

# ComEd Single Family Upgrades Program Impact Evaluation Report

Energy Efficiency/Demand Response Plan: Program Year 2022 (CY2022) (1/1/2022-12/31/2022)

Prepared for:

ComEd

# **FINAL**

May 11, 2023

Prepared by:

Sophie Berne Guidehouse Gabriela Gaitan Guidehouse

guidehouse.com



## Submitted to:

ComEd 2011 Swift Drive Oak Brook, IL 60523

## Submitted by:

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

#### Contact:

Charles Maglione, Partner Jeff Erickson, Director 703.431.1983 608.616.4962

cmaglione@guidehouse.com jeff.erickson@guidehouse.com

Adam Knickelbein, Director
303.493.5483

Neil Curtis, Associate Director
802.526.5119

adam.knickelbein@guidehouse.com neil.curtis@guidehouse.com

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Savings<sup>-</sup>

711,126

51,254

3.352

52.542.086



## Introduction

Electrification)||

Total Electric Energy Savings#

Secondary Water Savings

Summer Peak\*† Demand

This report presents the results of the impact evaluation of the Single Family Upgrades program for the program year from January 1 to December 31, 2022 (CY2022). The program was designed to provide free energy saving products to single family homes.

The program is offered jointly to customers served by ComEd, Nicor Gas, Peoples Gas, and North Shore Gas. This report presents the results just for ComEd. The results for the gas utilities will be in a separate report.

# **Program Savings Detail**

kWh

kWh

54,424,149

0

3,600

Table 1 summarizes the incremental energy and demand savings the Single Family Upgrades program achieved in CY2022. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs. 1 The electrification savings are those resulting from fuel switching measures.<sup>2</sup> Table 2 summarizes the savings achieved from income eligible participants, and Table 3 summarizes savings from non-income eligible participants. Together, they make up the total shown in Table 1.

rogram Net-to-CY2020 Net CY2021 Net Units Ex Ante Gross Program Gross Verified Gross Savings\* Realization Rate Savings\* Verified Ne Savings Category (NTG) 17 720 682 1.00 17,766,845 16,075,849 Electric Energy Savings - Direct‡ kWh Varies Electric Energy Savings kWh 35,991,050 1.00 36,132,872 Varies 35,755,111 Converted from Gas§ Electric Energy Savings - Indirect from Fuel Switching (through kWh 712,418 1.00 711,126

1.00

1.00

54,610,843

51,254

3.599

Varies

Varies

Varies

Table 1. Total Annual Incremental Electric Savings - Total

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<sup>\*</sup> Ex ante and verified gross savings exclude gross carryover savings from CY2020 and CY2021.

<sup>†</sup> The Verified Net Savings in row one (Electric Energy Savings - Direct) excludes carryover savings as they do not apply to this program.

<sup>‡</sup> The Electric Energy Savings - Direct includes primary kWh savings from efficient measures (includes efficiency savings from fuel switching measures but excludes the fuel switching savings), secondary kWh savings from wastewater treatment, and electric heating penalties.

<sup>§</sup> 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 team will determine which gas savings will be converted to kWh and counted toward ComEd's electric savings goal while producing the portfoliowide Summary Report.

<sup>||</sup> Electrification savings from fuel switching measures excluding direct efficiency savings calculated from net electric savings from an increase in kWh consumption and decrease in gas consumption from fuel switching (kWh

<sup>&</sup>lt;sup>1</sup> The evaluation will determine which gas savings will be counted toward 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 total savings requirement as defined in paragraph (7.5) of subsection (g) of this Section be met through savings of fuels other than electricity."

<sup>&</sup>lt;sup>2</sup> The evaluation team will determine which electrification savings from fuel switching will be counted toward ComEd's electric savings goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-27) of the Illinois Public Utilities Act, "In no event shall electrification savings counted toward each year's applicable annual total savings requirement, as defined in paragraph (7.5) of subsection (g) of this Section, be greater than 5% per year for each year from 2022 through 2025."



equivalent).

# Total Electric Energy Savings is the sum of the Electric Energy Savings - Direct, the Electric Energy Savings Converted from Gas, and the Electrification Savings from fuel switching.

\*† The Peak Demand Savings are savings occurring at coincident Summer Peak period, defined as 1:00 p.m. - 5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August. This definition is in accordance with PJM requirement.

Note: The program-level NTG values are calculated as verified net/verified gross. The program-level analysis typically used measure-level deemed NTG values, which are listed here: <a href="https://www.ilsag.info/evaluator-ntg-recommendations-for-2022">https://www.ilsag.info/evaluator-ntg-recommendations-for-2022</a>.

Source: Evaluation team analysis

Table 2. Total Annual Incremental Electric Savings - Income Eligible

Savings Category	Units	Ex Ante Gross Savings*	Program Gross Realization Rate	Verified Gross Savings*	Program Net-to- Gross Ratio (NTG)	CY2020 Net Carryover Savings	CY2021 Net Carryover Savings	Verified Net Savings†
Electric Energy Savings - Direct‡	kWh	10,181,665	1.00	10,201,908	Varies	_	_	10,201,908
Electric Energy Savings - Converted from Gas§	kWh	33,598,355	1.00	33,736,379	Varies			33,736,379
Electric Energy Savings - Indirect from Fuel Switching (through Electrification)	kWh	712,418	1.00	711,126	1			711,126
Total Electric Energy Savings#	kWh	44,492,437	1.00	44,649,413	Varies			44,649,413
Secondary Water Savings	kWh	0		26,137	Varies			26,137
Summer Peak*† Demand Savings	kW	2,498	1.00	2,497	Varies			2,497

Footnotes are defined similarly as found in Table 1.

Source: Evaluation team analysis

Table 3. Total Annual Incremental Electric Savings - Non-Income Eligible

Savings Category	Units	Ex Ante Gross Savings*	Program Gross Realization Rate	Verified Gross Savings*	Program NTG Ratio	CY2020 Net Carryover Savings	CY2021 Net Carryover Savings	Verified Net Savings†
Electric Energy Savings - Direct‡	kWh	7,539,017	1.00	7,564,937	Varies		-	5,873,942
Electric Energy Savings - Converted from Gas§	kWh	2,392,695	1.00	2,396,493	Varies			2,018,732
Electric Energy Savings - Indirect from Fuel Switching (through Electrification)	kWh							
Total Electric Energy Savings#	kWh	9,931,712	1.00	9,961,430	Varies			7,892,674
Secondary Water Savings	kWh	0		25,117	Varies			25,117
Summer Peak*† Demand Savings	kW	1,102	1.00	1,102	Varies			855

Footnotes are defined similarly as found in Table 1.

Source: Evaluation team analysis

Figure 1 shows the electric energy savings by measure end use. It includes measure efficiency savings, secondary water kWh, and electrification savings. It does not include gas savings converted to kWh.

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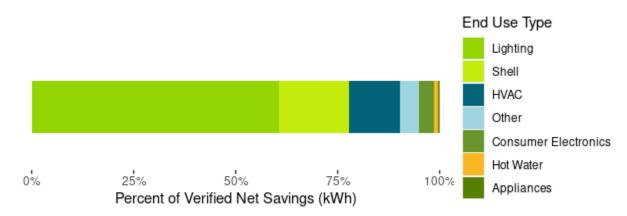


Figure 1. Verified Net Savings by End Use Type - Electric

Source: Evaluation team analysis

# **Cumulative Persistent Annual Savings**

Table 4 to Table 6 show the cumulative persisting annual savings (CPAS) for the measures installed in CY2022. Table 4 shows the electric CPAS across all measures installed in 2022. Table 5 shows the gas contribution to CPAS (converted to equivalent electricity). Table 6 shows the combined savings.

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### Table 4. CPAS – Electric

	CPAS Verified Net kWh Savings												
	Verified Gross	Lifetime Net Savings											
Savings Category	Savings (kWh)	(kWh)†	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
CY2022 Program Total Contribution to CPAS	17,766,845	162,378,031		_			16,075,849	16,029,959	16,029,959	15,908,106	13,373,019	13,211,711	13,001,864
Historic Program Total Contribution to CPAS‡			27,169,963	58,956,418	73,452,481	79,772,240	79,711,032	79,500,071	60,759,661	50,477,279	47,441,800	45,488,564	26,532,338
Program Total CPAS	17,766,845	162,378,031	27,169,963	58,956,418	73,452,481	79,772,240	95,786,882	95,530,030	76,789,620	66,385,386	60,814,819	58,700,275	39,534,202
CY2022 Program Incremental Expiring Savings§								45,890	0	121,853	2,535,088	161,308	209,847
Historic Program Incremental Expiring Savings							61,208	210,961	18,740,410	10,282,382	3,035,479	1,953,236	18,956,226
Program Total Incremental Expiring Savings#							61,208	256,852	18,740,410	10,404,235	5,570,567	2,114,544	19,166,072
		Lifetime Net											
Savings Category	Verified Gross Savings (kWh)	Savings (kWh)†2	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CY2022 Program Total Contribution to CPAS	17,766,845		11216444.065	10,848,669	10,739,800	3,597,758	2,951,662	2,931,400	2,925,413	2,925,413	2,671,918	2,161,428	2,158,283
Historic Program Total Contribution to CPAS‡			20380219.489	14,164,047	7,337,925	6,955,885	5,557,906	5,541,450	5,533,147	5,468,775	4,954,880	4,551,880	2,775,601
Program Total CPAS	17,766,845	162,378,031	31596663.555	25,012,716	18,077,725	10,553,643	8,509,568	8,472,851	8,458,560	8,394,188	7,626,798	6,713,309	4,933,884
CY2022 Program Incremental Expiring Savings§			1785420.1103	367,775	108,869	7,142,042	646,096	20,261	5,987	0	253,495	510,489	3,145
Historic Program Incremental Expiring Savings			6152118.6347	6,216,173	6,826,122	382,039	1,397,979	16,456	8,303	64,372	513,895	402,999	1,776,279
Program Total Incremental Expiring Savings#			7937538.7451	6,583,948	6,934,991	7,524,081	2,044,075	36,717	14,290	64,372	767,390	913,489	1,779,424
		Lifetime Net											
Savings Category	Verified Gross Savings (kWh)	Savings (kWh)†	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CY2022 Program Total Contribution to CPAS	17,766,845	162,378,031	2,001,354	1,617,023	499	499	0	0	0	0	0	0	0
Historic Program Total Contribution to CPAS‡			2,166,285	615,042	613,946	0	0	0	0	0	0	0	0
Program Total CPAS	17,766,845	162,378,031	4,167,639	2,232,065	614,445	499	0	0	0	0	0	0	0
CY2022 Program Incremental Expiring Savings§			156,929	384,331	1,616,524	0	499	0	0	0	0	0	0
Historic Program Incremental Expiring Savings			609,316	1,551,243	1,096	613,946	0	0	0	0	0	0	0
Program Total Incremental Expiring Savings#			766,245	1,935,574	1,617,620	613,946	499	0	0	0	0	0	0

<sup>†</sup> Lifetime savings are the sum of CPAS savings through the EUL.

Table 5. CPAS - Gas

<sup>‡</sup> Historical savings go back to CY2018.

<sup>§</sup> Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

|| Historic incremental expiring savings are equal to Historic CPAS Yn-1 – Historic CPAS Yn.

<sup>#</sup> Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.

Source: Evaluation team analysis



	Verified Gross	Lifetime Net		CPAS	Verified Net Th	erms Savings							
	Verified Gross Savings	Savings											
Savings Category	(Therms)	(Therms)†	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
CY2022 Program Total Gas Contribution to CPAS (Therms)	1,230,018	17,971,147				_	1,217,130	1,176,205	1,176,205	1,105,993	1,106,074	1,094,212	1,072,256
CY2022 Program Total Gas Contribution to CPAS (kWh Equivalent)‡	36,051,833						35,674,072	34,474,564	34,474,564	32,416,661	32,419,035	32,071,351	31,427,820
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§			1,480,075	2,178,396	10,471,724	21,634,821	21,591,822	21,546,328	21,175,681	21,086,773	21,025,482	20,906,717	20,762,274
Program Total Gas CPAS (kWh Equivalent)	29,857,135	0	1,480,075	2,178,396	10,471,724	21,634,821	57,265,894	56,020,892	55,650,245	53,503,434	53,444,517	52,978,067	52,190,094
CY2022 Program Incremental Expiring Gas Savings (Therms)								40,925	0	70,212	-81	11,862	21,956
CY2022 Program Incremental Expiring Gas Savings (kWh Equivalent)								1,199,508	0	2,057,903	-2,374	347,684	643,531
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#							42,999	45,494	370,648	88,907	61,291	118,765	144,443
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†							42,999	1,245,002	370,648	2,146,811	58,917	466,449	787,973
	Verified Gross	Lifetime Net											, and a second
	Savings	Savings	2222	2222	2221	2222	2222	222.4		2222		2222	2222
Savings Category	(Therms)	(Therms)†	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CY2022 Program Total Gas Contribution to CPAS (Therms)	1,230,018	17,971,147	1,072,256	1,069,040	1,054,991	806,973	732,826	703,667	665,833	665,833	647,200	642,587	642,587
CY2022 Program Total Gas Contribution to CPAS (kWh Equivalent)‡	36,051,833		31,427,820	31,333,567	30,921,785	23,652,364	21,479,141	20,624,472	19,515,556	19,515,556	18,969,430	18,834,219	18,834,219
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§			20,695,006	19,348,132	19,145,613	19,063,960	18,593,000	18,564,313	18,553,073	18,515,493	18,403,321	18,143,250	17,716,031
Program Total Gas CPAS (kWh Equivalent)	29,857,135	0	52,122,826	50,681,699	50,067,398	42,716,324	40,072,141	39,188,786	38,068,629	38,031,049	37,372,751	36,977,470	36,550,251
CY2022 Program Incremental Expiring Gas Savings (Therms)			0	3,216	14,049	248,018	74,146	29,160	37,834	0	18,633	4,613	0
CY2022 Program Incremental Expiring Gas Savings (kWh Equivalent)			0	94,254	411,782	7,269,421	2,173,224	854,668	1,108,916	0	546,126	135,210	0
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#			67,268	1,346,874	202,519	81,654	470,960	28,687	11,240	37,580	112,171	260,071	427,219
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†			67,268	1,441,128	614,301	7,351,074	2,644,183	883,355	1,120,157	37,580	658,297	395,282	427,219
	Verified Gross	Lifetime Net Savings											
Savings Category	Savings (Therms)	(Therms)†	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CY2022 Program Total Gas Contribution to CPAS (Therms)	1,230,018	17,971,147	642,587	642,587	6,996	6,996	6,996	6,996	6,996	0	0	0	0
CY2022 Program Total Gas Contribution to CPAS (kWh Equivalent)‡	36,051,833		18,834,219	18,834,219	205,045	205,045	205,045	205,045	205,045	0	0	0	0
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§			10,290,201	424,151	424,151	35,855	14,194	6,817	0	0	0	0	0
Program Total Gas CPAS (kWh Equivalent)	29,857,135	0	29,124,421	19,258,370	629,195	240,899	219,239	211,861	205,045	0	0	0	0
CY2022 Program Incremental Expiring Gas Savings (Therms)			0	0	635,591	0	0	0	0	6,996	0	0	0
CY2022 Program Incremental Expiring Gas Savings (kWh Equivalent)			0	0	18,629,175	0	0	0	0	205,045	0	0	0
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)#			7,425,830	9,866,050	0	388,296	21,661	7,377	6,817	0	0	0	0
Program Total Incremental Expiring Gas Savings (kWh Equivalent)*†			7,425,830	9,866,050	18,629,175	388,296	21,661	7,377	6,817	205,045	0	0	0
Lifeting a suite me and the sum of ODAC assistant the sum of the s			, , ,	, , ,	, , -	,	, -	,		, -			

<sup>†</sup> Lifetime savings are the sum of CPAS savings through the EUL.

Source: Evaluation team analysis

<sup>‡</sup> kWh equivalent savings are calculated by multiplying therm savings by 29.31. § Historical savings go back to CY2018.

<sup>|</sup> Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

<sup>#</sup> Historic incremental expiring savings are equal to Historic CPAS Yn-1 – Historic CPAS Yn.

\*† Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.



## Table 6. CPAS - Total

	CPAS Verified Net kWh Savings												
	\/- ::\footing = 1 \( \text{O} = 2 \)	Lifetime Net											
Savings Category	Verified Gross Savings (kWh)	Savings (kWh)†	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
CY2022 Program Total Contribution to CPAS	53,818,678	688,994,976	-	=	=	-	51,749,921	50,504,523	50,504,523	48,324,767	45,792,053	45,283,062	44,429,684
Historic Program Total Contribution to CPAS‡			28,650,038	61,134,814	83,924,204	101,407,062	101,302,855	101,046,399	81,935,342	71,564,052	68,467,282	66,395,280	47,294,612
Program Total CPAS	53,818,678	688,994,976	28,650,038	61,134,814	83,924,204	101,407,062	153,052,776	151,550,922	132,439,865	119,888,819	114,259,335	111,678,342	91,724,296
CY2022 Program Incremental Expiring Savings§								1,245,398	0	2,179,756	2,532,714	508,992	853,377
Historic Program Incremental Expiring Savings							104,207	256,456	19,111,057	10,371,290	3,096,770	2,072,002	19,100,668
Program Total Incremental Expiring Savings#							104,207	1,501,854	19,111,057	12,551,046	5,629,484	2,580,993	19,954,046
		Lifetime Net											
	Verified Gross	Savings	2222	0000	2224	0000	0000	0004	0005	0000	2007	2222	0000
Savings Category	Savings (kWh)	(kWh)†	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CY2022 Program Total Contribution to CPAS	53,818,678	688,994,976	42,644,264	42,182,235	41,661,585	27,250,122	24,430,802	23,555,873	22,440,969	22,440,969	21,641,348	20,995,648	20,992,502
Historic Program Total Contribution to CPAS‡			41,075,226	33,512,179	26,483,538	26,019,845	24,150,906	24,105,764	24,086,220	23,984,268	23,358,201	22,695,131	20,491,632
Program Total CPAS	53,818,678	688,994,976	83,719,490	75,694,414	68,145,123	53,269,967	48,581,709	47,661,636	46,527,189	46,425,237	44,999,549	43,690,779	41,484,135
CY2022 Program Incremental Expiring Savings§			1,785,420	462,029	520,650	14,411,463	2,819,320	874,930	1,114,904	0	799,621	645,700	3,145
Historic Program Incremental Expiring Savings			6,219,386	7,563,047	7,028,641	463,693	1,868,939	45,142	19,544	101,952	626,066	663,071	2,203,498
Program Total Incremental Expiring Savings#			8,004,806	8,025,075	7,549,291	14,875,156	4,688,259	920,072	1,134,447	101,952	1,425,688	1,308,771	2,206,644
		Lifetime Net											
On the second	Verified Gross	Savings	0040	0044	0040	00.40	0044	00.45	0040	00.47	0040	0040	0050
Savings Category	Savings (kWh)	(kWh)†	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CY2022 Program Total Contribution to CPAS	53,818,678	688,994,976	20,835,573	20,451,242	205,543	205,543	205,045	,-	,-	0	0	·	0
Historic Program Total Contribution to CPAS‡	=======================================		12,456,486	1,039,193	1,038,097	35,855	14,194	6,817	0	·	•	0	0
Program Total CPAS	53,818,678	688,994,976	33,292,060	21,490,435	1,243,641	241,398	219,239	211,861	205,045	0	0	0	0
CY2022 Program Incremental Expiring Savings§			156,929	384,331	20,245,699	0	499	0	0	205,045	0	0	0
Historic Program Incremental Expiring Savings			8,035,146	11,417,293	1,096	1,002,242	21,661	7,377	6,817	0	0	0	0
Program Total Incremental Expiring Savings#			8,192,075	11,801,624	20,246,795	1,002,242	22,160	7,377	6,817	205,045	0	0	0

Source: Evaluation team analysis

<sup>†</sup> Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historical savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Yn.

|| Historic incremental expiring savings are equal to Historic CPAS Yn.

# Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.