BASELINE AND POTENTIAL STUDY REPORT ADDENDUM

TO	ComEd, Ameren Illinois, and Nicor Gas
CC	Illinois Commerce Commission, Illinois Attorney General Office, National Resources Defense Council, and National Consumer Law Center
FROM	GDS Associates
DATE	January 06, 2025
RE	Baseline and Potential Study Report Addendum

INTRODUCTION

During the drafting of the final report for the Illinois Baseline and Potential Study, GDS received comments and requests that could not cleanly be accommodated in the body of the report without delaying the delivery of the final product. These addenda address those comments and requests fielded by the GDS team. Most address requests for additional detail related to details underpinning the potential study results, with one that expands on detail related to the residential baseline study. These addenda serve to provide additional results breakouts that were either not included in the main report and/or were not easily viewed in the detailed results files provided to the Joint Utilities and Potential Study Working Group stakeholders.

REQUEST FOR ADDITIONAL INFORMATION AND RESPONSES: UTILITY LEVEL RESULTS

REQUEST #1: For Figures 5-4 and 5-9 (and 6-4 and 6-9), please provide the figures the include a breakdown of electrification and traditional energy efficiency.

RESPONSE#1: The figures listed in the request above provide the Maximum Achievable Potential (MAP) and Realistic Achievable Potential (RAP) incremental annual savings from 2026-2029 by sector and electric utility. The tables below provide the requested details to show the incremental annual savings that include a breakdown of net electrification savings and traditional energy efficiency for MAP and RAP.

Figure 5-4 detail (ComEd – Residential)

	2026	2027	2028	2029
MAP				
Res. Market Rate EE	409,618	411,378	405,360	395,716
Res. Market Rate Elec.	259,369	389,056	432,193	463,008
Income Eligible EE	422,498	423,449	415,768	417,091
Income Eligible Elec.	161,881	242,822	269,749	288,984
RAP				
Res. Market Rate EE	339,506	346,196	345,173	342,087
Res. Market Rate Elec.	229,590	344,387	382,571	409,849
Income Eligible EE	361,236	366,969	363,848	371,124
Income Eligible Elec.	143,108	214,664	238,468	255,472

Figure 5-9 detail (ComEd – C&I)

	2026	2027	2028	2029
MAP				
EE	1,362,292	1,263,212	1,181,202	1,139,534
Elec.	235,966	353,949	393,277	421,368
RAP				
EE	1,188,215	1,108,868	1,043,961	1,016,490
Elec.	233,221	349,832	388,702	416,466

Figure 6-4 detail (Ameren Electric – Residential)

	2026	2027	2028	2029
MAP				
Res. Market Rate EE	165,197	163,462	159,592	155,877
Res. Market Rate Elec.	61,980	92,970	103,300	110,678
Income Eligible EE	124,586	131,178	134,038	141,385
Income Eligible Elec.	45,529	68,294	75,882	81,302
RAP				
Res. Market Rate EE	126,147	125,955	123,738	122,044
Res. Market Rate Elec.	56,962	85,443	94,936	101,718
Income Eligible EE	123,485	130,096	132,974	140,390
Income Eligible Elec.	41,829	62,744	69,716	74,696

Figure 5-9 detail (Ameren Electric – C&I)

	2026	2027	2028	2029
MAP				
EE	364,887	337,940	313,183	309,749
Elec.	83,632	125,447	139,386	149,342
RAP				
EE	297,773	278,731	261,480	264,223
Elec.	82,948	124,422	138,246	148,121

REQUEST #2: For Table 5-2 and 5-3 (and 6-2 and 6-3), consider providing an explanation of how you convert net Btus to electric, and breakdown of the actual added electric impacts (kwh) versus the reduced gas (therm) impacts.

RESPONSE#2: Table 5-2, 5-3, 6-2 and 6-3 provide a breakdown by sector and electric utility of the RAP savings between traditional EE and Electrification. The electrification impacts are net electric impacts and include the added kWh as well as the reduced therm savings (converted to electric savings). The therm savings are converted to kWh savings by a formula: therms * 100,000/3413.

Table 5-2 detail (ComEd – Residential)

	2026	2027	2028	2029
Added kWh	-76,491,415	-114,737,968	-127,451,360	-136,533,523
Reduced therms	15,330,856	22,996,417	25,545,987	27,367,293
Net Electric Saved (MWh)	372,699	559,051	621,039	665,321

Table 5-3 detail (ComEd – C&I)

	2026	2027	2028	2029
Added kWh	-53,559,027	-80,338,541	-89,265,045	-95,641,120
Reduced therms	9,787,803	14,681,705	16,313,005	17,478,220
Net Electric Saved (MWh)	233,221	349,832	388,702	416,466

Table 6-2 detail (Ameren Electric – Residential)

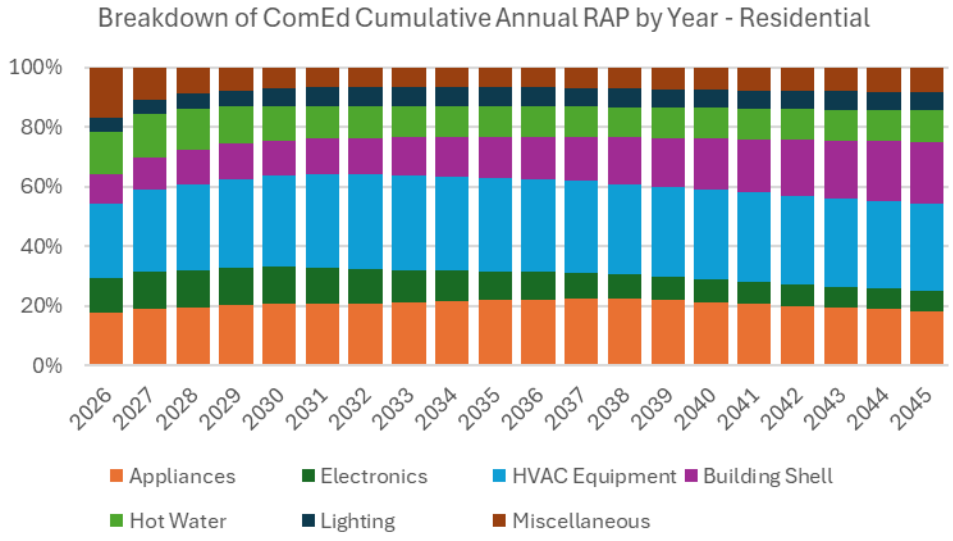
	2026	2027	2028	2029
Added kWh	-20,975,181	-31,462,772	-34,958,635	-37,455,680
Reduced therms	4,087,630	6,131,445	6,812,716	7,299,339
Net Electric Saved (MWh)	98,791	148,187	164,652	176,413

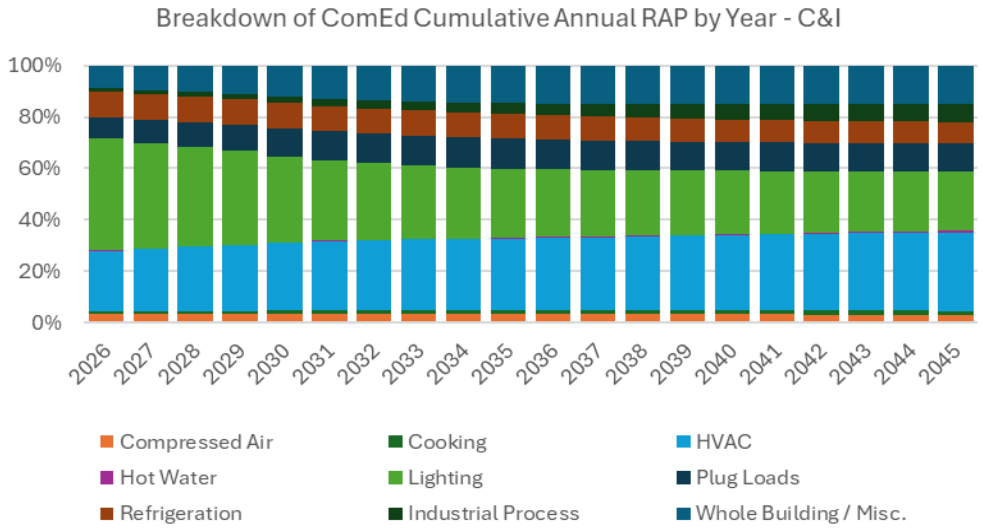
Table 6-3 detail (Ameren Electric – C&I)

	2026	2027	2028	2029
Added kWh	-16,869,773	-25,304,660	-28,116,289	-30,124,595
Reduced therms	3,406,773	5,110,160	5,677,956	6,083,524
Net Electric Saved (MWh)	82,948	124,422	138,246	148,121

REQUEST #3: For all end-use pie charts (i.e. Figure 5-5), please provide a figure that shows the breakdown of savings by end-use over time.

RESPONSE#3: The end-use pie charts provided in the main report are based on the 20-year cumulative (2045) annual RAP. The figures provide the cumulative annual potential by year. The figures are by utility and sector.




Breakdown of ComEd Cumulative Annual RAP by Year - C&I
100%
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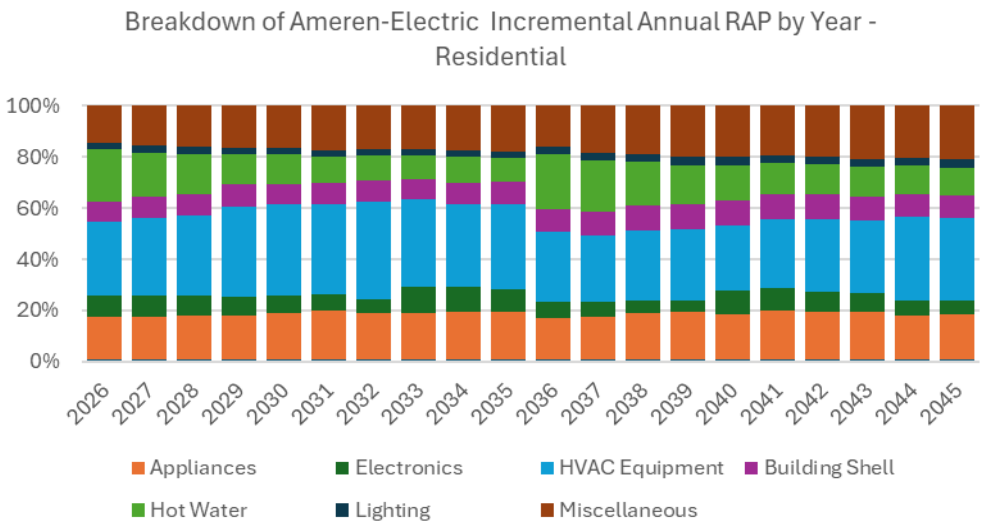
2045
Compressed Air
Cooking
HVAC
Hot Water
Lighting
Plug Loads
Refrigeration
Industrial Process
Whole Building / Misc.


Breakdown of Ameren-Electric Incremental Annual RAP by Year - Residential
100%
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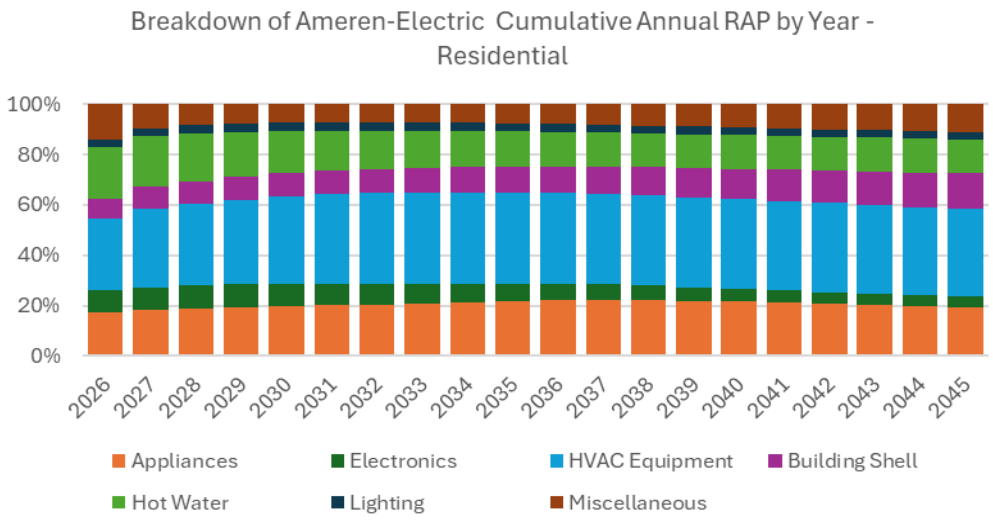
Appliances
Electronics
HVAC Equipment
Building Shell
Hot Water
Lighting
Miscellaneous


Breakdown of Ameren-Electric Cumulative Annual RAP by Year - Residential
100%
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Appliances
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HVAC Equipment
Building Shell
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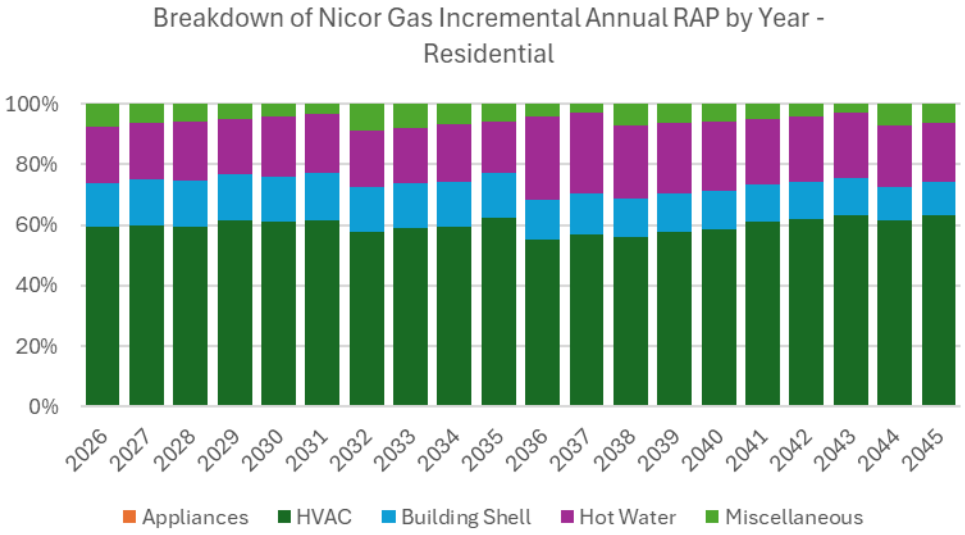
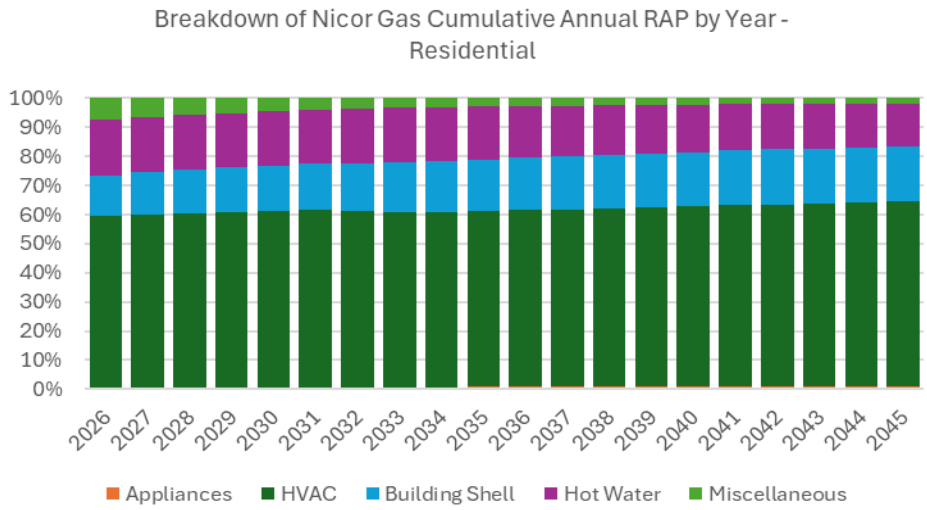
Lighting
Miscellaneous


Breakdown of Nicor Gas Incremental Annual RAP by Year - Residential
100%
80%
60%
40%
20%
0%
2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045
Appliances
HVAC
Building Shell
Hot Water
Miscellaneous


Breakdown of Nicor Gas Cumulative Annual RAP by Year - Residential
100%
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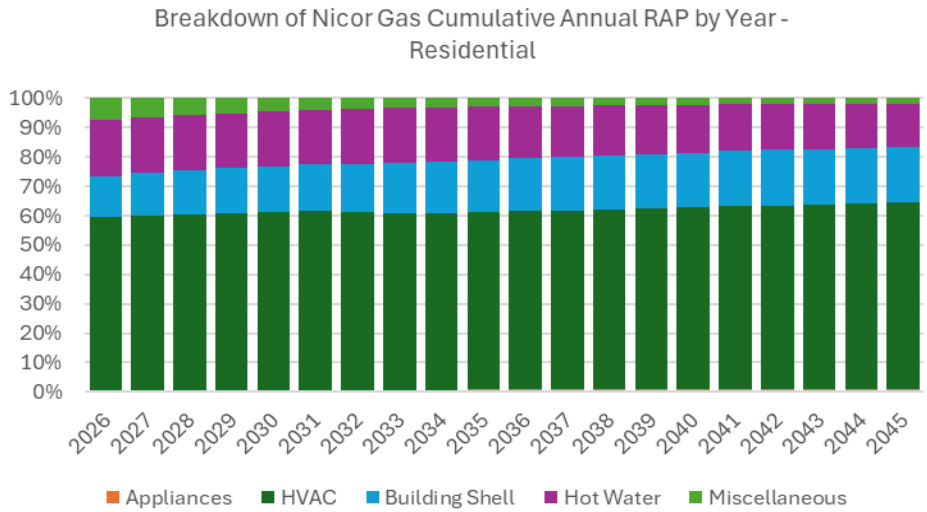
Appliances
HVAC
Building Shell
Hot Water
Miscellaneous


Breakdown of Nicor Gas Cumulative Annual RAP by Year - Residential
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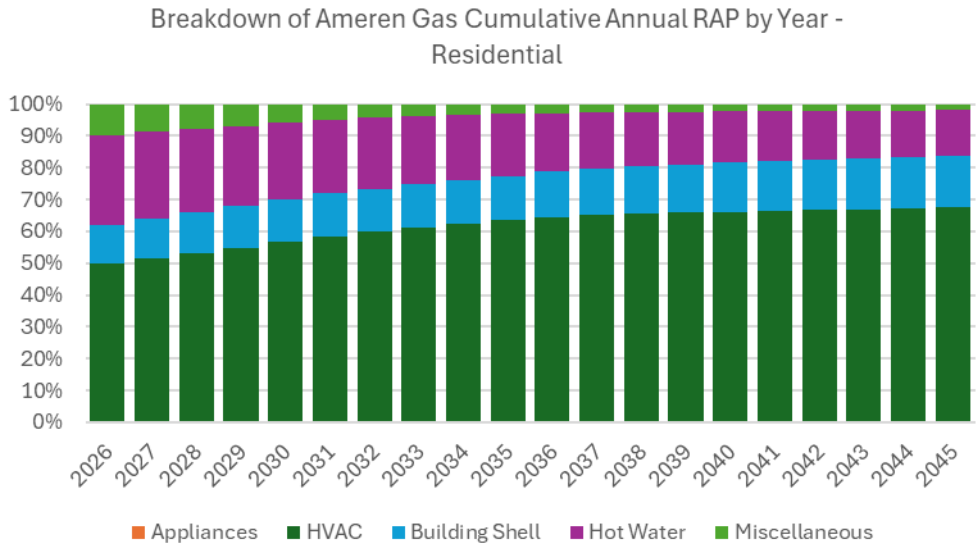
Appliances
HVAC
Building Shell
Hot Water
Miscellaneous



REQUEST #4: Please comment on the future savings opportunities from emerging technologies (i.e., Figure 5-7 and 5-12 in the ComEd chapter) and provide additional clarity on the types of measures that make up these future opportunities.

RESPONSE#4: The table below provides the end-use of the emerging technologies identified in the 20-year cumulative annual RAP.

	ComEd	Ameren-E	Nicor Gas	Ameren-G
Residential				
Appliances	3%	4%	0%	0%
HVAC Equipment	19%	19%	75%	65%
Building Shell	59%	36%	20%	31%
Hot Water	0%	1%	5%	3%
Lighting	3%	2%	0%	0%
Miscellaneous	16%	38%	1%	1%
Total ET (as a % of sector RAP)	*21%*	*20%*	*24%*	*20%*
C&I				
Compressed Air	3%	3%	0%	0%
HVAC Equipment	64%	64%	100%	100%
Hot Water	0%	1%	0%	0%
Lighting	23%	22%	0%	0%
Process	9%	9%	0%	0%
Miscellaneous	1%	1%	0%	0%
Total ET (as a % of sector RAP)	*8%*	*7%*	*10%*	*8%*

Residential electric emerging technologies savings in the building shell are represented by advanced insulation and windows, and by advanced heat pumps, air conditioning, and duct sealing in the HVAC equipment end-use. Additional residential electric emerging technology savings are represented by advanced home energy management systems (miscellaneous), advanced lighting controls (lighting), advanced heat

pump water heaters (hot water), and ultrasonic clothes dryers (appliances). For residential gas, emerging technologies savings were derived from advanced duct sealing and natural gas heat pumps (HVAC), advanced insulation and advanced windows (shell), advanced home energy management systems (miscellaneous), and advanced future natural gas water heating (hot water).

In the C&I sector, electric emerging technology savings were led by HVAC equipment (adsorbent air filtration, advanced duct sealing. Advanced EMS, and future ventilation and circulation improvements), lighting (future lighting improvements), future process improvements, future compressed air, and miscellaneous (advanced laundry). C&I gas emerging technologies include condensing gas rooftops and natural gas heat pumps.

Near and mid-term emerging technology savings made up 95% or more of the residential electric and gas emerging technology savings, with future "innovative" technologies representing 5% or less of the 20-yr cumulative annual potential. In the C&I sector, near and mid-term emerging technology savings represented roughly 55% of the 20-year cumulative annual potential for electric, and 100% for natural gas.

REQUEST #5: Please comment on the overall RAP public sector savings relative to sales.

RESPONSE#5: The table below provides the estimated public sector savings as a percent of total C&I RAP potential, as well as public sector sales (as a percent of total eligible C&I sector sales).

	ComEd	Ameren-E	Nicor Gas	Ameren-G
Public Sector- % of C&I RAP	12%	7%	7%	11%
Public Sector- Estimated % of C&I Sales	11%	11%	8%	9%

REQUEST #6: Regarding Table 5-6, a stakeholder noted that electrification savings potential is higher in the STIP scenario was higher than the SMAP scenario and requested clarification on why that occurs.

RESPONSE#6: As noted in Section 2.5.4.2.1, In discussion with the Joint Utilities and other Parties, electrification spending was capped at 20% of the income-eligible spending target, to allocate at least 80% of income-eligible funding towards traditional energy efficiency programs and measures. In turn, the income-eligible electrification spending cap (and associated savings) would dictate the required level of savings from market rate & nonresidential electrification (i.e., combined, no more than the 75% of electrification savings).

With higher income-eligible spending in the STIP scenario, there was a higher level of income-eligible electrification spending resulting in higher income-eligible electrification savings. As the income-eligible electrification savings increased, it also increased the allowable savings from the residential market rate and nonresidential sectors.

REQUEST #7: Regarding Table 5-7, a stakeholder noted that similar levels of overall savings between the SMAP scenario and STIP scenario, and requested additional context given the lower budgets available for non-income eligible opportunities.

RESPONSE#7: While the SMAP and STIP scenarios have identical total budgets, the STIP scenario has increased spending on the income-eligible sector. Another key difference, noted in Section 2.5.4.2.3 is that the STIP scenario reserved 80% of the sector spend targets for measures that are currently offered in existing utility portfolios. Only 20% of the spending target was permitted for measures that were designated as "not currently offered." This helped to ensure that the STIP savings levels were derived primarily from measures that are currently offered by utilities versus potentially more costly "no program" measures.

Thus, while there was more spending on the income-eligible sector in STIP scenario, and the income-eligible sector may have higher acquisition costs for saved energy, it was counter-balanced by focusing residential market rate and nonresidential spending on current program measures that have typically less expensive acquisition costs (relative to not currently offered measured), whereas the SMAP scenario did not prioritize current program vs. not currently offered measures.

REQUEST #8: Please provide a breakout of the acquisition cost table across key sector/measure groups.

RESPONSE#8: The acquisition cost table is the last table in each utility level results chapter. It provided a comparison of the acquisition costs from 2026-2029 for each of the scenarios. For ComEd, the table includes acquisition costs with and without the impacts of any converted gas savings. As noted in the report, GDS did not include converted gas savings for Ameren due to their status as an electric and gas utility. GDS has provided additional details of acquisition costs by sector (residential, income-eligible, and commercial) by utility, below.

Table 5-11 (Converted Gas Included) detail (ComEd - $/MWh)::

	2026	2027	2028	2029
Residential Market Rate				
SMAP	$239	$245	$251	$263
STIP	$188	$189	$192	$203
STIP+	$274	$280	$290	$287
STIP Wx	$370	$373	$379	$384
Income-Eligible				
SMAP	$521	$517	$515	$513
STIP	$650	$658	$665	$672
STIP+	$540	$562	$580	$586
STIP Wx	$638	$645	$651	$667
C&I				
SMAP	$263	$279	$293	$303
STIP	$261	$275	$287	$296
STIP+	$229	$243	$254	$260
STIP Wx	$262	$276	$288	$297
Total				
SMAP	$270	$282	$294	$304
STIP	$283	$293	$303	$314
STIP+	$275	$289	$302	$306
STIP Wx	$324	$337	$350	$359

Table 5-11 (Converted Gas Excluded) detail (ComEd - $/MWh):

	2026	2027	2028	2029
Residential Market Rate				
SMAP	$360	$368	$379	$391
STIP	$278	$284	$291	$304
STIP+	$300	$303	$311	$306
STIP Wx	$408	$408	$412	$415
Income-Eligible				
SMAP	$602	$589	$579	$564
STIP	$832	$818	$805	$788

	2026	2027	2028	2029
STIP+	$581	$603	$621	$620
STIP Wx	$818	$803	$791	$784
C&I				
SMAP	$263	$279	$293	$303
STIP	$261	$275	$287	$296
STIP+	$229	$243	$254	$260
STIP Wx	$262	$276	$288	$297
Total				
SMAP	$298	$312	$325	$335
STIP	$317	$329	$341	$351
STIP+	$282	$296	$308	$312
STIP Wx	$338	$351	$363	$371

Table 6-11 detail (Ameren Electric - $/MWh)

	2026	2027	2028	2029
Residential Market Rate				
SMAP	$529	$567	$599	$628
STIP	$587	$628	$663	$692
STIP+	$289	$304	$316	$341
STIP Wx	$659	$713	$752	$783
Income-Eligible				
SMAP	$2,247	$2,273	$2,307	$2,327
STIP	$2,375	$2,394	$2,420	$2,455
STIP+	$1,704	$1,657	$1,681	$1,760
STIP Wx	$2,258	$2,259	$2,265	$2,289
C&I				
SMAP	$308	$324	$341	$357
STIP	$305	$319	$334	$347
STIP+	$262	$276	$287	$299
STIP Wx	$305	$319	$334	$347
Total				
SMAP	$392	$413	$435	$455
STIP	$511	$535	$560	$581
STIP+	$386	$402	$418	$439
STIP Wx	$519	$543	$568	$589

Table 7-8 detail (Nicor Gas $/Therm):

	2026	2027	2028	2029
Residential Market Rate				
SMAP	$2.61	$2.71	$2.80	$2.84
STIP	$2.76	$2.85	$2.93	$2.97
STIP+	$1.35	$1.50	$1.55	$1.59
STIP Wx	$6.01	$6.13	$6.21	$6.22
Income-Eligible				
SMAP	$13.93	$13.21	$12.40	$11.68
STIP	$20.45	$20.59	$20.24	$19.73
STIP+	$13.80	$13.85	$13.87	$13.83

	2026	2027	2028	2029
STIP Wx	$20.45	$20.59	$20.24	$19.73
C&I				
SMAP	$1.70	$1.72	$1.73	$1.71
STIP	$1.83	$1.85	$1.88	$1.85
STIP+	$1.74	$1.69	$1.71	$1.72
STIP Wx	$1.83	$1.85	$1.88	$1.85
Total				
SMAP	$2.31	$2.36	$2.40	$2.40
STIP	$3.32	$3.39	$3.44	$3.43
STIP+	$2.23	$2.34	$2.39	$2.43
STIP Wx	$4.27	$4.33	$4.37	$4.33

Table 8-8 detail (Ameren Gas $/Therm):

	2026	2027	2028	2029
Residential Market Rate				
SMAP	$1.55	$1.58	$1.60	$1.62
STIP	$1.75	$1.78	$1.81	$1.82
STIP+	$1.23	$1.25	$1.27	$1.28
STIP Wx	$6.89	$6.68	$6.66	$6.40
Income-Eligible				
SMAP	$8.89	$8.96	$9.14	$9.36
STIP	$8.67	$8.75	$8.93	$9.16
STIP+	$3.69	$3.76	$3.86	$3.92
STIP Wx	$8.70	$8.78	$8.96	$9.18
C&I				
SMAP	$2.26	$2.27	$2.29	$2.32
STIP	$2.27	$2.28	$2.30	$2.34
STIP+	$2.10	$1.98	$1.91	$1.88
STIP Wx	$2.27	$2.28	$2.30	$2.34
Total				
SMAP	$2.44	$2.46	$2.50	$2.53
STIP	$3.13	$3.16	$3.20	$3.25
STIP+	$2.32	$2.27	$2.25	$2.24
STIP Wx	$3.75	$3.76	$3.81	$3.86

REQUEST #9: Please provide the overall benefit, costs, and benefit-cost ratios associated with the scenario savings. If possible, please provide the GHG impacts and an estimate of customer bill savings.

RESPONSE#9: The portfolio level annual NPV benefits, costs, and TRC ratios for 2026-2029, by utility and scenario, are provided in the tables below. GDS did not directly separate GHG benefit and cost impacts, nor did it conduct an estimate of customer bill savings.

ComEd

	2026	2027	2028	2029
NPV TRC Benefits (in millions)				
SMAP	$3,545	$3,376	$3,434	$3,384
STIP	$3,451	$3,189	$3,238	$3,171
STIP+	$4,662	$4,810	$4,968	$5,306
STIP Wx	$4,082	$4,028	$4,129	$4,066
NPV TRC Costs (in millions)				
SMAP	$658	$649	$643	$639
STIP	$653	$638	$627	$624
STIP+	$785	$790	$779	$807
STIP Wx	$764	$749	$738	$728
TRC Ratio				
SMAP	5.4	5.2	5.3	5.3
STIP	5.3	5.0	5.2	5.1
STIP+	5.9	6.1	6.4	6.6
STIP Wx	5.3	5.4	5.6	5.6

Ameren-Electric

	2026	2027	2028	2029
NPV TRC Benefits (in millions)				
SMAP	$868	$828	$816	$764
STIP	$819	$778	$770	$718
STIP+	$943	$882	$867	$807
STIP Wx	$888	$857	$852	$804
NPV TRC Costs (in millions)				
SMAP	$186	$183	$180	$175
STIP	$166	$164	$162	$158
STIP+	$184	$181	$178	$173
STIP Wx	$180	$177	$175	$171
TRC Ratio				
SMAP	4.7	4.5	4.5	4.4
STIP	4.9	4.7	4.8	4.5
STIP+	5.1	4.9	4.9	4.7
STIP Wx	4.9	4.8	4.9	4.7

Nicor Gas

	2026	2027	2028	2029
NPV TRC Benefits (in millions)				
SMAP	$682	$698	$717	$698
STIP	$479	$488	$499	$485
STIP+	$790	$756	$775	$793
STIP Wx	$391	$396	$405	$389
NPV TRC Costs (in millions)				
SMAP	$103	$101	$98	$93
STIP	$83	$81	$80	$77
STIP+	$124	$105	$101	$97
STIP Wx	$69	$69	$69	$67

	2026	2027	2028	2029
TRC Ratio				
SMAP	6.6	6.9	7.3	7.5
STIP	5.8	6.0	6.2	6.3
STIP+	6.4	7.2	7.7	8.2
STIP Wx	5.6	5.7	5.9	5.8

Ameren-Gas

	2026	2027	2028	2029
NPV TRC Benefits (in millions)				
SMAP	$230	$238	$246	$236
STIP	$187	$194	$201	$194
STIP+	$284	$305	$320	$330
STIP Wx	$156	$163	$169	$162
NPV TRC Costs (in millions)				
SMAP	$28	$29	$29	$28
STIP	$29	$30	$30	$30
STIP+	$40	$42	$42	$42
STIP Wx	$27	$28	$29	$28
TRC Ratio				
SMAP	8.1	8.2	8.5	8.4
STIP	6.4	6.4	6.6	6.5
STIP+	7.1	7.3	7.5	7.8
STIP Wx	5.7	5.7	5.9	5.7

REQUEST FOR ADDITIONAL INFORMATION AND RESPONSES: BASELINE STUDY REQUESTS

REQUEST #10: Please provide additional information from the residential onsite results regarding the age and efficiency of furnaces.

RESPONSE#10: GDS received a request for an analysis of residential onsite results for the age and efficiency of furnaces. The onsite dataset provides results for a subset of furnaces with manufacturing year. In discussion with the requesting stakeholder, GDS developed the following analysis to summarize the combination of furnace manufacturing year and whether a furnace AFUE indicated condensing (implying higher efficiency) or non-condensing (implying lower efficiency). The manufacturing year is a proxy for the installation year. Due to the relatively small count of furnaces with confirmed manufacturing dates, GDS suggests some caution at interpreting the individual year results. Additionally, due to the count of cases, GDS has not disaggregated single family and multifamily furnaces.

Comparing Furnace Manufacturing Date and Efficiency Shares

Manuf. Year	Furnace AFUE <90 AFUE	Furnace AFUE 90+ AFUE	Share 90+ AFUE
<2010	14	7	33%
2010-2015	7	11	61%
2016+	24	28	54%
2018+	20	20	50%
Total	**45**	**46**	**51%**

Overall, approximately half the furnaces in the onsite sample with confirmed manufacturing dates are condensing furnaces (AFUE 90 percent or higher). Data regarding the possible participation of these respondents in efficiency programs is not available. One can presume that program participants will reflect a furnace AFUE 90 percent or greater, though program eligibility may have changed over time. For furnaces manufactured in 2016 or later, the share of condensing furnaces is somewhat higher than the overall sample average (54 percent). However, the limited count of respondents for the whole sample or for more granular timeframes suggests caution at making statistical comparisons.