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ComEd Single Family Retrofits – Income Eligible Program Impact Evaluation Report

Energy Efficiency/Demand Response Plan: Program Year 2021 (CY2021) (1/1/2021-12/31/2021)

Prepared for:

ComEd

FINAL

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Prepared by:

Molly Lipman
Guidehouse

Tony Chen
Guidehouse

Gabriela Gaitan
Guidehouse

Christy Zook
Guidehouse

Submitted to:

ComEd
2011 Swift Drive
Oak Brook, IL 60523

Submitted by:

Guidehouse Inc.
150 N. Riverside Plaza, Suite 2100
Chicago, IL 60606

Contact:

Charles Maglione, Partner
703.431.1983
cmaglione@guidehouse.com

Jeff Erickson, Director
608.616.4962
jeff.erickson@guidehouse.com

Neil Curtis, Associate Director
802.431.1983
neil.curtis@guidehouse.com

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1. Introduction

The CY2021 Income Eligible Single Family Savings (CBA) and Single Family Illinois Home Weatherization Assistance Program (IHWAP) programs are offered jointly to income-eligible single family households served by ComEd, Nicor Gas, Peoples Gas, and North Shore Gas. This report presents the results of the impact evaluation of the CY2021 ComEd programs. The gas programs will be covered in separate reports.

This report summarizes the total energy and demand impacts for each program broken out by relevant measure and program structure details. The appendices provide the impact analysis methodology and details of the total resource cost (TRC) analysis inputs. CY2021 covers January 1, 2021 through December 31, 2021.

2. Program Description

The Single Family Retrofits – Income Eligible (IE) Program offers direct installation of energy efficiency measures and replacement of inefficient equipment. ComEd homeowners with a household income at or below 80% of the Area Median Income (AMI) qualify for participation. Eligible measures include light-emitting diode (LED) and energy efficient lighting retrofits, programmable thermostats, advanced power strips, water efficiency devices, weatherization measures, pipe insulation, refrigerators, heating and cooling equipment, and custom energy-saving measures for eligible properties. The program also offers installation of health and safety measures including vents, electrical repairs, and asbestos and mold remediation.

This program has two components:

- The Income Eligible Single Family Savings (CBA) program component is administered by ComEd, Peoples Gas, and North Shore Gas and is implemented by Franklin Energy Services.
- The Single Family – Illinois Home Weatherization Assistance Program (IHWAP) program component is administered by ComEd, Peoples Gas, North Shore Gas, and Nicor Gas and is implemented by Resource Innovations in partnership with IHWAP.

The CBA portion had 2,103 participants and distributed 8,148 measures in CY2021. The IHWAP portion had 577 participants and distributed 6,736 measures in CY2021 (see Table 2-1).

Table 2-1. Number of Participants and Projects

Participation	CBA	IHWAP	Total
Total Participants	2,103	577	**2,680**
Total Projects	8,148	6,736	**14,884**

Project is defined as a unique Project ID

Source: ComEd tracking data and evaluation team analysis

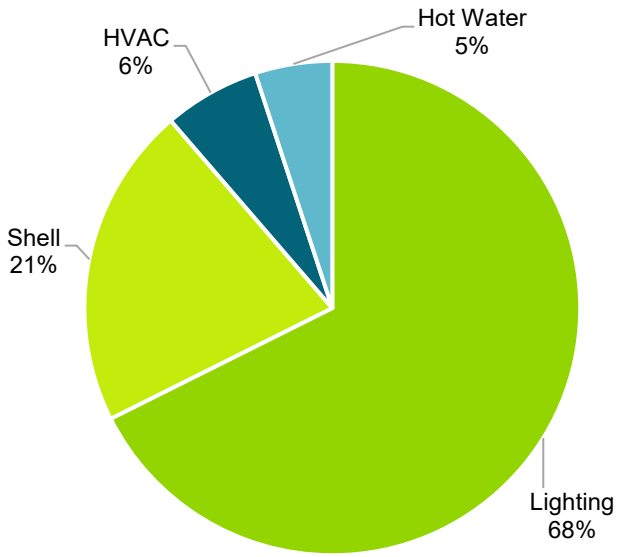
The CBA program component included the measures shown in Table 2-2 and Figure 2-1. For insulation measures the quantity is based on projects instead of square footage. For all other measures the quantity is based on each unit.

Table 2-2. CBA Number of Measures by Type

End Use Type	Research Category	Quantity	Unit
Shell	Air Sealing	1,118	Projects
Shell	Attic Insulation	1,097	Projects
Shell	Wall Insulation	1,618	Projects
Lighting	LED Omnidirectional Bulb - Interior	6,675	Each
Lighting	LED Specialty Lamp - Interior	6,148	Each
HVAC	Bathroom Exhaust Fan - Bathroom	1,104	Each
Lighting	LED Specialty Lamp - Exterior	155	Each
Lighting	LED Omnidirectional Bulb - Exterior	66	Each
HVAC	Programmable Thermostat	98	Each
Hot Water	Low Flow Showerhead	442	Each
Shell	Floor Insulation	135	Projects
HVAC	Advanced Thermostat	7	Each
Shell	Rim Insulation	102	Projects
Hot Water	Low Flow Faucet Aerator - Kitchen	142	Each
Hot Water	HW Pipe Insulation	268	Projects
Hot Water	Low Flow Faucet Aerator - Bathroom	119	Each
	Total	**19,294**	

Quantity for shell projects is per installation for comparison rather than square feet.
HVAC – heating, ventilation, and air conditioning
HW – Hot water
Note: The rows are sorted by verified gross savings.
Source: ComEd tracking data and evaluation team analysis

Figure 2-1. CBA Number of Measures Installed by Type



Source: ComEd tracking data and evaluation team analysis

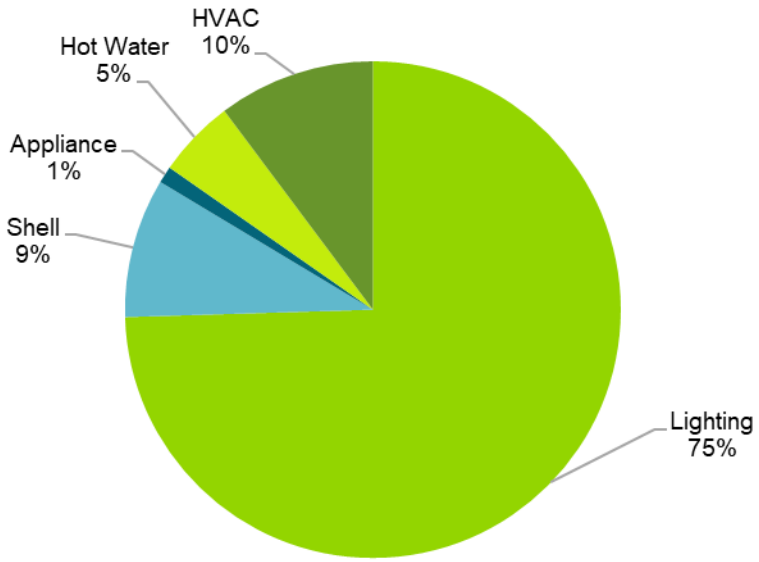
The IHWAP program component included the measures shown in Table 2-3 and Figure 2-2.

Table 2-3. IHWAP Number of Measures by Type

End Use Type	Research Category	Quantity	Unit
Lighting	LED Omnidirectional Bulb - Interior	11,410	Each
HVAC	Central Air Conditioning - ER	248	Each
Shell	Air Sealing	526	Projects†
HVAC	Gas High Efficiency Furnace - ER	242	Each
Shell	Attic Insulation	486	Projects†
HVAC	Advanced Thermostat	285	Each
HVAC	Bathroom Exhaust Fan	598	Each
HVAC	Duct Insulation and Sealing - Distribution Efficiency	76	Each
Lighting	LED Specialty Lamp - Exterior	205	Each
Appliance	Refrigerator - ER	102	Each
Lighting	LED Omnidirectional Bulb - Exterior	317	Each
Shell	Wall Insulation	156	Projects†
Shell	Basement Sidewall Insulation	115	Projects†
HVAC	Central Air Conditioning - TOS	89	Each
HVAC	Air Source Heat Pump - ER	2	Each
Lighting	LED Specialty Lamp - Interior	471	Each
Appliance	Room AC - ER	61	Each
HVAC	Furnace Tune-Up	68	Each
HVAC	Programmable Thermostat	82	Each
Shell	Rim Insulation	198	Projects†
Hot Water	HW Pipe Insulation	724	Each
Shell	Floor Insulation	29	Projects†
Hot Water	Low Flow Showerhead	36	Each
HVAC	Furnace Blower Motor	1	Each
Appliance	Freezer	17	Each
Hot Water	Low Flow Faucet Aerator - Kitchen	12	Each
Hot Water	Low Flow Faucet Aerator - Bathroom	50	Each
Appliance	Refrigerator - TOS	3	Each
HVAC	Gas High Efficiency Boiler - ER	1	Each
HVAC	Gas High Efficiency Boiler - TOS	4	Each
HVAC	Gas High Efficiency Furnace - TOS	6	Each
Hot Water	Gas Water Heater - ER	24	Each
	Total	**16,644**	

† Quantity for shell projects is per installation for comparison rather than square feet.
Note: The rows are sorted by verified gross savings.
Acronyms in the table: Early Replacement (ER), Time of Sale (TOS), Air Conditioning (AC)
Source: ComEd tracking data and evaluation team analysis

Figure 2-2. IHWAP Number of Measures Installed by Type



Source: ComEd tracking data and evaluation team analysis

3. Program Savings Detail

Table 3-1 summarizes the incremental energy and demand savings the CBA program component achieved in CY2021. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs.[1]

The total energy savings received a realization rate of 1.01 however the savings reported as gross energy savings (kWh) included both pure electric savings and converted gas savings. The converted gas savings had the effect of increasing the ex ante energy savings and lowering the realization rate. Section 6.1.1 further explains the 0.15 realization rate.

Table 3-1. CBA Total Annual Incremental Electric Savings

Savings Category	Units	Ex Ante Gross Savings	Program Gross Realization Rate	Verified Gross Savings*	Program Net-to-Gross Ratio (NTG)	CY2019 Net Carryover Savings	CY2020 Net Carryover Savings	Verified Net Savings
Electric Energy Savings - Direct	kWh	11,716,234	0.15	1,801,107	1.00	0	0	1,801,107
Adjusted Electric Energy Savings - Direct	kWh	1,897,829	0.95	1,801,107	1.00	0	0	1,801,107
Electric Energy Savings - Converted from Gas‡	kWh	9,967,614	1.00	9,996,603	1.00	N/A	N/A	9,996,603
Total Electric Energy Savings	kWh	11,716,234	1.01	11,797,710	1.00	0	0	11,797,710
Summer Peak§ Demand Savings	kW	774	0.92	712	1.00	0	0	712

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).
‡ Gas savings are converted to kilowatt-hours (kWh) by multiplying therms by 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation team will determine which gas savings will be converted to kWh and counted toward ComEd's electric savings goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-25) of the Illinois Public Utilities Act, “In no event shall more than 10% of each year's applicable annual incremental goal as defined in paragraph (7) of subsection (g) of this Section be met through savings of fuels other than electricity.”
§ The coincident summer peak period is defined as 1:00-5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August.
Source: ComEd tracking data and evaluation team analysis

Table 3-2 summarizes the incremental energy and demand savings the IHWAP program component achieved in CY2021. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs.[2]

Table 3-2. IHWAP Total Annual Incremental Electric Savings

Savings Category	Units	Ex Ante Gross Savings*	Program Gross Realization Rate	Verified Gross Savings*	Program Net-to-Gross Ratio (NTG)	CY2019 Net Carryover Savings	CY2020 Net Carryover Savings	Verified Net Savings†
Electric Energy Savings - Direct	kWh	1,983,801	1.00	1,979,150	1	N/A	N/A	1,979,150
Electric Energy Savings - Converted from Gas‡	kWh	1,166,472	1.00	1,166,495	1	N/A	N/A	1,166,495
Total Electric Energy Savings	kWh	3,150,274	1.00	3,145,645	1	N/A	N/A	3,145,645
Summer Peak§ Demand Savings	kW	610	1.00	611	1	N/A	N/A	611

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).
† Verified net savings includes net carryover savings from CY2019 and CY2020.
§ The coincident summer peak period is defined as 1:00-5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August.
Source: ComEd tracking data and evaluation team analysis

[1] The evaluation team will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.
[2] The evaluation team will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

4. Cumulative Persisting Annual Savings

4.1 CBA

Table 4-1 to Table 4-3 and Figure 4-1 show the measure-specific and total verified gross savings for the CBA program component and the cumulative persisting annual savings (CPAS) for the measures installed in CY2021. The electric CPAS across all measures installed in 2021 is shown in Table 4-1. The CY2021 gas contribution to CPAS (converted to equivalent electricity) is shown in Table 4-2. The combined savings are shown in Table 4-3. The historic rows in each table are the CPAS contribution back to CY2018. The Program Total Electric CPAS and the Program Total Gas CPAS are the sum of the CY2021 contribution and the historic contribution. Figure 4-1 shows the savings across the effective useful life (EUL) of the measures.

Table 4-1. CBA Cumulative Persisting Annual Savings – Electric

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	2018	2019	2020	2021	2022	2023	2024	2025	2026
Shell	Air Sealing	20.0	725,381	1.00	12,455,110				725,381	725,381	725,381	725,381	725,381	725,381
Shell	Attic Insulation	20.0	290,204	1.00	5,358,076				290,204	290,204	290,204	290,204	290,204	290,204
Shell	Wall Insulation	20.0	263,637	1.00	4,871,491				263,637	263,637	263,637	263,637	263,637	263,637
Lighting	LED Omnidirectional Bulb - Interior	10.0	253,740	1.00	2,100,939				253,740	253,740	253,740	253,740	253,740	253,740
Lighting	LED Specialty Lamp - Interior	10.0	194,135	1.00	1,623,224				194,135	194,135	194,135	194,135	194,135	194,135
HVAC	Bathroom Exhaust Fan - Bathroom	19.0	32,607	1.00	619,527				32,607	32,607	32,607	32,607	32,607	32,607
Lighting	LED Specialty Lamp - Exterior	6.9	17,542	1.00	114,522				17,542	17,542	17,542	17,542	17,542	17,542
Hot Water	Low Flow Showerhead	10.0	6,384	1.00	63,842				6,384	6,384	6,384	6,384	6,384	6,384
Lighting	LED Omnidirectional Bulb - Exterior	8.0	5,227	1.00	37,324				5,227	5,227	5,227	5,227	5,227	5,227
HVAC	Programmable Thermostat	16.0	4,987	1.00	79,798				4,987	4,987	4,987	4,987	4,987	4,987
Shell	Floor Insulation	20.0	3,396	1.00	63,990				3,396	3,396	3,396	3,396	3,396	3,396
HVAC	Advanced Thermostat	11.0	1,447	1.00	15,916				1,447	1,447	1,447	1,447	1,447	1,447
Shell	Rim Insulation	20.0	1,348	1.00	25,259				1,348	1,348	1,348	1,348	1,348	1,348
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	668	1.00	6,685				668	668	668	668	668	668
Hot Water	HW Pipe Insulation	15.0	231	1.00	3,460				231	231	231	231	231	231
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	172	1.00	1,722				172	172	172	172	172	172
CY2021 Program Total Electric Contribution to CPAS			**1,801,107**		**27,440,886**				**1,801,107**	**1,801,107**	**1,801,107**	**1,801,107**	**1,801,107**	**1,801,107**
Historic Program Total Electric Contribution to CPAS‡						**2,041,077**	**4,258,997**	**4,257,133**	**3,841,134**	**3,841,134**	**3,831,385**	**3,548,210**	**3,486,118**	**3,425,990**
Program Total Electric CPAS						**2,041,077**	**4,258,997**	**4,257,133**	**5,642,241**	**5,642,241**	**5,632,492**	**5,349,317**	**5,287,225**	**5,227,097**
CY2021 Program Incremental Expiring Electric Savings§														
Historic Program Incremental Expiring Electric Savings									**415,999**		**9,749**	**283,175**	**62,092**	**60,128**
Program Total Incremental Expiring Electric Savings									**415,999**		**9,749**	**283,175**	**62,092**	**60,128**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Shell	Air Sealing	725,381	725,381	725,381	538,790	538,790	538,790	538,790	538,790	538,790	538,790	538,790	538,790	538,790	538,790			
Shell	Attic Insulation	290,204	290,204	290,204	249,658	249,658	249,658	249,658	249,658	249,658	249,658	249,658	249,658	249,658	249,658			
Shell	Wall Insulation	263,637	263,637	263,637	227,159	227,159	227,159	227,159	227,159	227,159	227,159	227,159	227,159	227,159	227,159			
Lighting	LED Omnidirectional Bulb - Interior	144,624	144,624	144,624	144,624													
Lighting	LED Specialty Lamp - Interior	114,604	114,604	114,604	114,604													
HVAC	Bathroom Exhaust Fan - Bathroom	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607				
Lighting	LED Specialty Lamp - Exterior	9,273																
Hot Water	Low Flow Showerhead	6,384	6,384	6,384	6,384													
Lighting	LED Omnidirectional Bulb - Exterior	2,980	2,980															
HVAC	Programmable Thermostat	4,987	4,987	4,987	4,987	4,987	4,987	4,987	4,987	4,987	4,987							
Shell	Floor Insulation	3,396	3,396	3,396	3,039	3,039	3,039	3,039	3,039	3,039	3,039	3,039	3,039	3,039	3,039			
HVAC	Advanced Thermostat	1,447	1,447	1,447	1,447	1,447												
Shell	Rim Insulation	1,348	1,348	1,348	1,193	1,193	1,193	1,193	1,193	1,193	1,193	1,193	1,193	1,193	1,193			
Hot Water	Low Flow Faucet Aerator - Kitchen	668	668	668	668													
Hot Water	HW Pipe Insulation	231	231	231	231	231	231	231	231	231								
Hot Water	Low Flow Faucet Aerator - Bathroom	172	172	172	172													
CY2021 Program Total Electric Contribution to CPAS		**1,601,944**	**1,592,671**	**1,589,692**	**1,325,564**	**1,059,110**	**1,057,663**	**1,057,663**	**1,057,663**	**1,057,663**	**1,057,433**	**1,052,445**	**1,052,445**	**1,052,445**	**1,019,839**			
Historic Program Total Electric Contribution to CPAS‡		**3,423,185**	**3,020,760**	**2,597,578**	**2,534,744**	**2,534,744**	**2,523,683**	**1,806,806**	**1,806,806**	**1,806,806**	**1,806,806**	**1,668,799**	**1,624,171**	**527,281**	**527,281**	**527,281**	**527,281**	
Program Total Electric CPAS		**5,025,129**	**4,613,431**	**4,187,269**	**3,860,308**	**3,593,855**	**3,581,346**	**2,864,470**	**2,864,470**	**2,864,470**	**2,864,239**	**2,721,244**	**2,676,617**	**1,579,726**	**1,547,120**	**527,281**	**527,281**	
CY2021 Program Incremental Expiring Electric Savings§		**199,163**	**9,273**	**2,980**	**264,128**	**266,453**	**1,447**				**231**	**4,987**			**32,607**	**1,019,839**		
Historic Program Incremental Expiring Electric Savings		**2,805**	**402,425**	**423,182**	**62,833**		**11,062**	**716,876**				**138,007**	**44,627**	**1,096,890**				**527,281**
Program Total Incremental Expiring Electric Savings		**201,968**	**411,698**	**426,162**	**326,961**	**266,453**	**12,509**	**716,876**			**231**	**142,995**	**44,627**	**1,096,890**	**32,607**	**1,019,839**		**527,281**

Note: The green highlighted cell shows program total first-year electric savings. The gray cells are blank, indicating values irrelevant to the CY2021 contribution to CPAS.

* A deemed value. Source: Illinois Stakeholder Advisory Group (SAG) website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historical savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

Table 4-2. CBA Cumulative Persisting Annual Savings – Gas

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings (Therms)†	Verified Net Therms Savings 2018	2019	2020	2021	2022	2023	2024	2025	2026
Shell	Air Sealing	20.0	136,334	1.00	2,629,451				136,334	136,334	136,334	136,334	136,334	136,334
Shell	Attic Insulation	20.0	89,250	1.00	1,713,232				89,250	89,250	89,250	89,250	89,250	89,250
Shell	Wall Insulation	20.0	106,813	1.00	2,047,468				106,813	106,813	106,813	106,813	106,813	106,813
Lighting	LED Omnidirectional Bulb - Interior	10.0		1.00										
Lighting	LED Specialty Lamp - Interior	10.0		1.00										
HVAC	Bathroom Exhaust Fan - Bathroom	19.0		1.00										
Lighting	LED Specialty Lamp - Exterior	6.9		1.00										
Hot Water	Low Flow Showerhead	10.0	1,811	1.00	18,111				1,811	1,811	1,811	1,811	1,811	1,811
Lighting	LED Omnidirectional Bulb - Exterior	8.0		1.00										
HVAC	Programmable Thermostat	16.0	3,234	1.00	51,738				3,234	3,234	3,234	3,234	3,234	3,234
Shell	Floor Insulation	20.0	1,411	1.00	27,141				1,411	1,411	1,411	1,411	1,411	1,411
HVAC	Advanced Thermostat	11.0	481	1.00	5,295				481	481	481	481	481	481
Shell	Rim Insulation	20.0	633	1.00	12,074				633	633	633	633	633	633
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	197	1.00	1,969				197	197	197	197	197	197
Hot Water	HW Pipe Insulation	15.0	854	1.00	12,804				854	854	854	854	854	854
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	48	1.00	481				48	48	48	48	48	48
CY2021 Program Total Gas Contribution to CPAS (Therms)			**341,065**		**6,519,764**				**341,065**	**341,065**	**341,065**	**341,065**	**341,065**	**341,065**
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡									**9,996,603**	**9,996,603**	**9,996,603**	**9,996,603**	**9,996,603**	**9,996,603**
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§								**7,797,142**	**7,797,142**	**7,797,142**	**7,797,142**	**7,797,142**	**7,797,142**	**7,797,142**
Program Total Gas CPAS (kWh Equivalent)								**7,797,142**	**17,793,745**	**17,793,745**	**17,793,745**	**17,793,745**	**17,793,745**	**17,793,745**
CY2021 Program Incremental Expiring Gas Savings (Therms)														**0**
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)‖														**0**
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)														
Program Total Incremental Expiring Gas Savings (kWh Equivalent)														**0**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Shell	Air Sealing	136,334	136,334	136,334	129,926	129,926	129,926	126,584	126,584	126,584	126,584	126,584	126,584	126,584	126,584	
Shell	Attic Insulation	89,250	89,250	89,250	82,998	82,998	82,998	82,624	82,624	82,624	82,624	82,624	82,624	82,624	82,624	
Shell	Wall Insulation	106,813	106,813	106,813	98,993	98,993	98,993	98,646	98,646	98,646	98,646	98,646	98,646	98,646	98,646	
Lighting	LED Omnidirectional Bulb - Interior															
Lighting	LED Specialty Lamp - Interior															
HVAC	Bathroom Exhaust Fan - Bathroom															
Lighting	LED Specialty Lamp - Exterior															
Hot Water	Low Flow Showerhead	1,811	1,811	1,811	1,811											
Lighting	LED Omnidirectional Bulb - Exterior															
HVAC	Programmable Thermostat	3,234	3,234	3,234	3,234	3,234	3,234	3,234	3,234	3,234	3,234					
Shell	Floor Insulation	1,411	1,411	1,411	1,317	1,317	1,317	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312	
HVAC	Advanced Thermostat	481	481	481	481	481										
Shell	Rim Insulation	633	633	633	581	581	581	580	580	580	580	580	580	580	580	
Hot Water	Low Flow Faucet Aerator - Kitchen	197	197	197	197											
Hot Water	HW Pipe Insulation	854	854	854	854	854	854	854	854	854						
Hot Water	Low Flow Faucet Aerator - Bathroom	48	48	48	48											
CY2021 Program Total Gas Contribution to CPAS (Therms)		**341,065**	**341,065**	**341,065**	**320,440**	**318,384**	**317,903**	**313,832**	**313,832**	**313,832**	**312,979**	**309,745**	**309,745**	**309,745**	**309,745**	
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡		**9,996,603**	**9,996,603**	**9,996,603**	**9,392,096**	**9,331,835**	**9,317,725**	**9,198,428**	**9,198,428**	**9,198,428**	**9,173,408**	**9,078,631**	**9,078,631**	**9,078,631**	**9,078,631**	
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§		**7,797,142**	**7,783,418**	**7,783,418**	**7,158,623**	**7,103,480**	**7,103,480**	**7,080,514**	**7,080,514**	**7,075,588**	**7,075,588**	**7,075,588**	**7,075,588**	**7,075,588**	**-**	
Program Total Gas CPAS (kWh Equivalent)		**17,793,745**	**17,780,020**	**17,780,020**	**16,550,719**	**16,435,315**	**16,421,205**	**16,278,942**	**16,278,942**	**16,274,015**	**16,248,996**	**16,154,219**	**16,154,219**	**16,154,219**	**9,078,631**	
CY2021 Program Incremental Expiring Gas Savings (Therms)					**20,625**	**2,056**	**481**	**4,070**			**854**	**3,234**				**309,745**
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)‖					**604,506**	**60,262**	**14,110**	**119,297**			**25,020**	**94,777**				**9,078,631**
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)			**13,725**		**624,795**	**55,143**		**22,966**		**4,927**					**7,075,588**	
Program Total Incremental Expiring Gas Savings (kWh Equivalent)			**13,725**		**1,229,301**	**115,404**	**14,110**	**142,263**		**4,927**	**25,020**	**94,777**			**7,075,588**	**9,078,631**

Note: The green highlighted cell shows program total first-year gas savings in kWh equivalents. The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2021.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.

§ Historic savings go back to CY2020.

‖ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

Table 4-3. CBA Cumulative Persisting Annual Savings– Total

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings (Including Those Converted from Gas Savings) 2018	2019	2020	2021	2022	2023	2024	2025	2026
Shell	Air Sealing	20.0	4,721,319	1.00	89,524,318				4,721,319	4,721,319	4,721,319	4,721,319	4,721,319	4,721,318
Shell	Attic Insulation	20.0	2,906,117	1.00	55,572,915				2,906,117	2,906,117	2,906,117	2,906,117	2,906,117	2,906,117
Shell	Wall Insulation	20.0	3,394,335	1.00	64,882,781				3,394,335	3,394,335	3,394,335	3,394,335	3,394,335	3,394,335
Lighting	LED Omnidirectional Bulb - Interior	10.0	253,740	1.00	2,100,939				253,740	253,740	253,740	253,740	253,740	253,740
Lighting	LED Specialty Lamp - Interior	10.0	194,135	1.00	1,623,224				194,135	194,135	194,135	194,135	194,135	194,135
HVAC	Bathroom Exhaust Fan - Bathroom	19.0	32,607	1.00	619,527				32,607	32,607	32,607	32,607	32,607	32,607
Lighting	LED Specialty Lamp - Exterior	6.9	17,542	1.00	114,522				17,542	17,542	17,542	17,542	17,542	17,542
Hot Water	Low Flow Showerhead	10.0	59,466	1.00	594,662				59,466	59,466	59,466	59,466	59,466	59,466
Lighting	LED Omnidirectional Bulb - Exterior	8.0	5,227	1.00	37,324				5,227	5,227	5,227	5,227	5,227	5,227
HVAC	Programmable Thermostat	16.0	99,764	1.00	1,596,228				99,764	99,764	99,764	99,764	99,764	99,764
Shell	Floor Insulation	20.0	44,739	1.00	859,500				44,739	44,739	44,739	44,739	44,739	44,739
HVAC	Advanced Thermostat	11.0	15,557	1.00	171,123				15,557	15,557	15,557	15,557	15,557	15,557
Shell	Rim Insulation	20.0	19,892	1.00	379,157				19,892	19,892	19,892	19,892	19,892	19,892
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	6,439	1.00	64,386				6,439	6,439	6,439	6,439	6,439	6,439
Hot Water	HW Pipe Insulation	15.0	25,250	1.00	378,757				25,250	25,250	25,250	25,250	25,250	25,250
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	1,582.0	1.00	15,820				1,582	1,582	1,582	1,582	1,582	1,582
CY2021 Program Total Contribution to CPAS			**11,797,710**		**218,535,181**				**11,797,710**	**11,797,710**	**11,797,710**	**11,797,710**	**11,797,710**	**11,797,710**
Historic Program Total Contribution to CPAS‡						**2,041,077**	**4,258,997**	**12,054,276**	**11,638,277**	**11,638,277**	**11,628,527**	**11,345,352**	**11,283,260**	**11,223,133**
Program Total CPAS						**2,041,077**	**4,258,997**	**12,054,276**	**23,435,987**	**23,435,987**	**23,426,237**	**23,143,062**	**23,080,971**	**23,020,842**
CY2021 Program Incremental Expiring Savings§														**0**
Historic Program Incremental Expiring Savings‖									**415,999**		**9,749**	**283,175**	**62,092**	**60,128**
Program Total Incremental Expiring Savings#									**415,999**		**9,749**	**283,175**	**62,092**	**60,128**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Shell	Air Sealing	4,721,318	4,721,318	4,721,318	4,346,929	4,346,929	4,346,929	4,248,958	4,248,958	4,248,958	4,248,958	4,248,958	4,248,958	4,248,958	4,248,958			
Shell	Attic Insulation	2,906,117	2,906,117	2,906,117	2,682,331	2,682,331	2,682,331	2,671,358	2,671,358	2,671,358	2,671,358	2,671,358	2,671,358	2,671,358	2,671,358			
Shell	Wall Insulation	3,394,335	3,394,335	3,394,335	3,128,642	3,128,642	3,128,642	3,118,480	3,118,480	3,118,480	3,118,480	3,118,480	3,118,480	3,118,480	3,118,480			
Lighting	LED Omnidirectional Bulb - Interior	144,624	144,624	144,624	144,624													
Lighting	LED Specialty Lamp - Interior	114,604	114,604	114,604	114,604													
HVAC	Bathroom Exhaust Fan - Bathroom	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607	32,607				
Lighting	LED Specialty Lamp - Exterior	9,273																
Hot Water	Low Flow Showerhead	59,466	59,466	59,466	59,466													
Lighting	LED Omnidirectional Bulb - Exterior	2,980	2,980															
HVAC	Programmable Thermostat	99,764	99,764	99,764	99,764	99,764	99,764	99,764	99,764	99,764	99,764							
Shell	Floor Insulation	44,739	44,739	44,739	41,640	41,640	41,640	41,491	41,491	41,491	41,491	41,491	41,491	41,491	41,491			
HVAC	Advanced Thermostat	15,557	15,557	15,557	15,557	15,557												
Shell	Rim Insulation	19,892	19,892	19,892	18,225	18,225	18,225	18,182	18,182	18,182	18,182	18,182	18,182	18,182	18,182			
Hot Water	Low Flow Faucet Aerator - Kitchen	6,439	6,439	6,439	6,439													
Hot Water	HW Pipe Insulation	25,250	25,250	25,250	25,250	25,250	25,250	25,250	25,250	25,250								
Hot Water	Low Flow Faucet Aerator - Bathroom	1,582	1,582	1,582	1,582													
CY2021 Program Total Contribution to CPAS		**11,598,547**	**11,589,274**	**11,586,294**	**10,717,660**	**10,390,945**	**10,375,388**	**10,256,091**	**10,256,091**	**10,256,091**	**10,230,841**	**10,131,076**	**10,131,076**	**10,131,076**	**10,098,470**			
Historic Program Total Contribution to CPAS‡		**11,220,327**	**10,804,177**	**10,380,995**	**9,693,367**	**9,638,224**	**9,627,163**	**8,887,321**	**8,887,321**	**8,882,394**	**8,882,394**	**8,744,387**	**8,699,759**	**7,602,869**	**527,281**	**527,281**	**527,281**	
Program Total CPAS		**22,818,874**	**22,393,451**	**21,967,290**	**20,411,027**	**20,029,169**	**20,002,551**	**19,143,412**	**19,143,412**	**19,138,485**	**19,113,235**	**18,875,463**	**18,830,836**	**17,733,945**	**10,625,751**	**527,281**	**527,281**	
CY2021 Program Incremental Expiring Savings§		**199,163**	**9,273**	**2,980**	**868,634**	**326,715**	**15,557**	**119,297**			**25,250**	**99,764**			**32,607**	**10,098,470**		
Historic Program Incremental Expiring Savings‖		**2,805**	**416,150**	**423,182**	**687,628**	**55,143**	**11,062**	**739,842**		**4,927**		**138,007**	**44,627**	**1,096,890**	**7,075,588**			**527,281**
Program Total Incremental Expiring Savings#		**201,968**	**425,422**	**426,162**	**1,556,263**	**381,858**	**26,618**	**859,139**		**4,927**	**25,250**	**237,772**	**44,627**	**1,096,890**	**7,108,194**	**10,098,470**		**527,281**

Note: The green highlighted cell shows program total first-year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2021.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

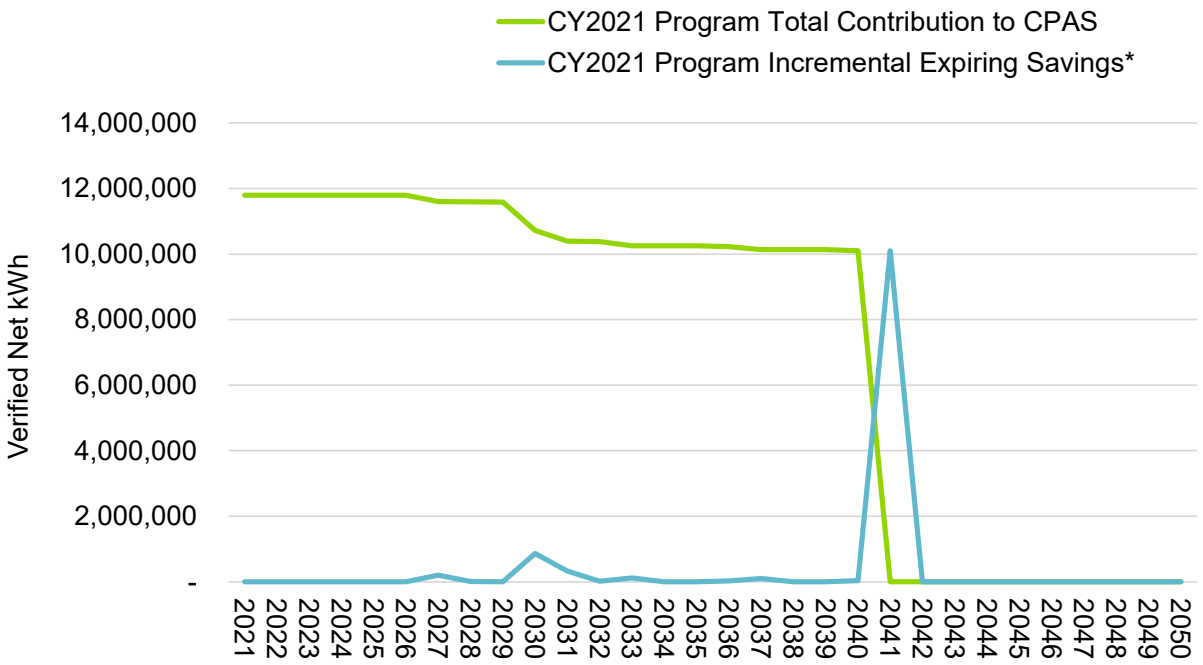
† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

Figure 4-1. CBA Cumulative Persisting Annual Savings



* Expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

4.2 IHWAP

Table 4-4 to Table 4-6 and Figure 4-1 show the measure-specific and total verified gross savings for the IHWAP program component and the CPAS for the measures installed in CY2021. The electric CPAS across all measures installed in 2021 is shown in Table 4-4. The CY2021 gas contribution to CPAS (converted to equivalent electricity) is shown in show Table 4-5. The combined savings are shown in Table 4-6. The historic rows in each table are in the CPAS contribution back to CY2018. The Program Total Electric CPAS and the Program Total Gas CPAS are the sum of the CY2021 contribution and the historic contribution. Figure 2 shows the savings across the EUL of the measures.

Table 4-4 IHWAP Cumulative Persisting Annual Savings (CPAS) – Electric

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings 2018	2019	2020	2021	2022	2023	2024	2025	2026
Lighting	LED Omnidirectional Bulb - Interior	10.0	637,132	1.00	5,275,456	-	-	-	637,132	637,132	637,132	637,132	637,132	637,132
HVAC	Central Air Conditioning - ER	18.0	366,229	1.00	2,909,927	-	-	-	366,229	366,229	366,229	366,229	366,229	366,229
Shell	Air Sealing	20.0	201,428	1.00	3,638,718	-	-	-	201,428	201,428	201,428	201,428	201,428	201,428
HVAC	Gas High Efficiency Furnace - ER	20.0	146,717	1.00	2,934,339	-	-	-	146,717	146,717	146,717	146,717	146,717	146,717
Shell	Attic Insulation	20.0	144,752	1.00	2,652,798	-	-	-	144,752	144,752	144,752	144,752	144,752	144,752
HVAC	Advanced Thermostat	11.0	75,992	1.00	835,913	-	-	-	75,992	75,992	75,992	75,992	75,992	75,992
HVAC	Bathroom Exhaust Fan	19.0	73,747	1.00	1,401,189	-	-	-	73,747	73,747	73,747	73,747	73,747	73,747
HVAC	Duct Insulation and Sealing - Distribution Efficiency	20.0	53,328	1.00	1,066,569	-	-	-	53,328	53,328	53,328	53,328	53,328	53,328
Lighting	LED Specialty Lamp - Exterior	6.9	48,733	1.00	321,783	-	-	-	48,733	48,733	48,733	48,733	48,733	48,733
Appliance	Refrigerator - ER	17.0	43,046	1.00	307,887	-	-	-	43,046	43,046	43,046	43,046	43,046	43,046
Lighting	LED Omnidirectional Bulb - Exterior	8.0	40,136	1.00	286,573	-	-	-	40,136	40,136	40,136	40,136	40,136	40,136
Shell	Wall Insulation	20.0	23,849	1.00	436,276	-	-	-	23,849	23,849	23,849	23,849	23,849	23,849
Shell	Basement Sidewall Insulation	20.0	23,537	1.00	433,973	-	-	-	23,537	23,537	23,537	23,537	23,537	23,537
HVAC	Central Air Conditioning - TOS	18.0	23,188	1.00	417,380	-	-	-	23,188	23,188	23,188	23,188	23,188	23,188
HVAC	Air Source Heat Pump - ER	16.0	20,871	1.00	333,939	-	-	-	20,871	20,871	20,871	20,871	20,871	20,871
Lighting	LED Specialty Lamp - Interior	10.0	16,596	1.00	138,054	-	-	-	16,596	16,596	16,596	16,596	16,596	16,596
Appliance	Room AC - ER	12.0	12,478	1.00	74,266	-	-	-	12,478	12,478	12,478	12,478	3,044	3,044
HVAC	Furnace Tune-Up	3.0	6,631	1.00	19,894	-	-	-	6,631	6,631	6,631	-	-	-
HVAC	Programmable Thermostat	16.0	5,580	1.00	89,281	-	-	-	5,580	5,580	5,580	5,580	5,580	5,580
Shell	Rim Insulation	20.0	5,385	1.00	101,384	-	-	-	5,385	5,385	5,385	5,385	5,385	5,385
Hot Water	HW Pipe Insulation	15.0	4,865	1.00	72,974	-	-	-	4,865	4,865	4,865	4,865	4,865	4,865
Shell	Floor Insulation	20.0	1,761	1.00	31,864	-	-	-	1,761	1,761	1,761	1,761	1,761	1,761
Hot Water	Low Flow Showerhead	10.0	1,052	1.00	10,519	-	-	-	1,052	1,052	1,052	1,052	1,052	1,052
HVAC	Furnace Blower Motor	6.0	920	1.00	5,520	-	-	-	920	920	920	920	920	920
Appliance	Freezer	22.0	577	1.00	12,698	-	-	-	577	577	577	577	577	577
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	287	1.00	2,872	-	-	-	287	287	287	287	287	287
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	207	1.00	2,066	-	-	-	207	207	207	207	207	207
Appliance	Refrigerator - TOS	17.0	126	1.00	2,135	-	-	-	126	126	126	126	126	126
HVAC	Gas High Efficiency Boiler - ER	25.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Efficiency Boiler - TOS	25.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Efficiency Furnace - TOS	20.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Hot Water	Gas Water Heater - ER	13.0	-	1.00	-	-	-	-	0	0.0	-	0.00	0.00	0.00
CY2021 Program Total Electric Contribution to CPAS			**1,979,150**		**23,816,247**				**1,979,150**	**1,979,150**	**1,979,150**	**1,972,519**	**1,963,085**	**1,963,085**
Historic Program Total Electric Contribution to CPAS‡						**979,006**	**3,127,173**	**4,923,665**	**4,072,239**	**4,011,031**	**4,003,506**	**3,786,132**	**3,322,063**	**2,990,925**
Program Total Electric CPAS						**979,006**	**3,127,173**	**4,923,665**	**6,051,389**	**5,990,181**	**5,982,656**	**5,758,651**	**5,285,148**	**4,954,010**
CY2021 Program Incremental Expiring Electric Savings§									-	-	-	**6,631**	**9,434**	-
Historic Program Incremental Expiring Electric Savings									**851,426**	**61,208**	**7,525**	**217,374**	**464,069**	**331,138**
Program Total Incremental Expiring Electric Savings									**851,426**	**61,208**	**7,525**	**224,005**	**473,503**	**331,138**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Lighting	LED Omnidirectional Bulb - Interior	363,165	363,165	363,165	363,165	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Central Air Conditioning - ER	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	-	-	-	-	-
Shell	Air Sealing	201,428	201,428	201,428	201,428	162,444	162,444	162,444	162,444	162,444	162,444	162,444	162,444	162,444	162,444	-	-	-
HVAC	Gas High Efficiency Furnace - ER	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	146,717	-	-	-
Shell	Attic Insulation	144,752	144,752	144,752	144,752	120,528	120,528	120,528	120,528	120,528	120,528	120,528	120,528	120,528	120,528	-	-	-
HVAC	Advanced Thermostat	75,992	75,992	75,992	75,992	75,992	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Bathroom Exhaust Fan	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	-	-	-	-
HVAC	Duct Insulation and Sealing - Distribution Efficiency	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	53,328	-	-	-
Lighting	LED Specialty Lamp - Exterior	29,386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - ER	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	-	-	-	-	-	-
Lighting	LED Omnidirectional Bulb - Exterior	22,878	22,878	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	Wall Insulation	23,849	23,849	23,849	23,849	19,778	19,778	19,778	19,778	19,778	19,778	19,778	19,778	19,778	19,778	-	-	-
Shell	Basement Sidewall Insulation	23,537	23,537	23,537	23,537	19,860	19,860	19,860	19,860	19,860	19,860	19,860	19,860	19,860	19,860	-	-	-
HVAC	Central Air Conditioning - TOS	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	-	-	-	-	-
HVAC	Air Source Heat Pump - ER	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	-	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Interior	9,619	9,619	9,619	9,619	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Room AC - ER	3,044	3,044	3,044	3,044	3,044	3,044	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Tune-Up	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Programmable Thermostat	5,580	5,580	5,580	5,580	5,580	5,580	5,580	5,580	5,580	5,580	-	-	-	-	-	-	-
Shell	Rim Insulation	5,385	5,385	5,385	5,385	4,753	4,753	4,753	4,753	4,753	4,753	4,753	4,753	4,753	4,753	-	-	-
Hot Water	HW Pipe Insulation	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	4,865	-	-	-	-	-	-	-	-
Shell	Floor Insulation	1,761	1,761	1,761	1,761	1,425	1,425	1,425	1,425	1,425	1,425	1,425	1,425	1,425	1,425	-	-	-
Hot Water	Low Flow Showerhead	1,052	1,052	1,052	1,052	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Blower Motor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Freezer	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	-
Hot Water	Low Flow Faucet Aerator - Kitchen	287	287	287	287	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Bathroom	207	207	207	207	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - TOS	126	126	126	126	126	126	126	126	126	126	126	-	-	-	-	-	-
HVAC	Gas High Efficiency Boiler - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Efficiency Boiler - TOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Efficiency Furnace - TOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Gas Water Heater - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY2021 Program Total Electric Contribution to CPAS		**1,299,230**	**1,269,844**	**1,246,967**	**1,246,967**	**800,715**	**724,723**	**721,678**	**721,678**	**721,678**	**716,813**	**690,362**	**685,726**	**603,159**	**529,412**	**577**	**577**	-
Historic Program Total Electric Contribution to CPAS‡		**2,672,502**	**2,547,717**	**2,391,135**	**1,890,853**	**1,846,543**	**1,844,291**	**1,729,861**	**1,721,786**	**1,717,577**	**1,666,559**	**1,543,274**	**1,189,537**	**592,716**	**89,753**	**87,184**	**86,088**	-
Program Total Electric CPAS		**3,971,732**	**3,817,562**	**3,638,102**	**3,137,820**	**2,647,258**	**2,569,014**	**2,451,539**	**2,443,464**	**2,439,255**	**2,383,373**	**2,233,636**	**1,875,264**	**1,195,875**	**619,165**	**87,761**	**86,665**	-
CY2021 Program Incremental Expiring Electric Savings§		**663,855**	**29,386**	**22,878**	-	**446,252**	**75,992**	**3,044**	-	-	**4,865**	**26,451**	**4,636**	**82,567**	**73,747**	**528,835**	-	**577**
Historic Program Incremental Expiring Electric Savings		**318,423**	**124,785**	**156,582**	**500,282**	**44,310**	**2,252**	**114,430**	**8,075**	**4,209**	**51,018**	**123,286**	**353,736**	**596,822**	**502,963**	**2,569**	**1,096**	**86,088**
Program Total Incremental Expiring Electric Savings		**982,278**	**154,171**	**179,459**	**500,282**	**490,562**	**78,244**	**117,475**	**8,075**	**4,209**	**55,883**	**149,737**	**358,372**	**679,389**	**576,709**	**531,404**	**1,096**	**86,665**

Note: The green highlighted cell shows program total first-year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2021.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

Table 4-5 IHWAP Cumulative Persisting Annual Savings (CPAS) – Gas

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings (Therms)†	Verified Net Therms Savings 2018	2019	2020	2021	2022	2023	2024	2025	2026
Lighting	LED Omnidirectional Bulb - Interior	10.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Central Air Conditioning - ER	18.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Shell	Air Sealing	20.0	7,445	1.00	143,331	-	-	-	7,445	7,445	7,445	7,445	7,445	7,445
HVAC	Gas High Effciency Furnace - ER	20.0	5,287	1.00	56,798	-	-	-	5,287	5,287	5,287	5,287	5,287	5,287
Shell	Attic Insulation	20.0	9,242	1.00	179,344	-	-	-	9,242	9,242	9,242	9,242	9,242	9,242
HVAC	Advanced Thermostat	11.0	2,465	1.00	27,120	-	-	-	2,465	2,465	2,465	2,465	2,465	2,465
HVAC	Bathroom Exhaust Fan	19.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Duct Insulation and Sealing - Distribution Efficiency	20.0	5,321	1.00	106,413	-	-	-	5,321	5,321	5,321	5,321	5,321	5,321
Lighting	LED Specialty Lamp - Exterior	6.9	-	1.00	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - ER	17.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Lighting	LED Omnidirectional Bulb - Exterior	8.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Shell	Wall Insulation	20.0	3,221	1.00	62,228	-	-	-	3,221	3,221	3,221	3,221	3,221	3,221
Shell	Basement Sidewall Insulation	20.0	638	1.00	12,438	-	-	-	638	638	638	638	638	638
HVAC	Central Air Conditioning - TOS	18.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Air Source Heat Pump - ER	16.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Interior	10.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Appliance	Room AC - ER	12.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Tune-Up	3.0	3,087	1.00	9,261	-	-	-	3,087	3,087	3,087	-	-	-
HVAC	Programmable Thermostat	16.0	593	1.00	9,495	-	-	-	593	593	593	593	593	593
Shell	Rim Insulation	20.0	156	1.00	3,032	-	-	-	156	156	156	156	156	156
Hot Water	HW Pipe Insulation	15.0	429	1.00	6,428	-	-	-	429	429	429	429	429	429
Shell	Floor Insulation	20.0	46	1.00	879	-	-	-	46	46	46	46	46	46
Hot Water	Low Flow Showerhead	10.0	62	1.00	624	-	-	-	62	62	62	62	62	62
HVAC	Furnace Blower Motor	6.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Appliance	Freezer	22.0	-	1.00	-	-	-	-	-	-	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	74	1.00	738	-	-	-	74	74	74	74	74	74
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	33	1.00	334	-	-	-	33	33	33	33	33	33
Appliance	Refrigerator - TOS	17.0	-	1.00	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Effciency Boiler - ER	25.0	265	1.00	4,953	-	-	-	265	265	265	265	265	265
HVAC	Gas High Efficiency Boiler - TOS	25.0	66	1.00	1,648	-	-	-	66	66	66	66	66	66
HVAC	Gas High Efficiency Furnace - TOS	20.0	453	1.00	9,066	-	-	-	453	453	453	453	453	453
Hot Water	Gas Water Heater - ER	13.0	914	1.00	9,605	-	-	-	914	914	914	914	661	661
CY2021 Program Total Gas Contribution to CPAS (Therms)			**39,799**		**643,735**				**39,799**	**39,799**	**39,799**	**36,712**	**36,459**	**36,459**
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡						-	-	-	**1,166,495**	**1,166,495**	**1,166,495**	**1,076,015**	**1,068,603**	**1,068,603**
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§						**1,463,579**	**2,144,794**	**2,640,980**	**2,640,980**	**2,597,981**	**2,552,487**	**2,272,318**	**2,190,823**	**2,129,533**
Program Total Gas CPAS (kWh Equivalent)						**1,463,579**	**2,144,794**	**2,640,980**	**3,807,474**	**3,764,475**	**3,718,981**	**3,348,334**	**3,259,426**	**3,198,136**
CY2021 Program Incremental Expiring Gas Savings (Therms)										-	-	**3,087**	**253**	-
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)‖										-	-	**90,479**	**7,413**	-
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#									-	**42,999**	**45,494**	**280,168**	**81,495**	**61,291**
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†									-	**42,999**	**45,494**	**370,648**	**88,907**	**61,291**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Lighting	LED Omnidirectional Bulb - Interior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Central Air Conditioning - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	Air Sealing	7,445	7,445	7,445	7,445	6,965	6,965	6,965	6,855	6,855	6,855	6,855	6,855	6,855	6,855	-	-	-	-	-	-
HVAC	Gas High Effciency Furnace - ER	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	1,791	-	-	-	-	-	-
Shell	Attic Insulation	9,242	9,242	9,242	9,242	8,780	8,780	8,780	8,655	8,655	8,655	8,655	8,655	8,655	8,655	-	-	-	-	-	-
HVAC	Advanced Thermostat	2,465	2,465	2,465	2,465	2,465	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Bathroom Exhaust Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Duct Insulation and Sealing - Distribution Efficiency	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	5,321	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Exterior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lighting	LED Omnidirectional Bulb - Exterior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	Wall Insulation	3,221	3,221	3,221	3,221	3,015	3,015	3,015	2,996	2,996	2,996	2,996	2,996	2,996	2,996	-	-	-	-	-	-
Shell	Basement Sidewall Insulation	638	638	638	638	606	606	606	606	606	606	606	606	606	606	-	-	-	-	-	-
HVAC	Central Air Conditioning - TOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Air Source Heat Pump - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Interior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Room AC - ER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Tune-Up	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Programmable Thermostat	593	593	593	593	593	593	593	593	593	593	-	-	-	-	-	-	-	-	-	-
Shell	Rim Insulation	156	156	156	156	147	147	147	147	147	147	147	147	147	147	-	-	-	-	-	-
Hot Water	HW Pipe Insulation	429	429	429	429	429	429	429	429	429	-	-	-	-	-	-	-	-	-	-	-
Shell	Floor Insulation	46	46	46	46	42	42	42	42	42	42	42	42	42	42	-	-	-	-	-	-
Hot Water	Low Flow Showerhead	62	62	62	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Blower Motor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Freezer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Kitchen	74	74	74	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Bathroom	33	33	33	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - TOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Gas High Effciency Boiler - ER	265	265	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	-
HVAC	Gas High Efficiency Boiler - TOS	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	-
HVAC	Gas High Efficiency Furnace - TOS	453	453	453	453	453	453	453	453	453	453	453	453	453	453	-	-	-	-	-	-
Hot Water	Gas Water Heater - ER	661	661	661	661	661	661	661	-	-	-	-	-	-	-	-	-	-	-	-	-
CY2021 Program Total Gas Contribution to CPAS (Therms)		**32,963**	**32,963**	**32,864**	**32,864**	**31,501**	**29,035**	**29,035**	**28,120**	**28,120**	**27,691**	**27,098**	**27,098**	**27,098**	**27,098**	**233**	**233**	**233**	**233**	**233**	-
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡		**966,142**	**966,142**	**963,258**	**963,258**	**923,282**	**851,020**	**851,020**	**824,191**	**824,191**	**811,631**	**794,236**	**794,236**	**794,236**	**794,236**	**6,817**	**6,817**	**6,817**	**6,817**	**6,817**	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§		**2,113,229**	**1,999,006**	**1,934,622**	**1,834,155**	**1,787,016**	**1,791,734**	**1,463,037**	**1,461,180**	**1,454,867**	**1,454,867**	**1,454,867**	**1,194,796**	**767,576**	**417,334**	**417,334**	**417,334**	**29,038**	**7,377**	-	-
Program Total Gas CPAS (kWh Equivalent)		**3,079,370**	**2,965,147**	**2,897,880**	**2,797,413**	**2,710,299**	**2,642,755**	**2,314,058**	**2,285,371**	**2,279,058**	**2,266,497**	**2,249,103**	**1,989,032**	**1,561,812**	**1,211,570**	**424,151**	**424,151**	**35,855**	**14,194**	**6,817**	-
CY2021 Program Incremental Expiring Gas Savings (Therms)		**3,496**	-	**98**	-	**1,364**	**2,465**	-	**915**	-	**429**	**593**	-	-	-	**26,865**	-	-	-	-	**233**
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)‖		**102,461**	-	**2,883**	-	**39,976**	**72,262**	-	**26,830**	-	**12,560**	**17,395**	-	-	-	**787,419**	-	-	-	-	**6,817**
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#		**16,304**	**114,223**	**64,384**	**100,467**	**47,139**	**(4,718)**	**328,697**	**1,857**	**6,314**	-	-	**260,071**	**427,219**	**350,242**	-	-	**388,296**	**21,661**	**7,377**	-
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†		**118,765**	**114,223**	**67,268**	**100,467**	**87,114**	**67,544**	**328,697**	**28,687**	**6,314**	**12,560**	**17,395**	**260,071**	**427,219**	**350,242**	**787,419**	-	**388,296**	**21,661**	**7,377**	**6,817**

Note: The green highlighted cell shows program total first-year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2021.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

Table 4-6 IHWAP Cumulative Persisting Annual Savings (CPAS) – Total

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings (Including Those Converted from Gas Savings) 2018	2019	2020	2021	2022	2023	2024	2025	2026
Lighting	LED Omnidirectional Bulb - Interior	10.0	637,132	1.00	5,275,456				637,132	637,132	637,132	637,132	637,132	637,132
HVAC	Central Air Conditioning - ER	18.0	366,229	1.00	2,909,927				366,229	366,229	366,229	366,229	366,229	366,229
Shell	Air Sealing	20.0	419,652	1.00	7,839,744				419,652	419,652	419,652	419,652	419,652	419,652
HVAC	Gas High Efficiency Furnace - ER	20.0	301,678	1.00	4,599,100				301,678	301,678	301,678	301,678	301,678	301,678
Shell	Attic Insulation	20.0	415,637	1.00	7,909,363	-	-	-	415,637	415,637	415,637	415,637	415,637	415,637
HVAC	Advanced Thermostat	11.0	148,254	1.00	1,630,795	-	-	-	148,254	148,254	148,254	148,254	148,254	148,254
HVAC	Bathroom Exhaust Fan	19.0	73,747	1.00	1,401,189	-	-	-	73,747	73,747	73,747	73,747	73,747	73,747
HVAC	Duct Insulation and Sealing - Distribution Efficiency	20.0	209,276	1.00	4,185,521	-	-	-	209,276	209,276	209,276	209,276	209,276	209,276
Lighting	LED Specialty Lamp - Exterior	6.9	48,733	1.00	321,783	-	-	-	48,733	48,733	48,733	48,733	48,733	48,733
Appliance	Refrigerator - ER	17.0	43,046	1.00	307,887	-	-	-	43,046	43,046	43,046	43,046	43,046	43,046
Lighting	LED Omnidirectional Bulb - Exterior	8.0	40,136	1.00	286,573	-	-	-	40,136	40,136	40,136	40,136	40,136	40,136
Shell	Wall Insulation	20.0	118,259	1.00	2,260,189	-	-	-	118,259	118,259	118,259	118,259	118,259	118,259
Shell	Basement Sidewall Insulation	20.0	42,226	1.00	798,536	-	-	-	42,226	42,226	42,226	42,226	42,226	42,226
HVAC	Central Air Conditioning - TOS	18.0	23,188	1.00	417,380	-	-	-	23,188	23,188	23,188	23,188	23,188	23,188
HVAC	Air Source Heat Pump - ER	16.0	20,871	1.00	333,939	-	-	-	20,871	20,871	20,871	20,871	20,871	20,871
Lighting	LED Specialty Lamp - Interior	10.0	16,596	1.00	138,054	-	-	-	16,596	16,596	16,596	16,596	16,596	16,596
Appliance	Room AC - ER	12.0	12,478	1.00	74,266	-	-	-	12,478	12,478	12,478	12,478	3,044	3,044
HVAC	Furnace Tune-Up	3.0	97,110	1.00	291,331	-	-	-	97,110	97,110	97,110	-	-	-
HVAC	Programmable Thermostat	16.0	22,975	1.00	367,594	-	-	-	22,975	22,975	22,975	22,975	22,975	22,975
Shell	Rim Insulation	20.0	9,966	1.00	190,256	-	-	-	9,966	9,966	9,966	9,966	9,966	9,966
Hot Water	HW Pipe Insulation	15.0	17,425	1.00	261,379	-	-	-	17,425	17,425	17,425	17,425	17,425	17,425
Shell	Floor Insulation	20.0	3,119	1.00	57,634	-	-	-	3,119	3,119	3,119	3,119	3,119	3,119
Hot Water	Low Flow Showerhead	10.0	2,880	1.00	28,799	-	-	-	2,880	2,880	2,880	2,880	2,880	2,880
HVAC	Furnace Blower Motor	6.0	920	1.00	5,520	-	-	-	920	920	920	920	920	920
Appliance	Freezer	22.0	577	1.00	12,698	-	-	-	577	577	577	577	577	577
Hot Water	Low Flow Faucet Aerator - Kitchen	10.0	2,450	1.00	24,496	-	-	-	2,450	2,450	2,450	2,450	2,450	2,450
Hot Water	Low Flow Faucet Aerator - Bathroom	10.0	1,185	1.00	11,853	-	-	-	1,185	1,185	1,185	1,185	1,185	1,185
Appliance	Refrigerator - TOS	17.0	126	1.00	2,135	-	-	-	126	126	126	126	126	126
HVAC	Gas High Efficiency Boiler - ER	25.0	7,767	1.00	145,167	-	-	-	7,767	7,767	7,767	7,767	7,767	7,767
HVAC	Gas High Efficiency Boiler - TOS	25.0	1,933	1.00	48,317	-	-	-	1,933	1,933	1,933	1,933	1,933	1,933
HVAC	Gas High Efficiency Furnace - TOS	20.0	13,286	1.00	265,714	-	-	-	13,286	13,286	13,286	13,286	13,286	13,286
Hot Water	Gas Water Heater - ER	13.0	26,787	1.00	281,519	-	-	-	26787.19772	26787.2	26,787	26787.20	19,374	19,374
CY2021 Program Total Contribution to CPAS			**3,145,645**		**42,684,115**				**3,145,645**	**3,145,645**	**3,145,645**	**3,048,534**	**3,031,688**	**3,031,688**
Historic Program Total Contribution to CPAS‡						**2,442,585**	**5,271,967**	**7,564,645**	**6,713,219**	**6,609,012**	**6,555,992**	**6,058,450**	**5,512,886**	**5,120,458**
Program Total CPAS						**2,442,585**	**5,271,967**	**7,564,645**	**9,858,864**	**9,754,656**	**9,701,637**	**9,106,985**	**8,544,575**	**8,152,146**
CY2021 Program Incremental Expiring Savings§										-	-	**97,110**	**16,846**	-
Historic Program Incremental Expiring Savings									**851,426**	**104,207**	**53,019**	**497,542**	**545,564**	**392,429**
Program Total Incremental Expiring Savings									**851,426**	**104,207**	**53,019**	**594,653**	**562,410**	**392,429**

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Lighting	LED Omnidirectional Bulb - Interior	363,165	363,165	363,165	363,165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Central Air Conditioning - ER	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	59,379	-	-	-	-	-	-	-	-
Shell	Air Sealing	419,652	419,652	419,652	419,652	366,577	366,577	366,577	363,357	363,357	363,357	363,357	363,357	363,357	363,357	-	-	-	-	-	-
HVAC	Gas High Efficiency Furnace - ER	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	199,217	-	-	-	-	-	-
Shell	Attic Insulation	415,637	415,637	415,637	415,637	377,868	377,868	377,868	374,198	374,198	374,198	374,198	374,198	374,198	374,198	-	-	-	-	-	-
HVAC	Advanced Thermostat	148,254	148,254	148,254	148,254	148,254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Bathroom Exhaust Fan	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	73,747	-	-	-	-	-	-	-
HVAC	Duct Insulation and Sealing - Distribution Efficiency	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	209,276	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Exterior	29,386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - ER	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	4,510	-	-	-	-	-	-	-	-	-
Lighting	LED Omnidirectional Bulb - Exterior	22,878	22,878	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shell	Wall Insulation	118,259	118,259	118,259	118,259	108,155	108,155	108,155	107,590	107,590	107,590	107,590	107,590	107,590	107,590	-	-	-	-	-	-
Shell	Basement Sidewall Insulation	42,226	42,226	42,226	42,226	37,628	37,628	37,628	37,628	37,628	37,628	37,628	37,628	37,628	37,628	-	-	-	-	-	-
HVAC	Central Air Conditioning - TOS	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	23,188	-	-	-	-	-	-	-	-
HVAC	Air Source Heat Pump - ER	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	20,871	-	-	-	-	-	-	-	-	-	-
Lighting	LED Specialty Lamp - Interior	9,619	9,619	9,619	9,619	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Room AC - ER	3,044	3,044	3,044	3,044	3,044	3,044	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Tune-Up	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Programmable Thermostat	22,975	22,975	22,975	22,975	22,975	22,975	22,975	22,975	22,975	22,975	-	-	-	-	-	-	-	-	-	-
Shell	Rim Insulation	9,966	9,966	9,966	9,966	9,059	9,059	9,059	9,059	9,059	9,059	9,059	9,059	9,059	9,059	-	-	-	-	-	-
Hot Water	HW Pipe Insulation	17,425	17,425	17,425	17,425	17,425	17,425	17,425	17,425	17,425	-	-	-	-	-	-	-	-	-	-	-
Shell	Floor Insulation	3,119	3,119	3,119	3,119	2,644	2,644	2,644	2,644	2,644	2,644	2,644	2,644	2,644	2,644	-	-	-	-	-	-
Hot Water	Low Flow Showerhead	2,880	2,880	2,880	2,880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Furnace Blower Motor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Freezer	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	577	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Kitchen	2,450	2,450	2,450	2,450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Low Flow Faucet Aerator - Bathroom	1,185	1,185	1,185	1,185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Appliance	Refrigerator - TOS	126	126	126	126	126	126	126	126	126	126	126	-	-	-	-	-	-	-	-	-
HVAC	Gas High Efficiency Boiler - ER	7,767	7,767	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	4,884	-
HVAC	Gas High Efficiency Boiler - TOS	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	1,933	-
HVAC	Gas High Efficiency Furnace - TOS	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	13,286	-	-	-	-	-	-
Hot Water	Gas Water Heater - ER	19,374	19,374	19,374	19,374	19,374	19,374	19,374	-	-	-	-	-	-	-	-	-	-	-	-	-
CY2021 Program Total Contribution to CPAS		**2,265,372**	**2,235,986**	**2,210,225**	**2,210,225**	**1,723,997**	**1,575,743**	**1,572,699**	**1,545,869**	**1,545,869**	**1,528,444**	**1,484,598**	**1,479,962**	**1,397,395**	**1,323,648**	**7,394**	**7,394**	**6,817**	**6,817**	**6,817**	-
Historic Program Total Contribution to CPAS‡		**4,785,731**	**4,546,723**	**4,325,757**	**3,725,008**	**3,633,559**	**3,636,026**	**3,192,898**	**3,182,966**	**3,172,444**	**3,121,426**	**2,998,140**	**2,384,333**	**1,360,292**	**507,087**	**504,518**	**503,422**	**29,038**	**7,377**	-	-
Program Total CPAS		**7,051,102**	**6,782,709**	**6,535,982**	**5,935,233**	**5,357,556**	**5,211,769**	**4,765,597**	**4,728,835**	**4,718,313**	**4,649,870**	**4,482,738**	**3,864,295**	**2,757,687**	**1,830,736**	**511,912**	**510,816**	**35,855**	**14,194**	**6,817**	-
CY2021 Program Incremental Expiring Savings§		**766,316**	**29,386**	**25,761**	-	**486,228**	**148,254**	**3,044**	**26,830**	-	**17,425**	**43,846**	**4,636**	**82,567**	**73,747**	**1,316,254**	-	**577**	-	-	**6,817**
Historic Program Incremental Expiring Savings		**334,727**	**239,007**	**220,966**	**600,749**	**91,449**	**(2,466)**	**443,127**	**9,932**	**10,522**	**51,018**	**123,286**	**613,808**	**1,024,041**	**853,205**	**2,569**	**1,096**	**474,384**	**21,661**	**7,377**	-
Program Total Incremental Expiring Savings		**1,101,043**	**268,393**	**246,727**	**600,749**	**577,677**	**145,788**	**446,172**	**36,762**	**10,522**	**68,443**	**167,132**	**618,443**	**1,106,608**	**926,952**	**1,318,824**	**1,096**	**474,961**	**21,661**	**7,377**	**6,817**

Note: The green highlighted cell shows program total first-year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2021.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

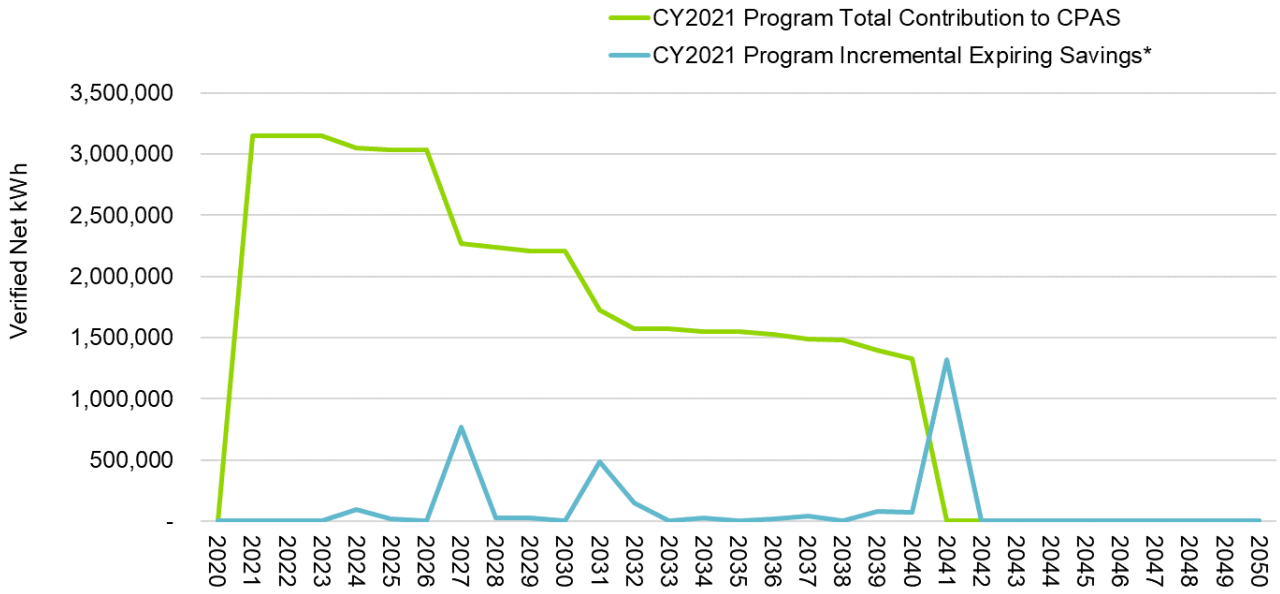
† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis A deemed value. Source: Illinois SAG website*

Figure 2-2. IHWAP Cumulative Persisting Annual Savings



5. Program Savings by Measure

5.1 CBA

The CBA program component included the measures shown in Table 5-1 and Figure 5-1.

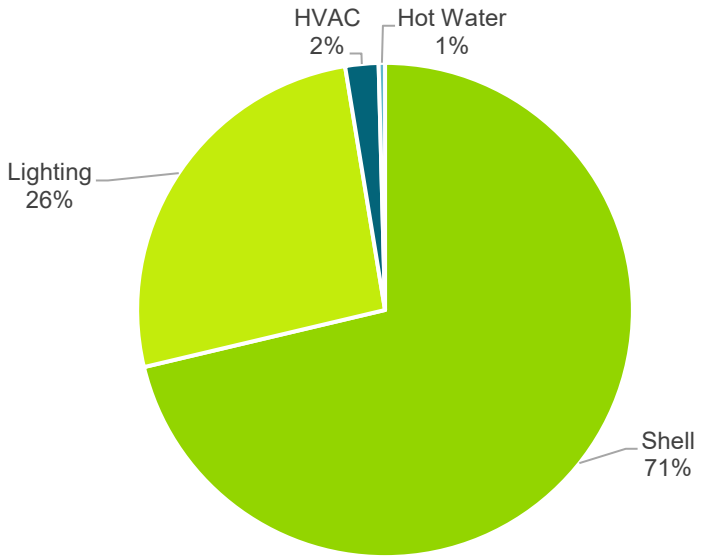
Table 5-1. CBA Number of Measures by Type

End Use Type	Research Category	Quantity	Unit
Shell	Air Sealing	1,118	Projects
Shell	Attic Insulation	1,097	Projects
Shell	Wall Insulation	1,618	Projects
Lighting	LED Omnidirectional Bulb - Interior	6,675	Each
Lighting	LED Specialty Lamp - Interior	6,148	Each
HVAC	Bathroom Exhaust Fan - Bathroom	1,104	Each
Lighting	LED Specialty Lamp - Exterior	155	Each
Lighting	LED Omnidirectional Bulb - Exterior	66	Each
HVAC	Programmable Thermostat	98	Each
Hot Water	Low Flow Showerhead	442	Each
Shell	Floor Insulation	135	Projects
HVAC	Advanced Thermostat	7	Each
Shell	Rim Insulation	102	Projects
Hot Water	Low Flow Faucet Aerator - Kitchen	142	Each
Hot Water	HW Pipe Insulation	268	Projects
Hot Water	Low Flow Faucet Aerator - Bathroom	119	Each
	Total	**19,294**	

Note: This is the same table as Table 2-2.

Source: ComEd tracking data and evaluation team analysis

Figure 5-1. CBA Verified Net Savings by End Use Type – Electric



Source: ComEd tracking data and evaluation team analysis

Measure-level energy and demand savings for the CBA program component are provided in the following tables. Note that converted gas savings were included in the reported electric savings, resulting in a low electric realization rate (see 6.1.1). The electric savings have been adjusted in Table 5-3 to reflect realization rates without the converted gas finding. These converted gas savings are captured in the gas and total energy savings tables, resulting in a 1.01 total program level realization rate.

Table 5-2. CBA Energy Savings by Measure – Electric

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)	EUL (years)
Shell	Air Sealing	4,669,666	0.16	725,381	1.00	725,381	20.0
Shell	Attic Insulation	2,940,891	0.10	290,204	1.00	290,204	20.0
Shell	Wall Insulation	3,471,346	0.08	263,637	1.00	263,637	20.0
Lighting	LED Omnidirectional Bulb - Interior	252,085	1.01	253,740	1.00	253,740	10.0
Lighting	LED Specialty Lamp - Interior	192,303	1.01	194,135	1.00	194,135	10.0
HVAC	Bathroom Exhaust Fan - Bathroom	29,534	1.10	32,607	1.00	32,607	19.0
Lighting	LED Specialty Lamp - Exterior	17,542	1.00	17,542	1.00	17,542	6.9
Hot Water	Low Flow Showerhead	4,106	1.55	6,384	1.00	6,384	10.0
Lighting	LED Omnidirectional Bulb - Exterior	5,522	0.95	5,227	1.00	5,227	8.0
HVAC	Programmable Thermostat	27,774	0.18	4,987	1.00	4,987	16.0
Shell	Floor Insulation	44,902	0.08	3,396	1.00	3,396	20.0
HVAC	Advanced Thermostat	15,528	0.09	1,447	1.00	1,447	11.0
Shell	Rim Insulation	11,680	0.12	1,348	1.00	1,348	20.0
Hot Water	Low Flow Faucet Aerator - Kitchen	6,106	0.11	668	1.00	668	10.0
Hot Water	HW Pipe Insulation	25,776	0.01	231	1.00	231	15.0
Hot Water	Low Flow Faucet Aerator - Bathroom	1,474	0.12	172	1.00	172	10.0
	Total	**11,716,234**	**0.15**	**1,801,107**		**1,801,107**	

Note: The savings in this table include secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd. The savings account for electric heating penalties, where applicable. Additionally, ComEd included converted therms in the ex ante gross electric savings and Guidehouse did not, which is the main driver of the low realization rates.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

Source: ComEd tracking data and evaluation team analysis

Table 5-3. CBA Adjusted Energy Savings by Measure - Electric

End Use Type	Research Category	Ex Ante Adjusted Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)	EUL (years)
Shell	Air Sealing	715,399	1.01	725,381	1.00	725,381	20.0
Shell	Attic Insulation	315,380	0.92	290,204	1.00	290,204	20.0
Shell	Wall Insulation	330,890	0.80	263,637	1.00	263,637	20.0
Lighting	LED Omnidirectional Bulb - Interior	252,085	1.01	253,740	1.00	253,740	10.0
Lighting	LED Specialty Lamp - Interior	192,303	1.01	194,135	1.00	194,135	10.0
HVAC	Bathroom Exhaust Fan - Bathroom	29,534	1.10	32,607	1.00	32,607	19.0
Lighting	LED Specialty Lamp - Exterior	17,542	1.00	17,542	1.00	17,542	6.9
Hot Water	Low Flow Showerhead†	4,106	1.55	6,384	1.00	6,384	10.0
Lighting	LED Omnidirectional Bulb - Exterior	5,522	0.95	5,227	1.00	5,227	8.0
HVAC	Programmable Thermostat†	27,774	0.18	4,987	1.00	4,987	16.0
Shell	Floor Insulation	3,433	0.99	3,396	1.00	3,396	20.0
HVAC	Advanced Thermostat	1,424	1.02	1,447	1.00	1,447	11.0
Shell	Rim Insulation	1,754	0.77	1,348	1.00	1,348	20.0
Hot Water	Low Flow Faucet Aerator - Kitchen	386	1.73	668	1.00	668	10.0
Hot Water	HW Pipe Insulation	217	1.06	231	1.00	231	15.0
Hot Water	Low Flow Faucet Aerator - Bathroom	81	2.12	172	1.00	172	10.0
	Total	**1,897,829**	**0.95**	**1,801,107**		**1,801,107**	

Note: The evaluation removed the converted gas savings from the ex ante savings in this table to be able to show the realization rates for each measure without this issue.
The savings in this table include secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd. The savings account for electric heating penalties, where applicable. Additionally, ComEd included converted therms in the ex ante gross electric savings and Guidehouse did not, which is the main driver of the low realization rates.
* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† Measures that did not include converted gas savings
Source: ComEd tracking data and evaluation team analysis

Table 5-4. CBA Summer Peak Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTG*	Verified Net Peak Demand Reduction (kW)
Shell	Air Sealing	417.11	0.99	414.16	1.00	414.16
Shell	Attic Insulation	141.87	0.85	120.58	1.00	120.58
Shell	Wall Insulation	146.31	0.74	107.65	1.00	107.65
Lighting	LED OmnidirectioN/Al Bulb - Interior	30.76	1.02	31.24	1.00	31.24
Lighting	LED Specialty Lamp - Interior	28.52	1.02	29.03	1.00	29.03
HVAC	Bathroom Exhaust Fan - Bathroom	3.66	1.10	4.04	1.00	4.04
Lighting	LED Specialty Lamp - Exterior	1.93	1.00	1.94	1.00	1.94
Hot Water	Low Flow Showerhead	0.45	1.00	0.45	1.00	0.45
Lighting	LED OmnidirectioN/Al Bulb - Exterior	0.61	0.95	0.58	1.00	0.58
HVAC	Programmable Thermostat	0.00	N/A	0.00	N/A	N/A
Shell	Floor Insulation	0.99	0.99	0.98	1.00	0.98
HVAC	Advanced Thermostat	0.73	0.99	0.73	1.00	0.73
Shell	Rim Insulation	0.85	0.64	0.55	1.00	0.55
Hot Water	Low Flow Faucet Aerator - Bathroom	0.13	1.01	0.13	1.00	0.13
Hot Water	HW Pipe Insulation	0.00	N/A	0.00	N/A	N/A
Hot Water	Low Flow Faucet Aerator - Kitchen	0.08	1.01	0.08	1.00	0.08
	Total	**774.00**	**0.92**	**712.14**		**712.14**

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
Source: ComEd tracking data and evaluation team analysis

The CBA program component includes measures that save water. That reduction in water produces secondary kWh savings from water supply and wastewater treatment. Table 5-5 shows the secondary measure-level savings. The savings in this table are included in the electricity savings in the previous tables in this section.

Table 5-5. CBA Secondary Energy Savings from Water Reduction by Measure – Electric

End Use Type	Research Category	Ex Ante Annual Water Savings (gallons)	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate (RR_{water})	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Shell	Air Sealing	0	0	N/A	0	N/A	0
Shell	Attic Insulation	0	0	N/A	0	N/A	0
Shell	Wall Insulation	0	0	N/A	0	N/A	0
Lighting	LED OmnidirectioN/Al Bulb - Interior	0	0	N/A	0	N/A	0
Lighting	LED Specialty Lamp - Interior	0	0	N/A	0	N/A	0
HVAC	Bathroom Exhaust Fan - Bathroom	0	0	N/A	0	N/A	0
Lighting	LED Specialty Lamp - Exterior	0	0	N/A	0	N/A	0
Hot Water	Low Flow Showerhead	773,500	2,272	1.00	2,278	1.00	2,278
Lighting	LED OmnidirectioN/Al Bulb - Exterior	0	0	N/A	0	N/A	0
HVAC	Programmable Thermostat	0	0	N/A	0	N/A	0
Shell	Floor Insulation	0	0	N/A	0	N/A	0
HVAC	Advanced Thermostat	0	0	N/A	0	N/A	0
Shell	Rim Insulation	0	0	N/A	0	N/A	0
Hot Water	Low Flow Faucet Aerator - Kitchen	95,140	281	1.00	280	1.00	280
Hot Water	HW Pipe Insulation	0	0	N/A	0	N/A	0
Hot Water	Low Flow Faucet Aerator - Bathroom	30,940	92	0.99	91	1.00	91
	Total	**899,580**	**2,645**	**1.00**	**2,649**		**2,649**

Note: The savings in this table reflect only secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd, not those claimed by gas utilities.
* A deemed value. Source: the Illinois SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2021.

Source: ComEd tracking data and evaluation team analysis

Measure level gas savings are provided in Table 5-6 as therm savings. Total energy savings are provided in Table 5-7. The total includes electric energy savings and converted electric savings from gas measures.

Table 5-6. CBA Energy Savings by Measure – Gas

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)	EUL (years)
Shell	Air Sealing	134,958	1.01	136,334	1.00	136,334	20.0
Shell	Attic Insulation	89,608	1.00	89,250	1.00	89,250	20.0
Shell	Wall Insulation	107,183	1.00	106,813	1.00	106,813	20.0
Lighting	LED OmnidirectioN/Al Bulb - Interior	0	N/A	0	N/A	0	10.0
Lighting	LED Specialty Lamp - Interior	0	N/A	0	N/A	0	10.0
HVAC	Bathroom Exhaust Fan - Bathroom	0	N/A	0	N/A	0	19.0
Lighting	LED Specialty Lamp - Exterior	0	N/A	0	N/A	0	6.9
Hot Water	Low Flow Showerhead	1,811	1.00	1,811	1.00	1,811	10.0
Lighting	LED OmnidirectioN/Al Bulb - Exterior	0	N/A	0	1.00	0	8.0
HVAC	Programmable Thermostat	3,165	1.02	3,234	1.00	3,234	16.0
Shell	Floor Insulation	1,415	1.00	1,411	1.00	1,411	20.0
HVAC	Advanced Thermostat	481	1.00	481	1.00	481	11.0
Shell	Rim Insulation	339	1.87	633	1.00	633	20.0
Hot Water	Low Flow Faucet Aerator - Kitchen	195	1.01	197	1.00	197	10.0
Hot Water	HW Pipe Insulation	872	0.98	854	1.00	854	15.0
Hot Water	Low Flow Faucet Aerator - Bathroom	48	1.01	48	1.00	48	10.0
	Total Therms	**340,076**	**1.00**	**341,065**		**341,065**	
	Total kWh Converted From Therms†	**9,967,614**	**1.00**	**9,996,603**		**9,996,603**	

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† Gas savings converted to kWh by multiplying therms by 29.31 (which is based on 100,000 Btu/term and 3,412 Btu/kWh).

Source: ComEd tracking data and evaluation team analysis

Table 5-7. CBA Energy Savings by Measure – Total

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Shell	Air Sealing	4,669,666	1.01	4,721,319	1.00	4,721,319
Shell	Attic Insulation	2,940,891	0.99	2,906,117	1.00	2,906,117
Shell	Wall Insulation	3,471,346	0.98	3,394,335	1.00	3,394,335
Lighting	LED Omnidirectional Bulb - Interior	252,085	1.01	253,740	1.00	253,740
Lighting	LED Specialty Lamp - Interior	192,303	1.01	194,135	1.00	194,135
HVAC	Bathroom Exhaust Fan - Bathroom	29,534	1.10	32,607	1.00	32,607
Lighting	LED Specialty Lamp - Exterior	17,542	1.00	17,542	1.00	17,542
Hot Water	Low Flow Showerhead	4,106	14.48	59,466	1.00	59,466
Lighting	LED Omnidirectional Bulb - Exterior	5,522	0.95	5,227	1.00	5,227
HVAC	Programmable Thermostat	27,774	3.59	99,764	1.00	99,764
Shell	Floor Insulation	44,902	1.00	44,739	1.00	44,739
HVAC	Advanced Thermostat	15,528	1.00	15,557	1.00	15,557
Shell	Rim Insulation	11,680	1.70	19,892	1.00	19,892
Hot Water	Low Flow Faucet Aerator - Kitchen	6,106	1.05	6,439	1.00	6,439
Hot Water	HW Pipe Insulation	25,776	0.98	25,250	1.00	25,250
Hot Water	Low Flow Faucet Aerator - Bathroom	1,474	1.07	1,582	1.00	1,582
	Total†	**11,716,234**	**1.01**	**11,797,710**		**11,797,710**

Note: Guidehouse believes ComEd has included converted gas savings in the ex ante electric savings. Therefore, Guidehouse is treating claimed electric savings as their total claimed and listed them in this table.
* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† The total includes the electric equivalent of the total therms.

Source: ComEd tracking data and evaluation team analysis

5.2 IHWAP

The IHWAP program component included the measures shown in Table 5-8 and Figure 5-2.

Table 5-8. IHWAP Number of Measures by Type

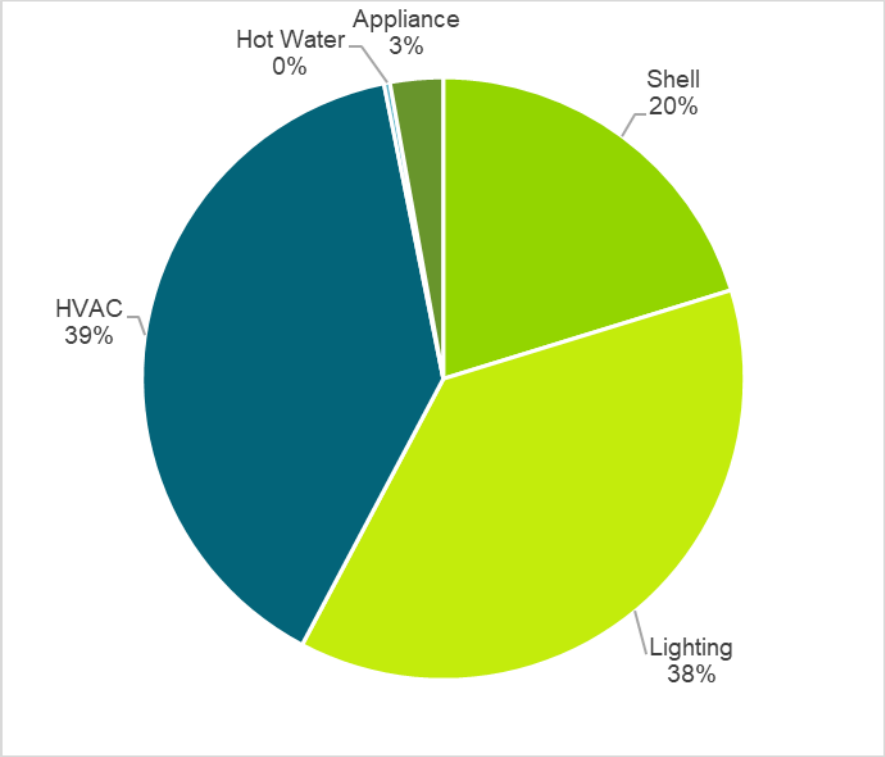
End Use Type	Research Category	Quantity	Unit
Lighting	LED Omnidirectional Bulb - Interior	11,410	Each
HVAC	Central Air Conditioning - ER	248	Each
Shell	Air Sealing	526	Projects†
HVAC	Gas High Efficiency Furnace - ER	242	Each
Shell	Attic Insulation	486	Projects†
HVAC	Advanced Thermostat	285	Each
HVAC	Bathroom Exhaust Fan	598	Each
HVAC	Duct Insulation and Sealing - Distribution Efficiency	76	Each
Lighting	LED Specialty Lamp - Exterior	205	Each
Appliance	Refrigerator - ER	102	Each
Lighting	LED Omnidirectional Bulb - Exterior	317	Each
Shell	Wall Insulation	156	Projects†
Shell	Basement Sidewall Insulation	115	Projects†
HVAC	Central Air Conditioning - TOS	89	Each
HVAC	Air Source Heat Pump - ER	2	Each
Lighting	LED Specialty Lamp - Interior	471	Each
Appliance	Room AC - ER	61	Each
HVAC	Furnace Tune-Up	68	Each
HVAC	Programmable Thermostat	82	Each
Shell	Rim Insulation	198	Projects†
Hot Water	HW Pipe Insulation	724	Each
Shell	Floor Insulation	29	Projects†
Hot Water	Low Flow Showerhead	36	Each
HVAC	Furnace Blower Motor	1	Each
Appliance	Freezer	17	Each
Hot Water	Low Flow Faucet Aerator - Kitchen	12	Each
Hot Water	Low Flow Faucet Aerator - Bathroom	50	Each
Appliance	Refrigerator - TOS	3	Each
HVAC	Gas High Efficiency Boiler - ER	1	Each
HVAC	Gas High Efficiency Boiler - TOS	4	Each
HVAC	Gas High Efficiency Furnace - TOS	6	Each
Hot Water	Gas Water Heater - ER	24	Each
	Total	**16,644**	

Note: This is the same table as Table 2-3.

† Quantity for shell projects is per installation for comparison rather than square feet.

Source: ComEd tracking data and evaluation team analysis

Figure 5-2. IHWAP Verified Net Savings by Measure – Electric



Source: ComEd tracking data and evaluation team analysis

Measure-level energy and demand savings for the IHWAP program component are provided in the following tables.

Table 5-9. IHWAP Energy Savings by Measure – Electric

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)	EUL (years)
Lighting	LED Omnidirectional Bulb - Interior	644,243	0.99	637,132	1.00	637,132	10.0
HVAC	Central Air Conditioning - ER	366,229	1.00	366,229	1.00	366,229	18.0
Shell	Air Sealing	201,426	1.00	201,428	1.00	201,428	20.0
HVAC	Gas High Efficiency Furnace - ER	146,533	1.00	146,717	1.00	146,717	20.0
Shell	Attic Insulation	144,750	1.00	144,752	1.00	144,752	20.0
HVAC	Advanced Thermostat	75,785	1.00	75,992	1.00	75,992	11.0
HVAC	Bathroom Exhaust Fan	73,747	1.00	73,747	1.00	73,747	19.0
HVAC	Duct Insulation and Sealing - Distribution Efficiency	53,117	1.00	53,328	1.00	53,328	20.0
Lighting	LED Specialty Lamp - Exterior	48,733	1.00	48,733	1.00	48,733	6.9
Appliance	Refrigerator - ER	43,046	1.00	43,046	1.00	43,046	17.0
Lighting	LED Omnidirectional Bulb - Exterior	40,136	1.00	40,136	1.00	40,136	8.0
Shell	Wall Insulation	23,849	1.00	23,849	1.00	23,849	20.0
Shell	Basement Sidewall Insulation	23,495	1.00	23,537	1.00	23,537	20.0
HVAC	Central Air Conditioning - TOS	23,188	1.00	23,188	1.00	23,188	18.0
HVAC	Air Source Heat Pump - ER	19,229	1.09	20,871	1.00	20,871	16.0
Lighting	LED Specialty Lamp - Interior	16,596	1.00	16,596	1.00	16,596	10.0
Appliance	Room AC - ER	12,478	1.00	12,478	1.00	12,478	12.0
HVAC	Furnace Tune-Up	6,631	1.00	6,631	1.00	6,631	3.0
HVAC	Programmable Thermostat	5,580	1.00	5,580	1.00	5,580	16.0
Shell	Rim Insulation	5,385	1.00	5,385	1.00	5,385	20.0
Hot Water	HW Pipe Insulation	4,865	1.00	4,865	1.00	4,865	15.0
Shell	Floor Insulation	1,761	1.00	1,761	1.00	1,761	20.0
Hot Water	Low Flow Showerhead	982	1.07	1,052	1.00	1,052	10.0
HVAC	Furnace Blower Motor	920	1.00	920	1.00	920	6.0
Appliance	Freezer	577	1.00	577	1.00	577	22.0
Hot Water	Low Flow Faucet Aerator - Kitchen	225	1.28	287	1.00	287	10.0
Hot Water	Low Flow Faucet Aerator - Bathroom	169	1.22	207	1.00	207	10.0
Appliance	Refrigerator - TOS	126	1.00	126	1.00	126	17.0
HVAC	Gas High Efficiency Boiler - ER	0	N/A	0	1.00	0	25.0
HVAC	Gas High Efficiency Boiler - TOS	0	N/A	0	1.00	0	25.0
HVAC	Gas High Efficiency Furnace - TOS	0	N/A	0	1.00	0	20.0
Hot Water	Gas Water Heater - ER	0	N/A	0	1.00	0	13.0
	Total	**1,983,801**	**1.00**	**1,979,150**		**1,979,150**	

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

Note: The savings in this table include secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd. The savings account for electric heating penalties, where applicable.

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

Source: ComEd tracking data and evaluation team analysis

Table 5-10. IHWAP Summer Peak Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTG*	Verified Net Peak Demand Reduction (kW)
Lighting	LED Omnidirectional Bulb - Interior	79.29	1.00	79.29	1.00	79.29
HVAC	Central Air Conditioning - ER	200.65	1.00	200.65	1.00	200.65
Shell	Air Sealing	98.05	1.00	98.05	1.00	98.05
HVAC	Gas High Efficiency Furnace - ER	35.96	1.00	35.96	1.00	35.96
Shell	Attic Insulation	57.80	1.00	57.80	1.00	57.80
HVAC	Advanced Thermostat	36.63	1.00	36.78	1.00	36.78
HVAC	Bathroom Exhaust Fan	8.47	1.00	8.47	1.00	8.47
HVAC	Duct Insulation and Sealing - Distribution Efficiency	21.55	1.01	21.72	1.00	21.72
Lighting	LED Specialty Lamp - Exterior	5.38	1.00	5.38	1.00	5.38
Appliance	Refrigerator - ER	6.49	1.00	6.49	1.00	6.49
Lighting	LED Omnidirectional Bulb - Exterior	4.43	1.00	4.43	1.00	4.43
Shell	Wall Insulation	9.15	1.00	9.15	1.00	9.15
Shell	Basement Sidewall Insulation	8.56	1.00	8.60	1.00	8.60
HVAC	Central Air Conditioning - TOS	23.34	1.00	23.34	1.00	23.34
HVAC	Air Source Heat Pump - ER	-1.91	1.00	-1.91	1.00	-1.91
Lighting	LED Specialty Lamp - Interior	2.48	1.00	2.48	1.00	2.48
Appliance	Room AC - ER	10.34	1.00	10.34	1.00	10.34
HVAC	Furnace Tune-Up	0.00	N/A	0.00	1.00	0.00
HVAC	Programmable Thermostat	0.00	N/A	0.00	1.00	0.00
Shell	Rim Insulation	1.50	1.00	1.50	1.00	1.50
Hot Water	HW Pipe Insulation	0.55	1.00	0.55	1.00	0.55
Shell	Floor Insulation	0.58	1.00	0.58	1.00	0.58
Hot Water	Low Flow Showerhead	0.10	1.00	0.10	1.00	0.10
HVAC	Furnace Blower Motor	0.26	1.00	0.26	1.00	0.26
Appliance	Freezer	0.09	1.00	0.09	1.00	0.09
Hot Water	Low Flow Faucet Aerator - Kitchen	0.08	1.00	0.08	1.00	0.08
Hot Water	Low Flow Faucet Aerator - Bathroom	0.29	1.00	0.29	1.00	0.29
Appliance	Refrigerator - TOS	0.02	1.00	0.02	1.00	0.02
HVAC	Gas High Efficiency Boiler - ER	0.00	N/A	0.00	1.00	0.00
HVAC	Gas High Efficiency Boiler - TOS	0.00	N/A	0.00	1.00	0.00
HVAC	Gas High Efficiency Furnace - TOS	0.00	N/A	0.62	1.00	0.62
Hot Water	Gas Water Heater - ER	0.00	N/A	0.00	1.00	0.00
	Total	**610.15**	**1.00**	**611.13**		**611.13**

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

Source: ComEd tracking data and evaluation team analysis

The IHWAP program component includes measures that save water. That reduction in water produces secondary kWh savings from water supply and wastewater treatment. Table 5-11 shows the secondary measure-level savings. The savings in this table are included in the electricity savings in the previous tables in this section.

Table 5-11. IHWAP Secondary Energy Savings from Water Reduction by Measure – Electric

End Use Type	Research Category	Ex Ante Annual Water Savings (gallons)	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate (RR_{water})	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	LED Omnidirectional Bulb - Interior	0	0		0	1.00	0
HVAC	Central Air Conditioning - ER	0	0		0	1.00	0
Shell	Air Sealing	0	0		0	1.00	0
HVAC	Gas High Efficiency Furnace - ER	0	0		0	1.00	0
Shell	Attic Insulation	0	0		0	1.00	0
HVAC	Advanced Thermostat	0	0		0	1.00	0
HVAC	Bathroom Exhaust Fan	0	0		0	1.00	0
HVAC	Duct Insulation and Sealing - Distribution Efficiency	0	0		0	1.00	0
Lighting	LED Specialty Lamp - Exterior	0	0		0	1.00	0
Appliance	Refrigerator - ER	0	0		0	1.00	0
Lighting	LED Omnidirectional Bulb - Exterior	0	0		0	1.00	0
Shell	Wall Insulation	0	0		0	1.00	0
Shell	Basement Sidewall Insulation	0	0		0	1.00	0
HVAC	Central Air Conditioning - TOS	0	0		0	1.00	0
HVAC	Air Source Heat Pump - ER	0	0		0	1.00	0
Lighting	LED Specialty Lamp - Interior	0	0		0	1.00	0
Appliance	Room AC - ER	0	0		0	1.00	0
HVAC	Furnace Tune-Up	0	0		0	1.00	0
HVAC	Programmable Thermostat	0	0		0	1.00	0
Shell	Rim Insulation	0	0		0	1.00	0
Hot Water	HW Pipe Insulation	0	0		0	1.00	0
Shell	Floor Insulation	0	0		0	1.00	0
Hot Water	Low Flow Showerhead	20,840	70	1.00	70	1.00	70
HVAC	Furnace Blower Motor	0	0		0	1.00	0
Appliance	Freezer	0	0		0	1.00	0
Hot Water	Low Flow Faucet Aerator - Kitchen	20,099	62	1.00	62	1.00	62
Hot Water	Low Flow Faucet Aerator - Bathroom	11,923	39	1.00	38	1.00	38
Appliance	Refrigerator - TOS	0	0		0	1.00	0
HVAC	Gas High Efficiency Boiler - ER	0	0		0	1.00	0
HVAC	Gas High Efficiency Boiler - TOS	0	0		0	1.00	0
HVAC	Gas High Efficiency Furnace - TOS	0	0		0	1.00	0
Hot Water	Gas Water Heater - ER	0	0		0	1.00	0
	Total	**52,862**	**171**	**1.00**	**171**		**171**

Note: The savings in this table reflect only secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd, not those claimed by gas utilities.
N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).
* A deemed value. Source: the Illinois SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2021.
Source: ComEd tracking data and evaluation team analysis

The IHWAP program component includes measures that save gas. Table 5-12 shows the measure-level gas savings.

Table 5-12. IHWAP Energy Savings by Measure – Gas

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)	EUL (years)
Lighting	LED Omnidirectional Bulb - Interior	0	N/A	0	1.00	0	10.0
HVAC	Central Air Conditioning - ER	0	N/A	0	1.00	0	18.0
Shell	Air Sealing	7,445	1.00	7,445	1.00	7,445	20.0
HVAC	Gas High Efficiency Furnace - ER	5,287	1.00	5,287	1.00	5,287	20.0
Shell	Attic Insulation	9,242	1.00	9,242	1.00	9,242	20.0
HVAC	Advanced Thermostat	2,465	1.00	2,465	1.00	2,465	11.0
HVAC	Bathroom Exhaust Fan	0	N/A	0	1.00	0	19.0
HVAC	Duct Insulation and Sealing - Distribution Efficiency	5,320	1.00	5,321	1.00	5,321	20.0
Lighting	LED Specialty Lamp - Exterior	0	N/A	0	1.00	0	6.9
Appliance	Refrigerator - ER	0	N/A	0	1.00	0	17.0
Lighting	LED Omnidirectional Bulb - Exterior	0	N/A	0	1.00	0	8.0
Shell	Wall Insulation	3,221	1.00	3,221	1.00	3,221	20.0
Shell	Basement Sidewall Insulation	638	1.00	638	1.00	638	20.0
HVAC	Central Air Conditioning - TOS	0	N/A	0	1.00	0	18.0
HVAC	Air Source Heat Pump - ER	0	N/A	0	1.00	0	16.0
Lighting	LED Specialty Lamp - Interior	0	N/A	0	1.00	0	10.0
Appliance	Room AC - ER	0	N/A	0	1.00	0	12.0
HVAC	Furnace Tune-Up	3,087	1.00	3,087	1.00	3,087	3.0
HVAC	Programmable Thermostat	593	1.00	593	1.00	593	16.0
Shell	Rim Insulation	156	1.00	156	1.00	156	20.0
Hot Water	HW Pipe Insulation	429	1.00	429	1.00	429	15.0
Shell	Floor Insulation	46	1.00	46	1.00	46	20.0
Hot Water	Low Flow Showerhead	62	1.00	62	1.00	62	10.0
HVAC	Furnace Blower Motor	0	N/A	0	1.00	0	6.0
Appliance	Freezer	0	N/A	0	1.00	0	22.0
Hot Water	Low Flow Faucet Aerator - Kitchen	74	1.00	74	1.00	74	10.0
Hot Water	Low Flow Faucet Aerator - Bathroom	33	1.00	33	1.00	33	10.0
Appliance	Refrigerator - TOS	0	N/A	0	1.00	0	17.0
HVAC	Gas High Efficiency Boiler - ER	265	1.00	265	1.00	265	25.0
HVAC	Gas High Efficiency Boiler - TOS	66	1.00	66	1.00	66	25.0
HVAC	Gas High Efficiency Furnace - TOS	453	1.00	453	1.00	453	20.0
Hot Water	Gas Water Heater - ER	914	1.00	914	1.00	914	13.0
	Total	**39,798**	**1.00**	**39,799**		**39,799**	
	Total kWh Converted from Therms†	**1,166,472**	**1.00**	**1,166,495**		**1,166,495**	

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

† Gas savings converted to kWh by multiplying therms by 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

Source: ComEd tracking data and evaluation team analysis

The total energy savings are provided in Table 5-13. The total includes electric energy savings and converted electric savings from gas measures.

Table 5-13. IHWAP Energy Savings by Measure – Total

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	LED Omnidirectional Bulb - Interior	644,243	0.99	637,132	1.00	637,132
HVAC	Central Air Conditioning - ER	366,229	1.00	366,229	1.00	366,229
Shell	Air Sealing	419,644	1.00	419,652	1.00	419,652
HVAC	Gas High Efficiency Furnace - ER	301,494	1.00	301,678	1.00	301,678
Shell	Attic Insulation	415,628	1.00	415,637	1.00	415,637
HVAC	Advanced Thermostat	148,047	1.00	148,254	1.00	148,254
HVAC	Bathroom Exhaust Fan	73,747	1.00	73,747	1.00	73,747
HVAC	Duct Insulation and Sealing - Distribution Efficiency	209,059	1.00	209,276	1.00	209,276
Lighting	LED Specialty Lamp - Exterior	48,733	1.00	48,733	1.00	48,733
Appliance	Refrigerator - ER	43,046	1.00	43,046	1.00	43,046
Lighting	LED Omnidirectional Bulb - Exterior	40,136	1.00	40,136	1.00	40,136
Shell	Wall Insulation	118,256	1.00	118,259	1.00	118,259
Shell	Basement Sidewall Insulation	42,184	1.00	42,226	1.00	42,226
HVAC	Central Air Conditioning - TOS	23,188	1.00	23,188	1.00	23,188
HVAC	Air Source Heat Pump - ER	19,229	1.09	20,871	1.00	20,871
Lighting	LED Specialty Lamp - Interior	16,596	1.00	16,596	1.00	16,596
Appliance	Room AC - ER	12,478	1.00	12,478	1.00	12,478
HVAC	Furnace Tune-Up	97,110	1.00	97,110	1.00	97,110
HVAC	Programmable Thermostat	22,975	1.00	22,975	1.00	22,975
Shell	Rim Insulation	9,966	1.00	9,966	1.00	9,966
Hot Water	HW Pipe Insulation	17,426	1.00	17,425	1.00	17,425
Shell	Floor Insulation	3,119	1.00	3,119	1.00	3,119
Hot Water	Low Flow Showerhead	2,810	1.02	2,880	1.00	2,880
HVAC	Furnace Blower Motor	920	1.00	920	1.00	920
Appliance	Freezer	577	1.00	577	1.00	577
Hot Water	Low Flow Faucet Aerator - Kitchen	2,387	1.03	2,450	1.00	2,450
Hot Water	Low Flow Faucet Aerator - Bathroom	1,148	1.03	1,185	1.00	1,185
Appliance	Refrigerator - TOS	126	1.00	126	1.00	126
HVAC	Gas High Efficiency Boiler - ER	7,767	1.00	7,767	1.00	7,767
HVAC	Gas High Efficiency Boiler - TOS	1,933	1.00	1,933	1.00	1,933
HVAC	Gas High Efficiency Furnace - TOS	13,286	1.00	13,286	1.00	13,286
Hot Water	Gas Water Heater - ER	26,787	1.00	26,787	1.00	26,787
	Total†	**3,150,274**	**1.00**	**3,145,645**		**3,145,645**

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† The total includes the electric equivalent of the total therms.
Source: ComEd tracking data and evaluation team analysis

6. Impact Analysis Findings and Recommendations

6.1 CBA

The main contribution to the adjustment in verified gross savings for the CBA program component was from claimed gas savings being included in the pure electric savings (see Finding 1 below) and a difference in values used to calculate insulation savings (see finding 6-8). The converted gas savings led to an electric realization rate of 0.15 however the gas realization rate was 1.0 and demand was 0.92.

The evaluation team developed several recommendations based on findings from the CY2021 evaluation.

6.1.1 Converted Gas Savings and Secondary Water Savings

Finding 1. The savings reported in the Calculated_Total_Gross_kWh column of the program tracker include both pure electric savings and converted gas savings for all measures except for low flow showerheads. Guidehouse used Total_Gross_kWh to determine the ex ante total program savings (electric and converted). This resulted in an elevated realization rate for low flow showerheads when compared to other program measures. Additionally, that column did not include converted secondary water savings.

> **Recommendation 1.** Report pure electric and secondary water savings only in the Calculated_Total_Gross_kWh column—do not include converted gas savings.

6.1.2 HVAC: Programmable Thermostat Electric Savings

Finding 2. Furnace projects were reported without electric savings, while boiler projects were reported with electric savings. The Illinois Technical Reference Manual v9.0 (IL-TRM)[3]does not provide boiler project electric savings and provides fractional savings for furnace projects.

> **Recommendation 2.** Include the electric savings for furnace projects and remove electric savings claimed for boiler projects in accordance with the IL-TRM.

6.1.3 Shell: Air Sealing nHeat Value

Finding 3. The ex ante savings for air sealing measures used a static ηHeat value of 0.72. Guidehouse used a variable value based on the heating fuel type and the heating system annual fuel utilization efficiency (AFUE) provided in the program tracker.

> **Recommendation 3.** Use a variable ηHeat value to calculate savings for air sealing measures.

[3] In this report, unless stated otherwise, IL-TRM and IL-TRM Errata refers to version 9.0 (v9.0).

6.1.4 Lighting: LED Bulbs Waste Heat Factor (WHF)

Finding 4. The ex ante calculations used values of 1.05 for WHFe and 1.9 for WHFd to determine savings, and the source of these values was not documented in the program tracker. Guidehouse used values of 1.06 and 1.11 as noted in the IL-TRM for single-family homes.

> **Recommendation 4.** Use the WHFe and WHFd from the IL-TRM for single-family homes to calculate savings for this measure.

6.1.5 Shell: Rim Insulation Quantities

Finding 5. The ex ante gas savings per unit did not match the savings per unit described in the master measure database (MMDB) provided by ComEd. Guidehouse used the square footage included in the Measure_Quantity column of the program tracker to calculate savings.

> **Recommendation 5.** Calculate savings based on the square footage found in the Measure_Quantity column of the program tracker per the IL-TRM.

6.1.6 Hot Water: Pipe Insulation Thickness

Finding 6. The program tracker included specific pipe insulation thickness values that Guidehouse used to calculate verified savings per the IL-TRM. The ex ante calculator used average values to calculate savings instead of the specific values recorded in the tracker.

> **Recommendation 6.** Calculate pipe insulation savings based on the exact pipe insulation thicknesses per the IL-TRM.

6.1.7 Insulation Cooling Calculations

Finding 7. The ex ante calculations assigned cooling savings for all insulation measures even when then there were no existing cooling systems. This affects the peak demand calculations and the total savings that include pure electric savings.

> **Recommendation 7.** Apply cooling peak demand savings only when there are cooling systems per the IL-TRM.

6.2 IHWAP

The realization rates for the program level total, gas, and demand savings are 1.00. The measure that had the largest effect on adjusting ex ante gross savings for the IHWAP program component was the interior omnidirectional lamps because of the heating penalty.

The evaluation team developed several recommendations based on findings from the CY2021 evaluation.

6.2.1 LED: Omnidirectional Lamps Heating Penalties

Finding 8. The ex ante savings did not account for an electric heating penalty adjustment as required by the IL-TRM. Guidehouse determined that at least 19 LED: Omnidirectional Bulb projects (2.2% of all LED: Omnidirectional Bulb projects in CY2021) should have savings

affected by the heating penalty adjustment. The evaluation team's verified gross savings adjusted for 7,111 kWh of heating penalties.

> **Recommendation 8.** Include kWh heating penalties in energy savings calculations per the IL-TRM.

6.2.2 HVAC: Air Source Heat Pumps Tracking Data

Finding 9. The program tracker was incomplete for several inputs used to calculate measure savings. Guidehouse used the default values in the IL-TRM in these instances, including: HSPFee (8.5), ~0 for 1/EER_base, 1/EER_exist, 1/SEER_base, and 1/SEER_exist, 3.41 for HSPF_base and HSPF_existand 0% de-rating for cooling and heating for a quality installation. Guidehouse calculated 1,593 kWh additional savings across two projects using these defaults.

> **Recommendation 9.** Ensure program tracking data includes all relevant inputs to calculate measure savings.

6.2.3 Water Savings Accounting

Finding 10. The tracking data provides gallons of water saved but does not calculate the secondary electric energy (kWh) savings from water supply and wastewater treatment plants. Guidehouse calculated 171 kWh as the total secondary water savings, which increased the gross savings realization rates for the bathroom aerator, kitchen aerator, and showerhead measures.

> **Recommendation 10.** Include secondary water savings as part of the ex ante kWh value in the program tracking data.

Appendix A. Impact Analysis Methodology

Guidehouse determined the verified gross savings for each measure by:

- Reviewing the tracking data for completeness and alignment of savings values with the MMDB, IL-TRM, and IL-TRM Errata, where applicable.
- Validating the savings algorithms were applied correctly.
- Cross-checking per-unit savings values in the tracking data with verified values obtained using the MMDB, IL-TRM, and IL-TRM Errata, where applicable, to determine the cause behind any discrepancy.

The team calculated verified net energy and demand (coincident peak and overall) savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) ratio of 1.0. For CY2021, the Single Family Retrofits – Income Eligible Program's NTG estimate was defined by a consensus process through the Illinois SAG.

Appendix B. Total Resource Cost Detail

Table B-1 shows the CBA TRC cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. This table does not include additional required cost data (e.g., measure costs, program-level incentives, and non-incentive costs). ComEd will provide this data to the evaluation team later.

Table B-1. CBA Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Gross Electric Energy Savings (kWh)	Gross Peak Demand Reduction (kW)	Gross Gas Savings (Therms)	Gross Secondary Savings due to Water Reduction (kWh)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (kW)	NTG (Therms)	Net Electric Energy Savings (kWh)	Net Peak Demand Reduction (kW)	Net Gas Savings (Therms)	Net Secondary Savings due to Water Reduction (kWh)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Shell	Air Sealing	Projects	1,118	20.0	No	725,381	414.16	136,334	0	0	0	1.00	1.00	1.00	725,381	414.16	136,334	0	0	0
Shell	Attic Insulation	Projects	1,097	20.0	No	290,204	120.58	89,250	0	0	0	1.00	1.00	1.00	290,204	120.58	89,250	0	0	0
Shell	Wall Insulation	Projects	1,618	20.0	No	263,637	107.65	106,813	0	0	0	1.00	1.00	1.00	263,637	107.65	106,813	0	0	0
Lighting	LED Omnidirectional Bulb - Interior	Each	6,675	10.0	No	253,740	31.24	0	0	0	-5,716	1.00	1.00	1.00	253,740	31.24	0	0	0	-5,716
Lighting	LED Specialty Lamp - Interior	Each	6,148	10.0	No	194,135	29.03	0	0	0	-4,374	1.00	1.00	1.00	194,135	29.03	0	0	0	-4,374
HVAC	Bathroom Exhaust Fan - Bathroom	Each	1,104	19.0	No	32,607	4.04	0	0	0	0	1.00	1.00	1.00	32,607	4.04	0	0	0	0
Lighting	LED Specialty Lamp - Exterior	Each	155	6.9	No	17,542	1.94	0	0	0	0	1.00	1.00	1.00	17,542	1.94	0	0	0	0
Lighting	LED Omnidirectional Bulb - Exterior	Each	66	8.0	No	5,227	0.58	0	0	0	0	1.00	1.00	1.00	5,227	0.58	0	0	0	0
HVAC	Programmable Thermostat	Each	98	16.0	No	4,987	0.00	3,234	0	0	0	1.00	1.00	1.00	4,987	0.00	3,234	0	0	0
Hot Water	Low Flow Showerhead	Each	442	10.0	No	4,106	0.45	1,811	2,278	0	0	1.00	1.00	1.00	4,106	0.45	1,811	2,278	0	0
Shell	Floor Insulation	Projects	135	20.0	No	3,396	0.98	1,411	0	0	0	1.00	1.00	1.00	3,396	0.98	1,411	0	0	0
HVAC	Advanced Thermostat	Each	7	11.0	No	1,447	0.73	481	0	0	0	1.00	1.00	1.00	1,447	0.73	481	0	0	0
Shell	Rim Insulation	Projects	102	20.0	No	1,348	0.55	633	0	0	0	1.00	1.00	1.00	1,348	0.55	633	0	0	0
Hot Water	Low Flow Faucet Aerator - Kitchen	Each	142	10.0	No	388	0.08	197	280	0	0	1.00	1.00	1.00	388	0.08	197	280	0	0
Hot Water	HW Pipe Insulation	Projects	268	15.0	No	231	0.03	854	0	0	0	1.00	1.00	1.00	231	0.03	854	0	0	0
Hot Water	Low Flow Faucet Aerator - Bathroom	Each	119	10.0	No	82	0.13	48	91	0	0	1.00	1.00	1.00	82	0.13	48	91	0	0
	Total		**5,542,566**			**1,798,458**	**712**	**341,065**	**2,649**	**0**	**-10,090**				**1,798,458**	**712**	**341,065**	**2,649**	**0**	**-10,090**

Note: To avoid double counting, the verified gross kWh and net kWh used in the TRC analysis exclude secondary energy savings from water reduction measures.
‡ The EUL for this measure varies over time. See the CPAS tables (Table 4-1 to Table 4-3).

Source: ComEd tracking data and evaluation team analysis

Table B-2 shows the IHWAP TRC cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. This table does not include additional required cost data (e.g., measure costs, program-level incentives, and non-incentive costs). ComEd will provide this data to the evaluation team later.

Table B-2. IHWAP Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Gross Electric Energy Savings (kWh)	Gross Peak Demand Reduction (kW)	Gross Gas Savings (Therms)	Gross Secondary Savings due to Water Reduction (kWh)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (kW)	NTG (Therms)	Net Electric Energy Savings (kWh)	Net Peak Demand Reduction (kW)	Net Gas Savings (Therms)	Net Secondary Savings due to Water Reduction (kWh)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Lighting	LED Omnidirectional Bulb - Interior‡	Each	11,410	10.0	No	637,132	79.29	0	0	0	-14,170	1.00	1.00	1.00	637,132	79.29	0	0	0	-14,170
HVAC	Central Air Conditioning - ER‡	Each	248	18.0	Yes	366,229	200.65	0	0	0	0	1.00	1.00	1.00	366,229	200.65	0	0	0	0
Shell	Air Sealing‡	Projects	526	20.0	No	201,428	98.05	7,445	0	0	0	1.00	1.00	1.00	201,428	98.05	7,445	0	0	0
HVAC	Gas High Efficiency Furnace - ER‡	Each	242	20.0	Yes	146,717	35.96	5,287	0	0	-1,367	1.00	1.00	1.00	146,717	35.96	5,287	0	0	-1,367
Shell	Attic Insulation‡	Square Feet	407,349	20.0	No	144,752	57.80	9,242	0	0	0	1.00	1.00	1.00	144,752	57.80	9,242	0	0	0
HVAC	Advanced Thermostat	Each	298	11.0	No	75,992	36.78	2,465	0	0	0	1.00	1.00	1.00	75,992	36.78	2,465	0	0	0
HVAC	Bathroom Exhaust Fan	Each	598	19.0	No	73,747	8.47	0	0	0	0	1.00	1.00	1.00	73,747	8.47	0	0	0	0
HVAC	Duct Insulation and Sealing - Distribution Efficiency	Each	76	20.0	No	53,328	21.72	5,321	0	0	0	1.00	1.00	1.00	53,328	21.72	5,321	0	0	0
Lighting	LED Specialty Lamp - Exterior‡	Each	205	6.9	No	48,733	5.38	0	0	0	0	1.00	1.00	1.00	48,733	5.38	0	0	0	0
Appliance	Refrigerator - ER‡	Each	102	17.0	Yes	43,046	6.49	0	0	0	0	1.00	1.00	1.00	43,046	6.49	0	0	0	0
Lighting	LED Omnidirectional Bulb - Exterior‡	Each	317	8.0	No	40,136	4.43	0	0	0	0	1.00	1.00	1.00	40,136	4.43	0	0	0	0
Shell	Wall Insulation‡	Square Feet	126,158	20.0	No	23,849	9.15	3,221	0	0	0	1.00	1.00	1.00	23,849	9.15	3,221	0	0	0
Shell	Basement Sidewall Insulation‡	Square Feet	29,472	20.0	No	23,537	8.60	638	0	0	0	1.00	1.00	1.00	23,537	8.60	638	0	0	0
HVAC	Central Air Conditioning - TOS	Each	89	18.0	No	23,188	23.34	0	0	0	0	1.00	1.00	1.00	23,188	23.34	0	0	0	0
HVAC	Air Source Heat Pump - ER‡	Each	2	16.0	Yes	20,871	-1.91	0	0	0	0	1.00	1.00	1.00	20,871	-1.91	0	0	0	0
Lighting	LED Specialty Lamp - Interior‡	Each	471	10.0	No	16,596	2.48	0	0	0	-374	1.00	1.00	1.00	16,596	2.48	0	0	0	-374
Appliance	Room AC - ER‡	Each	61	12.0	Yes	12,478	10	0	0	0	0	1.00	1.00	1.00	12,478	10	0	0	0	0
HVAC	Furnace Tune-Up	Each	68	3.0	No	6,631	0.00	3,087	0	0	0	1.00	1.00	1.00	6,631	0.00	3,087	0	0	0
HVAC	Programmable Thermostat	Each	84	16.0	No	5,580	0.00	593	0	0	0	1.00	1.00	1.00	5,580	0.00	593	0	0	0
Shell	Rim Insulation‡	Square Feet	19,540	20.0	No	5,385	1.50	156	0	0	0	1.00	1.00	1.00	5,385	1.50	156	0	0	0
Hot Water	HW Pipe Insulation	Linear Feet	724	15.0	No	4,865	0.55	429	0	0	0	1.00	1.00	1.00	4,865	0.55	429	0	0	0
Shell	Floor Insulation‡	Square Feet	8,745	20.0	No	1,761	0.58	46	0	0	0	1.00	1.00	1.00	1,761	0.58	46	0	0	0
Hot Water	Low Flow Showerhead	Each	36	10.0	No	982	0.10	62	70	0	0	1.00	1.00	1.00	982	0.10	62	70	0	0
HVAC	Furnace Blower Motor	Each	1	6.0	No	920	0.26	0	0	0	-8	1.00	1.00	1.00	920	0.26	0	0	0	-8
Appliance	Freezer	Each	17	22.0	No	577	0.09	0	0	0	0	1.00	1.00	1.00	577	0.09	0	0	0	0
Hot Water	Low Flow Faucet Aerator - Kitchen	Each	12	10.0	No	225	0.08	74	62	0	0	1.00	1.00	1.00	225	0.08	74	62	0	0
Hot Water	Low Flow Faucet Aerator - Bathroom	Each	50	10.0	No	168	0.29	33	38	0	0	1.00	1.00	1.00	168	0.29	33	38	0	0
Appliance	Refrigerator - TOS	Each	3	17.0	No	126	0.02	0	0	0	0	1.00	1.00	1.00	126	0.02	0	0	0	0
HVAC	Gas High Efficiency Boiler - ER‡	Each	1	25.0	Yes	0	0.00	265	0	0	0	1.00	1.00	1.00	0	0.00	265	0	0	0
HVAC	Gas High Efficiency Boiler - TOS	Each	4	25.0	No	0	0.00	66	0	0	0	1.00	1.00	1.00	0	0.00	66	0	0	0
HVAC	Gas High Efficiency Furnace - TOS	Each	6	20.0	No	0	0.62	453	0	0	-30	1.00	1.00	1.00	0	0.62	453	0	0	-30
Hot Water	Gas Water Heater - ER‡	Each	24	13.0	Yes	0	0.00	914	0	0	0	1.00	1.00	1.00	0	0.00	914	0	0	0
	Total		**606,939**	**15.1**		**1,978,979**	**611.13**	**39,799**	**171**	**0**	**-15,950**				**1,978,979**	**611.13**	**39,799**	**171**	**0**	**-15,950**

Note: To avoid double counting, the verified gross kWh and net kWh used in the TRC analysis exclude secondary energy savings from water reduction measures.
‡ The EUL for this measure varies over time. See the CPAS tables (Table 4-4 to Table 4-6).

Source: ComEd tracking data and evaluation team analysis