Joint Utility Affordable Housing New Construction Impact Evaluation Report

Energy Efficiency / Demand Response Plan: Program Year 2019 (CY2019) (1/1/2019-12/31/2019)

Presented to
ComEd
Nicor Gas
Peoples Gas
North Shore Gas

FINAL

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Joint Utility AHNC Impact Evaluation Report

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1. Introduction

This report presents the results of the impact evaluation of the Joint Utility CY2019 Affordable Housing New Construction (AHNC) Program. It includes a summary of the energy and demand impacts for the total program broken out by relevant measure and program structure details. The appendix provides the impact analysis methodology and details of the Total Resource Cost inputs. CY2019 covers January 1, 2019 through December 31, 2019.

2. Program Description

The AHNC Program provides technical assistance and incentives for energy-efficient construction and major renovation of multi-family affordable housing. The program targets affordable housing developers and owners for the construction of housing for households with incomes at or below 80% of the Area Median Income (AMI). An additional goal of the program is to educate housing developers on cost-effective energy efficient building practices. The program has two participation levels: major renovation, and new multi-family. The program is implemented by Slipstream[1], and is jointly offered by ComEd, Peoples Gas, North Shore Gas, and Nicor Gas.

In CY2019, the AHNC Program had ten projects and distributed 12 measure types[2] to 620 income eligible residential units as shown in the following table and graph. The CY2019 program had two participation levels: major renovation and new multi-family.

Table 2-1. CY2019 Volumetric Findings Detail

Participation	Quantity	Units
Participants (ComEd)	10	Projects
Participants (Nicor Gas)	6	Projects
Participants (Peoples Gas)	1	Project
Number of AMI Units	620	Residential units
Shell: Windows	84,162	SF
Shell: Reduced Infiltration	195,779	CFM50
Shell: Reduced Thermal Bridging	573,431	SF*
HVAC	1,023	HVAC Systems
Lighting	9,324	Lamps
Appliances	1,713	Appliances**
Hot Water	620	Water heaters

* Includes combination of wall area and attic area

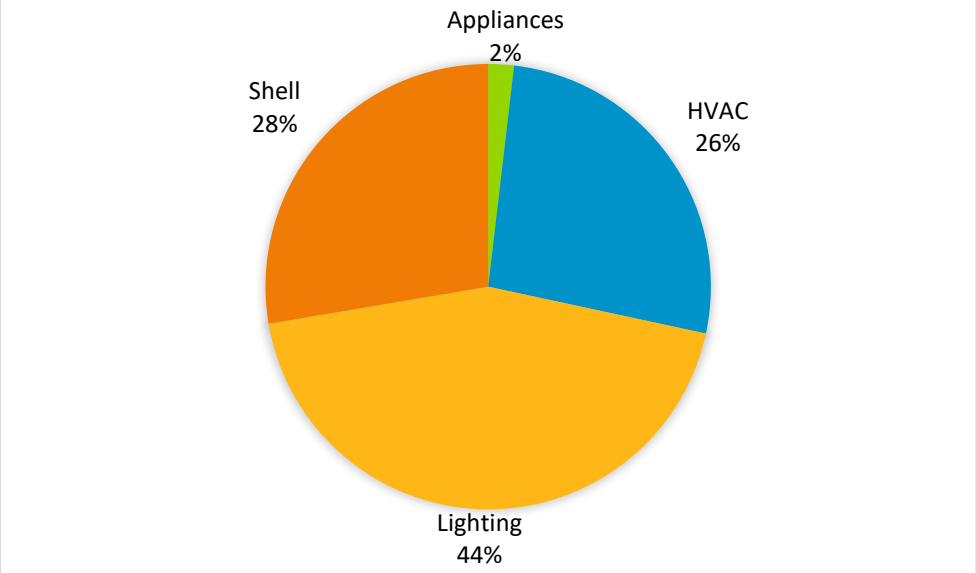
† Includes combination of measures (dishwashers, clothes washers, clothes dryers, refrigerators)

Source: Utility tracking data and evaluation team analysis.

[1] Formerly known as Seventhwave.

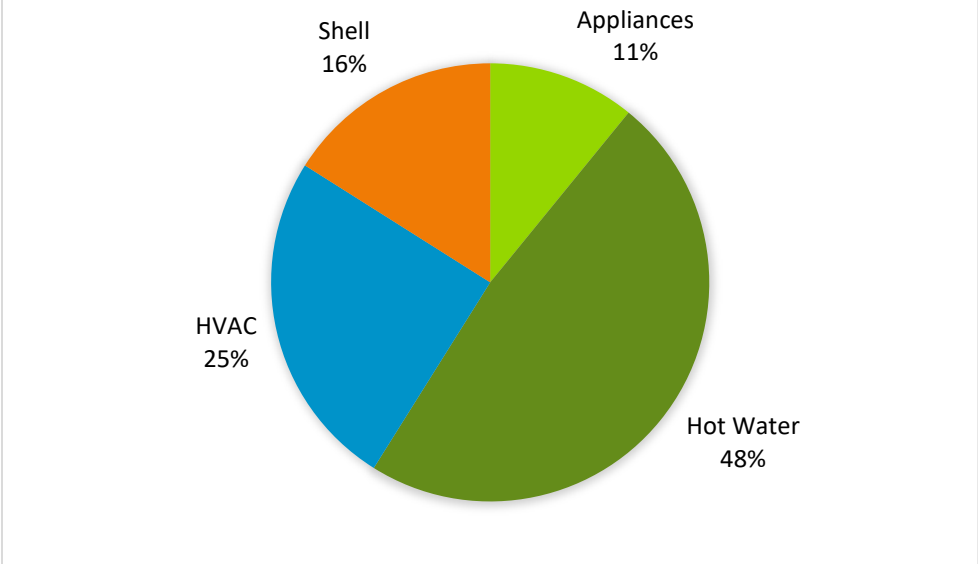
[2] 13 measure types were available to participants; Advanced HVAC Controls had no participation.

Figure 2-1. Distribution of Measures by Ex Ante Electric Savings



Source: Utility tracking data and evaluation team analysis

Figure 2-2. Distribution of Measures by Ex Ante Gas Savings



Source: Utility tracking data and evaluation team analysis

3. Program Savings Detail

Table 3-1 summarizes the incremental energy and demand savings the AHNC Program achieved in CY2019. 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.[3] Table 3-2 show gas savings for the three gas utilities.

Table 3-1. CY2019 Total Annual Incremental Electric Savings

Savings Category	Energy Savings (kWh)	Non-Coincident Demand Savings (kW)	Summer Peak* Demand Savings (kW)
Electricity			
Ex Ante Gross Savings	2,378,159	NR	287
Program Gross Realization Rate	0.96	NA	0.95
Verified Gross Savings	2,292,235	1,253	273
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	2,292,235	1,253	273
Converted from Gas†			
Ex Ante Gross Savings	744,351	NA	NA
Program Gross Realization Rate	0.90	NA	NA
Verified Gross Savings	672,456	NA	NA
Program Net-to-Gross Ratio (NTG)	1.00	NA	NA
Verified Net Savings	672,456	NA	NA
Total Electric Plus Gas			
Ex Ante Gross Savings	3,122,510	NR	287
Program Gross Realization Rate	0.95	NA	0.95
Verified Gross Savings	2,964,691	1,253	273
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	2,964,691	1,253	273

NR = Not reported (refers to data that was not reported, i.e., non-coincident demand savings)
NA = Not applicable (refers to 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.
† Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation 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."
Source: ComEd tracking data and evaluation team analysis

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

Table 3-2. CY2019 Total Annual Incremental Gas Savings

Savings Category	Nicor Gas (Therms)[1]	Peoples Gas (Therms)[2]	North Shore Gas (Therms)[3]
Natural Gas*			
Ex Ante Gross Savings	18,743	6,865	NA
Program Gross Realization Rate	0.95	0.99	NA
Verified Gross Savings	17,837	6,774	NA
Program Net-to-Gross Ratio (NTG	1.00	1.00	NA
Verified Net Savings	17,837	6,774	NA

NA = Not applicable
* Verified natural gas savings shown do not include electric interactive effects.
[1] Nicor Gas ex ante gross savings shown do not include electric interactive effects. Ex ante gross savings is based on measure calculators and project files provided by Slipstream. Nicor Gas ex ante tracking data reported 16,796 net therms.
[2] Peoples Gas ex ante gross savings shown do not include electric interactive effects. Ex ante gross savings is based on measure calculators and project files provided by Slipstream.
[3] North Shore Gas reported no savings in 2019.
Source: Measure calculators and project files provided by Slipstream and Guidehouse team analysis.

4. Cumulative Persisting Annual Savings

Table 4-1 to Table 4-3 and Figure 4-1 show the ComEd measure-specific and total verified gross savings for the AHNC Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2019. The electric CPAS across all measures installed in 2019 is 2,292,235 kWh (Table 4-1). The CY2019 gas contribution to CPAS (converted to equivalent electricity) is 672,456 kWh (Table 4-2). Adding the gas and electric contributions produces 2,964,691 kWh of total ComEd CY2019 contribution to CPAS (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 CY2019 contribution and the historic contribution.

Table 4-1. Cumulative Persisting Annual Savings (CPAS) – Electric

End Use Type	Research Category	CY2019 Verified Gross EUL	CY2019 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	9.1	851,165	1.00	7,258,886		851,165	851,165	782,614	782,614	782,614	782,614	782,614	782,614
HVAC	High-Performance HVAC Equipment	18.5	509,904	1.00	9,433,229		509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904
Shell	Reduced Thermal Bridging	25.0	314,254	1.00	7,856,357		314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254
Shell	Reduced Infiltration	15.0	280,653	1.00	4,209,790		280,653	280,653	280,653	280,653	280,653	280,653	280,653	280,653
Lighting	High-Performance Exterior Lighting	10.2	179,489	1.00	1,830,788		179,489	179,489	179,489	179,489	179,489	179,489	179,489	179,489
HVAC	High-Performance Fans	19.0	66,665	1.00	1,266,631		66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665
Appliances	Efficient Appliances	13.1	44,141	1.00	578,253		44,141	44,141	44,141	44,141	44,141	44,141	44,141	44,141
Shell	High-Performance Windows	25.0	29,707	1.00	742,664		29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707
HVAC	Efficient Ventilation	19.0	11,490	1.00	218,312		11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490
Lighting	Interior Lighting Controls	8.0	4,767	1.00	38,135		4,767	4,767	4,767	4,767	4,767	4,767	4,767	4,767
Hot Water	High-Performance Water Heating Equip	13.0	-	1.00	-									
Hot Water	Hot Water Conservation	9.9	-	1.00	-									
CY2019 Program Total Electric Contribution to CPAS			**2,292,235**		**33,433,046**		**2,292,235**	**2,292,235**	**2,223,684**	**2,223,684**	**2,223,684**	**2,223,684**	**2,223,684**	**2,223,684**
Historic Program Total Electric Contribution to CPAS‡						**1,935,089**	**1,935,089**	**1,935,089**	**1,707,148**	**1,707,148**	**1,707,148**	**1,707,148**	**1,707,148**	**1,707,148**
Program Total Electric CPAS						**1,935,089**	**4,227,324**	**4,227,324**	**3,930,832**	**3,930,832**	**3,930,832**	**3,930,832**	**3,930,832**	**3,930,832**
CY2019 Program Incremental Expiring Electric Savings§								-	**68,551**	-	-	-	-	-
Historic Program Incremental Expiring Electric Savings‡§							-	-	**227,941**	-	-	-	-	-
Program Total Incremental Expiring Electric Savings§							-	-	**296,492**	-	-	-	-	-

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	High-Performance Interior Lighting	782,614	78,261										
HVAC	High-Performance HVAC Equipment	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	254,952	
Shell	Reduced Thermal Bridging	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254
Shell	Reduced Infiltration	280,653	280,653	280,653	280,653	280,653	280,653	280,653					
Lighting	High-Performance Exterior Lighting	179,489	179,489	35,898									
HVAC	High-Performance Fans	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	
Appliances	Efficient Appliances	44,141	44,141	44,141	44,141	44,141	4,414						
Shell	High-Performance Windows	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707
HVAC	Efficient Ventilation	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	
Lighting	Interior Lighting Controls												
Hot Water	High-Performance Water Heating Equipment												
Hot Water	Hot Water Conservation												
CY2019 Program Total Electric Contribution to CPAS		**2,218,917**	**1,514,565**	**1,292,712**	**1,256,814**	**1,256,814**	**1,217,087**	**1,212,673**	**932,020**	**932,020**	**932,020**	**677,068**	**343,961**
Historic Program Total Electric Contribution to CPAS‡		**980,483**	**710,028**	**662,599**	**633,157**	**629,608**	**622,690**	**347,899**	**347,899**	**347,899**	**321,472**	**301,101**	**44,129**
Program Total Electric CPAS		**3,199,400**	**2,224,592**	**1,955,311**	**1,889,972**	**1,886,423**	**1,839,777**	**1,560,572**	**1,279,919**	**1,279,919**	**1,253,492**	**978,169**	**388,090**
CY2019 Program Incremental Expiring Electric Savings		**4,767**	**704,352**	**221,853**	**35,898**	**-**	**39,727**	**4,414**	**280,653**	**-**	**-**	**254,952**	**333,107**
Historic Program Incremental Expiring Electric Savings		**726,665**	**270,455**	**47,429**	**29,442**	**3,549**	**6,918**	**274,791**	**-**	**-**	**26,427**	**20,371**	**256,972**
Program Total Incremental Expiring Electric Savings§		**731,432**	**974,807**	**269,281**	**65,340**	**3,549**	**46,645**	**279,205**	**280,653**	**-**	**26,427**	**275,323**	**590,079**

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 Thermal Bridging	314,254	314,254	314,254	314,254	314,254							
Shell	Reduced Infiltration												
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans												
Appliances	Efficient Appliances												
Shell	High-Performance Windows	29,707	29,707	29,707	29,707	29,707							
HVAC	Efficient Ventilation												
Lighting	Interior Lighting Controls												
Hot Water	High-Performance Water Heating Equipment												
Hot Water	Hot Water Conservation												
CY2019 Program Total Electric Contribution to CPAS		**343,961**	**343,961**	**343,961**	**343,961**	**343,961**	-	-	-	-	-	-	-
Historic Program Total Electric Contribution to CPAS‡		**44,129**	**44,129**	**44,129**	**44,129**	-	-	-	-	-	-	-	-
Program Total Electric CPAS		**388,090**	**388,090**	**388,090**	**388,090**	**343,961**	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Electric Savings		-	-	-	-	-	**343,961**	-	-	-	-	-	-
Historic Program Incremental Expiring Electric Savings		-	-	-	-	**44,129**	-	-	-	-	-	-	-
Program Total Incremental Expiring Electric Savings§		-	-	-	-	**44,129**	**343,961**	-	-	-	-	-	-

Note: The green highlighted cell shows program total first year electric savings. The gray cells are blank, indicating values irrelevant to the CY2019 contribution to CPAS.
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
† Lifetime savings are the sum of CPAS savings through the effective useful life (EUL).
‡ Historical savings go back to CY2018
§ Expiring savings are equal to CPAS Yn-1 - CPAS Yn
Source: Evaluation team analysis

Table 4-2. Cumulative Persisting Annual Savings (CPAS) – Gas – ComEd

End Use Type	Research Category	EUL	CY2019 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	9.1	-	1.00	-									
HVAC	High-Performance HVAC Equipment	18.5	-	1.00	-									
Shell	Reduced Thermal Bridging	25.0	-	1.00	-									
Shell	Reduced Infiltration	15.0	-	1.00	-									
Lighting	High-Performance Exterior Lighting	10.2	-	1.00	-									
HVAC	High-Performance Fans	19.0	-	1.00	-									
Appliances	Efficient Appliances	13.1	5,424	1.00	71,058		5,424	5,424	5,424	5,424	5,424	5,424	5,424	5,424
Shell	High-Performance Windows	25.0	-	1.00	-									
HVAC	Efficient Ventilation	19.0	-	1.00	-									
Lighting	Interior Lighting Controls	8.0	-	1.00	-									
Hot Water	High-Performance Water Heating Equipment	13.0	14,623	1.00	190,100		14,623	14,623	14,623	14,623	14,623	14,623	14,623	14,623
Hot Water	Hot Water Conservation	9.9	2,896	1.00	28,666		2,896	2,896	2,896	2,896	2,896	2,896	2,896	2,896
CY2019 Program Total Gas Contribution to CPAS (Therms)			22,943		289,824		22,943	22,943	22,943	22,943	22,943	22,943	22,943	22,943
CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)‡					9,703,896		672,456	672,456	672,456	672,456	672,456	672,456	672,456	672,456
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§						-	-	-	-	-	-	-	-	-
Program Total Gas CPAS (kWh Equivalent)‡						-	672,456	672,456	672,456	672,456	672,456	672,456	672,456	672,456
CY2019 Program Incremental Expiring Gas Savings (Therms)‖								-	-	-	-	-	-	-
CY2019 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 Thermal Bridging												
Shell	Reduced Infiltration												
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans												
Appliances	Efficient Appliances	5,424	5,424	5,424	5,424	5,424	542						
Shell	High-Performance Windows												
HVAC	Efficient Ventilation												
Lighting	Interior Lighting Controls												
Hot Water	High-Performance Water Heating Equipment	14,623	14,623	14,623	14,623	14,623							
Hot Water	Hot Water Conservation	2,896	2,606										
CY2019 Program Total Gas Contribution to CPAS (Therms)		22,943	22,653	20,047	20,047	20,047	542	-	-	-	-	-	-
CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)‡		672,456	663,969	587,588	587,588	587,588	15,899	-	-	-	-	-	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§		-	-										
Program Total Gas CPAS (kWh Equivalent)‡		672,456	663,969	587,588	587,588	587,588	15,899	-	-	-	-	-	-
CY2019 Program Incremental Expiring Gas Savings (Therms)‖		-	290	2,606	-	-	19,505	542	-	-	-	-	-
CY2019 Program Incremental Expiring Gas Savings (kWh Equivalent)‡‖		-	8,487	76,381	-	-	571,690	15,899	-	-	-	-	-
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§‖		-	-	-	-	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡‖		-	8,487	76,381	-	-	571,690	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 CY2019.
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
† 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 CY2018.
‖ Expiring savings are equal to CPAS Yn-1 - CPAS Yn
Source: Evaluation team analysis

Table 4-3. Cumulative Persisting Annual Savings (CPAS) – Total

End Use Type	Research Category	EUL	CY2019 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	9.1	851,165	1.00	7,258,886		851,165	851,165	782,614	782,614	782,614	782,614	782,614	782,614
HVAC	High-Performance HVAC Equipment	18.5	509,904	1.00	9,433,229		509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904
Shell	Reduced Thermal Bridging	25.0	314,254	1.00	7,856,357		314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254
Shell	Reduced Infiltration	15.0	280,653	1.00	4,209,790		280,653	280,653	280,653	280,653	280,653	280,653	280,653	280,653
Lighting	High-Performance Exterior Lighting	10.2	179,489	1.00	1,830,788		179,489	179,489	179,489	179,489	179,489	179,489	179,489	179,489
HVAC	High-Performance Fans	19.0	66,665	1.00	1,266,631		66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665
Appliances	Efficient Appliances	13.1	203,127	1.00	2,660,965		203,127	203,127	203,127	203,127	203,127	203,127	203,127	203,127
Shell	High-Performance Windows	25.0	29,707	1.00	742,664		29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707
HVAC	Efficient Ventilation	19.0	11,490	1.00	218,312		11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490
Lighting	Interior Lighting Controls	8.0	4,767	1.00	38,135		4,767	4,767	4,767	4,767	4,767	4,767	4,767	4,767
Hot Water	High-Performance Water Heating Equipmer	13.0	428,602	1.00	5,571,832		428,602	428,602	428,602	428,602	428,602	428,602	428,602	428,602
Hot Water	Hot Water Conservation	9.9	84,868	1.00	840,195		84,868	84,868	84,868	84,868	84,868	84,868	84,868	84,868
CY2019 Program Total Contribution to CPAS			2,964,691		41,927,785		2,964,691	2,964,691	2,896,140	2,896,140	2,896,140	2,896,140	2,896,140	2,896,140
Historic Program Total Contribution to CPAS‡						1,935,089	1,935,089	1,935,089	1,707,148	1,707,148	1,707,148	1,707,148	1,707,148	1,707,148
Program Total CPAS						1,935,089	4,899,780	4,899,780	4,603,288	4,603,288	4,603,288	4,603,288	4,603,288	4,603,288
CY2019 Program Incremental Expiring Savings§								-	68,551	-	-	-	-	-
Historic Program Incremental Expiring Savings‡§							-	-	227,941	-	-	-	-	-
Program Total Incremental Expiring Savings§							-	-	296,492	-	-	-	-	-

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	High-Performance Interior Lighting	782,614	78,261										
HVAC	High-Performance HVAC Equipment	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	509,904	254,952	
Shell	Reduced Thermal Bridging	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254	314,254
Shell	Reduced Infiltration	280,653	280,653	280,653	280,653	280,653	280,653	280,653					
Lighting	High-Performance Exterior Lighting	179,489	179,489	35,898									
HVAC	High-Performance Fans	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	66,665	
Appliances	Efficient Appliances	203,127	203,127	203,127	203,127	203,127	20,313						
Shell	High-Performance Windows	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707	29,707
HVAC	Efficient Ventilation	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	11,490	
Lighting	Interior Lighting Controls												
Hot Water	High-Performance Water Heating Equipmer	428,602	428,602	428,602	428,602	428,602							
Hot Water	Hot Water Conservation	84,868	76,381										
CY2019 Program Total Contribution to CPAS		2,891,373	2,178,534	1,880,300	1,844,402	1,844,402	1,232,985	1,212,673	932,020	932,020	932,020	677,068	343,961
Historic Program Total Contribution to CPAS‡		980,483	710,028	662,599	633,157	629,608	622,690	347,899	347,899	347,899	321,472	301,101	44,129
Program Total CPAS		3,871,856	2,888,562	2,542,899	2,477,560	2,474,011	1,855,676	1,560,572	1,279,919	1,279,919	1,253,492	978,169	388,090
CY2019 Program Incremental Expiring Savings§		4,767	712,839	298,234	35,898	-	611,417	20,313	280,653	-	-	254,952	333,107
Historic Program Incremental Expiring Savings‡§		726,665	270,455	47,429	29,442	3,549	6,918	274,791	-	-	26,427	20,371	256,972
Program Total Incremental Expiring Savings§		731,432	983,294	345,663	65,340	3,549	618,335	295,104	280,653	-	26,427	275,323	590,079

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 Thermal Bridging	314,254	314,254	314,254	314,254	314,254							
Shell	Reduced Infiltration												
Lighting	High-Performance Exterior Lighting												
HVAC	High-Performance Fans												
Appliances	Efficient Appliances												
Shell	High-Performance Windows	29,707	29,707	29,707	29,707	29,707							
HVAC	Efficient Ventilation												
Lighting	Interior Lighting Controls												
Hot Water	High-Performance Water Heating Equipment												
Hot Water	Hot Water Conservation												
CY2019 Program Total Contribution to CPAS		**343,961**	**343,961**	**343,961**	**343,961**	**343,961**	-	-	-	-	-	-	-
Historic Program Total Contribution to CPAS‡		**44,129**	**44,129**	**44,129**	**44,129**	-	-	-	-	-	-	-	-
Program Total CPAS		**388,090**	**388,090**	**388,090**	**388,090**	**343,961**	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Savings§		-	-	-	-	-	**343,961**	-	-	-	-	-	-
Historic Program Incremental Expiring Savings‡§		-	-	-	-	**44,129**	-	-	-	-	-	-	-
Program Total Incremental Expiring Savings§		-	-	-	-	**44,129**	**343,961**	-	-	-	-	-	-

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 CY2019.

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

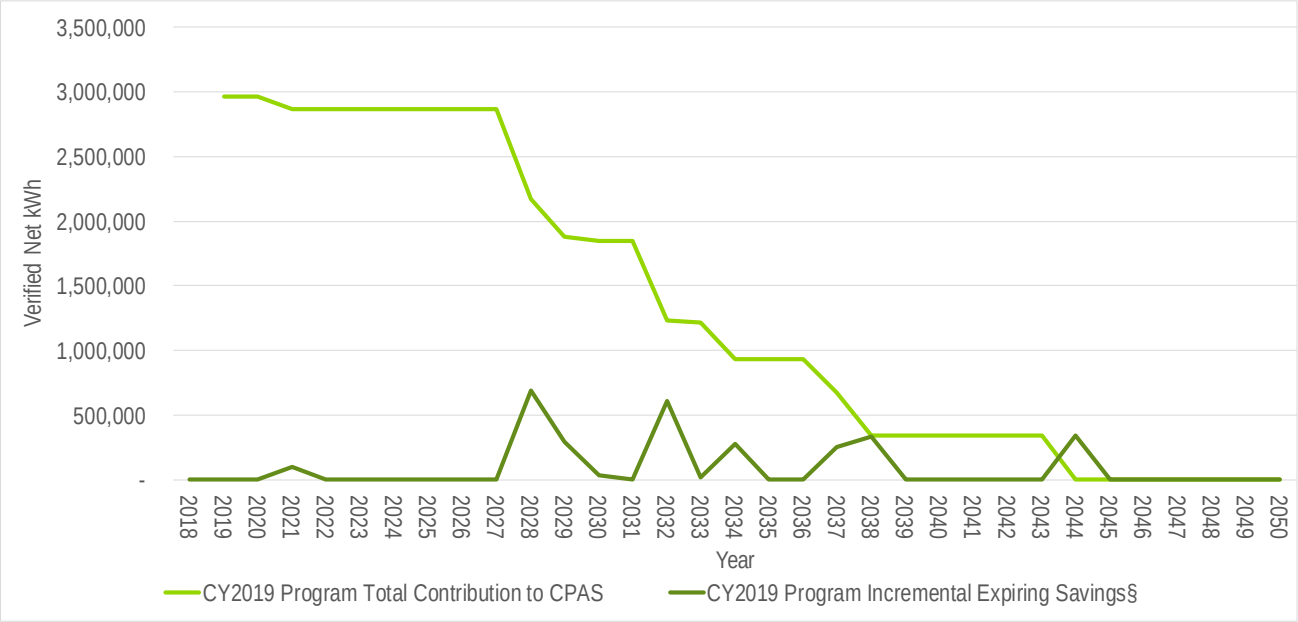
† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Expiring savings are equal to CPAS Yn-1 - CPAS Yn

Source: Evaluation team analysis

Figure 4-1. Cumulative Persisting Annual Savings

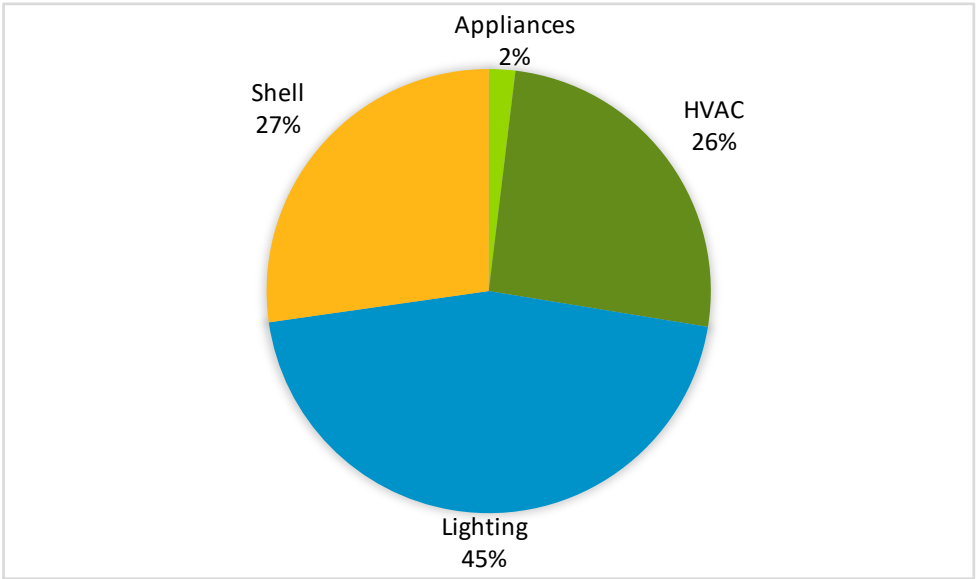


* Expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n
Source: Evaluation team analysis

5. Program Savings by Measure

The program includes 12 measures as shown in the following tables. The lighting and building shell measures contributed the greatest savings (see Figure 5-1).

Figure 5-1. Verified Net Savings by Measure – Electric



Source: ComEd tracking data and evaluation team analysis

Table 5-1. CY2019 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	864,746	0.98	851,165	1.00	851,165	9.1
HVAC	High-Performance HVAC Equipment	552,217	0.92	509,904	1.00	509,904	18.5
Shell	Reduced Thermal Bridging	340,807	0.92	314,254	1.00	314,254	25.0
Shell	Reduced Infiltration	287,397	0.98	280,653	1.00	280,653	15.0
Lighting	High-Performance Exterior Lighting	178,897	1.00	179,489	1.00	179,489	10.2
HVAC	High-Performance Fans	67,059	0.99	66,665	1.00	66,665	19.0
Appliances	Efficient Appliances	44,205	1.00	44,141	1.00	44,141	13.1
Shell	High-Performance Windows	29,705	1.00	29,707	1.00	29,707	25.0
HVAC	Efficient Ventilation	11,368	1.01	11,490	1.00	11,490	19.0
Lighting	Interior Lighting Controls	1,757	2.71	4,767	1.00	4,767	8.0
Hot Water	High-Performance Water Heating Equipment	0	NA	0	1.00	0	13.0
Hot Water	Hot Water Conservation	0	NA	0	1.00	0	9.9
	Total	2,378,159	0.96	2,292,235	1.00	2,292,235	14.8

NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
Note: The savings in this table does not include secondary electric energy (kWh) savings from water supply and wastewater treatment plants because under agreed upon program evaluation rules, projects were reviewed under the TRM version that was effective when the project application was received. All projects in CY2019 were reviewed under TRM v6.0, which did not specify secondary water savings.
Source: ComEd tracking data and evaluation team analysis

Table 5-2. CY2019 Non-Coincident Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Non-Coincident Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Non-Coincident Demand Reduction (kW)	NTG*	Verified Net Non-Coincident Demand Reduction (kW)
Lighting	High-Performance Interior Lighting	NR	NA	696	1.00	696
HVAC	High-Performance HVAC Equipment	NR	NA	193	1.00	193
Shell	Reduced Thermal Bridging	NR	NA	73	1.00	73
Shell	Reduced Infiltration	NR	NA	103	1.00	103
Lighting	High-Performance Exterior Lighting	NR	NA	22	1.00	22
HVAC	High-Performance Fans	NR	NA	37	1.00	37
Appliances	Efficient Appliances	NR	NA	114	1.00	114
Shell	High-Performance Windows	NR	NA	7	1.00	7
HVAC	Efficient Ventilation	NR	NA	6	1.00	6
Lighting	Interior Lighting Controls	NR	NA	1	1.00	1
Hot Water	High-Performance Water Heating Equipment	NR	NA	0	1.00	0
Hot Water	Hot Water Conservation	NR	NA	0	1.00	0
	Total	NR	NA	1,253	1.00	1,253

NR = Not reported
NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
Source: ComEd tracking data and evaluation team analysis

Table 5-3. CY2019 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	71.7	0.99	70.9	1.00	70.9
HVAC	High-Performance HVAC Equipment	96.3	0.91	87.4	1.00	87.4
Shell	Reduced Thermal Bridging	37.8	0.90	34.2	1.00	34.2
Shell	Reduced Infiltration	49.9	0.97	48.4	1.00	48.4
Lighting	High-Performance Exterior Lighting	10.0	1.00	10.0	1.00	10.0
HVAC	High-Performance Fans	9.1	1.00	9.1	1.00	9.1
Appliances	Efficient Appliances	6.1	1.00	6.1	1.00	6.1
Shell	High-Performance Windows	3.5	0.98	3.4	1.00	3.4
HVAC	Efficient Ventilation	3.0	1.00	3.0	1.00	3.0
Lighting	Interior Lighting Controls	0.1	3.17	0.4	1.00	0.4
Hot Water	High-Performance Water Heating Equipment	0.0	NA	0.0	1.00	0.0
Hot Water	Hot Water Conservation	0.0	NA	0.0	1.00	0.0
	Total	287.4	0.95	272.7	1.00	272.7

NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
Source: ComEd tracking data and evaluation team analysis

Table 5-4. CY2019 Energy Savings by Measure – Gas – ComEd

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	High-Performance Interior Lighting	0	NA	0	1.00	0	9.1
HVAC	High-Performance HVAC Equipment	0	NA	0	1.00	0	18.5
Shell	Reduced Thermal Bridging	0	NA	0	1.00	0	25.0
Shell	Reduced Infiltration	0	NA	0	1.00	0	15.0
Lighting	High-Performance Exterior Lighting	0	NA	0	1.00	0	10.2
HVAC	High-Performance Fans	0	NA	0	1.00	0	19.0
Appliances	Efficient Appliances	5,424	1.00	5,424	1.00	5,424	13.1
Shell	High-Performance Windows	0	NA	0	1.00	0	25.0
HVAC	Efficient Ventilation	0	NA	0	1.00	0	19.0
Lighting	Interior Lighting Controls	0	NA	0	1.00	0	8.0
Hot Water	High-Performance Water Heating Equipment	17,076	0.86	14,623	1.00	14,623	13.0
Hot Water	Hot Water Conservation	2,896	1.00	2,896	1.00	2,896	9.9
	Total Therms	25,396	0.90	22,943	1.00	22,943	NA
	Total kWh Converted From Therms†	744,351	0.90	672,456	1.00	672,456	NA

NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
† Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).
Source: ComEd tracking data and evaluation team analysis

Table 5-5. CY2019 Energy Savings by Measure – Total Combining Electricity and Gas – ComEd

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	High-Performance Interior Lighting	864,746	0.98	851,165	1.00	851,165
HVAC	High-Performance HVAC Equipment	552,217	0.92	509,904	1.00	509,904
Shell	Reduced Thermal Bridging	340,807	0.92	314,254	1.00	314,254
Shell	Reduced Infiltration	287,397	0.98	280,653	1.00	280,653
Lighting	High-Performance Exterior Lighting	178,897	1.00	179,489	1.00	179,489
HVAC	High-Performance Fans	67,059	0.99	66,665	1.00	66,665
Appliances	Efficient Appliances	203,191	1.00	203,127	1.00	203,127
Shell	High-Performance Windows	29,705	1.00	29,707	1.00	29,707
HVAC	Efficient Ventilation	11,368	1.01	11,490	1.00	11,490
Lighting	Interior Lighting Controls	1,757	2.71	4,767	1.00	4,767
Hot Water	High-Performance Water Heating Equipment	500,498	0.86	428,602	1.00	428,602
Hot Water	Hot Water Conservation	84,868	1.00	84,868	1.00	84,868
	Total†	3,122,510	0.95	2,964,691	1.00	2,964,691

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
† The total includes the electric equivalent of the total therms.
Source: ComEd tracking data and evaluation team analysis

Table 5-6. CY2019 Natural 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	-	NA	-	1.00	-
HVAC	High-Performance HVAC Equipment	9,598	0.96	9,241	1.00	9,241
Shell	Reduced Thermal Bridging	725	1.01	730	1.00	730
Shell	Reduced Infiltration	4,104	1.00	4,104	1.00	4,104
Lighting	High-Performance Exterior Lighting	-	NA	-	1.00	-
HVAC	High-Performance Fans	-	NA	-	1.00	-
Appliances	Efficient Appliances	106	1.00	106	1.00	106
Shell	High-Performance Windows	220	1.01	222	1.00	222
HVAC	Efficient Ventilation	-	NA	-	1.00	-
Lighting	Interior Lighting Controls	-	NA	-	1.00	-
Hot Water	High-Performance Water Heating Equipmer	3,152	0.82	2,597	1.00	2,597
Hot Water	Hot Water Conservation	837	1.00	837	1.00	837
	Total	18,743	0.95	17,837	1.00	17,837

NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
Source: Measure calculators and project files provided by Slipstream and Guidehouse team analysis.

Table 5-7. CY2019 Natural 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	-	NA	-	1.00	-
HVAC	High-Performance HVAC Equipment	3,178	1.00	3,178	1.00	3,178
Shell	Reduced Thermal Bridging	497	1.00	497	1.00	497
Shell	Reduced Infiltration	2,216	1.00	2,216	1.00	2,216
Lighting	High-Performance Exterior Lighting	-	NA	-	1.00	-
HVAC	High-Performance Fans	-	NA	-	1.00	-
Appliances	Efficient Appliances	22	1.00	22	1.00	22
Shell	High-Performance Windows	417	1.00	417	1.00	417
HVAC	Efficient Ventilation	-	NA	-	1.00	-
Lighting	Interior Lighting Controls	-	NA	-	1.00	-
Hot Water	High-Performance Water Heating Equipmer	535	0.83	444	1.00	444
Hot Water	Hot Water Conservation	-	NA	-	1.00	-
	Total	6,865	0.99	6,774	1.00	6,774

NA = Not applicable
* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
Source: Measure calculators and project files provided by Slipstream and Guidehouse team analysis.

6. Impact Analysis Findings and Recommendations

6.1 Impact Parameter Estimates

The implementer 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 implementer 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.

Natural gas ex ante gross savings include electric interactive effects. Verified natural gas savings are shown with electric interactive effects removed. Ex ante gross savings are based on measure calculators and project files provided by Slipstream. Nicor Gas ex ante tracking data reported 16,796 net therms, and Peoples Gas tracking data reported 8,062 net therms. North Shore Gas reported no savings in 2019.

The evaluation team applied algorithms outlined in the Illinois Technical Reference Manual version 6.0, which was effective when the project applications were received, to calculate verified gross savings for the AHNC Program. The evaluation 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 Stakeholder Advisory Group (SAG).

Table 6-1. Savings Parameters

Gross Savings Input Parameters	Value	Units	Deemed or Evaluated?	Source *
Quantity	Varies	# measures	Evaluated	Tracking Database
NTG	100	%	Deemed	Illinois SAG Consensus
Hours of Use	Varies	Hours/year	Deemed	TRM – Sections vary
Gross Savings per Unit, Deemed Measures	Varies	kWh	Deemed	TRM - Sections vary
Gross Savings per Unit, Non-Deemed Measures	Varies	kWh	Evaluated	Project Documentation
Effective Useful Life (EUL)	Varies	Years	Mixture	TRM – Sections vary

* TRM is the State of Illinois Technical Reference Manual from http://www.ilsag.info/technical-reference-manual.html. Project application date determined applicable TRM version The NTG values can be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

6.2 Other Impact Findings and Recommendations

6.2.1 ComEd

The program wide electric energy realization rate is 96%, the electric demand realization rate is 95%. The program wide gas realization rate is 90% (heating penalties excluded). The evaluation team developed several recommendations based on findings from the CY2019 evaluation.

Finding 1. Measure assumptions**,** quantities, and installed equipment specifications could not be consistently verified through project documentation. Each project file contained between 111 and over 671 individual reference documents.

This finding includes three distinct types of discrepancies:

i. **Assumptions based on Incorrect TRM Version:** Assumptions in the savings calculator did not reflect applicable TRM version (9 measure instances).
ii. **No Documentation:** Savings calculator workbook value could not be consistently verified in preliminary review of submitted documentation (48 measure occurrences). Follow-up correspondence with implementation team resulted in lengthy descriptions of specific source materials.
iii. **Inconsistent Documentation:** Savings calculator workbook value was not consistent with documented measure analysis or specifications (14 measure occurrences).

Recommendation 1. Consider developing a Project Memo for each project explaining key measure analysis details and specific documentation sources in support of project savings. Use memo to both support the implementation team's internal quality assurance-quality control (QAQC) procedures and to inform evaluation team. Memo details should be determined collaboratively between AHNC stakeholders (Utilities, Slipstream, Guidehouse, etc.) and may include:

a. Applicable TRM and Code versions,
b. Measure analysis methodology,
c. Measure documentation location for key quantities and efficiency specifications

Finding 2. High Performance Water Heating Equipment has a gas realization rate of 86%, driven by ex ante savings based on an incorrect hot water usage assumption.

Recommendation 2 Update savings calculator tools to 17.6 gallons per person per day consistent with TRM.

Finding 3. Reduced Infiltration had an electric energy realization rate of 98%. The realization rate was due to errors calculating building surface areas (window areas were not deducted from gross building insulated surface areas, resulting in an over-estimation of insulated surface area).

Recommendation 3. Calculate window and door square footage separately from gross wall square footage and calculate net insulated surface area for use in the Reduced Infiltration measure. Conduct QAQC review on analysis.

Finding 4. The quantity of installed measures is not summarized in the tracking data.

Recommendation 4. Summarize the quantity of each installed measure as a field in the tracking data.

Finding 5. High Performance Fans had an electric energy realization rate of 99%, due to several projects with incorrect fan CFM specifications to calculate savings. It appears the calculations used values based on preliminary construction documentation were not updated to reflect the actual installed equipment.

Recommendation 5. Conduct QAQC review on analyses to ensure energy savings calculations are updated to reflect actual installed equipment specifications.

6.2.2 Nicor Gas

The Nicor Gas realization rate is 95% (heating penalties excluded ex ante and ex post). The evaluation team developed several recommendations based on findings from the CY2019 evaluation.

Finding 6. Measure assumptions**,** quantities and installed equipment specifications could not consistently be verified through project documentation. Each project file contained between 111 and over 671 individual reference documents.

This finding includes three distinct types of discrepancies:

i. **Assumptions based on Incorrect TRM Version:** Assumptions in the savings calculator did not reflect applicable TRM version (9 measure instances).
ii. **No Documentation:** Savings calculator workbook value could not be consistently verified in preliminary review of submitted documentation (48 measure occurrences). Follow-up correspondence with implementation team resulted in lengthy descriptions of specific source materials.
iii. **Inconsistent Documentation:** Savings calculator workbook value was not consistent with documented measure analysis or specifications (14 measure occurrences).

Recommendation 6. Consider developing a Project Memo for each project explaining key measure analysis details and specific documentation sources in support of project savings. Use memo to both support the implementation team's internal QAQC review and to inform evaluation team. Memo details should be determined collaboratively between AHNC stakeholders (Utilities, Slipstream, Guidehouse, etc.) and may include:

a. Applicable TRM and Code versions,
b. Measure analysis methodology,
c. Measure documentation location for key quantities and efficiency specifications

Finding 7. High Performance Water Heating Equipment has a gas realization rate of 82%, driven by ex ante savings based on an incorrect hot water usage assumption.
Recommendation 7. Update savings calculator tools to 17.6 gallons per person per day consistent with TRM.

Finding 8. Quantity of installed measures is not summarized in the tracking data.
Recommendation 8. Summarize the quantity of each installed measure as a field in the tracking data.

Finding 9. Nicor Gas program tracking data provided total therm savings for each project that did not match project savings in the final measure calculators and project files provided by Slipstream. Of the six projects, two matched and four did not match.
Recommendation 9. Update program tracking data with final project therm savings obtained from the implementation contractor.

6.2.3 Peoples Gas

The Peoples Gas realization rate is 99% (heating penalties excluded ex ante and ex post). The evaluation team developed several recommendations based on findings from the CY2019 evaluation.

Finding 10. Measure assumptions**,** quantities and installed equipment specifications could not consistently be verified through project documentation. Each project file contained between 111 and over 671 individual reference documents.

This finding includes three distinct types of discrepancies:

i. **Assumptions based on Incorrect TRM Version:** Assumptions in the savings calculator did not reflect applicable TRM version (9 measure instances).
ii. **No Documentation:** Savings calculator workbook value could not be consistently verified in preliminary review of submitted documentation (48 measure occurrences). Follow-up correspondence with implementation team resulted in lengthy descriptions of specific source materials.
iii. **Inconsistent Documentation:** Savings calculator workbook value was not consistent with documented measure analysis or specifications (14 measure occurrences).

Recommendation 10. Consider developing a Project Memo for each project explaining key measure analysis details and specific documentation sources in support of project savings. Use memo to both support the implementation team's internal QAQC review and to inform evaluation team. Memo details should be determined collaboratively between AHNC stakeholders (Utilities, Slipstream, Guidehouse, etc.) and may include:

a. Applicable TRM and Code versions,
b. Measure analysis methodology,
c. Measure documentation location for key quantities and efficiency specifications

Finding 11. High Performance Water Heating Equipment has a gas realization rate of 83%, driven by ex ante savings based on an incorrect hot water usage assumption.
Recommendation 11. Update savings calculator tools to 17.6 gallons per person per day consistent with TRM.

Finding 12. Quantity of installed measures is not summarized in the tracking data.
Recommendation 12. Summarize the quantity of each installed measure as a field in the tracking data.

Finding 13. Peoples Gas program tracking data provided total therm savings for the one completed project that did not match project savings in the final measure calculators and project files provided by Slipstream.

Recommendation 13. Update program tracking data with final project therm savings obtained from the implementation contractor.

7. Appendix 1. Impact Analysis Methodology

The evaluation team calculated gross verified savings for the AHNC Program by applying savings algorithms from the TRM. The team prioritized project specific documentation[4] to inform savings calculations where the TRM advises to use actual values. For variables where project documentation did not provide this information, the evaluation team relied on defaults from the TRM.

The evaluation team calculated verified net energy and demand savings by multiplying the verified gross savings estimates by a deemed NTG ratio of 1.0. In CY2019, the NTG ratio estimates used to calculate the verified net savings were based on past evaluation research and approved through a consensus process managed through the Illinois Energy Efficiency Stakeholder Advisory Group (SAG).

8. Appendix 2. Impact Analysis Detail

Guidehouse relied on the following documents to verify the per-unit savings for each program measure:

- Measure calculator's provided by Slipstream
  - !AH0009_Summary_CY2019FinalEval.xlsx
  - AH0009_N01_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N02_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N03_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N04_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N05_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N06_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N07_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N08_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N09_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N010_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N011_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N012_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N013_Calc_2-05_CY2019FinalEval.xlsx
  - AH0009_N014_Calc_2-05_CY2019FinalEval.xlsx
  - AH0011_Calc_2-05_CY2019FinalEval.xlsx
  - AH0013_Calc_2-05_CY2019FinalEval.xlsx
  - AH0018_Calc_2-05_CY2019FinalEval.xlsx
  - AH0029_Calc_2-05_CY2019FinalEval.xlsx
  - AH0033_Calc_2-05_CY2019FinalEval.xlsx
  - AH0045_Calc_2-05_CY2019FinalEval.xlsx
  - AH0049_Calc_2-05_CY2019FinalEval.xlsx
  - AH0051_Calc_2-05_CY2019FinalEval.xlsx
  - AH0052_Calc_2-05_CY2019FinalEval.xlsx

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

- Assortment of project specific files provided by Slipstream. Each project file contained between 111 and 671 individual reference documents including:
    - Project plans and specifications
    - Project verification reports and documentation
    - Incentive agreements
    - Photographs
- Illinois Technical Reference Manual (TRM) for deemed input parameters or secondary evaluation research to verify any custom inputs used in the ex ante calculations. Project application date determined TRM version:
    - V5 = Applications dated 6/1/16 – 12/31/2017
    - V6 = Applications dated 1/1/2018 – 12/31/2018
    - V7 = Applications dated 1/1/2019 – 12/31/2019
    - V8 = for future project applications dated after 1/1/2020
- IECC Code version in effect at time of project permitting

9. Appendix 3. Total Resource Cost Detail

Table 9-1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later.

Table 9-1. Total Resource Cost Savings Summary for ComEd

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Verified Gross Electric Energy Savings (kWh)	Verified Gross Peak Demand Reduction (kW)	Verified Gross Gas Savings (Therms)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (kW)	NTG (Therms)	Verified Net Electric Energy Savings (kWh)	Verified Net Peak Demand Reduction (kW)	Verified Net Gas Savings (Therms)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Lighting	High-Performance Interior Lighting	Lamps	8,637	9.1	No	851,165	70.86	0	0	-3,660	1.00	1.00	1.00	851,165	70.86	0	0	-3,660
HVAC	High-Performance HVAC Equipment	Systems	285	18.5	No	509,904	87.36	0	0	0	1.00	1.00	1.00	509,904	87.36	0	0	0
Shell	Reduced Thermal Bridging	Sq. Ft.	573,431	25.0	No	314,254	34.16	0	0	0	1.00	1.00	1.00	314,254	34.16	0	0	0
Shell	Reduced Infiltration	CFM50	195,779	15.0	No	280,653	48.35	0	0	0	1.00	1.00	1.00	280,653	48.35	0	0	0
Lighting	High-Performance Exterior Lighting	Lamps	687	10.2	No	179,489	9.99	0	0	0	1.00	1.00	1.00	179,489	9.99	0	0	0
HVAC	High-Performance Fans	Fans	732	19.0	No	66,665	9.13	0	0	0	1.00	1.00	1.00	66,665	9.13	0	0	0
Appliances	Efficient Appliances	Appliances	1,713	13.1	No	44,141	6.09	5,424	0	0	1.00	1.00	1.00	44,141	6.09	5,424	0	0
Shell	High-Performance Windows	Sq. Ft.	84,162	25.0	No	29,707	3.40	0	0	0	1.00	1.00	1.00	29,707	3.40	0	0	0
HVAC	Efficient Ventilation	Makeup Air Unit	6	19.0	No	11,490	2.97	0	0	0	1.00	1.00	1.00	11,490	2.97	0	0	0
Lighting	Interior Lighting Controls	Watts	1,478	8.0	No	4,767	0.37	0	0	0	1.00	1.00	1.00	4,767	0.37	0	0	0
Hot Water	High-Performance Water Heating Equipment	Heaters	620	13.0	No	0	0.00	14,623	0	0	1.00	1.00	1.00	0	0.00	14,623	0	0
Hot Water	Hot Water Conservation	Each	318	9.9	No	0	0.00	2,896	0	0	1.00	1.00	1.00	0	0.00	2,896	0	0
	Total			14.8		2,292,235	273	22,943	0	-3,660	1.00	1.00	1.00	2,292,235	273	22,943	0	-3,660

Note: The savings in this table does not include secondary electric energy (kWh) savings from water supply and wastewater treatment plants because under agreed upon program evaluation rules, projects were reviewed under the TRM version that was effective when the project application was received. All projects in CY2019 were reviewed under TRM v6.0, which did not specify secondary water savings.

‡ 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 9-2. Total Resource Cost Savings Summary for Nicor Gas

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	NTG (Therms)	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	Lamps	8,637	9.1	No	-	-	1.00	-
HVAC	High-Performance HVAC Equipment	Systems	285	18.5	No	9,598	9,241	1.00	9,241
Shell	Reduced Thermal Bridging	Sq. Ft.	573,431	25.0	No	725	730	1.00	730
Shell	Reduced Infiltration	CFM50	195,779	15.0	No	4,104	4,104	1.00	4,104
Lighting	High-Performance Exterior Lighting	Lamps	687	10.2	No	-	-	1.00	-
HVAC	High-Performance Fans	Fans	732	19.0	No	-	-	1.00	-
Appliances	Efficient Appliances	Appliances	1,713	13.1	No	106	106	1.00	106
Shell	High-Performance Windows	Sq. Ft.	84,162	25.0	No	220	222	1.00	222
HVAC	Efficient Ventilation	Makeup Air Units	6	19.0	No	-	-	1.00	-
Lighting	Interior Lighting Controls	Watts	1,478	8.0	No	-	-	1.00	-
Hot Water	High-Performance Water Heating Equipment	Heaters	620	13.0	No	3,152	2,597	1.00	2,597
Hot Water	Hot Water Conservation	Each	318	9.9	No	837	837	1.00	837
				16.8		18,743	17,837	1.00	17,837

* 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.
Source: Measure calculators and project files from Slipstream and evaluation team analysis

Table 9-3. Total Resource Cost Savings Summary for Peoples Gas

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	NTG (Therms)	Verified Net Savings (Therms)
Lighting	High-Performance Interior Lighting	Lamps	8,637	9.1	No	-	-	1.00	-
HVAC	High-Performance HVAC Equipment	Systems	285	18.5	No	3,178	3,178	1.00	3,178
Shell	Reduced Thermal Bridging	Sq. Ft.	573,431	25.0	No	497	497	1.00	497
Shell	Reduced Infiltration	CFM50	195,779	15.0	No	2,216	2,216	1.00	2,216
Lighting	High-Performance Exterior Lighting	Lamps	687	10.2	No	-	-	1.00	-
HVAC	High-Performance Fans	Fans	732	19.0	No	-	-	1.00	-
Appliances	Efficient Appliances	Appliances	1,713	13.1	No	22	22	1.00	22
Shell	High-Performance Windows	Sq. Ft.	84,162	25.0	No	417	417	1.00	417
HVAC	Efficient Ventilation	Makeup Air Units	6	19.0	No	-	-	1.00	-
Lighting	Interior Lighting Controls	Watts	1,478	8.0	No	-	-	1.00	-
Hot Water	High-Performance Water Heating Equipment	Heaters	620	13.0	No	535	444	1.00	444
Hot Water	Hot Water Conservation	Each	318	9.9	No	-	-	1.00	-
				19.2		6,865	6,774	1.00	6,774

* 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.
Source: Measure calculators and project files from Slipstream and evaluation team analysis