 Kits Initiatives Measures Evaluated	128
Table 136. Food Bank Kit and Holiday LED Verification Summary	128
Table 137. 2022 Retail Products Initiative Propane Savings by Measure	130
Table 138. 2022 Retail Products Initiative Gas Penalties	130
Table 139. 2022 Retail Products Initiative Secondary Electric Savings	131
Table 140. 2022 Retail Products Initiative Verified Gross Impacts for Cost-Effectiveness	131
Table 141. 2022 Income Qualified Initiative – Single Family Offerings Gas Penalties	132
Table 142. 2022 Income Qualified Initiative - Single Family Offerings Secondary Electric Savings	132
Table 143. 2022 Income Qualified Initiative – Single Family Offerings Verified Gross Impacts for Cos Effectiveness	st- 133
Table 144. 2022 Multifamily Initiatives Gas Penalties	
Table 145. 2022 Multifamily Initiatives Secondary Electric Savings	134
Table 146. 2022 Multifamily Initiatives Verified Gross Impacts for Cost-Effectiveness	134
Table 147. 2022 Market Rate Single Family Initiative Gas Penalties	135
Table 148. 2022 Market Rate Single Family Initiative Secondary Electric Savings	135
Table 149. 2022 Market Rate Single Family Initiative Verified Gross Impacts for Cost-Effectiveness.	135
Table 150. 2022 Kits Initiatives Gas Penalties	136
Table 151. 2022 Kits Initiatives Secondary Electric Savings	136
Table 152. 2022 Kits Initiatives Verified Gross Impacts for Cost-Effectiveness	137
Table 153. 2022 Residential Program CPAS and WAML	138
Table 154. 2022 Retail Products Initiative CPAS and WAML	139
Table 155. 2022 Retail Products Initiative – Propane Conversion CPAS and WAML	139
Table 156. 2022 Income Qualified Initiative – Single Family Offerings CPAS and WAML	140
Table 157. 2022 Income Qualified Initiative – Single Family Channel Gas Conversion CPAS and WAI	۸L141
Table 158. 2022 Income Qualified Initiative – Smart Savers Channel Gas Conversion CPAS and WA	ML141
Table 159. 2022 Multifamily Initiatives CPAS and WAML	142
Table 160. 2022 Market Rate Single Family Initiative CPAS and WAML	143
Table 161. 2022 Kits Initiatives CPAS and WAML	144
Table 162. 2022 Residential Program Carryover Savings CPAS and WAML	145

Table 163. Detailed 2022 IQ Initiative - Single Family Channel Participation Summary	146
Table 164. Detailed 2022 Income Qualified Initiative – CAA Channel Participation Summary	147
Table 165. Detailed 2022 Income Qualified Initiative – MHAS Channel Participation Summary	148
Table 166. Detailed 2022 Income Qualified Initiative - Joint Utility Channel Participation Summary	148
Table 167. 2022 Income Qualified Initiative - MHAS Channel Alternative Electric Energy Savings Estimates	150

### **1.** Executive Summary

This report presents impact evaluation results from Ameren Illinois Company's (AIC) 2022 Residential Program. The Residential Program is part of AIC's overall portfolio of residential and nonresidential energy efficiency programs implemented during the 2022 calendar year. The overarching objective of the 2022 Residential Program impact evaluation is to determine the gross and net electric energy, electric demand, and natural gas impacts associated with the Program.

### **1.1 Program Overview**

The Residential Program is formally made up of six initiatives, most of which are further broken down into channels, which the evaluation team assessed as part of the 2022 evaluation:

- Retail Products Initiative
  - Point of Purchase channel
  - Downstream Rebates channel
  - Online Marketplace channel
  - Efficient Choice Tool (ECT) channel
- Income Qualified Initiative
  - Single Family channel
    - Safe and Virtual Efficiency (SAVE) kits offering
  - Healthier Homes channel
  - Community Action Agency (CAA) channel
  - Smart Savers channel
  - Mobile Homes & Air Sealing (MHAS) channel
  - Joint Utility channel
  - Community Kits channel
  - Multifamily channel
  - Retail Products channel
- Public Housing Initiative
- Market Rate Multifamily Initiative
  - Direct Install channel
  - Heat Pumps channel
  - Whole Building channel
- Market Rate Single Family Initiative
  - Midstream HVAC channel
  - Home Efficiency channel

- Direct Distribution Efficient Products (Direct Distribution) Initiative
  - School Kits channel
  - High School Innovation channel

The initiatives are designed to achieve energy savings in accordance with AIC's plan filing and to provide energy efficiency services and assistance to customers through a wide range of channels. The Retail Products Initiative, which provides point-of-sale (POS) and instant discounts to customers purchasing energy-efficient products, is the largest component of the Program from an electric energy and gas savings perspective. The Income Qualified Initiative, which provides whole-home retrofit services and energy efficiency measures through a range of channels, is the largest component of the Program from a program cost perspective.

To best serve AIC and stakeholders, we have considered the delivery strategy and unique characteristics for each AIC offering at the Initiative and channel level, and have organized our evaluation activities to most effectively use evaluation resources, minimize customer touchpoints, and optimize research insights.

As a result, evaluation efforts are not always organized in a way that perfectly aligns with formal portfolio organization. In particular, our report makes the following organizational choices:

- The Retail Products channel of the Income Qualified Initiative is grouped with the market rate channels of the Retail Products Initiative as program delivery is not notably differentiated across these channels. Additionally, the Point of Purchase, Downstream Rebates, and Online Marketplace channels are collectively referred to as "incentive-based channels" reflecting their differentiation from the ECT channel, which does not utilize incentives.
- The Income Qualified Initiative's channels that focus on delivery of measures directly to single family customer homes (as differentiated from retail offerings, multifamily offerings, or kit-based offerings) are grouped together as the Income Qualified Initiative Single Family offerings.
- The three separate AIC efforts that deliver services to multifamily customers (the Multifamily channel of the Income Qualified Initiative, all channels of the Market Rate Multifamily Initiative, and the Public Housing Initiative) are grouped together as program delivery is coordinated across these channels.
- All AIC efforts that deliver efficiency measures to residential customers through kits or other similar delivery channels (with the exception of the Income Qualified Initiative's SAVE Kits offering) are grouped together as evaluation efforts for these efforts are similar.

Throughout this report, where possible, we identify and/or break out program impacts on income qualified and other hard-to-reach customers. We acknowledge that some of these organizational choices may make it more challenging for readers to understand the sum total impact of the Residential Program on these customers in 2022; we will continue to refine evaluation reporting efforts to support this goal wherever possible.

### **1.2** Policy Background

This is the first calendar year of AIC's sixth Electric and Gas Energy Efficiency and Demand Response Plan, covering calendar years 2022-2025 ("Plan 6"). AIC's Plan 6 portfolio is governed by components of Illinois state law (220 ILCS 5/8-103B ["Section 8-103B"] and 220 ILCS 5/8-104 ["Section 8-104"]) which directs large, regulated utilities to offer electric and gas energy efficiency programs. Section 8-103B and 8-104 were most recently substantively revised through the passage of Illinois Public Act 102-0662 (the Climate and Equitable Jobs Act, or "CEJA") in September 2021.

Section 8-103B and Section 8-104 define key points of policy that are relevant to the evaluation of the 2022 AIC Residential Program, which we summarize below as context for this evaluation report.

- Cumulative Persisting Annual Savings (CPAS): Since 2018, electric energy savings goals for Illinois utilities have been primarily defined based on persisting savings as a percentage of sales. As such, annual evaluations of AIC's electric energy efficiency programs must present both annual and persisting savings over the life of delivered measures. As a result, AIC and its program implementer have sought to deliver programs that achieve savings that persist for longer periods of time.
- Weighted Average Measure Life (WAML): Section 8-103B allows AIC to create a regulatory asset from all of its 8-103B expenditures, 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."<sup>1</sup> Therefore, annual evaluations of AIC's electric energy efficiency programs must present a WAML in accordance with the guidelines for calculation presented in the Illinois Stakeholder Advisory Group's (SAG) WAML Report.<sup>2</sup>
- Applicable Annual Incremental Goal (AAIG): Section 8-103B allows AIC to earn a rate of return on their electric energy efficiency spending if they create a regulatory asset, as discussed above. The rate of return that is earned can be adjusted either up or down as a function of AIC's performance relative to its 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. AIC must achieve sufficient savings through its programs to replace savings from measures at the end of their measure life before progress can be counted toward the AAIG. Therefore, annual evaluations of AIC's electric energy efficiency programs must assess AIC's performance against its AAIG.
- (b-25) Savings Conversion: Subsection (b-25) of Section 8-103B allows electric utilities to "convert" savings achieved of other fuels, including natural gas, to electric savings for the purposes of goal attainment in certain cases. The total amount of savings allowed to be converted is capped at a maximum of 10% of the utility's applicable annual total savings requirement.<sup>3,4</sup> Electric savings reported in summary sections of this report therefore include converted savings where applicable.

### **1.3 Program Savings**

In the following sections, the evaluation team presents annual savings (annualized 2022 energy savings) and CPAS for AIC's Residential Program. As discussed in greater detail in the 2022 AIC Integrated Impact Evaluation Report, AIC's performance compared to its AAIG is determined based on both types of savings.

### **1.3.1** Annual Savings

The 2022 Residential Program achieved 153,806 MWh, 23.22 MW, and 2,171,063 therms in verified net savings to be counted toward AIC's energy savings goals. These savings include a non-participant spillover (NPSO) "adder" on net savings.<sup>5,6</sup> These savings are also reported after accounting for the legislatively-allowed

<sup>2</sup> Ibid.

<sup>&</sup>lt;sup>1</sup> Illinois Energy Efficiency Stakeholder Advisory Group. *Weighted Average Measure Life Report*. 2018.

<sup>&</sup>lt;sup>3</sup> The annual total savings requirement is the AAIG plus the additional savings that need to be acquired on an annual basis to replace any savings from measures at the end of their measure life before progress can be counted toward AAIG.

<sup>&</sup>lt;sup>4</sup> Note that prior to the passage of CEJA, the (b-25) savings conversion was capped at 10% of AAIG, rather than the annual total savings requirement.

<sup>&</sup>lt;sup>5</sup> Opinion Dynamics. Ameren Illinois Company Energy Efficiency Portfolio 2022 Net-to-Gross Ratios.

https://www.ilsag.info/wp-content/uploads/AIC-2022-NTGR-Recommendations-for-SAG-FINAL-2021-09-27.xlsx

<sup>&</sup>lt;sup>6</sup> The process of computing savings from the residential NPSO adder is complex. See Section 2.3.1 for more detail.

conversion of other fuel savings to electric energy savings for the purpose of goal attainment. Converted savings include savings of fuels not provided by AIC, which are detailed further in Appendix B.

Table 1, Table 2, and Table 3 present ex ante gross, verified gross, and verified net electric energy, electric demand, gas, and by initiative and channel for the 2022 Residential Program.

Initiative	Channel	Ex Ante Gross MWh	Gross Realization Rate	Verified Gross MWh	Net-to-Gross Ratio (NTGR)	Verified Net MWh
Retail	Incentive-Based Channels	129,678	97%	126,311	0.832	105,110
Products	ECT	N/A	N/A	1,525	0.673	1,026
Initiative	Carryover <sup>a</sup>	N/A	N/A	11,217	0.751	8,421
	Single Family	2,137	100%	2,133	1.000	2,133
	SAVE Kits	1,615	100%	1,615	1.000	1,615
Income	Healthier Homes	1	100%	1	1.000	1
Qualified	CAA	892	100%	889	1.000	889
Single Family	Smart Savers	1,050	115%	1,209	1.000	1,209
Offerings	MHAS	108	96%	103	1.000	103
	Joint Utility	112	97%	109	1.000	109
	Carryover <sup>a</sup>	N/A	N/A	1,349	1.000	1,349
	IQ Multifamily	5,071	100%	5,074	1.000	5,074
Multifamily	Market Rate Multifamily	1,416	100%	1,417	0.860	1,219
Indutves	Public Housing	850	100%	851	1.000	851
Market Rate	Midstream HVAC	5,888	100%	5,896	0.801	4,726
SF Initiative	Home Efficiency	162	100%	162	0.810	132
	School Kits	3,028	100%	3,028	1.000	3,028
	High School Innovation	580	101%	584	1.000	584
KITS INITIATIVES	Community Kits	1,248	99%	1,232	1.000	1,232
	Ad Hoc Distribution	3,827	57%	2,184	1.000	2,184
	Carryover <sup>a</sup>	N/A	N/A	1,543	0.996	1,538
Residential Pro	gram Subtotal <sup>b</sup>	157,662	97%	168,431	0.846	142,530
Residential NPSO Adder						1,910
IQ - Single Family (gas conversion)						5,342
IQ - Smart Save	ers (gas conversion)					3,957
Retail Products	(propane conversion)					66
<b>Residential Pro</b>	gram Total					153,806

Table 1. 2022 Residential Program Electric Energy Annual Savings Summary

<sup>a</sup> Carryover savings are those achieved through installation of measures during 2022 that were distributed or rebated in prior program years. For clarity, we break out carryover separately throughout this report. More information on carryover savings is available in Section 2.2.3.

<sup>b</sup> Calculations of gross realization rate at the Residential Program level exclude categories of savings with no ex ante savings.

Initiative	Initiative Channel		Gross Realization Rate	Verified Gross MW	NTGR	Verified Net MW	
Retail Products	Incentive-Based Channels	20.40	97%	19.74	0.831	16.41	
Initiative	ECT	N/A	N/A	0.15	0.672	0.10	
	Carryover <sup>a</sup>	N/A	N/A	1.47	0.750	1.10	
	Single Family	0.75	99%	0.74	1.000	0.74	
	SAVE Kits	0.21	100%	0.21	1.000	0.21	
Income	Healthier Homes	<0.01	100%	<0.01	1.000	<0.01	
Qualified	CAA	0.24	100%	0.24	1.000	0.24	
Single Family	Smart Savers	0.31	127%	0.39	1.000	0.39	
Offerings	MHAS	0.04	84%	0.03	1.000	0.03	
	Joint Utility	0.04	106%	0.05	1.000	0.05	
	Carryover <sup>a</sup>	N/A	N/A	0.16	1.000	0.16	
	IQ Multifamily	0.69	107%	0.73	1.000	0.73	
Multifamily	Market Rate Multifamily	0.19	136%	0.26	0.834	0.21	
Indutves	Public Housing	0.13	100%	0.14	1.000	0.14	
Market Rate SF	Midstream HVAC	1.47	100%	1.47	0.800	1.18	
Initiative	Home Efficiency	0.04	100%	0.04	0.826	0.04	
	School Kits	0.46	100%	0.46	1.000	0.46	
	High School Innovation	0.08	101%	0.08	1.000	0.08	
Kits initiatives	Community Kits	0.15	96%	0.15	1.000	0.15	
	Ad Hoc Distribution	0.46	58%	0.27	1.000	0.27	
	Carryover <sup>a</sup>	N/A	N/A	0.18	0.996	0.18	
Residential Prog	ram Subtotal <sup>b</sup>	25.67	97%	26.97	0.848	22.88	
Residential NPS	O Adder					0.34	
<b>Residential Prog</b>	ram Total					23.22	

#### Table 2. 2022 Residential Program Electric Demand Annual Savings Summary

<sup>a</sup> Carryover savings are those achieved through installation of measures during 2022 that were distributed or rebated in prior program years. For clarity, we break out carryover separately throughout this report. More information on carryover savings is available in Section 2.2.3.

<sup>b</sup> Calculations of gross realization rate at the Residential Program level exclude categories of savings with no ex ante savings.

Initiative	Channel	Ex Ante Gross Therms	Gross Realization Rate	Verified Gross Therms	NTGR	Verified Net Therms
Retail Products	Incentive-Based Channels	1,545,220	98%	1,510,190	0.929	1,402,568
Initiative	ECT	N/A	N/A	90,188	0.603	54,385
	Single Family	346,103	99%	344,257	1.000	344,257
Income	SAVE Kits	55,689	100%	55,681	1.000	55,681
Qualified	Healthier Homes	0	N/A	0	N/A	0
Initiative -	CAA	92,282	100%	92,042	1.000	92,042
Single Family	Smart Savers	121,776	111%	135,047	1.000	135,047
Onerings	MHAS	29,529	100%	29,418	1.000	29,418
	Joint Utility	0	N/A	0	N/A	0
	IQ Multifamily	65,226	99%	64,818	1.000	64,818
Multifamily Initiatives	Market Rate Multifamily	4,252	100%	4,252	0.917	3,899
	Public Housing	6,117	100%	6,117	1.000	6,117
Market Rate	Midstream HVAC	48,619	100%	48,410	0.900	43,569
SF Initiative	Home Efficiency	18,868	100%	18,881	0.826	15,591
	School Kits	105,449	100%	105,449	1.000	105,449
Kits	High School Innovation	20,850	100%	20,850	1.000	20,850
muatives	Community Kits	53,829	96%	51,578	1.000	51,578
	Ad Hoc Distribution	27,747	58%	15,954	1.000	15,954
Residential Pr	ogram Subtotal <sup>a</sup>	2,541,554	98%	2,593,132	0.941	2,441,224
Residential NPSO Adder						47,221
IQ - Single Family (gas conversion)						-182,335
IQ - Smart Sav conversion)	vers (gas					-135,047
Residential Pr	ogram Total					2,171,063

#### Table 3. 2022 Residential Program Gas Annual Savings Summary

<sup>a</sup> Calculations of gross realization rate at the Residential Program level exclude categories of savings with no ex ante savings.

Executive Summary

### **1.3.2** Cumulative Persisting Annual Savings

Table 4 summarizes CPAS and WAML for the 2022 Residential Program at the initiative level. For additional detail related to CPAS and measure life, please see the individual initiative chapters in Section 3 and Appendix C, which presents CPAS for each year of program operation. The overall WAML for the 2022 Residential Program is 11.0 years.

				0						
		First-Year		CPAS - Verified Net Savings (MWh)					Lifetime	
Initiative	WAML	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Retail Products Initiative	10.4	127,836	0.830	106,136	106,136	106,136	106,136		68,222	 967,202
Retail Products Carryover	9.5	11,217	0.751	8,421	8,421	8,421	8,421		5,112	 67,899
IQ Initiative – Single Family Offerings	13.2	6,057	1.000	6,057	6,057	6,057	6,057		4,808	 74,641
IQ Carryover	10.0	1,349	1.000	1,349	1,349	1,349	1,349		1,014	 12,487
Multifamily Initiatives	12.7	7,342	0.973	7,144	7,144	7,144	6,995		6,060	 86,468
Market Rate SF Initiative	15.7	6,059	0.802	4,857	4,857	4,857	4,857		4,815	 75,895
Kits Initiatives	10.0	7,027	1.000	7,027	7,027	6,721	6,721		4,610	 67,238
Kits Carryover	10.0	1,543	0.996	1,538	1,538	1,538	1,538		1,155	 14,260
Residential NPSO Adder	10.4	2,565	N/A	1,910	1,910	1,910	1,910		1,082	 16,419
IQ – Single Family (gas conversion)	18.7	5,342	1.000	5,342	5,342	5,342	5,342		2,580	 60,470
IQ – Smart Savers (gas conversion)	11.0	3,957	1.000	3,957	3,957	3,957	3,957		3,957	 43,526
RP (propane conversion)	11.0	71	0.929	66	66	66	66		66	 730
2022 CPAS		180,367	0.853	153,806	153,806	153,499	153,350		103,483	 1,487,236
Expiring 2022 CPAS				0	0	306	149		941	
Expired 2022 CPAS				0	0	306	456		50,323	
WAML	11.0									

Table 1 2022	Decidential	Drodrom	CDAC	and	<b>\A/AN/I</b>
Table 4. ZUZZ	Residential	Program	UPAS	anu	WANL

### 2. Evaluation Approach

The following section of the report describes the evaluation approach taken for the 2022 Residential Program impact evaluation. As part of the evaluation process, the evaluation team applied the versions of the Illinois Energy Efficiency Policy Manual and the Illinois Technical Reference Manual (IL-TRM) applicable to the 2022 program year (Version 2.1 and Version 10.0 [V10.0], respectively) wherever relevant.<sup>7</sup> Appendix A of this report provides more detailed, initiative-specific methodology where appropriate.

### 2.1 **Research Objectives and Evaluation Activities**

The overarching research objectives for the impact evaluation of AIC's 2022 Residential Program are as follows:

- Estimate the estimated gross energy and demand impacts from the Program
- Estimate the net energy and demand impacts from the Program

The evaluation team met these objectives by conducting the impact evaluation activities outlined in Table 5. As shown, for each initiative, the impact evaluation primarily consisted of applying savings algorithms from the IL-TRM V10.0 to final initiative tracking databases to estimate verified gross savings and applying SAG-approved net-to-gross ratios (NTGRs) to these verified gross savings to derive verified net savings. In addition, we reviewed initiative materials and interviewed initiative managers.

		Gross Impacts	Net Impacts		
Initiative	IL-TRM Application Review	Engineering Desk Reviews	Survey-Based Analysis	Consumption Analysis	Application of SAG-Approved NTGRs
Retail Products Initiative	✓		✓		✓
Income Qualified Initiative – Single Family Offerings	~				~
Multifamily Initiatives	✓				✓
Market Rate Single Family Initiative	✓				✓
Kits Initiatives	$\checkmark$				$\checkmark$

#### Table 5. 2022 Residential Program Impact Evaluation Activities

The following sections provide further details on the approaches to estimating verified gross and net savings for the Residential Program.

### 2.2 Verified Gross Impact Analysis Approach

### 2.2.1 Application of IL-TRM V10.0

To determine verified gross impacts associated with the measures delivered through the Residential Program, we reviewed the content of the initiative tracking databases to identify database errors and duplicate records, and to ensure that the implementer correctly applied savings algorithms and assumptions stated in the IL-

<sup>&</sup>lt;sup>7</sup> 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.

TRM V10.0 and the IL-TRM V10.0 errata document. In particular, we applied the algorithms and assumptions provided in the IL-TRM V10.0, while using project-specific data from the initiative tracking databases as inputs where appropriate. We also verified measure installations through analysis of initiative tracking databases, as well as through a review of supporting project documentation. Appendix A provides detailed information on the IL-TRM V10.0 measures used in this evaluation.

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.

In accordance with Illinois policy, the evaluation team omitted gas penalties from savings reported in the body of this report. Appendix B presents details on gas penalties for use in cost-effectiveness analyses.

#### 2.2.2 IL-TRM V10.0 Deviations

During our 2022 evaluation activities, we identified a measure type, "space constrained HVAC products," that we do not believe is characterized appropriately in the IL-TRM V10.0. AIC delivered these measures through the MHAS channel of the Income Qualified Initiative. As a result, we choose in the body of this report to deviate from the IL-TRM V10.0 measure characterization. Appendix A presents further detail on this deviation.

In line with existing Illinois policy, we notified the IL-TRM Administrator (Vermont Energy Investment Corporation [VEIC]) and the Illinois Technical Advisory Committee (TAC) of our decision to deviate from the existing measure characterization. We also present alternative estimates of savings that are in-line with the IL-TRM V10.0 in 0.

#### 2.2.3 Carryover Savings

In addition to savings achieved by AIC's Residential Program through measures delivered during the 2022 program year, AIC also claims savings in 2022 from lighting measures distributed by the Residential Program in prior years but not installed until 2022. Past measures that AIC claims savings for were distributed through the Retail Products, Income Qualified, and Kits Initiatives in 2020 and 2021.

Carryover savings are evaluated using the applicable 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 V10.0 and IL-TRM V10.0 errata assumptions for all other relevant impact parameters.

We reported previously on AIC's 2022 carryover savings as part of an earlier memo.<sup>8</sup> Carryover savings are not reported as part of individual initiative subsections in Section 3.

### 2.2.4 Application of Custom Impact Methods

While all other Residential Program offerings in 2022 were analyzed in a fully prescriptive manner, the ECT channel of the Retail Products Initiative is not suitable for gross impact analysis using solely the IL-TRM. As an emerging program design that was not yet characterized for prescriptive impact analysis when the 2022 evaluation began, evaluation of the ECT required a custom, survey-based analysis approach. The evaluation team applied an evaluation approach that has previously been applied and accepted in multiple impact evaluations for AIC and that has been closely coordinated with other Illinois evaluators. While many components of the approach are fully custom, gross unit savings assumptions used in the ECT evaluation are

<sup>&</sup>lt;sup>8</sup> https://www.ilsag.info/wp-content/uploads/AIC-2022-Lighting-Carryover-Savings-Memo-FINAL-2023-03-20.pdf

directly derived from the IL-TRM V10.0 in accordance with Illinois best practice. Further details on the custom impact methods applied for ECT are presented in Appendix A.

### 2.3 Verified Net Impact Analysis Approach

To determine verified net savings for the 2022 Residential Program, we applied SAG-approved NTGRs to verified gross savings.

### 2.3.1 Non-Participant Spillover

Net impact evaluation of AIC's Residential Program includes a NPSO adder on net savings achieved by nonincome qualified (non-IQ) efforts.<sup>9</sup> This NPSO adder is 3.1% for non-IQ electric savings (energy and demand) and 4.4% for non-IQ gas savings. Table 6 summarizes verified, non-IQ net savings for AIC's Residential Program by initiative and computes the NPSO adder as defined above.

Initiative/Channel	Verified Net MWh	Verified Net MW	Verified Net Therms
Retail Products – Incentive-Based Channels (non-IQ)	49,647	8.69	955,767
Efficient Choice Tool	1,026	0.10	54,385
Retail Products Carryover (non-IQ)	4,873	0.85	0
Market Rate Multifamily	1,219	0.21	3,899
Midstream HVAC	4,726	1.18	43,569
Home Efficiency	132	0.04	15,591
Non-IQ Residential Program Subtotal	61,623	11.07	1,073,211
Residential NPSO Adder	1,910	0.34	47,221

Table 6. 2022 Residential Program Verified Net Savings Summary for Non-Income Qualified Initiatives

### 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 2022 evaluation. In particular, we considered the following types of error and took relevant courses of action to address potential sources of error in the 2022 evaluation. Note that there is no sampling error associated with any Residential Program evaluation activity because we did not conduct any sampling-based evaluation activities for the 2022 impact evaluation.<sup>10</sup> The majority of the potential errors and mitigation approaches apply only to the ECT evaluation, which used primary data, in comparison to other evaluation efforts, which primarily used prescriptive approaches defined in the IL-TRM V10.0.

Analysis Error: For prescriptive gross impact calculations, we applied IL-TRM V10.0 calculations to the participant data in the tracking database to calculate gross impacts. To minimize data analysis error in impact calculations, a separate team member reviewed all calculations to verify their accuracy. For net impact calculations, we applied SAG-approved NTGRs to estimated gross impacts to derive net impacts where appropriate. To minimize analytical errors, all calculations were reviewed by a separate team member to verify their accuracy.

<sup>9</sup> Opinion Dynamics. Ameren Illinois Company Energy Efficiency Portfolio 2022 Net-to-Gross Ratios. <u>https://www.ilsag.info/wp-content/uploads/AIC-2022-NTGR-Recommendations-for-SAG-FINAL-2021-09-27.xlsx</u>

<sup>&</sup>lt;sup>10</sup> The survey-based evaluation approach for ECT was conducted as a census attempt, and therefore no sampling error is present.

Survey Measurement Error: The validity and reliability of survey data were addressed through multiple strategies. First, we relied on our experience to create questions that align with the idea or construct that they were intended to measure (i.e., face value validity). We reviewed the questions to ensure that we did not ask double-barreled questions (i.e., questions that ask about two subjects, but allow only one response) or loaded questions (i.e., questions that are slanted one way or the other). We also checked the overall logical flow of the questions to avoid confusing respondents, which would decrease reliability.

All survey instruments were reviewed by key members of the evaluation team and were provided to AIC and ICC Staff for review.

- Non-Response Bias: Because the yield for the ECT survey was approximately 8%, there is the potential for non-response bias. We attempted to mitigate possible bias by sending multiple reminder emails to each prospective respondent at different times of the day and week.
- Self-Report Error: By conducting rigorous efficiency verification (asking respondents to submit photos of product receipts, nameplates, or model numbers of equipment), we addressed potential self-report error associated with improper respondent categorization of equipment as efficient through the ECT survey.

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

### 3. Initiative-Level Results

### 3.1 Retail Products Initiative

The AIC Retail Products Initiative includes several incentive-based channels as well as the more recently incorporated ECT channel, which does not directly utilize incentives. The incentive-based channels offer discounts on a wide range of qualifying ENERGY STAR® products, including LED lighting, Tier 1 advanced power strips (APS), advanced thermostats, and more than a dozen other household appliances and miscellaneous equipment. The ECT is an online platform for comparing and reviewing residential home appliances and consumer electronics, which launched as a pilot in 2020 and was integrated into the Retail Products Initiative as a full channel at the start of 2022.

### 3.1.1 Initiative Annual Savings Summary

Table 7 presents the Retail Products Initiative annual savings achieved in 2022. The 2022 Retail Products Initiative achieved 106,136 MWh, 16.52 MW, and 1,456,953 therms (natural gas) in verified net savings. The Initiative also produced 2,265 therms in verified net propane savings in 2022, which are detailed further in Appendix B.

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	129,678	20.40	1,545,220
Gross Realization Rate	97%	97%	98%
Verified Gross Savings	127,836	19.90	1,600,377
NTGR	0.830	0.830	0.910
Verified Net Savings	106,136	16.52	1,456,953

#### Table 7. 2022 Retail Products Initiative Annual Savings

Note: The ECT channel of the Retail Products Initiative does not report ex ante savings. Therefore, reported ex ante gross savings and gross realization rates are based only on the incentive-based components of the Retail Products Initiative, and gross realization rates cannot be directly calculated from the table above.

### 3.1.2 Incentive-Based Channels

The AIC Retail Products Initiative offers incentives in various forms on a wide range of qualifying ENERGY STAR<sup>®</sup> products through several different participation channels:

- Point-of-Purchase (POP) channel: By partnering with retailers and manufacturers, the POP channel provides in-store discounts that reduce the purchase price of select products.
- Downstream Rebates channel: This channel allows AIC customers to apply for a post-purchase reimbursement (rebate) to cover a portion of the cost of qualifying product purchases.
- Online Marketplace channel: This channel offers AIC customers select products at discounted price points to be purchased from AIC's own online store.

The types of products incentivized through the Retail Products Initiative in 2022 included:11

<sup>&</sup>lt;sup>11</sup> The ENERGY STAR® name and mark are registered trademarks owned by the US Environmental Protection Agency (USEPA).

- LED lighting, including a variety of bulb shapes and fixtures.
- Consumer electronics, including advanced thermostats and Tier 1 advanced power strips (APS).
- Appliances, including dehumidifiers, air purifiers, clothes washers, clothes dryers, refrigerators, freezers, water dispensers, room air conditioners, gas water heaters, and heat pump water heaters.
- Miscellaneous other equipment, including variable-speed pool pumps, bathroom exhaust fans, lighted ceiling fans, and showerhead kits.<sup>12</sup>

Leidos implements the incentive-based channels of the Retail Products Initiative with support from subcontractors. Walker-Miller Energy Services (Walker-Miller) provides field services, including store visits and promotional events, while CLEAResult operates the Online Marketplace. Discounts provided through the Initiative are designed to incentivize customers to purchase energy-efficient versions of selected retail products instead of less-efficient, and typically cheaper, alternatives by offsetting the difference in price, and therefore helping customers to reduce their energy usage, energy bills, and carbon footprints.

#### Summary of Key Implementation Changes in 2022

In 2022, primary implementation of the incentive-based channels of the Retail Products Initiative shifted from CLEAResult to Leidos (with the aforementioned support from Walker-Miller and CLEAResult as subcontractors). In addition to this shift in implementation contractors, the Retail Products Initiative adapted its measure offerings and incentives as follows:

- Added gas water heaters and lighted ceiling fans as Downstream Rebate channel offerings.
- Added kits containing showerhead kits and low-flow faucet aerators as a POP channel offering.
- Added dehumidifiers, air purifiers, bathroom exhaust fans, and water dispensers<sup>13</sup> as Downstream Rebate channel offerings while continuing to provide incentives through the POP and Online Marketplace channels.

<sup>&</sup>lt;sup>12</sup> Showerhead kits included one low-flow showerhead (1.5 GPM), one bathroom faucet aerator (1.0 GPM), and one kitchen faucet aerator (1.5 GPM).

<sup>&</sup>lt;sup>13</sup> Although a downstream rebate was made available for water dispensers before the end of 2022, no customers received a downstream rebate for this measure during the evaluation period.

#### **Participation Summary**

LED lighting remained the primary end use for the incentive-based channels in 2022, accounting for 96% of all units rebated. Standard LEDs were the predominant category, representing 51% of all incentivized product sales, followed by specialty LEDs and LED fixtures, which accounted for another 32% and 11% of sales, respectively. The Initiative also discounted more than 52,000 tier 1 advanced power strips, 36,000 advanced thermostats, and 7,700 dehumidifiers, which together amount to 4% of all sales<sup>14</sup> and the vast majority of non-lighting sales. The remaining measures collectively accounted for less than 1% of total sales volume. Table 8 presents incentive-based channels participation during 2022 by measure.

Measure Type	Bulb Shape	Sales Quantity	Share of Sales
Standard LEDs	A-line	1,390,357	51%
Specialty ( EDe (Directional)	BR/R	290,772	11%
	PAR/MR	46,998	2%
	Decorative	385,072	14%
Specialty LEDs (Decorative)	Globe	105,449	4%
	3-way	39,857	1%
LED Fixtures	N/A	289,768	11%
LED Nightlights	N/A	21,216	1%
Connected LEDs	N/A	16,066	1%
Advanced Power Strip	N/A	52,026	2%
Advanced Thermostat	N/A	36,402	1%
Dehumidifier	N/A	7,747	<1%
Bathroom Exhaust Fan	N/A	4,364	<1%
Air Purifier	N/A	3,733	<1%
Showerhead Kit <sup>a</sup>	N/A	915	<1%
Clothes Washer	N/A	2,562	<1%
Refrigerator	N/A	2,206	<1%
Electric Clothes Dryer	N/A	1,399	<1%
Water Dispenser	N/A	548	<1%
Room Air Conditioner	N/A	290	<1%
Freezer	N/A	189	<1%
Heat Pump Water Heater	N/A	96	<1%
Pool Pump	N/A	89	<1%
Gas Water Heater	N/A	24	<1%
Lighted Ceiling Fan	N/A	3	<1%
Total	N/A	2,698,148	100%

Table 8, 2022	Incentive-Based	Channels	Participat	ion Summary
		<b>Under Interes</b>	i uluoiput	ion ounnur,

<sup>a</sup> Initiative tracking data identified 2,745 units representing the total quantity of kit contents (i.e. three units per kit), whereas the quantity shown here reflects the count of kits distributed.

<sup>&</sup>lt;sup>14</sup> Percentages shown in table do not sum exactly due to rounding.

#### **Historic Product Sales**

Since 2009, AIC has discounted 40.2 million energy-efficient lighting products through the Retail Products Initiative and its predecessors, beginning with compact fluorescent lamp (CFL) products and shifting toward LEDs as the lighting market has transformed. The incentive-based channels discounted 2,585,555 LED bulbs and fixtures during 2022. AIC discounted nearly twice as many LED bulbs in 2022 than in 2021, primarily driven by standard LED sales. Figure 1 shows efficient lighting sales from PY1 through 2022.



Figure 1. Retail Products Initiative Historical Lighting Sales (PY1-2022)

<sup>a</sup> We do not have a record of the number of CFLs sold by shape for PY1.

<sup>b</sup> LEDs were sold, but the quantity is too small for the bar to be clearly visible.

° Connected LEDs and LED Nightlights are included as Specialty LEDs.

The incentive-based channels featured 16 non-lighting measures in 2022, with advanced power strips and advanced thermostats accounting for more than 75% of those sales. The Initiative sold higher volumes of most measures than in 2021, and introduced showerhead kits, gas water heaters, and lighted ceiling fans. Overall, the incentive-based channels sold nearly 10% more non-lighting units than in 2021, due in part to increases in advanced thermostat sales. These non-lighting measure-mix trends are outlined in Table 9.

Measure Type	2018	2019	2020	2021	2022
Advanced Power Strip	25,803	55,275	66,438	54,881	52,026
Advanced Thermostat	14,403	16,044	33,073	28,289	36,402
Dehumidifier	0	0	5,768	7,735	7,747
Bathroom Exhaust Fan	0	0	1,675	1,315	4,364
Air Purifier	0	0	1,237	3,316	3,733
Showerhead Kit	0	0	0	0	915
Clothes Washer	0	177	2,587	3,299	2,562

Table 9. 2022 Incentive-Based Channels Historical Non-Lighting Sales

N

Measure Type	2018	2019	2020	2021	2022
Refrigerator	0	82	1,388	2,915	2,206
Electric Clothes Dryer	0	79	1,357	1,714	1,399
Water Dispenser	0	0	611	1,110	548
Room Air Conditioner	0	0	0	422	290
Freezer	0	6	83	230	189
Heat Pump Water Heater	0	0	0	55	96
Pool Pump	206	8	59	124	89
Gas Water Heater	0	0	0	0	24
Ceiling Fan	0	0	0	0	3
Total	40,412	71,671	114,276	105,405	112,593

#### Sales by Delivery Channel

Nearly all LEDs and advanced power strips (over 99%) were discounted at participating retailers in the POP delivery channel, while the remainder were sold through the Online Marketplace channel. Sales through the Online Marketplace channel accounted for 95% of advanced thermostat sales. The Downstream Rebates channel accounted for the vast majority of larger appliance sales, including clothes washers, refrigerators, and heat pump water heaters. Table 10 provides a breakdown of 2022 sales of each measure by delivery channel.

Measure Type	POP	Downstream Rebate	Online Marketplace
LED Lighting	2,584,666	0	889
Advanced Power Strip	51,909	0	117
Advanced Thermostat	0	1,799	34,603
Dehumidifier	7,642	46	59
Bathroom Exhaust Fan	4,349	15	0
Air Purifier	3,541	53	139
Showerhead Kit	915	0	0
Clothes Washer	0	2,562	0
Refrigerator	0	2,206	0
Electric Clothes Dryer	0	1,399	0
Water Dispenser	548	0	0
Room Air Conditioner	0	290	0
Freezer	0	189	0
Heat Pump Water Heater	0	96	0
Pool Pump	0	89	0
Gas Water Heater	0	24	0
Lighted Ceiling Fan	0	3	0
Total	2,653,570	8,771	35,807

#### **Retail Store Type Coverage**

Throughout 2022, AIC discounted LED products across 475 different store locations representing more than 7 retail store types and the Online Marketplace. Big box stores and thrift stores collectively account for 60% of sales, while DIY and Club stores made up another 24% of units sold. Table 11 provides a breakdown of lighting sales and total store locations by retail store type.

Retail Store Type	Store Locations	Sales Quantity	Share of Sales
Big Box	80	798,162	31%
Thrift	50	755,006	29%
DIY	52	362,105	14%
Club	10	263,712	10%
Dollar	128	138,342	5%
Hardware	87	124,650	5%
Grocery	57	114,539	4%
Other	10	28,150	1%
Marketplace	1	889	<1%
Total	475	2,585,555	100%

Table 11. 2022 Incentive-Based Channels Lighting Sales by Retail Store Type

#### **Purchases by Income Qualified Customers**

The Retail Products Initiative program team makes concerted efforts to maximize outreach to low- and moderate-income customers by engaging thrift stores, dollar stores, and retailers in ZIP codes with higher incidences of income qualified (IQ) customers.

Table 12 summarizes the share of sales for each measure assumed to reach IQ customers (referred to henceforth as the "IQ allocation"), along with the total sales volumes for each measure type provided in the initiative tracking data and the distribution of IQ and non-IQ sales. We also present the associated distribution of IQ and non-IQ verified kWh savings.<sup>15</sup> A further explanation of how IQ allocations are determined and applied is provided in Appendix A.

Table 12. 2022 Incentive-Based Channels Income Qualified Allocations by Measure

Measure Category	IQ Allocation	Total Sales Quantity	IQ Sales Quantity	Non-IQ Sales Quantity	IQ Verified Gross kWh	Non-IQ Verified Gross kWh
Standard LED	51.6%	1,390,357	717,705	672,652	23,547,463	24,955,368
Decorative LED	47.7%	530,378	252,855	277,523	9,025,124	12,143,700
Directional LED	49.8%	337,770	168,184	169,586	7,307,698	9,744,114
Fixture LED	77.3%	289,768	224,065	65,703	12,098,657	5,180,837
Connected LED	33.7%	16,066	5,418	10,648	230,952	455,359
Nightlight LED	92.1%	21,216	19,534	1,682	427,872	36,847
Advanced Thermostat	29.1%	36,402	10,593	25,809	4,201,505	10,236,325
Advanced Power Strip	46.2%	52,026	24,021	28,005	1,756,662	2,047,999

<sup>15</sup> Note that because per-unit savings vary by individual product within each measure category, the ratio of IQ to non-IQ savings does not necessarily align with sales-weighted IQ allocations.

Measure Category	IQ Allocation	Total Sales Quantity	IQ Sales Quantity	Non-IQ Sales Quantity	IQ Verified Gross kWh	Non-IQ Verified Gross kWh
Dehumidifier	32.7%	7,747	2,531	5,216	394,499	812,995
Air Purifier	32.9%	3,733	1,228	2,505	225,979	460,866
Electric Dryer	26.9%	1,399	376	1,023	60,265	164,186
Heat Pump Water Heater	27.7%	96	27	69	61,381	160,542
Clothes Washer	27.2%	2,562	698	1,864	43,312	115,699
Refrigerator	27.6%	2,206	609	1,597	35,665	93,507
Bathroom Exhaust Fan	33.3%	4,364	1,452	2,912	36,427	73,049
Showerhead Kit	100.0%	915	915	0	57,449	0
Water Dispenser	32.6%	548	178	370	22,351	46,303
Pool Pump	24.3%	89	22	67	6,839	21,307
Room Air Conditioner	30.3%	290	88	202	3,784	8,702
Freezer	28.6%	189	54	135	2,634	6,586
Lighted Ceiling Fan	20.1%	3	1	2	32	128
Gas Water Heater	23.7%	24	6	18	N/A	N/A
Total	53.1%	2,698,148	1,430,558	1,267,590	59,546,550	66,764,418

#### **Savings Detail**

Table 13 summarizes claimed ex ante savings from the incentive-based channels tracking data reviewed by the evaluation team. In addition, we indicate the IL-TRM V10.0 measure category used for evaluation of each measure. In total, the incentive-based channels claimed 129,678 MWh of electric energy savings, 20.40 MW of electric demand savings, and 1,545,220 therms of gas savings. LED lighting accounted for 96% of all units sold, 83% of ex ante electric energy savings, and 71% of ex ante electric demand savings. Despite making up just 1% of total program sales, advanced thermostats accounted for 12% of ex ante electric energy, 24% of ex ante electric demand, and 99% of ex ante gas savings.

Table 13. 2022 Incentive-Based Channels Participation Summary by Measure
--

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Standard LED	LED Screw Based Omnidirectional Bulbs	1,390,357	49,337,205	6,492	N/A
Decorative LED	LED Specialty Lamps	530,378	21,668,411	2,913	N/A
Directional LED	LED Specialty Lamps	337,770	17,728,820	2,361	N/A
Fixture LED	LED Fixtures	289,768	17,603,063	2,672	N/A
Connected LED	LED Nightlights	16,066	537,551	78	N/A
Nightlight LED	LED Connected Lamps	21,216	464,719	0	N/A
Advanced Thermostat	Advanced Thermostats	36,402	15,591,478	4,962	1,522,413
Advanced Power Strip	Advanced Power Strip – Tier 1	52,026	3,804,661	427	N/A
Dehumidifier	ENERGY STAR Dehumidifier	7,747	1,207,276	274	N/A
Air Purifier	ENERGY STAR Air Purifier	3,733	687,143	78	N/A
Electric Dryer	ENERGY STAR Clothes Dryers	1,399	225,466	30	N/A

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Heat Pump Water Heater	Heat Pump Water Heaters	96	220,289	10	N/A
Clothes Washer	ENERGY STAR Clothes Washers	2,562	158,551	18	4,553
Refrigerator	ENERGY STAR and CEE Tier 2 Refrigerators	2,206	123,863	19	N/A
Bathroom Exhaust Fan	High Efficiency Bathroom Exhaust	4,364	108,858	13	N/A
Showerhead Kit	Low Flow Faucet Aerators and Low Flow Showerheads	915	91,271	7	17,129
Water Dispenser	ENERGY STAR Water Coolers	548	68,719	8	N/A
Pool Pump	High Efficiency Pool Pumps	89	28,146	19	N/A
Room Air Conditioner	ENERGY STAR Room Air Conditioners	290	12,561	12	N/A
Freezer	ENERGY STAR Freezers	189	9,696	2	N/A
Lighted Ceiling Fan	ENERGY STAR Ceiling Fan	3	169	0	N/A
Gas Water Heater	Gas Water Heater	24	N/A	N/A	1,125
Total	N/A	2,698,148	129,677,917	20,397	1,545,220

The incentive-based channels achieved 126,311 MWh in verified gross electric energy savings and 105,110 MWh in verified net electric energy savings, as shown in Table 14. Lighting products accounted for the majority of electric energy savings (83% of gross and 82% of net). Advanced thermostats made up 11% of gross and 12% of net electric energy savings. Total ex ante electric energy savings included as part of tracking data were very closely aligned with verified gross estimates, resulting in an overall gross realization rate of 97%.

Table 14. 2022 Incentive	-Based Channels	<b>Electric Energy</b>	Savings by	y Measure
--------------------------	-----------------	------------------------	------------	-----------

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR <sup>a</sup>	Verified Net Savings (MWh)
Standard LED	49,337	98%	48,503	0.812	39,368
Decorative LED	21,668	98%	21,169	0.785	16,620
Directional LED	17,729	96%	17,052	0.794	13,542
Fixture LED	17,603	98%	17,279	0.911	15,739
Connected LED	538	128%	686	0.694	476
Nightlight LED	465	100%	465	0.974	452
Advanced Thermostat	15,591	93%	14,438	0.904	13,055
Advanced Power Strip	3,805	100%	3,805	0.925	3,518
Dehumidifier	1,207	100%	1,207	0.778	939
Air Purifier	687	100%	687	0.859	590
Electric Dryer	225	100%	224	0.759	170
Heat Pump Water Heater	220	101%	222	0.856	190
Clothes Washer	159	100%	159	0.732	116
Refrigerator	124	104%	129	0.746	96
Bathroom Exhaust Fan	109	101%	109	0.773	85

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR <sup>a</sup>	Verified Net Savings (MWh)
Showerhead Kit	91	63%	57	1.000	57
Water Dispenser	69	100%	69	0.777	53
Pool Pump	28	100%	28	0.818	23
Room Air Conditioner	13	99%	12	0.805	10
Freezer	10	95%	9	0.735	7
Lighted Ceiling Fan	<1	95%	<1	0.841	<1
Gas Water Heater	0	N/A	0	N/A	0
Total	129,678	97%	126,311	0.832	105,110

<sup>a</sup> NTGR values shown here are savings-weighted and reflect the application of SAG-approved NTGRs, deemed at 1.0 for IQ sales.

The Retail Products Initiative achieved 19.75 MW in verified gross peak demand savings and 16.42 MW in verified net demand savings as shown in Table 15. As with energy savings, lighting products accounted for the majority of demand savings (71% of gross and 70% of net). Advanced thermostats amounted to another 25% of gross and net demand savings. Total ex ante electric demand savings included as part of the Initiative's tracking data were very closely aligned with verified gross estimates, resulting in an overall gross realization rate of 97%.

Table 15. 2022 Incentive-Based Channels El	lectric Demand Savings by Measure
--	-----------------------------------

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGRª	Verified Net Savings (MW)
Standard LED	6.49	97%	6.32	0.812	5.13
Decorative LED	2.91	96%	2.81	0.785	2.21
Directional LED	2.36	96%	2.26	0.794	1.80
Fixture LED	2.67	92%	2.47	0.912	2.25
Connected LED	0.08	108%	0.08	0.694	0.06
Nightlight LED	0.00	N/A	0.00	N/A	0.00
Advanced Thermostat	4.96	98%	4.87	0.858	4.18
Advanced Power Strip	0.43	100%	0.43	0.925	0.39
Dehumidifier	0.27	100%	0.27	0.778	0.21
Air Purifier	0.08	100%	0.08	0.859	0.07
Electric Dryer	0.03	100%	0.03	0.759	0.02
Heat Pump Water Heater	0.01	101%	0.01	0.856	0.01
Clothes Washer	0.02	101%	0.02	0.732	0.01
Refrigerator	0.02	104%	0.02	0.746	0.01
Bathroom Exhaust Fan	0.01	101%	0.01	0.773	0.01
Showerhead Kit	0.01	124%	0.01	1.000	0.01
Water Dispenser	0.01	100%	0.01	0.777	0.01
Pool Pump	0.02	100%	0.02	0.818	0.02
Room Air Conditioner	0.01	99%	0.01	0.806	0.01
Freezer	<0.01	95%	<0.01	0.735	<0.01

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR <sup>a</sup>	Verified Net Savings (MW)
Lighted Ceiling Fan	<0.01	81%	<0.01	0.843	<0.01
Gas Water Heater	0.00	N/A	0.00	N/A	0.00
Total	20.40	97%	19.74	0.831	16.41

<sup>a</sup> NTGR values shown here are savings-weighted and reflect the application of SAG-approved NTGRs, deemed at 1.0 for IQ sales.

The incentive-based channels achieved 1,510,190 therms in verified gross gas savings and 1,402,568 in verified net gas savings, as shown in Table 16. Advanced thermostats amounted to 99% of verified gas savings, while the remaining 1% was attributable to clothes washers, showerhead kits, and gas water heaters. Total ex ante gas savings included as part of the Initiative's tracking data were very closely aligned with verified gross estimates, resulting in an overall gross realization rate of 98%.

Table 16. 2022 Incentive-Based	d Channels Gas	Savings by	/ Measure
--------------------------------	----------------	------------	-----------

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR <sup>a</sup>	Verified Net Savings (Therms)
Advanced Thermostat	1,522,413	98%	1,493,988	0.929	1,387,771
Clothes Washer	4,553	101%	4594	0.730	3,354
Showerhead Kit	17,129	62%	10,536	1.000	10,536
Gas Water Heater	1,125	95%	1,073	0.846	907
Total	1,545,220	98%	1,510,190	0.929	1,402,568

<sup>a</sup> NTGR values shown here are savings-weighted and reflect the application of SAG-approved NTGRs, deemed at 1.0 for IQ sales.

We compared ex ante and verified savings for each measure. We describe discrepancies between ex ante and verified gross savings estimates below and provide explanation where possible. We ordered the list of discrepancies below from largest to smallest contribution to Initiative ex ante electric energy savings, focusing first on lighting and then non-lighting product categories.

- Standard LEDs (38% of ex ante kWh, 32% of ex ante kW): The gross realization rate for standard LEDs is 98% for electric energy and 97% for electric demand savings.
  - In more than 99% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 2%. Virtually all differences between ex ante and verified savings are explained by differences in baseline wattage assignments.
- Decorative LEDs (17% of ex ante kWh, 14% of ex ante kW): The gross realization rate for decorative LEDs is 98% for electric energy savings and 96% for electric demand savings.
  - In more than 99% of cases, ex ante and verified electric energy savings values matched exactly or reflected differences of less than 2% and ex ante and verified electric demand savings matched exactly or reflected differences of less than 3%. Virtually all differences between ex ante and verified savings are explained by differences in baseline wattage assignments.
- Directional LEDs (14% of ex ante kWh, 12% of ex ante kW): The gross realization rate for directional LEDs is 96% for electric energy savings and 96% for electric demand savings.

- In 96% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 3%. Virtually all differences between ex ante and verified savings are explained by differences in baseline wattage assignments.
- LED Fixtures (14% of ex ante kWh and 13% of ex ante kW): The gross realization rate for LED fixtures is 98% for electric energy savings and 92% for electric demand savings.
  - In 93% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%. Differences between ex ante and verified savings are nearly all explained by differences in hours of use and coincidence factor assumptions (ex ante savings assume unknown installation locations, whereas verified savings use indoor- or outdoor-specific assumptions depending on the type of fixture.
- Connected LEDs (<1% of ex ante kWh and kW): The gross realization rate for Connected LEDs is 128% for electric energy savings and 108% for electric demand savings.</p>
  - In all cases, ex ante savings used an ISR of 76%, whereas verified savings used an ISR of 98%, which accounted for the vast majority of differences between ex ante and verified savings.
- Nightlight LEDs (<1% of ex ante kWh): The gross realization rate for Nightlight LEDs is 100% for electric energy savings.</p>
  - Ex ante and verified savings values matched exactly in 100% of cases.
- Advanced Thermostats (12% of ex ante kWh, 24% of ex ante kW, 99% of ex ante therms): The gross realization rate for advanced thermostats is 93% for electric energy savings, and 98% for electric demand and gas savings.
  - In 72% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%. In the remaining 28% of cases, we are unable to determine the exact source of discrepancies based on the available data.
  - In 98% of cases, ex ante and verified electric demand and gas per-unit savings matched exactly.
- Advanced Power Strips (3% of ex ante kWh and 2% of ex ante kW): The gross realization rate for advanced power strips is 100% for electric energy and demand savings.
  - Ex ante and verified savings values matched exactly in 100% of cases.
- Dehumidifiers (1% of ex ante kWh and 1% of ex ante kW): The gross realization rate for dehumidifiers is 100% for both electric energy savings and electric demand savings.
  - In more than 99% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%.
  - In 5 cases, verified savings reflected corrected measure specifications or included savings for records that did not include ex ante savings.
- Air Purifiers (1% of ex ante kWh and <1% of ex ante kW): The gross realization rate for air purifiers is 100% for electric energy and demand savings.
  - In more than 99% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%.
- Electric Clothes Dryers (<1% of ex ante kWh and kW): The gross realization rate for electric clothes dryers is 100% for electric energy and demand savings.</p>

- In more than 99% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%.
- Heat Pump Water Heaters (<1% of ex ante kWh and kW): The gross realization rate for heat pump water heaters is 101% for electric energy savings and electric demand savings.</p>
  - In 85% of cases, ex ante and verified savings values are within 2% of each other.
  - In the remaining 15% of cases, ex ante savings used a baseline Uniform Energy Factor that assumed either unknown or zero capacity whereas verified savings used capacities specified in tracking data.
- Clothes Washers (<1% of ex ante kWh and kW, <1% of ex ante therms): The gross realization rate for clothes washers is 100% for electric energy savings and 101% for electric demand savings and gas savings.</p>
  - In all cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%.
- Refrigerators (<1% of ex ante kWh and kW): The gross realization rate for refrigerators is 104% for both electric energy savings and electric demand savings.</p>
  - In 72% of cases, the gross realization rate ranged from 90% to 105% for both electric energy savings and electric demand savings. The exact source of discrepancies between ex ante and verified savings remains unclear as all available ex ante savings parameters matched those used to calculate verified savings.
  - The evaluation team calculated adjusted volumes based on total volumes provided for each incented product using the proportion of refrigerator to freezer volumes provided by the IL-TRM V10.0. If available, the inclusion of the adjusted volume used in ex ante savings calculations would allow the evaluation team to better determine the causes of the remaining 28% of cases with major discrepancies between ex ante and verified savings.
- Bathroom Exhaust Fans (<1% of ex ante kWh and kW): The gross realization rate for bathroom exhaust fans is 101% for electric energy and demand savings.</p>
  - In 96% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 1%.
  - In the remaining 4% of cases, gross realization rates are between 104% and 279%. The majority of these are between 104% and 109%. The evaluation team could not identify the source of the discrepancy.
- Showerhead Kits (<1% of ex ante kWh, kW, and therms): The gross realization rate for showerhead kits is 63% for electric energy savings, 124% for electric demand savings, and 62% for gas savings.
  - In 100% of cases, ex ante savings are reflective of per-unit low-flow showerhead savings multiplied by the total quantity of items included in kits (i.e., the quantity of kits times three). These ex ante per-unit low-flow showerhead savings exactly match verified per-unit low-flow showerhead savings, but do not reflect the actual quantity of showerheads delivered and do not account for savings from bathroom or kitchen faucet aerators.
- Water Dispensers (<1% of ex ante kWh and kW): The gross realization rate for water dispensers is 100% for electric energy savings and demand savings.
  - Ex ante and verified per-unit savings values matched exactly in all cases.

- Variable-Speed Pool Pumps (<1% of ex ante kWh and kW): The gross realization rate for variable-speed pool pumps is 100% for both electric energy and demand savings.
  - Ex ante and verified per-unit savings values matched exactly in all cases.
- Room Air Conditioners (<1% of ex ante kWh and kW): The gross realization rate for room air conditioners is 99% for electric energy savings and electric demand savings.</p>
  - In more than 99% of cases, ex ante and verified electric energy and demand savings matched exactly or reflected differences of less than 3%.
- Freezers (<1% of ex ante kWh and kW): The gross realization rate for freezers is 95% for electric energy and demand savings.
  - In 98% of cases, ex ante and verified electric energy and demand savings reflected differences of less than 5%. In the remaining 2% of cases, the exact source of discrepancies between ex ante and verified savings remains unclear as all available ex ante savings parameters matched those used to calculate verified savings.
- Lighted Ceiling Fan (<1% of ex ante kWh and kW): The gross realization rate for lighted ceiling fans is 95% for electric energy savings and 81% for electric demand savings.
  - In all three cases, verified electric energy savings amounted to either 94% or 95% of ex ante energy savings. The exact source of discrepancies between ex ante and verified energy savings remains unclear as all available ex ante savings parameters matched those used to calculate verified savings
  - In two of three cases, verified electric demand savings amounted to either 84% or 85%, of verified demand savings as a result of differences in coincidence factor assumptions (ex ante used a coincidence factor of 0.127, whereas verified used a coincidence factor of 0.071).
- Gas Water Heater (<1% of ex ante therms): The gross realization rate for gas water heaters is 95% for gas savings.</p>
  - In all cases, ex ante savings use a single default baseline Uniform Energy Factor (UEF), whereas verified savings use tank sizes included In tracking data to assign product-specific baseline UEF values.

### 3.1.3 Efficient Choice Tool Channel

The ECT channel, launched as a pilot in 2020 and implemented by Enervee, is an online platform for comparing and reviewing residential home appliances and consumer electronics.<sup>16</sup> The ECT is designed to eliminate barriers to adoption of energy-efficient (EE) products and help AIC customers conduct relevant product research using a range of information that includes product specifications, pricing, tips for use, reviews, images, and vendor locations. Key factors differentiating the ECT from other sources of product information include the following key features:

Enervee Score: A number between 0 and 100 assigned to all models available in the market. The closer to 100 a product's score is, the more energy efficient that particular product is.<sup>17</sup>

<sup>16</sup> https://amerenillinoisefficientchoice.com/

<sup>&</sup>lt;sup>17</sup> An Enervee Score of 50 indicates that a product is in the 50th percentile of Enervee's market catalogue when ranked based on efficiency.

- YOUSAVE: YOUSAVE translates energy savings to dollars. It shows how much money consumers could save in energy costs by choosing a given product over similar products in the market.<sup>18</sup>
- CLEARCOST: CLEARCOST shows the combined implications of a product's cost and energy usage. It uses the current lowest price available for a given product along with its estimated lifetime energy use to present an approximate cumulative cost relative to a representative alternative product with an Enervee Score of 50.<sup>19</sup>
- Aggregation of Retail Offers: ECT collects currently available prices and associated offers from a wide array of retailers, updated daily, allows shoppers to make comparisons and set price drop alerts for preferred products.

#### **Summary of Key Implementation Changes in 2022**

The ECT became a full part of the AIC portfolio in 2022 after operating as a pilot in 2020 and 2021.

#### **Participation Summary**

In this section, we provide a summary of the population of AIC customers who engaged with the ECT and estimates of the number of non-incented EE products purchased by these customers during 2022. We also outline how the evaluation team estimated savings from these EE purchases. For a more complete discussion of our approach to estimating savings, see Appendix A.

While the ECT channel does not have a tracked population of "participants" in the same way as other residential initiatives, website traffic indicates that over 40,000 unique active shoppers visited and engaged with the ECT during 2022.<sup>20</sup> To estimate savings for the channel, the evaluation team completed a participant survey in two waves to estimate purchase rates for product categories found on the site and the proportions of those purchases that were EE and did not receive an incentive through another AIC initiative. The survey included a verification component to validate EE purchases reported by respondents. We then used implementer-tracked unique active shopper counts based on observed site traffic to scale estimated EE purchase quantities to the population of ECT users. Based on participant survey results, we estimate that AIC customers purchased over 7,800 energy-efficient products after engaging with the ECT.<sup>21</sup>

We fielded two waves of surveys with ECT users as part of the evaluation. The sample of likely ECT users consisted of customers who created a profile or responded to a pop-up survey on the ECT website as well as those who engaged with marketing emails during the evaluation period (i.e., used embedded links directing them to the ECT). Marketing emails included regular outreach to over 20,000 AIC customers as well as more targeted email campaigns focused on smaller groups of customers. Table 17 summarizes the Wave 1 and Wave 2 sample frames, samples, and completes from each source along with unique active shopper counts.

<sup>&</sup>lt;sup>18</sup> YOUSAVE estimates are based on assumptions about the number of years a product will be used, the amount of product usage, and the cost of energy (defaulted to the typical residential rate for the AIC service territory). These assumptions can be adjusted by the shopper to customize outputs.

<sup>&</sup>lt;sup>19</sup> CLEARCOST employs the same assumptions as YOUSAVE and can likewise be adjusted by the shopper to customize outputs.

<sup>&</sup>lt;sup>20</sup> Website traffic in this context refers to all observable site visitation and engagement. Unique active shoppers are defined by Enervee as ECT visitors that conducted at least one of ten specific actions on the site based on observed traffic. These unique active shoppers are automatically tracked by IP address, and implementer staff provide counts by month and measure category.

<sup>&</sup>lt;sup>21</sup> This total count of energy-efficient purchases includes some electric-only and some gas-only measures.

	Wave 1			Wave 2		
	Sample	Completes	% Yield	Sample	Completes	% Yield
Engaged with ECT marketing emaila	32,582	1,585	4.9%	18,386	2,592	14.1%
Responded to ECT pop-up survey	295	10	3.4%	245	46	18.8%
Created ECT profile	630	106	16.8%	637	109	17.1%
Total	33,507	1,701	5.1%	19,268	2,747	14.3%

#### Table 17. 2022 ECT Channel Survey Sample and Fielding Summary

<sup>a</sup> Counts shown exclude customers who also provided contact info on the ECT website.

#### Savings Detail

To develop verified savings estimates, we calculated counts of EE products purchased by customers for each product category following engagement with the ECT. We then applied per-unit gross savings developed using IL-TRM V10.0 recommendations and SAG-approved NTGRs to estimate total gross and net savings for each product category.

Table 18, Table 19, and Table 20 summarize electric energy, electric demand, and gas savings resulting from verified EE purchases for each evaluated measure.

#### Verified Gross Verified Net Measure Category **Quantity**<sup>a</sup> NTGR Savings (MWh) Savings (MWh) LED Lighting 2.506 0.676 49 73 Advanced Power Strips 101 6 0.676 4 Advanced Thermostats 451 97 66 0.676 Air Purifiers 715 221 0.676 149 **Air Conditioners** 143 3 0.676 2 **Dehumidifiers** 619 82 0.676 56 2 172 3 0.620 Dishwashers 49 Refrigerators 980 0.620 31 Freezers 94 4 0.676 3 **Clothes Washers** 595 35 0.676 24 **Electric Clothes Dryers** 138 24 0.610 15 2 Pool Pumps 11 3 0.676 Heat Pump Water Heaters 374 0.676 926 626 Total 6,900 1.525 0.673 1,026

#### Table 18. 2022 ECT Channel Electric Energy Savings by Measure

<sup>a</sup> Quantity refers to the estimated total number of EE purchases for each corresponding measure group based on results from the participant survey scaled to the population of ECT unique active shoppers based on observed site traffic.

Table 19 2022 F	<b>CT</b> Channel	Electric Demand	Savings h	Measure
TANG 13. ZUZZ L		LICCUIC Demanu	Savings by	INICASULE

Measure Category	Quantitya	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
LED Lighting	2,506	0.01	0.676	0.01
Advanced Power Strips	101	<0.01	0.676	<0.01
Advanced Thermostats	451	0.03	0.676	0.02

Measure Category	Quantitya	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Air Purifiers	715	0.03	0.676	0.02
Air Conditioners	143	<0.01	0.676	<0.01
Dehumidifiers	619	0.02	0.676	0.01
Dishwashers	172	<0.01	0.620	<0.01
Refrigerators	980	0.01	0.620	<0.01
Freezers	94	<0.01	0.676	<0.01
Clothes Washers	595	<0.01	0.676	<0.01
Electric Clothes Dryers	138	<0.01	0.610	<0.01
Pool Pumps	11	<0.01	0.676	<0.01
Heat Pump Water Heaters	374	0.04	0.676	0.03
Total	6,900	0.15	0.672	0.10

<sup>a</sup> Quantity refers to the estimated total number of EE purchases for each corresponding measure group based on results from the participant survey scaled to the population of ECT unique active shoppers based on observed site traffic.

#### Table 20. 2022 ECT Channel Verified Gas Savings by Measure

Measure Category	Quantity <sup>a</sup>	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostats	451	34,235	0.603	20,643
Dishwashers	172	106	0.620	66
Clothes Washers	595	1,428	0.603	861
Gas Clothes Dryers	7	6	0.603	4
Gas Water Heaters	967	54,412	0.603	32,810
Total	2,192	90,188	0.603	54,385

<sup>a</sup> Quantity refers to the estimated total number of EE purchases for each corresponding measure group based on results from the participant survey scaled to the population of ECT unique active shoppers based on observed site traffic.
## 3.1.4 Cumulative Persisting Annual Savings

Table 21 presents CPAS and WAML for the 2022 Retail Products Initiative by channel. The total verified gross savings for the Initiative are summarized, and CPAS in 2022–2025 and 2030 are presented.<sup>22</sup> The WAML for the Initiative is 10.4 years. CPAS and WAML for each channel at a measure level are presented in Table 22 and Table 23. In 2022, AIC converted some propane savings produced by Retail Products-rebated advanced thermostats to CPAS for the purposes of goal attainment; further details on these savings can be found in Appendix B.

	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime
Channel				2022	2023	2024	2025		2030		Savings (MWh)
Incentive-Based Channels	10.4	126,311	0.832	105,110	105,110	105,110	105,110		67,231		953,536
Efficient Choice Tool	13.5	1,525	0.673	1,026	1,026	1,026	1,026		992		13,666
2022 CPAS		127,836	0.830	106,136	106,136	106,136	106,136		68,222		967,202
Expiring 2022 CPAS				0	0	0	0		452		
Expired 2022 CPAS			0	0	0	0		37,914			
WAML	10.4										

Table 21. 2022 Re	etail Products Initiative	CPAS and WAML
-------------------	---------------------------	---------------

Table 22. 2022 Incentive-Based	Channels CPAS and WAML
--------------------------------	------------------------

	Measure	First-Year		CPAS – Verified Net Savings (MWh)							Lifetime
Measure Category	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)
Standard LED - Residential Non-IQ	10.0	20,304	0.690	14,009	14,009	14,009	14,009		4,763		84,617
Standard LED - Residential IQ	10.0	23,547	0.917	21,582	21,582	21,582	21,582		17,482		203,521
Standard LED - Commercial	5.5	4,652	0.812	3,776	3,776	3,776	3,776		0		17,078
Directional LED - Residential Non- IQ	10.0	7,466	0.690	5,151	5,151	5,151	5,151		3,142		39,460
Directional LED - Residential IQ	10.0	7,308	0.901	6,581	6,581	6,581	6,581		4,804		60,481
Directional LED - Commercial	6.9	2,278	0.794	1,809	1,809	1,809	1,809		0		10,462
Decorative LED - Residential Non- IQ	10.0	9,315	0.690	6,428	6,428	6,428	6,428		4,499		52,706
Decorative LED - Residential IQ	10.0	9,025	0.883	7,972	7,972	7,972	7,972		5,341		71,830
Decorative LED - Commercial	4.7	2,828	0.785	2,221	2,221	2,221	2,221		0		9,981

<sup>&</sup>lt;sup>22</sup> For further detail, including achieved CPAS in years not presented in this table, please see Appendix D.

#### Initiative-Level Results

	Measure	First-Year			CPAS – V	erified Net	Savings (M\	Nh)		Lifetime
Measure Category	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Fixture LED - Residential Non-IQ	15.0	3,574	0.690	2,466	2,466	2,466	2,466		1,504	 26,414
Fixture LED - Residential IQ	15.0	12,049	0.979	11,795	11,795	11,795	11,795		8,610	 151,448
Fixture LED - Commercial	14.8	1,500	0.914	1,370	1,370	1,370	1,370		1,370	 20,279
Outdoor Fixture LED - Residential Non-IQ	15.0	100	0.690	69	69	69	69		42	 738
Outdoor Fixture LED - Residential IQ	15.0	49	0.690	34	34	34	34		25	 438
Outdoor Fixture LED - Commercial	11.6	7	0.690	5	5	5	5		5	 53
Connected LED - Residential Non- IQ	10.0	455	0.690	314	314	314	314		141	 2,103
Connected LED - Residential IQ	10.0	231	0.703	162	162	162	162		131	 1,528
Nightlight LED - Residential Non-IQ	8.0	37	0.690	25	25	25	25		0	 203
Nightlight LED - Residential IQ	8.0	428	0.998	427	427	427	427		0	 3,416
Advanced Power Strip - Non-IQ	7.0	2,048	0.860	1,761	1,761	1,761	1,761		0	 12,329
Heat Pump Water Heater - Non-IQ	15.0	161	0.801	129	129	129	129		129	 1,902
Advanced Thermostat - Non-IQ	11.0	10,236	0.865	8,854	8,854	8,854	8,854		8,854	 97,391
Dehumidifier - Non-IQ	12.0	813	0.670	545	545	545	545		545	 6,538
Air Purifier - Non-IQ	9.0	461	0.790	364	364	364	364		364	 3,277
Clothes Washer - Non-IQ	14.0	116	0.631	73	73	73	73		73	 1,023
Electric Dryer - Non-IQ	16.0	164	0.670	110	110	110	110		110	 1,760
Refrigerator - Non-IQ	17.0	94	0.649	61	61	61	61		61	 1,032
Freezer - Non-IQ	22.0	7	0.629	4	4	4	4		4	 91
Pool Pump - Non-IQ	7.0	21	0.760	16	16	16	16		0	 113
Water Dispenser - Non-IQ	10	46	0.670	31	31	31	31		31	 310
Bathroom Exhaust Fan - Non-IQ	19.0	73	0.660	48	48	48	48		48	 916
Room Air Conditioner - Non-IQ	12.0	9	0.721	6	6	6	6		6	 75
Lighted Ceiling Fan - Non-IQ	10.0	<1	0.801	<1	<1	<1	<1		<1	 1
Advanced Power Strip - IQ	7.0	1,757	1.000	1,757	1,757	1,757	1,757		0	 12,297
Heat Pump Water Heater - IQ	15.0	61	1.000	61	61	61	61		61	 908
Advanced Thermostat - IQ	11.0	4,202	1.000	4,202	4,202	4,202	4,202		4,202	 46,217
Dehumidifier - IQ	12.0	394	1.000	394	394	394	394		394	 4,734

#### Initiative-Level Results

	Measure	First-Year		CPAS – Verified Net Savings (MWh)							Lifetime
Measure Category	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)
Air Purifier - IQ	9.0	226	1.000	226	226	226	226		226		2,034
Clothes Washer - IQ	14.0	43	1.000	43	43	43	43		43		606
Electric Dryer - IQ	16.0	60	1.000	60	60	60	60		60		964
Refrigerator - IQ	17.0	36	1.000	36	36	36	36		36		606
Freezer - IQ	22.0	3	1.000	3	3	3	3		3		58
Pool Pump - IQ	7.0	7	1.000	7	7	7	7		0		48
Water Dispenser - IQ	10.0	22	1.000	22	22	22	22		22		224
Bathroom Exhaust Fan - IQ	19.0	36	1.000	36	36	36	36		36		692
Room Air Conditioner - IQ	12.0	4	1.000	4	4	4	4		4		45
Lighted Ceiling Fan - IQ	10.0	<1	1.000	<1	<1	<1	<1		<1		0
Showerhead Kit - IQ	10.0	57	1.000	57	57	57	57		57		574
2022 CPAS		126,311	0.832	105,110	105,110	105,110	105,110		67,231		953,536
Expiring 2022 CPAS				0	0	0	0		452		
Expired 2022 CPAS			0	0	0	0		37,879			
WAML	10.4										

#### Initiative-Level Results

Magaura Catagany	Measure	First-Year Verified			Lifetime				
measure Category	Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025	 2030	 Savings (MWh)
LED Lighting	10.0	73	0.676	49	49	49	49	 20	 316
Advanced Power Strips	7.0	6	0.676	4	4	4	4	 0	 27
Advanced Thermostats	11.0	97	0.676	66	66	66	66	 66	 722
Air Purifiers	9.0	221	0.676	149	149	149	149	 149	 1,343
Air Conditioners	12.0	3	0.676	2	2	2	2	 2	 22
Dehumidifiers	12.0	82	0.676	56	56	56	56	 56	 668
Dishwashers	11.0	3	0.620	2	2	2	2	 2	 19
Refrigerators	17.0	49	0.620	31	31	31	31	 31	 519
Freezers	22.0	4	0.676	3	3	3	3	 3	 61
Clothes Washers	14.0	35	0.676	24	24	24	24	 24	 330
Electric Clothes Dryers	16.0	24	0.610	15	15	15	15	 15	 238
Pool Pumps	7.0	3	0.676	2	2	2	2	 0	 13
Heat Pump Water Heaters	15.0	926	0.676	626	626	626	626	 626	 9,387
2022 CPAS		1,525	0.673	1,026	1,026	1,026	1,026	 992	 13,666
Expiring 2022 CPAS			0	0	0	0	 0		
Expired 2022 CPAS			0	0	0	0	 35		
WAML	13.5								-

## Table 23. 2022 ECT Channel CPAS and WAML

## 3.1.5 Conclusions and Recommendations

## **Incentive-Based Channels**

- Key Finding #1: Initiative tracking data is generally clear, comprehensive, and free of any noteworthy data entry errors, gaps, or inconsistencies and included all necessary measure-level detail to calculate verified savings in accordance with the IL-TRM V10.0 for nearly all measures, allowing evaluators to develop defensible verified savings estimates and identify most differences between ex ante and verified savings.
  - Recommendation: Continue to track detailed measure specifications and ex ante savings assumptions for all records.
- Key Finding #2: By targeting specific retailers and retail channels that disproportionately serve lowerincome customers, the Initiative effectively delivered incentives to large numbers of IQ customers across all product categories. In particular, showerhead kits and LED nightlights were almost exclusively sold at dollar and discount retailers. As in the prior year, just over 50% of sales across all product categories are estimated to have been delivered to IQ customers.

## **Efficient Choice Tool Channel**

- Key Finding #1: Based on survey results and unique active shopper counts, we estimate that more than 7,800 EE products were purchased as a direct result of customers engaging with the ECT without the need for incentives through other AIC program offerings over the course of 2022.
- Key Finding #2: High rates of EE purchases after interacting with the website and very high EE verification rates suggest that the ECT is accomplishing its goal of encouraging customers to make more energy efficient purchasing decisions.

# 3.2 Income Qualified Initiative - Single Family Offerings

The IQ Initiative encompasses nearly all of AIC's low and moderate income targeted energy efficiency offerings, including efforts targeted at both single and multifamily customers. This section of the report provides results for seven single family-focused offerings included in the IQ Initiative:

- Single Family Channel Core
- Single Family Channel SAVE Kits
- Healthier Homes Channel
- CAA Channel
- Smart Savers Channel
- MHAS Channel
- Joint Utility Channel

This section of the report does not include the Income Qualified Initiative's Multifamily channel, for which evaluation findings are reported in Section 3.3, or IQ-focused kit and measure distribution offerings (specifically Community Kits, Food Bank Kits, and Holiday LED light string exchanges), for which evaluation findings are reported in Section 3.5.

## 3.2.1 Initiative Annual Savings Summary

As shown in Table 67, the IQ Initiative Single Family Offerings achieved 6,057 MWh, 1.66 MW, and 656,445 therms in verified net savings. Overall, the Initiative achieved strong gross realization rates of 102%, 105%, and 98% for electric energy, electric demand, and gas savings, respectively. We multiplied the verified gross savings by the SAG-approved NTGR of 1.000 to derive verified net savings.

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	5,914	1.58	645,378
Gross Realization Rate	102%	105%	98%
Verified Gross Savings	6,057	1.66	656,445
NTGR	1.000	1.000	1.000
Verified Net Savings	6,057	1.66	656,445

Table 24. 2022 Income Qualified Initiative - Single Family Offerings Annual Savings

Note: Ex ante savings presented in this chapter differ from ex ante claims for the IQ Initiative overall tracking data due to the organization of other IQ Initiative offerings into separate sections of this report.

## 3.2.2 Single Family Channel – Core

We use the term "Core" to refer to the traditional in-person and virtual activities of the Single Family channels which are distinct from the SAVE Kits we describe in Section 3.2.6. The Single Family channel – Core serves moderate-income, single family customers as well as low-income single family customers who did not participate in the Illinois Home Weatherization Assistance Program (IHWAP). The channel provides no-cost Building Performance Institute (BPI) energy audits that identify building shell and HVAC retrofit opportunities for their low-income customers (not guaranteed for moderate income customers). During the audit, implementation staff also install EE direct install (DI) measures such as LEDs, showerheads, faucet aerators, advanced power strips, pipe insulation, and programmable/advanced thermostats at no cost. Following the audit, customers may also receive additional retrofits, in some cases with a copayment,<sup>23</sup> such as air sealing and insulation improvements, central air conditioner (CAC) replacements, and air source heat pump (ASHP) replacements. Leidos oversees the implementation of this channel in coordination with Walker-Miller and BPI-certified AIC Program Allies.

## Summary of Key Implementation Changes in 2022

The key changes made to Single Family channel design and implementation since 2021 are below:

- In 2022, AIC expanded funding for health and safety improvements needed to install building envelope and retrofit measures; up to \$2,500 for each low-income household and \$1,250 for each moderateincome household.
- AIC increased financial bonuses for moderate-income customers to help with out-of-pocket costs for building envelope and HVAC retrofits, excluding air conditioners.
- Increased costs of equipment and labor, due to broader economic and market trends, posed a barrier to Program Allies ability to complete projects. In response, AIC increased standard pricing for Program

<sup>&</sup>lt;sup>23</sup> Moderate-income participants in the Single Family Core channel may have copayments for certain measures. Low-income participants in Single Family Core have no copayments.

Allies by 15%; removed their project allocations (i.e., limits on the number of projects they could complete); and added a \$500 bonus per project completion.

- The implementation team increased quality control efforts in 2022. The implementation team also discontinued virtual audits, as these audits required significant staff time and effort while not providing adequate information.
- Toward the end of 2022, the implementation team launched new marketing efforts using the Propel software application. While this new marketing activity did not contribute much to 2022 participation, the implementation team saw increased applications for 2023.

## **Participation Summary**

The Single Family channel – Core provided its energy efficiency services to over 1,200 homes in 2022 (i.e., outside of SAVE kits or additional offerings), as shown in Table 25. Three quarters of participants (75%) completed HVAC and/or building envelope retrofits measures, while the remainder only received DI measures. More detail on the percentage of customers who received each type of measure is available in Appendix D.

Participation	Total
Number of single family homes served	1,241
Building shell or HVAC retrofits only	693
DI measures only	314
Full Participation: DI + building envelope or HVAC retrofits	234
Source: We determined unique homes based on electric or gas account numbers. The exclude 166 unique account numbers with only "Other" measures (based on the "proc family" field in the tracking data). "Other" measures have no ex ante savings estimates include Administrative Cost Program Support Health and Safety Authorized Measure	se counts luct and and

Table 25.	2022 Sing	le Family Cha	nnel – Core	Participation	Summary
-----------	-----------	---------------	-------------	---------------	---------

## **Savings Detail**

Program Support.

As shown in Table 26, the Single Family channel – Core included 45 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Air Source Heat Pump - Replaces Electric Resistance (ER)	Air Source Heat Pump	31	Systems	328	0.03	0
Air Sealing	Air Sealing	845,478	Cubic Feet per Minute (CFM)	327	0.19	47,343
Attic Insulation	Ceiling/Attic Insulation	819,895	Square Feet	227	0.11	52,485
BPM Motor	Furnace Blower Motor	425	Motors	223	0.07	0
Central Air Conditioning (ER)	Central Air Conditioning	123	Systems	219	0.16	0
Advanced Thermostat	Advanced Thermostats	523	Thermostats	161	0.07	33,706
Bathroom Exhaust Fan	High Efficiency Bathroom Exhaust Fan	721	Fans	156	0.02	0

Table 26. 2022 Single Family Channel - Core Participation Summary by Measure

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Standard LED	LED Screw Based Omnidirectional Bulbs	3,511	Bulbs	133	0.02	0
Crawl Space Insulation	Basement Sidewall Insulation	42,910	Square Feet	85	0.02	22,335
Heat Pump Water Heater	Heat Pump Water Heaters	24	Water Heaters	61	0.003	0
Decorative LED	LED Specialty Lamps	1,746	Bulbs	46	0.01	0
Wall Insulation	Wall Insulation	173,103	Square Feet	42	0.02	17,547
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	467	Power Strips	36	0.004	0
Duct Sealing	Duct Insulation and Sealing	23	Participants	15	0.01	7,600
Rim Joist Insulation	Rim/Band Joist Insulation	76,116	Linear Feet	14	0.004	4,141
Directional LED	LED Specialty Lamps	266	Bulbs	11	0.002	0
Ductless Heat Pump (ER)	Ductless Heat Pumps	1	Systems	9	0.0004	0
Room Air Conditioner (ER)	ENERGY STAR Room Air Conditioner	57	Systems	7	0.01	0
Exterior Standard LED	LED Screw Based Omnidirectional Bulbs	83	Bulbs	7	0.001	0
Air Source Heat Pump (TOS)	Air Source Heat Pump	5	Systems	6	0.002	0
Pipe Insulation	Domestic Hot Water Pipe Insulation	1,245	Linear Feet	5	0.001	2,340
Showerhead	Low Flow Showerheads	89	Showerhead s	4	0.0004	713
Ductless Heat Pump (TOS)	Ductless Heat Pumps	1	Systems	4	0.0002	0
Air Source Heat Pump - Replaces HP (ER)	Air Source Heat Pump	1	Systems	3	0.001	0
Kitchen Faucet Aerator	Low Flow Faucet Aerators	83	Aerators	3	0.0005	680
Exterior Directional LED	LED Specialty Lamps	9	Bulbs	1	0.0001	0
Central Air Conditioning (TOS)	Central Air Conditioning	1	Systems	1	0.001	0
Bathroom Faucet Aerator	Low Flow Faucet Aerators	79	Aerators	<1	0.0004	71
Exterior Decorative LED	LED Specialty Lamps	5	Bulbs	<1	0.0000 5	0
Restrictor Shower Valve	Thermostatic Restrictor Shower Valve	9	Valves	<1	0.0000 1	23
Gas High Efficiency Boiler (ER)	Gas High Efficiency Boiler	17	Systems	0	0	10,640
Gas High Efficiency Boiler (TOS)	Gas High Efficiency Boiler	6	Systems	0	0	528

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Furnace (ER)	Gas High Efficiency Furnace	452	Systems	0	0	130,295
Furnace (TOS)	Gas High Efficiency Furnace	152	Systems	0	0	15,657
Single Family Channel Total		1,967,657		2,137	0.75	346,103

Table 27 through Table 29 present electric, demand, and gas impacts for the IQ Single Family – Core channel by measure.

Table 27. 2022 Single Family Channel - Core Electric Energy Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Air Source Heat Pump - Replaces Electric Resistance (ER)	328	100%	328	1.000	328
Air Sealing	327	101%	332	1.000	332
Attic Insulation	227	100%	227	1.000	227
BPM Motor	223	94%	210	1.000	210
Central Air Conditioning (ER)	219	100%	219	1.000	219
Advanced Thermostat	161	102%	164	1.000	164
Bathroom Exhaust Fan	156	100%	156	1.000	156
Standard LED	133	100%	133	1.000	133
Crawl Space Insulation	85	99%	85	1.000	85
Heat Pump Water Heater	61	100%	61	1.000	61
Decorative LED	46	100%	46	1.000	46
Wall Insulation	42	100%	42	1.000	42
Advanced Power Strip - Tier 1	36	100%	36	1.000	36
Duct Sealing	15	111%	17	1.000	17
Rim Joist Insulation	14	100%	14	1.000	14
Directional LED	11	100%	11	1.000	11
Ductless Heat Pump (ER)	9	100%	9	1.000	9
Room Air Conditioner (ER)	7	100%	7	1.000	7
Exterior Standard LED	7	100%	7	1.000	7
Air Source Heat Pump (TOS)	6	100%	6	1.000	6
Pipe Insulation	5	98%	5	1.000	5
Showerhead	4	100%	4	1.000	4
Ductless Heat Pump (TOS)	4	100%	4	1.000	4
Air Source Heat Pump - Replaces HP (ER)	3	106%	4	1.000	4
Kitchen Faucet Aerator	3	100%	3	1.000	3
Exterior Directional LED	1	100%	1	1.000	1

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Central Air Conditioning (TOS)	1	100%	1	1.000	1
Bathroom Faucet Aerator	<1	100%	<1	1.000	<1
Exterior Decorative LED	<1	100%	<1	1.000	<1
Restrictor Shower Valve	<1	82%	<1	1.000	<1
Single Family Channel Total	2,137	100%	2,133	1.000	2,133

Table 28. 2022 Single Family Channel - Core Electric Demand Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Air Source Heat Pump - Replaces Electric Resistance (ER)	0.03	100%	0.03	1.000	0.03
Air Sealing	0.19	100%	0.19	1.000	0.19
Attic Insulation	0.11	100%	0.11	1.000	0.11
BPM Motor	0.07	75%	0.06	1.000	0.06
Central Air Conditioning (ER)	0.16	103%	0.16	1.000	0.16
Advanced Thermostat	0.07	110%	0.07	1.000	0.07
Bathroom Exhaust Fan	0.02	100%	0.02	1.000	0.02
Standard LED	0.02	100%	0.02	1.000	0.02
Crawl Space Insulation	0.02	100%	0.02	1.000	0.02
Heat Pump Water Heater	0.003	100%	0.003	1.000	0.003
Decorative LED	0.01	100%	0.01	1.000	0.01
Wall Insulation	0.02	100%	0.02	1.000	0.02
Advanced Power Strip - Tier 1	0.004	100%	0.004	1.000	0.004
Duct Sealing	0.01	118%	0.01	1.000	0.01
Rim Joist Insulation	0.004	100%	0.004	1.000	0.004
Directional LED	0.002	100%	0.002	1.000	0.002
Ductless Heat Pump (ER)	0.0004	100%	0.0004	1.000	0.0004
Room Air Conditioner (ER)	0.01	100%	0.01	1.000	0.01
Exterior Standard LED	0.001	100%	0.001	1.000	0.001
Air Source Heat Pump (TOS)	0.002	100%	0.002	1.000	0.002
Pipe Insulation	0.001	98%	0.0006	1.000	0.0006
Showerhead	0.0004	100%	0.0004	1.000	0.0004
Ductless Heat Pump (TOS)	0.0002	100%	0.0002	1.000	0.0002
Air Source Heat Pump - Replaces HP (ER)	0.001	120%	0.001	1.000	0.001
Kitchen Faucet Aerator	0.0005	91%	0.0004	1.000	0.0004
Exterior Directional LED	0.0001	100%	0.0001	1.000	0.0001
Central Air Conditioning (TOS)	0.001	100%	0.001	1.000	0.001

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Bathroom Faucet Aerator	0.0004	100%	0.0004	1.000	0.0004
Exterior Decorative LED	0.00005	100%	0.00005	1.000	0.00005
Restrictor Shower Valve	0.00001	83%	0.00001	1.000	0.00001
Single Family Channel Total	0.75	99%	0.74	1.000	0.74

Table 29. 2022 Single Family Channel - Core Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Air Sealing	47,343	100%	47,340	1.000	47,340
Attic Insulation	52,485	100%	52,459	1.000	52,459
Advanced Thermostat	33,706	100%	33,706	1.000	33,706
Crawl Space Insulation	22,335	100%	22,315	1.000	22,315
Wall Insulation	17,547	100%	17,594	1.000	17,594
Duct Sealing	7,600	66%	5,012	1.000	5,012
Rim Joist Insulation	4,141	100%	4,143	1.000	4,143
Pipe Insulation	2,340	100%	2,333	1.000	2,333
Showerhead	713	100%	713	1.000	713
Kitchen Faucet Aerator	680	100%	680	1.000	680
Bathroom Faucet Aerator	71	100%	71	1.000	71
Restrictor Shower Valve	23	72%	17	1.000	17
Gas High Efficiency Boiler (ER)	10,640	107%	11,392	1.000	11,392
Gas High Efficiency Boiler (TOS)	528	100%	528	1.000	528
Furnace (ER)	130,295	100%	130,299	1.000	130,299
Furnace (TOS)	15,657	100%	15,657	1.000	15,657
Single Family Channel Total	346,103	99%	344,257	1.000	344,257

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 83 individual discrepancies in our final impact analysis. In part, this reflects the size of the Initiative and a wide variety of available measures. Many of these discrepancies affect measure categories that provide a relatively small proportion of Initiative savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to the IQ Single Family channel - Core ex ante energy savings.

Air Sealing (15% of ex ante energy savings, 26% of demand savings, and 14% of therm savings): The gross realization rate for air sealing is 101% for energy, 100% for demand, and 100% for therm savings.

- In 559 cases, the evaluation team calculated savings including the IE\_net\_correction term for both kWh\_gas\_heating and therm savings calculations, as indicated in IL TRM V10, whereas the implementation team calculated savings and only incorporated the IE\_net\_correction term in the therms calculations. This resulted in increased verified energy savings.
- BPM Motor (10% of ex ante energy savings, 10% of demand savings, and 0% of therm savings): The gross realization rate for BPM motors is 94% for energy and 75% for demand. This measure does not claim therm savings.
  - In 113 cases, the evaluation team did not claim savings for cooling since a new central air conditioner (CAC) was installed and those savings already account for the ECM benefits; whereas the implementation team claimed savings for cooling. This resulted in lower verified energy and demand savings.
  - In nine cases, the evaluation team applied the existing cooling system capacity from the tracking database, whereas the implementation team applied an existing cooling capacity from an unknown source. This discrepancy resulted in a mixture of higher and lower verified energy and demand savings depending on the project.
  - In six cases, the evaluation team applied the new cooling system capacity from the data, whereas the implementation team applied the existing cooling system capacity. This discrepancy resulted in a mixture of higher and lower verified energy and demand savings depending on the project.
  - In three cases, the evaluation team did not calculate savings for this measure because this project also received a TOS furnace and the IL-TRM V10.0 states that this measure cannot claim savings in TOS scenarios; whereas the implementation team calculated savings for this measure. This resulted in lower verified energy and demand savings.
- Central Air Conditioning (ER) (10% of ex ante energy savings, 21% of demand savings, and 0% of therm savings): The gross realization rate for ER central air conditioners is 100% for energy and 103% for demand savings. This measure does not claim therm savings.
  - The evaluation team derated existing SEER based on the equipment age shown in the data, whereas the implementation team derated existing SEER by a different age than indicated in the data. This resulted in higher verified energy and demand savings.
  - In 10 cases, the evaluation team applied the IL-TRM V10.0 default of 7.5 EER when equipment age is unknown, whereas the implementation team applied the SEER-to-EER conversion specified by the IL-TRM V10.0 when equipment age is unknown. This resulted in higher verified demand savings.
- Advanced Thermostat (8% of ex ante energy savings, 9% of demand savings, and 10% of therm savings): The gross realization rate for advanced thermostats is 102% for energy, 110% for demand, and 100% for therm savings.
  - In 243 cases, the evaluation team applied the SEER-to-EER conversion specified by the IL-TRM V10.0, whereas the implementation team did not appropriately apply this conversion. This resulted in higher verified demand savings.
  - In 99 cases with newly installed HVAC equipment, the evaluation team applied the new HVAC efficiency, whereas the implementation team used the existing HVAC efficiency. This resulted in higher verified energy savings.
- Standard LED (7% of ex ante energy savings, 2% of demand savings, and 0% of therm savings): The gross realization rate for Standard LED is 100% for electric energy and 100% for demand. This

measure does not claim therm savings. Although the realization rates round to 100%, the following discrepancies occurred:

- In 16 cases, the evaluation team set WHFe = 1.0 for those where primary cooling type indicates "None." The implementation team included cooling benefits when primary cooling type indicates "None" for cooling. This resulted in lower verified energy and demand savings.
- In 16 cases, the evaluation team set WHFd = 1.0 for those where primary cooling type indicates "None." The implementation team included cooling benefits when primary cooling type indicates "None" for cooling. This resulted in lower verified energy and demand savings.
- Crawl Space Insulation (4% of ex ante energy savings, 3% of demand savings, and 6% of therm savings): The gross realization rate for crawl space insulation is 99% for energy, 100% for demand, and 100% for therm savings.
  - In 14 cases, the evaluation team did not apply kWh\_gas\_heating savings since heating type was a boiler or propane, and not a furnace, which is in line with IL-TRM V10.0, whereas the implementation team applied kWh\_gas\_heating savings. This resulted in lower verified energy and therm savings.
  - In five cases with tested ratings, the evaluation team applied the tested AFUE from the data for ηHeat, whereas the implementation team derated ηHeat. This resulted in lower verified energy and/or therm savings.

## 3.2.3 Single Family Channel – SAVE Kits

SAVE Kits are a distinct offering within the Single Family channel. In June 2020, AIC developed the SAVE Kits offering to continue helping IQ customers manage their energy costs and improve the comfort of their homes while avoiding in-person contact during the COVID-19 pandemic. The SAVE Kits not only provide energy savings for customers, but also act as a "foot in the door" for hard to reach and underserved customers in energy efficiency offerings. The SAVE Kits are designed to act as a catalyst for participation in other AIC offerings, such as the IQ Single Family channel – Core and the Retail Products Online Marketplace channel.

The SAVE Kits includes several energy- and water-saving products (e.g., LEDs, low-flow showerheads, advanced power strips, and door sweeps), a booklet of installation instructions, and the tools customers need to install the products (e.g., a screwdriver and plumber's tape). Once customers have received the kit, they may choose from two verification options:

- Virtually Assisted Install (or "Virtual" Verification): A video call with a Personal Energy Advisor (PEA) who will walk the customer through product installation and verify the customer installed the products correctly.
- Postcard Verification: Customers install the measures on their own and then submit a verification postcard.

Customers may also choose not to complete a verification option. AIC provides SAVE Kits at no cost to the customer. SAVE Kits contents do not vary by customer type (i.e., the kit contains the same items regardless of whether the customer receives electricity, gas, or both from AIC).

## Summary of Key Implementation Changes in 2022

The key changes to SAVE Kits design and implementation since 2021 are below:

- In 2022, the implementation team increased quality control activities to cover 50% of all completed projects. As part of the increased quality control efforts, the implementation team planned to virtually verify 300 of 2,000 SAVE Kits distributed. Verification efforts included two options: one was a Virtually Assisted Install through a video call with a Personal Energy Advisor; and the second, a postcard survey response. By mid-2022, however, the implementation team discontinued these verification efforts as they perceived the benefits of conducting them as minimal, while these efforts required a lot of staff and time to conduct.
- By the end of 2022, the implementation team exhausted all SAVE Kits in their inventory and discontinued distributing SAVE Kits. In 2023, the Personal Energy Advisors will be installing direct install materials (DIMs) and conducting energy education through in-person energy assessments.

## **Participation Summary**

The Single Family channel - SAVE Kits offering of the IQ Initiative distributed over 2,000 SAVE Kits in 2022, reaching 2,044 unique customers. A total of three kit recipients (<1%) completed a verification option. Table 30 provides the total number of SAVE Kits distributed.

Table 30. 2022 Single Family Channel - SAVE Kits Participation Summary

Verification Type	<b>Total Recipients</b>	Total Kits
Unverified	2,041	2,046
Verified Self-Install	3	3
Total SAVE Kits Distributed	2,044	2,049

Note: Total recipients does not match the number of kits distributed because 5 customers (defined by unique account number) received two Unverified SAVE Kits.

## **Savings Detail**

As shown in Table 31, the SAVE Kits offering included 22 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Unverified SAVE Kit - 9W LED	LED Screw Based Omnidirectional Bulbs	12,276	Bulbs	438	0.05	0
Unverified SAVE Kit - APS Tier 1	Advanced Power Strip - Tier 1	4,092	Power Strips	375	0.04	0
Unverified SAVE Kit - 6W LED	LED Specialty Lamps	8,184	Bulbs	256	0.03	0
Unverified SAVE Kit - 8W LED	LED Specialty Lamps	4,092	Bulbs	214	0.03	0
Unverified SAVE Kit - Door Sweep	Air Sealing	4,092	Door Sweeps	63	-	9,909

Table 31. 2022 Single Family Channel - SAVE Kits Participation Summary by Measure

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Unverified SAVE Kit - Showerhead, 1.5 gpm	Low Flow Showerheads	2,046	Showerheads	61	0.005	11,167
Unverified SAVE Kit - Outlet Gasket	Air Sealing	49,104	Gaskets	58	0.02	5,513
Unverified SAVE Kit - 3/4" Pipe Insulation	Domestic Hot Water Pipe Insulation	12,276	Linear Feet	56	0.01	12,303
Unverified SAVE Kit - Kitchen Aerator, 1.5 gpm	Low Flow Faucet Aerators	2,046	Aerators	50	0.01	8,642
Unverified SAVE Kit - 1/2" Pipe Insulation	Domestic Hot Water Pipe Insulation	6,138	Linear Feet	22	0.003	4,916
Unverified SAVE Kit - Shower TSV	Thermostatic Restrictor Shower Valve	2,046	Valves	12	0.004	2,105
Unverified SAVE Kit - Bath Aerator, 1.0 gpm	Low Flow Faucet Aerators	2,046	Aerators	6	0.01	1,078
Verified SAVE Kit - Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	6	Power Strips	1	0.0001	0
Verified SAVE Kit - Pipe Insulation	Domestic Hot Water Pipe Insulation	9	Per 3-ft	<1	0.0001	19
Verified SAVE Kit - Standard LED	LED Screw Based Omnidirectional Bulbs	18	Bulbs	<1	0.0001	0
Verified SAVE Kit - Door Sweep	Air Sealing	6	Door Sweeps	<1	-	13
Verified SAVE Kit - Faucet Aerator	Low Flow Faucet Aerators	6	Aerators	<1	0.0001	6
Verified SAVE Kit - Showerhead	Low Flow Showerheads	3	Showerheads	<1	0.00004	7
Verified SAVE Kit - Outlet Gasket	Air Sealing	72	Gaskets	<1	-	8
Verified SAVE Kit - Decorative LED	LED Specialty Lamps	12	Bulbs	<1	0.00005	0
Verified SAVE Kit - Directional LED	LED Specialty Lamps	6	Bulbs	<1	0.00004	0
Verified SAVE Kit - Restrictor Shower Valve	Thermostatic Restrictor Shower Valve	3	Valves	<1	0.00001	2
Total		108,579		1,615	0.21	55,689

Table 32 through Table 34 present electric, demand, and gas impacts by measure.

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Unverified SAVE Kit - 9W LED	438	100%	438	1.000	438
Unverified SAVE Kit - APS Tier 1	375	100%	375	1.000	375
Unverified SAVE Kit - 6W LED	256	100%	256	1.000	256
Unverified SAVE Kit - 8W LED	214	100%	214	1.000	214
Unverified SAVE Kit - Door Sweep	63	100%	63	1.000	63
Unverified SAVE Kit - Showerhead, 1.5 gpm	61	100%	61	1.000	61
Unverified SAVE Kit - Outlet Gasket	58	100%	58	1.000	58
Unverified SAVE Kit - 3/4" Pipe Insulation	56	100%	56	1.000	56
Unverified SAVE Kit - Kitchen Aerator, 1.5 gpm	50	100%	50	1.000	50
Unverified SAVE Kit - 1/2" Pipe Insulation	22	100%	22	1.000	22
Unverified SAVE Kit - Shower TSV	12	100%	12	1.000	12
Unverified SAVE Kit - Bath Aerator, 1.0 gpm	6	100%	6	1.000	6
Verified SAVE Kit - Advanced Power Strip - Tier 1	1	100%	1	1.000	1
Verified SAVE Kit - Pipe Insulation	<1	100%	<1	1.000	<1
Verified SAVE Kit - Standard LED	<1	100%	<1	1.000	<1
Verified SAVE Kit - Door Sweep	<1	66%	<1	1.000	<1
Verified SAVE Kit - Faucet Aerator	<1	100%	<1	1.000	<1
Verified SAVE Kit - Showerhead	<1	100%	<1	1.000	<1
Verified SAVE Kit - Outlet Gasket	<1	58%	<1	1.000	<1
Verified SAVE Kit - Decorative LED	<1	100%	<1	1.000	<1
Verified SAVE Kit - Directional LED	<1	100%	<1	1.000	<1
Verified SAVE Kit - Restrictor Shower Valve	<1	105%	<1	1.000	<1
Total	1,615	100%	1,615	1.000	1,615

## Table 32. 2022 Single Family Channel - SAVE Kits Energy Savings by Measure

Table 33. 2022 Single Family Channel - SAVE Kits Electric Demand Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Unverified SAVE Kit - 9W LED	0.05	100%	0.053	1.000	0.053
Unverified SAVE Kit - APS Tier 1	0.04	100%	0.042	1.000	0.042
Unverified SAVE Kit - 6W LED	0.03	100%	0.030	1.000	0.030
Unverified SAVE Kit - 8W LED	0.03	100%	0.025	1.000	0.025
Unverified SAVE Kit - Showerhead, 1.5 gpm	0.005	100%	0.005	1.000	0.005
Unverified SAVE Kit - Outlet Gasket	0.02	100%	0.024	1.000	0.024
Unverified SAVE Kit - 3/4" Pipe Insulation	0.01	100%	0.006	1.000	0.006
Unverified SAVE Kit - Kitchen Aerator, 1.5 gpm	0.01	100%	0.008	1.000	0.008
Unverified SAVE Kit - 1/2" Pipe Insulation	0.003	100%	0.003	1.000	0.003

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Unverified SAVE Kit - Shower TSV	0.004	100%	0.004	1.000	0.004
Unverified SAVE Kit - Bath Aerator, 1.0 gpm	0.01	100%	0.006	1.000	0.006
Verified SAVE Kit - Advanced Power Strip - Tier 1	0.0001	100%	0.0001	1.000	0.0001
Verified SAVE Kit - Pipe Insulation	0.0001	100%	0.0001	1.000	0.0001
Verified SAVE Kit - Standard LED	0.0001	100%	0.0001	1.000	0.0001
Verified SAVE Kit - Door Sweep	0	N/A	0.000001	1.000	0.0000
Verified SAVE Kit - Faucet Aerator	0.0001	90%	0.0001	1.000	0.0001
Verified SAVE Kit - Showerhead	0.00004	98%	0.00004	1.000	0.00004
Verified SAVE Kit - Outlet Gasket	0	N/A	0.00003	1.000	0.00003
Verified SAVE Kit - Decorative LED	0.00005	100%	0.00005	1.000	0.00005
Verified SAVE Kit - Directional LED	0.00004	100%	0.00004	1.000	0.00004
Verified SAVE Kit - Restrictor Shower Valve	0.00001	100%	0.00001	1.000	0.00001
Total	0.21	100%	0.21	1.000	0.21

Table 34. 2022 Single Family Channel - SAVE Kits Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Unverified SAVE Kit - Door Sweep	9,909	100%	9,909	1.000	9,909
Unverified SAVE Kit - Showerhead, 1.5 gpm	11,167	100%	11,167	1.000	11,167
Unverified SAVE Kit - Outlet Gasket	5,513	100%	5,513	1.000	5,513
Unverified SAVE Kit - 3/4" Pipe Insulation	12,303	100%	12,303	1.000	12,303
Unverified SAVE Kit - Kitchen Aerator, 1.5 gpm	8,642	100%	8,642	1.000	8,642
Unverified SAVE Kit - 1/2" Pipe Insulation	4,916	100%	4,916	1.000	4,916
Unverified SAVE Kit - Shower TSV	2,105	100%	2,105	1.000	2,105
Unverified SAVE Kit - Bath Aerator, 1.0 gpm	1,078	100%	1,078	1.000	1,078
Verified SAVE Kit - Pipe Insulation	19	100%	19	1.000	19
Verified SAVE Kit - Door Sweep	13	66%	8	1.000	8
Verified SAVE Kit - Faucet Aerator	6	100%	6	1.000	6
Verified SAVE Kit - Showerhead	7	100%	7	1.000	7
Verified SAVE Kit - Outlet Gasket	8	59%	5	1.000	5
Verified SAVE Kit - Restrictor Shower Valve	2	105%	2	1.000	2
Total	55,689	100%	55,681	1.000	55,681

All discrepancies specifically affected verified SAVE Kit measures but have an insignificant influence on the overall realization rate since verified SAVE Kit measures account for a relatively small proportion of total ex ante savings (0.2%). We describe the key drivers of discrepancies between ex ante and verified gross savings

estimates below. We ordered the list of discrepancies below from largest to smallest contribution to SAVE Kits ex ante energy savings.

- Verified SAVE Kit Door Sweep (<1% of ex ante energy, demand, and therm savings): The gross realization rate for door sweeps is 66% for energy, N/A for demand, and 66% for gas savings.</p>
  - The evaluation team applied in-service rates from the IL-TRM V10.0 (57%) in the verified analysis, whereas the implementation team applied the in-service rate from IL-TRM V9.0. The in-service rate in V10.0 is lower than that in V9.0, resulting in lower verified energy, demand, and therm savings.
  - The evaluation team applied algorithms from the IL-TRM V10.0 to claim savings from cooling in the verified analysis per the IL-TRM V10.0, whereas the implementation team did not. Including cooling savings resulted in higher verified electric energy and demand savings; however, these savings were superseded by the bullet above.
- Verified SAVE Kit Faucet Aerator (<1% of ex ante energy, demand, therm savings): The gross realization rate for faucet aerators is 100% for energy, 90% for demand, and 100% for therm savings.</p>
  - The evaluation team applied the IL-TRM V10.0 hours of use for bathroom (16 hours) and kitchen (112 hours) aerators in the verified analysis, whereas the implementation team applied the hours of use from the IL-TRM V9.0. The hours of use in V10.0 are higher than in V9.0, resulting in lower verified demand savings.
- Verified SAVE Kit Showerhead (<1% of ex ante energy, demand, and therm savings): The gross realization rate for showerheads is 100% for energy, 98% for demand, and 100% for therm savings.</p>
  - In cases where showerheads were verified as left-behind, the evaluation team applied the IL-TRM V10.0 hours of use for leave-behind showerheads (286 hours) in the verified analysis, whereas the implementation team applied the hours of use for direct install showerheads (273 hours). The leave-behind hours of use are lower than direct installations, resulting in lower verified demand savings.
- Verified SAVE Kit Outlet Gasket (<1% of ex ante energy, demand, and therm savings): The gross realization rate for outlet gaskets is 58% for energy, N/A for demand savings, and 59% for therm savings.</p>
  - The evaluation team applied the in-service rate from the IL-TRM V10.0 (51%) for heating and cooling savings in the verified analysis whereas the implementation team applied the in-service rate from IL-TRM V9.0. The in-service rate in V10.0 is lower than in V9.0, resulting in lower verified energy and therm savings.
  - The evaluation team applied an average N\_cool value for all stories (1-3) from the IL-TRM V10.0 that varied by the cooling city provided in the tracking database for the verified analysis. The implementation team applied an N\_cool value for 1.5 story homes in Springfield, IL and did not vary the value by location. The N\_cool value for 1.5 story homes is higher than the average N\_cool values for homes outside of Springfield, IL, resulting in lower verified energy and therm savings.
- Verified SAVE Kit Restrictor Shower Valve (<1% of ex ante energy, demand, and therm savings): The gross realization rate for thermostatic shower valve (TSV) is 105% for energy savings, 100% for demand, and 105% for therm savings.</p>
  - In cases where TSVs were verified as left-behind, the evaluation team applied the flow rate for a leave-behind TSV with the install of a low-flow showerhead (2.35 gpm) in the verified analysis. The implementation team applied the flow rate for a direct install TSV without the install of a low-flow

showerhead (2.24 gpm). The flow rate for a leave-behind TSV is higher than the flow rate for direct install TSV, resulting in higher verified energy, demand, and therm savings.

The evaluation team applied the IL-TRM V10.0 hours of use for leave-behind TSV (32.6 hours) in the verified analysis, whereas the implementation team applied the hours of use for direct install TSVs (31.1 hours). The leave-behind hours of use are higher than direct installs, thus resulting in lower verified demand savings. The decrease in demand savings here was superseded by the above bullet.

## 3.2.4 Healthier Homes Channel

The Healthier Homes channel is a third party offering implemented by CLEAResult in 2022 that partners with healthcare providers and local community organizations to identify IQ or underserved households with a history of asthma or other respiratory ailments. AIC provides a suite of energy efficiency and health and safety services to deliver both energy bill savings and preventative care benefits to these households.

Due to implementation challenges, the channel was unable to fully launch in 2022 and delivered services to only one customer. AIC is in the process of identifying a new implementation partner for this channel in 2023.

## Savings Detail

As shown in Table 35, the Healthier Homes channel included three categories of measures in 2023.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Standard LED	LED Screw Based Omnidirectional Bulbs	11	Bulbs	<1	0.0001	0
Dehumidifier	ENERGY STAR Dehumidifier	1	Systems	<1	0.00002	0
Air Purifier	ENERGY STAR Air Purifier	1	Systems	<1	0.00001	0
Healthier Homes Channel Total		13		1	0.0001	0

Table 35. 2022 Healthier Homes Channel Participation Summary by Measure

Table 36 and Table 37 present electric energy and demand savings by measure. The Healthier Homes channel produced no gas savings in 2022.

#### Table 36. 2022 Healthier Homes Channel Electric Energy Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Standard LED	<1	100%	<1	1.000	<1
Dehumidifier	<1	100%	<1	1.000	<1
Air Purifier	<1	100%	<1	1.000	<1
Healthier Homes Channel Total	1	100%	1	1.000	1

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Standard LED	0.0001	100%	0.0001	1.000	0.0001
Dehumidifier	0.00002	100%	0.00002	1.000	0.00002
Air Purifier	0.00001	100%	0.00001	1.000	0.00001
Healthier Homes Channel Total	0.0001	100%	0.0001	1.000	0.0001

#### Table 37. 2022 Healthier Homes Channel Electric Demand Savings by Measure

# 3.2.5 Community Action Agency Channel

The IQ Initiative Community Action Agency (CAA) channel combines funding from AIC and the Illinois Home Weatherization Program (IHWAP) to provide comprehensive energy efficiency and health and safety improvements to low-income customers in AIC service territory who are IHWAP-eligible. The channel provides no-cost Building Performance Institute (BPI) energy audits that identify building shell and HVAC retrofit opportunities. During the audit, implementation staff also install energy-efficient direct install (DI) measures such as LEDs, showerheads, faucet aerators, advanced power strips, pipe insulation, and programmable/advanced thermostats at no cost. Following the audit, customers may also receive additional retrofits at no cost, such as air sealing and insulation improvements, and HVAC replacements. The AIC components of the CAA channel are implemented primarily by Walker-Miller as a subcontractor to Leidos.

## Summary of Key Implementation Changes in 2022

The key changes to channel design and implementation are below:

- Walker-Miller took over implementation of the CAA channel.
- IHWAP began funding mechanical work on heat pumps, heat pump water heaters, furnace fans, furnaces, gas water heaters, boilers, and window air conditioning units.
- Several CAAs encountered staffing shortages and changes in 2022, which affected their ability to complete projects. The implementation team provided staffing support and allowed Program Allies to work with affected CAAs to help alleviate CAA staffing challenges and achieve goals.
- For 2022, the CAA channel implementation team planned to create Account Partnership Plans to help ensure that each agency's goals align with the IQ Initiative's goals. However, by the end of 2022, these plans had not yet been implemented.

## **Participation Summary**

The CAA channel provided energy efficiency services to over 300 homes in 2022, as shown in Table 38. Almost all participants (99%) received HVAC and/or building envelope retrofits, while the remainder only received DI measures. More detail on the percentage of customers who received each type of measure is available in Appendix D.

## Table 38. 2022 CAA Channel Participation Summary

Participation	Total
Number of single family homes served	310
Full Participation: DI + building envelope or HVAC measures	287
Building shell or HVAC measures only	20
DI measures only	3
Source: We determined unique homes based on electric or de	0.0000

Source: We determined unique homes based on electric or gas account numbers.

## **Savings Detail**

As shown in Table 39, the CAA channel included 25 categories of measures.

Table 39. 2022 CAA Channe	el Participation Summa	y by Measure
---------------------------	------------------------	--------------

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Air Sealing	Air Sealing	561,293	CFM	229	0.11	22,982
Standard LED	LED Screw Based Omnidirectional Bulbs	5,237	Bulbs	178	0.02	0
Attic Insulation	Ceiling/Attic Insulation	244,406	Square Feet	108	0.04	19,432
Bathroom Exhaust Fan	High Efficiency Bathroom Exhaust Fan	273	Fans	59	0.01	0
Air Source Heat Pump - Replaces Electric Resistance (ER)	Air Source Heat Pump	8	Systems	55	(0.002)	0
BPM Motor	Furnace Blower Motor	88	Motors	48	0.01	0
Crawl Space Insulation	Basement Sidewall Insulation	20,005	Square Feet	38	0.01	7,823
Pipe Insulation	Domestic Hot Water Pipe Insulation	2,090	Linear Feet	37	0.004	2,789
Floor Insulation	Floor Insulation Above Crawl Space	50,699	Square Feet	33	0.005	3,100
Heat Pump Water Heater	Heat Pump Water Heaters	9	Water Heaters	23	0.001	0
Showerhead	Low Flow Showerheads	149	Showerheads	20	0.002	763
Wall Insulation	Wall Insulation	66,960	Square Feet	18	0.01	4,607
Ductless Heat Pump (TOS)	Ductless Heat Pumps	2	Systems	12	0.0003	0
Decorative LED	LED Specialty Lamps	417	Bulbs	8	0.001	0
Advanced Thermostat	Advanced Thermostats	21	Thermostats	7	0.003	1,111
Bathroom Faucet Aerator	Low Flow Faucet Aerators	323	Aerators	6	0.01	185
Rim Joist Insulation	Rim/Band Joist Insulation	25,663	Linear Feet	5	0.001	1,046
Air Source Heat Pump (TOS)	Air Source Heat Pump	4	Systems	3	0.001	0
Room Air Conditioner (ER)	ENERGY STAR Room Air Conditioner	16	Systems	3	0.002	0

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Kitchen Faucet Aerator	Low Flow Faucet Aerators	20	Aerators	2	0.0003	121
Gas High Efficiency Boiler (ER)	Gas High Efficiency Boiler	1	Systems	0	0	262
Gas High Efficiency Boiler (TOS)	Gas High Efficiency Boiler	2	Systems	0	0	180
Furnace (ER)	Gas High Efficiency Furnace	93	Systems	0	0	24,627
Furnace (TOS)	Gas High Efficiency Furnace	15	Systems	0	0	1,290
Gas Water Heater	Gas Water Heater	33	Water Heaters	0	0	1,963
Total		977,826		892	0.24	92,282

Table 40 through Table 42 present CAA channel electric, demand, and gas impacts by measure.

Table 40	. 2022	CAA	Channel	Electric	Energy	Savings	by	Measure
----------	--------	-----	---------	----------	--------	---------	----	---------

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Air Sealing	229	100%	229	1.000	229
Standard LED	178	100%	178	1.000	178
Attic Insulation	108	100%	108	1.000	108
Bathroom Exhaust Fan	59	95%	56	1.000	56
Air Source Heat Pump - Replaces Electric Resistance (ER)	55	100%	55	1.000	55
BPM Motor	48	99%	47	1.000	47
Crawl Space Insulation	38	99%	38	1.000	38
Pipe Insulation	37	100%	37	1.000	37
Floor Insulation	33	100%	33	1.000	33
Heat Pump Water Heater	23	100%	23	1.000	23
Showerhead	20	103%	20	1.000	20
Wall Insulation	18	100%	18	1.000	18
Ductless Heat Pump (TOS)	12	100%	12	1.000	12
Decorative LED	8	99%	8	1.000	8
Advanced Thermostat	7	100%	7	1.000	7
Bathroom Faucet Aerator	6	100%	6	1.000	6
Rim Joist Insulation	5	99%	5	1.000	5
Air Source Heat Pump (TOS)	3	100%	3	1.000	3
Room Air Conditioner (ER)	3	100%	3	1.000	3
Kitchen Faucet Aerator	2	100%	2	1.000	2
Total	892	100%	889	1.000	889

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Air Sealing	0.11	99%	0.11	1.000	0.11
Standard LED	0.02	100%	0.02	1.000	0.02
Attic Insulation	0.04	100%	0.04	1.000	0.04
Bathroom Exhaust Fan	0.01	95%	0.01	1.000	0.01
Air Source Heat Pump - Replaces Electric Resistance (ER)	(0.002)	100%	(0.002)	1.000	(0.002)
BPM Motor	0.01	100%	0.01	1.000	0.01
Crawl Space Insulation	0.01	99%	0.01	1.000	0.01
Pipe Insulation	0.004	100%	0.004	1.000	0.004
Floor Insulation	0.005	100%	0.005	1.000	0.005
Heat Pump Water Heater	0.001	100%	0.001	1.000	0.001
Showerhead	0.002	103%	0.002	1.000	0.002
Wall Insulation	0.01	100%	0.01	1.000	0.01
Ductless Heat Pump (TOS)	0.0003	100%	0.000	1.000	0.000
Decorative LED	0.001	100%	0.001	1.000	0.001
Advanced Thermostat	0.003	119%	0.003	1.000	0.003
Bathroom Faucet Aerator	0.01	100%	0.01	1.000	0.01
Rim Joist Insulation	0.001	99%	0.001	1.000	0.001
Air Source Heat Pump (TOS)	0.001	100%	0.001	1.000	0.001
Room Air Conditioner (ER)	0.002	100%	0.002	1.000	0.002
Kitchen Faucet Aerator	0.0003	91%	0.0003	1.000	0.0003
Total	0.24	100%	0.24	1.000	0.24

## Table 41. 2022 CAA Channel Electric Demand Savings by Measure

Table 42. 2022 CAA Channel Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Air Sealing	22,982	100%	23,033	1.000	23,033
Attic Insulation	19,432	100%	19,476	1.000	19,476
Crawl Space Insulation	7,823	100%	7,843	1.000	7,843
Pipe Insulation	2,789	102%	2,839	1.000	2,839
Floor Insulation	3,100	97%	3,005	1.000	3,005
Showerhead	763	100%	767	1.000	767
Wall Insulation	4,607	100%	4,607	1.000	4,607
Advanced Thermostat	1,111	100%	1,111	1.000	1,111
Bathroom Faucet Aerator	185	101%	186	1.000	186
Rim Joist Insulation	1,046	99%	1,038	1.000	1,038

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Kitchen Faucet Aerator	121	100%	121	1.000	121
Gas High Efficiency Boiler (ER)	262	100%	262	1.000	262
Gas High Efficiency Boiler (TOS)	180	100%	180	1.000	180
Furnace (ER)	24,627	99%	24,318	1.000	24,318
Furnace (TOS)	1,290	100%	1,290	1.000	1,290
Gas Water Heater	1,963	100%	1,963	1.000	1,963
Total	92,282	100%	92,042	1.000	92,042

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 45 individual discrepancies in our final impact analysis. Many of these discrepancies affect measure categories that provide a relatively small proportion of Initiative savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to CAA channel ex ante electric energy savings.

- Air Sealing (26% of ex ante energy savings, 46% of demand savings, and 25% of therm savings): The gross realization rate for air sealing is 100% for energy, 99% for demand, and 100% for therm savings.
  - In five cases, the evaluation team applied ADJ factors for a project that did not receive attic insulation, whereas the implementation team applied ADJ factors for a site that had received attic insulation. This resulted in lower verified energy and demand savings but increased verified therm savings.
- Bathroom Exhaust Fan (7% of ex ante energy savings, 3% of demand savings, and 0% of therm savings): The gross realization rate for bathroom exhaust fan is 95% for energy and 95% for demand savings. This measure does not claim therm savings.
  - The evaluation team calculated energy savings according to information in the tracking database, whereas the implementation team used a deemed savings value from the IL-TRM V10.0, resulting in higher verified energy and demand savings.
  - In 18 cases, the evaluation team calculated energy savings for a standard fan because the project did not include air sealing, whereas the implementation team applied the deemed savings value for a continuous fan specified in the IL-TRM V10.0. This resulted in decreased electric energy and electric demand savings.
- BPM Motor (5% of ex ante energy savings, 6% of demand savings, and 0% of therm savings): The gross realization rate for BPM motors is 99% for energy and 100% for demand. This measure does not claim therm savings.
  - In six cases, the evaluation team applied the heating capacity (tonnage) based on the tracking database, whereas the implementation team applied an incorrect tonnage. This resulted in lower verified energy and demand savings.

- Crawl Space Insulation (4% of ex ante energy savings, 3% of demand savings, and 8% of therm savings): The gross realization rate for crawl space insulation is 99% for energy, 99% for demand, and 100% for therm savings.
  - In eight cases, the evaluation team did not apply kWh\_gas\_heating savings since heating type is a boiler and not a furnace, in line with IL-TRM V10, whereas the implementation team applied kWh\_gas\_heating savings. This resulted in lower verified energy and therm savings.
  - In four cases, the evaluation team derated the ηHeat value based on information in the tracking database, whereas the implementation team applied a ηHeat value from an unknown source. This resulted in higher verified energy and therm savings.

## 3.2.6 Smart Savers Channel

The Smart Savers channel is a third party offering implemented in 2022 by CLEAResult and Leidos that provides advanced thermostats at no-cost to IQ customers. The overarching goals of the channel are to achieve energy savings through advanced thermostat installation, reach customers who have not previously benefited from AIC's Residential Program, and act as an entry point into other AIC energy efficiency offerings.

Customers in target IQ zip codes may learn about the Smart Savers channel in a variety of ways including email, direct mail, social media messaging, and search engine optimization (SEO). Customers may apply online or by phone for a free advanced thermostat to install in their homes. Most participating customers have the option of installing the thermostat themselves or selecting a Program Ally to install the device. After participants complete their journey through the Smart Savers channel, AIC cross-promotes additional offerings through other channels, such as the Single Family channel and the Retail Product Online Marketplace channel.

## Summary of Key Implementation Changes in 2022

The key changes to channel design and implementation are below:

- Implementation challenges led to less participation in the channel than expected. AIC ended their contract with CLEAResult in November of 2022 and Leidos took over implementation of Smart Savers until AIC finds a new implementer.
- The post-participation customer satisfaction survey fielded in 2021 was not fielded in 2022.
- AIC removed the \$25 incentive for self-install customers, as customer research<sup>24</sup> and implementation team experiences suggested that it was not necessary to incentivize customers to install the thermostat.

## **Participation Summary**

The Smart Savers channel provided thermostats to over 2,800 customers in 2022. Most customers (82%) installed the thermostat themselves, while the remaining customers had their new thermostat installed by a Program Ally (18%). The vast majority of participants (98%) live in single family homes, but there were 45 multifamily participants.

Table 43 presents Smart Savers channel participation during 2022.

<sup>&</sup>lt;sup>24</sup> Opinion Dynamics. Ameren Illinois Company Smart Savers Initiative Process Evaluation.

https://www.ilsag.info/wp-content/uploads/AIC-Smart-Savers-Process-Evaluation-Memo-FINAL-2021-12-13.pdf

Installation TypeThermostatsSingle-Family Self-install2,304Single-Family Direct Install466Multifamily Direct Install45Total2,815

 Table 43. 2022 Smart Savers Channel Participation Summary

## **Savings Detail**

As shown in Table 44, the Smart Savers channel included three measure categories, based on customer and delivery type.

Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Advanced Thermostats – Single- Family Self-Install	Advanced Thermostats	2,304	Thermostats	910	250	93,802
Advanced Thermostats – Single- Family Direct Install	Advanced Thermostats	466	Thermostats	134	53	25,725
Advanced Thermostats – Multifamily Direct Install	Advanced Thermostats	45	Thermostats	6	5	2,249
Total	N/A	2,815	N/A	1,050	307	121,776

Table 44. 2022 Smart Savers Channel Participation Summary by Measure

Table 45 through Table 47 present electric, demand, and gas impacts by measure.

Table 45. 2022 Smart Savers Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Advanced Thermostats – Single-Family Self-Install	910	115%	1,047	1.000	1,047
Advanced Thermostats – Single-Family Direct Install	134	115%	154	1.000	154
Advanced Thermostats – Multifamily Direct Install	6	120%	7	1.000	7
Total	1,050	115%	1,209	1.000	1,209

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Advanced Thermostats – Single-Family Self-Install	0.25	125%	0.31	1.000	0.31
Advanced Thermostats – Single-Family Direct Install	0.05	138%	0.07	1.000	0.07
Advanced Thermostats – Multifamily Direct Install	<0.01	139%	0.01	1.000	0.01
Total	0.31	127%	0.39	1.000	0.39

Table 40. 2022 Smart Savers Channel Electric Demand Savings by Measure	Table 46.	2022 Smart	Savers (	Channel	Electric	Demand	Savings	by Measure
--	-----------	------------	----------	---------	----------	--------	---------	------------

Table 47. 2022 Smart Savers Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostats – Single-Family Self-Install	93,802	111%	104,095	1.000	104,095
Advanced Thermostats – Single-Family Direct Install	25,725	111%	28,454	1.000	28,454
Advanced Thermostats – Multifamily Direct Install	2,249	111%	2,499	1.000	2,499
Total	121,776	111%	135,047	1.000	135,047

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We ordered the list of discrepancies below from largest to smallest contribution to Smart Savers Channel ex ante energy savings.

- Advanced Thermostats (100% of ex ante energy, demand, and therm savings): The gross realization rate for advanced thermostats provided through the Smart Savers channel across housing type (single family and multifamily) and installation type (self-install and direct install) was 115% for energy, 127% for demand, and 111% for therm savings.
  - The evaluation team did not apply a net-to-gross (NTG) adjustment to gross savings, whereas the implementation team applied NTG adjustments of 0.80 for cooling and 0.90 for heating, resulting in higher verified energy, demand, and therm savings.
  - For projects with electric demand savings, the evaluation team used an ISR of 100% for direct install projects, whereas the implementation team used an ISR of 90%, resulting in higher demand savings.
  - In seven cases, the evaluation team excluded savings for repeat participants (i.e., duplicates or more than one thermostat per household), in line with IL-TRM V10.0 guidance, whereas the implementation team included savings for these repeat participants, resulting in lower verified energy, demand, and therm savings.

## 3.2.7 Mobile Homes and Air Sealing Channel

The IQ Initiative Mobile Homes & Air Sealing (MHAS) channel is a third party offering implemented by Future Energy Enterprises and the Champaign Country Regional Planning Commission (CCRPC) that delivers energy efficiency and other improvements to IQ customers living in mobile homes. The channel provides kits with

energy-saving products, as well as larger building envelope and HVAC upgrades, including some mobile homespecific measures like "belly board" (i.e., subfloor) insulation. Customers will also receive energy literacy education and certain health and safety measures, such as carbon monoxide (CO) and smoke detectors and fire extinguishers. In addition, AIC and its partners are actively recruiting and training Program Allies to work on mobile home projects, as well as developing partnerships with CAAs and community-based organizations (CBOs) for channel delivery and community engagement.

## Summary of Key Implementation Changes in 2022

The key changes to channel design and implementation in 2022 are given below:

- Contractual delays caused the channel to launch mid-year, which presented challenges in terms of achieving original participation goals.
- AIC and the implementation team made several changes to HVAC measure delivery, based on lessons learned on the ground, related to the specifics of mobile home construction. First, while originally the channel was only offering furnace upgrades, AIC decided to also allow replacement of air conditioners when replacing furnaces. This was due to concerns that the furnace work could create potential air conditioner operation issues. For example, many of the air conditioners were old or poorly maintained, which could lead to issues like broken coils or coolant leakage. Second, AIC approved installation of 14 SEER units in cases where space constraints did not allow for the typical 16 SEER or higher units the IQ Initiative provides through other channels.
- Staffing challenges led the implementation team to make changes to the roles of Program Allies and partners mid-year. These included changing the Program Ally responsible for air sealing work and passing responsibility for in-home assessments from CCRPC to Program Allies.

## **Participation Summary**

Table 48 summarizes MHAS channel participation in 2022. Overall, the MHAS channel provided energy efficiency services to a total of 115 customers in 2022.<sup>25</sup> Almost all these customers (97%) received building envelope and/or HVAC upgrades. A little over a third (38%) also received a Mobile Home Kit with various energy-saving products, such as LEDs and faucet aerators.<sup>26</sup> Three customers only received a kit, which suggests that they were in the middle of the participation process at the end of 2022 and will likely receive additional HVAC and building envelope retrofits in 2023.

Participation	Total
Number of customers served	115
Building envelope or HVAC measures only	71
Full Participation: kit + building envelope or HVAC measures	41
Kit only	3

Table 48.	2022	MHAS	Channel	Participation	Summary

Source: We determined unique homes based on electric or gas account numbers.

<sup>&</sup>lt;sup>25</sup> The customer counts exclude 20 customers with only "Other" measures (based on the "product family" field in the tracking data).
"Other" measures have no ex ante savings and include Homeowner Bonus, Authorized Measure, and Health and Safety.

<sup>&</sup>lt;sup>26</sup> The implementation team worked with customers to directly install as many kit measures as possible. However, due to data issues, AIC was unable to accurately track the installation status of specific measures. As such, AIC treated these measures as kits.

## **Savings Detail**

As shown in Table 49, the MHAS channel included 14 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
BPM Motor	Furnace Blower Motor	61	Motors	37	0.01	0
Mobile Home Kit - 9W LED	LED Screw Based Omnidirectional Bulbs	528	Bulbs	19	<0.01	0
Advanced Thermostat	Advanced Thermostats	54	Thermostats	13	0.01	3,342
Air Sealing	Air Sealing	42,494	CFM	11	0.01	3,284
Central Air Conditioner (TOS)	Central Air Conditioning	44	Systems	11	< 0.01	0
Bathroom Exhaust Fan	High Efficiency Bathroom Exhaust Fan	27	Fans	6	<0.01	0
Floor Insulation	Floor Insulation Above Crawl Space	12,860	12,860 Square Feet		<0.01	1,461
Mobile Home Kit - APS Tier 1	Advanced Power Strip – Tier 1	44	44 Power Strips		<0.01	0
Mobile Home Kit - Showerhead	Low Flow Showerheads	44	Showerheads	1	<0.01	246
Mobile Home Kit - Kitchen Aerator	Low Flow Faucet Aerators	44	Aerators	1	<0.01	190
Mobile Home Kit - Thermostatic Restrictor Valve	Thermostatic Restrictor Shower Valve	44	Valves	<1	<0.01	71
Mobile Home Kit - Bath Aerator	Low Flow Faucet Aerators	44	Aerators	<1	<0.01	40
Gas Furnace (ER)	Gas High Efficiency Furnace	62	Systems	0	0	20,794
Gas Furnace (TOS)	Gas High Efficiency Furnace	1	Systems	0	0	100
Total				108	0.04	29,529

Table 49. 2022 MHAS Channel Participation Summary by Measure

Table 50 through Table 52 present electric, demand, and gas impacts by measure.

Table 50. 2022 MHAS Channel Electric Energy Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
BPM Motor	37	83%	30	1.000	30
Mobile Home Kit - 9W LED	19	100%	19	1.000	19
Advanced Thermostat	13	106%	13	1.000	13
Air Sealing	11	107%	12	1.000	12
Central Air Conditioner (TOS)	11	100%	11	1.000	11
Bathroom Exhaust Fan	6	101%	6	1.000	6
Floor Insulation	4	99%	4	1.000	4
Mobile Home Kit - APS Tier 1	4	100%	4	1.000	4

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Mobile Home Kit - Showerhead	1	100%	1	1.000	1
Mobile Home Kit - Kitchen Aerator	1	100%	1	1.000	1
Mobile Home Kit - Thermostatic Restrictor Valve	<1	100%	<1	1.000	<1
Mobile Home Kit - Bath Aerator	<1	100%	<1	1.000	<1
Total	108	96%	103	1.000	103

# Evaluation Measure CategoryEx Ante Gross<br/>Savings<br/>(MW)Gross<br/>Realization<br/>RateVerified Gross<br/>Savings<br/>(MW)Verified Net<br/>Savings<br/>(MW)BPM Motor0.0140%0.011.0000.01Mobile Home Kit - 9W LED<0.01</td>100%<0.01</td>1.000<0.01</td>Advanced Thermostation0.010.010.010.010.01

Table 51. 2022 MHAS Channel Electric Demand Savings by Measure

Mobile Home Kit - Bath Aerator	<0.01	100%	<0.01	1.000	<0.01
Mobile Home Kit - Thermostatic Restrictor Valve	< 0.01	100%	< 0.01	1.000	< 0.01
Mobile Home Kit - Kitchen Aerator	< 0.01	100%	< 0.01	1.000	< 0.01
Mobile Home Kit - Showerhead	< 0.01	100%	<0.01	1.000	< 0.01
Mobile Home Kit - APS Tier 1	<0.01	100%	<0.01	1.000	<0.01
Floor Insulation	<0.01	98%	<0.01	1.000	<0.01
Bathroom Exhaust Fan	<0.01	101%	<0.01	1.000	<0.01
Central Air Conditioner (TOS)	<0.01	100%	<0.01	1.000	<0.01
Air Sealing	0.01	111%	0.01	1.000	0.01
Advanced Thermostat	0.01	117%	0.01	1.000	0.01
Mobile Home Kit - 9W LED	<0.01	100%	<0.01	1.000	<0.01
BPM Motor	0.01	40%	0.01	1.000	0.01

#### Table 52. 2022 MHAS Channel Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostat	3,342	96%	3,218	1.000	3,218
Air Sealing	3,284	99%	3,258	1.000	3,258
Floor Insulation	1,461	100%	1,461	1.000	1,461
Mobile Home Kit - Showerhead	246	100%	246	1.000	246
Mobile Home Kit - Kitchen Aerator	190	100%	190	1.000	190
Mobile Home Kit - Thermostatic Restrictor Valve	71	100%	71	1.000	71
Mobile Home Kit - Bath Aerator	40	100%	40	1.000	40
Gas Furnace (ER)	20,794	100%	20,834	1.000	20,834
Gas Furnace (TOS)	100	100%	100	1.000	100
Total	29,529	100%	29,418	1.000	29,418

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered close to 20 individual discrepancies in our final impact analysis. Some of these discrepancies affect measure categories that provide a relatively small proportion of Initiative savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to MHAS channel ex ante electric energy savings.

- BPM Motor (34% of ex ante energy savings and 36% of demand savings): The gross realization rate for BPM motors is 83% for electric energy and 40% for demand savings. This measure does not claim therm savings.
  - The evaluation team excluded savings from cooling for those customers who installed new central air conditioners in the verified analysis as the efficiency rating of the new cooling equipment accounts for the BPM motor electrical load. The implementation team included cooling savings in these cases. Excluding BPM motor cooling benefits resulted in lower verified electric energy and demand savings.
  - The evaluation team applied the cooling capacity specified in the tracking database in the verified analysis, whereas the implementation team applied a capacity from an unknown source. In total, this resulted in higher verified electric energy and demand savings.
  - The evaluation team applied assumptions from the IL-TRM V10.0 for "Existing CAC" for those with existing central cooling present (e.g., did not install a new air conditioner) in the verified analysis, whereas the implementation team applied the IL-TRM V10.0 assumption for "Furnace, No Cooling System." This resulted in higher verified electric energy and demand savings.
- Advanced Thermostat (12% of ex ante energy savings, 22% of demand savings, and 11% of therm savings): The gross realization rate for advanced thermostats is 106% for electric energy, 117% for demand, and 96% for therm savings.
  - The evaluation team applied the new cooling efficiency and capacity for those who installed new central air conditioners and did not improve weatherization (e.g., air sealing, insulation), whereas the implementation team applied existing cooling efficiency and capacity. In total, this resulted in higher verified electric energy and demand savings.
  - The evaluation team applied existing cooling capacity and derated existing efficiency using equipment age from the tracking database for those who installed new central air conditioners and improved weatherization (e.g., air sealing, insulation), whereas the implementation team applied efficiency values from an unknown source. This resulted in higher verified electric energy and demand savings.
  - The evaluation team applied the Household Factor (HF) for mobile homes (83%) from the IL-TRM V10.0 in the verified analysis, whereas the implementation team used the HF for single-family homes (100%). The mobile home HF is lower than the single-family value, resulting in lower verified electric energy and therm savings.
  - The evaluation team applied the cooling efficiency specified in the tracking database in the verified analysis, whereas the implementation team applied a cooling efficiency from an unknown source. In total, this resulted in higher verified electric energy and demand savings.
  - The evaluation team applied the default cooling capacity from the IL-TRM V10.0 for mobile homes in the verified analysis, whereas the implementation team used the cooling capacity for single-

family homes. The mobile home capacity from the IL-TRM V10.0 is lower than the single-family value, resulting in lower verified electric and demand savings.

- Air Sealing (10% of ex ante energy savings, 18% of demand savings, and 11% of therm savings): The gross realization rate for air sealing is 107% for electric energy, 111% for demand, and 99% for therm savings.
  - The evaluation team applied assumptions from the IL-TRM V10.0 for "air sealing without attic insulation" in the verified analysis, whereas the implementation team used assumptions for "air sealing with attic insulation." This resulted in lower verified electric energy, demand, and therm savings.
  - The evaluation team applied the existing cooling and heating efficiency from the tracking database in the verified analysis, whereas the implementation team used the IL-TRM V10.0 default efficiency. The existing cooling and heating efficiencies from the tracking database are lower than the IL-TRM V10.0 default efficiency, resulting in higher verified electric, demand, and therm savings.
  - The evaluation team applied values for N\_cool and N\_heat for the number of stories specified in the tracking database in the verified analysis, whereas the implementation team used values from the IL-TRM V10.0 for homes with 1.5 stories. This resulted in lower verified electric, demand, and therm savings.
  - The evaluation team derated existing heating and cooling efficiency using equipment age from the tracking database according to the IL-TRM V10.0 guidance in the verified analysis, whereas the implementation team did not derate. This resulted in increased verified electric energy, demand, and therm savings.
  - The evaluation team included therm savings only for participants who are AIC gas customers in the verified analysis, whereas the implementation team also calculated therm savings for those who are not AIC gas customers. This resulted in lower verified therm savings.

## 3.2.8 Joint Utility Channel

The IQ Initiative Joint Utility channel began as a pilot in 2020 and was scaled up to a full offering in 2021. It has similar design and implementation processes to the Single Family channel, but is a partnership between AIC and Nicor Gas to serve low and moderate-income customers in the shared utility territory of Bloomington-Normal. Measures are similar to the Single Family channel, with the exception that the AIC does not provide predominantly gas-saving measures, like furnaces; those are provided by Nicor Gas. AIC partners with Resource Innovations to implement this channel.

## **Summary of Key Implementation Changes in 2022**

The key changes to channel design and implementation are below:

- The channel began funding health and safety measures consisting of home repairs that were necessary prior to installation of measures offered by the Initiative. In conjunction with this, the implementation team partnered with Program Allies who specialize in health and safety work.
- AIC discontinued offering the Bloomington-Normal (BN) kits that the channel had provided during the pilot phase. AIC continued to offer direct install (DI) measures that are similar to the kit measures.

## **Participation Summary**

The Joint Utility channel provided energy efficiency services to 62 customers in 2022, as shown in Table 53. Most participants (95%) received HVAC and/or building envelope retrofits measures, while the remainder only received DI measures. More detail on the percentage of customers who received each type of measure is available in Appendix D.

Project Type	Number of Participants
Number of single family homes served	62
Full Participation: DI + Building envelope or HVAC retrofits	54
Building envelope or HVAC retrofits only	5
DI only	3

Table 53. 2022 Joint Utility Channel Participation Summa	Table 53. 2022	<b>Joint Utility Channel</b>	Participation Summary
--	----------------	------------------------------	-----------------------

Note: The total excludes one participant who only received an assessment.

## **Savings Detail**

As shown in Table 54, the Joint Utility channel included 19 categories of measures.

Table 54. 2022	2 Joint Utility Chanr	el Participation	n Summary b	by Measure
----------------	-----------------------	------------------	-------------	------------

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW
Central Air Conditioning (ER)	Central Air Conditioning	13	Systems	30	0.02
Standard LED	LED Screw Based Omnidirectional Bulbs	449	Bulbs	18	<0.01
BPM Motor	Furnace Blower Motor	32	Motors	17	<0.01
Advanced Thermostat	Advanced Thermostats	45	Thermostats	11	0.01
Decorative LED	LED Specialty Lamps	234	Bulbs	6	<0.01
Bathroom Exhaust Fan High Efficiency Bathroom Exhaust Fan		24	Fans	5	<0.01
Air Sealing	Air Sealing	13,446	CFM	5	<0.01
Heat Pump Water Heater	Heat Pump Water Heaters	2	Water Heaters	5	<0.01
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	47	Power Strips	5	<0.01
Attic Insulation	Ceiling/Attic Insulation	24,026	Square Feet	5	<0.01
Directional LED	LED Specialty Lamps	40	Bulbs	2	<0.01
Exterior Standard LED	LED Screw Based Omnidirectional Bulbs	6	Bulbs	1	<0.01
Exterior Decorative LED	LED Specialty Lamps	8	Bulbs	1	<0.01
Showerhead	Low Flow Showerheads	17	Showerheads	1	<0.01
Pipe Insulation	Domestic Hot Water Pipe Insulation	9	Linear Feet	<1	<0.01
Rim Joist Insulation	Rim/Band Joist Insulation	1,686	Linear Feet	<1	<0.01
Bathroom Faucet Aerator	Low Flow Faucet Aerators	17	Aerators	<1	<0.01
Wall Insulation	Wall Insulation	367	Square Feet	<1	< 0.01

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW
Kitchen Faucet Aerator	Low Flow Faucet Aerators	4	Aerators	<1	0
Total		40,472		112	0.04

Table 55 and Table 56 present energy and demand impacts by measure. AIC does not claim gas savings for Joint Utility channel projects.

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Central Air Conditioning (ER)	30	100%	30	1.000	30
Standard LED	18	100%	18	1.000	18
BPM Motor	17	96%	16	1.000	16
Advanced Thermostat	11	89%	10	1.000	10
Decorative LED	6	100%	6	1.000	6
Bathroom Exhaust Fan	5	93%	5	1.000	5
Air Sealing	5	95%	5	1.000	5
Heat Pump Water Heater	5	99%	5	1.000	5
Advanced Power Strip - Tier 1	5	100%	5	1.000	5
Attic Insulation	5	102%	5	1.000	5
Directional LED	2	70%	1	1.000	1
Exterior Standard LED	1	100%	1	1.000	1
Exterior Decorative LED	1	100%	1	1.000	1
Showerhead	1	100%	1	1.000	1
Pipe Insulation	<1	100%	<1	1.000	<1
Rim Joist Insulation	<1	101%	<1	1.000	<1
Bathroom Faucet Aerator	<1	100%	<1	1.000	<1
Wall Insulation	<1	100%	<1	1.000	<1
Kitchen Faucet Aerator	<1	100%	<1	1.000	<1
Total	112	97%	109	1.000	109

Table 55. 2022 Joint Utility Channel Electric Energy Savings by Measure

Table 56. 2022 Joint Utility Channel Electric Demand Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Central Air Conditioning (ER)	0.02	100%	0.02	1.000	0.02
Standard LED	<0.01	100%	<0.01	1.000	<0.01
BPM Motor	<0.01	175%	<0.01	1.000	<0.01
Advanced Thermostat	0.01	98%	0.01	1.000	0.01

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Decorative LED	<0.01	100%	<0.01	1.000	<0.01
Bathroom Exhaust Fan	<0.01	94%	<0.01	1.000	<0.01
Air Sealing	<0.01	94%	<0.01	1.000	<0.01
Heat Pump Water Heater	<0.01	99%	<0.01	1.000	<0.01
Advanced Power Strip - Tier 1	< 0.01	100%	<0.01	1.000	<0.01
Attic Insulation	< 0.01	141%	<0.01	1.000	<0.01
Directional LED	<0.01	85%	<0.01	1.000	<0.01
Exterior Standard LED	<0.01	100%	<0.01	1.000	<0.01
Exterior Decorative LED	<0.01	100%	<0.01	1.000	<0.01
Showerhead	<0.01	100%	<0.01	1.000	<0.01
Pipe Insulation	< 0.01	100%	<0.01	1.000	<0.01
Rim Joist Insulation	<0.01	101%	<0.01	1.000	<0.01
Bathroom Faucet Aerator	<0.01	88%	<0.01	1.000	<0.01
Wall Insulation	<0.01	100%	<0.01	1.000	<0.01
Total	0.04	106%	0.05	1.000	0.05

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 25 individual discrepancies in our final impact analysis. Many of these discrepancies affect measure categories that provide a relatively small proportion of channel savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to Joint Utility channel ex ante electric energy savings.

- BPM Motor (15% of ex ante energy savings and 7% of demand savings): The gross realization rate for BPM Motor is 96% for energy and 175% for demand savings.
  - The evaluation team performed savings calculations using the input values in the tracking database, whereas the implementation team made a possible error where the kW savings value was erroneously copied down for these values. This resulted in higher verified demand savings.
  - In seven cases, the evaluation team did not claim savings for cooling since a new CAC was installed and those savings already account for the ECM benefits; whereas the implementation team claimed savings for cooling. This resulted in lower verified energy and demand savings.
- Advanced Thermostat (10% of ex ante energy savings and 15% of demand savings): The gross realization rate for Advanced Thermostat is 89% for energy and 98% for demand savings.
  - The evaluation team derated existing SEER based on the equipment age shown in the tracking data, whereas the implementation team did not derate. This resulted in higher verified energy savings.
  - In 13 cases, the evaluation team applied the newly installed CAC SEER value, whereas the implementation team applied the existing CAC SEER value. This resulted in lower verified energy and demand savings.

- **Bathroom Exhaust Fan (5% of ex ante energy savings and 1% of demand savings):** The gross realization rate for Bathroom Exhaust Fan is 93% for energy and 94% for demand savings.
  - The evaluation team calculated energy savings according to information in the tracking database, whereas the implementation team used a deemed savings value from the IL-TRM V10.0, resulting in higher verified energy and demand savings.
  - In two cases, the evaluation team calculated energy savings for a standard fan because the project did not include air sealing, whereas the implementation team applied the deemed savings value for a continuous fan specified in the IL-TRM V10.0. This resulted in decreased electric energy and electric demand savings.
- Air Sealing (5% of ex ante energy savings and 9% of demand savings): The gross realization rate for Air Sealing is 95% for energy and 94% for demand savings.
  - The evaluation team applied an N\_cool value corresponding to the stories specified in the tracking database or if unknown assumed a 1-story building, which is the conservative assumption from the IL-TRM V10.0; whereas the implementation team applied an N\_cool value corresponding to a 1.5 story building in all cases. This resulted in lower verified energy and demand savings.
  - The evaluation team calculated savings using an IE\_Net\_Correction value of 110%, which is the IL-TRM V10.0 specification for properties that have attic insulation; whereas the implementation team used a value of 100%, which is the specification for properties without attic insulation. This resulted in higher verified energy and/or demand savings.
- Attic Insulation (4% of ex ante energy savings and 5% of demand savings): The gross realization rate for Attic Insulation is 102% for electric energy and 141% for demand savings.
  - The evaluation team performed savings calculations using the input values in the tracking database, whereas the implementation team made a possible error where the kW savings value was erroneously copied down for these values. This resulted in higher verified demand savings.
### 3.2.9 Cumulative Persisting Annual Savings

Table 57 presents CPAS and WAML for the 2022 Income Qualified Initiative - Single Family Offerings. The measure-specific and total verified gross savings for the Initiative are summarized by channel, and CPAS in 2022–2025 and 2030 are presented.<sup>27</sup> The WAML for the Initiative is 13.2 years. CPAS and WAML for each channel or offering at a measure level are summarized in Table 58 through Table 64.

In 2022, AIC converted some natural gas savings produced by select Single Family channel - Core measures and all Smart Savers channel measures to CPAS for the purposes of goal attainment; those savings are presented separately in Table 65 and Table 66.

		First-Year Verified		(	CPAS - Ve	erified Ne	t Savings	5 (M	Wh)	Lifetime
Channel/Offering	WAML	Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Single Family - Core	15.6	2,133	1.000	2,133	2,133	2,133	2,133		1,661	 29,834
Single Family - SAVE Kits	10.3	1,615	1.000	1,615	1,615	1,615	1,615		1,013	 15,955
Healthier Homes	10.3	1	1.000	1	1	1	1		0.5	 6
CAA	16.0	889	1.000	889	889	889	889		804	 13,305
Smart Savers	11.0	1,209	1.000	1,209	1,209	1,209	1,209		1,209	 13,294
MHAS	11.7	103	1.000	103	103	103	103		65	 1,165
Joint Utility	13.1	109	1.000	109	109	109	109		56	 1,081
2022 CPAS		6,057	1.000	6,057	6,057	6,057	6,057		4,808	 74,611
Expiring 2022 CPAS				0	0	0	0		6	
Expired 2022 CPAS				0	0	0	0		1,249	
WAML	13.2									

Table 57. 2022 Income Qualified Initiative Single Family Offerings CPAS and WAML by Channel

<sup>&</sup>lt;sup>27</sup> For further detail, including achieved CPAS in years not presented in this table, please see Appendix D.

	Measure First-Year Verified Gross NTGR			CPAS – Verified Net Savings (MWh)							Lifetime	
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)	
Air Source Heat Pump - Replaces Electric Resistance (ER)	16.0	328	1.000	328	328	328	328		328		5,249	
Air Sealing	20.0	332	1.000	332	332	332	332		332		5,860	
Attic Insulation	20.0	227	1.000	227	227	227	227		227		4,062	
BPM Motor	6.0	210	1.000	210	210	210	210		0		1,261	
Central Air Conditioning (ER)	18.0	219	1.000	219	219	219	219		48		1,896	
Advanced Thermostat	11.0	164	1.000	164	164	164	164		164		1,802	
Bathroom Exhaust Fan	19.0	156	1.000	156	156	156	156		156		2,963	
Standard LED	10.0	133	1.000	133	133	133	133		108		1,256	
Crawl Space Insulation	20.0	85	1.000	85	85	85	85		85		1,555	
Heat Pump Water Heater	15.0	61	1.000	61	61	61	61		61		1,215	
Decorative LED	10.0	46	1.000	46	46	46	46		31		417	
Wall Insulation	20.0	42	1.000	42	42	42	42		42		738	
Advanced Power Strip - Tier 1	7.0	36	1.000	36	36	36	36		0		253	
Duct Sealing	20.0	17	1.000	17	17	17	17		17		313	
Rim Joist Insulation	20.0	14	1.000	14	14	14	14		14		263	
Directional LED	10.0	11	1.000	11	11	11	11		8		100	
Ductless Heat Pump (ER)	15.0	9	1.000	9	9	9	9		8		124	
Room Air Conditioner (ER)	12.0	7	1.000	7	7	7	7		7		85	
Exterior Standard LED	8.0	7	1.000	7	7	7	7		0		55	
Air Source Heat Pump (TOS)	16.0	6	1.000	6	6	6	6		6		89	
Pipe Insulation	15.0	5	1.000	5	5	5	5		5		79	
Showerhead	10.0	4	1.000	4	4	4	4		4		45	
Ductless Heat Pump (TOS)	15.0	4	1.000	4	4	4	4		4		66	
Air Source Heat Pump - Replaces HP (ER)	16.0	4	1.000	4	4	4	4		1		28	
Kitchen Faucet Aerator	10.0	3	1.000	3	3	3	3		3		30	
Exterior Directional LED	10.0	1	1.000	1	1	1	1		1		11	

### Table 58. 2022 Single Family Channel – Core CPAS and WAML

	Measure	First-Year		C	PAS – Ve	erified Ne	et Saving	gs (I	MWh)	Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Central Air Conditioning (TOS)	18.0	1	1.000	1	1	1	1		1	 10
Bathroom Faucet Aerator	10.0	0.4	1.000	0.4	0.4	0.4	0.4		0.4	 4
Exterior Decorative LED	6.9	0.4	1.000	0.4	0.4	0.4	0.4		0	 3
Restrictor Shower Valve	10.0	0.1	1.000	0.1	0.1	0.1	0.1		0.1	 1
2022 CPAS		2,133	1.000	2,133	2,133	2,133	2,133		1,661	 29,834
Expiring 2022 CPAS				0	0	0	0		6	
Expired 2022 CPAS				0	0	0	0		472	
WAML	15.6									

### Table 59. 2022 Single Family Channel – SAVE Kits CPAS and WAML

	Measure First-Year CPA		CPAS – Verified Net Savings (MWh)							Lifetime	
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)
Unverified SAVE Kit - 9W LED	10	438	1.000	438	438	438	438		354		4,126
Unverified SAVE Kit - APS Tier 1	7	375	1.000	375	375	375	375		0		2,626
Unverified SAVE Kit - 6W LED	10	256	1.000	256	256	256	256		171		2,302
Unverified SAVE Kit - 8W LED	10	214	1.000	214	214	214	214		156		1,968
Unverified SAVE Kit - Door Sweep	20	63	1.000	63	63	63	63		63		1,263
Unverified SAVE Kit - Showerhead, 1.5 gpm	10	61	1.000	61	61	61	61		61		612
Unverified SAVE Kit - Outlet Gasket	20	58	1.000	58	58	58	58		58		1,159
Unverified SAVE Kit - 3/4" Pipe Insulation	15	56	1.000	56	56	56	56		56		843
Unverified SAVE Kit - Kitchen Aerator, 1.5 gpm	10	50	1.000	50	50	50	50		50		496
Unverified SAVE Kit - 1/2" Pipe Insulation	15	22	1.000	22	22	22	22		22		337
Unverified SAVE Kit - Shower TSV	10	12	1.000	12	12	12	12		12		119
Unverified SAVE Kit - Bath Aerator, 1.0 gpm	10	6	1.000	6	6	6	6		6		64
Verified SAVE Kit - Advanced Power Strip - Tier 1	7	1	1.000	1	1	1	1		0		4
Verified SAVE Kit - Pipe Insulation	15	0.5	1.000	0.5	0.5	0.5	0.5		0.5		7

	Measure First-Year CPAS		CPAS – V	Lifetime					
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025	 2030	 Savings (MWh)
Verified SAVE Kit - Standard LED	10	0.5	1.000	0.5	0.5	0.5	0.5	 0.4	 5
Verified SAVE Kit - Door Sweep	20	0.3	1.000	0.3	0.3	0.3	0.3	 0.3	 6
Verified SAVE Kit - Faucet Aerator	10	0.4	1.000	0.4	0.4	0.4	0.4	 0.4	 4
Verified SAVE Kit - Showerhead	10	0.4	1.000	0.4	0.4	0.4	0.4	 0.4	 4
Verified SAVE Kit - Outlet Gasket	20	0.2	1.000	0.2	0.2	0.2	0.2	 0.2	 4
Verified SAVE Kit - Decorative LED	10	0.3	1.000	0.3	0.3	0.3	0.3	 0.3	 3
Verified SAVE Kit - Directional LED	10	0.2	1.000	0.2	0.2	0.2	0.2	 0.2	 2
Verified SAVE Kit - Restrictor Shower Valve	10	0.1	1.000	0.1	0.1	0.1	0.1	 0.1	 1
2022 CPAS		1,615	1.000	1,615	1,615	1,615	1,615	 1,013	 15,955
Expiring 2022 CPAS				0	0	0	0	 0	
Expired 2022 CPAS				0	0	0	0	 601	
WAML	10.3								

### Table 60. 2022 Healthier Homes Channel CPAS and WAML

	Measure	ure First-Year			CPAS – V	/erified N	et Savin	gs (N	/IWh)	Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Standard LED	10.0	0.4	1.000	0.4	0.4	0.4	0.4		0.3	 4
Dehumidifier	12.0	0.1	1.000	0.1	0.1	0.1	0.1		0.1	 1
Air Purifier	9.0	0.05	1.000	0.05	0.05	0.05	0.05		0.05	 0.5
2022 CPAS		1	1.000	1	1	1	1		0	 6
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS				0	0	0	0		0	
WAML	10.3									

#### **CPAS** – Verified Net Savings (MWh) Lifetime First-Year Measure **Verified Gross** NTGR Savings Measure Life 2022 2025 ... 2023 2024 2030 Savings (MWh) (MWh) 229 Air Sealing 20.0 229 1.000 229 229 229 229 4,082 ... .... 10.0 178 1.000 178 178 178 178 144 1.679 Standard LED ... ... 20.0 108 1.000 108 108 108 108 108 1,958 Attic Insulation ... ... Bathroom Exhaust Fan 19.0 56 1.000 56 56 56 56 56 1,069 ... ... Air Source Heat Pump - Replaces Electric Resistance 1.000 55 16.0 55 55 55 55 | ... 55 877 ... (ER) 47 **BPM Motor** 6.0 47 1.000 47 47 47 0 284 ... ... 20.0 38 1.000 38 38 38 38 38 707 **Crawl Space Insulation** ... ... 15.0 37 1.000 37 37 37 37 37 554 **Pipe Insulation** ... ... 20.0 Floor Insulation 33 1.000 33 33 33 33 33 649 ... ... Heat Pump Water Heater 15.0 23 1.000 23 23 23 23 23 342 .... ... 1.000 20 20 20 20 20 205 Showerhead 10.0 20 ... ... Wall Insulation 20.0 18 1.000 18 18 18 18 18 333 ... ... 12 12 12 15.0 12 1.000 12 12 186 Ductless Heat Pump (TOS) ... ... 8 8 8 8 8 6 75 Decorative LED 10.0 1.000 ... ... 7 7 7 1.000 7 7 7 75 Advanced Thermostat 11.0 ... ... 6 1.000 6 6 6 6 6 57 **Bathroom Faucet Aerator** 10.0 ... .... **Rim Joist Insulation** 20.0 5 1.000 5 5 5 5 5 89 ... ... 3 3 3 Air Source Heat Pump (TOS) 16.0 3 1.000 3 3 47 ... ... 3 3 3 3 Room Air Conditioner (ER) 12.0 3 1.000 1 18 ... ... 2 2 2 17 2 1.000 2 2 **Kitchen Faucet Aerator** 10.0 ... ... 889 .... 2022 CPAS 889 1.000 889 889 889 804 13,305 ... Expiring 2022 CPAS 0 0 0 0 .... 0 ... 0 0 Expired 2022 CPAS 0 0 .... 85 ... WAML 16.0

#### Table 61. 2022 CAA Channel CPAS and WAML

#### Table 62. 2022 Smart Savers Channel CPAS and WAML

	Measure First-Year			CPAS – Verified Net Savings (MWh)							Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)
Advanced Thermostat - Single Family Self-Install	11.0	1,047	1.000	1,047	1,047	1,047	1,047		1,047		11,522
Advanced Thermostat - Single Family Direct Install	11.0	154	1.000	154	154	154	154		154		1,698
Advanced Thermostat - Multifamily Direct Install	11.0	7	1.000	7	7	7	7		7		74
2022 CPAS		1,209	1.000	1,209	1,209	1,209	1,209		1,209		13,294
Expiring 2022 CPAS				0	0	0	0		0		
Expired 2022 CPAS				0	0	0	0		0		
WAML	11.0										

#### Table 63. 2022 MHAS Channel CPAS and WAML

	Measure First-Year C	Lifetime							
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025	 2030	 Savings (MWh)
BPM Motor	6	30	1.000	30	30	30	30	 0	 183
Mobile Home Kit - 9W LED	10	19	1.000	19	19	19	19	 16	 181
Advanced Thermostat	11	13	1.000	13	13	13	13	 13	 146
Air Sealing	20	12	1.000	12	12	12	12	 12	 206
Central Air Conditioner (TOS)	18	11	1.000	11	11	11	11	 11	 198
Bathroom Exhaust Fan	19	6	1.000	6	6	6	6	 6	 112
Floor Insulation	20	4	1.000	4	4	4	4	 4	 78
Mobile Home Kit - APS Tier 1	7	4	1.000	4	4	4	4	 0	 29
Mobile Home Kit - Showerhead	10	1	1.000	1	1	1	1	 1	 14
Mobile Home Kit - Kitchen Aerator	10	1	1.000	1	1	1	1	 1	 12
Mobile Home Kit - Thermostatic Restrictor Valve	10	0.4	1.000	0.4	0.4	0.4	0.4	 0.4	 4

	Measure	First-Year			CPAS – V	erified N	et Saving	gs (N	/IWh)	Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Mobile Home Kit - Bath Aerator	10	0.3	1.000	0.3	0.3	0.3	0.3		0.3	 3
2022 CPAS		103	1.000	103	103	103	103		65	 1,165
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS				0	0	0	0		38	
WAML	11.7									-

### Table 64. 2022 Joint Utility Channel CPAS and WAML

	Measure	ure First-Year Verified Gross NTGR	CPAS – Verified Net Savings (MWh)							Lifetime	
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030		Savings (MWh)
Central Air Conditioning (ER)	18.0	30	1.000	30	30	30	30		5		244
Standard LED	10.0	18	1.000	18	18	18	18		14		168
BPM Motor	6.0	16	1.000	16	16	16	16		0		97
Advanced Thermostat	11.0	10	1.000	10	10	10	10		10		108
Decorative LED	10.0	6	1.000	6	6	6	6		4		56
Bathroom Exhaust Fan	19.0	5	1.000	5	5	5	5		5		92
Air Sealing	20.0	5	1.000	5	5	5	5		5		82
Heat Pump Water Heater	15.0	5	1.000	5	5	5	5		5		74
Advanced Power Strip - Tier 1	7.0	5	1.000	5	5	5	5		0		34
Attic Insulation	20.0	5	1.000	5	5	5	5		5		82
Directional LED	10.0	1	1.000	1	1	1	1		1		14
Exterior Standard LED	8.0	1	1.000	1	1	1	1		0		5
Exterior Decorative LED	6.9	1	1.000	1	1	1	1		0		4
Showerhead	10.0	1	1.000	1	1	1	1		1		6
Pipe Insulation	15.0	0.4	1.000	0.4	0.4	0.4	0.4		0.4		6
Rim Joist Insulation	20.0	0.2	1.000	0.2	0.2	0.2	0.2		0.2		4
Bathroom Faucet Aerator	10.0	0.1	1.000	0.1	0.1	0.1	0.1		0.1		1

	Measure	re First-Year		(	CPAS – V	erified N	et Saving	gs (N	/IWh)	Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Wall Insulation	20.0	0.1	1.000	0.1	0.1	0.1	0.1		0.1	 2
Kitchen Faucet Aerator	10.0	0.04	1.000	0.04	0.04	0.04	0.04		0.04	 0.4
2022 CPAS		109	1.000	109	109	109	109		56	 1,081
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS				0	0	0	0		52	
WAML	13.1									-

### Table 65. 2022 Single Family Channel - Core (Gas Conversion) CPAS and WAML

	Measure	First-Year			CPAS – Ve	erified Net S	avings (MW	h)		Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Advanced Thermostats	11.0	956	1.000	956	956	956	956		956	 10,520
Gas High Efficiency Boiler (ER)	25.0	334	1.000	334	334	334	334		53	 3,564
Gas High Efficiency Boiler (TOS)	25.0	15	1.000	15	15	15	15		15	 386
Gas High Efficiency Furnace (ER)	20.0	3,593	1.000	3,593	3,593	3,593	3,593		1,112	 37,132
Gas High Efficiency Furnace (TOS)	20.0	443	1.000	443	443	443	443		443	 8,867
2022 CPAS		5,342	1.000	5,342	5,342	5,342	5,342		2,580	 60,470
Expiring 2022 CPAS				0	0	0	0		281	
Expired 2022 CPAS				0	0	0	0		2,762	
WAML	18.7									

	Measure	First-Year		CPAS – Verified Net Savings (MWh)					Lifetime	
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Advanced Thermostat - Single Family Self-Install	11.0	3,050	1.000	3,050	3,050	3,050	3,050		3,050	 33,550
Advanced Thermostat - Single Family Direct Install	11.0	834	1.000	834	834	834	834		834	 9,171
Advanced Thermostat - Multifamily Direct Install	11.0	73	1.000	73	73	73	73		73	 805
2022 CPAS		3,957	1.000	3,957	3,957	3,957	3,957		3,957	 43,526
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS			<u> </u>	0	0	0	0		0	
WAML	11.0									-

### Table 66. 2022 Smart Savers Channel (Gas Conversion) CPAS and WAML

### **3.2.10** Conclusions and Recommendations

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the IQ Initiative moving forward:

### Single Family Channel – Core

- Key Finding #1: For gas water heater measures, there was no information in the tracking database indicating whether the replacement was TOS or ER. The evaluation team assumed early replacement in these cases.
  - Recommendation: Include a field in the tracking database or update the measure name to indicate whether gas water heater measures are TOS or ER.

#### Single Family Channel - SAVE Kits

Based on the results of this evaluation, and that SAVE Kits are discontinued in 2023, the evaluation team does not offer any additional recommendations.

#### **Healthier Homes Channel**

Based on the results of this evaluation, the evaluation team offers no additional findings and recommendations for the Healthier Homes channel.

#### CAA Channel

Based on the results of this evaluation, the evaluation team offers no additional findings and recommendations for the CAA channel.

#### **Smart Savers Channel**

Based on the results of this evaluation, the evaluation team does not offer any additional recommendations for the Smart Savers channel.

#### **MHAS Channel**

- Key Finding #1: The tracking database includes a mobile home flag that identifies whether the home type is a mobile home. All participants in the MHAS channel are mobile homes. However, only 113 out of 188 participants are identified in the tracking database as mobile homes.
  - Recommendation: Ensure the mobile home flag accurately reflects home type, which should be mobile home in all cases for the MHAS Channel.
- Key Finding #2: In some cases, across various measures that require heating and cooling efficiency and capacity (e.g., BPM motors, advanced thermostats, air sealing, floor insulation), the implementation team applied a different value than what is provided in the tracking database.
  - Recommendation: Ensure the heating and cooling efficiency and capacity in the tracking database is consistent with those used to calculate ex ante savings.
- Key Finding #3: When mobile homes receive both advanced thermostats and central air conditioner upgrades, the IL-TRM V10.0 specifies different cooling efficiency and capacity assumptions to use based on whether weatherization upgrades (e.g., air sealing, insulation) also occurred in the home.

The implementation team did not appropriately apply these assumptions when developing ex ante savings.

- Recommendation: Apply new efficiency and capacity for cases where mobile homes receive weatherization measures and install a new central air conditioner.
- Recommendation: Apply existing efficiency and capacity for cases where mobile homes do not receive weatherization measures and install a new central air conditioner.
- Key Finding #4: The MHAS channel delivered a number of measures to customers and worked with program staff to direct install as many of these measures as possible. However, program data tracking issues prevented AIC from having a clear picture of the installation status of these measures, and therefore the measures were treated as kit measures in 2022. Implementation calculations used a range of ISRs for these measures that were not always well aligned with this delivery mode.
  - Recommendation: Where possible, work to better track the installation status of delivered measures so that measures can be more appropriately characterized.
  - Recommendation: If measures must be treated with unknown installation statuses, select conservative ISRs to minimize evaluation risk.
- Key Finding #5: In late 2022, the evaluation team identified a situation that occurred in the MHAS channel that we believe is not currently characterized accurately in the IL-TRM V10.0. This situation relates to baseline definitions for certain types of heat pumps and central air conditioners, defined as "space constrained products" in federal standards.<sup>28</sup> Federal standards prescribe different minimum standard baselines for these products for SEER, SEER2, HSPF, and HSPF2. The current IL-TRM includes baselines derived from the standard minimum standard baseline only and does not offer a separate characterization for space constrained products. In this evaluation, as described in Section 2.2.2 and Appendix A, we deviated from the IL-TRM V10.0 characterization to more appropriately represent these systems.
  - Recommendation: Update the IL-TRM characterization of HVAC systems to appropriately represent this definition. The evaluation team will work with the Illinois TRM Administrator and the Illinois Technical Advisory Committee to update these characterizations in the forthcoming IL-TRM V12.0, which will be used in 2024, and to define these changes as errata to the IL-TRM V11.0, which will be applied in 2023.

#### Joint Utility Channel

Based on the results of this evaluation, we offer no additional findings and recommendations for the Joint Utility Channel.

<sup>&</sup>lt;sup>28</sup> 10 CFR 430.2 "Space constrained product"

https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430#p-430.2(Space%20constrained%20product)

# 3.3 Multifamily Initiatives

In this chapter, we present the results of the impact evaluation of the 2022 Multifamily Initiatives. The results are broken out by the three distinct components of the Initiatives: the Multifamily channel of the Income Qualified (IQ) Initiative (henceforth IQ Multifamily channel), the Market Rate Multifamily Initiative, and the Public Housing Initiative.

### 3.3.1 Multifamily Initiatives Annual Savings Summary

Table 67 presents Multifamily Initiatives annual savings achieved in 2022. Across the three components, the 2022 Multifamily Initiatives achieved a total of 7,144 MWh, 1.08 MW, and 74,834 therms in verified net savings. The IQ Multifamily channel was by far the largest contributor, providing 70% of net MWh savings and 86% of net therms savings.

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	7,337	1.01	75,595
Gross Realization Rate	100%	111%	99%
Verified Gross Savings	7,342	1.12	75,187
NTGR	0.973	0.962	0.995
Verified Net Savings	7,144	1.08	74,834

#### Table 67. 2022 Multifamily Initiatives Annual Savings

### 3.3.2 Initiative Description

The Multifamily Initiatives provide multifamily property owners and managers with comprehensive property assessments, health and safety evaluations, in-unit and common area direct install measures, and weatherization and HVAC retrofits. The Initiatives are available for subsidized or low-income housing; non-subsidized, or "market-rate", multifamily and mixed-use buildings; and publicly-owned housing serving low-income customers. Properties must have three or more units to be considered multifamily in the Initiatives. The Initiatives are primarily implemented by CMC Energy Services (CMC) as a subcontractor to Leidos.

This chapter focuses specifically on the measures provided through the Multifamily Initiatives. However, in 2020, AIC transitioned the delivery of the Multifamily Initiatives to a "one-stop shop" (OSS) model. The OSS model is intended to streamline the participation experience by seamlessly connecting offerings available to multifamily properties across the Multifamily Initiatives and other Residential and Business Program offerings. In cases where participants choose to pursue additional upgrades beyond the offerings available through the Multifamily Initiatives, the EA continues to serve as the single point of contact, helping the participant navigate an expanded project scope. This delivery model creates an opportunity for multifamily property owners and managers to develop a trusted, longer-term relationship with their EA, allowing AIC to continuously serve their energy efficiency needs.

### Summary of Key Implementation Changes in 2022

The key changes to Initiatives design and implementation are below:

Ductless heat pumps, which were offered as a pilot in 2021, were fully rolled out as a Multifamily Initiatives measure in 2022 for units with electric heating. Additionally, air source heat pumps were added in 2022. AIC and implementation team staff note increased participation in 2022, especially for the Public Housing Channel, which had been dealing with a backlog of maintenance issues since the pandemic. To handle increased demand, CMC added an additional EA to its staff.

### 3.3.3 Participation Summary

Table 68 through Table 70 summarize participation in the Multifamily Initiatives by channel and initiative. Across the three components, the Multifamily Initiatives completed 251 projects and served over 5,000 tenants.

Participation	Count
Unique Projects	182
Unique Tenant Units	3,860
Measure Count	82,941

Table 68. 2022 IQ Multifamily Channel Participation Summary

Table 69. 2022 Market Rate Multifamily Initiative Participation Summary

Participation	Count
Unique Projects	39
Unique Tenant Units	849
Measure Count	10,069

 Table 70. 2022 Public Housing Initiative Participation Summary

Participation	Count
Unique Projects	30
Unique Tenant Units	578
Measure Count	4,665

### 3.3.4 Income Qualified Multifamily Channel Savings Detail

As shown in Table 71, the IQ Multifamily channel included 21 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Ductless Heat Pump (ER)	Ductless Heat Pumps	255	Systems	1,357	0.16	0
Air Source Heat Pump	Air Source Heat Pump	131	Systems	963	0.04	0
Standard LED	LED Screw Based Omnidirectional Bulbs	33,225	Bulbs	900	0.15	0
Advanced Thermostat	Advanced Thermostats	1,153	Thermostats	542	0.13	28,785
Decorative LED	LED Specialty Lamps	14,242	Bulbs	325	0.06	0
Standard LED (Common Area)	LED Bulbs and Fixtures	1,104	Bulbs	220	0.03	0
Showerhead	Low Flow Showerheads	2,431	Showerheads	190	0.02	21,353
Kitchen Faucet Aerator	Low Flow Faucet Aerators	1,805	Aerators	162	0.04	8,124

Table 71. 2022 IQ Multifamily Channel Participation Summary by Measure

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	2,405	Power Strips	99	0.01	0
Directional LED	LED Specialty Lamps	1,952	Bulbs	69	0.01	0
Wall Plate Gasket	Air Sealing	9,093	Gaskets	57	0.00	639
Door Sweep	Air Sealing	482	Door Sweeps	50	0.00	249
Bathroom Faucet Aerator	Low Flow Faucet Aerators	1,651	Aerators	37	0.03	1,311
Pipe Insulation	Domestic Hot Water Pipe Insulation	923	Linear Feet	36	0.004	414
Restrictor Shower Valve	Thermostatic Restrictor Shower Valve	1,889	Valves	30	0.002	4,039
Directional LED (Common Area)	LED Specialty Lamps	104	Bulbs	26	0.004	0
Attic Insulation	Ceiling/Attic Insulation	6,264	Square Feet	3	0.0004	128
Air Sealing	Air Sealing	3,466	CFM Reduced	3	0.001	43
Decorative LED (Common Area)	LED Specialty Lamps	6	Bulbs	1	0.0002	0
Rim Joist Insulation	Rim/Band Joist Insulation	180	Square Feet	0	0.00	13
Crawl Space Insulation	Basement Sidewall Insulation	180	Square Feet	0	0.00	129
Total		82,941		5,071	0.69	65,226

Table 72 through Table 74 present electric, demand, and gas impacts by measure.

Table 72. 2022 IQ Multifamily Channe	I Electric Energy Savings by Measure
--------------------------------------	--------------------------------------

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Ductless Heat Pump (ER)	1,357	100%	1,358	1.000	1,358
Air Source Heat Pump	963	100%	963	1.000	963
Standard LED	900	100%	900	1.000	900
Advanced Thermostat	542	100%	543	1.000	543
Decorative LED	325	100%	325	1.000	325
Standard LED (Common Area)	220	100%	220	1.000	220
Showerhead	190	100%	190	1.000	190
Kitchen Faucet Aerator	162	100%	162	1.000	162
Advanced Power Strip - Tier 1	99	100%	99	1.000	99
Directional LED	69	100%	69	1.000	69
Wall Plate Gasket	57	103%	58	1.000	58
Door Sweep	50	101%	50	1.000	50
Bathroom Faucet Aerator	37	100%	37	1.000	37
Pipe Insulation	36	100%	36	1.000	36
Restrictor Shower Valve	30	100%	30	1.000	30

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Directional LED (Common Area)	26	100%	26	1.000	26
Attic Insulation	3	103%	4	1.000	4
Air Sealing	3	101%	3	1.000	3
Decorative LED (Common Area)	1	100%	1	1.000	1
Total	5,071	100%	5,074	1.000	5,074

#### Table 73. 2022 IQ Multifamily Channel Electric Demand Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Ductless Heat Pump (ER)	0.16	103%	0.17	1.000	0.17
Air Source Heat Pump	0.04 0.04	107%	0.04	1.000	0.04
Standard LED	0.15	100%	0.15	1.000	0.15
Advanced Thermostat	0.13	133%	0.17	1.000	0.17
Decorative LED	0.06	100%	0.06	1.000	0.06
Standard LED (Common Area)	0.03	100%	0.03	1.000	0.03
Showerhead	0.02	100%	0.02	1.000	0.02
Kitchen Faucet Aerator	0.04	100%	0.04	1.000	0.04
Advanced Power Strip - Tier 1	0.01	100%	0.01	1.000	0.01
Directional LED	0.01	100%	0.01	1.000	0.01
Wall Plate Gasket	0.00	N/A	0.009	1.000	0.009
Door Sweep	0.00	N/A	0.0001	1.000	0.0001
Bathroom Faucet Aerator	0.03	100%	0.03	1.000	0.03
Pipe Insulation	0.004	100%	0.004	1.000	0.004
Restrictor Shower Valve	0.002	100%	0.002	1.000	0.002
Directional LED (Common Area)	0.004	100%	0.004	1.000	0.004
Attic Insulation	0.0004	100%	0.0004	1.000	0.0004
Air Sealing	0.001	100%	0.001	1.000	0.001
Decorative LED (Common Area)	0.0002	100%	0.0002	1.000	0.0002
Total	0.69	107%	0.73	1.000	0.73

Table 74. 2022 IQ Multifamily Channel Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostat	28,785	100%	28,785	1.000	28,785
Showerhead	21,353	99%	21,157	1.000	21,157
Kitchen Faucet Aerator	8,124	98%	7,986	1.000	7,986
Wall Plate Gasket	639	100%	639	1.000	639
Door Sweep	249	100%	249	1.000	249

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Bathroom Faucet Aerator	1,311	98%	1,282	1.000	1,282
Pipe Insulation	414	100%	414	1.000	414
Restrictor Shower Valve	4,039	99%	3,994	1.000	3,994
Attic Insulation	128	100%	128	1.000	128
Air Sealing	43	100%	43	1.000	43
Rim Joist Insulation	13	100%	13	1.000	13
Crawl Space Insulation	129	100%	129	1.000	129
Total	65,226	99%	64,818	1.000	64,818

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 16 individual discrepancies in our final impact analysis. Some of these discrepancies affect measure categories that provide a relatively small proportion of overall IQ Multifamily channel ex ante savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to Income Qualified Multifamily channel ex ante electric energy savings.

- Ductless Heat Pump (27% of ex ante energy savings and 24% of demand savings): The gross realization rate for ductless heat pumps is 100% for electric energy and 103% for demand savings. This measure does not claim therm savings.
  - The evaluation team applied default cooling efficiencies from the IL-TRM V10.0 for Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER) in the verified analysis when actual values were not provided in the tracking database. The implementation team applied the IL-TRM V10.0 default for SEER and converted SEER to EER, instead of applying the EER value from the IL-TRM V10.0. This resulted in higher verified demand savings.
- Air Source Heat Pump (19% of ex ante energy savings and 6% of demand savings): The gross realization rate for air source heat pumps is 100% for electric energy and 107% for demand savings. This measure does not claim therm savings.
  - The evaluation team applied default efficiencies from the IL-TRM V10.0 for Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER) in the verified analysis when actual values were not provided in the tracking database. The implementation team applied the IL-TRM V10.0 default for SEER and converted SEER to EER, instead of applying the EER value from the IL-TRM V10.0. This resulted in higher verified demand savings.
- Advanced Thermostat (11% of ex ante energy savings, 18% of demand savings, and 44% of therm savings): The gross realization rate for advanced thermostats is 100% for electric energy, 133% for demand, and 100% for therm savings.
  - The evaluation team calculated demand savings for the total measure quantity provided in the tracking database, whereas the implementation team claimed demand savings for one advanced thermostat measure per project. This resulted in higher verified demand savings.

# 3.3.5 Market Rate Multifamily Initiative Savings Detail

As shown in Table 75, the Market Rate Multifamily Initiative included 15 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Air Source Heat Pump	Air Source Heat Pump	68	Systems	671	0.13	0
Advanced Thermostat	Advanced Thermostats	499	Thermostats	401	0.01	2,870
Standard LED	LED Screw Based Omnidirectional Bulbs	4,711	Bulbs	139	0.02	0
Showerhead	Low Flow Showerheads	338	Showerheads	76	0.01	465
Decorative LED	LED Specialty Lamps	2,471	Bulbs	39	0.01	0
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	784	Power Strips	32	0.004	0
Directional LED (Common Area)	LED Specialty Lamps	35	Bulbs	13	0.001	0
Standard LED (Common Area)	LED Bulbs and Fixtures	44	Bulbs	13	0.001	0
Kitchen Faucet Aerator	Low Flow Faucet Aerators	87	Aerators	11	0.002	250
Door Sweep	Air Sealing	88	Door Sweeps	8	0.00	128
Restrictor Shower Valve	Thermostatic Restrictor Shower Valve	120	Valves	5	0.0004	107
Bathroom Faucet Aerator	Low Flow Faucet Aerators	120	Aerators	4	0.003	49
Directional LED	LED Specialty Lamps	64	Bulbs	3	0.0004	0
Pipe Insulation	Domestic Hot Water Pipe Insulation	153	Linear Feet	1	0.0001	289
Wall Plate Gasket	Air Sealing	487	Gaskets	1	0.00	94
Total		10,069		1,416	0.19	4,252

Table	75.	2022	Market	Rate	Multifamily	/ Initiative	Participation	Summary by	Measure
1 GINIO			mantoc	naco	manananni	maarvo	1 and ofpadion	ourning by	modouro

Table 76 through Table 78 present electric, demand, and gas impacts by measure.

	Table	76.2022	2 Market Ra	te Multifamil	y Initiative	Electric	Energy	Savings	by M	easure
--	-------	---------	-------------	---------------	--------------	----------	--------	---------	------	--------

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Air Source Heat Pump	671	100%	671	0.800	537
Advanced Thermostat	401	100%	401	0.882	353
Standard LED	139	100%	139	0.960	133

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Showerhead	76	100%	76	1.004	76
Decorative LED	39	100%	39	0.960	38
Advanced Power Strip - Tier 1	32	100%	32	0.980	32
Directional LED (Common Area)	13	100%	13	0.773	10
Standard LED (Common Area)	13	100%	13	0.773	10
Kitchen Faucet Aerator	11	100%	11	1.004	11
Door Sweep	8	101%	8	0.861	7
Restrictor Shower Valve	5	100%	5	0.800	4
Bathroom Faucet Aerator	4	100%	4	1.004	4
Directional LED	3	100%	3	0.960	2
Pipe Insulation	1	100%	1	0.794	1
Wall Plate Gasket	1	141%	2	0.861	1
Total	1,416	100%	1,417	0.860	1,219

Table 77. 2022 Market Rate Multifamily Channel Electric Demand Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Air Source Heat Pump	0.13	100%	0.13	0.800	0.10
Advanced Thermostat	0.01	1,100%	0.10	0.800	0.06
Standard LED	0.02	100%	0.02	0.960	0.02
Showerhead	0.01	100%	0.01	1.004	0.01
Decorative LED	0.01	100%	0.01	0.960	0.01
Advanced Power Strip - Tier 1	0.004	100%	0.004	0.980	0.004
Directional LED (Common Area)	0.001	100%	0.001	0.773	0.001
Standard LED (Common Area)	0.001	100%	0.001	0.773	0.001
Kitchen Faucet Aerator	0.002	100%	0.002	1.004	0.002
Door Sweep	0.00	N/A	0.00003	0.861	0.00003
Restrictor Shower Valve	0.0004	100%	0.0004	0.800	0.0003
Bathroom Faucet Aerator	0.003	100%	0.003	1.004	0.003
Directional LED	0.0004	100%	0.0004	0.960	0.0004
Pipe Insulation	0.0001	100%	0.0001	0.794	0.0001
Wall Plate Gasket	0.00	N/A	0.0003	0.861	0.0003
Total	0.19	136%	0.26	0.834	0.21

#### Table 78. 2022 Market Rate Multifamily Initiative Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostat	2,870	100%	2,870	0.900	2,583
Showerhead	465	100%	465	1.000	465
Kitchen Faucet Aerator	250	100%	250	1.000	250

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Door Sweep	128	100%	128	0.800	102
Restrictor Shower Valve	107	100%	107	0.800	86
Bathroom Faucet Aerator	49	100%	49	1.000	49
Pipe Insulation	289	100%	289	1.000	289
Wall Plate Gasket	94	100%	94	0.800	75
Total	4,252	100%	4,252	0.917	3,899

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered five individual discrepancies in our final impact analysis. All but one discrepancy affects measure categories that provide a relatively small proportion of overall Market Rate Multifamily Initiative ex ante savings (less than 5%). As such, the evaluation team does not detail them below but is prepared to share and discuss the full list of discrepancies with AIC, if desired.

Below we include the one discrepancy that impacts more than 5% of ex ante Multifamily Market Rate Initiative savings.

- Advanced Thermostat (28% of ex ante energy savings, 4% of demand savings, and 68% of therm savings): The gross realization rate for advanced thermostats is 100% for electric energy, 1,100% for demand, and 100% for therm savings.
  - The evaluation team calculated demand savings for the total measure quantity provided in the tracking database in the verified analysis, whereas the implementation team claimed demand savings for one advanced thermostat measure per project. This resulted in higher verified demand savings.

# 3.3.6 Public Housing Initiative Savings Detail

As shown in Table 79, the Public Housing Initiative included 14 categories of measures.

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Ductless Heat Pump (ER)	Ductless Heat Pumps	118	Systems	607	0.08	0
Showerhead	Low Flow Showerheads	333	Showerheads	67	0.01	881
Kitchen Faucet Aerator	Low Flow Faucet Aerators	443	Aerators	54	0.01	1,258
Standard LED	LED Screw Based Omnidirectional Bulbs	1,682	Bulbs	51	0.01	0
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	472	Power Strips	19	0.002	0
Advanced Thermostat	Advanced Thermostats	77	Thermostats	15	0.01	3,352
Bathroom Faucet Aerator	Low Flow Faucet Aerators	473	Aerators	11	0.01	360
Pipe Insulation	Domestic Hot Water Pipe Insulation	197	Linear Feet	10	0.001	0
Restrictor Shower Valve	Thermostatic Restrictor Shower Valve	199	Valves	8	0.001	161

Table 79. 2022 Public Housing Initiative Participation Summary by Measure

Evaluation Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Standard LED (Common Area)	LED Bulbs and Fixtures	10	Bulbs	2	0.0004	0
Wall Plate Gasket	Air Sealing	550	Gaskets	2	0.00	105
Directional LED	LED Specialty Lamps	74	Bulbs	2	0.001	0
Refrigerator	ENERGY STAR and CEE Tier 2 Refrigerator	32	Refrigerators	1	0.0002	0
Room Air Conditioner (ER)	ENERGY STAR Room Air Conditioner	5	Room ACs	<1	0.001	0
Total		4,665		850	0.13	6,117

Table 80 through Table 82 present electric, demand, and gas impacts by measure.

Table 80. 2022 Public Housing Initiative Electric Energy Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Ductless Heat Pump (ER)	607	100%	607	1.000	607
Showerhead	67	100%	67	1.000	67
Kitchen Faucet Aerator	54	100%	54	1.000	54
Standard LED	51	100%	51	1.000	51
Advanced Power Strip - Tier 1	19	100%	19	1.000	19
Advanced Thermostat	15	100%	15	1.000	15
Bathroom Faucet Aerator	11	100%	11	1.000	11
Pipe Insulation	10	100%	10	1.000	10
Restrictor Shower Valve	8	100%	8	1.000	8
Standard LED (Common Area)	2	100%	2	1.000	2
Wall Plate Gasket	2	118%	2	1.000	2
Directional LED	2	100%	2	1.000	2
Refrigerator	1	100%	1	1.000	1
Room Air Conditioner (ER)	<1	100%	<1	1.000	<1
Total	850	100%	851	1.000	851

Evaluation Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Ductless Heat Pump (ER)	0.08	100%	0.08	1.000	0.08
Showerhead	0.01	100%	0.01	1.000	0.01
Kitchen Faucet Aerator	0.01	100%	0.01	1.000	0.01
Standard LED	0.01	100%	0.01	1.000	0.01
Advanced Power Strip - Tier 1	0.002	100%	0.002	1.000	0.002
Advanced Thermostat	0.01	100%	0.01	1.000	0.01
Bathroom Faucet Aerator	0.01	100%	0.01	1.000	0.01
Pipe Insulation	0.001	100%	0.001	1.000	0.001
Restrictor Shower Valve	0.001	100%	0.001	1.000	0.001
Standard LED (Common Area)	0.0004	100%	0.0004	1.000	0.0004
Wall Plate Gasket	0.00	N/A	0.0002	1.000	0.0002
Directional LED	0.001	100%	0.001	1.000	0.001
Refrigerator	0.0002	100%	0.0002	1.000	0.0002
Room Air Conditioner (ER)	0.001	100%	0.001	1.000	0.001
Total	0.13	100%	0.14	1.000	0.14

#### Table 81. 2022 Public Housing Initiative Electric Demand Savings by Measure

Table 82. 2022 Public Housing Initiative Gas Savings by Measure

Evaluation Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Showerhead	881	100%	881	1.000	881
Kitchen Faucet Aerator	1,258	100%	1,258	1.000	1,258
Advanced Thermostat	3,352	100%	3,352	1.000	3,352
Bathroom Faucet Aerator	360	100%	360	1.000	360
Restrictor Shower Valve	161	100%	161	1.000	161
Wall Plate Gasket	105	100%	105	1.000	105
Total	6,117	100%	6,117	1.000	6,117

We discovered three individual discrepancies in our final impact analysis. All discrepancies affect measure categories that provide a relatively small proportion of overall Public Housing Initiative ex ante savings (less than 5%). As such, the evaluation team does not detail them below but is prepared to share and discuss the full list of discrepancies with AIC, if desired.

# 3.3.7 Cumulative Persisting Annual Savings

Table 83 through Table 86 present CPAS and WAML for the 2022 Multifamily Initiatives (IQ Multifamily channel, Market Rate Multifamily Initiative, and Public Housing Initiative). The tables also include a summary of the measure-specific and total verified gross savings for the Initiatives, as well as CPAS in each year of the 2022-2025 Plan.<sup>29</sup> The WAML for the Initiatives are 12.5, 13.0, and 13.6 years for the IQ Multifamily channel, Market Rate Multifamily Initiative, and Public Housing Initiative.

Initiative/Channel		First-Year	NTGR		Lifetime					
	WAML	Verified Gross Savings (MWh)		2022	2023	2024	2025	 2030		Savings (MWh)
IQ Multifamily Channel	12.5	5,074	1.000	5,074	5,074	5,074	4,933	 4,313		61,234
Market Rate Multifamily Initiative	13.0	1,417	0.860	1,219	1,219	1,219	1,213	 987		14,218
Public Housing Initiative	13.6	851	1.000	851	851	851	849	 761		11,016
2022 CPAS		7,342	0.973	7,144	7,144	7,144	6,995	 6,060		86,468
Expiring 2022 CPAS			•	0	0	0	149	 0		
Expired 2022 CPAS				0	0	0	149	 1,084		
WAML	12.7									

#### Table 83. 2022 Multifamily Initiatives CPAS and WAML Summary

	Measure First-Year				CPAS – Ver	ified Net Sa	vings (MV	Vh)		Lifetime
Measure	Life	Verified Gross N Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Ductless Heat Pump (ER)	15.0	1,358	1.000	1,358	1,358	1,358	1,358		1,275	 19,620
Air Source Heat Pump	16.0	963	1.000	963	963	963	963		928	 15,051
Standard LED	10.0	900	1.000	900	900	900	900		729	 8,491
Advanced Thermostat	11.0	543	1.000	543	543	543	543		543	 5,969
Decorative LED	10.0	325	1.000	325	325	325	325		218	 2,926
Standard LED (Common Area)	3.4	220	1.000	220	220	220	79		0	 738
Showerhead	10.0	190	1.000	190	190	190	190		190	 1,899
Kitchen Faucet Aerator	10.0	162	1.000	162	162	162	162		162	 1,624
Advanced Power Strip - Tier 1	7.0	99	1.000	99	99	99	99		0	 694
Directional LED	10.0	69	1.000	69	69	69	69		51	 638

#### Table 84. 2022 IQ Multifamily Channel CPAS and WAML

<sup>&</sup>lt;sup>29</sup> For further detail, including achieved CPAS in years not presented in this table, please see the summary CPAS spreadsheet attached to this report.

#### Initiative-Level Results

	Measure	First-Year			CPAS – Ver	ified Net Sa	vings (MV	Vh)		Lifetime
Measure	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Wall Plate Gasket	20.0	58	1.000	58	58	58	58		58	 1,137
Door Sweep	20.0	50	1.000	50	50	50	50		50	 1,000
Bathroom Faucet Aerator	10.0	37	1.000	37	37	37	37		37	 371
Pipe Insulation	15.0	36	1.000	36	36	36	36		36	 537
Restrictor Shower Valve	10.0	30	1.000	30	30	30	30		30	 301
Directional LED (Common Area)	4.2	26	1.000	26	26	26	26		0	 107
Attic Insulation	20.0	4	1.000	4	4	4	4		4	 68
Air Sealing	20.0	3	1.000	3	3	3	3		3	 61
Decorative LED (Common Area)	2.9	1	1.000	1	1	1	0		0	 4
2022 CPAS		5,074	1.000	5,074	5,074	5,074	4,933		4,313	 61,234
Expiring 2022 CPAS				0	0	0	141		0	
Expired 2022 CPAS				0	0	0	142		762	
WAML	12.5									

#### Initiative-Level Results

		First-Year		C	PAS – \	/erified	Net Savi	ngs	(MWh)	Lifetime
Measure	Measure Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
Air Source Heat Pump	16.0	671	0.800	537	537	537	537		457	 7,790
Advanced Thermostat	11.0	401	0.882	353	353	353	353		353	 3,884
Standard LED	10.0	139	0.960	133	133	133	133		45	 804
Showerhead	10.0	76	1.004	76	76	76	76		76	 764
Decorative LED	10.0	39	0.960	38	38	38	38		27	 311
Advanced Power Strip - Tier 1	7.0	32	0.980	32	32	32	32		0	 222
Directional LED (Common Area)	4.0	13	0.773	10	10	10	10		0	 41
Standard LED (Common Area)	3.4	13	0.773	10	10	10	4		0	 34
Kitchen Faucet Aerator	10.0	11	1.004	11	11	11	11		11	 107
Door Sweep	20.0	8	0.861	7	7	7	7		7	 129
Restrictor Shower Valve	10.0	5	0.800	4	4	4	4		4	 39
Bathroom Faucet Aerator	10.0	4	1.004	4	4	4	4		4	 36
Directional LED	10.0	3	0.960	2	2	2	2		2	 19
Pipe Insulation	15.0	1	0.794	1	1	1	1		1	 15
Wall Plate Gasket	20.0	2	0.861	1	1	1	1		1	 25
2022 CPAS		1,417	0.860	1,219	1,219	1,219	1,213		987	 14,218
Expiring 2022 CPAS				0	0	0	6		0	
Expired 2022 CPAS				0	0	0	6		233	
WAML	13.0									-

#### Table 85. 2022 Market Rate Multifamily Initiative CPAS and WAML

#### Initiative-Level Results

Magaura	Maggura Life	First-Year Verified		CP	AS – Ve	rified No	et Savin	gs (	(MWh)	Lifetime
Measure	Measure Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025		2030	 Savings (MWh)
Ductless Heat Pump (ER)	15.0	607	1.000	607	607	607	607		550	 8,590
Showerhead	10.0	67	1.000	67	67	67	67		67	 666
Kitchen Faucet Aerator	10.0	54	1.000	54	54	54	54		54	 545
Standard LED	10.0	51	1.000	51	51	51	51		41	 477
Advanced Power Strip - Tier 1	7.0	19	1.000	19	19	19	19		0	 136
Advanced Thermostat	11.0	15	1.000	15	15	15	15		15	 164
Bathroom Faucet Aerator	10.0	11	1.000	11	11	11	11		11	 110
Pipe Insulation	15.0	10	1.000	10	10	10	10		10	 154
Restrictor Shower Valve	10.0	8	1.000	8	8	8	8		8	 84
Standard LED (Common Area)	3.4	2	1.000	2	2	2	1		0	 7
Wall Plate Gasket	20.0	2	1.000	2	2	2	2		2	 43
Directional LED	10.0	2	1.000	2	2	2	2		1	 15
Refrigerator	17.0	1	1.000	1	1	1	1		1	 22
Room Air Conditioner (ER)	12.0	0.4	1.000	0.4	0.4	0.4	0.4		0.1	 2
2022 CPAS		851	1.000	851	851	851	849		761	 11,016
Expiring 2022 CPAS				0	0	0	1		0	
Expired 2022 CPAS				0	0	0	1		89	
WAML	13.6									

#### Table 86. 2022 Public Housing Initiative CPAS and WAML

# 3.3.8 Conclusions and Recommendations

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Multifamily Initiatives moving forward. Note, several of these findings had relatively small effects on Initiatives savings in 2022 and, as such, were not listed in the reported discrepancies above. However, these issues could have larger impacts on Initiatives savings in future years.

- Key Finding #1: Across multiple Multifamily Initiatives components, the implementation team did not apply measure quantities when calculating advanced thermostat demand savings, and instead assumed one thermostat per project.
  - Recommendation: Apply measure quantities when calculating demand savings for advanced thermostats for projects where advanced thermostats are installed in multiple tenant units.
- Key Finding #2 The evaluation team included cooling electric energy and demand savings from prescriptive air sealing measures (e.g., door sweeps and outlet gaskets) as prescribed in the IL-TRM V10.0, while the implementation team excluded cooling savings for prescriptive air sealing measures.
  - Recommendation: Include cooling savings for prescriptive air sealing measures using the cooling savings algorithms from the IL-TRM V10.0.
- Key Finding #3: For three IQ Multifamily Channel projects, across various measures (e.g., air sealing and attic insulation), the evaluation team applied the default percentage of homes with cooling from the IL-TRM V10.0 when the primary cooling type was not provided in the tracking database. The implementation team did not include cooling savings for these homes.
  - Recommendation: Apply the "unknown" percentage of homes with cooling default from the IL-TRM V10.0 when the tracking database does not provide the primary cooling type.

# 3.4 Market Rate Single Family Initiative

As part of the 2022 Residential Program, AIC operated the Market Rate Single Family Initiative, which delivered services to market rate residential customers through two distinct channels, the Midstream HVAC channel and the Home Efficiency channel, which are described in more detail below.

## 3.4.1 Initiative Annual Savings Summary

Table 87 presents Market Rate Single Family Initiative annual savings achieved in 2022. The 2022 Market Rate Single Family Initiative achieved 4,857 MWh, 1.21 MW, and 59,160 therms in verified net savings.

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	6,050	1.51	67,487
Gross Realization Rate	100%	100%	100%
Verified Gross Savings	6,059	1.51	67,291
NTGR	0.802	0.801	0.879
Verified Net Savings	4,857	1.21	59,160

#### Table 87. 2022 Market Rate Single Family Initiative Annual Savings

# 3.4.2 Midstream HVAC Channel

AIC launched the Midstream HVAC channel in 2021, transitioning from a previous downstream model. The channel encourages market actors, such as distributors and contractors, in AIC territory to promote and install high-efficiency air-source heat pumps (ASHPs), ductless heat pumps (DHPs), central air conditioners (CACs), ENERGY STAR-certified advanced thermostats, and heat pump water heaters (HPWHs).

Participating distributors promote and sell units that qualify for the channel and provide contractors with an instant incentive for qualifying equipment. Using information that the contractor provides about the end-use customer, the distributor submits an incentive application to the channel through an online portal. When an application is approved, the channel pays the distributor a base incentive and a pay-for-performance incentive for the unit sold. The incentive provided to distributors, in turn, lowers the cost of efficient equipment for contractors, thus encouraging them to pass those savings onto their customers. The incentive also encourages contractors to install more energy efficient heating and cooling equipment and water heaters than they might normally install.

Although distributors are the main point of contact for the channel, contractors play a large role in its implementation. Contractors must provide end-use customer data to the distributor, which is used to verify the existing unit falls within the parameters of the Initiative and that the end user lives in the AIC service territory. In addition, most marketing materials provided to distributors are directed at contractors, such as point-of-sale flyers, postcards, and other materials.

The channel also collects quarterly market data from distributors to support ongoing assessment of the channel's effects on the HVAC and HPWH market in AIC service territory.

### Summary of Key Implementation Changes in 2022

The key changes to Midstream HVAC channel design and implementation since 2021 are below:

- The Midstream HVAC channel started to implement on-bill financing for end-use customers. According to the implementation team, end-use customers interested in on-bill financing can fill out an application, which the contractor provides to the distributor.
- There was a \$300 increase in the payment for HPWHs, making the total payment \$1,300. The implementation team reported they increased the payment in response to inflation during 2022. This is the second consecutive program year in which the total payment amount has changed, as it went from \$1,000 to \$800 and back to \$1,000 during 2021.
- The ASHP total payment increased to \$750 total.
- The Midstream HVAC channel held roundtable discussions with distributors to collect their feedback about participation, including distributor barriers and suggestions for program support to increase contractor participation. These discussions also gathered market intelligence on current supply chain conditions. 30 participating distributors participated in roundtable discussions in 2022, which was up from 19 in 2021. There were several key qualitative impacts that the program tried to achieve through the distributor roundtable discussions:
  - Refresh distributors on the current Midstream incentive offerings and processes to bring them front-of-mind, leading toward increased participation in the Initiative.
  - Learn which market barriers are getting in distributors' way to move high efficiency equipment (supply chain constraints, increased equipment costs, pricing issues, contractor buy-in/knowledge of technology, etc.)

- Gain feedback on Midstream Initiative design and resources for improvement opportunities.
- Explore interest and moving forward on planning cooperative marketing and installer training opportunities.
- Channel staff attended two distributor showcases to promote Midstream to their contractors.
- The channel conducted a heat pump webinar blitz presented by three heat pump manufacturers, a contractor webinar explaining the Initiative, and a transaction submission portal webinar for distributors. Among these larger trainings were consistent one-on-one discussions with distributors through their Distributor Account Managers, who were added in 2022 to be the primary relationshipholders with the distributor network.
- The channel continued to make improvements to the online portal for submitting incentive applications.

### **Participation Summary**

Table 88 presents Midstream HVAC channel participation by measure category during 2022.

Measure Category	Participants <sup>a</sup>	<b>Projects</b> <sup>a</sup>	Measure Count
Ductless Heat Pump	435	469	501
Air Source Heat Pump	512	531	533
Central Air Conditioner	2,451	2,501	2,521
Advanced Thermostat	926	926	926
Heat Pump Water Heater	26	26	27
Total	4,350	4,453	4,508

Table 88. 2022 Midstream HVAC Channel Participation Summary by Measure Category

<sup>a</sup> Totals do not add up because some participants and projects may install multiple measure types.

#### **Savings Detail**

As shown in Table 89, the 2022 Midstream HVAC channel included five categories of measures.

Table 89. 2022 Midstream HVAC Initiative Ex Ante Gross Energy Savings by Measure

Measure Category	IL-TRM Measure Name	Measure Quantity Units		Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Ductless Heat Pump	Ductless Heat Pumps	501	Systems	2,508	0.03	0
Air Source Heat Pump	Air Source Heat Pump	533	Systems	1,936	0.14	0
Central Air Conditioner	Central Air Conditioning	2,521	Systems	1,155	1.16	0
Advanced Thermostat	Advanced Thermostat	926	Thermostats	229	0.14	48,619
Heat Pump Water Heater	Heat Pump Water Heaters	27	Water Heaters	60	0.003	0
Total		4,508		5,888	1.47	48,619

Table 90 through Table 92 present electric, demand, and gas impacts by measure.

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Ductless Heat Pump	2,508	100%	2,508	0.800	2,006
Air Source Heat Pump	1,936	100%	1,936	0.800	1,549
Central Air Conditioner	1,155	100%	1,155	0.800	924
Advanced Thermostat	229	100%	229	0.837	192
Heat Pump Water Heater	60	115%	68	0.800	55
Total	5,888	100%	5,896	0.801	4,726

#### Table 90. 2022 Midstream HVAC Initiative Electric Energy Savings by Measure

Table 91. 2022 Midstream HVAC Initiative Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Ductless Heat Pump	0.03	100%	0.03	0.800	0.02
Air Source Heat Pump	0.14	100%	0.14	0.800	0.11
Central Air Conditioner	1.16	100%	1.16	0.800	0.93
Advanced Thermostat	0.14	100%	0.14	0.800	0.11
Heat Pump Water Heater	<0.01	115%	<0.01	0.800	<0.01
Total	1.47	100%	1.47	0.800	1.18

Table 92. 2022 Midstream HVAC Initiative Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)		
Advanced Thermostat	48,619	100%	48,410	0.900	43,569		
Total	48,619	100%	48,410	0.900	43,569		

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 9 individual discrepancies in our final impact analysis. Some of these discrepancies have a relatively small impact on savings. As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

- Heat Pump Water Heater (1% of ex ante energy savings and <1% of demand savings): The gross realization rate for heat pump water heater is 115% for electric energy and demand savings.</p>
  - The evaluation team applied the baseline uniform energy factors (UEF) from the IL-TRM V10.0 that aligned with the rated volume of the heat pump water heater in the verified analysis. The implementation team applied a value for UEF that varied from the IL-TRM V10.0. This resulted in higher verified electric energy and demand savings.
  - The evaluation team included savings for all projects in the verified analysis, where the implementation team did not claim savings for one project, resulting in higher verified electric energy and demand savings.
  - The evaluation team corrected for a data energy error and calculated UEF from the water heater volume in the verified analysis. The implementation team inadvertently applied 0 for the baseline

UEF, which led to formula errors for some of the terms in the IL-TRM V10.0 electric energy savings algorithm, resulting in higher electric energy and demand savings.

The evaluation team applied the UEF values from the tracking database in the verified analysis. The implementation team applied UEF values for new equipment that are inconsistent with those provided in the tracking database, resulting in higher verified electric energy and demand savings.

### **3.4.3** Home Efficiency Channel

The Market Rate Single Family Initiative's Home Efficiency channel, launched in 2021, is an initiative offered by AIC as part of the 2022 portfolio. The channel focuses on providing home weatherization, envelope efficiency measures, and select measure direct installations to a broader segment of residential customers in conjunction with the existing Income Qualified (IQ) Initiative's Single Family channel. The Home Efficiency channel and the IQ Initiative's Single Family channel both offer the same weatherization measures coupled with a tiered incentive system that provides higher incentives for low- and moderate- income customers treated through the IQ Initiative, and somewhat lower incentives for market-rate customers served through the Home Efficiency channel. Table 93 outlines the incentives offered through the Home Efficiency channel for weatherization measures.

Measure	Tier 3 (Market Rate) Incentives
Air Sealing	\$0.50/CFM
Attic Insulation	\$0.90/sq. ft.
Wall Insulation	\$0.90/sq. ft.
Rim Joist Insulation	\$1.00/lin. ft.
Crawl Space Wall Insulation	\$2.00/lin. ft.

Table 93. 2022 Home Efficiency Channel Incentives

To further motivate customers to pursue energy efficiency improvements, the Home Efficiency channel offers optional on-bill financing to offset upfront project costs.

In addition to the weatherization measures listed in Table 93, the Home Efficiency channel conducted duct sealing and offered select direct installs (advanced thermostats, advanced power strips, LEDs, showerheads, faucet aerators, and pipe insulation) in participating homes.

Unlike the IQ Initiative's Single Family channel, the Home Efficiency channel does not have an income eligibility criterion. Owner-occupied homes with a residential DS-1/GDS-1 AIC account and heated with an AIC-provided fuel are eligible to participate; however, Program Allies may determine a home is ineligible to move forward with a project during the home assessment if there are health and safety barriers.

### Summary of Key Implementation Changes in 2022

The key changes to Home Efficiency channel design and implementation since 2021 are below:

- The Home Efficiency channel added direct install measures to its scope in 2022, including advanced thermostats, advanced power strips, LEDs, showerheads, faucet aerators, and pipe insulation.
- The channel added a \$100 non-project stipend and a \$200 project completion bonus. The non-project stipend compensates Program Allies for home assessments that do not result in a project. Program Allies receive a \$200 bonus for the completion of a project.

- The Home Efficiency channel shortened the Reservation Application and Incentive Application to one page each in response to Program Ally concerns that the forms were cumbersome and time-consuming. The channel modified the Reservation Application into an editable PDF to allow Program Allies to fill out the form digitally. In the future, the channel aims to integrate the Reservation Application directly into their Program Ally Portal. The channel updated this portal in 2022 to make it more intuitive and informative.
- As of summer 2022, the channel had no plans to increase incentives. Despite plans, the channel did not add solar powered attic fans as a measure in 2022. Additionally, the channel did not implement planned cross promotion with the Retail Products Initiative and AIC's demand response offerings.

#### **Participation Summary**

Table 94 presents a summary of Home Efficiency channel participation during 2022.

Measure	Number of Premises Receiving Measure						
Advanced Power Strip	81						
Advanced Thermostat	17						
Air Sealing	65						
Attic Insulation	54						
Bathroom Exhaust Fan	40						
Crawl Space Insulation	17						
Door Sweep	43						
Faucet Aerator	236						
Pipe Insulation	33						
Rim Joist Insulation	42						
Showerhead	177						
Decorative LEDs	240						
Standard LED	189						
Wall Insulation	21						
Total	441						

 Table 94. 2022 Home Efficiency Channel Participation Summary

<sup>a</sup> Total does not sum the column as it counts the total number of premises who received services through the channel in 2022.

### **Savings Detail**

As shown in Table 95, the 2022 Home Efficiency channel included eighteen categories of measures.

Measure Category	IL-TRM Measure Name	Measure Quantityª	Units	Ex Ante Gross MWh	Ex Ante Gross MW <sup>b</sup>	Ex Ante Gross Therms
Standard LED	LED Screw Based Omnidirectional Bulbs	1,005	Bulbs	40	0.005	0
Decorative LED	LED Specialty Lamps	642	Bulbs	17	0.003	0
Air Sealing	Air Sealing	79,815	CFM	18	0.01	4,646
Attic Insulation	Attic Insulation	67,690	Square Feet	13	0.01	5,404
Directional LED	LED Specialty Lamps	294	Bulbs	13	0.002	0
Advanced Power Strip - Tier 1	Advanced Power Strip - Tier 1	131	Power Strips	12	0.001	0
Faucet Aerator	Low Flow Faucet Aerators	457	Aerators	11	0.003	1,529
Showerhead	Low Flow Showerheads	208	Showerheads	9	0.001	1,398
Bathroom Exhaust Fan	High Efficiency Bathroom Exhaust Fan	40	Fans	9	0.001	0
Wall Insulation	Wall Insulation	23,288	Square Feet	6	0.004	2,558
Crawl Space Insulation	Basement Sidewall Insulation	1,887	Square Feet	5	0.001	993
Advanced Thermostat	Advanced Thermostats	17	Thermostats	3	0.002	1,367
Decorative LED - Exterior	LED Specialty Lamps	16	Bulbs	1	0.0001	0
Door Sweep	Air Sealing	81	Door Sweeps	1	0.00	219
Standard LED - Exterior	LED Screw Based Omnidirectional Bulbs	16	Bulbs	1	0.0001	0
Rim Joist Insulation	Rim/Band Joist Insulation	4,768	Linear Feet	1	0.0002	273
Pipe Insulation	Domestic Hot Water Pipe Insulation	229	Linear Feet	1	0.0001	482
Directional LED - Exterior	LED Specialty Lamps	1	Bulbs	<1	0.00001	0
Total		180,585		162	0.04	18,868

Table 95. 2022 Home Efficiency Channel Ex Ante Gross Energy Savings by Measure

<sup>a</sup> As reported in ex ante tracking data. <sup>b</sup> Reported to the nearest significant digit.

Table 96 shows the ex ante gross, verified gross, and verified net energy savings for the channel by measure category. For most measures, the gross realization rate was 100%. The overall gross realization rate for the channel was also 100%. The overall NTGR is 0.810, resulting in verified net savings of 132 MWh.

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Standard LED	40	100%	40	0.800	32
Decorative LED	17	100%	17	0.800	14
Air Sealing	18	100%	18	0.880	16
Attic Insulation	13	101%	13	0.800	10
Directional LED	13	100%	13	0.800	10
Advanced Power Strip - Tier 1	12	102%	13	0.800	10
Faucet Aerator	11	100%	11	0.800	9
Showerhead	9	100%	9	0.800	7
Bathroom Exhaust Fan	9	101%	9	0.800	7
Wall Insulation	6	100%	6	0.800	5
Crawl Space Insulation	5	99%	5	0.800	4
Advanced Thermostat	3	100%	3	0.841	3
Decorative LED - Exterior	1	100%	1	0.800	1
Door Sweep	1	102%	1	0.800	1
Standard LED - Exterior	1	100%	1	0.800	1
Rim Joist Insulation	1	98%	1	0.800	1
Pipe Insulation	1	100%	1	0.800	<1
Directional LED - Exterior	<1	100%	<1	0.800	<1
Total	162	100%	162	0.810	132

Table 96. 2022 Home Efficiency Channel Electric Energy Savings by Measure

Table 97. 2022 Home Efficiency Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Standard LED	<0.01	100%	<0.01	0.800	<0.01
Decorative LED	<0.01	100%	<0.01	0.800	<0.01
Air Sealing	0.01	100%	0.01	0.888	0.01
Attic Insulation	<0.01	101%	0.01	0.800	0.01
Directional LED	<0.01	100%	<0.01	0.800	<0.01
Advanced Power Strip - Tier 1	<0.01	102%	<0.01	0.800	<0.01
Faucet Aerator	<0.01	90%	<0.01	0.800	<0.01
Showerhead	< 0.01	100%	<0.01	0.800	<0.01
Bathroom Exhaust Fan	<0.01	101%	<0.01	0.800	<0.01
Wall Insulation	<0.01	100%	<0.01	0.800	<0.01
Crawl Space Insulation	< 0.01	100%	<0.01	0.800	<0.01
Advanced Thermostat	<0.01	100%	<0.01	0.800	<0.01
Decorative LED - Exterior	< 0.01	100%	< 0.01	0.800	< 0.01

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	/erified Gross Savings (MW) NTGR	
Door Sweep	0.00	N/A	<0.01	0.800	<0.01
Standard LED - Exterior	<0.01	100%	<0.01	0.800	<0.01
Rim Joist Insulation	<0.01	95%	<0.01	0.800	<0.01
Pipe Insulation	<0.01	100%	<0.01	0.800	<0.01
Directional LED - Exterior	<0.01	100%	<0.01	0.800	<0.01
Total	0.04	100%	0.04	0.826	0.04

Table 98. 2022 Home Efficiency Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Air Sealing	4,646	100%	4,659	0.875	4,077
Attic Insulation	5,404	100%	5,417	0.800	4,333
Faucet Aerator	1,529	100%	1,529	0.800	1,223
Showerhead	1,398	100%	1,398	0.800	1,118
Wall Insulation	2,558	100%	2,558	0.800	2,047
Crawl Space Insulation	993	100%	993	0.800	795
Advanced Thermostat	1,367	100%	1,367	0.900	1,230
Door Sweep	219	100%	219	0.800	176
Rim Joist Insulation	273	95%	260	0.800	208
Pipe Insulation	482	100%	482	0.800	386
Total	18,868	100%	18,881	0.826	15,591

We describe the key drivers of discrepancies between ex ante and verified gross savings estimates below. We discovered 13 individual discrepancies in our final impact analysis. Some of these discrepancies affect measure categories that provide a relatively small proportion of Initiative savings (less than 5%). As such, the list below includes the most significant, but not all, realization rate drivers. The evaluation team is prepared to share and discuss the full list of discrepancies with AIC, if desired.

We ordered the list of discrepancies below from largest to smallest contribution to Home Efficiency Market Rate ex ante electric energy savings.

- Advanced Power Strip (11% of ex ante energy savings and 8% of demand savings): The gross realization rate for advanced power strips is 102% for both electric energy and demand savings. This measure does not claim therm savings.
  - The evaluation team applied the in-service rate from the IL-TRM V10.0 for single family leavebehind measures in the verified analysis whereas the implementation team applied the in-service rate for multifamily leave-behind measures. The in-service rate for single family homes (55%) is higher than the in-service rate for multifamily homes (40%), resulting in higher verified energy and demand savings.
- Faucet Aerator (7% of ex ante energy savings, 7% of demand savings, and 8% of therm savings): The gross realization rate for faucet aerators is 100% for electric energy, 90% for demand, and 100% for therm savings.

The evaluation team applied the IL-TRM V10.0 hours of use for bathroom (16 hours) and kitchen (112 hours) aerators in the verified analysis whereas the implementation team applied the hours of use from the IL-TRM V9.0. The hours of use in V10.0 are higher than V9.0, resulting in lower verified demand savings.

### 3.4.4 Cumulative Persisting Annual Savings

Table 99 presents CPAS and WAML for the 2022 Market Rate Single Family Initiative by channel. The table also includes a summary of the measurespecific and total verified gross savings for the Initiative, as well as CPAS in each year of the 2022-2025 Plan.<sup>30</sup> The WAML for the Initiative is 15.7 years. Table 100 and Table 101 present CPAS and WAML for the Midstream HVAC and Home Efficiency channels, respectively, at a measure level.

Channel	WAML	First-Year Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)						Lifetime Savings	
Channer				2022	2023	2024	2025		2030		(MWh)
Midstream HVAC	15.8	5,970	0.801	4,784	4,784	4,784	4,784		4,784		75,367
Home Efficiency	13.0	162	0.810	132	132	132	132		90		1,468
2022 CPAS		6,132	0.802	4,916	4,916	4,916	4,916		4,874		76,836
Expiring 2022 CPAS				0	0	0	0		0		
Expired 2022 CPAS				0	0	0	0		42		
WAML	15.7								·		•

#### Table 99. 2022 Market Rate Single Family Initiative CPAS and WAML

#### Table 100. 2022 Midstream HVAC Channel CPAS and WAML

Magaura	Measure	First-Year Verified		CPAS – Verified Net Savings (MWh)						Lifetime
Measure	Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025		2030	 Savings (MWh)
Ductless Heat Pump	15.0	2,508	0.800	2,006	2,006	2,006	2,006		2,006	 30,093
Air Source Heat Pump	16.0	2,009	0.800	1,549	1,549	1,549	1,549		1,549	 24,778
Central Air Conditioner	18.0	1,155	0.800	924	924	924	924		924	 16,632
Advanced Thermostat	11.0	229	0.837	192	192	192	192		192	 2,112
Heat Pump Water Heater	15.0	68	0.800	55	55	55	55		55	 812
2022 CPAS		5,970	0.801	4,726	4,726	4,726	4,726		4,784	 74,427
Expiring 2022 CPAS			0	0	0	0		0		
Expired 2022 CPAS		0	0	0	0		0			
WAML	15.8									

<sup>&</sup>lt;sup>30</sup> For further detail, including achieved CPAS in years not presented in this table, please see the summary CPAS spreadsheet attached to this report.
Magguro	Measure	First-Year Verified Gross	CPAS – Verified Net Savings (MWh)					Lifetime		
Measure	Life	Savings (MWh)	NIGR	2022	2023	2024	2025		2030	 Savings (MWh)
Standard LED	10.0	40	0.800	32	32	32	32		11	 195
Decorative LED	10.0	17	0.800	14	14	14	14		10	 112
Air Sealing	20.0	18	0.880	16	16	16	16		16	 285
Attic Insulation	20.0	13	0.800	10	10	10	10		10	 187
Directional LED	10.0	13	0.800	10	10	10	10		6	 78
Advanced Power Strip - Tier 1	7.0	13	0.800	10	10	10	10		0	 70
Faucet Aerator	10.0	11	0.800	9	9	9	9		9	 90
Showerhead	10.0	9	0.800	7	7	7	7		7	 70
Bathroom Exhaust Fan	19.0	9	0.800	7	7	7	7		7	 133
Wall Insulation	20.0	6	0.800	5	5	5	5		5	 87
Crawl Space Insulation	20.0	5	0.800	4	4	4	4		4	 78
Advanced Thermostat	11.0	3	0.841	3	3	3	3		3	 28
Decorative LED - Exterior	6.9	1	0.800	1	1	1	1		0	 6
Door Sweep	20.0	1	0.800	1	1	1	1		1	 21
Standard LED - Exterior	8.0	1	0.800	1	1	1	1		0	 5
Rim Joist Insulation	20.0	1	0.800	1	1	1	1		1	 13
Pipe Insulation	15.0	1	0.800	0.4	0.4	0.4	0.4		0.4	 7
Directional LED - Exterior	10.0	0.1	0.800	0.1	0.1	0.1	0.1		0.1	 1
2022 CPAS	-	162	0.810	132	132	132	132		90	 1,468
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS				0	0	0	0		42	
WAML	13.0									

Table 101. 2022 Home Efficiency Channel CPAS and WAML

# 3.4.5 Conclusions and Recommendations

#### Midstream HVAC Channel

Based on the results of this evaluation, the evaluation team offers no additional findings and recommendations for the Midstream HVAC channel moving forward.

#### **Home Efficiency Channel**

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Home Efficiency channel moving forward:

- Key Finding #1: The evaluation team included cooling electric energy and demand savings from door sweeps as prescribed in the IL-TRM V10.0, whereas the implementation team excluded cooling savings.
  - Recommendation: Include cooling savings for prescriptive air sealing measures using the cooling savings algorithms from the IL-TRM V10.0.
- Key Finding #2: The evaluation team excluded furnace fan runtime savings in homes with natural gas boilers for all program measures, whereas the implementation team included them when calculating savings for crawl space insulation.
  - Recommendation: Exclude furnace fan runtime savings for cases where primary heating type is natural gas boiler.

# 3.5 Kits Initiatives

In this chapter, we present the results of the impact evaluation of AIC's kit and ad hoc measure distribution efforts in 2022. AIC formally operates three kit distribution channels as part of its portfolio: the School Kits and High School Innovation channels of the Direct Distribution Initiative, and the Community Kits channel of the Income Qualified Initiative. In addition, AIC conducts ad hoc kit and measure distribution efforts on a rolling basis. Because kit-focused energy efficiency programs share similar characteristics, we group these efforts together in this report chapter.

### 3.5.1 Initiative Description

The objectives of AIC's Residential Kit Initiatives are to reach underserved communities, as well as low- to moderate-income customers with free energy saving measures and educational materials designed to engage them in energy efficiency and give them immediate tools they can use to improve their quality of life.

### 3.5.2 Kits Initiatives Annual Savings Summary

Table 102 presents Kits Initiatives annual savings achieved in 2022. Across all four evaluated components, the 2022 Kits Initiatives achieved a total of 7,027 MWh, 0.96 MW, and 193,832 therms in verified net savings. The School Kits channel was the largest contributor, providing 43% of verified net MWh savings and 54% of verified net therms savings.

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	8,683	1.16	207,874
Gross Realization Rate	81%	83%	93%
Verified Gross Savings	7,027	0.96	193,832
NTGR	1.000	1.000	1.000
Verified Net Savings	7,027	0.96	193,832

#### Table 102. 2022 Kits Initiatives Annual Savings

# 3.5.3 School Kits Channel

The School Kits channel provides school presentations and energy saving kits to students in participating fifth grade classrooms with a focus on underserved communities in AIC service territory. In particular, the channel serves schools in which 50% or more of the student body is participating in free or reduced price lunch programs, or schools that are located in an AIC income qualified ZIP code. By providing the kits in conjunction with energy conservation education in the classroom, AIC hopes to establish an interest in energy efficiency and reduce energy use in participating student homes. The School Kits channel is primarily implemented by National Energy Foundation (NEF) as a subcontractor to Leidos.

### Summary of Key Implementation Changes in 2022

There were a few changes to the School Kits channel in 2022 with regard to the target audience, energy saving measure offerings, the format of the presentations, and implementation partner staffing and marketing and outreach:

- In 2022, the target audience for the School Kits channel changed slightly. Prior to 2022, the School Kits channel targeted fifth and sixth graders. However, in 2022, only fifth graders were eligible to participate.
- The School Kits channel made some changes to measure offerings included in the energy saving kit. The LED light bulbs included in the energy saving kit switched from 9W omnidirectional bulbs to 8W directional LEDs in 2022. The energy saving kit also added weatherstripping in 2022.
- Due to COVID restrictions, some presentations were held remotely. However, in the fall of 2022, while the implementation team still offers virtual presentations, the School Kits channel began conducting in-person presentations similar to how presentations were conducted prior to the pandemic.
- In 2022, NEF brought on Sparrow Energy Services as part of the implementation team. NEF and Sparrow Energy Services conducted additional marketing and outreach activities in school-based community action events. The additional outreach enabled them to reach not just fifth grade and high school students, but their families and adults as well. According to program staff, the implementation partners also gave out free connected LED bulbs to customers they engaged with during the events.

### **Participation Summary**

In 2022, the School Kits channel conducted energy efficiency education and distributed 8,500 energy saving kits to students at 110 unique schools in AIC service territory. Seventeen schools received presentations and kit distribution in both spring and fall 2022.

Table 103 summarizes the measures distributed through the School Kits channel in 2022.

Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Advanced Power Strip	Advanced Power Strip – Tier 1	8,500	power strips	453,947	50.94	0
Pipe Insulation	Domestic Hot Water Pipe Insulation	25,500	,500 linear feet of pipe insulation		10.97	21,471
Bathroom Aerator	Low Flow Faucet	8,500	aerators	32,496	36.18	1,355
Kitchen Aerator	Aerators	8,500	aerators	267,644	49.79	11,251
Shower Timer	Shower Timer	8,500	shower timers	306,192	134.08	13,091
Showerhead	Low Flow Showerheads	8,500	showerheads	301,882	28.16	12,989
8W Directional LED	LED Specialty Lamps	34,000	lamps	1,240,615	147.34	0
Door Sweep		8,500	door sweeps	150,807	0.00	21,208
Weatherstripping Air Sealing		144,500	linear feet of weatherstripping	178,772	6.84	24,084
Total		255,000		3,027,858	464.30	105,449

Table 103. 2022 School Kits Channel Participation Summary by Measure

### **Savings Detail**

Table 104 through Table 106 present electric, demand, and gas impacts by measure for the 2022 School Kits channel.

Table 104. 2022 School Kits Channel Electric Energy Savings by Measu
--

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Advanced Power Strip	454	100%	454	1.000	454
Pipe Insulation	96	100%	96	1.000	96
Bathroom Aerator	32	100%	32	1.000	32
Kitchen Aerator	268	100%	268	1.000	268
Shower Timer	306	100%	306	1.000	306
Showerhead	302	100%	302	1.000	302
8W Directional LED	1,241	100%	1,241	1.000	1,241
Door Sweep	151	100%	151	1.000	151
Weatherstripping	179	100%	179	1.000	179
Total	3,028	100%	3,028	1.000	3,028

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Advanced Power Strip	0.05	100%	0.05	1.000	0.05
Pipe Insulation	0.01	100%	0.01	1.000	0.01
Bathroom Aerator	0.04	100%	0.04	1.000	0.04
Kitchen Aerator	0.05	100%	0.05	1.000	0.05
Shower Timer	0.13	100%	0.13	1.000	0.13
Showerhead	0.03	100%	0.03	1.000	0.03
8W Directional LED	0.15	100%	0.15	1.000	0.15
Door Sweep	0.00	N/A	0.00	1.000	0.00
Weatherstripping	0.01	100%	0.01	1.000	0.01
Total	0.46	100%	0.46	1.000	0.46

#### Table 105. 2022 School Kits Channel Electric Demand Savings by Measure

Table 106. 2022 School Kits Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Pipe Insulation	21,471	100%	21,471	1.000	21,471
Bathroom Aerator	1,355	100%	1,355	1.000	1,355
Kitchen Aerator	11,251	100%	11,251	1.000	11,251
Shower Timer	13,091	100%	13,091	1.000	13,091
Showerhead	12,989	100%	12,989	1.000	12,989
Door Sweep	21,208	100%	21,208	1.000	21,208
Weatherstripping	24,084	100%	24,084	1.000	24,084
Total	105,449	100%	105,449	1.000	105,449

There were no discrepancies between claimed and evaluated savings for the School Kits channel in 2022.

# 3.5.4 High School Innovation Channel

The High School Innovation channel is targeted at high school students and conducts in-class presentations to introduce high school students to advance energy literacy education.<sup>31</sup> The presentations target science and math classrooms such as economics, chemistry, and biology classes. After each presentation, students receive take home energy saving kits. The High School Innovation channel is primarily implemented by National Energy Foundation (NEF) as a subcontractor to Leidos.

### Summary of Key Implementation Changes in 2022

The High School Innovation channel was a new addition to the Residential Program in 2022.

<sup>&</sup>lt;sup>31</sup> According to the AIC Energy Efficiency 2022 Program Implementation Plan (PIP) and program staff interviews, the High School Innovation presentations cover topics such as energy reduction strategies and technology, and include interactive activities. The presentations also cover workforce development education in an effort to generate interest in careers within the energy and Science, Technology, Engineering and Math (STEM) sectors.

- The implementation team launched the High School Innovation channel in 2022 and began conducting presentations and distributed energy saving kits in the fall of 2022.
- In addition to the presentations, the implementation team also held an after-school Innovation Camp in the fall of 2022. The Innovation Camp focused on careers within the energy sector and allowed students to engage with professionals in the energy industry.
- Sparrow Energy Services supported NEF as part of the implementation team, and helped NEF design and implement an after-school Innovation Camp for high school students. The camp focused on energy education, energy efficiency behaviors, and energy industry career opportunities.

### **Participation Summary**

In 2022, the High School Innovation channel conducted energy efficiency education and distributed 2,500 energy saving kits to students at 20 unique schools in AIC service territory. The channel also distributed connected LEDs at a community event and the after-school Innovation Camp.

Table 107 summarizes the measures distributed through the High School Innovation channel in 2022.

Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Pipe Insulation	Domestic Hot Water Pipe Insulation	7,500	linear feet of pipe insulation	28,090	3.23	6,315
Bathroom Aerator	Low Flow Faucet Aerators	2,500	aerators	9,558	10.64	398
Showerhead	Low Flow Showerheads	2,500	showerheads	88,789	8.28	3,820
8W Directional LED	LED Specialty Lamps	7,500	lamps	273,665	32.50	0
LED Desk Lamp	LED Fixtures	2,500	desk lamps	79,984	13.33	0
Weatherstripping	Air Sealing	42,500	linear feet of weatherstripping	52,580	2.01	7,083
Outlet Gaskets	Air Sealing	25,000	outlet gaskets	36,503	11.56	3,233
Connected LED	Connected LED Lamps	394	lamps	10,764	1.32	0
Total		90,394		579,931	82.87	20,850

Table 107. 2022 High School Innovation Channel Participation Summary by Measure

### **Savings Detail**

Table 108 through Table 110 present electric, demand, and gas impacts by measure for the 2022 High School Innovation channel.

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Pipe Insulation	28	100%	28	1.000	28
Bathroom Aerator	10	100%	10	1.000	10
Showerhead	89	100%	89	1.000	89
8W Directional LED	274	100%	274	1.000	274
LED Desk Lamp	80	100%	80	1.000	80
Weatherstripping	53	100%	53	1.000	53
Outlet Gaskets	37	100%	37	1.000	37
Connected LED	11	136%	15	1.000	15
Total	580	101%	584	1.000	584

#### Table 108. 2022 High School Innovation Channel Electric Energy Savings by Measure

Table 109. 2022 High School Innovation Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Pipe Insulation	<0.01	100%	<0.01	1.000	<0.01
Bathroom Aerator	0.01	100%	0.01	1.000	0.01
Showerhead	0.01	100%	0.01	1.000	0.01
8W Directional LED	0.03	100%	0.03	1.000	0.03
LED Desk Lamp	0.01	100%	0.01	1.000	0.01
Weatherstripping	<0.01	100%	<0.01	1.000	<0.01
Outlet Gaskets	0.01	100%	0.01	1.000	0.01
Connected LED	<0.01	136%	<0.01	1.000	<0.01
Total	0.08	101%	0.08	1.000	0.08

Table 110. 2022 High School Innovation Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Pipe Insulation	6,315	100%	6,315	1.000	6,315
Bathroom Aerator	398	100%	398	1.000	398
Showerhead	3,820	100%	3,820	1.000	3,820
Weatherstripping	7,083	100%	7,083	1.000	7,083
Outlet Gaskets	3,233	100%	3,233	1.000	3,233
Total	20,850	100%	20,850	1.000	20,850

We compared ex ante and verified savings for each measure and discovered one discrepancy in our final impact analysis. We describe this discrepancy between ex ante and verified gross savings estimates below.

Connected LEDs (2% of ex ante energy savings, 1% of ex ante demand savings): Savings for connected LEDs are estimated in a two-step process. First, savings for the efficiency gain from a baseline lighting product to a LED lighting product are estimated. Secondly, savings for the efficiency gain from connected LED controls are estimated. Both steps of the savings estimation process require application of an ISR. The IL-TRM V10.0 nominally defines different ISRs for LED efficiency gain and

the connected LED component of the savings estimates, which the implementation team applied as defined. However, we applied the connected LED-specific ISR of 84% in both steps, which increases energy and demand savings.

### 3.5.5 Community Kits Channel

The Community Kits channel provides energy saving kits and educational materials to AIC low-to-moderateincome customers in under-served/challenged communities at community events or following home visits conducted as part of the Income Qualified Initiative. The objective of the channel is to partner with communitybased organizations (CBOs) and diverse businesses to provide do-it-yourself no cost energy saving measures that will help improve the quality of life for our customers and start them on an energy efficiency journey. The channel is implemented primarily by Resource Innovations.

#### Summary of Key Implementation Changes in 2022

The key changes to channel design and implementation in 2022 are below:

- The channel added a kit portal that improved the quality and security of customer data collection for kit distribution.
- Green Home Experts served as the marketing vendor for the Community Kits channel. Their responsibilities included development, design, and delivery/distribution of the Community Kit channel's energy saving kits.

#### **Participation Summary**

In 2022, the Community Kits channel distributed 2,945 energy saving kits to AIC low-to-moderate-income customers in under-served/challenged communities. Table 111 summarizes the measures distributed through the Community Kits channel in 2022.

Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Standard LED	LED Screw Based Omnidirectional Bulbs	17,670	lamps	610,103	73.90	0
Advanced Power Strip	Advanced Power Strip - Tier 1	2,945	power strips	261,507	29.35	0
Showerhead	Low Flow Showerheads	5,890	showerheads	170,549	13.76	24,549
Kitchen Aerator	Low Flow Faucet Aerators	2,945	aerators	69,091	10.87	9,499
Bathroom Aerator	Low Flow Faucet Aerators	5,890	aerators	17,866	16.37	2,371
Pipe Insulation	Domestic Hot Water Pipe Insulation	8,835	linear feet of pipe insulation	31,348	3.60	5,403
Pipe Insulation	Domestic Hot Water Pipe Insulation	8,835	linear feet of pipe insulation	39,185	4.50	6,762
Door Sweep	Air Sealing	2,945	door sweeps	48,647	0.00	5,245
Total		55,955		1,248,296	152.36	53,829

### **Savings Detail**

Table 112 through Table 114 present electric, demand, and gas impacts by measure for the 2022 Community Kits channel.

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Standard LED	610	100%	610	1.000	610
Advanced Power Strip	262	100%	261	1.000	261
Showerhead	171	100%	170	1.000	170
Kitchen Aerator	69	82%	57	1.000	57
Bathroom Aerator	18	79%	14	1.000	14
Pipe Insulation	71	100%	71	1.000	71
Door Sweep	49	100%	49	1.000	49
Total	1,248	99%	1,232	1.000	1,232

#### Table 112. 2022 Community Kits Channel Electric Energy Savings by Measure

Table 113. 2022 Community Kits Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Standard LED	0.07	100%	0.07	1.000	0.07
Advanced Power Strip	0.03	100%	0.03	1.000	0.03
Showerhead	0.01	100%	0.01	1.000	0.01
Kitchen Aerator	0.01	82%	0.01	1.000	0.01
Bathroom Aerator	0.02	79%	0.01	1.000	0.01
Pipe Insulation	0.01	100%	0.01	1.000	0.01
Door Sweep	0.00	N/A	0.00	N/A	0.00
Total	0.15	96%	0.15	1.000	0.15

Table 114. 2022 Community Kits Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Showerhead	24,549	100%	24,537	1.000	24,537
Kitchen Aerator	9,499	82%	7,769	1.000	7,769
Bathroom Aerator	2,371	79%	1,871	1.000	1,871
Pipe Insulation	12,165	100%	12,159	1.000	12,159
Door Sweep	5,245	100%	5,243	1.000	5,243
Total	53,829	96%	51,578	1.000	51,578

We compared ex ante and verified savings for each measure. We describe discrepancies between ex ante and verified gross savings estimates below and provide explanations for each discrepancy.

- Quantity Adjustment: We verified savings for only 2,944 kits as compared to 2,945 kits claimed in tracking data. Review of tracking data indicated that one customer receiving a kit appears to be a nonresidential AIC customer for whom residential energy savings assumptions are not appropriate.
- Faucet Aerators (7% of ex ante energy, 18% of ex ante demand, and 22% of ex ante gas savings): The gross realization rates for kitchen and faucet aerators are 82% and 79%, respectively, for all fuels.
  - The implementation team applied the IL-TRM V10.0 ISR for Distributed Efficiency Kit (Income Eligible) of 55% and 57% for kitchen and bath aerators, respectively. We applied the Community Kits-specific ISR of 45% (for both kitchen and bath aerators). This change decreases electric energy, electric demand, and gas savings.

## 3.5.6 Ad Hoc Measure Distribution

AIC also conducted two ad hoc offerings to its customers in 2022: LED holiday light string exchanges; and distribution of energy saving kits at food banks that contained LED lighting, Tier 1 advanced power strips, and low-flow faucet aerators. These efforts were tracked as part of the Income Qualified Initiative's Single Family channel, but because they do not resemble the majority of that channel's efforts, we report on them separately here.

### **Participation Summary**

In 2022, AIC reported conducting 2,660 holiday string lighting exchanges and distribution of 5,000 energy efficiency kits at food banks. Table 111 summarizes these ad hoc distribution efforts.

Measure Category	IL-TRM Measure Name	Measure Quantity	Units	Ex Ante Gross kWh	Ex Ante Gross kW	Ex Ante Gross Therms
Holiday LED Lights	Holiday String Lighting	2,660	light strings	65,496	0.00	0
Food Bank Kit - 11W Directional LED	LED Specialty Lamps	15,000	lamps	760,501	90.32	0
Food Bank Kit - 5W Decorative LED	LED Specialty Lamps	20,000	lamps	657,223	78.05	0
Food Bank Kit - 15W Standard LED	LED Screw Based Omnidirectional Bulbs	10,000	lamps	611,003	74.01	0
Food Bank Kit - Advanced Power Strip	Advanced Power Strip – Tier 1	5,000	power strips	468,650	52.59	0
Food Bank Kit - 15W 3-Way LED	LED Specialty Lamps	5,000	lamps	400,436	47.56	0
Food Bank Kit - 9W Standard LED	LED Screw Based Omnidirectional Bulbs	10,000	lamps	364,458	44.15	0
Food Bank Kit - LED Nightlight	LED Nightlights	10,000	nightlights	185,584	0.00	0
Food Bank Kit - LED Desk Lamp	LED Fixtures	5,000	desk lamps	158,049	26.34	0
Food Bank Kit - Kitchen Aerator	Low Flow Faucet Aerators	5,000	aerators	123,820	19.48	22,205
Food Bank Kit - Bathroom Aerator	Low Flow Faucet Aerators	10,000	aerators	32,018	29.34	5,541
Total		97,660		3,827,238	461.85	27,747

#### Table 115. 2022 Ad Hoc Measure Distribution Participation Summary

## **Savings Detail**

Table 116 through Table 118 present electric, demand, and gas impacts by measure from 2022 ad hoc distribution efforts.

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
9W Standard LED	364	58%	210	1.000	210
Advanced Power Strip	469	58%	269	1.000	269
11W Directional LED	761	58%	437	1.000	437
15W Standard LED	611	58%	351	1.000	351
5W Decorative LED	657	58%	378	1.000	378
15W 3-Way LED	400	58%	230	1.000	230
LED Nightlight	186	58%	107	1.000	107
LED Desk Lamp	158	58%	91	1.000	91
Bathroom Aerator	32	58%	18	1.000	18
Kitchen Aerator	124	58%	71	1.000	71
Holiday Lights	65	32%	21	1.000	21
Total	3,827	57%	2,184	1.000	2,184

Toble 116	2022 14 14	o Mooouro	Distribution	Electric	Enorm	Covindo	by	Magaura
Table TTO.				Electric	CHEIgy	Javiligs	Dy	INICASULE

Table 117. 2022 Ad Hoc Measure Distribution Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
9W Standard LED	0.04	58%	0.03	1.000	0.03
Advanced Power Strip	0.05	58%	0.03	1.000	0.03
11W Directional LED	0.09	58%	0.05	1.000	0.05
15W Standard LED	0.07	58%	0.04	1.000	0.04
5W Decorative LED	0.08	58%	0.04	1.000	0.04
15W 3-Way LED	0.05	58%	0.03	1.000	0.03
LED Nightlight	0.00	N/A	0.00	N/A	0.00
LED Desk Lamp	0.03	58%	0.02	1.000	0.02
Bathroom Aerator	0.03	58%	0.02	1.000	0.02
Kitchen Aerator	0.02	58%	0.01	1.000	0.01
Holiday Lights	0.00	N/A	0.00	N/A	0.00
Total	0.46	58%	0.27	1.000	0.27

### Table 118. 2022 Ad Hoc Measure Distribution Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)	
Kitchen Aerator	22,205	58%	12,768	1.000	12,768	
Bathroom Aerator	5,541	58%	3,186	1.000	3,186	
Total	27,747	58%	15,954	1.000	15,954	

We compared ex ante and verified savings for each measure. We describe discrepancies between ex ante and verified gross savings estimates below and provide explanations for each discrepancy.

- Food Bank Kit (63% of ex ante energy savings, 38% of demand savings, and 7% of therm savings): The gross realization rate for the kit measures range is 58% for all savings.
  - The evaluation team applied an adjusted measure quantity of 2,875, based on back-up documentation on the number of kits distributed, whereas the implementation team used a quantity of 5,000, likely based on the number of kits purchased. This resulted in lower verified energy, demand, and therms savings. Further detail on this adjustment is presented in Appendix A.
- Holiday LED (3% of ex ante energy savings): The gross realization rate for the holiday LED light strings is 32% for energy savings. This measure does not claim demand or therm savings.
  - The evaluation team applied an adjusted measure quantity of 975, based on back-up documentation on the number of measures distributed, and applied the default leakage assumption of 13.1% from the IL-TRM V10.0. The implementation team used a quantity of 2,660, likely based on the number of measures purchased, and did not apply leakage assumptions. This resulted in lower verified energy savings. Further detail on this adjustment is presented in Appendix A.

# 3.5.7 Cumulative Persisting Annual Savings

Table 119 presents CPAS and WAML for the 2022 Kits Initiatives by channel. The table also includes a summary of the measurespecific and total verified gross savings for the Initiatives, as well as CPAS in each year of the 2022-2025 Plan.<sup>32</sup> The WAML for the Initiative is 10.1 years. Table 120 through Table 123 present CPAS and WAML by channel at a measure level.

		First-Year			CPAS ·	Verified Ne	et Savings (N	۸Wh	)	Lifetime
Channel	WAML	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
School Kits	10.0	3,028	1.000	3,028	3,028	2,722	2,722		1,933	 29,236
High School Innovation	11.8	584	1.000	584	584	584	584		486	 6,575
Community Kits	10.0	1,232	1.000	1,232	1,232	1,232	1,232		854	 12,022
Ad Hoc Distribution	9.5	2,135	1.000	2,184	2,184	2,184	2,184		1,337	 19,405
2022 CPAS		6,978	1.000	7,027	7,027	6,721	6,721		4,610	 67,238
Expiring 2022 CPAS				0	0	306	0		107	
Expired 2022 CPAS				0	0	306	306		2,417	
WAML	10.1									

<sup>&</sup>lt;sup>32</sup> For further detail, including achieved CPAS in years not presented in this table, please see the summary CPAS spreadsheet attached to this report.

Manager October 1	Measure	First-Year Verified	First-Year Verified			CPAS - Verified Net Savings (MWh)						
Measure Category	Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025		2030		Savings (MWh)	
Advanced Power Strip	7.0	454	1.000	454	454	454	454		0		3,178	
Pipe Insulation	15.0	96	1.000	96	96	96	96		96		1,433	
Bathroom Aerator	10.0	32	1.000	32	32	32	32		32		325	
Kitchen Aerator	10.0	268	1.000	268	268	268	268		268		2,676	
Shower Timer	2.0	306	1.000	306	306	0	0		0		612	
Showerhead	10.0	302	1.000	302	302	302	302		302		3,019	
8W Directional LED	10.0	1,241	1.000	1,241	1,241	1,241	1,241		906		11,401	
Door Sweep	20.0	151	1.000	151	151	151	151		151		3,016	
Weatherstripping	20.0	179	1.000	179	179	179	179		179		3,575	
2022 CPAS		3,028	1.000	3,028	3,028	2,722	2,722		1,933		29,236	
Expiring 2022 CPAS				0	0	306	0		0			
Expired 2022 CPAS				0	0	306	306		1,095			
WAML	10.0											

#### Table 120. 2022 School Kits Channel CPAS and WAML

#### Table 121. 2022 High School Innovation Channel CPAS and WAML

Maggura Catagony	Measure	First-Year Verified			CPAS - V	erified N	let Savin	gs (N	1Wh)	Lifetime
Measure Category	Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025		2030	 Savings (MWh)
Pipe Insulation	15.0	28	1.000	28	28	28	28		28	 421
Bathroom Aerator	10.0	10	1.000	10	10	10	10		10	 96
Showerhead	10.0	89	1.000	89	89	89	89		89	 888
8W Directional LED	10.0	274	1.000	274	274	274	274		200	 2,515
LED Desk Lamp	10.0	80	1.000	80	80	80	80		58	 735
Weatherstripping	20.0	53	1.000	53	53	53	53		53	 1,052
Outlet Gaskets	20.0	37	1.000	37	37	37	37		37	 730
Connected LED	10.0	15	1.000	15	15	15	15		12	 139
2022 CPAS		584	1.000	584	584	584	584	••••	486	 6,575
Expiring 2022 CPAS				0	0	0	0	••••	0	
Expired 2022 CPAS				0	0	0	0		98	
WAML	11.8									

Manager Cotogow	Measure	First-Year Verified	fied NTOD		CPAS - V	erified N	let Savin	igs (N	1Wh)	Lifetime
measure Category	Life	Gross Savings (MWh)	NIGR	2022	2023	2024	2025		2030	 Savings (MWh)
Standard LED	10.0	610	1.000	610	610	610	610		494	 5,751
Advanced Power Strip	7.0	261	1.000	261	261	261	261		0	 1,830
Showerhead	10.0	170	1.000	170	170	170	170		170	 1,705
Kitchen Aerator	10.0	57	1.000	57	57	57	57		57	 565
Bathroom Aerator	10.0	14	1.000	14	14	14	14		14	 141
Pipe Insulation	15.0	71	1.000	71	71	71	71		71	 1,058
Door Sweep	20.0	49	1.000	49	49	49	49		49	 973
2022 CPAS	•	1,232	1.000	1,232	1,232	1,232	1,232		854	 12,022
Expiring 2022 CPAS				0	0	0	0		0	
Expired 2022 CPAS				0	0	0	0		377	
WAML	10.0									

Table 122. 2022 Community Kits Channel CPAS and WAML

#### Table 123. 2022 Ad Hoc Measure Distribution CPAS and WAML

Measure		First-Year			CPAS - Ve	erified Net Sa	avings (MWI	1)		Lifetime
Measure Category	Life	Verified Gross Savings (MWh)	NTGR	2022	2023	2024	2025		2030	 Savings (MWh)
9W Standard LED	10.0	210	1.000	210	210	210	210		170	 1,976
Advanced Power Strip	7.0	269	1.000	269	269	269	269		0	 1,886
11W Directional LED	10.0	437	1.000	437	437	437	437		319	 4,019
15W Standard LED	10.0	321	1.000	351	351	351	351		285	 3,313
5W Decorative LED	10.0	378	1.000	378	378	378	378		253	 3,405
15W 3-Way LED	10.0	230	1.000	230	230	230	230		154	 2,075
LED Nightlight	8.0	107	1.000	107	107	107	107		0	 854
LED Desk Lamp	10.0	91	1.000	91	91	91	91		66	 835
Bathroom Aerator	10.0	18	1.000	18	18	18	18		18	 184
Kitchen Aerator	10.0	71	1.000	71	71	71	71		71	 712
Holiday Lights	7.0	21	1.000	21	21	21	21		0	 146
2022 CPAS		2,184	1.000	2,184	2,184	2,184	2,184		1,337	 19,405
Expiring 2022 CPAS				0	0	0	0		107	
Expired 2022 CPAS				0	0	0	0		847	
WAML	9.7									

# 3.5.8 Conclusions and Recommendations

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for AIC.

- Key Finding #1: The implementation team conducted several holiday light exchange and food bank kit distribution events towards the end of 2022. Based on back-up documentation, in both cases, the implementation team claimed savings for an incorrect quantity, likely the quantity purchased, which did not match the quantity distributed. Further, the implementation team did not provide sufficient documentation that the old holiday lights customers exchanged were also 25-bulb string lights (as assumed by the IL-TRM V10.0) or that there was verification that all recipients were AIC customers to avoid application of leakage assumptions.
  - Recommendation: For similar events in the future, claim savings only for measures distributed.
  - Recommendation: Before conducting holiday light exchange events in the future, coordinate with the evaluation team to discuss how the implementation team is ensuring the old lights are also 25-bulb strings.
  - Recommendation: For future holiday light exchange events, provide evidence that the implementation team verified all recipients were AIC customers; otherwise, use the default leakage assumptions specified by the applicable IL-TRM when calculating ex ante savings.

# Appendix A. Impact Analysis Methodology

# **Retail Products Initiative**

The evaluation team applied separate methodologies, detailed in the sections below, to estimate verified gross impacts for the incentive-based and Efficient Choice Tool channels of the 2022 Retail Products Initiative. In all cases, IL-TRM V10.0 algorithms were used to estimate unit-level measure savings. Table 124 lists the measures in the Retail Products Initiative, their corresponding IL-TRM entries, and whether or not TRM errata applied to the measure in the 2022 evaluation.

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
ENERGY STAR Air Purifier/Cleaner	5.1.1	No errata present
ENERGY STAR Clothes Washers	5.1.2	No errata present
ENERGY STAR Dehumidifier	5.1.3	No errata present
ENERGY STAR Freezer	5.1.5	No errata present
ENERGY STAR and CEE Tier 2 Refrigerator	5.1.6	No errata present
ENERGY STAR Room Air Conditioner	5.1.7	No errata present
ENERGY STAR Clothes Dryer	5.1.10	No errata present
ENERGY STAR Water Coolers	5.1.11	No errata present
Advanced Power Strip – Tier 1	5.2.1	No errata present
ENERGY STAR Ceiling Fan	5.3.15 & 5.5.9	No errata present
Advanced Thermostats	5.3.16	No errata present
High Efficiency Bathroom Exhaust Fan	5.3.9	No errata present
Gas Water Heater	5.4.2	No errata present
Heat Pump Water Heaters	5.4.3	No errata present
Low Flow Faucet Aerators	5.4.4	No errata present
Low Flow Showerheads	5.4.5	No errata present
LED Nightlights	5.5.11	No errata present
Connected LED Lamps	5.5.12 & 5.5.6/5.5.8	Errata are not relevant to 2022 impact evaluation
LED Specialty Lamps	5.5.6 & 4.5.4	Errata are not relevant to 2022 impact evaluation
LED Screw Based Omnidirectional Bulbs	5.5.8 & 4.5.4	Errata are not relevant to 2022 impact evaluation
LED Fixtures	5.5.9 & 4.5.4	Errata are not relevant to 2022 impact evaluation
High Efficiency Pool Pumps	5.7.1	No errata present

# **Gross Impact Methodology – Incentive Based Channels**

The evaluation team calculated verified savings for the incentive-based channels of the Retail Products Initiative by applying savings algorithms from the IL-TRM V10.0 to known information from initiative tracking data. We leveraged the wide range of measure specifications and participant information (e.g., LED wattage, bulb type, heating and cooling equipment type) in tracking data to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM V10.0.

#### **Measure Lives and Cumulative Persisting Annual Savings**

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS. For LED lighting, mid-life adjustments vary depending on whether products are assumed to reach market rate or IQ customers. Therefore, we leverage IQ allocations for Retail Products as defined in the Net Impact Methodology section below to apply appropriate mid-life adjustments for LED lighting products.

## **Gross Impact Methodology – Efficient Choice Tool Channel**

The evaluation team used a multi-step approach to estimate impacts from the Efficient Choice Tool channel of the Retail Products Initiative. Impact estimates are derived from customer self-reported ECT engagement and subsequent purchases of EE products as well as from model numbers provided by some customers as verification of their EE purchases. We then used implementer-tracked counts of unique active shoppers that interacted with the ECT to scale estimated EE purchase quantities to the population of ECT users and applied per-unit gross savings estimates and NTGRs for each product category. Figure 2 outlines the overarching process for estimating ECT savings.





### **Survey Sampling and Fielding**

Opinion Dynamics conducted two waves of online surveys with likely ECT users in 2022. We conducted the first wave in August of 2022 and included users from January through June. Our team fielded the second wave in February of 2023 and included users from July through December of 2022. The population of likely ECT users consisted of customers that created a profile or responded to a pop-up survey on the ECT website and those who engaged with marketing emails during the evaluation period (i.e., customers that clicked on embedded links directing them to the ECT). The sample excluded those who had already been included in prior ECT survey samples. Table 125 summarizes the sample, completes, and resulting survey yields by source.

Source		Wave 1	Wave 2			
Source	Sample	Completes	% Yield	Sample	Completes	% Yield
Engaged with ECT marketing email <sup>a</sup>	32,582	1,585	4.9%	18,386	2,592	14.1%
Responded to ECT pop-up survey	295	10	3.4%	245	46	18.8%
Created ECT profile	630	106	16.8%	637	109	17.1%
Total	33,507	1,701	5.1%	19,268	2,747	14.3%

#### Table 125. 2022 ECT Channel Survey Sample and Fielding Summary

Opinion Dynamics sent email invitations to customers inviting them to participate in the survey. Customers were offered a \$5 gift card for qualifying and completing the survey. They were also offered additional tiered incentives of \$5, \$10, or \$15 to provide verification of an efficient purchase in the form of a photo or hand-entered model number.

#### Purchase, Non-Rebated Purchase, and EE Purchase Rates

Of the customers that responded to the survey, 2,833 confirmed being an AIC customer and reported visiting the ECT website. The survey then presented each of these 2,833 respondents with a list of the product categories included on the ECT and asked them to identify which, if any, they considered or viewed using the ECT. Next, for any product categories they viewed, the survey asked which, if any, they later purchased, and which of those purchases received a discount or rebate from another AIC offering. Based on these responses, we calculated measure-level rates for each category that reflect a) the percentage of customers who considered each product category that later went on to purchase a product; and b) the percentage of those purchases that were not incentivized by an AIC offering.<sup>33</sup>

For respondents that reported making a purchase not discounted by AIC, the survey then asked if the purchase was of an energy-efficient ("EE") or ENERGY STAR product. To minimize respondent burden and survey attrition, we asked this question and associated follow-up questions for up to three product categories only. We used these responses to compute an EE purchase rate, or a portion of purchases that were reportedly EE. For relevant measures, we also asked for the quantity of units purchased.<sup>34</sup> By combining purchase rates with responses to these follow-up questions, we estimated counts of EE products purchased by survey respondents for each measure type. Of those who visited the ECT during the evaluation period, between 14% and 57% went on to make a purchase by the time of the survey (a respondent-weighted average of 38%). Among those who reported the efficiency of purchased products, the vast majority indicated EE purchases for most product categories. Those who did not indicate the efficiency of their purchased product are excluded from the calculation of EE purchase rate. Table 126 provides purchase, non-rebated purchase, and EE purchase rates for each product category.

<sup>&</sup>lt;sup>33</sup> We have historically explored this approach in the past and determined that customer self-report is the most viable current option for making this adjustment and appears to be relatively reliable as compared to other data sources.

<sup>&</sup>lt;sup>34</sup> We asked about quantities for light bulbs and power strips as other product categories are not typically purchased in multiples or, in the case of thermostats, do not produce additional savings.

Table 126. 2022 ECT Channel Counts of Respondent Purchases by Product Category

Product Category	Viewed on ECT	Purchased After Viewing	Purchase Rate	Purchased Non-Rebated	Non-Rebated Purchase Rate	Reported Efficiency	Reported EE Purchase	EE Purchase Rate
LED Lighting	524	300	57.3%	174	58.0%	126	113	89.7%
Advanced Power Strips	277	122	44.0%	63	51.6%	44	28	63.6%
Advanced Thermostats	1,244	664	53.4%	116	17.5%	115	77	67.0%
Air Purifiers	246	79	32.1%	54	68.4%	25	17	68.0%
Room Air Conditioners	305	85	27.9%	85	100.0%	35	29	82.9%
Dehumidifiers	318	98	30.8%	80	81.6%	60	47	78.3%
Dishwashers	237	67	28.3%	67	100.0%	25	19	76.0%
Refrigerators	520	145	27.9%	101	69.7%	73	56	76.7%
Freezers	200	64	32.0%	47	73.4%	25	20	80.0%
Clothes Washers	325	114	35.1%	73	64.0%	47	38	80.9%
Electric Clothes Dryers	273	94	34.4%	60	63.8%	28	18	64.3%
Gas Clothes Dryers	138	35	25.4%	35	100.0%	16	11	68.8%
Pool Pumps	28	9	32.1%	6	66.7%	3	1	33.3%
Heat Pump Water Heaters	222	31	14.0%	31	100.0%	34	21	61.8%
Gas Water Heaters	311	80	25.7%	80	100.0%	51	42	82.4%

#### **EE Verification**

The ECT does not provide incentives or deliver products directly to AIC customers, instead providing them with information and tools to help inform and influence their purchase decisions. As a result, the pilot cannot directly track product purchases. The evaluation team therefore relies on self-reported survey responses to quantify these purchases. As such, we also take steps in the survey to verify EE purchases by offering additional incentives for a proof of purchase.

We developed an EE verification rate to account for the degree to which customers may misreport purchases as EE when answering questions pertaining to EE purchase rates shown in Table 126. As part of the survey, we asked customers that reported purchasing at least one EE product to provide a model number to verify the purchase. In cases where customers reported multiple EE purchases, we asked about a single purchase to minimize respondent burden. To maximize sample sizes for uncommon product categories, we prioritized less commonly purchased measures.

We employed a tiered incentive strategy to encourage customers to provide model numbers via the most reliable method possible. We first offered respondents an additional \$15 incentive if they were willing to provide a photo of their purchase receipt or invoice. If they declined, we offered \$10 for a photo of the product nameplate. If they still declined, we offered \$5 for a manually entered model number. The evaluation team researched each legible model to determine whether they qualified as EE. In total, 135 respondents provided a valid model number and 91.1% of them validated the customer's EE claim. This single value is applied for all product categories due to limited sample sizes and minimal variation across categories.

#### **Population-Level EE Purchases**

Unlike traditional energy efficiency programs, ECT participation is not readily trackable in terms of customer or measure counts. Conceptually, the participant population would be every ECT visitor who has engaged with the site. To approximate this population, the evaluation team worked with implementer staff to review and apply their tracked counts of unique IP addresses engaging with the site and with specific product categories. We refer to these counts as unique active shoppers.

A unique active shopper is defined by Enervee as an ECT visitor that conducted at least one of nine specific actions on the site. The actions include: (1) engaged with recommendations, (2) selected a model, (3) sorted a list, (4) filtered products, (5) engaged with a histogram, (6) favorited a product, (7) tracked prices, (8) clicked on an offer, "(9) compare started" and "(10) compare button engaged." Implementer staff provided counts of unique active shoppers by product category for each month of the evaluation period (January through December 2022).

We used the measure-specific sum of unique active shopper counts across the evaluation period as the base to which we applied purchase rates, EE purchase rates, and EE verification rates to estimate total population-level EE purchases. Equation 1 outlines how measure-specific purchase rates and the average EE verification rate are applied to the unique active shopper counts to estimate total population-level EE purchases.

Equation 1. Population-Level EE Purchases Estimation

Population – Level EE Purchases<sub>P</sub> =  $UAS_P \times PR_P \times EEPR_p \times EEVR$ 

- UAS = Unique Active Shoppers
- PR = Purchase Rate
- EEPR = EE Purchase Rate
- EEVR = EE Verification Rate
- p = Product Category

#### Per-Unit Gross Savings Methodology

The evaluation team calculated verified savings for the ECT by applying per-unit gross savings using algorithms from the IL-TRM V10.0 along with evaluation assumptions about the appropriate parameters to apply for each measure. Table 127 lists the measures in the ECT a summary of per unit kWh, kW, and therm savings estimates for each.

Evaluation Measure Category	IL-TRM Measure	Per-Unit Gross kWh	Per-Unit Gross kW	Per-Unit Gross Therm
LED Lighting	5.5.6, 5.5.8	28.95	0.0038	N/A
Advanced Power Strips	5.2.1	56.60	0.0064	N/A
Advanced Thermostat	5.3.16	215.41	0.0741	75.91
Clothes Washer	5.1.2	58.60	0.0075	2.40
Electric Clothes Dryer	5.1.10	176.61	0.0237	N/A
Gas Clothes Dryer	5.1.10	N/A	N/A	0.85
Dishwasher	5.1.4	16.15	0.0012	0.62
Refrigerator	5.1.6	50.21	0.0076	N/A
Freezer	5.1.5	43.78	0.0071	N/A
Room Air Conditioner	5.1.7	19.22	0.0230	N/A
Dehumidifier	5.1.3	133.00	0.0300	N/A
Air Purifier	5.1.1	308.75	0.0353	N/A
Variable-Speed Pool Pump	5.7.1	260.42	0.3208	N/A
Heat Pump Water Heater	5.4.3	2,473.84	0.1172	N/A
Gas Water Heater	5.4.2	N/A	N/A	56.27

Table 127, 2022 Efficient Choice Tool Channel Measures Evaluated and Per Unit Savings Summary

#### Measure Lives and Cumulative Persisting Annual Savings

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS for the Efficient Choice Tool channel.

# **Net Impact Methodology**

The evaluation team applied SAG-approved NTGRs to verified gross savings to calculate verified net savings. NTGRs applied vary depending on whether sales are assumed to reach market rate or income qualified customers. Because the incentive-based channels of the Retail Products Initiative do not verify customer income, we estimate the IQ allocation using a consistent methodology and apply NTGRs accordingly.

- For POP channel offerings, IQ allocations are based on United States Census Bureau American Community Survey (ACS) data for all census tracts within a 10-mile radius of each store location. Each participating store location has an assigned percentage representing its expected incidence of IQ customers,<sup>35</sup> and by extension, the expected portion of sales going to IQ customers.
  - This approach does not apply to sales from thrift stores, for which IQ allocation is deemed at 100% in the absence of adequate research but with the understanding that these types of retailers tend to attract a higher proportion of IQ customers than other retail channels.
- For Downstream Rebate and Online Marketplace offerings, tracking data included customer addresses from rebate applications, allowing for assignment of IQ allocations based on individual participant ZIP codes. These IQ allocations use household-level data from ACS data to calculate the percentage of population that is IQ for each ZIP code in AIC's service territory. The evaluation team used these ZIP code-based IQ allocations to estimate the portion of purchases by each IQ participants based on the incidence of IQ customers in that ZIP code.<sup>36</sup>
- All Efficient Choice Tool-attributed purchases of products use market rate NTGRs.

Table 128 outlines the SAG-approved NTGR values applied to verified gross savings to calculate verified net savings.

Channel	Measure	Market Rate NTGR	IQ NTGR
	LED Lighting <sup>a</sup>	0.690	1.000
	Advanced Thermostats (Heating)	0.900	1.000
	Advanced Thermostats (Cooling)	0.800	1.000
	Advanced Power Strips	0.860	1.000
	Electric Clothes Dryers	0.670	1.000
	Clothes Washers	0.630	1.000
	Air Purifiers	0.790	1.000
Incentive-Based Channels	Refrigerators	0.650	1.000
	Heat Pump Water Heaters	0.800	1.000
	Dehumidifiers	0.670	1.000
	Variable-Speed Pool Pumps	0.760	1.000
	Bathroom Exhaust Fans	0.660	1.000
	Room Air Conditioners	0.720	1.000
	Freezers	0.630	1.000
	Water Dispensers	0.670	1.000

#### Table 128. 2022 SAG-Approved Retail Products Initiative NTGRs

<sup>&</sup>lt;sup>35</sup> IQ customers are defined as households with an income of 200% or less of the federal poverty level.

<sup>&</sup>lt;sup>36</sup> In the event that customer ZIP codes are unavailable, IQ allocation is set to 0%.

Channel	Measure	Market Rate NTGR	IQ NTGR
	All Other Measures	0.800	0.800
	Refrigerators	0.620	N/A
Efficient Chaiga Taol	Dishwashers	0.620	N/A
	Electric Dryers	0.610	N/A
	All Other Measures	0.676	N/A

<sup>a</sup> LED bulbs and fixtures sold at Big Box, DIY, or Warehouse retailers are excluded from consideration for 1.000 IQ NTGR; all sales at these locations use market rate NTGRs regardless of IQ allocation.

# **Income Qualified Initiative – Single Family Offerings**

# **Gross Impact Methodology**

The evaluation team calculated verified savings for the Income Qualified Initiative – Single Family Offerings by applying savings algorithms from the IL-TRM V10.0. The team leveraged initiative tracking data such as primary heating and cooling type, the delivery mechanism (e.g., direct install, leave-behind), LED wattage, LED lamp type, project location (e.g., for weather-dependent variables), and installed measure location (e.g., for faucet aerators) to inform savings assumptions. For variables outside these parameters, the evaluation team typically relied on defaults from the IL-TRM V10.0. Table 129 lists the measures in the IQ Initiative, their corresponding IL-TRM entry, and whether or not TRM errata applied to the measure in the 2022 evaluation.

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
ENERGY STAR Air Purifier/Cleaner	5.1.1	No errata present for this measure
ENERGY STAR Dehumidifier	5.1.3	No errata present for this measure
Income Qualified: ENERGY STAR Room Air Conditioner	5.1.13	No errata present for this measure
Advanced Power Strip – Tier 1	5.2.1	No errata present for this measure
Air Source Heat Pump	5.3.1	No errata present for this measure
Central Air Conditioning	5.3.3	No errata present for this measure
Furnace Blower Motor	5.3.5	No errata present for this measure
Gas High Efficiency Boiler	5.3.6	No errata present for this measure
Gas High Efficiency Furnace	5.3.7	No errata present for this measure
High Efficiency Bathroom Exhaust Fan	5.3.9	No errata present for this measure
Ductless Heat Pumps	5.3.12	No errata present for this measure
Advanced Thermostats	5.3.16	No errata present for this measure
Domestic Hot Water Pipe Insulation	5.4.1	No errata present for this measure
Gas Water Heater	5.4.2	No errata present for this measure
Heat Pump Water Heaters	5.4.3	No errata present for this measure
Low Flow Faucet Aerators	5.4.4	No errata present for this measure
Low Flow Showerheads	5.4.5	No errata present for this measure
Thermostatic Restrictor Shower Valve	5.4.8	No errata present for this measure
LED Specialty Lamps	5.5.6	Errata are not relevant to 2022 impact evaluation
LED Screw Based Omnidirectional Bulbs	5.5.8	Errata are not relevant to 2022 impact evaluation

#### Table 129. 2022 Income Qualified Initiative Measures Evaluated

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
Air Sealing	5.6.1	No errata present for this measure
Basement Sidewall Insulation	5.6.2	No errata present for this measure
Floor Insulation Above Crawl Space	5.6.3	No errata present for this measure
Wall Insulation	5.6.4	No errata present for this measure
Ceiling/Attic Insulation	5.6.5	No errata present for this measure
Rim/Band Joist Insulation	5.6.6	No errata present for this measure

### **IL-TRM Deviation – Space Constrained HVAC Systems**

In late 2022, the evaluation team identified a situation that occurred in the MHAS channel that we believe is not currently characterized accurately in the IL-TRM V10.0. This situation relates to baseline definitions for certain types of heat pumps and central air conditioners, defined as "space constrained products" in federal standards.<sup>37</sup> Federal standards prescribe different minimum standard baselines for these products for SEER, SEER2, HSPF, and HSPF2. The current IL-TRM includes baselines derived from the standard split system minimum standard only and does not offer a separate characterization for space constrained products. Table 130 shows the differences in the prescribed minimum standards values between standard split systems and space constrained products.

Table 130. Minimum Federal Standard Efficiencies for Split Systems vs. Space Constrained Products

Parameter	Standard Split System Minimum Standard (IL-TRM V10.0 Baseline)	Space Constrained Products Minimum Standard
SEER (Air conditioners)	13.0	12.0
SEER (Heat pumps)	14.0	12.0
HSPF (Heat pumps)	8.2	7.4

In the body of this Residential Program report, we deviate from the IL-TRM characterization in evaluation of these systems in the MHAS channel. As previously noted in Section 2.2.2, alternative estimates of first-year savings for these systems that comply with the IL-TRM V10.0 characterization are presented in 0.

### **Measure Lives and Cumulative Persisting Annual Savings**

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS.

### Net Impact Methodology

The evaluation team applied SAG-approved 2022 NTGRs to verified gross savings to calculate verified net savings. SAG-approved NTGRs for the Income Qualified Initiative are 1.00 for all measures. Therefore, gross savings are equivalent to net savings.

<sup>37 10</sup> CFR 430.2 "Space constrained product"

https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430#p-430.2(Space%20constrained%20product)

# **Multifamily Initiatives**

## **Gross Impact Methodology**

The evaluation team calculated verified savings for the Multifamily Initiatives by applying savings algorithms from the IL-TRM V10.0. The team leveraged information from the initiative tracking data such as primary heating and cooling type, the delivery mechanism (e.g., direct install, leave behind), LED wattage, LED lamp type, project location (e.g., for weather-dependent variables), and installed measure location (e.g., for faucet aerators) to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM V10.0. Table 131 lists the measures in the Multifamily Initiatives, their corresponding IL-TRM entry, and whether or not TRM errata applied to the measure in the 2022 evaluation.

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
LED Bulbs and Fixtures	4.5.4	Errata are not relevant to 2022 impact evaluation
ENERGY STAR and CEE Tier 2 Refrigerator	5.1.6	No errata present for this measure
ENERGY STAR Room Air Conditioner	5.1.7	No errata present for this measure
Advanced Power Strip – Tier 1	5.2.1	No errata present for this measure
Air Source Heat Pump	5.3.1	No errata present for this measure
Ductless Heat Pumps	5.3.12	No errata present for this measure
Advanced Thermostats	5.3.16	No errata present for this measure
Domestic Hot Water Pipe Insulation	5.4.1	No errata present for this measure
Low Flow Faucet Aerators	5.4.4	No errata present for this measure
Low Flow Showerheads	5.4.5	No errata present for this measure
Thermostatic Restrictor Shower Valve	5.4.8	No errata present for this measure
LED Specialty Lamps	5.5.6	Errata are not relevant to 2022 impact evaluation
LED Screw Based Omnidirectional Bulbs	5.5.8	Errata are not relevant to 2022 impact evaluation
Air Sealing	5.6.1	No errata present for this measure
Basement Sidewall Insulation	5.6.2	No errata present for this measure
Ceiling/Attic Insulation	5.6.5	No errata present for this measure
Rim/Band Joist Insulation	5.6.6	No errata present for this measure

#### Table 131. 2022 Multifamily Initiatives Measures Evaluated

### Measure Lives and Cumulative Persisting Annual Savings

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS.

### Net Impact Methodology

The evaluation team applied SAG-approved 2022 NTGRs to the verified gross savings to calculate verified net savings. Table 132 outlines the SAG-approved NTGR values applied to verified gross savings to calculate verified net savings.

Initiative/Channel	Measure	Electric NTGR	Gas NTGR
Income Qualified – Multifamily	All Measures	1.000	1.000
Market Rate Multifamily	Air Source Heat Pump	0.800	N/A
Market Rate Multifamily	Advanced Thermostat (Cooling)	0.800	N/A
Market Rate Multifamily	Advanced Thermostat (Heating)	0.900	0.900
Market Rate Multifamily	Standard LED	0.960	N/A
Market Rate Multifamily	Showerhead	1.004	1.000
Market Rate Multifamily	Specialty LED	0.960	N/A
Market Rate Multifamily	Advanced Power Strip – Tier 1	0.980	N/A
Market Rate Multifamily	Directional LED (Common Area)	0.773	N/A
Market Rate Multifamily	Standard LED (Common Area)	0.773	N/A
Market Rate Multifamily	Kitchen Faucet Aerator	1.004	1.000
Market Rate Multifamily	Door Sweep	0.861	0.800
Market Rate Multifamily	Restrictor Shower Valve	0.800	0.800
Market Rate Multifamily	Bathroom Faucet Aerator	1.004	1.000
Market Rate Multifamily	Directional LED	0.800	0.800
Market Rate Multifamily	Pipe Insulation	0.794	1.000
Market Rate Multifamily	Wall Plate Gasket	0.861	0.800
Public Housing	All Measures	1.000	1.000

#### Table 132. 2022 SAG-Approved Multifamily Initiatives NTGRs

# **Market Rate Single Family Initiative**

The evaluation team calculated verified savings for the Market Rate Single Family Initiative by applying savings algorithms from the IL-TRM V10.0. The team leveraged initiative tracking data such as primary heating and cooling type, new and existing heating and cooling efficiencies and capacities, project location (e.g., for weather-dependent variables), and water heater tank volumes. For variables outside these parameters, the evaluation team relied on default values from the IL-TRM V10.0. Table 133 lists the measures in the Market Rate Single Family Initiative, their corresponding IL-TRM entries, and whether TRM errata applied to the measure in the 2022 evaluation.

Table	133	2022	Market	Rate	Single	Family	Initiative	Measures	Evaluated
Ianc	TOO.	2022	IVIAINEL	nate	JIIIgic	I alling	muauve	ivicasules	Lvaluateu

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
Advanced Power Strip – Tier 1	5.2.1	No errata present for this measure
Air Source Heat Pump	5.3.1	No errata present for this measure
Ductless Heat Pumps	5.3.12	No errata present for this measure
Advanced Thermostats	5.3.16	No errata present for this measure
Central Air Conditioning	5.3.3	No errata present for this measure
High Efficiency Bathroom Exhaust Fan	5.3.9	No errata present for this measure
Domestic Hot Water Pipe Insulation	5.4.1	No errata present for this measure
Heat Pump Water Heaters	5.4.3	No errata present for this measure
Low Flow Faucet Aerators	5.4.4	No errata present for this measure
Low Flow Showerheads	5.4.5	No errata present for this measure

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
LED Specialty Lamps	5.5.6	Errata are not relevant to 2022 impact evaluation
LED Screw Based Omnidirectional Bulbs	5.5.8	Errata are not relevant to 2022 impact evaluation
Air Sealing	5.6.1	No errata present for this measure
Basement Sidewall Insulation	5.6.2	No errata present for this measure
Wall Insulation	5.6.4	No errata present for this measure
Ceiling/Attic Insulation	5.6.5	No errata present for this measure
Rim/Band Joist Insulation	5.6.6	No errata present for this measure

#### Measure Lives and Cumulative Persisting Annual Savings

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS.

### Net Impact Methodology

The evaluation team applied SAG-approved 2022 NTGRs to verified gross savings to calculate verified net savings. Table 134 outlines the SAG-approved NTGR values applied to verified gross savings to calculate verified net savings.

Channel	Measure	Electric NTGR	Gas NTGR
	Air Conditioners and Heat Pumps	0.800	N/A
Midstream HVAC	Heat Pump Water Heaters	0.800	0.800
	Advanced Thermostats – Cooling	0.800	N/A
	Advanced Thermostats – Heating	0.900	0.900
	Air Sealing (when insulation is also installed)	0.900	0.900
	Air Sealing (when insulation is not installed)	0.800	0.800
	Advanced Thermostats – Cooling	0.800	N/A
	Advanced Thermostats – Heating	0.900	0.900
	Insulation	0.800	0.800
	All Other Measures	0.800	0.800

Table 134. 2022 SAG-Approved Market Rate Single Family Initiative NTGRs

# **Kits Initiatives**

### Gross Impact Methodology

The evaluation team calculated verified savings for the Kits Initiatives by applying savings algorithms from the IL-TRM V10.0 to verified measure counts. The team primarily relied on defaults from the IL-TRM to inform savings assumptions given the delivery channel of the Initiatives. Table 135 lists the measures in the Kits Initiatives, their corresponding IL-TRM entry, and whether or not TRM errata applied to the measure in the 2022 evaluation.

IL-TRM Measure Name	IL-TRM Measure	Errata Applied?
Advanced Power Strip – Tier 1	5.2.1	No errata present for this measure
Domestic Hot Water Pipe Insulation	5.4.1	No errata present for this measure
Low Flow Faucet Aerators	5.4.4	No errata present for this measure
Low Flow Showerheads	5.4.5	No errata present for this measure
Shower Timer	5.4.9	No errata present for this measure
LED Specialty Lamps	5.5.6	Errata are not relevant to 2022 impact evaluation
LED Screw Based Omnidirectional Bulbs	5.5.8	Errata are not relevant to 2022 impact evaluation
Holiday String Lighting	5.5.10	No errata present for this measure
Connected LED	5.5.12 & 5.5.8	Errata are not relevant to 2022 impact evaluation
Air Sealing	5.6.1	No errata present for this measure

#### Table 135. 2022 Kits Initiatives Measures Evaluated

### **Kit Verification**

For ad hoc measure distribution efforts in 2022, initiative tracking data bundled holiday light distribution and food bank kit distribution into single database entries with no supporting data to verify quantities. The evaluation team requested, received, and reviewed back-up documentation (invoices and sign-up sheets) for these events. Based on our review of available data, we adjusted ex ante quantities based on the number of measures distributed that we could verify. Verified measure counts are shown in Table 136.

#### Table 136. Food Bank Kit and Holiday LED Verification Summary

Measure	Ex Ante Quantity	Verified Quantity	Verification Rate
Food Bank Kits	5,000	2,875	57.5%
Holiday LEDs	2,660	975	36.7%

Source: Opinion Dynamics review of backup documentation provided.

#### Measure Lives and Cumulative Persisting Annual Savings

The evaluation team applied measure lives, baseline shifts, and mid-life adjustments from the IL-TRM V10.0 to calculate CPAS.

#### Net Impact Methodology

The evaluation team applied SAG-approved 2022 NTGRs to verified gross savings to calculate verified net savings. SAG-approved NTGRs for the Kits Initiatives are 1.000 for all measures. Therefore, gross savings are equivalent to net savings.

# Appendix B. Additional Impacts

# Introduction

In this appendix, we provide additional quantified impacts from AIC's Residential Program that are not presented in the body of the report. Three specific types of additional inputs are provided:

- Summaries of fossil fuel impacts achieved by the Residential Program that cannot be directly claimed against AIC's goals but can be used in cost-effectiveness testing and support savings conversions under Illinois law;
- Summaries of gas penalties that are not counted toward goal attainment but are required for costeffectiveness analysis; and
- Summaries of secondary electric savings from water supply and wastewater treatment that are required for cost-effectiveness analysis.

# **Additional Fossil Fuel Impacts**

Some AIC customers receive natural gas from other providers or use unregulated fuels such as propane to serve their energy needs. Measures provided by AIC through its existing programs to these customers may save units of these fuels in addition to energy sources provided by AIC. While these savings cannot be directly claimed against AIC's energy savings goals, where possible, we quantify these impacts in this appendix to support both cost-effectiveness testing as well as savings conversions under Illinois state law.

The Retail Products Initiative was the only Residential Program component to produce quantifiable propane impacts in 2022.

### **Gas Penalties**

By agreement with SAG,<sup>38</sup> AIC is not penalized for gas penalties resulting from the installation of efficient prescriptive measures that create an increase in energy usage, when considering savings for goal attainment purposes. Therefore, we exclude those effects from all savings reported throughout the body of this report. However, these effects must be evaluated and considered as part of cost-effectiveness testing, and are therefore presented in this appendix.

In the following sections, the evaluation team focuses specifically on the following gas penalties:

- Lighting Heating Penalties. The inclusion of waste heat factors for lighting is based on the concept that heating loads are increased to supplement the reduction in waste heat that was once provided by the existing, less-efficient lamp type. The evaluation team applied the IL-TRM waste heat factors to lamps based on heating fuel types provided in the tracking database to arrive at gross heating penalties. For cases where tracking data did not provide the heating type, the team assumed natural gas heating, per the IL-TRM.
- Furnace Blower Motor Heating Penalties. High-efficiency fan motors operate at cooler temperatures than traditional furnace blower motors. The amount of heat that is released decreases due to cooler operating conditions. Heating equipment must make up for this loss of heat during the heating season,

<sup>&</sup>lt;sup>38</sup> Treatment of gas penalties is consistent with a draft SAG policy agreement on this topic. The draft agreement is no longer available on the SAG website but can be provided by the evaluation team on request. SAG is currently working to finalize the draft agreement.

resulting in an increase in HVAC heating loads. The team applied IL-TRM algorithms to calculate the associated heating penalty.

Heat Pump Water Heater Penalties. When HPWHs are installed in conditioned space, they move heat from the ambient air into water stored in a tank. During the heating season, this can result in an increase in HVAC heating loads. The team applied IL-TRM algorithms to calculate the associated heating penalty.

All gas penalties were calculated using algorithms from the IL-TRM V10.0 (with applicable errata applied).

### Secondary Electric Savings from Water Supply and Wastewater Treatment

Some measures delivered through the Residential Program produce water savings as well as energy savings. For applicable measures, the IL-TRM V10.0 includes an algorithm to calculate the secondary electric impacts of these water savings resulting from decreased electricity usage for water supply and wastewater treatment. As directly instructed in the IL-TRM, these savings may be included toward goal attainment but must be removed for the purpose of cost-effectiveness calculations. Therefore, we present these savings separately in this appendix to provide transparency on the reduced savings that will be used when conducting testing for cost-effectiveness. All secondary electric savings were calculated using algorithms from the IL-TRM V10.0.

# **Retail Products Initiative**

### **Additional Fossil Fuel Impacts**

A small number of advanced thermostats rebated through the Retail Products Initiative's incentive-based channels went to participants with propane heating. Propane savings associated with 34 thermostats distributed to customers with propane heating are reflected in Table 137.

Channel	Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGRª	Verified Net Savings (Therms)
Incentive-Based Channels	Advanced Thermostats	2,438	100%	2,438	0.929	2,265
Total		2,438	100%	2,438	0.929	2,265

#### Table 137. 2022 Retail Products Initiative Propane Savings by Measure

<sup>a</sup> NTGR values shown here are savings-weighted and reflect the application of SAG-approved NTGRs, deemed at 1.0 for IQ sales.

In 2022, AIC converted some propane savings produced by Retail Products-rebated advanced thermostats to CPAS for the purposes of goal attainment. Those conversion-related savings are presented separately in Appendix C.

### **Gas Penalties**

Table 138 presents gas penalties not reported in the body of the report for the Retail Products Initiative.

Channel	Measure	Therms
Incentive Record Channels	Standard LED	-920,118
	Decorative LED	-398,237

#### Table 138. 2022 Retail Products Initiative Gas Penalties

Channel	Measure	Therms
	Directional LED	-320,785
	LED Fixture	-325,729
	Connected LED	-12,583
	LED Nightlights	-10,531
	Heat Pump Water Heaters	-93
FOT	LED Lighting	-1,829
	Heat Pump Water Heaters	-10,931
Total Gas Penalties		-2,000,835

# Secondary Electric Savings from Water Supply and Wastewater Treatment

Table 139 presents secondary electric and water savings for the 2022 Retail Products Initiative.

Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
	ENERGY STAR Clothes Washers	3,306,581		16,566
Incentive-Based	Low Flow Faucet Aerators	1,216,296	5.04.0	6,094
onumeis	Low Flow Showerheads	3,648,888	5,010 kWh/million gala	18,281
ECT	ENERGY STAR Clothes Washers	770,738	KWN/ million gai	3,863
	ENERGY STAR Dishwashers	43,262		216
Total		6,593,595		33,035

Table 139	. 2022 Retail	Products	Initiative	Secondary	Electric	Savings
-----------	---------------	----------	------------	-----------	----------	---------

a Source: IL-TRM V10.0.

# **Total Impacts for Cost-Effectiveness**

Table 140 presents final 2022 Retail Products Initiative verified gross impacts to be used for costeffectiveness, adjusted for gas penalties and secondary electric savings.

Table 140	2022 Retail	Products	Initiative	Verified	Gross In	nnacts fo	or Cost-Effe	ctiveness
TADIC THO.		TTOUUCIO	muauvo	VCIIICU	01033 11	inpacto it		0010010000

	kWh	Therms (Gas)	Therms (Propane)	Water (Gal)
Verified Gross Impacts for Goal Attainment	127,836,131	1,600,377	N/A	N/A
Gas Penalties	N/A	-2,000,835	N/A	N/A
Water Savings	N/A	N/A	N/A	6,593,595
Secondary Electric Savings	-33,035	N/A	N/A	N/A
Propane Savings	N/A	N/A	2,438	N/A
Final Verified Gross Impacts for Cost-Effectiveness	127,803,096	-400,458	2,438	6,593,595

# **Income Qualified Initiative – Single Family Offerings**

### **Gas Penalties**

Table 141 presents gas penalties not reported in the body of the report for the Income Qualified Initiative – Single Family offerings.

Channel	Measure	Therms
	Standard LED	-2,847
	Decorative LED	-987
Single Family – Core	Directional LED	-212
	Heat Pump Water Heater	-1,623
	Furnace Blower Motor	-19
	Standard LED	-8,719
Single Family – SAVE Kits	Decorative LED	-5,116
	Directional LED	-4,288
Healthier Homes	Standard LED	-5
	Standard LED	-2,769
CAA	Decorative LED	-137
	Heat Pump Water Heater	-10
	Furnace Blower Motor	-348
	Standard LED	-892
	Furnace Blower Motor	-282
	Standard LED	-400
	Decorative LED	-140
Joint Utility	Directional LED	-33
	Heat Pump Water Heater	-2
	Furnace Blower Motor	-145
Total Gas Penalties		-28,977

Table 141 2022 Income	Qualified Initiative –	Single Family	Offerings Gas Penalties
			onerings aus renaries

# Secondary Electric Savings from Water Supply and Wastewater Treatment

Table 142 presents secondary electric and water savings for the Income Qualified Initiative.

Table 142. 2022 Income Qualified Initiative – Single Family Offerings Secondary Electric Savings

Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
	Low Flow Faucet Aerators	193,943		972
Single Family – Core	Low Flow Showerheads	161,468	<b>F</b> 040	809
	Thermostatic Restrictor Shower Valve	4,095	5,010 kWh/million gala	21
Single Femily SAVE Kite	Low Flow Faucet Aerators	2,664,866	KWN/ million gai	13,351
	Low Flow Showerheads	2,504,717		12,549

Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
	Thermostatic Restrictor Shower Valve	489,186		2,451
CAA	Low Flow Faucet Aerators	149,261		748
CAA	Low Flow Showerheads	293,874		1,472
	Low Flow Faucet Aerators	65,977		331
MHAS	Low Flow Showerheads	56,882		285
	Thermostatic Restrictor Shower Valve	16,440		82
	Low Flow Faucet Aerators	12,808		64
	Low Flow Showerheads	29,832		149
Total		6,643,351		33,283

<sup>a</sup> Source: IL-TRM V10.0.

# **Total Impacts for Cost-Effectiveness**

Table 143 presents final total 2022 Income Qualified Initiative – Single Family Offerings verified gross impacts to be used for cost-effectiveness, adjusted for gas penalties and secondary electric savings.

Table 143. 2022 Income Qualified Initiative - Single Family Offerings Verified Gross Impacts for Cost-Effectiveness

	kWh	Therms	Water (Gal)
Verified Gross Impacts for Goal Attainment	6,057,382	656,445	N/A
Gas Penalties	N/A	-28,977	N/A
Water Savings	N/A	N/A	6,643,351
Secondary Electric Savings	-33,283	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	6,024,099	627,468	6,643,351

# **Multifamily Initiatives**

### **Gas Penalties**

Table 144 presents gas penalties not reported in the body of the report for the Multifamily Initiatives by initiative/channel.

Initiative/Channel	Measure	Therms
	Standard LED	-10,272
	Decorative LED	-5,914
IO Multiformilu	Directional LED	-1,201
	Standard LED (Common Area)	-1,546
	Decorative LED (Common Area)	-27
	Directional LED (Common Area)	-370
Markat Data Multifamily	Standard LED	-720
	Decorative LED	-208

#### Table 144. 2022 Multifamily Initiatives Gas Penalties

Initiative/Channel	Measure	Therms
	Directional LED	-55
	Standard LED (Common Area)	-142
	Directional LED (Common Area)	-249
Public Housing	Standard LED	-661
Total Gas Penalties		-21,365

# Secondary Electric Savings from Water Supply and Wastewater Treatment

Table 145 presents secondary electric and water savings for the Multifamily Initiatives by initiative/channel.

Initiative/Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
	Low Flow Faucet Aerators	3,615,340		18,113
IQ Multifamily	Low Flow Showerheads	4,719,025		23,642
	Thermostatic Restrictor Shower Valve	848,114		4,249
	Low Flow Faucet Aerators	190,941	= 0.4 0	957
Market Rate Multifamily	Low Flow Showerheads	656,121	5,010 kWh/million gala	3,287
	Thermostatic Restrictor Shower Valve	53,877	KWN/ million gai	270
	Low Flow Faucet Aerators	915,292		4,586
Public Housing	Low Flow Showerheads	646,415		3,239
	Thermostatic Restrictor Shower Valve	89,346		448
Total Savings		11,734,471		58,790

Table 145. 2022 Multifamily Initiatives Secondary Electric Savings

<sup>a</sup> Source: IL-TRM V10.0.

# **Total Impacts for Cost-Effectiveness**

Table 146 presents the final total 2022 Multifamily Initiatives verified gross impacts to be used in the costeffectiveness analysis, adjusted for gas penalties and secondary electric savings.

Table 146.	2022 Multifamily	Initiatives	Verified Gross	Impacts for	<b>Cost-Effectiveness</b>
------------	------------------	-------------	----------------	-------------	---------------------------

	kWh	Therms	Gallons
Verified Gross Impacts for Goal Attainment	7,341,724	75,187	N/A
Gas Penalties	N/A	-21,365	N/A
Water Savings	N/A	N/A	11,734,471
Secondary Electric Savings	-58,790	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	7,282,934	53,821	11,734,471

# Market Rate Single Family Initiative

### **Gas Penalties**

Table 147 presents gas penalties not reported in the body of the report for the Market Rate Single Family Initiative by channel.

Channel	Measure	Therms
Midstream HVAC	Heat Pump Water Heater	-25
	Standard LED	-755
Home Efficiency	Decorative LED	-325
	Directional LED	-230
Total Gas Penalties		-1,334

				<b>A B W</b>
Table 147. 2022	Market Rate	e Single Famil	v Initiative	Gas Penalties

## Secondary Electric Savings from Water Supply and Wastewater Treatment

Table 148 presents water savings and secondary electric savings for the Market Rate Single Family Initiative by channel.

#### Table 148. 2022 Market Rate Single Family Initiative Secondary Electric Savings

Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
Llama Efficiency	Low Flow Faucet Aerators	532,709	E 010 kWb (million data	2,669
	Low Flow Showerheads	364,997		1,829
Total Savings		897,707		4,498

<sup>a</sup> Source: IL-TRM V10.0.

### **Total Impacts for Cost-Effectiveness**

Table 149 presents the final total 2022 Market Rate Single Family Initiative verified gross impacts to be used in the cost-effectiveness analysis, adjusted for gas penalties and secondary electric savings.

Table 149. 2022 Market Rate Single Family Initiative Verified Gross Impacts for Cost-Effectiveness

	kWh	Therms	Water (Gal)
Verified Gross Impacts for Goal Attainment	6,058,744	67,291	N/A
Gas Penalties	N/A	-1,334	N/A
Water Savings	N/A	N/A	897,707
Secondary Electric Savings	-4,498	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	6,054,246	65,957	897,707
## **Kits Initiatives**

### **Gas Penalties**

Table 150 presents gas penalties not reported in the body of the report for the Kits Initiatives by channel.

Channel	Measure	Therms
School Kits	Directional LED	-24,281
	Directional LED	-5,356
High School Innovation	LED Desk Lamp	-1,539
	Connected LED	-267
Community Kits	Standard LED	-1,408
	Standard LED	-10,925
	Directional LED	-8,558
Ad Hoc Measure Distribution	Decorative LED	-11,903
	LED Nightlight	-2,418
	LED Desk Lamp	-1,770
Total Gas Penalties		-68,426

Table 150. 2022 Kits Initiatives Gas Penalties

### Secondary Electric Savings from Water Supply and Wastewater Treatment

Table 151 presents water savings and secondary electric savings for the Kits Initiatives by channel.

Channel	Measure	Gallons	Conversion Factor	Secondary Electric Savings (kWh)
	Low Flow Faucet Aerators	5,399,883		27,053
School Kits	Low Flow Showerheads	4,556,018		22,826
	Shower Timer	4,621,064		23,152
High School Innovation	Low Flow Faucet Aerators	198,785	5,010	996
	Low Flow Showerheads	1,340,005	kWh/million gal <sup>a</sup>	6,713
Community Kite	Low Flow Faucet Aerators	4,321,328		21,650
	Low Flow Showerheads	7,195,636		36,050
Ad Hoc Measure Distribution	Low Flow Faucet Aerators	4,220,047		21,142
Total Savings		31,852,767		159,582

Table 151. 2022 Kits Initiatives Secondary Electric Savings

### **Total Impacts for Cost-Effectiveness**

Table 152 presents the final total 2022 Kits Initiatives verified gross impacts to be used in the costeffectiveness analysis, adjusted for gas penalties and secondary electric savings.

	kWh	Therms	Water (Gal)
Verified Gross Impacts for Goal Attainment	7,027,101	193,832	N/A
Gas Penalties	N/A	-68,426	N/A
Water Savings	N/A	N/A	31,852,767
Secondary Electric Savings	-159,582	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	6,867,518	125,406	31,852,767

### Table 152. 2022 Kits Initiatives Verified Gross Impacts for Cost-Effectiveness

# Appendix C. Cumulative Persisting Annual Savings

This appendix presents detailed CPAS for the 2022 AIC Residential Program and its subcomponents. Due to many years of CPAS, tables are challenging to read; please reference the separately provided CPAS spreadsheet for additional detail as needed.

Table 153 presents CPAS for the 2022 Residential Program through 2047. Lifetime savings for the Program are 11,487,236 MWh.

Natata Ali	14/4 5/1	First-Year Verified	NTOD	CPAS – Veri	fied Net MW	/h										
Initiative	WANIL	Gross MWh	NIGR	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Retail Products Initiative	10.4	127,836	0.830	106,136	106,136	106,136	106,136	87,441	85,749	84,972	68,675	68,222	67,483	27,042	13,917	12,907
Retail Products Carryover	9.5	11,217	0.751	8,421	8,421	8,421	8,421	6,432	6,218	6,170	5,115	5,112	5,112	12	12	12
IQ Initiative – Single Family Offerings	13.2	6,057	1.000	6,057	6,057	6,057	6,057	6,056	6,056	5,552	4,814	4,808	4,808	3,380	1,977	1,969
IQ Carryover	10.0	1,349	1.000	1,349	1,349	1,349	1,349	1,349	1,349	1,349	1,014	1,014	1,014	0	0	0
Multifamily Initiatives	12.7	7,342	0.973	7,144	7,144	7,144	6,995	6,778	6,774	6,518	6,060	6,060	6,060	4,288	3,378	3,378
Market Rate SF Initiative	15.7	6,059	0.802	4,857	4,857	4,857	4,857	4,827	4,827	4,827	4,816	4,815	4,815	4,764	4,569	4,569
Kits Initiatives	10.0	7,027	1.000	7,027	7,027	6,721	6,721	6,721	6,721	6,721	4,716	4,610	4,610	661	661	661
Kits Carryover	10.0	1,543	0.996	1,538	1,538	1,538	1,538	1,518	1,518	1,518	1,246	1,155	1,155	0	0	0
Residential NPSO Adder	10.4	2,565	1.000	1,910	1,910	1,910	1,910	1,264	1,205	1,177	1,083	1,082	1,066	594	300	282
IQ – Single Family (gas conversion)	18.7	5,342	1.000	5,342	5,342	5,342	5,342	5,342	5,342	2,861	2,861	2,580	2,580	2,580	1,624	1,624
IQ – Smart Savers (gas conversion)	11.0	3,957	1.000	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	0	0
RP (propane conversion)	11.0	71	0.929	66	66	66	66	66	66	66	66	66	66	66	0	0
2022 Portfolio CPAS		180,367	0.853	153,806	153,806	153,499	153,350	131,751	129,782	125,689	104,424	103,483	102,728	47,345	26,439	25,402
Expiring 2022 Portfolio CPAS	ring 2022 Portfolio CPAS			0	0	306	149	21,599	1,969	4,093	21,265	941	755	55,383	20,905	1,037
Expired 2022 Portfolio CPAS				0	0	306	456	22,055	24,024	28,117	49,382	50,323	51,078	106,461	127,366	128,403

Table 153. 2022 Residential Program CPAS and WAML

In this wait in a	14/A B.41	First-Year Verified	NTOD	CPAS – Ver	ified Net MW	′h										
Initiative	WANL	Gross MWh	NIGR	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Retail Products Initiative	10.4	127,836	0.830	12,907	12,490	406	221	94	94	10	10	10	7	0	0	0
Retail Products Carryover	9.5	11,217	0.751	12	9	0	0	0	0	0	0	0	0	0	0	0
IQ Initiative – Single Family Offerings	13.2	6,057	1.000	1,969	1,969	1,795	1,403	1,403	1,338	1,115	0	0	0	0	0	0
IQ Carryover	10.0	1,349	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Multifamily Initiatives	12.7	7,342	0.973	3,378	3,378	1,506	122	121	121	121	0	0	0	0	0	0
Market Rate SF Initiative	15.7	6,059	0.802	4,569	4,569	2,510	961	961	37	30	0	0	0	0	0	0
Kits Initiatives	10.0	7,027	1.000	661	661	467	467	467	467	467	0	0	0	0	0	0
Kits Carryover	10.0	1,543	0.996	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential NPSO Adder	10.4	2,565	1.000	282	270	101	35	32	3	1	0	0	0	0	0	0
IQ - Single Family (gas conversion)	18.7	5,342	1.000	1,624	1,624	1,624	1,624	1,624	1,624	1,624	68	68	68	68	68	0
IQ – Smart Savers (gas conversion)	11.0	3,957	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0
RP (propane conversion)	11.0	71	0.929	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 Portfolio CPAS		180,367	0.853	25,402	24,970	8,409	4,833	4,702	3,684	3,368	78	78	75	68	68	0
Expiring 2022 Portfolio CPAS				0	432	16,561	3,576	131	1,018	316	3,290	0	3	7	0	68
Expired 2022 Portfolio CPAS	iring 2022 Portfolio CPAS red 2022 Portfolio CPAS					145,397	148,973	149,104	150,122	150,438	153,728	153,728	153,731	153,737	153,737	153,806
WAMI	11.0													-		

## **Retail Products Initiative**

Table 153 presents CPAS for the 2022 Retail Products Initiative through 2045 by channel. Lifetime savings for the Initiative are 967,202 MWh.

Channel	Measure	First-Year Verified	NITOD	CPAS (Verifi	ied Net MWh	I)									
Chaimei	Life	Gross MWh	NIGR	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incentive-Based Channels	10.4	126,311	0.832	105,110	105,110	105,110	105,110	86,444	84,751	83,975	67,683	67,231	66,641	26,219	13,162
Efficient Choice Tool	13.5	1,525	0.673	1,026	1,026	1,026	1,026	997	997	997	992	992	842	822	755
2022 CPAS		127,836	0.830	106,136	106,136	106,136	106,136	87,441	85,749	84,972	68,675	68,222	67,483	27,042	13,917
Expiring 2022 CPAS				0	0	0	0	18,695	1,693	776	16,298	452	739	40,442	13,124
Expired 2022 CPAS		0	0	0	0	18,695	20,387	21,164	37,461	37,914	38,653	79,094	92,219		

#### Table 154. 2022 Retail Products Initiative CPAS and WAML

Measure	Measure	First-Year Verified		CPAS (Verifi	ed Net MWh	)									
Measure	Life	Gross MWh	MIGH	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Incentive-Based Channels	10.4	126,311	0.832	12,210	12,210	11,816	358	188	91	91	7	7	7	7	0
Efficient Choice Tool	13.5	1,525	0.673	698	698	674	48	33	3	3	3	3	3	0	0
2022 CPAS		127,836	0.830	12,907	12,907	12,490	406	221	94	94	10	10	10	7	0
Expiring 2022 CPAS	022 CPAS   127,836   0.8 (piring 2022 CPAS			1,010	0	418	12,083	185	127	0	85	0	0	3	7
kpired 2022 CPAS				93,229	93,229	93,646	105,730	105,915	106,042	106,042	106,126	106,126	106,126	106,129	106,136
WAML	10.4														

Table 155 presents CPAS for the 2022 Retail Products Initiative propane conversion through 2033. Lifetime savings for the conversion are 730 MWh.

#### Table 155. 2022 Retail Products Initiative - Propane Conversion CPAS and WAML

Measure	Measure	First-Year Verified	NTCP	CPAS (Verifi	ed Net MWh	)									
measure	Life	Gross MWh	NIGN	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Advanced Thermostats	11.0	71	0.929	66	66	66	66	66	66	66	66	66	66	66	0
2022 CPAS		71	0.929	66	66	66	66	66	66	66	66	66	66	66	0
Expiring 2022 CPAS	22 CPAS 71 0 Iring 2022 CPAS			0	0	0	0	0	0	0	0	0	0	0	66
Expired 2022 CPAS	ing 2022 CPAS ed 2022 CPAS			0	0	0	0	0	0	0	0	0	0	0	66
WAML	11.0														

## **Income Qualified Initiative – Single Family Offerings**

Table 156 presents CPAS for the 2022 Income Qualified Initiative – Single Family Offerings through 2043 by channel. Lifetime savings for the Initiative are 74,641 MWh.

Channol		First-Year Verified	NTOP	CPAS (Ver	ified Net M	Wh)								
Channer	WANE	Gross MWh	NIGR	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Single Family	15.6	2,133	1.000	2,133	2,133	2,133	2,133	2,133	2,133	1,748	1,667	1,661	1,661	1,351
SAVE Kits	10.3	1,615	1.000	1,615	1,615	1,615	1,615	1,615	1,615	1,615	1,013	1,013	1,013	201
Healthier Homes	10.3	1	1.000	1	1	1	1	1	1	1	0	0	0	0
CAA	16.0	889	1.000	889	889	889	889	887	887	840	804	804	804	544
Smart Savers	11.0	1,209	1.000	1,209	1,209	1,209	1,209	1,209	1,209	1,209	1,209	1,209	1,209	1,209
MHAS	11.7	103	1.000	103	103	103	103	103	103	73	65	65	65	43
Joint Utility	13.1	109	1.000	109	109	109	109	109	109	67	56	56	56	32
2022 CPAS		6,057	1.000	6,057	6,057	6,057	6,057	6,056	6,056	5,552	4,814	4,808	4,808	3,380
Expiring 2022 Cl	PAS			0	0	0	0	2	0	503	739	6	0	1,428
Expired 2022 CF	PAS			0	0	0	0	2	2	505	1,244	1,249	1,249	2,678

Table 156. 2022 Income Qualified Initiative – Single Family Offerings CPAS and WAML

Channel	WA MI	First-Year Verified		CPAS (Ver	ified Net M	Wh)								
Channer	WAIVIL	Gross MWh	MIGN	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Single Family	15.6	2,133	1.000	1,187	1,180	1,180	1,180	1,163	828	828	779	623	0	0
SAVE Kits	10.3	1,615	1.000	201	201	201	201	122	122	122	122	122	0	0
CAA	16.0	889	1.000	537	536	536	536	464	406	406	406	350	0	0
Smart Savers	11.0	1,209	1.000	0	0	0	0	0	0	0	0	0	0	0
MHAS	11.7	103	1.000	29	29	29	29	29	29	29	18	12	0	0
Joint Utility	13.1	109	1.000	23	23	23	23	17	17	17	12	7	0	0
Healthier Homes	10.3	1	1.000	0	0	0	0	0	0	0	0	0	0	0
2022 CPAS		6,057	1.000	1,977	1,969	1,969	1,969	1,795	1,403	1,403	1,338	1,115	0	0
Expiring 2022 Cl	PAS			1,402	8	0	0	174	392	0	65	223	1,115	0
Expired 2022 CF	PAS			4,080	4,088	4,088	4,088	4,262	4,654	4,654	4,720	4,943	6,057	6,057
WAML	13.2													

#### Cumulative Persisting Annual Savings

Table 157 presents CPAS for the 2022 Income Qualified Initiative – Single Family channel gas conversion through 2047. Lifetime savings for the conversion are 60,470 MWh.

Menaura	Measure	First-Year Verified	NITOD	CPAS (Verifi	ied Net MWh	)										
Measure	Life	Gross MWh	NIGR	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Advanced Thermostats	11.0	956	1.000	956	956	956	956	956	956	956	956	956	956	956	0	0
Gas High Efficiency Boiler (ER)	25.0	334	1.000	334	334	334	334	334	334	334	334	53	53	53	53	53
Gas High Efficiency Boiler (TOS)	25.0	15	1.000	15	15	15	15	15	15	15	15	15	15	15	15	15
Gas High Efficiency Furnace (ER)	20.0	3,593	1.000	3,593	3,593	3,593	3,593	3,593	3,593	1,112	1,112	1,112	1,112	1,112	1,112	1,112
Gas High Efficiency Furnace (TOS)	20.0	443	1.000	443	443	443	443	443	443	443	443	443	443	443	443	443
2022 CPAS		5,342	1.000	5,342	5,342	5,342	5,342	5,342	5,342	2,861	2,861	2,580	2,580	2,580	1,624	1,624
Expiring 2022 CPAS				0	0	0	0	0	0	2,481	0	281	0	0	956	0
Expired 2022 CPAS				0	0	0	0	0	0	2,481	2,481	2,762	2,762	2,762	3,719	3,719

Table 157. 2022 Income Qualified Initiative - Single Family Channel Gas Conversion CPAS and WAML

Maaaura	Measure	First-Year Verified	NTOD	CPAS (Verifi	ed Net MWh	)										
measure	Life	Gross MWh	NIGR	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Advanced Thermostats	11.0	956	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas High Efficiency Boiler (ER)	25.0	334	1.000	53	53	53	53	53	53	53	53	53	53	53	53	0
Gas High Efficiency Boiler (TOS)	25.0	15	1.000	15	15	15	15	15	15	15	15	15	15	15	15	0
Gas High Efficiency Furnace (ER)	20.0	3,593	1.000	1,112	1,112	1,112	1,112	1,112	1,112	1,112	0	0	0	0	0	0
Gas High Efficiency Furnace (TOS)	20.0	443	1.000	443	443	443	443	443	443	443	0	0	0	0	0	0
2022 CPAS		5,342	1.000	1,624	1,624	1,624	1,624	1,624	1,624	1,624	68	68	68	68	68	0
Expiring 2022 CPAS				0	0	0	0	0	0	0	1,556	0	0	0	0	68
Expired 2022 CPAS				3,719	3,719	3,719	3,719	3,719	3,719	3,719	5,274	5,274	5,274	5,274	5,274	5,342
WAML	18.7															

Table 158 presents CPAS for the 2022 Income Qualified Initiative – Smart Savers channel gas conversion through 2033. Lifetime savings for the conversion are 43,526 MWh.

Table 158. 2022 Income Qualified Initiative - Smart Savers Channel Gas Conversion CPAS and WAML

Managura	Measure	First-Year Verified	NTOD	CPAS (Verifi	ed Net MWh	)						2030 2031   050 3,050 3,050   334 834 834   73 73 73   57 3,957 3,957   0 0 0   0 0 0			
Measure	Life	Gross MWh	NIGR	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Advanced Thermostats – Single-Family Self-Install	11.0	3,050	1.000	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050	0
Advanced Thermostats – Single-Family Direct Install	11.0	834	1.000	834	834	834	834	834	834	834	834	834	834	834	0
Advanced Thermostats – Multifamily Direct Install	11.0	73	1.000	73	73	73	73	73	73	73	73	73	73	73	0
2022 CPAS		3,957	1.000	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	3,957	0
Expiring 2022 CPAS				0	0	0	0	0	0	0	0	0	0	0	3,957
Expired 2022 CPAS				0	0	0	0	0	0	0	0	0	0	0	3,957
WAML	11.0														

# **Multifamily Initiatives**

Table 159 presents CPAS for the 2022 Multifamily Initiatives through 2043 by channel. Lifetime savings for the Initiatives are 86,468 MWh.

Channel		First-Year Verified		CPAS (V	erified Ne	et MWh)								
Channer	VVAIVIL	Gross MWh	NIGK	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Income Qualified - Multifamily	12.5	5,074	1.000	5,074	5,074	5,074	4,933	4,830	4,827	4,709	4,313	4,313	4,313	2,892
Public Housing	13.6	851	1.000	851	851	851	849	848	848	791	761	761	761	578
Multifamily Market Rate	13.0	1,417	0.860	1,219	1,219	1,219	1,213	1,099	1,099	1,018	987	987	987	818
2022 CPAS		7,342	0.973	7,144	7,144	7,144	6,995	6,778	6,774	6,518	6,060	6,060	6,060	4,288
Expiring 2022 CPAS				0	0	0	149	217	4	257	457	0	0	1,772
Expired 2022 CPAS				0	0	0	149	366	370	626	1,084	1,084	1,084	2,856

Channel		First-Year Verified	NTOP	CPAS (V	erified Ne	et MWh)								
Channel	VVAIVIL	Gross MWh	NIGK	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Income Qualified - Multifamily	12.5	5,074	1.000	2,349	2,349	2,349	2,349	1,039	111	111	111	111	0	0
Public Housing	13.6	851	1.000	563	563	563	563	3	3	2	2	2	0	0
Multifamily Market Rate	13.0	1,417	0.860	465	465	465	465	464	7	7	7	7	0	0
2022 CPAS		7,342	0.973	3,378	3,378	3,378	3,378	1,506	122	121	121	121	0	0
Expiring 2022 CPAS				911	0	0	0	1,871	1,384	1	0	0	121	0
xpired 2022 CPAS				3,766	3,766	3,766	3,766	5,638	7,022	7,023	7,023	7,023	7,144	7,144
WAML	12.7													

# Market Rate Single Family Initiative

Table 160 presents CPAS for the 2022 Market Rate Single Family Initiative through 2043 by channel. Lifetime savings for the Initiative are 76,895 MWh.

Channel	W/A MI	First-Year Verified		CPAS (V	erified Ne	et MWh)								
Channel	WAINE	Gross MWh	MIGIN	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Midstream HVAC	15.8	5,896	0.801	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,724
Home Efficiency	13.0	162	0.810	132	132	132	132	101	101	101	90	90	90	40
2022 CPAS		6,059	0.802	4,857	4,857	4,857	4,857	4,827	4,827	4,827	4,816	4,815	4,815	4,764
Expiring 2022 CPAS				0	0	0	0	30	0	0	11	0	0	52
Expired 2022 CPAS				0	0	0	0	30	30	31	41	42	42	93

Table 160. 2022 Market Rate Single Family Initiative CPAS and WAML

Channel		First-Year Verified	NTCP	CPAS (V	erified Ne	et MWh)								
Channer	WAIVIL	Gross MWh	NTGR	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Midstream HVAC	15.8	5,896	0.801	4,532	4,532	4,532	4,532	2,473	924	924	0	0	0	0
Home Efficiency	13.0	162	0.810	38	38	38	38	37	37	37	37	30	0	0
2022 CPAS		6,059	0.802	4,569	4,569	4,569	4,569	2,510	961	961	37	30	0	0
Expiring 2022 CPAS				195	0	0	0	2,060	1,549	0	924	7	30	0
Expired 2022 CPAS				288	288	288	288	2,347	3,896	3,896	4,820	4,827	4,857	4,857
WAML	15.7			-			-	-			-			

## **Kits Initiatives**

Table 161 presents CPAS for the 2022 Kits Initiatives Initiative through 2043 by channel. Lifetime savings for the Initiatives are 67,238 MWh.

Channel	<b>WAMI</b>	First-Year Verified	NTGR	CPAS (V	erified Ne	et MWh)								
onanner	WAINE	Gross MWh	NI GIV	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
School Kits	10.0	3,028	1.000	3,028	3,028	2,722	2,722	2,722	2,722	2,722	1,933	1,933	1,933	425
High School Innovation Kits	11.8	584	1.000	584	584	584	584	584	584	584	486	486	486	117
Community Kits	10.0	1,232	1.000	1,232	1,232	1,232	1,232	1,232	1,232	1,232	854	854	854	119
Ad Hoc Distribution	9.5	2,184	1.000	2,184	2,184	2,184	2,184	2,184	2,184	2,184	1,444	1,337	1,337	0
2022 CPAS		7,027	1.000	7,027	7,027	6,721	6,721	6,721	6,721	6,721	4,716	4,610	4,610	661
Expiring 2022 CPAS				0	0	306	0	0	0	0	2,004	107	0	3,948
Expired 2022 CPAS				0	0	306	306	306	306	306	2,311	2,417	2,417	6,366

Table TOT. 2022 Mits initiatives of AS and WAIVIN	Table 161.	. 2022 Kits	Initiatives	<b>CPAS</b>	and \	WAML
---	------------	-------------	-------------	-------------	-------	------

Channel		First-Year Verified	NTOP	CPAS (V	erified Ne	et MWh)								
onamer	WAINE	Gross MWh	IN GIV	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
School Kits	10.0	3,028	1.000	425	425	425	425	330	330	330	330	330	0	0
High School Innovation Kits	11.8	584	1.000	117	117	117	117	89	89	89	89	89	0	0
Community Kits	10.0	1,232	1.000	119	119	119	119	49	49	49	49	49	0	0
Ad Hoc Distribution	9.5	2,184	1.000	0	0	0	0	0	0	0	0	0	0	0
2022 CPAS		7,027	1.000	661	661	661	661	467	467	467	467	467	0	0
Expiring 2022 CPAS				0	0	0	0	194	0	0	0	0	467	0
Expired 2022 CPAS				6,366	6,366	6,366	6,366	6,560	6,560	6,560	6,560	6,560	7,027	7,027
WAML	10.0													

## Carryover

Table 162 presents CPAS for the 2022 Residential Program carryover savings by initiative through 2033. Lifetime savings from Residential Program carryover savings are 94,646 MWh.

Initiative W	WAMI	First-Year Verified	NTCP	CPAS (Veri	fied Net MV	Vh)													
	TO AIME	Gross MWh	NT CITY	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Retail Products Carryover	9.5	11,217	0.751	8,421	8,421	8,421	8,421	6,432	6,218	6,170	5,115	5,112	5,112	12	12	12	12	9	0
Income Qualified Carryover	10.0	1,349	1.000	1,349	1,349	1,349	1,349	1,349	1,349	1,349	1,014	1,014	1,014	0	0	0	0	0	0
Kits Carryover	10.0	1,543	0.996	1,538	1,538	1,538	1,538	1,518	1,518	1,518	1,246	1,155	1,155	0	0	0	0	0	0
2022 CPAS		14,110	0.801	11,308	11,308	11,308	11,308	9,298	9,085	9,037	7,375	7,281	7,281	12	12	12	12	9	0
Expiring 2022 CPAS				0	0	0	0	2,010	214	48	1,662	94	0	7,269	0	0	0	2	9
Expired 2022 CPAS				6,098	6,098	6,098	6,098	8,107	8,321	8,369	10,031	10,124	10,124	17,393	17,394	17,394	17,394	17,396	17,406
WAML	9.6																		

Table 162. 2022 Residential Program Carryover Savings CPAS and WAML

# Appendix D. Income Qualified Initiative Participation Summary

Presented at stakeholder request, Table 163 through Table 166 provide a detailed summary of measures received by participants in the Single Family, CAA, and MHAS channels of the 2022 Income Qualified Initiative, with an explicit focus on characterizing the percentage of participants in each channel that received a given measure.

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
1,241	Air Source Heat Pump	37	3%	37	Systems	1
1,241	Air Sealing	774	62%	845,478	CFM	1,092
1,241	Ceiling/Attic Insulation	751	61%	819,895	Square Feet	1,092
1,241	Furnace Blower Motor	425	34%	425	Motors	1
1,241	Central Air Conditioning	124	10%	124	Systems	1
1,241	Advanced Thermostats	523	42%	523	Thermostats	1
1,241	High Efficiency Bathroom Exhaust Fan	721	58%	721	Fans	1
1,241	LED Screw Based Omnidirectional Bulbs	384	31%	3,594	Bulbs	9
1,241	Basement Sidewall Insulation	391	32%	42,910	Square Feet	110
1,241	Heat Pump Water Heaters	24	2%	24	Water Heaters	1
1,241	LED Specialty Lamps	283	23%	1,751	Bulbs	6
1,241	Wall Insulation	209	17%	173,103	Square Feet	828
1,241	Advanced Power Strip - Tier 1	265	21%	467	Power Strips	2
1,241	Duct Insulation and Sealing	23	2%	23	Participants	1
1,241	Rim/Band Joist Insulation	630	51%	76,116	Linear Feet	121
1,241	LED Specialty Lamps	58	5%	275	Bulbs	5
1,241	Ductless Heat Pumps	2	<1%	2	Systems	1
1,241	ENERGY STAR Room Air Conditioner	22	2%	57	Systems	3
1,241	Domestic Hot Water Pipe Insulation	149	12%	1,245	Linear Feet	8
1,241	Low Flow Showerheads	80	6%	89	Showerheads	1
1,241	Low Flow Faucet Aerators	120	10%	162	Aerators	1
1,241	Thermostatic Restrictor Shower Valve	9	1%	9	Valves	1

Table 163. Detailed 2022 IQ Initiative - Single Family Channel Participation Summary

Income Qualified Initiative Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
1,241	Gas High Efficiency Boiler	23	2%	23	Systems	1
1,241	Gas High Efficiency Furnace	604	49%	604	Systems	1

### Table 164. Detailed 2022 Income Qualified Initiative - CAA Channel Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
310	Air Sealing	279	90%	561,293	CFM	2,012
310	LED Screw Based Omnidirectional Bulbs	271	87%	5,237	Bulbs	19
310	Ceiling/Attic Insulation	238	77%	244,406	Square Feet	1,027
310	High Efficiency Bathroom Exhaust Fan	272	88%	273	Fans	1
310	Air Source Heat Pump	12	4%	12	Systems	1
310	Furnace Blower Motor	88	28%	88	Motors	1
310	Basement Sidewall Insulation	151	49%	20,005	Square Feet	132
310	Domestic Hot Water Pipe Insulation	191	62%	2,090	Linear Feet	11
310	Floor Insulation Above Crawl Space	52	17%	50,699	Square Feet	975
310	Heat Pump Water Heaters	9	3%	9	Water Heaters	1
310	Low Flow Showerheads	122	39%	149	Showerheads	1
310	Wall Insulation	86	28%	66,960	Square Feet	779
310	Ductless Heat Pumps	1	0%	2	Systems	2
310	LED Specialty Lamps	67	22%	417	Bulbs	6
310	Advanced Thermostats	21	7%	21	Thermostats	1
310	Low Flow Faucet Aerators	181	58%	343	Aerators	2
310	Rim/Band Joist Insulation	189	61%	25,663	Linear Feet	136
310	ENERGY STAR Room Air Conditioner	13	4%	16	Systems	1
310	Gas High Efficiency Boiler	3	1%	3	Systems	1

opiniondynamics.com

#### Income Qualified Initiative Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
310	Gas High Efficiency Furnace	108	35%	108	Systems	1
310	Gas Water Heater	33	11%	33	Water Heaters	1

Table 165. Detailed 2022 Income Qualified Initiative – MHAS Channel Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
115	Air Sealing	100	87%	42,494	CFM	425
115	Gas Furnace (ER)	62	54%	62	Systems	1
115	Gas Furnace (TOS)	1	1%	1	Systems	1
115	BPM Motor	61	53%	61	Motors	1
115	Advanced Thermostat	54	47%	54	Thermostats	1
115	Central Air Conditioner (TOS)	44	38%	44	Systems	1
115	LED Screw Based Omnidirectional Bulbs	44	38%	528	Bulbs	12
115	Advanced Power Strip – Tier 1	44	38%	44	Power Strips	1
115	Low Flow Showerheads	44	38%	44	Showerheads	1
115	Low Flow Faucet Aerators	44	38%	44	Aerators	1
115	Thermostatic Restrictor Shower Valve	44	38%	44	Valves	1
115	Low Flow Faucet Aerators	44	38%	44	Aerators	1
115	Bathroom Exhaust Fan	27	23%	27	Fans	1
115	Floor Insulation	10	9%	12,860	Square Feet	1,286

Table 166. Detailed 2022 Income Qualified Initiative - Joint Utility Channel Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
62	Central Air Conditioning	13	21%	13	Systems	1
62	LED Screw Based Omnidirectional Bulbs	50	81%	455	Bulbs	9
62	Furnace Blower Motor	32	52%	32	Motors	1

Income Qualified Initiative Participation Summary

Unique Participants	IL-TRM Measure Name	Participants Receiving Measure	% Participants Receiving Measure	Total Quantity	Unit	Average Quantity per Participant Receiving
62	Advanced Thermostats	45	73%	45	Thermostats	1
62	LED Specialty Lamps	31	50%	242	Bulbs	8
62	High Efficiency Bathroom Exhaust Fan	24	39%	24	Fans	1
62	Air Sealing	22	35%	13,446	CFM	611
62	Heat Pump Water Heaters	2	3%	2	Water Heaters	1
62	Advanced Power Strip - Tier 1	42	68%	47	Power Strips	1
62	Ceiling/Attic Insulation	23	37%	24,026	Square Feet	1,045
62	LED Specialty Lamps	18	29%	40	Bulbs	2
62	Low Flow Showerheads	14	23%	17	Showerheads	1
62	Domestic Hot Water Pipe Insulation	1	2%	9	Linear Feet	9
62	Rim/Band Joist Insulation	16	26%	1,686	Linear Feet	105
62	Low Flow Faucet Aerators	17	27%	21	Aerators	1
62	Wall Insulation	1	2%	367	Square Feet	367

# Appendix E. Alternative Savings Estimates

Table 167 presents alternative estimates for electric energy savings for central air conditioners installed through the 2022 Income Qualified Initiative's MHAS channel. As discussed in Section 2.2.2 and Appendix A, the evaluation team deviated from the IL-TRM characterization of this measure in the body of this report. This table presents estimates of annual electric energy savings for this measure that comply with the IL-TRM V10.0 characterization. Note that electric demand savings did not deviate from the IL-TRM V10.0 characterization, and therefore estimates of electric demand savings presented in the body of the report remain accurate under either treatment.

Table 167. 2022 Income Qualified Initiative - MHAS Channel Alternative Electric Energy Savings Estimates

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Central Air Conditioners (As Reported)	11	100%	11	1.000	11
Central Air Conditioners (Alternative Estimate)	11	31%	3	1.000	3

### For more information, please contact:

Hannah Howard Senior Vice President

510 214 0183 tel hhoward@opiniondynamics.com

1000 Winter Street Waltham, MA 02451



	Boston   Headquarters	San Francisco Bay	San Diego	Portland
	617 492 1400 tel 617 492 7944 fax 800 966 1254 toll free	510 444 5050 tel 510 444 5222 fax	858 270 5010 tel 858 270 5211 fax	503 287 9136 tel 503-281-7375 fax
5	1000 Winter Street Waltham, MA 02451	1 Kaiser Plaza Suite 445 Oakland, CA 94612	1200 Prospect Street Suite #G-100 La Jolla, CA 92037	1500 NE Irving Street Suite #370 Portland, OR 97232