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Combined Utility Affordable Housing New Construction Program Impact Evaluation Report

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

Prepared for:

ComEd
Nicor Gas
Peoples Gas
North Shore Gas

FINAL

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Prepared by:

Ryan Kroll
Driftless Energy

Brian Uchtmann
Driftless Energy

Neil Curtis
Guidehouse

DRIFTLESS ENERGY

Submitted to:

ComEd
2011 Swift Drive
Oak Brook, IL 60523

Nicor Gas Company
1844 Ferry Road
Naperville, IL 60563

Peoples Gas and North Shore Gas
200 East Randolph Street
Chicago, IL 60601

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
802.526.5119
neil.curtis@guidehouse.com

Ed Balbis, Partner
561.644.9407
ebalbis@guidehouse.com

Stu Slote, Director
802.526.5113
stu.slote@guidehouse.com

Kevin Grabner, Associate Director
608.616.5805
kevin.grabner@guidehouse.com

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1. Introduction

The Affordable Housing New Construction (AHNC) Program is offered jointly to affordable housing developers and owners served by ComEd, Nicor Gas, Peoples Gas, and North Shore Gas. This report presents results for all utilities.

This report presents the CY2021 AHNC Program impact evaluation results. It summarizes the total energy and demand impacts for the program broken out by relevant measure and program structure details including by utility. 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 AHNC Program provides technical assistance and incentives for energy efficient construction and major renovation of multifamily affordable housing. The program targets affordable housing developers and owners constructing housing for households with incomes at or below 80% of the area median income. The program also aims to educate housing developers on cost-effective energy efficient building practices. The program has two participation levels: major renovation and new multifamily. The program is implemented by Slipstream and is jointly offered by ComEd, Nicor Gas, Peoples Gas, and North Shore Gas.

In CY2021, the AHNC Program had 10 total projects with 623 eligible residential units, as shown in Table 2-1. All projects were served by ComEd and either Nicor Gas or Peoples Gas. No CY2021 projects were served by North Shore Gas. The projects included 13 measure types across the lighting, HVAC, shell, appliances, and hot water end use types, shown in Table 2-2.

Table 2-1. Number of Participants and Units

Participation	Quantity	Units
Participants (ComEd)	10	Projects
Participants (Nicor Gas)	5	Projects
Participants (Peoples Gas)	5	Projects
Number of Affordable Units (ComEd)	623	Residential Units
Number of Affordable Units (Nicor Gas)	163	Residential Units
Number of Affordable Units (Peoples Gas)	460	Residential Units

Source: ComEd, Nicor Gas, and Peoples Gas tracking data and evaluation team analysis

Table 2-2. Number of Measures by Type

End Use Type	Research Category	Quantity	Unit
Lighting	High-Performance Interior Lighting	6,461	Lamps
HVAC	High-Performance HVAC Equipment	731	Units
Shell	Reduced Infiltration	206,570	CFM50
Lighting	Interior Lighting Controls	46,901	Watts
Shell	Reduced Thermal Bridging	415,273	SF
Lighting	High-Performance Exterior Lighting	361	Lamps
HVAC	High-Performance Fans	504	Units
Appliances	Efficient Appliances	936	Units
HVAC	Efficient Ventilation	9	Units
Shell	High-Performance Windows	61,820	SF
HVAC	Advanced HVAC Controls	140	Units
Hot Water	Hot Water Conservation	1,689	Units
Hot Water	High-Performance Water Heating Equipment	123	Units
	Total	**741,517**	

HVAC – heating, ventilation, and air conditioning
Note: The rows are sorted by verified gross savings.
Shell square footage includes combination of wall area and roof/attic area
High performance appliances includes dishwasher, clothes washer, clothes dryer, and refrigerator measures
Source: ComEd, Nicor Gas, and Peoples Gas tracking data and evaluation team analysis

3. Program Savings Detail

Table 3-1 summarizes the CY2021 incremental energy and demand savings the AHNC Program achieved. The program does not have any electric energy savings converted from gas. All of the gas savings are claimed by the gas utilities and are shown in Table 3-2.

Table 3-1. 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	1,363,000	1.01	1,374,420	1.00	0	0	1,374,420
Electric Energy Savings - Converted from Gas	kWh	0	N/A	0	1.00	N/A	N/A	0
Total Electric Energy Savings	kWh	1,363,000	1.01	1,374,420	1.00	0	0	1,374,420
Summer Peak§ Demand Savings	kW	206	0.97	199	1.00	0	0	199

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

§ 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. CY2021 Total Annual Incremental Therm Savings

Savings Category	Nicor Gas (therms)¥	Peoples Gas (Therms)†	North Shore Gas (Therms)
Natural Gas*			
Ex Ante Gross Savings	31,924	84,524	0
Program Gross Realization Rate	1.01	0.99	N/A
Verified Gross Savings	32,141	83,796	0
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	32,141	83,796	0

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

* Gas savings with electric interactive effects removed.

¥ Ex ante gross savings values are based on the measure calculators and project files provided by the implementer. Nicor Gas tracked ex ante gross savings of 31,215 therms, which included interactive effects on two of the five projects.

† Ex ante gross savings values are based on the measure calculators and project files provided by the implementer. Peoples Gas tracked ex ante gross savings of 82,672 therms, which included savings values inconsistent with final implementer savings values for three of five projects.

Source: ComEd, Nicor Gas, Peoples Gas, and North Shore Gas tracking data and evaluation team analysis

4. Cumulative Persisting Annual Savings

Table 4-1 to Table 4-3 and Figure 4-1 show the measure-specific and total verified gross savings for the AHNC Program 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. There was no gas contribution to CY2021 CPAS for ComEd. Table 4-2 is included to show the historic savings from previous years. 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. Cumulative Persisting Annual Savings – 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	High-Performance Interior Lighting	14.5	574,536	1.00	8,325,029				574,536	574,536	574,536	574,536	574,536	574,536
HVAC	High-Performance HVAC Equipment	16.6	325,877	1.00	5,409,565				325,877	325,877	325,877	325,877	325,877	325,877
Shell	Reduced Infiltration	16.3	95,423	1.00	1,553,482				95,423	95,423	95,423	95,423	95,423	95,423
Lighting	Interior Lighting Controls	8.0	87,971	1.00	703,766				87,971	87,971	87,971	87,971	87,971	87,971
Shell	Reduced Thermal Bridging	23.9	75,066	1.00	1,793,333				75,066	75,066	75,066	75,066	75,066	75,066
Lighting	High-Performance Exterior Lighting	14.7	55,754	1.00	820,702				55,754	55,754	55,754	55,754	55,754	55,754
HVAC	High-Performance Fans	19.0	48,487	1.00	921,256				48,487	48,487	48,487	48,487	48,487	48,487
Appliances	Efficient Appliances	13.1	31,508	1.00	412,437				31,508	31,508	31,508	31,508	31,508	31,508
HVAC	Efficient Ventilation	16.0	31,455	1.00	502,334				31,455	31,455	31,455	31,455	31,455	31,455
Shell	High-Performance Windows	23.5	19,387	1.00	455,587				19,387	19,387	19,387	19,387	19,387	19,387
HVAC	Advanced HVAC Controls	10.9	27,233	1.00	296,843				27,233	27,233	27,233	27,233	27,233	27,233
Hot Water	Hot Water Conservation	10.0	1,722	1.00	17,223				1,722	1,722	1,722	1,722	1,722	1,722
Hot Water	High-Performance Water Heating Equipment	17.0		1.00										
CY2021 Program Total Electric Contribution to CPAS		**15.4**	**1,374,420**		**21,211,557**				**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**
Historic Program Total Electric Contribution to CPAS‡						**1,935,089**	**4,227,324**	**5,896,588**	**5,542,214**	**5,542,214**	**5,542,214**	**5,542,214**	**5,542,214**	**5,542,214**
Program Total Electric CPAS						**1,935,089**	**4,227,324**	**5,896,588**	**6,916,634**	**6,916,634**	**6,916,634**	**6,916,634**	**6,916,634**	**6,916,634**
CY2021 Program Incremental Expiring Electric Savings§										-	-	-	-	-
Historic Program Incremental Expiring Electric Savings‖									**354,374**	-	-	-	-	-
Program Total Incremental Expiring Electric Savings#									**354,374**	-	-	-	-	-

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	High-Performance Interior Lighting	574,536	574,536	574,536	574,536	574,536	574,536	574,536	574,536	281,523			
HVAC	High-Performance HVAC Equipment	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	195,526	
Shell	Reduced Infiltration	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	26,718	
Lighting	Interior Lighting Controls	87,971	87,971										
Shell	Reduced Thermal Bridging	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066
Lighting	High-Performance Exterior Lighting	55,754	55,754	55,754	55,754	55,754	55,754	55,754	55,754	40,143			
HVAC	High-Performance Fans	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487
Appliances	Efficient Appliances	31,508	31,508	31,508	31,508	31,508	31,508	31,508	2,836				
HVAC	Efficient Ventilation	31,455	31,455	31,455	31,455	31,455	31,455	31,455	31,455	31,455	30,511		
Shell	High-Performance Windows	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387
HVAC	Advanced HVAC Controls	27,233	27,233	27,233	27,233	24,510							
Hot Water	Hot Water Conservation	1,722	1,722	1,722	1,722								
Hot Water	High-Performance Water Heating Equipment												
CY2021 Program Total Electric Contribution to CPAS		**1,374,420**	**1,374,420**	**1,286,449**	**1,286,449**	**1,282,003**	**1,257,493**	**1,257,493**	**1,228,821**	**917,361**	**594,751**	**365,185**	**142,940**
Historic Program Total Electric Contribution to CPAS‡		**4,810,782**	**3,817,142**	**2,927,147**	**2,620,964**	**2,617,415**	**2,545,729**	**2,228,962**	**1,948,309**	**1,717,825**	**1,691,397**	**1,416,074**	**682,948**
Program Total Electric CPAS		**6,185,202**	**5,191,562**	**4,213,596**	**3,907,413**	**3,899,418**	**3,803,222**	**3,486,455**	**3,177,130**	**2,635,186**	**2,286,148**	**1,781,259**	**825,888**
CY2021 Program Incremental Expiring Electric Savings§		**-**	**-**	**87,971**	**-**	**4,446**	**24,510**	**-**	**28,672**	**311,460**	**322,609**	**229,567**	**222,245**
Historic Program Incremental Expiring Electric Savings‖		**731,432**	**993,640**	**889,995**	**306,183**	**3,549**	**71,686**	**316,767**	**280,653**	**230,484**	**26,428**	**275,323**	**733,126**
Program Total Incremental Expiring Electric Savings#		**731,432**	**993,640**	**977,966**	**306,183**	**7,995**	**96,196**	**316,767**	**309,325**	**541,944**	**349,037**	**504,890**	**955,371**

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting	High-Performance Interior Lighting												
HVAC	High-Performance HVAC Equipment												
Shell	Reduced Infiltration												
Lighting	Interior Lighting Controls												
Shell	Reduced Thermal Bridging	75,066	75,066	75,066	75,066	75,066	66,809						
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans	48,487											
Appliances	Efficient Appliances												
HVAC	Efficient Ventilation												
Shell	High-Performance Windows	19,387	19,387	19,387	19,387	19,387	9,693						
HVAC	Advanced HVAC Controls												
Hot Water	Hot Water Conservation												
Hot Water	High-Performance Water Heating Equipment												
CY2021 Program Total Electric Contribution to CPAS		**142,940**	**94,453**	**94,453**	**94,453**	**94,453**	**76,502**	**-**	**-**	**-**	**-**	**-**	**-**
Historic Program Total Electric Contribution to CPAS‡		**442,972**	**442,972**	**442,972**	**442,972**	**398,843**	**54,882**	**-**	**-**	**-**	**-**	**-**	**-**
Program Total Electric CPAS		**585,912**	**537,425**	**537,425**	**537,425**	**493,296**	**131,384**	**-**	**-**	**-**	**-**	**-**	**-**
CY2021 Program Incremental Expiring Electric Savings§		**-**	**48,487**	**-**	**-**	**-**	**17,951**	**76,502**	**-**	**-**	**-**	**-**	**-**
Historic Program Incremental Expiring Electric Savings‖		**239,976**	**-**	**-**	**-**	**44,129**	**343,961**	**54,882**	**-**	**-**	**-**	**-**	**-**
Program Total Incremental Expiring Electric Savings#		**239,976**	**48,487**	**-**	**-**	**44,129**	**361,912**	**131,384**	**-**	**-**	**-**	**-**	**-**

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.

‡ Historic savings go back to CY2018.

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

|| Incremental expiring savings are equal to Historic Total CPAS Y_{n-1} - Historic Total CPAS Y_n.

Program total expiring savings are equal to Historic Total Incremental Expiring CPAS Y_n + CY2021 Program Incremental Expiring CPAS Y_n.

Source: Evaluation team analysis

Table 4-2. 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
Lighting	High-Performance Interior Lighting	14.5	-	1.00	-									
HVAC	High-Performance HVAC Equipment	16.6	-	1.00	-									
Shell	Reduced Infiltration	16.3	-	1.00	-									
Lighting	Interior Lighting Controls	8.0	-	1.00	-									
Shell	Reduced Thermal Bridging	23.9	-	1.00	-									
Lighting	High-Performance Exterior Lighting	14.7	-	1.00	-									
HVAC	High-Performance Fans	19.0	-	1.00	-									
Appliances	Efficient Appliances	13.1	-	1.00	-									
HVAC	Efficient Ventilation	16.0	-	1.00	-									
Shell	High-Performance Windows	23.5	-	1.00	-									
HVAC	Advanced HVAC Controls	10.9	-	1.00	-									
Hot Water	Hot Water Conservation	10.0	-	1.00	-									
Hot Water	High-Performance Water Heating Equipment	17.0	-	1.00	-									
CY2021 Program Total Gas Contribution to CPAS (Therms)			-		-				-	-	-	-	-	-
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)						-	-	-	-	-	-	-	-	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§						-	672,456	672,456	672,456	672,456	672,456	672,456	672,456	672,456
Program Total Gas CPAS (kWh Equivalent)						-	672,456	672,456	672,456	672,456	672,456	672,456	672,456	672,456
CY2021 Program Incremental Expiring Gas Savings (Therms)										-	-	-	-	-
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)										-	-	-	-	-
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#									-	-	-	-	-	-
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†									-	-	-	-	-	-

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	High-Performance Interior Lighting												
HVAC	High-Performance HVAC Equipment												
Shell	Reduced Infiltration												
Lighting	Interior Lighting Controls												
Shell	Reduced Thermal Bridging												
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans												
Appliances	Efficient Appliances												
HVAC	Efficient Ventilation												
Shell	High-Performance Windows												
HVAC	Advanced HVAC Controls												
Hot Water	Hot Water Conservation												
Hot Water	High-Performance Water Heating Equipment												
CY2021 Program Total Gas Contribution to CPAS (Therms)		-	-	-	-	-	-	-	-	-	-	-	-
CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)		-	-	-	-	-	-	-	-	-	-	-	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§		672,456	663,969	587,588	587,588	587,588	15,899	-	-	-	-	-	-
Program Total Gas CPAS (kWh Equivalent)		672,456	663,969	587,588	587,588	587,588	15,899	-	-	-	-	-	-
CY2021 Program Incremental Expiring Gas Savings (Therms)		-	-	-	-	-	-	-	-	-	-	-	-
CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)		-	-	-	-	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#		-	8,487	76,381	-	-	571,689	15,899	-	-	-	-	-
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†		-	8,487	76,381	-	-	571,689	15,899	-	-	-	-	-

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.
§ Historic savings go back to CY2018. kWh equivalent savings are calculated by multiplying therm savings by 29.31
# Program total expiring savings are equal to Historic Total Incremental Expiring CPAS Y_n + CY2021 Program Incremental Expiring CPAS Y_n.
Source: Evaluation team analysis

Table 4-3. 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
Lighting	High-Performance Interior Lighting	14.5	574,536	1.00	8,325,029				574,536	574,536	574,536	574,536	574,536	574,536
HVAC	High-Performance HVAC Equipment	16.6	325,877	1.00	5,409,565				325,877	325,877	325,877	325,877	325,877	325,877
Shell	Reduced Infiltration	16.3	95,423	1.00	1,553,482				95,423	95,423	95,423	95,423	95,423	95,423
Lighting	Interior Lighting Controls	8.0	87,971	1.00	703,766				87,971	87,971	87,971	87,971	87,971	87,971
Shell	Reduced Thermal Bridging	23.9	75,066	1.00	1,793,333				75,066	75,066	75,066	75,066	75,066	75,066
Lighting	High-Performance Exterior Lighting	14.7	55,754	1.00	820,702				55,754	55,754	55,754	55,754	55,754	55,754
HVAC	High-Performance Fans	19.0	48,487	1.00	921,256				48,487	48,487	48,487	48,487	48,487	48,487
Appliances	Efficient Appliances	13.1	31,508	1.00	412,437				31,508	31,508	31,508	31,508	31,508	31,508
HVAC	Efficient Ventilation	16.0	31,455	1.00	502,334				31,455	31,455	31,455	31,455	31,455	31,455
Shell	High-Performance Windows	23.5	19,387	1.00	455,587				19,387	19,387	19,387	19,387	19,387	19,387
HVAC	Advanced HVAC Controls	10.9	27,233	1.00	296,843				27,233	27,233	27,233	27,233	27,233	27,233
Hot Water	Hot Water Conservation	10.0	1,722	1.00	17,223				1,722	1,722	1,722	1,722	1,722	1,722
Hot Water	High-Performance Water Heating Equipment	17.0	-	1.00	-									
CY2021 Program Total Contribution to CPAS		**15.4**	**1,374,420**		**21,211,557**				**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**	**1,374,420**
Historic Program Total Contribution to CPAS‡						**1,935,089**	**4,899,780**	**6,569,044**	**6,214,670**	**6,214,670**	**6,214,670**	**6,214,670**	**6,214,670**	**6,214,670**
Program Total CPAS						**1,935,089**	**4,899,780**	**6,569,044**	**7,589,090**	**7,589,090**	**7,589,090**	**7,589,090**	**7,589,090**	**7,589,090**
CY2021 Program Incremental Expiring Savings§										-	-	-	-	-
Historic Program Incremental Expiring Savings‖									**354,374**	-	-	-	-	-
Program Total Incremental Expiring Savings#									**354,374**	-	-	-	-	-

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	High-Performance Interior Lighting	574,536	574,536	574,536	574,536	574,536	574,536	574,536	574,536	281,523			
HVAC	High-Performance HVAC Equipment	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	325,877	195,526	
Shell	Reduced Infiltration	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	95,423	26,718	
Lighting	Interior Lighting Controls	87,971	87,971										
Shell	Reduced Thermal Bridging	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066	75,066
Lighting	High-Performance Exterior Lighting	55,754	55,754	55,754	55,754	55,754	55,754	55,754	55,754	40,143			
HVAC	High-Performance Fans	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487	48,487
Appliances	Efficient Appliances	31,508	31,508	31,508	31,508	31,508	31,508	31,508	2,836				
HVAC	Efficient Ventilation	31,455	31,455	31,455	31,455	31,455	31,455	31,455	31,455	31,455	30,511		
Shell	High-Performance Windows	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387	19,387
HVAC	Advanced HVAC Controls	27,233	27,233	27,233	27,233	24,510							
Hot Water	Hot Water Conservation	1,722	1,722	1,722	1,722								
Hot Water	High-Performance Water Heating Equipment												
CY2021 Program Total Contribution to CPAS		**1,374,420**	**1,374,420**	**1,286,449**	**1,286,449**	**1,282,003**	**1,257,493**	**1,257,493**	**1,228,821**	**917,361**	**594,751**	**365,185**	**142,940**
Historic Program Total Contribution to CPAS‡		**5,483,238**	**4,481,111**	**3,514,735**	**3,208,552**	**3,205,003**	**2,561,628**	**2,228,962**	**1,948,309**	**1,717,825**	**1,691,397**	**1,416,074**	**682,948**
Program Total CPAS		**6,857,658**	**5,855,531**	**4,801,184**	**4,495,001**	**4,487,006**	**3,819,121**	**3,486,455**	**3,177,130**	**2,635,186**	**2,286,148**	**1,781,259**	**825,888**
CY2021 Program Incremental Expiring Savings§		**-**	**-**	**87,971**	**-**	**4,446**	**24,510**	**-**	**28,672**	**311,460**	**322,609**	**229,567**	**222,245**
Historic Program Incremental Expiring Savings‖		**731,432**	**1,002,127**	**966,376**	**306,183**	**3,549**	**643,375**	**332,666**	**280,653**	**230,484**	**26,428**	**275,323**	**733,126**
Program Total Incremental Expiring Savings#		**731,432**	**1,002,127**	**1,054,347**	**306,183**	**7,995**	**667,885**	**332,666**	**309,325**	**541,944**	**349,037**	**504,890**	**955,371**

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting	High-Performance Interior Lighting												
HVAC	High-Performance HVAC Equipment												
Shell	Reduced Infiltration												
Lighting	Interior Lighting Controls												
Shell	Reduced Thermal Bridging	75,066	75,066	75,066	75,066	75,066	66,809						
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans	48,487											
Appliances	Efficient Appliances												
HVAC	Efficient Ventilation												
Shell	High-Performance Windows	19,387	19,387	19,387	19,387	19,387	9,693						
HVAC	Advanced HVAC Controls												
Hot Water	Hot Water Conservation												
Hot Water	High-Performance Water Heating Equipment												
CY2021 Program Total Contribution to CPAS		**142,940**	**94,453**	**94,453**	**94,453**	**94,453**	**76,502**	**-**	**-**	**-**	**-**	**-**	**-**
Historic Program Total Contribution to CPAS‡		**442,972**	**442,972**	**442,972**	**442,972**	**398,843**	**54,882**	**-**	**-**	**-**	**-**	**-**	**-**
Program Total CPAS		**585,912**	**537,425**	**537,425**	**537,425**	**493,296**	**131,384**	**-**	**-**	**-**	**-**	**-**	**-**
CY2021 Program Incremental Expiring Savings§		**-**	**48,487**	**-**	**-**	**-**	**17,951**	**76,502**	**-**	**-**	**-**	**-**	**-**
Historic Program Incremental Expiring Savings||		**239,976**	**-**	**-**	**-**	**44,129**	**343,961**	**54,882**	**-**	**-**	**-**	**-**	**-**
Program Total Incremental Expiring Savings#		**239,976**	**48,487**	**-**	**-**	**44,129**	**361,912**	**131,384**	**-**	**-**	**-**	**-**	**-**

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.

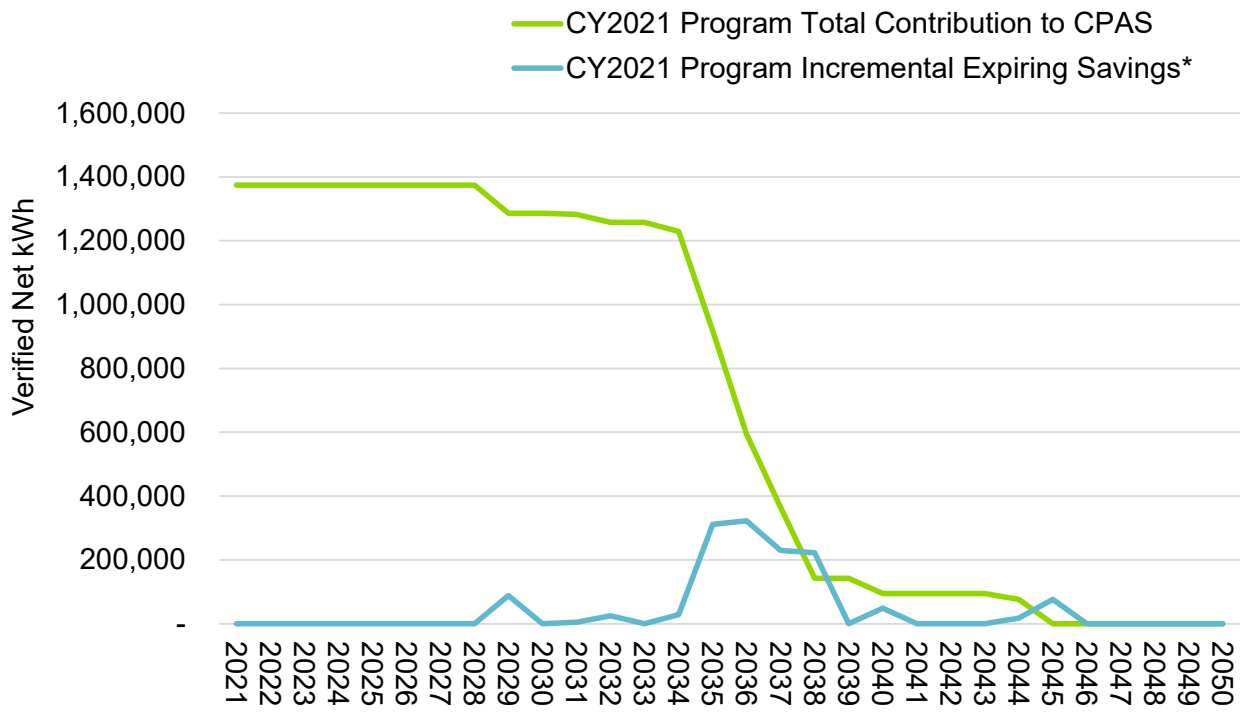
§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

|| Incremental expiring savings are equal to Historic Total CPAS Y_{n-1} - Historic Total CPAS Yn.

Program total expiring savings are equal to Historic Total Incremental Expiring CPAS Y_n + CY2021 Program Incremental Expiring CPAS Y_n.

Source: Evaluation team analysis

Figure 4-1. Cumulative Persisting Annual Savings



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

Source: Evaluation team analysis

Table 4-4 shows the ex ante and verified weighted average measure life (WAML) by utility, as determined based on the measures installed by utility and the expected useful life (EUL) of each measure. The adjustments to the WAML in the evaluation were minor and primarily due to changes in the savings associated with individual measures for each utility.

Table 4-4. Ex ante and Verified WAML by Utility

Utility	Ex Ante WAML	Verified WAML	Change
ComEd	15.4	15.4	-0.1%
Nicor Gas	18.2	18.2	0.1%
Peoples Gas	17.3	17.3	-0.1%

5. Program Savings by Measure

The AHNC Program included 13 measure groups across the lighting, HVAC, shell, appliances, and hot water end use types. The number of installed measures by type is shown in Table 5-1 and by measure and utility in Table 5-2. The lighting end use measures (including high-performance interior lighting, interior lighting controls, and high-performance exterior lighting) account for more than half of the net program electric savings at 52%. The percentage of program savings by end use type is shown in Figure 5-1.

Table 5-1. Number of Measures by Type

End Use Type	Research Category	Quantity	Unit
Lighting	High-Performance Interior Lighting	6,461	Lamps
HVAC	High-Performance HVAC Equipment	731	Units
Shell	Reduced Infiltration	206,570	CFM50
Lighting	Interior Lighting Controls	46,901	Watts
Shell	Reduced Thermal Bridging	415,273	SF
Lighting	High-Performance Exterior Lighting	361	Lamps
HVAC	High-Performance Fans	504	Units
Appliances	Efficient Appliances	936	Units
HVAC	Efficient Ventilation	9	Units
Shell	High-Performance Windows	61,820	SF
HVAC	Advanced HVAC Controls	140	Units
Hot Water	Hot Water Conservation	1,689	Units
Hot Water	High-Performance Water Heating Equipment	123	Units
	Total	**741,517**	

Note: This is the same table as Table 2 2.
Note: The rows are sorted by verified gross savings.
Shell square footage includes combination of wall area and roof/attic area
High performance water heating equipment includes the dishwasher, clothes washer, clothes dryer, and refrigerator measures

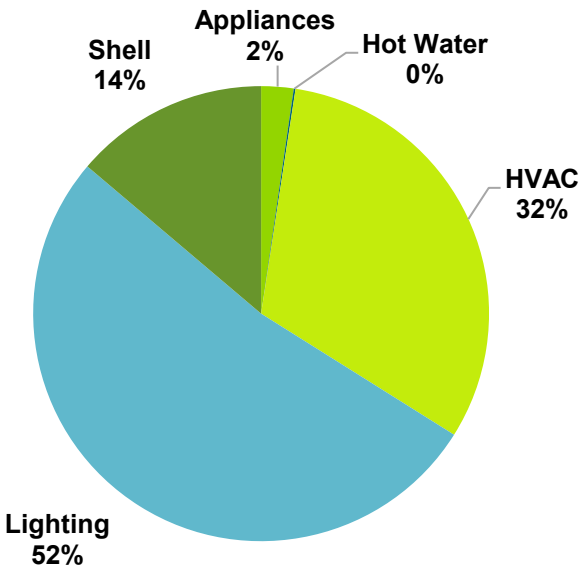
Source: ComEd, Nicor Gas, and Peoples Gas tracking data and evaluation team analysis

Table 5-2. Number of Measures by Type and Utility

Research Category	ComEd Quantity	Nicor Gas Quantity	Peoples Gas Quantity	Unit
High-Performance Interior Lighting	6,461	0	0	Lamps
High-Performance HVAC Equipment	731	247	484	Units
Reduced Infiltration	206,570	55,445	151,125	CFM50
Interior Lighting Controls	46,901	0	0	Watts
Reduced Thermal Bridging	415,273	131,050	284,223	SF
High-Performance Exterior Lighting	361	0	0	Lamps
High-Performance Fans	504	0	0	Units
Efficient Appliances	936	56	238	Units
Efficient Ventilation	9	3	6	Units
High-Performance Windows	61,820	14,734	47,086	SF
Advanced HVAC Controls	140	38	102	Units
Hot Water Conservation	1,689	534	1,155	Units
High-Performance Water Heating Equipment	0	79	44	Units
Total	**741,394**	**202,186**	**484,462**	

Note: The rows are sorted by verified gross savings.
Note: Measures with both gas and electric savings will be included both for ComEd and either Nicor Gas or Peoples Gas. Therefore, the sum of the utility quantities will be greater than the total installed quantity.
Shell square footage includes combination of wall area and roof/attic area
High performance appliances include dishwasher, clothes washer, clothes dryer, and refrigerator measures
Source: ComEd, Nicor Gas, and Peoples Gas tracking data and evaluation team analysis

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



Source: ComEd tracking data and evaluation team analysis

Measure-level energy and demand savings are provided in the following tables.

Table 5-3. 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	High-Performance Interior Lighting	571,851	1.00	574,536	1.00	574,536	12.3
HVAC	High-Performance HVAC Equipment	318,441	1.02	325,877	1.00	325,877	16.2
Shell	Reduced Infiltration	95,541	1.00	95,423	1.00	95,423	16.3
Lighting	Interior Lighting Controls	87,473	1.01	87,971	1.00	87,971	8.0
Shell	Reduced Thermal Bridging	75,069	1.00	75,066	1.00	75,066	23.9
Lighting	High-Performance Exterior Lighting	54,669	1.02	55,754	1.00	55,754	14.6
HVAC	High-Performance Fans	48,487	1.00	48,487	1.00	48,487	19.0
Appliances	Efficient Appliances	31,508	1.00	31,508	1.00	31,508	13.1
HVAC	Efficient Ventilation	31,455	1.00	31,455	1.00	31,455	15.0
Shell	High-Performance Windows	19,394	1.00	19,387	1.00	19,387	23.5
HVAC	Advanced HVAC Controls	27,455	0.99	27,233	1.00	27,233	10.9
Hot Water	Hot Water Conservation	1,657	1.04	1,722	1.00	1,722	10.0
Hot Water	High-Performance Water Heating Equipment	0	N/A	0	1.00	0	17.0
	Total	**1,363,000**	**1.01**	**1,374,420**		**1,374,420**	

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 5-4. 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	High-Performance Interior Lighting	68.48	1.04	71.02	1.00	71.02
HVAC	High-Performance HVAC Equipment	35.48	1.00	35.59	1.00	35.59
Shell	Reduced Infiltration	15.82	1.00	15.82	1.00	15.82
Lighting	Interior Lighting Controls	39.31	0.76	30.04	1.00	30.04
Shell	Reduced Thermal Bridging	10.41	1.00	10.42	1.00	10.42
Lighting	High-Performance Exterior Lighting	9.24	1.01	9.32	1.00	9.32
HVAC	High-Performance Fans	6.59	1.00	6.59	1.00	6.59
Appliances	Efficient Appliances	4.51	1.00	4.51	1.00	4.51
HVAC	Efficient Ventilation	6.03	1.00	6.03	1.00	6.03
Shell	High-Performance Windows	3.82	0.97	3.82	1.00	3.82
HVAC	Advanced HVAC Controls	6.31	1.00	6.31	1.00	6.31
Hot Water	Hot Water Conservation	0.00	N/A	0.00	1.00	0.00
Hot Water	High-Performance Water Heating Equipment	0.00	N/A	0.00	1.00	0.00
	Total	**206.00**	**0.97**	**199.48**		**199.48**

* 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 AHNC Program 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. 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	High-Performance Interior Lighting	0	0	N/A	0	1.00	0
HVAC	High-Performance HVAC Equipment	0	0	N/A	0	1.00	0
Shell	Reduced Infiltration	0	0	N/A	0	1.00	0
Lighting	Interior Lighting Controls	0	0	N/A	0	1.00	0
Shell	Reduced Thermal Bridging	0	0	N/A	0	1.00	0
Lighting	High-Performance Exterior Lighting	0	0	N/A	0	1.00	0
HVAC	High-Performance Fans	0	0	N/A	0	1.00	0
Appliances	Efficient Appliances	174,374	315	1.00	315	1.00	315
HVAC	Efficient Ventilation	0	0	N/A	0	1.00	0
Shell	High-Performance Windows	0	0	N/A	0	1.00	0
HVAC	Advanced HVAC Controls	0	0	N/A	0	1.00	0
Hot Water	Hot Water Conservation	2,511,522	1,722	1.00	1,722	1.00	1,722
Hot Water	High-Performance Water Heating Equipment	0	0	N/A	0	1.00	0
	Total	**2,685,896**	**2,038**	**1.00**	**2,038**	**1.00**	**2,038**

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

The Affordable Housing New Construction Program includes measures that save gas. The following tables show the measure level gas savings for each utility.

Table 5-6. CY2021 Gas Energy Savings by Measure – Nicor Gas

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	-	N/A	-	1.00	-
HVAC	High-Performance HVAC Equipment	12,181	1.02	12,399	1.00	12,399
Shell	Reduced Infiltration	1,919	1.00	1,918	1.00	1,918
Lighting	Interior Lighting Controls	-	N/A	-	1.00	-
Shell	Reduced Thermal Bridging	3,386	1.00	3,387	1.00	3,387
Lighting	High-Performance Exterior Lighting	-	N/A	-	1.00	-
HVAC	High-Performance Fans	-	N/A	-	1.00	-
Appliances	Efficient Appliances	196	1.00	196	1.00	196
HVAC	Efficient Ventilation	26	1.00	26	1.00	26
Shell	High-Performance Windows	841	1.00	839	1.00	839
HVAC	Advanced HVAC Controls	1,070	1.00	1,070	1.00	1,070
Hot Water	Hot Water Conservation	4,484	1.00	4,484	1.00	4,484
Hot Water	High-Performance Water Heating Equipment	7,823	1.00	7,823	1.00	7,823
	Total†	**31,924**	**1.01**	**32,141**	**1.00**	**32,141**

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† The total excludes the electric interactive effects on the total therms.
Source: Nicor Gas tracking data and evaluation team analysis

Table 5-7. CY2021 Gas Energy Savings by Measure – Peoples Gas

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	-	N/A	-	1.00	-
HVAC	High-Performance HVAC Equipment	19,507	0.98	19,032	1.00	19,032
Shell	Reduced Infiltration	5,567	0.97	5,375	1.00	5,375
Lighting	Interior Lighting Controls	-	N/A	-	1.00	-
Shell	Reduced Thermal Bridging	8,490	1.00	8,522	1.00	8,522
Lighting	High-Performance Exterior Lighting	-	N/A	-	1.00	-
HVAC	High-Performance Fans	-	N/A	-	1.00	-
Appliances	Efficient Appliances	437	1.00	437	1.00	437
HVAC	Efficient Ventilation	30,240	1.00	30,240	1.00	30,240
Shell	High-Performance Windows	2,407	0.96	2,316	1.00	2,316
HVAC	Advanced HVAC Controls	1,463	1.00	1,463	1.00	1,463
Hot Water	Hot Water Conservation	8,342	1.00	8,342	1.00	8,342
Hot Water	High-Performance Water Heating Equipment	8,071	1.00	8,071	1.00	8,071
	Total†	**84,524**	**0.99**	**83,796**	**1.00**	**83,796**

* A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.
† The total excludes the electric interactive effects on the total therms.
Source: Peoples Gas tracking data and evaluation team analysis

6. Impact Analysis Findings and Recommendations

The evaluation team developed several recommendations for ComEd and the implementation team based on findings from the CY2021 evaluation.

6.1 ComEd

The AHNC Program electric energy realization rate is 1.01 and the electric demand realization rate is 0.97. All 10 of the projects had energy savings adjustments; however, the adjustments were minor in most cases. Seven of the projects had savings adjusted by 2% or less. Only two projects (AH0019 and AH0087) were adjusted by more than 10%. The team developed four recommendations based on findings from the CY2021 evaluation.

Finding 1. Omnidirectional lighting was mislabeled as directional or specialty lighting or directional lighting was mislabeled as omnidirectional lighting. The team relabeled and analyzed fixtures as appropriate, resulting in a baseline wattage change per the IL-TRM. This change affected five projects: projects AH0019, AH0066a, AH0068, AH0071, and AH0076 had interior lamps changed from directional to omnidirectional, reducing the high-performance lighting savings. The reduction in savings to AH0066a was partially offset by changes to the exterior lighting from omnidirectional to directional, which increased the exterior lighting savings.

> **Recommendation 1.** Institute a quality control (QC) process to review and confirm installed lighting products match the correct fixture type selections. Directional and specialty lighting should be limited to specialty lamps consistent with the equipment included in Section 5.5.6 of the Illinois Technical Reference Manual (IL-TRM).

Finding 2. Occupancy sensor savings for all other common spaces (spaces other than corridors, stairs, or lobby spaces) were calculated based on the incremental savings of vacancy sensors compared to occupancy sensors. This approach does not accurately account for spaces where vacancy sensors are code-required by International Energy Conservation Code (IECC) section C405.2.1, nor does it give credit for spaces where occupancy sensors were installed but not required. The evaluation team adjusted the analysis to account for the actual installed control type (occupancy sensor or vacancy sensor) and the code requirements for the space. This decreased the savings for two projects (AH0027 and AH0068) and increased the savings for two projects (AH0076 and AH0117). Overall, accounting for code-required occupancy sensors increased the sensor savings by approximately 0.6%.

> **Recommendation 2.** Compare the installed vacancy or occupancy sensor in each space to the code-required control type for that area to calculate savings.

Finding 3. Four projects were adjusted due to equipment quantity inconsistencies in the calculations compared to the project documentation. This included:

- The size of two windows for project AH0068 was inconsistent with noted design changes on the plans. This resulted in a negligible change to the project savings due to the window area reduction being offset by a corresponding increase in wall area and the increased savings for the reduced thermal bridging measure.

- The R-value of the wall insulation for project AH0019 was inconsistent with the R-value listed in the compliance certificate. Correcting this resulted in a slight increase in savings.
- The savings for the high-performance HVAC equipment for project AH0071 were based on the installation of 38 condensing units. However, the provided equipment submittal included information on 39 units.
- The building included in project AH0117 was a multi-story building. The roof insulation area used in the analysis was inadvertently based on the total floor area (of all floors) rather than the area of the actual roof area.

  Recommendation 3. Conduct additional QC steps to ensure calculations accurately reflect installed equipment quantities and specifications.

Finding 4. Project AH0117 did not account for electric secondary water savings impacts due to an error in the template not crediting these savings for IL-TRM v8.0 projects.

> **Recommendation 4.** Update the template to include electric secondary water savings for all projects completed for all IL-TRM versions after IL-TRM v6.0.

6.2 Nicor Gas

The Nicor Gas realization rate is 1.01 (electric interactive heating penalties excluded in ex ante and ex post savings values). Two of the five Nicor Gas projects had adjustments that impacted the gas savings levels. However, for both of these projects, the adjustment was minor, resulting in an adjustment of 2% or less to the gas savings for the project. The team developed one recommendation based on findings from the CY2021 evaluation.

Finding 1. Two projects were adjusted due to equipment quantity inconsistencies in the calculations compared to the project documentation. This included:

- The size of two windows for project AH0068 was inconsistent with noted design changes on the plans. This resulted in a negligible change to the project savings due to the window area reduction being offset by a corresponding increase in wall area and the increased savings for the reduced thermal bridging measure.
- The savings for the high-performance HVAC equipment for project AH0071 were based on the installation of 38 furnaces. However, the provided equipment submittal included information on 39 furnaces.

  Recommendation 1. Conduct additional QC steps to ensure calculations accurately reflect installed equipment quantities and specifications.

6.3 Peoples Gas

The Peoples Gas realization rate is 1.00 (electric interactive heating penalties excluded in ex ante and ex post savings values). Four of the five Peoples Gas projects had minor adjustments that impacted the gas savings levels.

Finding 1. Four of the five Peoples Gas projects were adjusted due to equipment quantity inconsistencies in the calculations compared to the project documentation. The adjustment for all four projects was minor, at 3% or less. This included:

- The R-value of the wall insulation for project AH0019 was inconsistent with the R-value listed in the compliance certificate. Correcting this resulted in a slight increase in savings.
- For project AH0048, the input capacity of the boiler was incorrectly input as the boiler output. Correcting this error resulted in a slight decrease in project savings.
- The specifications for one heat pump were input incorrectly for project AH0087. This resulted in a slight reduction in gas savings due to the allocation of heating energy reductions for other measures.
- The building included in project AH0117 was a multi-story building. The roof insulation area used in the analysis was inadvertently based on the total floor area (of all floors) rather than the area of the actual roof area.

  Recommendation 1. Conduct additional QC steps to ensure calculations accurately reflect installed equipment quantities and specifications.

Appendix A. Impact Analysis Methodology

The program provided project savings calculations and documentation for the evaluation team's review. Project documentation included program forms and applications; architectural, landscape, mechanical, and plumbing drawings; and appliance, lighting, HVAC, and window specifications. The program also provided photos and reports from site visits and testing results. The evaluation team analyzed all documentation and verified that savings and measure counts reported in the project calculators aligned with the provided project documentation and program tracking data.

The evaluation team applied algorithms outlined in the IL-TRM in use when the project applications were submitted to calculate AHNC Program verified gross savings. Seven of the projects were based on IL-TRM v6.0, two projects were based on IL-TRM v7.0, and one was based on IL-TRM v8.0.

The team verified that these algorithms and appropriate deemed input parameters were applied correctly and validated any custom parameters through project documentation and actual equipment specifications. The evaluation team calculated verified net savings by multiplying the verified gross savings by the net-to-gross (NTG) ratio approved through a consensus process managed through the Illinois SAG.

Table A-1 presents the parameters used in the verified gross and net savings calculations and indicates which were calculated through evaluation activities and which were deemed.

Table A-1. Savings Parameters

Gross Savings Input Parameters	Value	Units	Deemed or Evaluated?	Source*
Quantity	Varies	Units	Evaluated	Project Documentation
NTG	100	%	Deemed	Illinois Energy Efficiency Policy Manual
Hours of Use	Varies	Hours/Yr	Deemed	IL TRM - Sections vary
Gross Savings per Unit, Deemed Measures	Varies	kW, kWh, therms	Deemed	IL TRM - Sections vary
Gross Savings per Unit, Non-Deemed Measures	Varies	kW, kWh, therms	Evaluated	Project Documentation
EUL	Varies	Years	Mixture	IL TRM - Sections vary

*IL-TRM is the Illinois Technical Reference Manual from **http://www.ilsag.info/technical-reference-manual.html**. Project application date determined the applicable IL-TRM version used. The NTG values are deemed per the Illinois Energy Efficiency Policy Manual. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021.**

Source: Evaluation team analysis

The evaluation team determined verified gross savings for each program measure by:

- Reviewing the savings algorithm inputs in the project files for agreement with the IL-TRM and Errata in effect at the program application date. The majority of projects completed in CY2021 used v6.0. However, projects AH0054 and AH0087 were based on v7.0 and AH0117 was based on v8.0.
- Validating savings algorithms were applied correctly for the installed measures.

- Verifying specific algorithm inputs used to calculate savings. The team prioritized project-specific documentation[1] to inform savings calculations where the IL-TRM advises using actual values. For variables where project documentation did not provide this information, the evaluation team relied on defaults from the IL-TRM.
- Cross-checking per-unit savings values in the project files with the verified values in the measure workbook or in the team's calculations if the workbook did not agree with the IL-TRM.
- Multiplying the verified per-unit savings value by the quantity reported in the project files.

The evaluation team calculated verified net energy and demand (coincident peak and overall) savings by multiplying the verified gross savings estimates by a deemed NTG ratio of 1.0. For CY2021, the AHNC Program's NTG estimate was set at 1.00 per the Illinois Energy Efficiency Policy Manual Version 2.1.

The team relied on the following documents to verify the per-unit savings for each program measure. If a discrepancy was identified across project documentation, the evaluation team relied on the project site visit report for the final value.

- Measure calculators provided by the implementer:
  - AH0019_Calc_v2.09.3.xlsm
  - AH0027_Calc_v2.09.3.xlsm
  - AH0048_Calc_v2.09.3.xlsm
  - AH0054_Calc_v2.09.3.xlsm
  - AH0066a_Calc_v2.09.3.xlsm
  - AH0068_Summary_Final Evaluation.xlsm
  - AH0068Blgs_Calc_v2.09.3.xlsm
  - AH0071_Calc_v2.09.3.xlsm
  - AHNC_Calc_v9.09.3.xlsm [Project AH0076]
  - AH0087_Savings Summary_Updated.xlsm
  - AH0087_B5_Calc_v2.09.0.xlsm
  - AH0087_B31_Calc_v2.09.0.xlsm
  - AH0087_B32_Calc_v2.09.0.xlsm
  - AH0117_B32_Calc_v2.09.0.xlsm
- Assortment of project-specific files provided by the implementer. Each project file contained the following individual reference documents:
  - Project plans and specifications
  - Project site visit reports and documentation

[1] Project documentation included program forms and applications; architectural, landscape, mechanical, and plumbing drawings; equipment specifications; site visit photos; and testing results.

  - Incentive agreements
  - Photographs
- IL-TRM for deemed input parameters or secondary evaluation research to verify any custom inputs used in the ex ante calculations. Project application date determined the IL-TRM version used:
  - v6.0 = Applications dated January 1, 2018-December 31, 2018
  - v7.0 = Applications dated January 1, 2019-December 31, 2019
  - v8.0 = for future project applications dated after January 1, 2020
- IECC version in effect at time of project permitting

Appendix B. Total Resource Cost Detail

Table B-1 through Table B-3 show the TRC cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. These tables do 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. Total Resource Cost Savings Summary – ComEd

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	High-Performance Interior Lighting	Lamps	6,461	14.5	No	574,536	71.02	0	0	0	-7,042	1.00	1.00	1.00	574,536	71.02	0	0	0	-7,042
HVAC	High-Performance HVAC Equipment	Units	731	16.6	No	325,877	35.59	0	0	0	0	1.00	1.00	1.00	325,877	35.59	0	0	0	0
Shell	Reduced Infiltration	CFM50	206,570	16.3	No	95,423	15.82	0	0	0	0	1.00	1.00	1.00	95,423	15.82	0	0	0	0
Lighting	Interior Lighting Controls	Watts	46,901	8.0	No	87,971	30.04	0	0	0	0	1.00	1.00	1.00	87,971	30.04	0	0	0	0
Shell	Reduced Thermal Bridging	SF	415,273	23.9	No	75,066	10.42	0	0	0	0	1.00	1.00	1.00	75,066	10.42	0	0	0	0
Lighting	High-Performance Exterior Lighting	Lamps	361	14.7	No	55,754	9.32	0	0	0	0	1.00	1.00	1.00	55,754	9.32	0	0	0	0
HVAC	High-Performance Fans	Units	504	19.0	No	48,487	6.59	0	0	0	0	1.00	1.00	1.00	48,487	6.59	0	0	0	0
Appliances	Efficient Appliances	Units	936	13.1	No	31,192	4.51	0	315	0	0	1.00	1.00	1.00	31,192	4.51	0	315	0	0
HVAC	Efficient Ventilation	Units	9	16.0	No	31,455	6.03	0	0	0	-1,195	1.00	1.00	1.00	31,455	6.03	0	0	0	-1,195
Shell	High-Performance Windows	SF	61,820	23.5	No	19,387	3.82	0	0	0	0	1.00	1.00	1.00	19,387	3.82	0	0	0	0
HVAC	Advanced HVAC Controls	Units	140	10.9	No	27,233	6.31	0	0	0	0	1.00	1.00	1.00	27,233	6.31	0	0	0	0
Hot Water	Hot Water Conservation	Units	1,689	10.0	No	0	0.00	0	1,722	0	0	1.00	1.00	1.00	0	0.00	0	1,722	0	0
Hot Water	High-Performance Water Heating Equipment	Units	0	17.0	No	0	0.00	0	0	0	0	1.00	1.00	1.00	0	0.00	0	0	0	0
	Total			**15.4**		**1,372,382**	**199**	**0**	**2,038**	**0**	**-8,238**	**1.00**	**1.00**	**1.00**	**1,372,382**	**199**	**0**	**2,038**	**0**	**-8,238**

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 total of the EUL column is the weighted average measure life (WAML) and is calculated as the sum product of EUL and measure savings divided by total program savings.
† Early replacement (ER) measures are flagged as YES, otherwise a NO is indicated in the column.
‡ 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 B-2. Total Resource Cost Savings Summary – Nicor Gas

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	Lamps	0	13.0	No	-	-	1.00	-
HVAC	High-Performance HVAC Equipment	Units	247	19.8	No	12,181	12,399	1.00	12,399
Shell	Reduced Infiltration	CFM50	55,445	15.2	No	1,919	1,918	1.00	1,918
Lighting	Interior Lighting Controls	Watts	0	8.0	No	-	-	1.00	-
Shell	Reduced Thermal Bridging	SF	131,050	24.8	No	3,386	3,387	1.00	3,387
Lighting	High-Performance Exterior Lighting	Lamps	0	14.6	No	-	-	1.00	-
HVAC	High-Performance Fans	Units	0	19.0	No	-	-	1.00	-
Appliances	Efficient Appliances	Units	56	13.8	No	196	196	1.00	196
HVAC	Efficient Ventilation	Units	3	16.5	No	26	26	1.00	26
Shell	High-Performance Windows	SF	14,734	25.0	No	841	839	1.00	839
HVAC	Advanced HVAC Controls	Units	38	10.0	No	1,070	1,070	1.00	1,070
Hot Water	Hot Water Conservation	Units	534	9.6	No	4,484	4,484	1.00	4,484
Hot Water	High-Performance Water Heating Equipment	Units	79	19.0	No	7,823	7,823	1.00	7,823
	Total†			**18.2**		**31,924**	**32,141**	**1.00**	**32,141**

* The total of the EUL column is the weighted average measure life (WAML) and is calculated as the sum product of EUL and measure savings divided by total program savings.

† Early Replacement (ER) measures are flagged as YES, otherwise a NO is indicated in the column.

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

Source: Evaluation team analysis of tracking data

Table B-3. Total Resource Cost Savings Summary – Peoples Gas

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	Lamps	-	13.0	No	-	-	1.00	-
HVAC	High-Performance HVAC Equipment	Units	484	20.0	No	19,507	19,032	1.00	19,032
Shell	Reduced Infiltration	CFM50	151,125	16.4	No	5,567	5,375	1.00	5,375
Lighting	Interior Lighting Controls	Watts	-	8.0	No	-	-	1.00	-
Shell	Reduced Thermal Bridging	SF	284,223	23.7	No	8,490	8,522	1.00	8,522
Lighting	High-Performance Exterior Lighting	Lamps	-	14.6	No	-	-	1.00	-
HVAC	High-Performance Fans	Units	-	19.0	No	-	-	1.00	-
Appliances	Efficient Appliances	Units	238	13.4	No	437	437	1.00	437
HVAC	Efficient Ventilation	Units	6	16.5	No	30,240	30,240	1.00	30,240
Shell	High-Performance Windows	SF	47,086	23.9	No	2,407	2,316	1.00	2,316
HVAC	Advanced HVAC Controls	Units	102	11.0	No	1,463	1,463	1.00	1,463
Hot Water	Hot Water Conservation	Units	1,155	9.8	No	8,342	8,342	1.00	8,342
Hot Water	High-Performance Water Heating Equipment	Units	44	15.0	No	8,071	8,071	1.00	8,071
	Total†			**17.3**		**84,524**	**83,796**	**1.00**	**83,796**

* The total of the EUL column is the weighted average measure life (WAML) and is calculated as the sum product of EUL and measure savings divided by total program savings.
† Early Replacement (ER) measures are flagged as YES, otherwise a NO is indicated in the column.
‡ A deemed value. Source: Illinois SAG website: **https://www.ilsag.info/evaluator-ntg-recommendations-for-2021**.

Source: Evaluation team analysis of tracking data