Ameren Illinois
Demand Side Management Market Potential Study:
Volume 4 – APPENDICES

Final Report

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Market Profiles

Market profiles characterize the electricity and natural gas use by sector, segment, end use and technology in the base year of the study (2014). The market profiles are given for average, existing buildings.

Volume 3 includes market profiles for sectors as a whole, but this appendix provides the segment-level detail within each sector. This appendix presents the following market profiles:

- Residential market profiles by housing type
- Commercial market profiles by building type
- Industrial market profiles by industry type
- Street Lighting market profiles

Residential Market Profiles

Table A-1 Residential Single Family, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	91.8%	2,454	2,252	1,043.4
Cooling	Room AC	6.9%	1,081	74	34.4
Cooling	Air-Source Heat Pump	0.0%	2,331	0	0.0
Cooling	Geothermal Heat Pump	0.0%	1,970	0	0.0
Heating	Electric Furnace	0.0%	8,588	0	0.0
Heating	Electric Room Heat	0.0%	3,757	0	0.0
Heating	Air-Source Heat Pump	0.0%	5,153	0	0.0
Heating	Geothermal Heat Pump	0.0%	3,320	0	0.0
Water Heating	Water Heater (<= 55 Gal)	9.4%	3,537	333	154.3
Water Heating	Water Heater (> 55 Gal)	4.3%	3,740	160	74.1
Interior Lighting	General Service Screw-In	100.0%	847	847	392.7
Interior Lighting	Linear Lighting	100.0%	159	159	73.8
Interior Lighting	Exempted Screw-In	100.0%	297	297	137.8
Exterior Lighting	Screw-in	100.0%	369	369	170.9
Appliances	Refrigerator	100.0%	845	845	391.4
Appliances	Second Refrigerator	37.7%	984	371	172.1
Appliances	Freezer	55.3%	671	371	172.1
Appliances	Clothes Washer	99.5%	100	100	46.2
Appliances	Clothes Dryer	68.8%	903	622	288.1
Appliances	Dishwasher	80.3%	449	361	167.1
Appliances	Stove	52.4%	543	284	131.7
Appliances	Microwave	100.0%	147	147	68.0
Appliances	Dehumidifier	22.0%	1,130	249	115.3
Appliances	Air Purifier	13.8%	1,233	170	78.9
Electronics	Personal Computers	77.0%	209	161	74.7
Electronics	Monitor	92.6%	88	82	37.9
Electronics	Laptops	132.0%	55	73	33.9
Electronics	Printer/Fax/Copier	117.8%	68	80	37.0
Electronics	TVs	300.0%	188	564	261.3
Electronics	Set top Boxes/DVRs	197.0%	128	252	116.7
Electronics	Devices and Gadgets	100.0%	58	58	26.6
Miscellaneous	Electric Vehicles	1.5%	4,211	61	28.3
Miscellaneous	Pool Pump	7.6%	2,413	184	85.2
Miscellaneous	Pool Heater	3.8%	2,425	92	42.8
Miscellaneous	Furnace Fan	79.1%	851	673	311.8
Miscellaneous	Bathroom Exhaust Fan	39.0%	162	63	29.4
Miscellaneous	Well Pump	9.3%	645	60	27.8
Miscellaneous	Miscellaneous	100.0%	876	876	406.2
Total				**11,290**	**5,231.7**

Table A-2 Residential Single Family, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	79.1%	727	575	237.1
Heating	Boiler	2.4%	714	17	7.0
Water Heating	Water Heater (<= 55 Gal)	63.0%	187	118	48.6
Water Heating	Water Heater (> 55 Gal)	14.9%	198	29	12.1
Appliances	Clothes Dryer	28.2%	27	8	3.1
Appliances	Stove	43.5%	55	24	9.8
Miscellaneous	Pool Heater	3.8%	220	8	3.5
Miscellaneous	Miscellaneous	100.0%	15	15	6.4
Total				**794**	**327.6**

Table A-3 Residential Single Family - Electric Heat, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	77.2%	1,981	1,530	142.6
Cooling	Room AC	3.2%	872	28	2.6
Cooling	Air-Source Heat Pump	6.3%	1,882	118	11.0
Cooling	Geothermal Heat Pump	12.5%	1,590	198	18.5
Heating	Electric Furnace	72.6%	8,588	6,238	581.3
Heating	Electric Room Heat	8.6%	3,757	324	30.2
Heating	Air-Source Heat Pump	6.3%	5,153	324	30.2
Heating	Geothermal Heat Pump	12.5%	3,320	414	38.6
Water Heating	Water Heater (<= 55 Gal)	37.1%	2,868	1,063	99.0
Water Heating	Water Heater (> 55 Gal)	18.5%	3,553	658	61.3
Interior Lighting	General Service Screw-In	100.0%	813	813	75.8
Interior Lighting	Linear Lighting	100.0%	180	180	16.8
Interior Lighting	Exempted Screw-In	100.0%	286	286	26.7
Exterior Lighting	Screw-in	100.0%	371	371	34.5
Appliances	Refrigerator	100.0%	698	698	65.0
Appliances	Second Refrigerator	32.2%	813	262	24.4
Appliances	Freezer	42.0%	554	233	21.7
Appliances	Clothes Washer	100.0%	83	83	7.7
Appliances	Clothes Dryer	81.3%	746	606	56.5
Appliances	Dishwasher	73.9%	371	274	25.5
Appliances	Stove	73.6%	448	330	30.7
Appliances	Microwave	100.0%	121	121	11.3
Appliances	Dehumidifier	21.8%	934	203	18.9
Appliances	Air Purifier	12.0%	1,018	122	11.4
Electronics	Personal Computers	73.0%	173	126	11.8
Electronics	Monitor	87.8%	73	64	6.0
Electronics	Laptops	151.0%	46	69	6.4
Electronics	Printer/Fax/Copier	111.7%	56	63	5.8
Electronics	TVs	333.0%	155	517	48.2
Electronics	Set top Boxes/DVRs	289.0%	106	305	28.4
Electronics	Devices and Gadgets	100.0%	48	48	4.4
Miscellaneous	Electric Vehicles	0.7%	3,478	25	2.3
Miscellaneous	Pool Pump	8.0%	1,994	159	14.8
Miscellaneous	Pool Heater	2.0%	2,003	40	3.7
Miscellaneous	Furnace Fan	72.6%	703	510	47.6
Miscellaneous	Bathroom Exhaust Fan	32.7%	134	44	4.1
Miscellaneous	Well Pump	9.3%	533	50	4.6
Miscellaneous	Miscellaneous	100.0%	412	412	38.4
Total				**17,907**	**1,668.7**

Table A-4 Residential Single Family - Electric Heat, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	0.0%	727	0	0.0
Heating	Boiler	0.0%	714	0	0.0
Water Heating	Water Heater (<= 55 Gal)	30.7%	206	63	5.2
Water Heating	Water Heater (> 55 Gal)	3.6%	218	8	0.7
Appliances	Clothes Dryer	15.5%	28	4	0.4
Appliances	Stove	24.3%	58	14	1.2
Miscellaneous	Pool Heater	2.0%	231	5	0.4
Miscellaneous	Miscellaneous	100.0%	59	59	4.9
Total				**153**	**12.7**

Table A-5 Residential Single Family - Low Income, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	77.6%	2,454	1,905	491.9
Cooling	Room AC	18.8%	1,081	203	52.5
Cooling	Air-Source Heat Pump	0.0%	2,331	0	0.0
Cooling	Geothermal Heat Pump	0.0%	1,970	0	0.0
Heating	Electric Furnace	0.0%	7,335	0	0.0
Heating	Electric Room Heat	0.0%	3,209	0	0.0
Heating	Air-Source Heat Pump	0.0%	4,401	0	0.0
Heating	Geothermal Heat Pump	0.0%	2,836	0	0.0
Water Heating	Water Heater (<= 55 Gal)	15.7%	3,537	556	143.5
Water Heating	Water Heater (> 55 Gal)	6.3%	3,740	235	60.7
Interior Lighting	General Service Screw-In	100.0%	440	440	113.6
Interior Lighting	Linear Lighting	100.0%	84	84	21.6
Interior Lighting	Exempted Screw-In	100.0%	155	155	40.0
Exterior Lighting	Screw-in	100.0%	214	214	55.1
Appliances	Refrigerator	100.0%	808	808	208.6
Appliances	Second Refrigerator	24.0%	941	226	58.4
Appliances	Freezer	45.8%	642	294	75.9
Appliances	Clothes Washer	95.8%	96	92	23.7
Appliances	Clothes Dryer	69.9%	864	603	155.8
Appliances	Dishwasher	52.1%	430	224	57.8
Appliances	Stove	39.6%	519	205	53.0
Appliances	Microwave	97.0%	140	136	35.1
Appliances	Dehumidifier	17.0%	1,081	183	47.3
Appliances	Air Purifier	9.0%	1,179	106	27.3
Electronics	Personal Computers	71.0%	200	142	36.7
Electronics	Monitor	85.4%	84	72	18.6
Electronics	Laptops	92.0%	53	49	12.6
Electronics	Printer/Fax/Copier	108.6%	65	70	18.2
Electronics	TVs	268.0%	180	482	124.4
Electronics	Set top Boxes/DVRs	224.0%	122	274	70.7
Electronics	Devices and Gadgets	100.0%	55	55	14.2
Miscellaneous	Electric Vehicles	1.4%	4,027	54	14.0
Miscellaneous	Pool Pump	6.9%	2,308	160	41.2
Miscellaneous	Pool Heater	4.9%	2,320	115	29.6
Miscellaneous	Furnace Fan	70.7%	814	576	148.6
Miscellaneous	Bathroom Exhaust Fan	39.0%	155	61	15.6
Miscellaneous	Well Pump	9.3%	617	57	14.8
Miscellaneous	Miscellaneous	100.0%	750	750	193.7
Total				**9,586**	**2,475.0**

Table A-6 Residential Single Family - Low Income, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	70.7%	727	514	118.1
Heating	Boiler	3.1%	714	22	5.1
Water Heating	Water Heater (<= 55 Gal)	57.4%	187	107	24.7
Water Heating	Water Heater (> 55 Gal)	16.9%	198	34	7.7
Appliances	Clothes Dryer	27.5%	27	7	1.7
Appliances	Stove	58.7%	55	32	7.4
Miscellaneous	Pool Heater	0.0%	220	0	0.0
Miscellaneous	Miscellaneous	100.0%	18	18	4.2
Total				**735**	**168.9**

Table A-7 Residential Single Family - Electric Heat - Low Income, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	79.4%	1,610	1,278	58.9
Cooling	Room AC	9.9%	709	70	3.2
Cooling	Air-Source Heat Pump	5.7%	1,529	87	4.0
Cooling	Geothermal Heat Pump	3.7%	1,292	48	2.2
Heating	Electric Furnace	72.2%	7,475	5,398	248.9
Heating	Electric Room Heat	18.4%	3,270	601	27.7
Heating	Air-Source Heat Pump	5.7%	4,485	256	11.8
Heating	Geothermal Heat Pump	3.7%	2,890	107	4.9
Water Heating	Water Heater (<= 55 Gal)	45.8%	2,868	1,313	60.5
Water Heating	Water Heater (> 55 Gal)	16.6%	3,553	591	27.3
Interior Lighting	General Service Screw-In	100.0%	531	531	24.5
Interior Lighting	Linear Lighting	100.0%	85	85	3.9
Interior Lighting	Exempted Screw-In	100.0%	187	187	8.6
Exterior Lighting	Screw-in	100.0%	148	148	6.8
Appliances	Refrigerator	100.0%	698	698	32.2
Appliances	Second Refrigerator	12.3%	813	100	4.6
Appliances	Freezer	33.3%	554	185	8.5
Appliances	Clothes Washer	97.9%	83	81	3.7
Appliances	Clothes Dryer	95.5%	746	713	32.9
Appliances	Dishwasher	41.4%	371	154	7.1
Appliances	Stove	58.1%	448	260	12.0
Appliances	Microwave	97.0%	121	118	5.4
Appliances	Dehumidifier	12.3%	934	114	5.3
Appliances	Air Purifier	13.5%	1,018	137	6.3
Electronics	Personal Computers	45.0%	173	78	3.6
Electronics	Monitor	54.1%	73	39	1.8
Electronics	Laptops	106.0%	46	49	2.2
Electronics	Printer/Fax/Copier	68.8%	56	39	1.8
Electronics	TVs	324.0%	155	503	23.2
Electronics	Set top Boxes/DVRs	293.0%	106	309	14.3
Electronics	Devices and Gadgets	100.0%	48	48	2.2
Miscellaneous	Electric Vehicles	5.5%	3,478	191	8.8
Miscellaneous	Pool Pump	1.7%	1,994	34	1.6
Miscellaneous	Pool Heater	1.7%	2,003	35	1.6
Miscellaneous	Furnace Fan	72.2%	703	507	23.4
Miscellaneous	Bathroom Exhaust Fan	32.7%	134	44	2.0
Miscellaneous	Well Pump	9.3%	533	50	2.3
Miscellaneous	Miscellaneous	100.0%	611	611	28.2
Total				**15,796**	**728.4**

Table A-8 Residential Single Family - Electric Heat - Low Income, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	0.0%	727	0	0.0
Heating	Boiler	0.0%	714	0	0.0
Water Heating	Water Heater (<= 55 Gal)	16.3%	197	32	1.3
Water Heating	Water Heater (> 55 Gal)	10.9%	208	23	0.9
Appliances	Clothes Dryer	4.5%	28	1	0.1
Appliances	Stove	36.4%	58	21	0.9
Miscellaneous	Pool Heater	0.0%	231	0	0.0
Miscellaneous	Miscellaneous	100.0%	63	63	2.6
Total				**140**	**5.7**

Table A-9 Residential Multifamily, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	58.6%	1,227	719	30.0
Cooling	Room AC	37.1%	496	184	7.7
Cooling	Air-Source Heat Pump	0.0%	1,166	0	0.0
Cooling	Geothermal Heat Pump	0.0%	985	0	0.0
Heating	Electric Furnace	0.0%	3,250	0	0.0
Heating	Electric Room Heat	0.0%	1,625	0	0.0
Heating	Air-Source Heat Pump	0.0%	2,031	0	0.0
Heating	Geothermal Heat Pump	0.0%	1,122	0	0.0
Water Heating	Water Heater (<= 55 Gal)	38.1%	2,476	944	39.4
Water Heating	Water Heater (> 55 Gal)	0.0%	2,618	0	0.0
Interior Lighting	General Service Screw-In	100.0%	611	611	25.5
Interior Lighting	Linear Lighting	100.0%	113	113	4.7
Interior Lighting	Exempted Screw-In	100.0%	36	36	1.5
Exterior Lighting	Screw-in	100.0%	262	262	10.9
Appliances	Refrigerator	100.0%	768	768	32.1
Appliances	Second Refrigerator	42.9%	895	383	16.0
Appliances	Freezer	42.9%	612	262	11.0
Appliances	Clothes Washer	82.1%	92	75	3.1
Appliances	Clothes Dryer	69.8%	733	512	21.4
Appliances	Dishwasher	100.0%	410	410	17.1
Appliances	Stove	69.3%	302	209	8.7
Appliances	Microwave	99.3%	134	133	5.6
Appliances	Dehumidifier	5.1%	1,032	53	2.2
Appliances	Air Purifier	8.7%	1,126	98	4.1
Electronics	Personal Computers	58.0%	191	111	4.6
Electronics	Monitor	69.8%	81	56	2.4
Electronics	Laptops	115.0%	51	58	2.4
Electronics	Printer/Fax/Copier	76.5%	62	47	2.0
Electronics	TVs	233.0%	172	400	16.7
Electronics	Set top Boxes/DVRs	213.0%	117	249	10.4
Electronics	Devices and Gadgets	100.0%	53	53	2.2
Miscellaneous	Electric Vehicles	0.0%	3,844	0	0.0
Miscellaneous	Pool Pump	0.0%	2,203	0	0.0
Miscellaneous	Pool Heater	0.0%	2,214	0	0.0
Miscellaneous	Furnace Fan	57.6%	582	335	14.0
Miscellaneous	Bathroom Exhaust Fan	12.9%	148	19	0.8
Miscellaneous	Well Pump	0.0%	584	0	0.0
Miscellaneous	Miscellaneous	100.0%	677	677	28.3
Total				**7,776**	**324.9**

Table A-10 Residential Multifamily, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	57.6%	699	403	15.0
Heating	Boiler	4.4%	703	31	1.2
Water Heating	Water Heater (<= 55 Gal)	33.2%	154	51	1.9
Water Heating	Water Heater (> 55 Gal)	22.1%	162	36	1.3
Appliances	Clothes Dryer	24.5%	21	5	0.2
Appliances	Stove	23.7%	55	13	0.5
Miscellaneous	Pool Heater	0.0%	77	0	0.0
Miscellaneous	Miscellaneous	100.0%	12	12	0.4
Total				**551**	**20.5**

Table A-11 Residential Multifamily - Electric Heat, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	64.6%	802	518	12.1
Cooling	Room AC	30.5%	324	99	2.3
Cooling	Air-Source Heat Pump	0.0%	762	0	0.0
Cooling	Geothermal Heat Pump	0.0%	644	0	0.0
Heating	Electric Furnace	56.8%	2,762	1,570	36.8
Heating	Electric Room Heat	43.2%	1,381	596	14.0
Heating	Air-Source Heat Pump	0.0%	1,726	0	0.0
Heating	Geothermal Heat Pump	0.0%	954	0	0.0
Water Heating	Water Heater (<= 55 Gal)	100.0%	2,352	2,352	55.1
Water Heating	Water Heater (> 55 Gal)	0.0%	2,487	0	0.0
Interior Lighting	General Service Screw-In	100.0%	705	705	16.5
Interior Lighting	Linear Lighting	100.0%	43	43	1.0
Interior Lighting	Exempted Screw-In	100.0%	41	41	1.0
Exterior Lighting	Screw-in	100.0%	262	262	6.1
Appliances	Refrigerator	100.0%	695	695	16.3
Appliances	Second Refrigerator	0.0%	810	0	0.0
Appliances	Freezer	0.0%	553	0	0.0
Appliances	Clothes Washer	77.4%	83	64	1.5
Appliances	Clothes Dryer	83.9%	664	557	13.0
Appliances	Dishwasher	66.7%	371	247	5.8
Appliances	Stove	94.6%	273	258	6.0
Appliances	Microwave	99.3%	121	120	2.8
Appliances	Dehumidifier	27.1%	934	253	5.9
Appliances	Air Purifier	15.0%	1,018	152	3.6
Electronics	Personal Computers	36.0%	173	62	1.5
Electronics	Monitor	43.3%	73	32	0.7
Electronics	Laptops	116.0%	46	53	1.2
Electronics	Printer/Fax/Copier	47.5%	56	27	0.6
Electronics	TVs	134.0%	155	208	4.9
Electronics	Set top Boxes/DVRs	199.0%	106	210	4.9
Electronics	Devices and Gadgets	100.0%	48	48	1.1
Miscellaneous	Electric Vehicles	0.0%	3,478	0	0.0
Miscellaneous	Pool Pump	0.0%	1,994	0	0.0
Miscellaneous	Pool Heater	0.0%	2,003	0	0.0
Miscellaneous	Furnace Fan	56.8%	526	299	7.0
Miscellaneous	Bathroom Exhaust Fan	12.3%	134	17	0.4
Miscellaneous	Well Pump	0.0%	528	0	0.0
Miscellaneous	Miscellaneous	100.0%	296	296	6.9
Total				**9,784**	**229.2**

Table A-12 Residential Multifamily - Electric Heat, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	0.0%	699	0	0.0
Heating	Boiler	0.0%	703	0	0.0
Water Heating	Water Heater (<= 55 Gal)	0.0%	169	0	0.0
Water Heating	Water Heater (> 55 Gal)	0.0%	179	0	0.0
Appliances	Clothes Dryer	13.7%	22	3	0.1
Appliances	Stove	5.4%	58	3	0.1
Miscellaneous	Pool Heater	0.0%	81	0	0.0
Miscellaneous	Miscellaneous	100.0%	83	83	1.7
Total				**89**	**1.9**

Table A-13 Residential Multifamily - Low Income, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	74.6%	1,888	1,408	98.0
Cooling	Room AC	19.1%	763	146	10.1
Cooling	Air-Source Heat Pump	0.0%	1,793	0	0.0
Cooling	Geothermal Heat Pump	0.0%	1,516	0	0.0
Heating	Electric Furnace	0.0%	3,250	0	0.0
Heating	Electric Room Heat	0.0%	1,625	0	0.0
Heating	Air-Source Heat Pump	0.0%	2,031	0	0.0
Heating	Geothermal Heat Pump	0.0%	1,122	0	0.0
Water Heating	Water Heater (<= 55 Gal)	27.0%	2,476	667	46.4
Water Heating	Water Heater (> 55 Gal)	0.0%	2,618	0	0.0
Interior Lighting	General Service Screw-In	100.0%	553	553	38.5
Interior Lighting	Linear Lighting	100.0%	24	24	1.7
Interior Lighting	Exempted Screw-In	100.0%	32	32	2.2
Exterior Lighting	Screw-in	100.0%	142	142	9.9
Appliances	Refrigerator	100.0%	768	768	53.4
Appliances	Second Refrigerator	4.0%	895	36	2.5
Appliances	Freezer	0.0%	612	0	0.0
Appliances	Clothes Washer	68.2%	92	62	4.3
Appliances	Clothes Dryer	71.5%	733	524	36.5
Appliances	Dishwasher	65.0%	410	266	18.5
Appliances	Stove	55.1%	302	166	11.6
Appliances	Microwave	96.3%	134	129	9.0
Appliances	Dehumidifier	3.1%	1,032	32	2.2
Appliances	Air Purifier	8.0%	1,126	91	6.3
Electronics	Personal Computers	48.0%	191	92	6.4
Electronics	Monitor	57.7%	81	47	3.2
Electronics	Laptops	81.0%	51	41	2.9
Electronics	Printer/Fax/Copier	63.3%	62	39	2.7
Electronics	TVs	221.0%	172	379	26.4
Electronics	Set top Boxes/DVRs	128.0%	117	149	10.4
Electronics	Devices and Gadgets	100.0%	53	53	3.7
Miscellaneous	Electric Vehicles	0.0%	3,844	0	0.0
Miscellaneous	Pool Pump	0.0%	2,203	0	0.0
Miscellaneous	Pool Heater	0.0%	2,214	0	0.0
Miscellaneous	Furnace Fan	59.3%	582	345	24.0
Miscellaneous	Bathroom Exhaust Fan	12.9%	148	19	1.3
Miscellaneous	Well Pump	0.0%	584	0	0.0
Miscellaneous	Miscellaneous	100.0%	392	392	27.3
Total				**6,603**	**459.4**

Table A-14 Residential Multifamily - Low Income, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	59.3%	686	407	25.2
Heating	Boiler	1.2%	690	8	0.5
Water Heating	Water Heater (<= 55 Gal)	48.7%	154	75	4.6
Water Heating	Water Heater (> 55 Gal)	24.3%	162	39	2.4
Appliances	Clothes Dryer	22.6%	21	5	0.3
Appliances	Stove	44.9%	55	25	1.5
Miscellaneous	Pool Heater	0.0%	77	0	0.0
Miscellaneous	Miscellaneous	100.0%	12	12	0.7
Total				**571**	**35.4**

Table A-15 Residential Multifamily - Electric Heat - Low Income, 2014 Electric Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/HH)	Usage (GWh)
Cooling	Central AC	45.3%	755	342	22.9
Cooling	Room AC	40.7%	305	124	8.3
Cooling	Air-Source Heat Pump	0.0%	717	0	0.0
Cooling	Geothermal Heat Pump	0.0%	606	0	0.0
Heating	Electric Furnace	39.3%	2,600	1,022	68.4
Heating	Electric Room Heat	60.7%	1,300	789	52.8
Heating	Air-Source Heat Pump	0.0%	1,625	0	0.0
Heating	Geothermal Heat Pump	0.0%	897	0	0.0
Water Heating	Water Heater (<= 55 Gal)	91.7%	2,352	2,157	144.4
Water Heating	Water Heater (> 55 Gal)	0.0%	2,487	0	0.0
Interior Lighting	General Service Screw-In	100.0%	556	556	37.2
Interior Lighting	Linear Lighting	100.0%	36	36	2.4
Interior Lighting	Exempted Screw-In	100.0%	32	32	2.2
Exterior Lighting	Screw-in	100.0%	124	124	8.3
Appliances	Refrigerator	100.0%	695	695	46.5
Appliances	Second Refrigerator	0.0%	810	0	0.0
Appliances	Freezer	10.3%	553	57	3.8
Appliances	Clothes Washer	58.9%	83	49	3.3
Appliances	Clothes Dryer	83.9%	664	557	37.3
Appliances	Dishwasher	20.0%	371	74	5.0
Appliances	Stove	94.6%	273	258	17.3
Appliances	Microwave	96.3%	121	117	7.8
Appliances	Dehumidifier	3.2%	934	30	2.0
Appliances	Air Purifier	8.3%	1,018	85	5.7
Electronics	Personal Computers	42.0%	173	73	4.9
Electronics	Monitor	50.5%	73	37	2.5
Electronics	Laptops	105.0%	46	48	3.2
Electronics	Printer/Fax/Copier	55.4%	56	31	2.1
Electronics	TVs	218.0%	155	339	22.7
Electronics	Set top Boxes/DVRs	194.0%	106	205	13.7
Electronics	Devices and Gadgets	100.0%	48	48	3.2
Miscellaneous	Electric Vehicles	4.5%	3,478	156	10.5
Miscellaneous	Pool Pump	0.0%	1,994	0	0.0
Miscellaneous	Pool Heater	0.0%	2,003	0	0.0
Miscellaneous	Furnace Fan	39.3%	526	207	13.9
Miscellaneous	Bathroom Exhaust Fan	12.3%	134	17	1.1
Miscellaneous	Well Pump	0.0%	528	0	0.0
Miscellaneous	Miscellaneous	100.0%	368	368	24.6
Total				**8,630**	**577.9**

Table A-16 Residential Multifamily - Electric Heat - Low Income, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/HH)	Usage (MMtherms)
Heating	Furnace	0.0%	686	0	0.0
Heating	Boiler	0.0%	690	0	0.0
Water Heating	Water Heater (<= 55 Gal)	8.3%	169	14	0.8
Water Heating	Water Heater (> 55 Gal)	0.0%	179	0	0.0
Appliances	Clothes Dryer	13.7%	22	3	0.2
Appliances	Stove	5.4%	58	3	0.2
Miscellaneous	Pool Heater	0.0%	81	0	0.0
Miscellaneous	Miscellaneous	100.0%	78	78	4.7
Total				**98**	**5.9**

Commercial Market Profiles

Table A-1 Commercial Office, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	33.7%	3.22	1.08	170.6
Cooling	Water-Cooled Chiller	18.7%	2.84	0.53	83.6
Cooling	RTU	15.0%	2.93	0.44	69.1
Cooling	Central AC	3.7%	3.16	0.12	18.3
Cooling	Room AC	1.7%	2.79	0.05	7.4
Cooling	Air-Source Heat Pump	1.0%	3.16	0.03	4.8
Cooling	Geothermal Heat Pump	0.2%	2.12	0.00	0.8
Cooling	PTHP	2.0%	2.79	0.06	8.8
Heating	Electric Furnace	16.1%	3.32	0.53	84.0
Heating	Electric Room Heat	0.9%	3.32	0.03	5.0
Heating	Air-Source Heat Pump	1.0%	2.57	0.02	3.9
Heating	Geothermal Heat Pump	0.2%	2.10	0.00	0.8
Heating	PTHP	2.0%	2.31	0.05	7.3
Ventilation	Ventilation	100.0%	1.21	1.21	189.8
Water Heating	Water Heater	31.0%	0.53	0.17	26.1
Interior Lighting	Screw-in	100.0%	0.39	0.39	61.0
Interior Lighting	High-Bay Fixtures	100.0%	0.73	0.73	115.6
Interior Lighting	Linear Lighting	100.0%	2.28	2.28	358.7
Exterior Lighting	Screw-in	100.0%	0.09	0.09	14.3
Exterior Lighting	Area Lighting	100.0%	1.22	1.22	191.8
Exterior Lighting	Linear Lighting	100.0%	0.17	0.17	27.0
Refrigeration	Walk-in Refrig/Freezer	1.4%	0.38	0.01	0.8
Refrigeration	Reach-in Refrig/Freezer	8.4%	0.09	0.01	1.2
Refrigeration	Glass Door Display	34.4%	0.16	0.06	8.7
Refrigeration	Open Display Case	2.3%	0.52	0.01	1.9
Refrigeration	Icemaker	2.3%	0.18	0.00	0.7
Refrigeration	Vending Machine	1.2%	0.07	0.00	0.1
Food Preparation	Oven	0.0%	0.22	0.00	0.0
Food Preparation	Fryer	0.0%	0.49	0.00	0.0
Food Preparation	Dishwasher	3.2%	0.67	0.02	3.4
Food Preparation	Hot Food Container	0.0%	0.23	0.00	0.0
Food Preparation	Steamer	4.1%	0.68	0.03	4.4
Food Preparation	Griddle	4.6%	0.48	0.02	3.5
Office Equipment	Desktop Computer	100.0%	1.02	1.02	160.6
Office Equipment	Laptop	100.0%	0.16	0.16	24.8
Office Equipment	Server	97.9%	0.30	0.29	46.2
Office Equipment	Monitor	100.0%	0.18	0.18	28.3
Office Equipment	Printer/Copier/Fax	100.0%	0.14	0.14	22.0
Office Equipment	POS Terminal	35.5%	0.08	0.03	4.5
Miscellaneous	Non-HVAC Motors	13.1%	0.22	0.03	4.6
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.85	0.85	134.3
Total				**12.06**	**1,898.3**

Table A-2 Commercial Office, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	45.8%	0.14	0.07	6.5
Heating	Boiler	21.7%	0.31	0.07	6.6
Heating	Unit Heater	1.7%	0.07	0.00	0.1
Water Heating	Water Heater	69.0%	0.07	0.05	4.7
Food Preparation	Oven	1.6%	0.06	0.00	0.1
Food Preparation	Fryer	1.6%	0.09	0.00	0.1
Food Preparation	Broiler	0.0%	0.10	0.00	0.0
Food Preparation	Griddle	1.6%	0.07	0.00	0.1
Food Preparation	Range	1.6%	0.07	0.00	0.1
Food Preparation	Steamer	0.0%	0.08	0.00	0.0
Food Preparation	Com Food Prep Other	0.0%	0.03	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.3
Total				**0.19**	**18.7**

Table A-3 Commercial Restaurant, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	20.0%	6.78	1.36	27.6
Cooling	Water-Cooled Chiller	0.0%	5.60	0.00	0.0
Cooling	RTU	43.3%	6.27	2.71	55.2
Cooling	Central AC	3.5%	6.79	0.23	4.8
Cooling	Room AC	3.4%	5.98	0.20	4.2
Cooling	Air-Source Heat Pump	3.5%	6.79	0.23	4.8
Cooling	Geothermal Heat Pump	7.7%	4.55	0.35	7.1
Cooling	PTHP	1.0%	5.98	0.06	1.2
Heating	Electric Furnace	6.0%	6.86	0.41	8.4
Heating	Electric Room Heat	3.6%	6.53	0.23	4.7
Heating	Air-Source Heat Pump	3.5%	4.54	0.16	3.2
Heating	Geothermal Heat Pump	7.7%	3.31	0.25	5.1
Heating	PTHP	1.0%	4.09	0.04	0.8
Ventilation	Ventilation	100.0%	2.08	2.08	42.2
Water Heating	Water Heater	27.2%	7.38	2.01	40.8
Interior Lighting	Screw-in	100.0%	2.02	2.02	41.0
Interior Lighting	High-Bay Fixtures	100.0%	2.46	2.46	49.9
Interior Lighting	Linear Lighting	100.0%	1.75	1.75	35.6
Exterior Lighting	Screw-in	100.0%	0.26	0.26	5.4
Exterior Lighting	Area Lighting	100.0%	2.04	2.04	41.5
Exterior Lighting	Linear Lighting	100.0%	0.38	0.38	7.8
Refrigeration	Walk-in Refrig/Freezer	24.4%	6.18	1.51	30.6
Refrigeration	Reach-in Refrig/Freezer	16.0%	2.87	0.46	9.3
Refrigeration	Glass Door Display	68.6%	2.60	1.78	36.2
Refrigeration	Open Display Case	26.0%	8.43	2.19	44.6
Refrigeration	Icemaker	75.9%	2.95	2.24	45.6
Refrigeration	Vending Machine	0.0%	1.09	0.00	0.0
Food Preparation	Oven	10.1%	4.16	0.42	8.5
Food Preparation	Fryer	12.7%	9.29	1.18	24.0
Food Preparation	Dishwasher	40.7%	6.39	2.60	52.9
Food Preparation	Hot Food Container	18.8%	2.19	0.41	8.3
Food Preparation	Steamer	7.1%	6.50	0.46	9.4
Food Preparation	Griddle	7.9%	4.55	0.36	7.3
Office Equipment	Desktop Computer	100.0%	0.25	0.25	5.0
Office Equipment	Laptop	100.0%	0.03	0.03	0.6
Office Equipment	Server	54.6%	0.29	0.16	3.2
Office Equipment	Monitor	100.0%	0.04	0.04	0.9
Office Equipment	Printer/Copier/Fax	100.0%	0.05	0.05	1.1
Office Equipment	POS Terminal	83.2%	0.08	0.06	1.3
Miscellaneous	Non-HVAC Motors	14.1%	0.73	0.10	2.1
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	2.63	2.63	53.5
Total				**36.21**	**735.6**

Table A-4 Commercial Restaurant, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	66.2%	0.24	0.16	2.0
Heating	Boiler	1.3%	0.73	0.01	0.1
Heating	Unit Heater	0.9%	0.12	0.00	0.0
Water Heating	Water Heater	72.8%	0.36	0.26	3.4
Food Preparation	Oven	13.0%	0.11	0.01	0.2
Food Preparation	Fryer	85.1%	0.17	0.14	1.8
Food Preparation	Broiler	76.9%	0.18	0.14	1.7
Food Preparation	Griddle	87.8%	0.12	0.11	1.4
Food Preparation	Range	81.4%	0.12	0.10	1.3
Food Preparation	Steamer	5.6%	0.14	0.01	0.1
Food Preparation	Com Food Prep Other	0.3%	0.05	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.01	0.01	0.1
Total				**0.95**	**12.2**

Table A-5 Commercial Retail, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	10.2%	3.51	0.36	70.2
Cooling	Water-Cooled Chiller	2.9%	3.00	0.09	17.0
Cooling	RTU	19.4%	3.44	0.67	131.1
Cooling	Central AC	6.8%	3.72	0.25	49.8
Cooling	Room AC	2.9%	3.28	0.10	18.7
Cooling	Air-Source Heat Pump	1.1%	3.72	0.04	8.3
Cooling	Geothermal Heat Pump	1.9%	2.50	0.05	9.3
Cooling	PTHP	0.2%	3.28	0.01	1.6
Heating	Electric Furnace	5.9%	4.38	0.26	50.9
Heating	Electric Room Heat	3.3%	4.38	0.14	28.5
Heating	Air-Source Heat Pump	1.1%	4.46	0.05	10.0
Heating	Geothermal Heat Pump	1.9%	3.70	0.07	13.8
Heating	PTHP	0.2%	4.02	0.01	1.9
Ventilation	Ventilation	100.0%	0.85	0.85	167.0
Water Heating	Water Heater	44.8%	0.69	0.31	60.6
Interior Lighting	Screw-in	100.0%	0.57	0.57	111.9
Interior Lighting	High-Bay Fixtures	100.0%	0.85	0.85	166.8
Interior Lighting	Linear Lighting	100.0%	2.00	2.00	393.4
Exterior Lighting	Screw-in	100.0%	0.23	0.23	44.5
Exterior Lighting	Area Lighting	100.0%	0.81	0.81	158.1
Exterior Lighting	Linear Lighting	100.0%	0.08	0.08	15.0
Refrigeration	Walk-in Refrig/Freezer	0.0%	1.28	0.00	0.0
Refrigeration	Reach-in Refrig/Freezer	29.4%	0.30	0.09	17.2
Refrigeration	Glass Door Display	38.7%	0.54	0.21	41.0
Refrigeration	Open Display Case	7.8%	1.75	0.14	26.8
Refrigeration	Icemaker	4.0%	1.23	0.05	9.5
Refrigeration	Vending Machine	12.7%	0.45	0.06	11.3
Food Preparation	Oven	3.9%	0.46	0.02	3.5
Food Preparation	Fryer	2.5%	1.02	0.03	5.0
Food Preparation	Dishwasher	11.6%	1.40	0.16	31.9
Food Preparation	Hot Food Container	0.0%	0.48	0.00	0.0
Food Preparation	Steamer	0.0%	1.43	0.00	0.0
Food Preparation	Griddle	0.0%	1.00	0.00	0.0
Office Equipment	Desktop Computer	100.0%	0.14	0.14	28.2
Office Equipment	Laptop	100.0%	0.02	0.02	4.4
Office Equipment	Server	78.4%	0.17	0.13	26.0
Office Equipment	Monitor	100.0%	0.03	0.03	5.0
Office Equipment	Printer/Copier/Fax	100.0%	0.02	0.02	3.1
Office Equipment	POS Terminal	81.9%	0.05	0.04	7.3
Miscellaneous	Non-HVAC Motors	11.0%	0.16	0.02	3.4
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.67	0.67	130.9
Total				**9.59**	**1,882.7**

Table A-6 Commercial Retail, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	38.9%	0.36	0.14	17.3
Heating	Boiler	5.1%	0.77	0.04	4.8
Heating	Unit Heater	7.7%	0.18	0.01	1.7
Water Heating	Water Heater	55.2%	0.16	0.09	10.8
Food Preparation	Oven	3.3%	0.38	0.01	1.5
Food Preparation	Fryer	3.3%	0.59	0.02	2.4
Food Preparation	Broiler	0.0%	0.63	0.00	0.0
Food Preparation	Griddle	0.0%	0.44	0.00	0.0
Food Preparation	Range	0.0%	0.43	0.00	0.0
Food Preparation	Steamer	0.0%	0.50	0.00	0.0
Food Preparation	Com Food Prep Other	0.0%	0.18	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.01	0.01	0.8
Total				**0.32**	**39.4**

Table A-7 Commercial Grocery, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	5.1%	7.98	0.41	5.3
Cooling	Water-Cooled Chiller	0.0%	6.83	0.00	0.0
Cooling	RTU	39.0%	7.83	3.05	39.2
Cooling	Central AC	14.7%	8.38	1.23	15.8
Cooling	Room AC	0.0%	7.46	0.00	0.0
Cooling	Air-Source Heat Pump	5.6%	8.38	0.47	6.1
Cooling	Geothermal Heat Pump	0.0%	4.51	0.00	0.0
Cooling	PTHP	4.6%	7.46	0.34	4.4
Heating	Electric Furnace	6.5%	8.97	0.58	7.5
Heating	Electric Room Heat	3.6%	8.54	0.30	3.9
Heating	Air-Source Heat Pump	5.6%	4.49	0.25	3.3
Heating	Geothermal Heat Pump	0.0%	3.38	0.00	0.0
Heating	PTHP	4.6%	4.04	0.18	2.4
Ventilation	Ventilation	100.0%	2.32	2.32	29.7
Water Heating	Water Heater	41.9%	2.43	1.02	13.1
Interior Lighting	Screw-in	100.0%	0.35	0.35	4.5
Interior Lighting	High-Bay Fixtures	100.0%	0.68	0.68	8.7
Interior Lighting	Linear Lighting	100.0%	2.86	2.86	36.7
Exterior Lighting	Screw-in	100.0%	0.35	0.35	4.4
Exterior Lighting	Area Lighting	100.0%	1.70	1.70	21.8
Exterior Lighting	Linear Lighting	100.0%	0.36	0.36	4.7
Refrigeration	Walk-in Refrig/Freezer	16.6%	5.02	0.83	10.7
Refrigeration	Reach-in Refrig/Freezer	6.6%	0.33	0.02	0.3
Refrigeration	Glass Door Display	97.6%	6.03	5.89	75.7
Refrigeration	Open Display Case	95.6%	19.60	18.74	240.7
Refrigeration	Icemaker	66.6%	0.34	0.23	2.9
Refrigeration	Vending Machine	36.5%	0.25	0.09	1.2
Food Preparation	Oven	28.3%	0.44	0.13	1.6
Food Preparation	Fryer	28.3%	0.99	0.28	3.6
Food Preparation	Dishwasher	22.4%	1.37	0.31	3.9
Food Preparation	Hot Food Container	68.7%	0.47	0.32	4.1
Food Preparation	Steamer	0.0%	1.39	0.00	0.0
Food Preparation	Griddle	12.5%	0.97	0.12	1.6
Office Equipment	Desktop Computer	100.0%	0.17	0.17	2.2
Office Equipment	Laptop	64.0%	0.03	0.02	0.2
Office Equipment	Server	66.3%	0.10	0.07	0.9
Office Equipment	Monitor	100.0%	0.03	0.03	0.4
Office Equipment	Printer/Copier/Fax	100.0%	0.02	0.02	0.2
Office Equipment	POS Terminal	100.0%	0.07	0.07	0.9
Miscellaneous	Non-HVAC Motors	14.8%	0.84	0.12	1.6
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	3.32	3.32	42.6
Total				**47.23**	**606.8**

Table A-8 Commercial Grocery, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	67.3%	0.32	0.21	1.7
Heating	Boiler	0.7%	0.67	0.00	0.0
Heating	Unit Heater	0.0%	0.16	0.00	0.0
Water Heating	Water Heater	58.1%	0.15	0.08	0.7
Food Preparation	Oven	28.6%	0.02	0.01	0.0
Food Preparation	Fryer	28.6%	0.03	0.01	0.1
Food Preparation	Broiler	0.0%	0.03	0.00	0.0
Food Preparation	Griddle	28.6%	0.02	0.01	0.0
Food Preparation	Range	28.6%	0.02	0.01	0.0
Food Preparation	Steamer	0.0%	0.02	0.00	0.0
Food Preparation	Com Food Prep Other	0.0%	0.01	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.0
Total				**0.33**	**2.7**

Table A-9 Commercial College, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	7.8%	5.56	0.43	81.5
Cooling	Water-Cooled Chiller	63.5%	5.16	3.27	617.0
Cooling	RTU	16.9%	4.20	0.71	133.7
Cooling	Central AC	0.0%	4.54	0.00	0.0
Cooling	Room AC	3.9%	4.00	0.16	29.2
Cooling	Air-Source Heat Pump	0.0%	4.54	0.00	0.0
Cooling	Geothermal Heat Pump	4.7%	3.04	0.14	26.7
Cooling	PTHP	0.0%	4.00	0.00	0.0
Heating	Electric Furnace	3.2%	14.43	0.46	87.1
Heating	Electric Room Heat	0.0%	13.74	0.00	0.0
Heating	Air-Source Heat Pump	0.0%	8.90	0.00	0.0
Heating	Geothermal Heat Pump	4.7%	5.91	0.28	51.9
Heating	PTHP	0.0%	8.01	0.00	0.0
Ventilation	Ventilation	100.0%	1.49	1.49	281.5
Water Heating	Water Heater	35.1%	2.04	0.72	134.9
Interior Lighting	Screw-in	100.0%	0.10	0.10	18.3
Interior Lighting	High-Bay Fixtures	100.0%	0.69	0.69	129.4
Interior Lighting	Linear Lighting	100.0%	1.05	1.05	198.1
Exterior Lighting	Screw-in	100.0%	0.02	0.02	3.6
Exterior Lighting	Area Lighting	100.0%	0.27	0.27	51.6
Exterior Lighting	Linear Lighting	100.0%	0.71	0.71	134.6
Refrigeration	Walk-in Refrig/Freezer	2.5%	0.18	0.00	0.8
Refrigeration	Reach-in Refrig/Freezer	13.2%	0.08	0.01	2.1
Refrigeration	Glass Door Display	97.2%	0.08	0.07	13.9
Refrigeration	Open Display Case	4.8%	0.25	0.01	2.2
Refrigeration	Icemaker	28.2%	0.17	0.05	9.2
Refrigeration	Vending Machine	8.8%	0.06	0.01	1.1
Food Preparation	Oven	48.8%	0.04	0.02	3.7
Food Preparation	Fryer	48.8%	0.09	0.04	8.3
Food Preparation	Dishwasher	55.0%	0.12	0.07	12.8
Food Preparation	Hot Food Container	54.2%	0.04	0.02	4.3
Food Preparation	Steamer	13.4%	0.13	0.02	3.2
Food Preparation	Griddle	13.4%	0.09	0.01	2.2
Office Equipment	Desktop Computer	100.0%	0.64	0.64	120.7
Office Equipment	Laptop	100.0%	0.03	0.03	5.6
Office Equipment	Server	37.1%	0.08	0.03	5.3
Office Equipment	Monitor	100.0%	0.11	0.11	21.3
Office Equipment	Printer/Copier/Fax	100.0%	0.09	0.09	16.5
Office Equipment	POS Terminal	32.9%	0.03	0.01	1.6
Miscellaneous	Non-HVAC Motors	4.7%	0.17	0.01	1.5
Miscellaneous	Pool Pump	90.3%	0.03	0.02	4.3
Miscellaneous	Pool Heater	36.2%	0.03	0.01	2.2
Miscellaneous	Other Miscellaneous	100.0%	0.93	0.93	176.2
Total				**12.73**	**2,398.3**

Table A-10 Commercial College, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	0.4%	0.14	0.00	0.1
Heating	Boiler	83.1%	0.28	0.23	27.9
Heating	Unit Heater	0.0%	0.07	0.00	0.0
Water Heating	Water Heater	64.9%	0.14	0.09	10.7
Food Preparation	Oven	16.7%	0.00	0.00	0.1
Food Preparation	Fryer	10.8%	0.01	0.00	0.1
Food Preparation	Broiler	16.7%	0.01	0.00	0.2
Food Preparation	Griddle	23.6%	0.01	0.00	0.2
Food Preparation	Range	29.2%	0.01	0.00	0.2
Food Preparation	Steamer	10.5%	0.01	0.00	0.1
Food Preparation	Com Food Prep Other	1.3%	0.00	0.00	0.0
Miscellaneous	Pool Heater	1.2%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.5
Total				**0.34**	**39.9**

Table A-11 Commercial School, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	8.5%	3.88	0.33	26.4
Cooling	Water-Cooled Chiller	6.7%	3.60	0.24	19.3
Cooling	RTU	36.9%	2.93	1.08	86.2
Cooling	Central AC	2.1%	3.17	0.07	5.3
Cooling	Room AC	2.2%	2.79	0.06	4.8
Cooling	Air-Source Heat Pump	0.0%	3.17	0.00	0.0
Cooling	Geothermal Heat Pump	3.4%	2.13	0.07	5.8
Cooling	PTHP	0.0%	2.79	0.00	0.0
Heating	Electric Furnace	6.4%	8.25	0.53	42.1
Heating	Electric Room Heat	0.0%	7.86	0.00	0.0
Heating	Air-Source Heat Pump	0.0%	5.09	0.00	0.0
Heating	Geothermal Heat Pump	3.4%	3.38	0.12	9.2
Heating	PTHP	0.0%	4.58	0.00	0.0
Ventilation	Ventilation	100.0%	0.94	0.94	75.2
Water Heating	Water Heater	9.4%	1.31	0.12	9.9
Interior Lighting	Screw-in	100.0%	0.24	0.24	18.8
Interior Lighting	High-Bay Fixtures	100.0%	0.36	0.36	28.8
Interior Lighting	Linear Lighting	100.0%	0.74	0.74	59.2
Exterior Lighting	Screw-in	100.0%	0.00	0.00	0.3
Exterior Lighting	Area Lighting	100.0%	0.11	0.11	9.1
Exterior Lighting	Linear Lighting	100.0%	0.63	0.63	49.9
Refrigeration	Walk-in Refrig/Freezer	19.7%	0.33	0.07	5.2
Refrigeration	Reach-in Refrig/Freezer	21.3%	0.16	0.03	2.6
Refrigeration	Glass Door Display	45.1%	0.14	0.06	5.1
Refrigeration	Open Display Case	11.9%	0.46	0.05	4.3
Refrigeration	Icemaker	69.7%	0.32	0.22	17.7
Refrigeration	Vending Machine	21.8%	0.12	0.03	2.1
Food Preparation	Oven	16.6%	0.10	0.02	1.3
Food Preparation	Fryer	1.5%	0.22	0.00	0.3
Food Preparation	Dishwasher	57.0%	0.30	0.17	13.7
Food Preparation	Hot Food Container	26.3%	0.10	0.03	2.2
Food Preparation	Steamer	0.0%	0.31	0.00	0.0
Food Preparation	Griddle	29.6%	0.21	0.06	5.1
Office Equipment	Desktop Computer	100.0%	0.38	0.38	30.3
Office Equipment	Laptop	100.0%	0.02	0.02	1.9
Office Equipment	Server	96.2%	0.09	0.09	6.9
Office Equipment	Monitor	100.0%	0.07	0.07	5.3
Office Equipment	Printer/Copier/Fax	100.0%	0.04	0.04	3.3
Office Equipment	POS Terminal	21.6%	0.01	0.00	0.2
Miscellaneous	Non-HVAC Motors	4.7%	0.10	0.00	0.4
Miscellaneous	Pool Pump	8.1%	0.02	0.00	0.1
Miscellaneous	Pool Heater	0.0%	0.02	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.59	0.59	46.7
Total				**7.59**	**605.1**

Table A-12 Commercial School, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	30.0%	0.17	0.05	2.5
Heating	Boiler	24.6%	0.34	0.08	4.2
Heating	Unit Heater	4.3%	0.08	0.00	0.2
Water Heating	Water Heater	90.6%	0.11	0.10	5.1
Food Preparation	Oven	45.2%	0.01	0.01	0.3
Food Preparation	Fryer	14.5%	0.02	0.00	0.1
Food Preparation	Broiler	32.4%	0.02	0.01	0.3
Food Preparation	Griddle	27.9%	0.01	0.00	0.2
Food Preparation	Range	34.0%	0.01	0.00	0.2
Food Preparation	Steamer	9.5%	0.02	0.00	0.1
Food Preparation	Com Food Prep Other	0.0%	0.01	0.00	0.0
Miscellaneous	Pool Heater	0.3%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.1
Total				**0.27**	**13.4**

Table A-13 Commercial Health, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	3.3%	6.17	0.20	21.8
Cooling	Water-Cooled Chiller	73.6%	5.67	4.17	452.5
Cooling	RTU	8.7%	4.85	0.42	45.9
Cooling	Central AC	1.5%	5.25	0.08	8.4
Cooling	Room AC	1.3%	4.62	0.06	6.3
Cooling	Air-Source Heat Pump	1.1%	5.25	0.06	6.1
Cooling	Geothermal Heat Pump	1.8%	3.52	0.06	6.7
Cooling	PTHP	1.3%	4.62	0.06	6.3
Heating	Electric Furnace	3.6%	9.29	0.34	36.5
Heating	Electric Room Heat	3.8%	9.29	0.35	38.0
Heating	Air-Source Heat Pump	1.1%	5.81	0.06	6.8
Heating	Geothermal Heat Pump	1.8%	3.78	0.07	7.2
Heating	PTHP	1.3%	5.23	0.07	7.2
Ventilation	Ventilation	100.0%	2.58	2.58	280.0
Water Heating	Water Heater	43.5%	2.24	0.97	105.5
Interior Lighting	Screw-in	100.0%	0.53	0.53	57.0
Interior Lighting	High-Bay Fixtures	100.0%	1.06	1.06	115.2
Interior Lighting	Linear Lighting	100.0%	1.95	1.95	211.9
Exterior Lighting	Screw-in	100.0%	0.04	0.04	4.6
Exterior Lighting	Area Lighting	100.0%	0.63	0.63	68.7
Exterior Lighting	Linear Lighting	100.0%	0.08	0.08	8.5
Refrigeration	Walk-in Refrig/Freezer	7.7%	0.87	0.07	7.3
Refrigeration	Reach-in Refrig/Freezer	7.7%	0.20	0.02	1.7
Refrigeration	Glass Door Display	50.6%	0.37	0.19	20.2
Refrigeration	Open Display Case	6.4%	1.19	0.08	8.3
Refrigeration	Icemaker	20.3%	0.42	0.08	9.2
Refrigeration	Vending Machine	26.8%	0.15	0.04	4.5
Food Preparation	Oven	17.0%	0.32	0.05	5.9
Food Preparation	Fryer	17.1%	0.71	0.12	13.2
Food Preparation	Dishwasher	50.8%	0.98	0.50	53.9
Food Preparation	Hot Food Container	12.3%	0.33	0.04	4.5
Food Preparation	Steamer	3.6%	0.99	0.04	3.9
Food Preparation	Griddle	4.9%	0.70	0.03	3.7
Office Equipment	Desktop Computer	100.0%	0.33	0.33	35.4
Office Equipment	Laptop	100.0%	0.05	0.05	5.5
Office Equipment	Server	90.0%	0.19	0.17	18.7
Office Equipment	Monitor	100.0%	0.06	0.06	6.2
Office Equipment	Printer/Copier/Fax	100.0%	0.04	0.04	3.9
Office Equipment	POS Terminal	89.8%	0.05	0.05	5.0
Miscellaneous	Non-HVAC Motors	3.2%	0.43	0.01	1.5
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	3.95	3.95	428.0
Total				**19.74**	**2,141.5**

Table A-14 Commercial Health, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	7.8%	0.18	0.01	1.0
Heating	Boiler	69.5%	0.37	0.26	17.5
Heating	Unit Heater	0.0%	0.09	0.00	0.0
Water Heating	Water Heater	56.5%	0.27	0.15	10.5
Food Preparation	Oven	4.0%	0.10	0.00	0.3
Food Preparation	Fryer	22.9%	0.15	0.03	2.3
Food Preparation	Broiler	5.1%	0.16	0.01	0.6
Food Preparation	Griddle	5.1%	0.11	0.01	0.4
Food Preparation	Range	21.8%	0.11	0.02	1.6
Food Preparation	Steamer	2.4%	0.13	0.00	0.2
Food Preparation	Com Food Prep Other	0.0%	0.05	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.01	0.01	0.7
Total				**0.51**	**35.1**

Table A-15 Commercial Lodging, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	1.6%	1.24	0.02	0.8
Cooling	Water-Cooled Chiller	39.3%	1.07	0.42	15.7
Cooling	RTU	0.0%	2.15	0.00	0.0
Cooling	Central AC	1.5%	2.21	0.03	1.2
Cooling	Room AC	18.1%	2.05	0.37	13.9
Cooling	Air-Source Heat Pump	0.0%	2.21	0.00	0.0
Cooling	Geothermal Heat Pump	0.0%	1.95	0.00	0.0
Cooling	PTHP	17.1%	2.05	0.35	13.1
Heating	Electric Furnace	0.0%	2.08	0.00	0.0
Heating	Electric Room Heat	17.7%	2.02	0.36	13.4
Heating	Air-Source Heat Pump	0.0%	1.52	0.00	0.0
Heating	Geothermal Heat Pump	0.0%	0.79	0.00	0.0
Heating	PTHP	17.1%	1.37	0.23	8.7
Ventilation	Ventilation	100.0%	0.55	0.55	20.5
Water Heating	Water Heater	4.6%	1.85	0.08	3.2
Interior Lighting	Screw-in	100.0%	1.34	1.34	50.1
Interior Lighting	High-Bay Fixtures	100.0%	1.38	1.38	51.7
Interior Lighting	Linear Lighting	100.0%	0.55	0.55	20.5
Exterior Lighting	Screw-in	100.0%	0.04	0.04	1.4
Exterior Lighting	Area Lighting	100.0%	1.65	1.65	61.8
Exterior Lighting	Linear Lighting	100.0%	0.02	0.02	0.9
Refrigeration	Walk-in Refrig/Freezer	13.3%	0.35	0.05	1.7
Refrigeration	Reach-in Refrig/Freezer	13.3%	0.08	0.01	0.4
Refrigeration	Glass Door Display	11.7%	0.15	0.02	0.6
Refrigeration	Open Display Case	0.5%	0.47	0.00	0.1
Refrigeration	Icemaker	88.9%	0.17	0.15	5.5
Refrigeration	Vending Machine	57.8%	0.12	0.07	2.7
Food Preparation	Oven	42.6%	0.03	0.01	0.5
Food Preparation	Fryer	13.1%	0.07	0.01	0.3
Food Preparation	Dishwasher	90.8%	0.10	0.09	3.3
Food Preparation	Hot Food Container	0.0%	0.03	0.00	0.0
Food Preparation	Steamer	0.0%	0.10	0.00	0.0
Food Preparation	Griddle	23.4%	0.07	0.02	0.6
Office Equipment	Desktop Computer	100.0%	0.04	0.04	1.5
Office Equipment	Laptop	100.0%	0.01	0.01	0.2
Office Equipment	Server	84.0%	0.02	0.02	0.7
Office Equipment	Monitor	100.0%	0.01	0.01	0.3
Office Equipment	Printer/Copier/Fax	100.0%	0.00	0.00	0.2
Office Equipment	POS Terminal	75.4%	0.01	0.00	0.2
Miscellaneous	Non-HVAC Motors	5.7%	0.12	0.01	0.2
Miscellaneous	Pool Pump	51.1%	0.02	0.01	0.3
Miscellaneous	Pool Heater	3.6%	0.02	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.64	0.64	23.8
Total				**8.54**	**320.3**

Table A-16 Commercial Lodging, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	18.6%	0.11	0.02	0.5
Heating	Boiler	38.0%	0.16	0.06	1.5
Heating	Unit Heater	1.8%	0.06	0.00	0.0
Water Heating	Water Heater	95.4%	0.17	0.16	3.7
Food Preparation	Oven	25.0%	0.03	0.01	0.2
Food Preparation	Fryer	9.5%	0.04	0.00	0.1
Food Preparation	Broiler	9.5%	0.04	0.00	0.1
Food Preparation	Griddle	25.4%	0.03	0.01	0.2
Food Preparation	Range	0.4%	0.03	0.00	0.0
Food Preparation	Steamer	0.4%	0.04	0.00	0.0
Food Preparation	Com Food Prep Other	0.0%	0.01	0.00	0.0
Miscellaneous	Pool Heater	9.9%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.01	0.01	0.1
Total				**0.27**	**6.4**

Table A-17 Commercial Warehouse, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	4.7%	2.67	0.13	14.8
Cooling	Water-Cooled Chiller	0.0%	2.29	0.00	0.0
Cooling	RTU	11.8%	2.62	0.31	36.0
Cooling	Central AC	0.3%	2.84	0.01	0.9
Cooling	Room AC	0.0%	2.50	0.00	0.0
Cooling	Air-Source Heat Pump	0.0%	2.84	0.00	0.0
Cooling	Geothermal Heat Pump	0.0%	1.90	0.00	0.0
Cooling	PTHP	0.0%	2.50	0.00	0.0
Heating	Electric Furnace	1.5%	6.71	0.10	11.8
Heating	Electric Room Heat	0.6%	6.39	0.04	4.7
Heating	Air-Source Heat Pump	0.0%	6.84	0.00	0.0
Heating	Geothermal Heat Pump	0.0%	5.68	0.00	0.0
Heating	PTHP	0.0%	6.16	0.00	0.0
Ventilation	Ventilation	100.0%	0.23	0.23	26.5
Water Heating	Water Heater	44.1%	0.23	0.10	11.9
Interior Lighting	Screw-in	100.0%	0.10	0.10	11.1
Interior Lighting	High-Bay Fixtures	100.0%	1.71	1.71	198.6
Interior Lighting	Linear Lighting	100.0%	0.28	0.28	32.4
Exterior Lighting	Screw-in	100.0%	0.02	0.02	2.2
Exterior Lighting	Area Lighting	100.0%	0.36	0.36	41.9
Exterior Lighting	Linear Lighting	100.0%	0.07	0.07	8.6
Refrigeration	Walk-in Refrig/Freezer	0.0%	0.41	0.00	0.0
Refrigeration	Reach-in Refrig/Freezer	0.0%	0.10	0.00	0.0
Refrigeration	Glass Door Display	45.4%	0.17	0.08	9.1
Refrigeration	Open Display Case	0.0%	0.56	0.00	0.0
Refrigeration	Icemaker	8.3%	0.20	0.02	1.9
Refrigeration	Vending Machine	6.9%	0.07	0.00	0.6
Food Preparation	Oven	0.0%	0.00	0.00	0.0
Food Preparation	Fryer	1.8%	0.00	0.00	0.0
Food Preparation	Dishwasher	32.9%	0.01	0.00	0.2
Food Preparation	Hot Food Container	0.0%	0.00	0.00	0.0
Food Preparation	Steamer	3.0%	0.01	0.00	0.0
Food Preparation	Griddle	0.0%	0.00	0.00	0.0
Office Equipment	Desktop Computer	100.0%	0.09	0.09	10.2
Office Equipment	Laptop	100.0%	0.01	0.01	1.3
Office Equipment	Server	64.9%	0.10	0.07	7.8
Office Equipment	Monitor	100.0%	0.02	0.02	1.8
Office Equipment	Printer/Copier/Fax	100.0%	0.01	0.01	1.1
Office Equipment	POS Terminal	3.3%	0.03	0.00	0.1
Miscellaneous	Non-HVAC Motors	8.9%	0.06	0.01	0.7
Miscellaneous	Pool Pump	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.26	0.26	30.0
Total				**4.00**	**466.0**

Table A-18 Commercial Warehouse, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	44.2%	0.19	0.08	6.1
Heating	Boiler	1.3%	0.40	0.01	0.4
Heating	Unit Heater	24.2%	0.09	0.02	1.7
Water Heating	Water Heater	55.9%	0.02	0.01	0.9
Food Preparation	Oven	1.1%	0.00	0.00	0.0
Food Preparation	Fryer	1.1%	0.00	0.00	0.0
Food Preparation	Broiler	1.1%	0.00	0.00	0.0
Food Preparation	Griddle	1.1%	0.00	0.00	0.0
Food Preparation	Range	1.1%	0.00	0.00	0.0
Food Preparation	Steamer	1.1%	0.00	0.00	0.0
Food Preparation	Com Food Prep Other	1.1%	0.00	0.00	0.0
Miscellaneous	Pool Heater	0.0%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.1
Total				**0.13**	**9.2**

Table A-19 Commercial Miscellaneous, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/Sqft)	Usage (GWh)
Cooling	Air-Cooled Chiller	20.8%	1.83	0.38	63.3
Cooling	Water-Cooled Chiller	4.6%	1.56	0.07	12.0
Cooling	RTU	31.0%	1.79	0.56	92.4
Cooling	Central AC	5.2%	1.94	0.10	16.8
Cooling	Room AC	2.1%	1.88	0.04	6.6
Cooling	Air-Source Heat Pump	0.7%	1.94	0.01	2.4
Cooling	Geothermal Heat Pump	0.2%	1.30	0.00	0.4
Cooling	PTHP	2.0%	1.88	0.04	6.4
Heating	Electric Furnace	11.0%	2.89	0.32	52.9
Heating	Electric Room Heat	1.3%	2.75	0.04	5.9
Heating	Air-Source Heat Pump	0.7%	2.10	0.02	2.6
Heating	Geothermal Heat Pump	0.2%	1.43	0.00	0.4
Heating	PTHP	2.0%	1.89	0.04	6.4
Ventilation	Ventilation	100.0%	0.41	0.41	68.7
Water Heating	Water Heater	27.6%	0.79	0.22	36.0
Interior Lighting	Screw-in	100.0%	0.44	0.44	73.9
Interior Lighting	High-Bay Fixtures	100.0%	0.96	0.96	159.9
Interior Lighting	Linear Lighting	100.0%	1.23	1.23	203.8
Exterior Lighting	Screw-in	100.0%	0.09	0.09	14.7
Exterior Lighting	Area Lighting	100.0%	0.61	0.61	101.2
Exterior Lighting	Linear Lighting	100.0%	0.06	0.06	9.4
Refrigeration	Walk-in Refrig/Freezer	15.4%	0.22	0.03	5.5
Refrigeration	Reach-in Refrig/Freezer	15.4%	0.05	0.01	1.3
Refrigeration	Glass Door Display	25.5%	0.09	0.02	3.9
Refrigeration	Open Display Case	0.5%	0.30	0.00	0.2
Refrigeration	Icemaker	41.6%	0.10	0.04	7.1
Refrigeration	Vending Machine	28.6%	0.08	0.02	3.6
Food Preparation	Oven	29.0%	0.03	0.01	1.4
Food Preparation	Fryer	2.5%	0.07	0.00	0.3
Food Preparation	Dishwasher	20.7%	0.09	0.02	3.1
Food Preparation	Hot Food Container	10.0%	0.03	0.00	0.5
Food Preparation	Steamer	2.4%	0.09	0.00	0.4
Food Preparation	Griddle	16.0%	0.06	0.01	1.7
Office Equipment	Desktop Computer	100.0%	0.16	0.16	26.3
Office Equipment	Laptop	100.0%	0.02	0.02	4.1
Office Equipment	Server	43.6%	0.09	0.04	6.7
Office Equipment	Monitor	100.0%	0.03	0.03	4.6
Office Equipment	Printer/Copier/Fax	100.0%	0.02	0.02	2.9
Office Equipment	POS Terminal	37.0%	0.02	0.01	1.5
Miscellaneous	Non-HVAC Motors	11.4%	0.09	0.01	1.7
Miscellaneous	Pool Pump	80.4%	0.01	0.01	1.8
Miscellaneous	Pool Heater	0.0%	0.02	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.47	0.47	78.2
Total				**6.57**	**1,093.0**

Table A-20 Commercial Miscellaneous, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/Sqft)	Usage (MMtherms)
Heating	Furnace	47.3%	0.15	0.07	7.6
Heating	Boiler	13.5%	0.33	0.04	4.7
Heating	Unit Heater	0.5%	0.08	0.00	0.0
Water Heating	Water Heater	72.4%	0.10	0.07	7.3
Food Preparation	Oven	66.2%	0.00	0.00	0.2
Food Preparation	Fryer	2.8%	0.00	0.00	0.0
Food Preparation	Broiler	32.4%	0.00	0.00	0.2
Food Preparation	Griddle	35.9%	0.00	0.00	0.1
Food Preparation	Range	39.9%	0.00	0.00	0.1
Food Preparation	Steamer	0.0%	0.00	0.00	0.0
Food Preparation	Com Food Prep Other	0.0%	0.00	0.00	0.0
Miscellaneous	Pool Heater	1.2%	0.00	0.00	0.0
Miscellaneous	Other Miscellaneous	100.0%	0.00	0.00	0.3
Total				**0.20**	**20.5**

Industrial Market Profiles

Table A-1 Industrial - Food Products, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	2.2%	6,671	145	8.0
Cooling	Water-Cooled Chiller	12.7%	5,707	724	39.8
Cooling	RTU	0.1%	6,543	8	0.5
Cooling	Air-Source Heat Pump	0.2%	7,079	14	0.8
Cooling	Geothermal Heat Pump	3.5%	4,750	167	9.2
Heating	Electric Furnace	0.4%	16,752	63	3.5
Heating	Electric Room Heat	0.0%	15,954	6	0.3
Heating	Air-Source Heat Pump	0.2%	17,081	34	1.9
Heating	Geothermal Heat Pump	3.5%	14,179	498	27.3
Ventilation	Ventilation	100.0%	569	569	31.2
Interior Lighting	Screw-in	100.0%	83	83	4.5
Interior Lighting	High-Bay Fixtures	100.0%	1,476	1,476	81.1
Interior Lighting	Linear Lighting	100.0%	240	240	13.2
Exterior Lighting	Screw-in	100.0%	16	16	0.9
Exterior Lighting	Area Lighting	100.0%	312	312	17.1
Exterior Lighting	Linear Lighting	100.0%	64	64	3.5
Motors	Pumps	100.0%	3,980	3,980	218.6
Motors	Fans & Blowers	100.0%	2,863	2,863	157.2
Motors	Compressed Air	100.0%	1,613	1,613	88.6
Motors	Conveyors	100.0%	5,903	5,903	324.2
Motors	Other Motors	0.0%	1,040	0	0.0
Process	Process Heating	100.0%	2,282	2,282	125.3
Process	Process Cooling	100.0%	3,792	3,792	208.3
Process	Process Refrigeration	100.0%	3,792	3,792	208.3
Process	Process Electrochemical	100.0%	18	18	1.0
Process	Process Other	100.0%	170	170	9.3
Miscellaneous	Miscellaneous	100.0%	1,040	1,040	57.1
Total				**29,872**	**1,640.5**

Table A-2 Industrial - Food Products, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	2.4%	85	2	0.0
Heating	Boiler	12.7%	182	23	0.1
Heating	Unit Heater	0.0%	43	0	0.0
Process	Process Boiler	100.0%	223	223	0.8
Process	Process Heating	100.0%	141	141	0.5
Process	Process Cooling	100.0%	1	1	0.0
Process	Other Process	100.0%	7	7	0.0
Miscellaneous	Miscellaneous	100.0%	16	16	0.1
Total				**414**	**1.4**

Table A-3 Industrial - Petroleum, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	0.1%	29,668	19	0.1
Cooling	Water-Cooled Chiller	0.1%	25,380	33	0.1
Cooling	RTU	4.9%	29,098	1,413	4.0
Cooling	Air-Source Heat Pump	0.0%	29,098	0	0.0
Cooling	Geothermal Heat Pump	0.0%	19,408	0	0.0
Heating	Electric Furnace	1.5%	74,493	1,123	3.2
Heating	Electric Room Heat	0.6%	70,946	445	1.3
Heating	Air-Source Heat Pump	0.0%	55,870	0	0.0
Heating	Geothermal Heat Pump	0.0%	37,265	0	0.0
Ventilation	Ventilation	100.0%	2,529	2,529	7.1
Interior Lighting	Screw-in	100.0%	162	162	0.5
Interior Lighting	High-Bay Fixtures	100.0%	2,897	2,897	8.2
Interior Lighting	Linear Lighting	100.0%	472	472	1.3
Exterior Lighting	Screw-in	100.0%	32	32	0.1
Exterior Lighting	Area Lighting	100.0%	611	611	1.7
Exterior Lighting	Linear Lighting	100.0%	125	125	0.4
Motors	Pumps	100.0%	48,640	48,640	137.0
Motors	Fans & Blowers	100.0%	19,340	19,340	54.5
Motors	Compressed Air	100.0%	22,304	22,304	62.8
Motors	Conveyors	100.0%	52,444	52,444	147.7
Motors	Other Motors	100.0%	10,489	10,489	29.5
Process	Process Heating	100.0%	7,352	7,352	20.7
Process	Process Cooling	100.0%	4,457	4,457	12.6
Process	Process Refrigeration	100.0%	4,457	4,457	12.6
Process	Process Electrochemical	100.0%	44	44	0.1
Process	Process Other	100.0%	820	820	2.3
Miscellaneous	Miscellaneous	100.0%	1,572	1,572	4.4
Total				**181,782**	**512.0**

Table A-4 Industrial - Petroleum, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	5.1%	230	12	0.0
Heating	Boiler	0.9%	492	4	0.0
Heating	Unit Heater	0.0%	115	0	0.0
Process	Process Boiler	100.0%	367	367	0.1
Process	Process Heating	100.0%	732	732	0.1
Process	Process Cooling	100.0%	1	1	0.0
Process	Other Process	100.0%	41	41	0.0
Miscellaneous	Miscellaneous	100.0%	19	19	0.0
Total				**1,175**	**0.2**

Table A-5 Industrial - Chemical, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	0.9%	80,044	715	6.8
Cooling	Water-Cooled Chiller	3.8%	68,475	2,589	24.6
Cooling	RTU	14.5%	78,507	11,417	108.5
Cooling	Air-Source Heat Pump	0.0%	84,936	24	0.2
Cooling	Geothermal Heat Pump	0.0%	56,653	0	0.0
Heating	Electric Furnace	0.1%	200,983	128	1.2
Heating	Electric Room Heat	0.0%	191,412	0	0.0
Heating	Air-Source Heat Pump	0.0%	204,940	58	0.5
Heating	Geothermal Heat Pump	0.0%	136,695	0	0.0
Ventilation	Ventilation	100.0%	6,824	6,824	64.8
Interior Lighting	Screw-in	100.0%	602	602	5.7
Interior Lighting	High-Bay Fixtures	100.0%	10,737	10,737	102.0
Interior Lighting	Linear Lighting	100.0%	1,749	1,749	16.6
Exterior Lighting	Screw-in	100.0%	120	120	1.1
Exterior Lighting	Area Lighting	100.0%	2,266	2,266	21.5
Exterior Lighting	Linear Lighting	100.0%	464	464	4.4
Motors	Pumps	100.0%	54,249	54,249	515.3
Motors	Fans & Blowers	100.0%	15,069	15,069	143.2
Motors	Compressed Air	100.0%	60,277	60,277	572.6
Motors	Conveyors	100.0%	105,485	105,485	1,002.1
Motors	Other Motors	100.0%	9,042	9,042	85.9
Process	Process Heating	100.0%	27,735	27,735	263.5
Process	Process Cooling	100.0%	15,260	15,260	145.0
Process	Process Refrigeration	100.0%	15,260	15,260	145.0
Process	Process Electrochemical	100.0%	19,324	19,324	183.6
Process	Process Other	100.0%	2,931	2,931	27.8
Miscellaneous	Miscellaneous	100.0%	8,286	8,286	78.7
Total				**370,610**	**3,520.6**

Table A-6 Industrial - Chemical, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	2.9%	90	3	0.0
Heating	Boiler	16.1%	192	31	0.0
Heating	Unit Heater	0.0%	45	0	0.0
Process	Process Boiler	100.0%	665	665	0.4
Process	Process Heating	100.0%	347	347	0.2
Process	Process Cooling	100.0%	9	9	0.0
Process	Other Process	100.0%	57	57	0.0
Miscellaneous	Miscellaneous	100.0%	44	44	0.0
Total				**1,157**	**0.7**

Table A-7 Industrial - Primary Metal, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	0.5%	8,762	46	1.2
Cooling	Water-Cooled Chiller	0.0%	7,496	3	0.1
Cooling	RTU	15.5%	8,594	1,328	35.6
Cooling	Air-Source Heat Pump	0.4%	9,298	33	0.9
Cooling	Geothermal Heat Pump	0.1%	6,238	5	0.1
Heating	Electric Furnace	1.5%	22,001	332	8.9
Heating	Electric Room Heat	0.3%	20,953	61	1.6
Heating	Air-Source Heat Pump	0.4%	22,434	79	2.1
Heating	Geothermal Heat Pump	0.1%	18,622	14	0.4
Ventilation	Ventilation	100.0%	747	747	20.0
Interior Lighting	Screw-in	100.0%	115	115	3.1
Interior Lighting	High-Bay Fixtures	100.0%	2,051	2,051	55.0
Interior Lighting	Linear Lighting	100.0%	334	334	9.0
Exterior Lighting	Screw-in	100.0%	23	23	0.6
Exterior Lighting	Area Lighting	100.0%	433	433	11.6
Exterior Lighting	Linear Lighting	100.0%	89	89	2.4
Motors	Pumps	100.0%	2,593	2,593	69.5
Motors	Fans & Blowers	100.0%	4,321	4,321	115.9
Motors	Compressed Air	100.0%	4,321	4,321	115.9
Motors	Conveyors	100.0%	10,889	10,889	292.0
Motors	Other Motors	100.0%	6,049	6,049	162.2
Process	Process Heating	100.0%	23,330	23,330	625.7
Process	Process Cooling	100.0%	374	374	10.0
Process	Process Refrigeration	100.0%	374	374	10.0
Process	Process Electrochemical	100.0%	11,262	11,262	302.0
Process	Process Other	100.0%	611	611	16.4
Miscellaneous	Miscellaneous	100.0%	930	930	24.9
Total				**70,748**	**1,897.4**

Table A-8 Industrial - Primary Metal, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	15.1%	415	63	0.1
Heating	Boiler	0.1%	888	1	0.0
Heating	Unit Heater	1.7%	208	4	0.0
Process	Process Boiler	100.0%	77	77	0.1
Process	Process Heating	100.0%	658	658	1.1
Process	Process Cooling	100.0%	2	2	0.0
Process	Other Process	100.0%	18	18	0.0
Miscellaneous	Miscellaneous	100.0%	20	20	0.0
Total				**843**	**1.4**

Table A-9 Industrial - Machinery, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	3.4%	12,673	433	36.4
Cooling	Water-Cooled Chiller	13.7%	10,841	1,483	124.6
Cooling	RTU	1.3%	12,430	163	13.7
Cooling	Air-Source Heat Pump	0.0%	12,430	0	0.0
Cooling	Geothermal Heat Pump	0.0%	8,291	0	0.0
Heating	Electric Furnace	1.5%	31,821	480	40.3
Heating	Electric Room Heat	0.6%	30,306	190	16.0
Heating	Air-Source Heat Pump	0.0%	23,866	0	0.0
Heating	Geothermal Heat Pump	0.0%	15,919	0	0.0
Ventilation	Ventilation	100.0%	1,080	1,080	90.8
Interior Lighting	Screw-in	100.0%	102	102	8.6
Interior Lighting	High-Bay Fixtures	100.0%	1,827	1,827	153.5
Interior Lighting	Linear Lighting	100.0%	298	298	25.0
Exterior Lighting	Screw-in	100.0%	20	20	1.7
Exterior Lighting	Area Lighting	100.0%	385	385	32.4
Exterior Lighting	Linear Lighting	100.0%	79	79	6.6
Motors	Pumps	100.0%	1,015	1,015	85.3
Motors	Fans & Blowers	100.0%	2,363	2,363	198.5
Motors	Compressed Air	100.0%	2,012	2,012	169.0
Motors	Conveyors	100.0%	3,257	3,257	273.6
Motors	Other Motors	0.0%	921	0	0.0
Process	Process Heating	100.0%	1,278	1,278	107.3
Process	Process Cooling	100.0%	251	251	21.1
Process	Process Refrigeration	100.0%	251	251	21.1
Process	Process Electrochemical	100.0%	42	42	3.5
Process	Process Other	100.0%	345	345	29.0
Miscellaneous	Miscellaneous	100.0%	921	921	77.4
Total				**18,277**	**1,535.4**

Table A-10 Industrial - Machinery, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	34.6%	188	65	0.3
Heating	Boiler	5.6%	402	22	0.1
Heating	Unit Heater	0.2%	94	0	0.0
Process	Process Boiler	100.0%	45	45	0.2
Process	Process Heating	100.0%	58	58	0.3
Process	Process Cooling	100.0%	2	2	0.0
Process	Other Process	100.0%	10	10	0.1
Miscellaneous	Miscellaneous	100.0%	8	8	0.0
Total				**210**	**1.1**

Table A-11 Industrial - Other, 2014 Electric Average Market Profile

End Use	Technology	Saturation	EUI (kWh)	Intensity (kWh/employ)	Usage (GWh)
Cooling	Air-Cooled Chiller	1.7%	11,032	191	50.0
Cooling	Water-Cooled Chiller	0.8%	9,438	78	20.5
Cooling	RTU	8.5%	10,821	919	240.9
Cooling	Air-Source Heat Pump	0.2%	11,707	25	6.4
Cooling	Geothermal Heat Pump	0.0%	7,808	0	0.0
Heating	Electric Furnace	1.5%	27,701	415	108.8
Heating	Electric Room Heat	0.0%	26,382	4	1.1
Heating	Air-Source Heat Pump	0.2%	28,247	59	15.6
Heating	Geothermal Heat Pump	0.0%	18,841	0	0.0
Ventilation	Ventilation	100.0%	941	941	246.5
Interior Lighting	Screw-in	100.0%	76	76	19.9
Interior Lighting	High-Bay Fixtures	100.0%	1,352	1,352	354.2
Interior Lighting	Linear Lighting	100.0%	220	220	57.7
Exterior Lighting	Screw-in	100.0%	15	15	3.9
Exterior Lighting	Area Lighting	100.0%	285	285	74.7
Exterior Lighting	Linear Lighting	100.0%	58	58	15.3
Motors	Pumps	100.0%	803	803	210.5
Motors	Fans & Blowers	100.0%	965	965	252.8
Motors	Compressed Air	100.0%	780	780	204.4
Motors	Conveyors	100.0%	1,650	1,650	432.4
Motors	Other Motors	100.0%	28	28	7.3
Process	Process Heating	100.0%	1,297	1,297	340.0
Process	Process Cooling	100.0%	340	340	89.1
Process	Process Refrigeration	100.0%	340	340	89.1
Process	Process Electrochemical	100.0%	32	32	8.5
Process	Process Other	100.0%	86	86	22.4
Miscellaneous	Miscellaneous	100.0%	661	661	173.3
Total				**11,620**	**3,045.4**

Table A-12 Industrial - Other, 2014 Natural Gas Average Market Profile

End Use	Technology	Saturation	EUI (therms)	Intensity (therm/employ)	Usage (MMtherms)
Heating	Furnace	14.7%	702	103	1.7
Heating	Boiler	0.7%	1,501	10	0.2
Heating	Unit Heater	1.7%	351	6	0.1
Process	Process Boiler	100.0%	92	92	1.5
Process	Process Heating	100.0%	142	142	2.4
Process	Process Cooling	100.0%	1	1	0.0
Process	Other Process	100.0%	17	17	0.3
Miscellaneous	Miscellaneous	100.0%	20	20	0.3
Total				**391**	**6.5**

Street Lighting Market Profiles

Table A-1 Street Lighting, 2014 Average Market Profile

End Use	Technology	Saturation	UEC (kWh)	Intensity (kWh/Fixt)	Usage (GWh)
Street Lighting	Customer Owned <200W Fixture	100.0%	630	630	3.4
Street Lighting	Customer Owned 200-299W Fixture	100.0%	1,199	1,199	4.4
Street Lighting	Customer Owned 300-400W Fixture	100.0%	1,858	1,858	5.8
Street Lighting	Customer Owned >400W Fixture	100.0%	2,961	2,961	0.5
Street Lighting	Company <200W Fixture	100.0%	665	665	149.0
Street Lighting	Company 200-299W Fixture	100.0%	1,344	1,344	68.0
Street Lighting	Company 300-400W Fixture	100.0%	2,184	2,184	82.0
Total				**16.9**	**189.2**

Research on Behavioral Savings

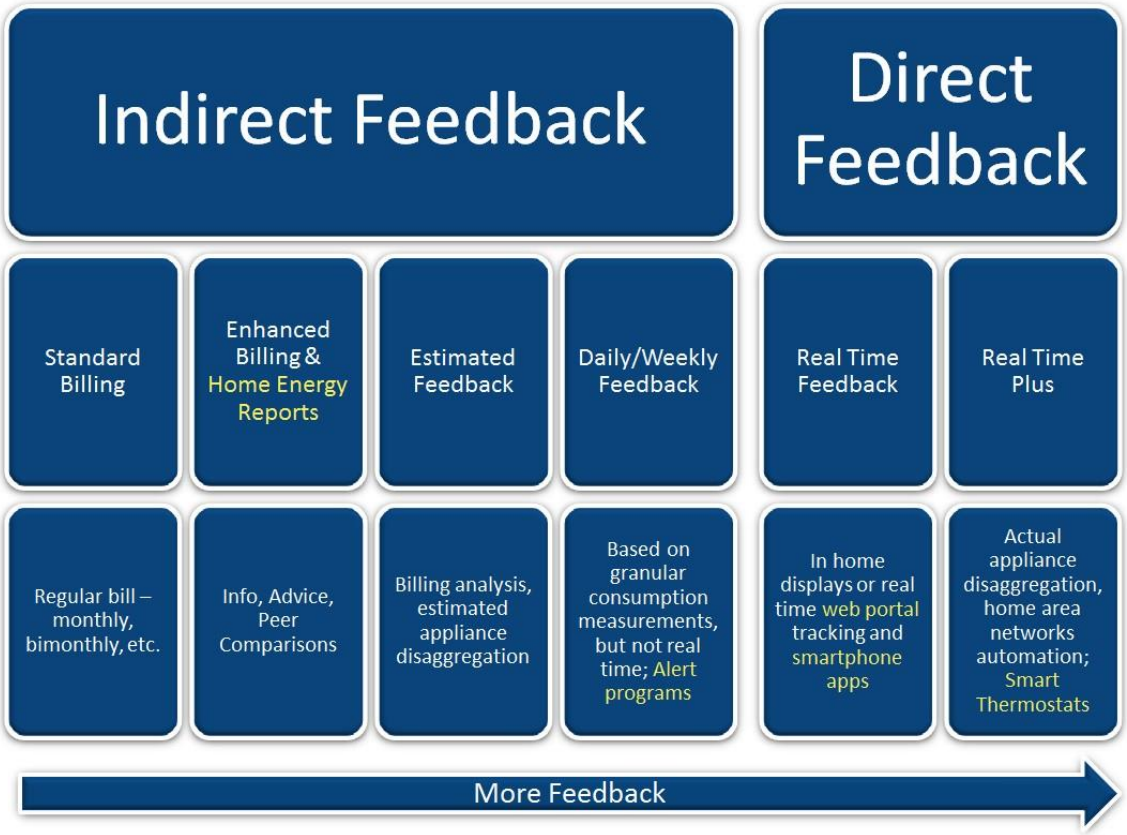
This appendix summarizes research on behavioral savings and initiatives as conducted by The Brattle Group. There is a brief overview of energy feedback programs as well as new technologies and programs that are being used to nudge customers towards energy conserving behaviors. The structure is as follows:

1. Overview of Feedback Mechanisms and impacts
2. Home Energy Report Programs
3. Smart Thermostats and Apps
4. Other Feedback - Web Portals, IHDs and Alert Programs

Overview of Feedback Mechanisms and Impacts

The Ameren Illinois Company (AIC) Behavioral Modification Program began in August 2010 and finished program year six (PY6) in May 2014. The program involved sending Home Energy Reports (HERs) to select treatment customers. These HERs provided customers with indirect feedback over their energy usage as well as a behavioral nudge through the use of social norms in a peer comparison. Figure B-1 shows the Electric Power Research Institute's (EPRI) categorization of feedback mechanisms based on whether feedback is concurrent with consumption - 'direct feedback' - and the level of granularity of feedback. This helps to contextualize HERs as well as the other forms of feedback discussed in this memo - smart thermostats, smartphone apps, web portals and usage alerts.

Figure B-1 Overview of Feedback Mechanisms (adapted from Ehrhardt-Martinez et al. (2010))[1]



Better feedback over energy usage can allow consumers to better understand when and how they are using electricity. This "know-how" can reduce the cost of conserving electricity, leading to improved energy usage decisions.[2] For example, appliance-specific (disaggregated) real-time energy usage information can show customers which appliances are using the most energy over the course of a day, making it easier for them to conserve electricity.

Feedback can also illustrate individual usage relative to comparable users.[3] This can create a social norm over electricity usage that increases the moral cost of not conserving.[4] There are two types of social norms – descriptive and injunctive. Descriptive social norms describe average behavior without any sort of value judgment, for example a comparison of a customer's energy usage to that of similar households in the same geographical area.[5] Such norms have been shown to cause a possible boomerang effect, where above average users conserve, but below average users increase their energy usage. An alternative is to create an inductive social norm, which creates a positive value for conservation behavior.[6] It is common practice for HERs to include an inductive social norm such as a smiley face for conservation,

[1] Ehrhardt-Martinez et al. (2010): "Advanced Metering Initiatives and Residential Feedback Programs: A Meta Review for Household Electricity-Saving Opportunities," American Council for an Energy-Efficient Economy, Report Number E105, June, pp 40

[2] Fischer, C. (2008): "Feedback on Household Electricity Consumption: A Tool for Saving Energy?", *Energy*, 1(1), pp 79-104

[3] Schultz et al. (2007): "The constructive, destructive, and reconstructive power of social norms", *Psychological Science*, 18(5), pp. 429-34; Ayers et al. (2009): "Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage", NBER Working Paper 15386; Alcott, H. (2011): "Social Norms and Energy Conservation", *Journal of Public Economics*, 95(9), pp.1082–95

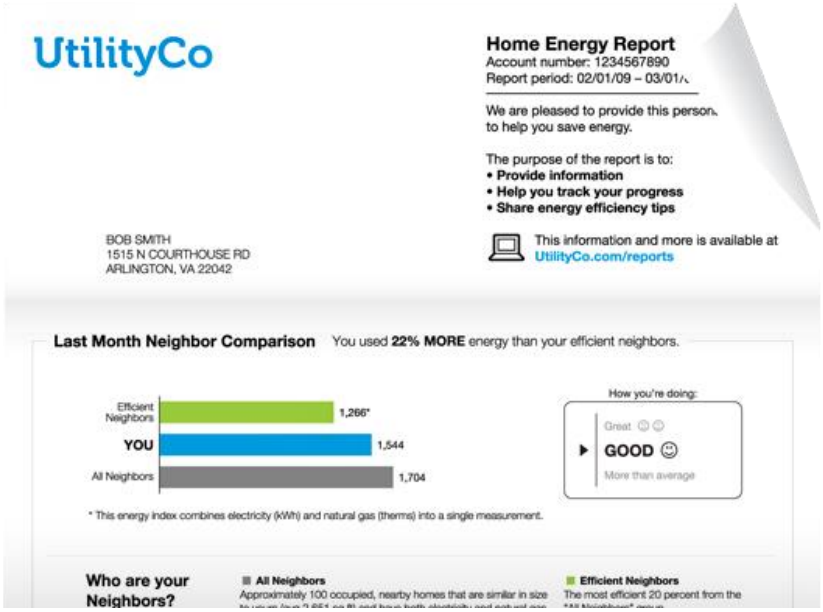
[4] Levitt, S and J. List (2007): "What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?", *The Journal of Economic Perspectives*, 21(2), pp. 153-174

[5] "Process and Impact Evaluation of 2013 (PY6) Ameren Illinois Company Behavioral Modification Program" (2015), (Hereinafter AIC Report) p10

[6] Schultz et al. (2007): "The constructive, destructive, and reconstructive power of social norms", *Psychological Science*, 18(5), pp. 429-34

or a comparison to a desirable group such as the customers "most efficient" neighbors. A sample image of an Opower report can be seen in Figure B-2.[7]

Figure B-2 Sample OPower Home Energy Report



Finally, feedback mechanisms may explicitly encourage conservation beyond merely providing information about energy usage. To this end, they include the provision of actual or hypothetical cost savings from conservation, carbon dioxide emissions data, detailed peer comparisons, and ways to reduce consumption.

The more concurrent the feedback is with energy usage and the more detailed it is, the greater its effect on energy conservation. A review article covering studies from USA, Canada, Scandinavia, the Netherlands and the UK, showed that conservation impacts from direct feedback range from 5% to 15% while conservation impacts from indirect feedback ranges from 0% to 10%.[8] A more recent quantitative meta-analysis covering 156 published trials of information-based energy conservation experiments from 1975 – 2012 estimates the average conservation impact from information strategies overall at 7.4%, with a range from a 55% reduction to an 18.5% increase.[9] Many of these studies suffer from methodological difficulties such as small samples,[10] short time periods,[11] or lack of controls.[12] To this end, Delmas et al. (2013) isolate 22 high quality studies and find that the average

[7] Opower is a provider of the software that produces and distributes HERs and manage customer information. Opower holds a contract with Conservation Service Group, who administers the program for Ameren Illinois Company. Figure available at: http://opower.com/uploads/solution/image/8/ee-banner-rev6.png. Accessed on: July 30, 2015.
[8] Darby, Sara (2006): "The effectiveness of feedback on energy consumption" Darby (2006), Working Paper, Oxford Environmental Change Institute, p3
[9] Delmas et al. (2013): "Information Strategies and Energy Conservation Behavior: A Meta-Analysis of Experimental Studies from 1975 to 2012", *Energy Policy,* 61, p734
[10] e.g. Allen, Daisy, & K. Janda, (2006): "The Effects of Household Characteristics and Energy Use Consciousness on the Effectiveness of Real-Time Energy Use Feedback: A Pilot Study Continuous Feedback: The Next Step In Residential Energy Conservation?", 2006 ACEEE Summer Study on Energy Efficiency in Buildings; Parker et al. (2008): "Pilot Evaluation of Energy Savings from Residential Energy Demand Feedback Devices", Final Report by the Florida Solar Energy Center to the US Department of Energy. FSEC-CR-1742-08, 2008
[11] e.g. Peterson et al. (2007): "Dormitory residents reduce electricity consumption when exposed to real-time visual feedback and incentives", *International Journal of Sustainability in Higher Education*, 8(1), pp16-33.
[12] Delmas et al. (2013): "Information Strategies and Energy Conservation Behavior: A Meta-Analysis of Experimental Studies from 1975 to 2012", *Energy Policy,* 61

conservation impact from energy feedback from these estimates is estimated at 2.0%, ranging from a 5% decrease to 5.5% increase in energy usage.[13] In contrast, lower quality studies without statistical controls find a savings effect of 9.57%, suggesting that many savings effects could be overestimated.

In the following sections we isolate the studies most relevant to the program and focus on pilots and programs that specifically deal with home energy reports, smart thermostats, web portals, alert programs, smartphone apps, and rewards programs.

Home Energy Reports and Rewards Programs

The AIC program was developed with the goal of reducing consumption, improving customers' knowledge of energy efficiency and how to save energy, and "about no-cost and low-cost energy-saving measures and behaviors."[14] In program year 6 (PY6)[15], there were about 224,000 participants (approximately one-third of their one million residential customers) most in their third year of the program, and 26,000 participants in their first year. The program was rolled out gradually with an original cohort followed by four expansion cohorts. Table B-1 below shows the breakdown of program participation.

Table B-1 Behavioral Modification Treatment Participants[16]

Cohort Name	Fuel Type	Treatment Pre-consumption (kWh)	Treatment Pre-consumption (Therms)	Number of Treated Customers in PY6	Start Date	Program Year
Original Cohort	Dual Fuel	34.43	2.695	41,787	August 2010	4th year in the program
Expansion Cohort 1	Dual Fuel	40.98	3.022	63,232	April 2011	3rd year in the program
Expansion Cohort 2	Dual Fuel	26.98	2.037	82,043	November 2011	3rd year in the program
Expansion Cohort 3	Gas only	NA	2.408	10,672	November 2011	3rd year in the program
Expansion Cohort 4	Dual Fuel	53.10	2.281	26,696	June 2013	1st year in the program

Notes:

[1]: Pre-consumption is the pre-program average daily consumption.

[2]: Expansion Cohort 3 (the gas-only cohort) stopped receiving program offerings in April 2012 and resumed receiving reports in April 2013. This cohort continued receiving treatment in PY6.

[3]: During the pre-period for Expansion Cohort 4, Illinois experienced lower than usual temperatures which could have contributed to the higher pre-period baseline usage.

The program was implemented in three ways - a mailed HER, an electronic copy of the same HER emailed to the customer, and a web portal that customers can access to view the HER as well as additional information. Results from PY6 showed that:

- Unadjusted net electricity savings per household ranged from 1.20% to 1.98% for all dual fuel cohorts.
- Unadjusted net gas savings ranged from 0.37% to 1.12% for all dual fuel cohorts and the gas only cohort[17]
- Dual fuel cohorts had higher electricity savings during summer and higher gas savings during winter.
- Each dual fuel cohort had higher adjusted net electricity savings than gas savings.

[13] Delmas et al. (2013): "Information Strategies and Energy Conservation Behavior: A Meta-Analysis of Experimental Studies from 1975 to 2012", *Energy Policy,* 61, p734

[14] AIC Report, p8

[15] June 2013 – May 2014

[16] AIC Report Adapted using information from Tables 2, 10, and 11.

[17] AIC Report, p35 Table 13; these savings are unadjusted per-household savings. The adjusted net savings remove the energy savings that resulted from customer participation in other AIC programs in PY and can be found on p7 (Table 1).

- Per-household percent savings tend to increase with the level of baseline consumption. For example, expansion cohort two, which is made up of customers with lower baseline energy usage than all other cohorts, experienced lower savings than the other cohorts for every year it has been in the program so far.[18]
- Within the original cohort, there are some low baseline usage customers (4,407 kWh annual consumption). In the early years of the program, these customers had much lower conservation impacts in percentage terms than the higher baseline customers in the same cohort. However by program year 6, this difference had dissipated somewhat with higher baseline usage customers in the original cohort conserving 2.21% and lower baseline customers conserving 1.5%.[19]
- Differences for gas are more pronounced with the original cohort higher baseline usage customers conserving 1.10% and lower baseline customers conserving 0.34%.[20]

These results are in line with the findings in Alcott (2011) which examined 17 HER experiments and estimated average treatment effects ranging from 1.4% to 3.3% with an unweighted mean of 2% for electricity.[21] Similar to the AIC program, Alcott also found that "households in the highest decile of pre-treatment consumption decrease usage by 6.3%, while consumption by the lowest decile decreases by ***only*** 0.3%," and "percentage treatment effects are higher in the winter and summer months, when heating and cooling loads increase underlying demand, than in the fall."[22] A separate study that examined the top 3 quartiles of energy use found that households that are likely to use air-conditioning save 2.3 times as much as households that are considered non-AC households.[23]

The AIC results also show a trend for savings increasing the longer a cohort is in the program.[24] Alcott (2011) found that HERs "appear to have constant or increasing effects as they are repeatedly delivered over the first two years of treatment."[25] Of the included experiments that had a full two years of post-treatment data, the programs' average treatment effects are higher in the second year than the first year.[26] Alcott and Rogers (2012) found that treatment groups receiving HERs "reduce electricity use within days of receiving their initial few reports, but that these responses decay rapidly in the months between reports."[27] However, when the reports continue "the decay rates between reports become statistically indistinguishable from zero" and "[w]hat remains is a durable treatment effect: for the group that continues to receive reports throughout [the] four-year sample, the effects continue to grow. For the group whose reports are discontinued after two years of treatment, the post-intervention effects decay six to twelve times more slowly than they had between the initial reports."[28] Alcott and Rogers claim that this finding "implies that as the intervention is repeated, people gradually develop a new "capital stock" that makes the effects persist."[29]

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[18] Ibid at 68
[19] AIC Report, p62 Table 49.
[20] AIC Report, p62 Table 50.
[21] Alcott, Hunt (2011): "Social Norms and Energy Conservation", *Journal of Public Economics*, 95(9), p1083
[22] Alcott, Hunt (2011): "Social Norms and Energy Conservation", *Journal of Public Economics*, 95(9), p1082, 1087
[23] "Insights from Smart Meters: Identifying Specific Actions, Behaviors, and Characteristics That Drive Savings in Behavior-Based Programs." State and Local Energy Efficient Action Network (SEE Action) (2014), p8; the households are categorized as likely or not likely to use AC based on a model that estimates the likelihood that each household owns and uses AC.
[24] AIC Report, pp68-69; The exceptions are that expansion cohort two had approximately the same electricity savings for its first and second year in the program and expansion cohort three's gas savings was less their second year in the program that their first year (however, they experienced their highest savings in their third year.)
[25] Alcott, Hunt (2011): "Social Norms and Energy Conservation", *Journal of Public Economics*, 95(9), p1083
[26] Alcott, Hunt (2011): "Social Norms and Energy Conservation", *Journal of Public Economics*, 95(9), p1087. The weather during these two years was also comparable.
[27] Alcott H., & T. Rogers (2012) "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation" NBER Working Paper 18492, p1
[28] Alcott H., & T. Rogers (2012) "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation" NBER Working Paper 18492, p3
[29] Ibid

HERs can also be combined with rewards programs. In a recent program in San Diego, customers were sent HERs with messaging encouraging them to activate an online account which gave them gift cards as rewards for conserving or following online tips. Conservation impacts of 3.8% were measured, although there was no way to separate out the impacts of rewards and HERs alone.[30]

For existing AIC Behavioral Modification Program customers it seems reasonable that electricity impacts in the range of 1.20% to 1.98% will persist, as will gas savings of 0.37% to 1.12%. Given the maturity of the program and the fact that the number of reports sent has decreased, it is unlikely that these impacts will increase. In terms of adding new customers, it appears that most of the high-usage customers (who achieve higher percentage savings) have been reached. The AIC pilot targeted households with "higher than average energy consumption,"[31] and the next two cohorts added focused on the next level of "high use dual-fuel customers."[32] Thus, we expect percentage savings to be lower as the program is expanded. Based on the low baseline usage customers in the AIC original cohort, we would expect program expansions to have impacts that are 25% lower for electricity and 50% lower for gas.

Treatment in Modeling

Home Energy Reports in the Behavioral Modification program in the potential modeling are ultimately assumed to have electricity savings of 1.55% and natural gas savings of 0.82% of total home energy consumption.

Smart Thermostats and Apps

A lot of energy savings can come from modifying heating and cooling behaviors. Wi-Fi programmable thermostats have been a common subject of utility's pilot programs to predict possible savings. Some common features of Wi-Fi programmable thermostats include:

- remote access to unit and control of heating, ventilating, and air conditioning (HVAC) system using a web portal or smartphone app
- ability to create a custom schedule to reduce energy usage when user is away from the home
- reports on HVAC performance and energy history
- alerts for any HVAC issues or necessary maintenance
- displaying current weather and forecast information

In addition, there are learning thermostats that use programming and algorithms to learn the user's behavior and create schedules that do not need to be manually set. Some learning thermostats also have the ability to display an icon, such as the Nest thermostat's leaf, that alerts users when they are choosing an energy-saving temperature.

Table B-1 below summarizes various studies that have examined the conservation impact of smart thermostats across the United States, along with their impact.

[30] Lessem N., & A. Faruqui (2015): "Impact Evaluation of the Manage-Act-Save Program", Report Prepared for Simple Energy and San Diego Gas & Electric
[31] AIC report, p10
[32] Ibid

Table B-1 Summary of Smart Thermostat Programs

	Source / Utility	Location	Gas / Electric	Year	Customer Type	# of Homes	% Therm Savings	% kWh Savings	Participation Rate
[1]	Energy Trust of Oregon (ETO)	OR	Electricity	2013 - 2014	Residential	11 - 92		-7.6% to 12.0%	22%
[2]	Honeywell	National	Electricity Natural Gas	2012	Residential	1,769	-8.5% to 18.0%	4.0% to 29.1%	N/A
	Liberty Utilities	NH	Natural Gas	2012 - 2013	Residential	23	8%		N/A
[3]	Massachusetts Program Admin (NGrid)	MA, RI	Natural Gas	2009 - 2012	Residential	23 - 43	8.0% to 10.0%		N/A
	Nest	Various	Electricity Natural Gas	2013 - 2014	Residential	735 (Gas) 624 (Electric)	9.6%	17.5%	N/A
[4]	Vectren Energy	IN	Electricity Natural Gas	2013 - 2015	Residential	300	12.5%	13.9%	N/A

Source: AEG

Notes:

Some ranges of savings include those for both programmable and Nest thermostats

Savings are given as percentage of thermal load

All results were obtained by experimental methods

[1] Participation rate is based on installation of thermostats among identified candidates. The pilot experienced high attrition rates.

[2] Sample size is small for some studies. Savings depend on climate zone.

[3] Electric savings were also calculated in this study, although it was done by the engineering method (and omitted for purposes of this analysis)

[4] Thermostats were offered to participants for free. The study suggests potentially lower savings from Nest Learning features, as such customers were less likely to install the accompanying app or connect to Wi-Fi

From this table we can see that the smart thermostats lead to electric savings in the range of -7.6% to 29.1%, and gas savings in the range of -8.5% to 18%. However it is also clear that the savings achieved are influenced by various factors including sample size and design. Most of the studies above use small samples including the Nest and Honeywell analyses, which include many smaller studies. The only study of moderate size was that by Vectren Energy. 600 dual-fuel participants were selected for the treatment group with half given a Nest Learning Thermostat and half given a standard programmable thermostat. 3,845 additional households were selected as a control group, and continued to use manual thermostats.

The results from this assessment showed that homes with a Nest Learning Thermostat had average gas savings of 12.5% of heating use, while programmable thermostats saved 5%. These savings can be attributed to the "Auto-Away" and "Auto-Schedule" features of the Nest thermostat which allows for temperature reduction during times when the house is unoccupied. Similarly, Nest thermostats had an average electric savings of 13.9% of cooling use, compared to 13.1% for programmable thermostats. [33] The study's authors suggest that potential savings may be lower than they would otherwise be since thermostats were given to participants for free, and such customers were less likely to install the accompanying phone / tablet apps or connect to Wi-Fi to use the Nest Learning features. Additionally, the study only measured impact after the first year, and there is the potential for this to change over time. For instance savings from the Nest thermostat could increase over time while that from programmable thermostats could decrease as users may override the settings. [34]

Depending on whether the reference group is programmable or manual thermostats, one may want to net off these impacts. The net impacts are 7.5% for gas and 0.8% for electric service. Given that programmable thermostats have been shown to be ineffectual in many longer term studies[35], it seems prudent to use the net numbers as a lower bound and the gross numbers as an upper bound, yielding 7.5 to 12.5 percent savings for gas and 0.8 to 13.9 percent for electric. The only study that had its participation rate readily available was that by the Energy Trust of Oregon at 22 percent. 20 percent seems like a reasonable participation rate if smart thermostats are distributed free of charge.

In some cases the smart thermostats are combined with smartphone apps, typically created by the behavioral software companies or the thermostat manufacturers. Using the apps allows customers to access HER information, set schedules, and receive push notifications. Between 2012 and 2014 a field assessment of Honeywell thermostats paired with the Opower app, which allowed remote HVAC control, was conducted among PG&E customers. The program was based on a recruit-and-deny design, with 695 volunteers randomly assigned to a control group and 693[36] randomly assigned to the treatment group. Data from these volunteers was collected using two online surveys – 2 months after thermostat installation and in February 2014.

Based on this assessment it was estimated that electricity savings was about 0.7% while gas energy savings was -1.4%. However, the study found that once pre-existing energy consumption differences between the treatment and control group were taken into account, "no significant electricity or natural gas savings were found at the 95% confidence level."[37, 38]

There are also some market barriers that prevent widespread usage of smart thermostats. These include the requirement that the customer must have broadband internet, and the cost as the

[33] Cadmus, "Evaluation of the 2013 – 2014 Programmable and Smart Thermostat Program," January 2015
[34] Cadmus, "Evaluation of the 2013 – 2014 Programmable and Smart Thermostat Program," January 2015p42
[35] The Environmental Protection Agency (EPA) revoked their Energy Star rating for this reason, see: https://www.energystar.gov/index.cfm?c=archives.thermostats_spec
[36] Of the 693, 505 had successful installations of the smart thermostat, and surveys were complete for 84% of them
[37] "Findings from the Opower/Honeywell Smart Thermostat Field Assessment" for PG&E. Data was gathered through two surveys – the first two months after the installation of the thermostat, and the second at the end of the assessment period in February 2014
[38] The authors acknowledge that the small sample sizes and "systematic differences between the treatment and control group" could have contributed to the lack of an effect (Ibid at 29). Part of the assessment was a survey that allowed customers to rank the features they thought most contributed towards helping them reduce energy consumption. Most respondents (70%) "cited the app as having the greatest impact."

technology is "offered at a premium cost to the incumbent technologies they are designed to replace."[39] Based on a survey of smart thermostat studies, it is estimated that the cost of using a smart thermostat is approximately $500 - $250 for the unit and $250 for installation.[40]

Treatment in Modeling

Smart thermostats in the potential modeling are ultimately assumed to have savings of 5.99% of cooling end-use energy and savings of 7.12% of heating end-use energy.

Other Feedback - Web Portals, IHDs and Alert Programs

Web portals are another common feature of behavioral software and HER programs like Opower and could also be created by the utility. The web portals usually allow online access to the same type of information that is included in the HERs but sometimes in much greater detail. The web portals often allow the user to look at historical energy usage over multiple time intervals as well as real-time energy usage. The web portals can also include customizable interface, comparisons, and detailed tips for saving energy. If paired with a Wi-Fi programmable thermostat, the user could also make changes to their settings and schedules.

In PY6, 5% of the treatment participants logged into the available portal for AIC. To our knowledge, we are not aware of studies that focus on the customer usage rate of web portals. However, a VaasaETT study reports that they "have not been very successful at attracting consumers (anecdotal figures from suppliers in the Nordic region indicate a typical uptake rate of 2-5%)."[41] While participation rates are low, it seems that engagement rates are higher. One utility had at least 845,800 customers participate in their web portal program by the end of their evaluation period (over two years) and 719,000 of those participants viewed their data in 2013. Of those that viewed their data, 51% of customers viewed it once and 39% between 2 and 6 times that year.[42] Another utility used both Aclara and Opower electronic HERs and when they were sent over the course of two and one months, respectively, they found that 51.7% and 39% were opened and both received around 3% click-through activity that would lead to a web portal.[43]

While many programs include web portals as a feature, they often do not report their impacts. A 2011 study that compared about 100 pilots found that web portals "have lowered consumption between 0.5% and 17%."[44]

Aside from the low uptake rates associated with web portals. Another potential drawback is that these accounts tend to only have access for the head of the account, but everyone in the household is using energy. Therefore, if only the head of the account is accessing the web portal, then they are the only one receiving the direct information that nudges conservation behaviors.

Alert programs can have different purposes for notifying the customer such as monetary goals, kWh goals, and possible tier changes (if a customer is likely to move into higher pricing tiers by the end of a billing cycle). Alert programs that are being offered typically send alerts via SMS text messaging or email and customers can choose which methods they prefer or both. SMS text messaging alerts have less content than email due to the character limits. Potential content that could be included in the alerts are:

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[39] "Findings from the Opower/Honeywell Smart Thermostat Field Assessment" for PG&E, p7
[40] Based on summary data from AEG
[41] "Case Study on Innovative Smart Billing for Household Consumers" VaasaETT (2013), p12
[42] "PG&E 2013 Program Year SmartMeter Program Enabled Demand Response and Energy Conservation Annual Report" PG&E (2014. the service was offered mid-November 2011 and has continued until the end of 2013. There was a data gap in 2012, where the company was not able to identify unique participants but this has been fixed for the 2013 year.
[43] "Southern California Gas Company Advanced Meter Semi-Annual Report" (2015), pp26-27
[44] Stromback et al. (2011): "The Potential of Smart Meter Enabled Programs to Increase Energy and Systems Efficiency: A Mass Pilot Comparison" VaasaETT, Global Energy Think Tank, p71; the "17% consumption reductions involved 55,000 households in Denmark over 3 years."

- monetary amount of the bill-to-date
- monetary amount for the projected next bill
- monetary seasonal comparisons (such as the previous year and same month bill amount)
- the number of days remaining in the current billing cycle
- monetary amount of the previous month's bill
- the number of days elapsed in the current billing cycle
- information about alert settings (opting out or changing type of alerts being received)

Because of the size limit of text messages, all of the previous features may not have been included in a SMS alert.

One utility offered its "Bill Alert" service to 38,000 residential customers and more than 3,200 customers enrolled to receive weekly updates.[45] This yields a participation rate of approximately 8.4%. Another utility offered an alert program as an option for customers with an installed smart meter. As of December 31 2013, there were more than 113,000 customers enrolled in the alerts program (out of the approximately 6 million customers in the service area) yielding a participation of approximately 1.9%.[46] Out of these 113,000, in 2013, 74,462 customers received alerts and of those more than half, 42,845 customers, also interacted with the web portal in that same year.[47] The impacts of the alerts program were evaluated based on a restricted population to avoid double counting, and the study found that customers enrolled in both the web presentment and alerts program, and those enrolled for only alerts "show an estimated savings between 260 and 295 kWh annually."[48] In another pilot with Bill Tracker Alerts, 93% of the customers were email only, 5% were SMS only, and 3% were SMS and email. The program had a retention rate of 92% and "[e]ighty-nine percent of the 'unsubscribes' were due to system factors such as account closures,"[49] rather than the customer choosing to unsubscribe from the service.

IHDs enable users to receive real-time feedback on their energy consumption, and thus modify their usage. They also include other features such as allowing users to set budgets, view current electricity prices and their expenditure thus far. Some IHDs also allow peer comparisons and consumption by appliance (Stromback et al., 2011)[50] The Sacramento's Residential Energy Use Behavior Change Pilot gave households an IHD and feedback on energy, lasting for 20 months covering 35,000 customers starting in 2008 with a low rejection rate (2%). Customers received real-time feedback, with customized energy conservation tips based on the demographic information of the household. The study reported an estimated 2.5% consumption reduction with higher energy savings achieved by higher usage customers and lower income populations. However a new study by SMUD on time varying rates found no incremental impacts on conservation from IHDs and no impact on sign up rates to the pricing programs.[51] The SMUD study also found that about two-thirds of the

[45] "Customer Participation in the Smart Grid – Lessons Learned" Central Maine Power (2014), p5. Central Maine Power has a customer base of more than 600,000.
[46] "PG&E 2013 Program Year SmartMeter Program Enabled Demand Response and Energy Conservation Annual Report" (2014). Number of customers with PG&E was estimated using information from http://www.pge.com/en/about/company/profile/index.page. Accessed August 25, 2015
[47] "PG&E 2013 Program Year SmartMeter Program Enabled Demand Response and Energy Conservation Annual Report" (2014)
[48] Ibid at Table 5-1. The evaluation was based on 26,415 participants enrolled only in Energy Alerts and 36,509 participants enrolled in both the alerts and the web presentment program
[49] "Southern California Gas Company Advanced Meter Semi-Annual Report" (2015), p28-29
[50] Stromback et al. (2011): "The Potential of Smart Meter Enabled Programs to Increase Energy and Systems Efficiency: A Mass Pilot Comparison" VaasaETT, Global Energy Think Tank, p13, 34
[51] Potter, Jennifer, Stephen George & Lupe Jimenez (2014): "SmartPricing Options Final Evaluation", Report Prepared for U.S. Department of Energy

opt-in customers who were still enrolled by the second summer never connected their device to the meter, while close to 42% of default customers never connected.[52] IHDs cost $94 to $255.[53]

Ameren Illinois already has a web portal and the capability to do bill alerts. Web portals have shown very little impacts on their own, but are most likely complements to other forms of feedback, such as home energy reports and there are certainly economies of scope in production since they use much of the same data and visualizations. Bill alerts have not been sufficiently tested to yield impacts, but are likely to do so if framed correctly. We estimate that participation would be in the 2 to 10 percent range with a conservative impact from 0 to 5 percent. The evidence on IHDs is mixed and the cost is high, since it is a standalone measure. As such we do not include IHDs in the other behavioral category, only web portals and bill alerts.

Treatment in Modeling

All these "other" behavioral savings are assumed to be captured in the potential study as part of other initiatives, specifically the existing Behavioral Modification program and Ameren's current billing process and customer portal.

[52] Potter, Jennifer, Stephen George & Lupe Jimenez (2014): "SmartPricing Options Final Evaluation", Report Prepared for U.S. Department of Energy p52. The study also found that approximately 95% of opt-in customers accepted IHDs, while only 21% - 24% of default customers did so. This can perhaps be attributed to the fact that default customers were required to take the extra step of requesting an IHD.
[53] Non-member pricing information from Kootenai Electric Cooperative available at http://kec.coopwebbuilder2.com/sites/keckec/files/Documents%20and%20PDFs/ihds_unit_info.pdf. Accessed August 24, 2015

Customer Adoption Factors

As described in Volume 3, in order to estimate the rate at which measures are phased into the study given market barriers such as customer preference, imperfect information, and commercial availability of technologies; we apply a set of customer adoption factors. These are also referred to as take rates or ramp rates. The values are the factors applied to the economic potential for a given measure in a given year to arrive at the realistic achievable or maximum achievable potential.

This appendix includes the customer adoption factors in the following tables:

- Table C-1 through C-12 represent Residential Customer Adoption Rates
- Table C-13 through C-18 represent Commercial Customer Adoption Rates
- Table C-19 through C-24 represent Industrial Customer Adoption Rates
- Table C-25 through C-28 represent Street Lighting Customer Adoption Rates

Table C-1 Residential Customer Adoption Rates – Electric Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Central AC	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Cooling	Room AC	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Cooling	Air-Source Heat Pump	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Cooling	Geothermal Heat Pump	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Heating	Electric Furnace	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Heating	Electric Room Heat	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Heating	Air-Source Heat Pump	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Heating	Geothermal Heat Pump	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Water Htg.	Water Heater (<= 55 Gal)	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Water Htg.	Water Heater (> 55 Gal)	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Int. Ltg.	General Service Screw-In	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%
Int. Ltg.	Linear Lighting	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%
Int. Ltg.	Exempted Screw-In	31%	31%	31%	32%	32%	32%	32%	33%	33%	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	36%	36%	36%
Ext. Ltg.	Screw-in	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%
Appliances	Refrigerator	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%
Appliances	Second Refrigerator	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%
Appliances	Freezer	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%
Appliances	Clothes Washer	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Appliances	Clothes Dryer	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Appliances	Dishwasher	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%
Appliances	Stove	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%
Appliances	Microwave	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%
Appliances	Dehumidifier	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%
Appliances	Air Purifier	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%
Electronics	Personal Computers	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%
Electronics	Monitor	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%
Electronics	Laptops	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%
Electronics	Printer/Fax/Copier	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%
Electronics	TVs	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%
Electronics	Set top Boxes/DVRs	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%
Electronics	Devices and Gadgets	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%
Misc.	Electric Vehicles	31%	31%	31%	32%	32%	32%	32%	33%	33%	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	36%	36%	36%

Misc.	Pool Pump	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Misc.	Pool Heater	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Misc.	Furnace Fan	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Misc.	Bathroom Exhaust Fan	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Misc.	Well Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Misc.	Miscellaneous	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%

Table C-2 Residential Customer Adoption Rates – Natural Gas Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Heating	Boiler	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Water Htg.	Water Heater (<= 55 Gal)	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Water Htg.	Water Heater (> 55 Gal)	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Appliances	Clothes Dryer	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Appliances	Stove	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%
Misc.	Pool Heater	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Misc.	Miscellaneous	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%

Table C-3 Residential Low Income Customer Adoption Rates – Electric Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Central AC	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Cooling	Room AC	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Cooling	Air-Source Heat Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Cooling	Geothermal Heat Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Electric Furnace	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Electric Room Heat	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Air-Source Heat Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Geothermal Heat Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Htg.	Water Heater (<= 55 Gal)	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Water Htg.	Water Heater (> 55 Gal)	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Int. Ltg.	General Service Screw-In	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%
Int. Ltg.	Linear Lighting	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%
Int. Ltg.	Exempted Screw-In	28%	28%	28%	29%	29%	29%	29%	30%	30%	30%	30%	31%	31%	31%	31%	32%	32%	32%	32%	33%	33%	33%

Ext. Ltg.	Screw-in	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%
Appliances	Refrigerator	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Appliances	Second Refrigerator	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Appliances	Freezer	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Appliances	Clothes Washer	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Appliances	Clothes Dryer	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Appliances	Dishwasher	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%
Appliances	Stove	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%
Appliances	Microwave	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%
Appliances	Dehumidifier	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%
Appliances	Air Purifier	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%
Electronics	Personal Computers	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Electronics	Monitor	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Electronics	Laptops	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Electronics	Printer/Fax/Copier	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Electronics	TVs	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%
Electronics	Set top Boxes/DVRs	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%
Electronics	Devices and Gadgets	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Misc.	Electric Vehicles	28%	28%	28%	29%	29%	29%	29%	30%	30%	30%	30%	31%	31%	31%	31%	32%	32%	32%	32%	33%	33%	33%
Misc.	Pool Pump	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Misc.	Pool Heater	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Misc.	Furnace Fan	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Misc.	Bathroom Exhaust Fan	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Misc.	Well Pump	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Misc.	Miscellaneous	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%

Table C-4 Residential Low Income Customer Adoption Rates – Natural Gas Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Boiler	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Htg.	Water Heater (<= 55 Gal)	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Water Htg.	Water Heater (> 55 Gal)	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Appliances	Clothes Dryer	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%

Appliances	Stove	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%
Misc.	Pool Heater	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Misc.	Miscellaneous	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%

Table C-5 Residential Customer Adoption Rates - Electric Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Central AC	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Cooling	Room AC	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Cooling	Air-Source Heat Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Cooling	Geothermal Heat Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Heating	Electric Furnace	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Heating	Electric Room Heat	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Heating	Air-Source Heat Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Heating	Geothermal Heat Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Water Htg.	Water Heater (<= 55 Gal)	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Water Htg.	Water Heater (> 55 Gal)	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Int. Ltg.	General Service Screw-In	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Int. Ltg.	Linear Lighting	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Int. Ltg.	Exempted Screw-In	20%	20%	20%	20%	21%	21%	21%	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%	25%
Ext. Ltg.	Screw-in	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Appliances	Refrigerator	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Appliances	Second Refrigerator	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Appliances	Freezer	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Appliances	Clothes Washer	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Appliances	Clothes Dryer	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Appliances	Dishwasher	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Appliances	Stove	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Appliances	Microwave	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Appliances	Dehumidifier	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Appliances	Air Purifier	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Electronics	Personal Computers	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Electronics	Monitor	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Electronics	Laptops	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%

Electronics	Printer/Fax/Copier	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Electronics	TVs	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%
Electronics	Set top Boxes/DVRs	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%
Electronics	Devices and Gadgets	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Misc.	Electric Vehicles	20%	20%	20%	20%	21%	21%	21%	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%	25%
Misc.	Pool Pump	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Misc.	Pool Heater	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Misc.	Furnace Fan	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Misc.	Bathroom Exhaust Fan	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Misc.	Well Pump	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Misc.	Miscellaneous	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%

Table C-6 Residential Customer Adoption Rates – Natural Gas Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Heating	Boiler	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Water Htg.	Water Heater (<= 55 Gal)	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Water Htg.	Water Heater (> 55 Gal)	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Appliances	Clothes Dryer	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Appliances	Stove	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Misc.	Pool Heater	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Misc.	Miscellaneous	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%

Table C-7 Residential Low Income Customer Adoption Rates - Electric Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Central AC	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Cooling	Room AC	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Cooling	Air-Source Heat Pump	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Cooling	Geothermal Heat Pump	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Heating	Electric Furnace	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Heating	Electric Room Heat	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Heating	Air-Source Heat Pump	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Heating	Geothermal Heat Pump	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%

Water Htg.	Water Heater (<= 55 Gal)	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Water Htg.	Water Heater (> 55 Gal)	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Int. Ltg.	General Service Screw-In	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Int. Ltg.	Linear Lighting	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Int. Ltg.	Exempted Screw-In	19%	20%	20%	20%	20%	21%	21%	21%	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%
Ext. Ltg.	Screw-in	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Appliances	Refrigerator	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Second Refrigerator	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Freezer	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Clothes Washer	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Clothes Dryer	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Dishwasher	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Appliances	Stove	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Appliances	Microwave	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Appliances	Dehumidifier	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%
Appliances	Air Purifier	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%
Electronics	Personal Computers	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Electronics	Monitor	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Electronics	Laptops	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Electronics	Printer/Fax/Copier	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Electronics	TVs	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%
Electronics	Set top Boxes/DVRs	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Electronics	Devices and Gadgets	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Misc.	Electric Vehicles	19%	20%	20%	20%	20%	21%	21%	21%	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%
Misc.	Pool Pump	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Misc.	Pool Heater	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Misc.	Furnace Fan	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Misc.	Bathroom Exhaust Fan	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Misc.	Well Pump	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Misc.	Miscellaneous	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%

Table C-8 Residential Low Income Customer Adoption Rates – Natural Gas Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Heating	Boiler	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Water Htg.	Water Heater (<= 55 Gal)	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Water Htg.	Water Heater (> 55 Gal)	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Appliances	Clothes Dryer	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Appliances	Stove	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Misc.	Pool Heater	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Misc.	Miscellaneous	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%

Table C-9 Residential Customer Adoption Rates – Non-Equipment Measures, Maximum Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Ducting	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Foundation	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Basement Sidewall	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Floor	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Building Shell - Air Sealing	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Radiant Barrier	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Wall Cavity	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Insulation - Wall Sheathing	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Ducting - Repair and Sealing	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%
Windows - High Efficiency	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%
Windows - Install Reflective Film	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%
Doors - Storm and Thermal	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%
Ductless Mini Split Heat Pump	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Attic Fan - Photovoltaic - Installation	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Ceiling Fan - ENERGY STAR	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Whole-House Fan - Installation	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Thermostat - Clock/Programmable	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%
Thermostat - Programmable/Interactive	72%	73%	74%	76%	77%	78%	79%	80%	81%	82%	83%	84%	85%	87%	88%	89%	90%	91%	92%	93%	94%	95%
Room AC - Removal of Second Unit	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%
Central AC - Maintenance	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%
Central Heat Pump - Maintenance	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%
Water Heater - Faucet Aerators	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Heater - Low-Flow Showerheads	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Heater - Pipe Insulation	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%

Water Heater - Desuperheater	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%
Water Heater - Temperature Setback	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Heater - Tank Wrap	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%
Water Heater - Thermostatic Restrictor Shower Valve	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting - Occupancy Sensors	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Exterior Lighting - Photosensor Control	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Exterior Lighting - Photovoltaic Installation	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Exterior Lighting - Timeclock Installation	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Refrigerator - Decommissioning and Recycling	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%
Freezer - Decommissioning and Recycling	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%
Electronics - Smart Power Strips	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%
Space Heating - Heat Recovery Ventilator	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Pool Pump - Timer	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Pool/Spa cover	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
ENERGY STAR Home Design	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Boiler - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Furnace - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Boiler - Pipe Insulation	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Boiler - Hot Water Reset	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%

Table C-10 Residential Low Income Customer Adoption Rates – Non-Equipment Measures, Maximum Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Insulation - Ducting	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%
Insulation - Foundation	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Insulation - Basement Sidewall	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%

Insulation - Floor	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Building Shell - Air Sealing	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Insulation - Radiant Barrier	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Insulation - Wall Cavity	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Insulation - Wall Sheathing	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Ducting - Repair and Sealing	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Windows - High Efficiency	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Windows - Install Reflective Film	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Doors - Storm and Thermal	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Ductless Mini Split Heat Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Attic Fan - Photovoltaic - Installation	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Ceiling Fan - ENERGY STAR	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Whole-House Fan - Installation	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Thermostat - Clock/Programmable	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Thermostat - Programmable/Interactive	59%	60%	61%	62%	63%	64%	65%	66%	68%	69%	70%	71%	72%	73%	74%	75%	76%	77%	79%	80%	81%	82%
Room AC - Removal of Second Unit	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Central AC - Maintenance	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Central Heat Pump - Maintenance	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Water Heater - Faucet Aerators	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Water Heater - Low-Flow Showerheads	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Water Heater - Pipe Insulation	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Water Heater - Desuperheater	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Water Heater - Temperature Setback	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Water Heater - Tank Wrap	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Water Heater - Thermostatic Restrictor Shower Valve	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Interior Lighting - Occupancy Sensors	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%

Exterior Lighting - Photosensor Control	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Exterior Lighting - Photovoltaic Installation	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Exterior Lighting - Timeclock Installation	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Refrigerator - Decommissioning and Recycling	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Freezer - Decommissioning and Recycling	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%
Electronics - Smart Power Strips	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%
Space Heating - Heat Recovery Ventilator	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%
Pool Pump - Timer	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Pool/Spa cover	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
ENERGY STAR Home Design	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Boiler - Maintenance	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%
Furnace - Maintenance	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%
Boiler - Pipe Insulation	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%
Boiler - Hot Water Reset	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%

Table C-11 Residential Customer Adoption Rates – Non-Equipment Measures, Realistic Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Insulation - Ducting	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Insulation - Foundation	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Insulation - Basement Sidewall	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Insulation - Floor	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Building Shell - Air Sealing	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Insulation - Radiant Barrier	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Insulation - Wall Cavity	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%

Insulation - Wall Sheathing	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Ducting - Repair and Sealing	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Windows - High Efficiency	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%
Windows - Install Reflective Film	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%
Doors - Storm and Thermal	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%
Ductless Mini Split Heat Pump	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Attic Fan - Photovoltaic - Installation	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Ceiling Fan - ENERGY STAR	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Whole-House Fan - Installation	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%
Thermostat - Clock/Programmable	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Thermostat - Programmable/Interactive	66%	67%	68%	69%	70%	71%	72%	73%	74%	75%	76%	77%	78%	79%	80%	81%	82%	83%	84%	85%	86%	87%
Room AC - Removal of Second Unit	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Central AC - Maintenance	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Central Heat Pump - Maintenance	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%
Water Heater - Faucet Aerators	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%
Water Heater - Low-Flow Showerheads	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%
Water Heater - Pipe Insulation	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Water Heater - Desuperheater	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%
Water Heater - Temperature Setback	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%
Water Heater - Tank Wrap	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Water Heater - Thermostatic Restrictor Shower Valve	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%
Interior Lighting - Occupancy Sensors	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Exterior Lighting - Photosensor Control	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Exterior Lighting - Photovoltaic Installation	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Exterior Lighting - Timeclock Installation	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Refrigerator - Decommissioning and Recycling	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%

Freezer - Decommissioning and Recycling	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Electronics - Smart Power Strips	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%
Space Heating - Heat Recovery Ventilator	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Pool Pump - Timer	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Pool/Spa cover	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
ENERGY STAR Home Design	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%
Boiler - Maintenance	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Furnace - Maintenance	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%
Boiler - Pipe Insulation	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%
Boiler - Hot Water Reset	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%

Table C-12 Residential Low Income Customer Adoption Rates – Non-Equipment Measures, Realistic Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Ducting	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Foundation	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Basement Sidewall	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Floor	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Building Shell - Air Sealing	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Radiant Barrier	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Wall Cavity	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Insulation - Wall Sheathing	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Ducting - Repair and Sealing	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Windows - High Efficiency	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%
Windows - Install Reflective Film	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%
Doors - Storm and Thermal	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%

Ductless Mini Split Heat Pump	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Attic Fan - Photovoltaic - Installation	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Ceiling Fan - ENERGY STAR	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Whole-House Fan - Installation	19%	20%	20%	21%	21%	22%	22%	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%
Thermostat - Clock/Programmable	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Thermostat - Programmable/Interactive	53%	54%	55%	56%	57%	58%	59%	60%	61%	62%	63%	64%	65%	66%	67%	68%	69%	70%	71%	72%	73%	74%
Room AC - Removal of Second Unit	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%
Central AC - Maintenance	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Central Heat Pump - Maintenance	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Water Heater - Faucet Aerators	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Water Heater - Low-Flow Showerheads	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Water Heater - Pipe Insulation	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Water Heater - Desuperheater	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Water Heater - Temperature Setback	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Water Heater - Tank Wrap	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%
Water Heater - Thermostatic Restrictor Shower Valve	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%
Interior Lighting - Occupancy Sensors	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%
Exterior Lighting - Photosensor Control	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%
Exterior Lighting - Photovoltaic Installation	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%
Exterior Lighting - Timeclock Installation	23%	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%
Refrigerator - Decommissioning and Recycling	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Freezer - Decommissioning and Recycling	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%
Electronics - Smart Power Strips	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%
Space Heating - Heat Recovery Ventilator	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Pool Pump - Timer	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Pool/Spa cover	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%

ENERGY STAR Home Design	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Boiler - Maintenance	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Furnace - Maintenance	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%	38%	38%
Boiler - Pipe Insulation	23%	24%	24%	25%	25%	26%	26%	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%
Boiler - Hot Water Reset	27%	27%	28%	28%	29%	29%	30%	30%	31%	31%	32%	32%	33%	33%	34%	34%	35%	35%	36%	36%	37%	37%

Table C-13 Commercial Customer Adoption Rates – Electric Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Air-Cooled Chiller	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Water-Cooled Chiller	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	RTU	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Central AC	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Room AC	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Air-Source Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Geothermal Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	PTHP	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Electric Furnace	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Electric Room Heat	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Air-Source Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Geothermal Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	PTHP	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Ventilation	Ventilation	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Water Heating	Water Heater	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Interior Lighting	Screw-in	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting	Linear Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting	High-Bay Fixtures	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Screw-in	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Area Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Linear Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Refrigeration	Walk-in Refrigerator/Freezer	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration	Reach-in Refrigerator/Freezer	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration	Glass Door Display	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration	Open Display Case	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration	Icemaker	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration	Vending Machine	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Food Preparation	Oven	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Fryer	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Dishwasher	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Hot Food Container	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Steamer	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%

Food Preparation	Griddle	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Office Equipment	Desktop Computer	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Office Equipment	Laptop	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Office Equipment	Server	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Office Equipment	Monitor	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Office Equipment	Printer/Copier/Fax	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%
Office Equipment	POS Terminal	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Miscellaneous	Non-HVAC Motors	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Miscellaneous	Pool Pump	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%
Miscellaneous	Pool Heater	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%
Miscellaneous	Miscellaneous	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%

Table C-14 Commercial Customer Adoption Rates – Natural Gas Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Boiler	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Unit Heater	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Water Heating	Water Heater	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Food Preparation	Oven	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Fryer	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Broiler	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Griddle	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Range	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Steamer	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Food Preparation	Commercial Food Prep Other	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Miscellaneous	Pool Heater	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%
Miscellaneous	Miscellaneous	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%

Table C-15 Commercial Customer Adoption Rates – Electric Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Air-Cooled Chiller	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Water-Cooled Chiller	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	RTU	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Central AC	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Room AC	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Air-Source Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Geothermal Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	PTHP	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Electric Furnace	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Electric Room Heat	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Air-Source Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Geothermal Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	PTHP	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Ventilation	Ventilation	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Water Heating	Water Heater	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Interior Lighting	Screw-in	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting	Linear Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting	High-Bay Fixtures	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Screw-in	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Area Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Linear Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Walk-in Refrigerator/Freezer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Reach-in Refrigerator/Freezer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Glass Door Display	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Open Display Case	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Icemaker	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Refrigeration	Vending Machine	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Oven	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Fryer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Dishwasher	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Hot Food Container	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Steamer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%

Food Preparation	Griddle	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	Desktop Computer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	Laptop	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	Server	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	Monitor	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	Printer/Copier/Fax	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Office Equipment	POS Terminal	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Non-HVAC Motors	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Pool Pump	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Pool Heater	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Miscellaneous	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%

Table C-16 Commercial Customer Adoption Rates – Natural Gas Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Boiler	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Heating	Unit Heater	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Heating	Water Heater	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Oven	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Fryer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Broiler	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Griddle	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Range	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Steamer	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Food Preparation	Commercial Food Prep Other	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Pool Heater	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Miscellaneous	Miscellaneous	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%

Table C-17 Commercial Customer Adoption Rates – Non-Equipment Measures, Maximum Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Ducting	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Foundation	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Radiant Barrier	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Wall Cavity	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
HVAC - Duct Repair and Sealing	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%
Windows - High Efficiency	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Cool Roofs	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Chiller - VSD on Fans	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%	81%	81%	82%
Chiller - Chilled Water Reset	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Chiller - Chilled Water Variable-Flow System	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%	81%	81%	82%
HVAC - Economizer	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Space Heating - Heat Recovery Ventilator	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Gas Boiler - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Furnace - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Boiler - Hot Water Reset	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%
Steam Trap Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Boiler - High Turndown	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Gas Boiler - O2 Trim	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Gas Boiler - Parallel Positioning Control	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
HVAC - Shut Off Damper	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Gas Boiler - Stack Economizer	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Gas Boiler - Insulate Steam Lines/Condensate Tank	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Ventilation - ECM on VAV Boxes	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Ventilation - Variable Speed Control	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%

Ventilation - Notched V-Belts	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
RTU - Maintenance	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%
RTU - Advanced Controls	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Water Heater – Drain-water Heat Recovery	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Water Heater - Faucet Aerators/Low Flow Nozzles	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%
Water Heater - Pipe Insulation	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Water Heater - Pre-Rinse Spray Valve	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%
Water Heater - Ozone Laundry	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%
Water Heater - Central Controls	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%
Interior Lighting - Daylighting Controls	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - LED Exit Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting - Occupancy Sensors	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - Timeclocks and Timers	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - Skylights	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Fluorescent - Bi-Level Fixture	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Fluorescent - Delamp and Install Reflectors	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting - Bi-Level Fixture	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Exterior Lighting - Enhanced Controls	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Exterior Lighting - Photovoltaic Installation	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Refrigeration - Anti-Sweat Heater	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigeration - Door Gasket Replacement	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigeration - Evaporator Fan Controls	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigeration - Floating Head Pressure	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration - Strip Curtain	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigeration - High Efficiency Compressor	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigeration - Variable Speed Compressor	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%

Refrigerator - Auto Door Closer	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Refrigerator - Economizer	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration - Demand Defrost	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Grocery - Display Case - LED Lighting	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Grocery - Display Case Motion Sensors	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Grocery - Open Display Case - Night Covers	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Grocery - ECMs for Display Cases	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%
Vending Machine - Occupancy Sensor	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Cooking - Exhaust Hoods with Sensor Control	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%
Office Equipment - Smart Power Strips	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Office Equipment - Computer Power Management Software	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Ventilation - Demand Controlled	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Thermostat - Programmable/Interactive	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%
Lodging - Guest Room Controls	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Destratification Fans (HVLS)	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Data Center - Air Flow Optimization and Commissioning	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Data Center - Server Virtualization	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%
Pool Pump - Timer	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%
Pool Heater - Night Covers	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%
Advanced New Construction Designs	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%	81%

Table C-18 Commercial Customer Adoption Rates – Non-Equipment Measures, Realistic Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Insulation - Ducting	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Insulation - Foundation	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%

Insulation - Radiant Barrier	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Insulation - Wall Cavity	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
HVAC - Duct Repair and Sealing	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Windows - High Efficiency	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Cool Roofs	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Chiller - VSD on Fans	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%
Chiller - Chilled Water Reset	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Chiller - Chilled Water Variable-Flow System	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%
HVAC - Economizer	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Space Heating - Heat Recovery Ventilator	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Gas Boiler - Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Furnace - Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Boiler - Hot Water Reset	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Steam Trap Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Boiler - High Turndown	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Gas Boiler - O2 Trim	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Gas Boiler - Parallel Positioning Control	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
HVAC - Shut Off Damper	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Gas Boiler - Stack Economizer	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Gas Boiler - Insulate Steam Lines/Condensate Tank	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Ventilation - ECM on VAV Boxes	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Ventilation - Variable Speed Control	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Ventilation - Notched V-Belts	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
RTU - Maintenance	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
RTU - Advanced Controls	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Water Heater – Drain-water Heat Recovery	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%

Water Heater - Faucet Aerators/Low Flow Nozzles	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Water Heater - Pipe Insulation	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Water Heater - Pre-Rinse Spray Valve	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%
Water Heater - Ozone Laundry	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Water Heater - Central Controls	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting - Daylighting Controls	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - LED Exit Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting - Occupancy Sensors	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - Timeclocks and Timers	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - Skylights	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Fluorescent - Bi-Level Fixture	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Fluorescent - Delamp and Install Reflectors	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting - Bi-Level Fixture	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Exterior Lighting - Enhanced Controls	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Exterior Lighting - Photovoltaic Installation	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Refrigeration - Anti-Sweat Heater	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigeration - Door Gasket Replacement	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigeration - Evaporator Fan Controls	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigeration - Floating Head Pressure	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Refrigeration - Strip Curtain	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigeration - High Efficiency Compressor	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigeration - Variable Speed Compressor	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigerator - Auto Door Closer	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Refrigerator - Economizer	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Refrigeration - Demand Defrost	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Grocery - Display Case - LED Lighting	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%

Grocery - Display Case Motion Sensors	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Grocery - Open Display Case - Night Covers	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Grocery - ECMs for Display Cases	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Vending Machine - Occupancy Sensor	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Cooking - Exhaust Hoods with Sensor Control	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%
Office Equipment - Smart Power Strips	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Office Equipment - Computer Power Management Software	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Ventilation - Demand Controlled	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Thermostat - Programmable/Interactive	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%
Lodging - Guest Room Controls	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Destratification Fans (HVLS)	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Data Center - Air Flow Optimization and Commissioning	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Data Center - Server Virtualization	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%
Pool Pump - Timer	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%
Pool Heater - Night Covers	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%
Advanced New Construction Designs	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%

Table C-19 Industrial Customer Adoption Rates – Electric Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Air-Cooled Chiller	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Water-Cooled Chiller	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	RTU	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Air-Source Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Cooling	Geothermal Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Electric Furnace	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Electric Room Heat	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Air-Source Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Geothermal Heat Pump	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Ventilation	Ventilation	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Interior Lighting	Screw-in	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting	Linear Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting	High-Bay Fixtures	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Screw-in	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Area Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting	Linear Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Process	Process Heating	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Process	Process Cooling	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Process	Process Refrigeration	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Process	Process Electrochemical	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Process	Process Other	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Motors	Pumps	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Motors	Fans & Blowers	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Motors	Compressed Air	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Motors	Conveyors	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Motors	Other Motors	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Miscellaneous	Miscellaneous	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%

Table C-20 Industrial Customer Adoption Rates – Natural Gas Equipment Measures, Maximum Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Boiler	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Process Boiler	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Heating	Unit Heater	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Process	Process Heating	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Process	Process Cooling	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Process	Other Process	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Miscellaneous	Miscellaneous	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%

Table C-21 Industrial Customer Adoption Rates – Electric Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cooling	Air-Cooled Chiller	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Water-Cooled Chiller	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	RTU	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Air-Source Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Cooling	Geothermal Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Electric Furnace	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Electric Room Heat	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Air-Source Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Geothermal Heat Pump	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Ventilation	Ventilation	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Interior Lighting	Screw-in	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting	Linear Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting	High-Bay Fixtures	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Screw-in	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Area Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting	Linear Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Process	Process Heating	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Process	Process Cooling	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Process	Process Refrigeration	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Process	Process Electrochemical	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%

Process	Process Other	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Motors	Pumps	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Motors	Fans & Blowers	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Motors	Compressed Air	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Motors	Conveyors	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Motors	Other Motors	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Miscellaneous	Miscellaneous	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%

Table C-22 Industrial Customer Adoption Rates – Natural Gas Equipment Measures, Realistic Achievable Case

End Use	Technology	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Heating	Furnace	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Boiler	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Process Boiler	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Heating	Unit Heater	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Process	Process Heating	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Process	Process Cooling	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Process	Other Process	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Miscellaneous	Miscellaneous	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%

Table C-23 Industrial Customer Adoption Rates – Non-Equipment Measures, Maximum Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Ducting	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Insulation - Wall Cavity	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
HVAC - Duct Repair and Sealing	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%
Cool Roofs	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Chiller - VSD on Fans	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%	81%	81%	82%
Chiller - Chilled Water Reset	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Chiller - Chilled Water Variable-Flow System	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%	80%	81%	81%	82%
HVAC - Economizer	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Gas Boiler - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Furnace - Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Boiler - Hot Water Reset	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%
Steam Trap Maintenance	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%
Gas Boiler - O2 Trim	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Gas Boiler - Parallel Positioning Control	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Gas Boiler - Stack Economizer	79%	80%	80%	81%	81%	82%	82%	83%	83%	84%	84%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Gas Boiler - Insulate Steam Lines/Condensate Tank	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%
Ventilation - Variable Speed Control	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Ventilation - Notched V-Belts	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
RTU - Maintenance	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%
Interior Lighting - Daylighting Controls	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - LED Exit Lighting	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Interior Lighting - Occupancy Sensors	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - Timeclocks and Timers	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Lighting - Skylights	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Fluorescent - Bi-Level Fixture	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Interior Fluorescent - Delamp and Install Reflectors	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Exterior Lighting - Bi-Level Fixture	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Exterior Lighting - Enhanced Controls	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Exterior Lighting - Photovoltaic Installation	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%	80%
Thermostat - Programmable/Interactive	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%	79%	79%
Destratification Fans (HVLS)	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%

Process - Conductivity Controls	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Process - Controls on Fume Hoods	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Process - Timers and Controls	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Refrigeration - Floating Head Pressure	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%
Refrigeration - System Optimization	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%	77%	78%	78%
Pumping System - Equipment Upgrade	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Pumping System - System Optimization	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Pumping System - Variable Speed Drive	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Fan System - Equipment Upgrade	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Fan System - Flow Optimization	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Fan System - Variable Speed Drive	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Compressed Air - Equipment Upgrade	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Compressed Air - System Controls	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Compressed Air - Leak Management Program	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Compressed Air - Variable Speed Drive	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%
Compressed Air - Low Pressure-Drop Filters	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Compressed Air - Zero-Loss Condensate Drain	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Compressed Air - Engineered Nozzles	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Motors - Green Rewind	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Agriculture - Engine Block Timer	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Agriculture - High Speed Fans	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%
Agriculture - Live Stock Waterer	60%	60%	61%	61%	62%	62%	63%	63%	64%	64%	65%	65%	66%	66%	67%	67%	68%	68%	69%	69%	70%	70%

Table C-24 Industrial Customer Adoption Rates – Non-Equipment Measures, Realistic Achievable Case

Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Insulation - Ceiling	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Insulation - Ducting	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Insulation - Wall Cavity	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
HVAC - Duct Repair and Sealing	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Cool Roofs	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Chiller - VSD on Fans	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%
Chiller - Chilled Water Reset	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Chiller - Chilled Water Variable-Flow System	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%

HVAC - Economizer	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Gas Boiler - Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Furnace - Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Boiler - Hot Water Reset	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Steam Trap Maintenance	34%	35%	35%	36%	36%	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%
Gas Boiler - O2 Trim	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Gas Boiler - Parallel Positioning Control	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Gas Boiler - Stack Economizer	51%	52%	52%	53%	53%	54%	54%	55%	55%	56%	56%	57%	57%	58%	58%	59%	59%	60%	60%	61%	61%	62%
Gas Boiler - Insulate Steam Lines/Condensate Tank	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%
Ventilation - Variable Speed Control	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Ventilation - Notched V-Belts	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
RTU - Maintenance	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%
Interior Lighting - Daylighting Controls	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - LED Exit Lighting	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Interior Lighting - Occupancy Sensors	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - Timeclocks and Timers	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Lighting - Skylights	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Fluorescent - Bi-Level Fixture	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Interior Fluorescent - Delamp and Install Reflectors	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Exterior Lighting - Bi-Level Fixture	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Exterior Lighting - Enhanced Controls	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Exterior Lighting - Photovoltaic Installation	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%	55%
Thermostat - Programmable/Interactive	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%	55%
Destratification Fans (HVLS)	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Process - Conductivity Controls	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Process - Controls on Fume Hoods	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Process - Timers and Controls	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Refrigeration - Floating Head Pressure	37%	37%	38%	38%	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%
Refrigeration - System Optimization	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%	54%	54%
Pumping System - Equipment Upgrade	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Pumping System - System Optimization	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Pumping System - Variable Speed Drive	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Fan System - Equipment Upgrade	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Fan System - Flow Optimization	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%

Fan System - Variable Speed Drive	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Compressed Air - Equipment Upgrade	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Compressed Air - System Controls	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Compressed Air - Leak Management Program	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Compressed Air - Variable Speed Drive	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%
Compressed Air - Low Pressure-Drop Filters	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Compressed Air - Zero-Loss Condensate Drain	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Compressed Air - Engineered Nozzles	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Motors - Green Rewind	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Agriculture - Engine Block Timer	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Agriculture - High Speed Fans	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%
Agriculture - Live Stock Waterer	39%	39%	40%	40%	41%	41%	42%	42%	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%

Table C-25 Street Lighting Customer Adoption Rates – Equipment Measures, Maximum Achievable Case

Segment	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Company <200W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Company 200-299W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Company 300-400W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer <200W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer 200-299W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer 300-400W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer >400W	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%

Table C-26 Street Lighting Customer Adoption Rates – Equipment Measures, Realistic Achievable Case

Segment	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Company <200W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Company 200-299W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Company 300-400W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer <200W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer 200-299W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer 300-400W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer >400W	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%

Table C-27 Street Lighting Customer Adoption Rates – Non-Equipment Measures, Maximum Achievable Case

Segment	Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Company <200W	Smart Dimming Controller	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	36%	36%	36%	36%	37%	37%	37%	37%	38%	38%	38%	38%
Company 200-299W	Smart Dimming Controller	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	36%	36%	36%	36%	37%	37%	37%	37%	38%	38%	38%	38%
Company 300-400W	Smart Dimming Controller	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	36%	36%	36%	36%	37%	37%	37%	37%	38%	38%	38%	38%
Customer <200W	Smart Dimming Controller	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer 200-299W	Smart Dimming Controller	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer 300-400W	Smart Dimming Controller	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%
Customer >400W	Smart Dimming Controller	66%	67%	67%	68%	68%	69%	69%	70%	70%	71%	71%	72%	72%	73%	73%	74%	74%	75%	75%	76%	76%	77%

Table C-28 Street Lighting Customer Adoption Rates – Non-Equipment Measures, Realistic Achievable Case

Segment	Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Company <200W	Smart Dimming Controller	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%	25%	25%	25%	26%	26%	26%	26%	27%
Company 200-299W	Smart Dimming Controller	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%	25%	25%	25%	26%	26%	26%	26%	27%
Company 300-400W	Smart Dimming Controller	21%	22%	22%	22%	22%	23%	23%	23%	23%	24%	24%	24%	24%	25%	25%	25%	25%	26%	26%	26%	26%	27%
Customer <200W	Smart Dimming Controller	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer 200-299W	Smart Dimming Controller	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer 300-400W	Smart Dimming Controller	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%
Customer >400W	Smart Dimming Controller	43%	43%	44%	44%	45%	45%	46%	46%	47%	47%	48%	48%	49%	49%	50%	50%	51%	51%	52%	52%	53%	53%

Residential Market Research Questionnaire

Ameren Illinois Market Potential Questionnaire RESIDENTIAL
[POST TESTING CHANGES HIGHLIGHTED IN BLUE]

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must have primary or shared responsibility for making energy-related decisions
- The respondent must be at least 18 years old
- The respondent must be billed for electricity or natural gas directly by Ameren Illinois

Hard Quotas

Total: n=800

Soft Quotas

TBD

RESPONDENT IDENTIFICATION / VERIFICATION

Welcome. This survey is sponsored by Ameren Illinois.

Survey results will be collected and summarized by the American Institute of Consumer Studies, a market research company.

Please enter the 5-digit "Survey ID#" that appears on the survey invitation postcard you received. This ID# should be located just above the mailing address on the front side of your postcard.

Survey ID# : _____

****PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE.****

We at Ameren Illinois and the American Institute of Consumer Studies value your privacy. We will use the information you provide for research purposes only and will NOT share it with third parties for marketing purposes. Information you provide will be stored in a secure database. If you have any questions about the legitimacy of this research, please call Ameren Illinois at 800-755-5000.

INTRODUCTION

Thank you for taking the time to see if you and your household qualify to participate in a new research study about energy. The study is sponsored by Ameren Illinois, and it has a very important purpose. Ameren Illinois is delivering programs to help its customers use energy more efficiently. Your answers to this survey will help the company to improve these programs so that they work best for everyone.

Your household is one of a small number being asked to respond to the survey. To show our appreciation for your time and effort, we will send a **$20 Thank You** payment to **the first 800 people** who complete the survey.

You will first be asked a few questions to make sure your household qualifies to complete the full survey.

Note: If you need to pause the survey at any time, you can come back later to where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.

Please note: Any word or phrase that appears in blue, underlined font will have a pop-up box with definition when you mouse-over that word or phrase.

Please click "Next" to begin.

RESPONDENT SCREENING

S1. What is your role in making energy-related decisions about things such as: adjusting your home's thermostat, choosing to install insulation, selecting new appliances, large electronic devices, and light bulbs that are used in your home?

*Any reference to "your home," here and throughout the rest of this survey, refers specifically to the residence at **[READ IN ADDRESS FROM SAMPLE]**.*

1. You are primarily responsible for some or all of these decisions
2. Someone else in your household is primarily responsible for these types of decisions **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA R1] []**
3. You share responsibility for these decisions with others in your household, or with a landlord or property manager
4. Don't know **[TERMINATE AFTER S4]**

****PROGRAMMER NOTE: IF S1=2 SKIP TO R1 AND THEN TERMINATE. IF S1=1 OR 3, ASK S1a; IF S1=4 TERMINATE AFTER S4.****

S1a. All of our questions will relate to the survey address shown on your invitation postcard and below.

*Any reference to "your home," here and throughout the rest of this survey, will refer specifically to the residence at **[READ IN ADDRESS FROM SAMPLE]**.*

Is this your home or residence?

1. Yes
2. No

****PROGRAMMER NOTE: IF S1a=2, CONTINUE, BUT TERMINATE AFTER S4.****

S2. Which of the following categories represents your current age?

1. Less than 18 years old **[TERMINATE AFTER S4]**
2. 18-24
3. 25-34
4. 35-44
5. 45-54
6. 55-64
7. 65 or more years old

****PROGRAMMER NOTE: IF S2=2-7, ASK S2a; OTHERWISE TERMINATE AFTER S4.****

S2a. Do you, or does anyone else in your household work for a gas or electric utility company?

1. Yes **[TERMINATE AFTER S4]**
2. No

****PROGRAMMER NOTE: IF S2A=1, TERMINATE AFTER S4.****

S2b. Which of the following best describes your situation?
You are . . . ?

1. The homeowner and live here
2. Tenant and live here
3. Landlord and live here
4. A landlord and live elsewhere
5. Something else (Please specify _____)

S3. Which of the following best describes how your household is billed for **electricity**?

1. My household is billed directly by Ameren Illinois for the electricity we use
2. My household is NOT billed directly by Ameren Illinois for the electricity we use; the cost of our electricity is included in our rent, or is paid by someone else
3. My household is served by another utility; **not** Ameren Illinois
4. Don't know **[TERMINATE AFTER S4]**

****PROGRAMMER NOTE: IF S3=4, TERMINATE AFTER S4.****

S3b. Which of the following best describes how your household is billed for natural gas?

1. My household is billed directly by Ameren Illinois for the **natural gas** we use
2. My household is NOT billed directly by Ameren Illinois for the natural gas we use; the cost of our natural gas is included in our rent, or is paid by someone else
3. My household is served by another utility; **not** Ameren Illinois
4. Don't know **[TERMINATE AFTER S4]**

****PROGRAMMER NOTE: IF S3B=4, TERMINATE AFTER S4.****

****PROGRAMMER NOTE: IF S3=2 OR 3 AND S3b=2 OR 3, TERMINATE AFTER S4.****

S4. Who is billed by your gas or electric company for each of the following things used in your home?

	1. Your household	2. Someone else (e.g., landlord, property manager)	3. Not sure	4. Not used in your home
A. Heating all or some of the space in your house / unit	○	○	○	○
B. Air conditioning or cooling all or some of the space in your house / unit (including any fans, dehumidifiers, etc.)	○	○	○	○
C. Water heating	○	○	○	○
D. Lights on the <u>outside</u> of your home or building	○	○	○	○
E. Clothes washer	○	○	○	○
F. Clothes dryer	○	○	○	○
G. Pump for a swimming pool or hot tub	○	○	○	○
H. Heater for a swimming pool or hot tub	○	○	○	○

****PROGRAMMER NOTE: TERMINATE HERE IF DISQUALIFIED OR OVER-QUOTA AND GO TO TERMINATE LANGUAGE; OTHERWISE CONTINUE.****

S5. What is the **main fuel type** used for each of the purposes listed below?

	Main Fuel Type					
	1. Electricity	**2. Natural gas (piped gas)**	**3. Propane**	**4. Something else [SPECIFY]**	**5. Not sure**	**6. Not applicable**
[PROGRAMMER: ONLY DISPLAY THIS OPTION IF S4_A=1] 1. Heating all or some of the space in your house / unit	○	○	○	○	○	○
[PROGRAMMER: ONLY DISPLAY THIS OPTION IF S4_C=1]2. Hot water heating for your home	○	○	○	○	○	○
[PROGRAMMER: ONLY DISPLAY THIS OPTION IF S4_D=1]3. Cooking	○	○	○	○	○	○
[PROGRAMMER: ONLY DISPLAY THIS OPTION IF S4_E=1] 4. Clothes dryer	○	○	○	○	○	○

****PROGRAMMER NOTE: IF S4_B=1, CONTINUE, OTHERWISE SKIP TO INSTRUCTION BEFORE S8.****

S6. Which of the following systems/equipment do you use to **cool** your home, even if only once in a while, and / or for part of your home? *Select all that apply.*

01. Central air conditioner
02. One or more room air conditioners
03. Air-source heat pump
04. Geothermal heat pump
05. Whole-house fan or attic fan
06. One or more portable dehumidifiers
07. One or more ceiling fans
08. One or more window or room fans
97. Other **[SPECIFY]**
98. Not sure **[EXCLUSIVE]**
00. My home has no cooling systems/equipment **[EXCLUSIVE]**

****PROGRAMMER NOTE: IF MORE THAN 1 ITEM SELECTED IN S6, DISPLAY S7, ONLY DISPLAY ITEMS SELECTED IN S6; OTHERWISE AUTOCODE S7=S6 AND SKIP TO S8.****

S7. Which one of these cooling systems/equipment do you use to cool **all or most** of your home? **[ONLY DISPLAY ITEMS SELECTED IN S6]**

01. Central air conditioner
02. One or more room air conditioners
03. Air-source heat pump
04. Geothermal heat pump
05. Whole-house fan or attic fan
06. One or more portable dehumidifiers
07. One or more ceiling fans
08. One or more window or room fans
97. Other **[SPECIFY]**
98. Not sure **[EXCLUSIVE]**
00. My home has no cooling systems/equipment **[EXCLUSIVE]**

****PROGRAMMER NOTE: IF S4_A=1, CONTINUE, OTHERWISE SKIP TO INSTRUCTION BEFORE R1.****

S8. Which of the following systems/equipment do you use to **heat** your home, even if only once in a while, and / or for part of your home? *Select all that apply.*

01. Central warm air furnace with ducts/vents to individual rooms
02. Central boiler with hot water/steam radiators or baseboards in individual rooms
03. Electric baseboard or electric coils radiant heating
04. An air-source heat pump
05. A geothermal heat pump
06. One or more wall furnaces
07. One or more fireplaces
08. One or more wood burning stoves
09. One or more wall-mounted space heaters
10. One or more portable space heaters
97. Other **[SPECIFY]**
98. Not sure **[EXCLUSIVE]**
00. My home has no heating systems/equipment **[EXCLUSIVE]**

****PROGRAMMER NOTE: IF MORE THAN 1 ITEM SELECTED IN S8, DISPLAY S9, ONLY DISPLAY ITEMS SELECTED IN S8; OTHERWISE AUTOCODE S9=S8 AND SKIP TO INSTRUCTION BEFORE R1.****

S9. Which one of these heating systems/equipment do you use to heat **all or most** of your home? **[ONLY DISPLAY ITEMS SELECTED IN S8]**

01. Central warm air furnace with ducts/vents to individual rooms
02. Central boiler with hot water/steam radiators or baseboards in individual rooms
03. Electric baseboard or electric coils radiant heating
04. An air-source heat pump
05. A geothermal heat pump
06. One or more wall furnaces
07. One or more fireplaces
08. One or more wood burning stoves
09. One or more wall-mounted space heaters
10. One or more portable space heaters
97. **[INSERT S8_990 RESPONSE]**
98. Not sure **[EXCLUSIVE]**
00. My home has no heating system/equipment that heat all of most of my home **[EXCLUSIVE]**

****PROGRAMMER NOTE: IF S1=2, CONTINUE, OTHERWISE SKIP TO EITHER "TERMINATE" LANGUAGE OR "INVITATION" LANAGUAGE AS APPROPRIATE.****

R1. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your household who has specific knowledge about the way your household makes decisions about energy-related issues are made for your home.
We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey:
[INSERT URL THAT INCLUDES SURVEY ID#]
[THEN DISPLAY "Thank you for your time." AND TERMINATE]

TERMINATE LANGUAGE FOR NON-QUALIFYING OR OVER-QUOTA RESPONDENTS

We truly appreciate your time and effort in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this time, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your home can save money on your energy bills, please visit us at www.actonenergy.com.

Thank you. Have a nice day!

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far! You qualify for the survey. We appreciate your time in filling out the survey as completely as possible.

The survey should take about 20 minutes to complete. Once you complete the survey you will be eligible to receive our $20 thank you payment. Information about how to receive this payment will be provided at the end of the survey.

Your responses are important to us, so please press "Next" to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything.

If you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the personalized URL to access your survey again. The survey will automatically take you to the point where you left off.

As you complete the survey, you will **not** be able to use your browser's "back" button. If you mistakenly press your browser's "back" button, you will need to press the "refresh" button to continue the survey.

HOUSEHOLD INFORMATION

****PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL SHOW POP-UP BOX WHEN THE RESPONDENT MOUSES OVER THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT.****

****PROGRAMMER NOTE: RANDOMIZE STATEMENTS.****

Q2b. Using a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree, please indicate how much your household agrees or disagrees with each of the following statements about Ameren Illinois.

Note: If you don't feel like you are very familiar with Ameren Illinois on any of the following, please just give your best guess.

Ameren Illinois is…

[RANDOMIZE 3,5]	**Strongly disagree**								**Strongly agree**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
3. …a credible information source for the community on energy efficiency	○	○	○	○	○	○	○	○	○	○
5. …a company that actively promotes programs to help its customers save money	○	○	○	○	○	○	○	○	○	○

Q3a. Overall, how satisfied would you say your household is with the service provided by Ameren Illinois?

Not at all satisfied								**Extremely satisfied**	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: RANDOMIZE STATEMENTS.****

Q4a. Using a 10-point scale, where '1' means it is not at all important and '10' means it is extremely important, please indicate how important it is to your household that Ameren Illinois do the following things, even if that means you would have to pay a little more in order for the company to pursue these types of initiatives.

[RANDOMIZE 1-3]	**Not at all important**								**Extremely important**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Actively encourage its customers to participate in energy saving and cost saving programs	○	○	○	○	○	○	○	○	○	○
2. Do everything possible to supply renewable, clean energy	○	○	○	○	○	○	○	○	○	○
3. Operate its business in a completely environmentally friendly manner	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: RANDOMIZE STATEMENTS.****

Q6a. We'd like to understand how your household as a whole thinks about using energy at your home. Using a 10-point scale where '1' means you strongly disagree, and '10' means you strongly agree, please indicate how much you agree or disagree with each of the following statements.

[RANDOMIZE 1-9]	**Strongly disagree**									**Strongly agree**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Comfort is very important to your household – even if it means spending more each month for energy	○	○	○	○	○	○	○	○	○	○
3. Realistically, there isn't much you can do to save money on energy costs	○	○	○	○	○	○	○	○	○	○
4. You just want to be left alone to use energy however you want in your home	○	○	○	○	○	○	○	○	○	○
6. Conserving energy at your home will make no difference to the quality of the environment overall	○	○	○	○	○	○	○	○	○	○
7. You would do more to make your home more energy efficient, but you don't know where to start	○	○	○	○	○	○	○	○	○	○
8. The threat from global warming is real, and significant	○	○	○	○	○	○	○	○	○	○
9. You are an "early adopter" of new home technologies	○	○	○	○	○	○	○	○	○	○

Q1. **Including yourself**, how many individuals normally live in your home?
Do not include anyone who is just visiting, those away in the military, or children who are away at college.

[RECORD NUMBER 1-20] individuals

Q2. Which of the following best describes your home at **[READ IN ADDRESS FROM SAMPLE]**?
01. Single-family house detached from any other houses

02. Single-family house attached to one or more houses
03. Multi-family house or building with 2-4 apartments/units
04. Multi-family house or building with 5 or more apartments/units
05. Mobile/manufactured home
97. Other **[SPECIFY]**

****PROGRAMMER NOTE: IF Q2=97, ASK Q2a; OTHERWISE SKIP TO Q4.****

Q2a. Rather than using one of the residence type descriptions we offered in the last question, you described your home as: "**[INSERT Q2=97 RESPONSE]**." Which of the following would you say best describes this dwelling?

Note: The term "single-family" does not necessarily mean that the individuals living in the house/building/structure must be family members. Rather, this term indicates individuals voluntarily living together in a single dwelling who share common areas and do not consider each other neighbors or tenants.

1. A **single-family fully detached house/building/structure** – a house/building/structure that is fully separated from any other house/building/structure (i.e., it has open space on all four sides of its ground-to-roof outer walls)

2. Either…
   - a **single-family semi-detached house/building/structure** – a house/building/structure that is **not** fully separated from all other houses/buildings/structures (i.e., it shares a wall with at least one other house/building/structure) and is occupied by a single party of individuals

   or…

   - **a multi-family house/building/structure**– a single house/building/structure that incorporates several relatively self-contained housing units, each of which are occupied by separate parties of individuals

   (This option includes any condominiums, town houses, row houses, duplexes, triplexes, apartment buildings, etc.)

Q4. About when was your home built?

01. Before 1940
02. 1940-1949
03. 1950-1959
04. 1960-1969
05. 1970-1979
06. 1980-1989
07. 1990-1999
08. 2000-2009
09. 2010-present
10. Not sure

Q6. What is the approximate square footage of your home? Please include only heated living space in your response.

If you are not certain, please give your best estimate.

1. Less than 500 sq. ft.
2. 500 – 999
3. 1,000 – 1,499
4. 1,500 – 1,999
5. 2,000 – 2,499
6. 2,500 – 2,999
7. 3,000 – 3,499
8. 3,500 – 3,999
9. 4,000 sq. ft. or more

Q7. How many stories or levels are there in your **[IF Q2=1 OR 5 OR Q2a=1, DISPLAY, "**home**"; IF Q2=2-4 OR Q2a=2, DISPLAY "**apartment / unit**"]**? Please do NOT count any basements or attics in your response.

1. 1 story / level
2. 2 stories / levels
3. 3 stories / levels
4. 4 or more stories / levels

Q8. How many bedrooms are in your home, include any that might be located in the basement or attic?

0. 0 / Studio/Efficiency apartment / SRO
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6 or more

Q9. How many bathrooms are in your home? (*Please consider a bathroom that does not include either a bathtub or shower as a half-bathroom.)*

a) Full bathrooms _____

b) Half bathrooms _____

****PROGRAMMER NOTE: IF S4_A=1 OR S4_B=1, CONTINUE, OTHERWISE SKIP TO Q24A.****

Q22. Does your home use one or more thermostats to control your heating and/or cooling system(s)? (Please select all that apply.)

1. Yes, a **programmable thermostat** (one that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week)
2. Yes, a **smart thermostat** (one that learns your schedule and automatically adjusts the temperature at different times of the day and/or different days of the week)
3. Yes, a **standard/manual thermostat** (one with a single setting for the internal temperature which you manually adjust)
4. No thermostat (exclusive)

****PROGRAMMER NOTE: IF Q22=1 OR 2, CONTINUE, OTHERWISE SKIP TO Q24A.****

Q22a. Does your programmable thermostat actually operate in a programmed mode for most of the year?

1. It is not programmed; we use it like a traditional thermostat
2. We occasionally run programmed settings
3. We always run programmed settings
4. Not sure

Q22b. Are you able to communicate with your thermostat over the internet or through your smart phone?

1. Yes, and we use this feature
2. Yes, but we do not use this feature
3. No

****PROGRAMMER NOTE: IF Q22b=1 OR 2, CONTINUE, OTHERWISE SKIP TO Q24A.****

Q22c. When you communicate with your thermostat, which device(s) do you regularly use to do so? *Check all that apply.*

Devices to communicate with your smart thermostat	Regularly use
1. Smart phone	☐
2. Computer	☐
3. Tablet	☐
4. None of the above **[EXCLUSIVE]**	☐

Q24a. What type of water heating system do you use in your home? *If you use more than one water heating system, answer for the system that is used most often*.

1. Standard tank
2. Heat pump water heater
3. Instantaneous / tankless system
4. Solar water heating system (not Photovoltaic)
5. Something else (please specify: _____)

LIGHTING

Thank you for your responses so far! Next we are going to ask you about your home's lighting.

Q27. About how many of the following types of light bulbs/lamps would you say you are currently using inside your home?

Your best estimate is fine, but please enter a whole number for each type of lamp / fixture.

Lamp/fixture type	Example Images	Number of interior lamps / fixtures
1. Traditional fluorescent tube-style lamps		**[RECORD NUM 0-9999]**
2. Compact fluorescent bulbs		**[RECORD NUM 0-9999]**
3. Other fluorescent lamps (circuline, U-type, etc.)		**[RECORD NUM 0-9999]**
4. Incandescent bulbs		**[RECORD NUM 0-9999]**
5. Screw-in LED bulbs		**[RECORD NUM 0-9999]**
6. LEDs that replace Linear Fluorescent Lights ("Panel LEDs" or "Tube LEDs")		**[RECORD NUM 0-9999]**
7. Halogen/Advanced incandescent light bulbs		**[RECORD NUM 0-9999]**
8. Other (all other lamps)		**[RECORD NUM 0-9999]**

Q30. Approximately how many of each of the following devices do you have to control lighting inside your home?

1. Timers: **[RECORD NUMBER 0-50]**
2. Motion detectors or occupancy sensors: **[RECORD NUMBER 0-50]**
3. Wifi enabled or smart-controllable lights: **[RECORD NUMBER 0-50]**

****PROGRAMMER NOTE: IF S4_D=1, ASK Q31; OTHERWISE SKIP TO Q31a.****

Q31. About how many of the each of the following types of light bulbs/lamps would you say you are currently on the outside of your home or residence? *Your best estimate is fine, but please enter whole numbers rather than ranges of numbers.*

	1.	2.	3.	4.	5.	
Area	**Conventional light bulbs /Incandescent lamps**	**Compact fluorescent lamps (CFLs)**	**Halogen light bulbs**	**LED lamps**	**Other [SPECIFY]**	**Total**
						
Outside your home	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[RECORD NUM 0-100]**	**[CALC TOTAL]**

Q31a. Over the last 2 years, about how many high efficiency CFL or LED bulbs would you say you installed that replaced traditional incandescent bulbs?

_____ [**RECORD NUMBER**]

****PROGRAMMER NOTE: ONLY DISPLAY ROWS >0 IN Q27.**; IF ALL Q27 ROWS =0, SKIP TO Q40]**

Q15. How many of the following types of bulbs did your home purchase in the **last 2 years**?

Light bulb type [ONLY DISPLAY ROWS >0 AT Q27]	**Bulbs purchased in the last 2 years**
1. Compact fluorescent light bulbs (CFLs)	**[RECORD NUM 0-100]**
2. Incandescent light bulbs	**[RECORD NUM 0-100]**
3. LED lamps (>0 for either 5 or 6 in Q27)	**[RECORD NUM 0-100]**
4. Halogen/Advanced incandescent light bulbs	**[RECORD NUM 0-100]**
5. Tubular fluorescent light bulbs	**[RECORD NUM 0-100]**
6. Other types of lights	**[RECORD NUM 0-100]**

Q40. How many of the following types of TV sets are used in your home?

	TV Set Type	Number of sets
2.	LCD TVs	**[RECORD NUM 0-9]**
3.	LED TVs	**[RECORD NUM 0-9]**
4.	Plasma TVs	**[RECORD NUM 0-9]**
5.	Other TVs	**[RECORD NUM 0-9]**
TOT.	**Total # of TV sets in your home:**	**[CALCULATE TOTAL]**

Q42. How many desktop and laptop computers are regularly used in your home?

	Computer Type	Number of Computers
1.	Desktops	**[RECORD NUM 0-9]**
2.	Laptops	**[RECORD NUM 0-9]**
3.	Tablets	**[RECORD NUM 0-9]**

Q44. How many of each of the following items are used in your home?

		Number
1.	Internet router / Cable set-top box / satellite set-top box / analog-to-digital TV converter set-top box	**[RECORD NUM 0-9]**
2.	Digital video recorder (TIVO, DVR)	**[RECORD NUM 0-9]**
3.	Stand-alone speakers and subwoofers that are part of a home theater system (not embedded in other devices like TVs or CD players)	**[RECORD NUM 0-9]**
4.	Gaming consoles (Xbox360, PS4, Wii, etc.)	**[RECORD NUM 0-9]**

Q67. How many plug-in electric vehicles do you garage at this residence?

0. None
1. One
2. Two or more
3. Not sure

Q68a. Are there any solar electric generation systems / panels (PV) operating at your home currently?

1. Yes
2. No

****PROGRAMMER NOTE: IF Q68a=1, CONTINUE, OTHERWISE SKIP TO Q15.****

Q68b. What is the approximate installed capacity of all of the PV systems at your home?

[ENTER NUMBER] Kilowatts of capacity

998. Don't know / Not sure

ENERGY EFFICIENCY ACTIONS
****PROGRAMMER NOTE: RANDOMIZE 1-4.****

Q15b. Which, if any, of the following items have you purchased for this residence in the **last 2 years**, and if these purchases have been made, were any of the new items specifically described as "high energy efficiency," or ENERGY STAR-qualified purchases?" *Please select one response for each row.*

[RANDOMIZE 1-4]	**Did not Purchase**	**Purchased "Standard Efficiency"**	**Purchased Highly Energy Efficient**
1. A new heating system	☐	☐	☐
2. New air conditioning equipment	☐	☐	☐
3. A new water heater	☐	☐	☐
4. A new refrigerator	☐	☐	☐

Q69. Which of the following other **energy efficiency measures** have been implemented in your home **within the last three years, or do you plan to implement in the next two years**?

Select all that apply for each time period. Select "Neither" in the appropriate column if you have not implemented / do not plan to implement any of the measures within that time period.

	Energy Efficiency Measures	**Have implemented in last 3 years**	**Plan to implement in next 2 years**	**Neither**
3.	Replacing windows with windows designated as "low-e" glass and/or have a gas core that increases their energy efficiency	☐	☐	☐
4.	Adding or upgrading insulation on exterior doors, walls, ceilings, or roofs	☐	☐	☐

Q70. Some utilities offer residential customers rebates or incentives to reduce the cost of highly efficient, or Energy Star, appliances or lighting. To the best of your knowledge, does Ameren Illinois offer any rebates or incentives of this type?

1. Yes
2. No
3. Not sure

****PROGRAMMER NOTE: IF Q70=1, CONTINUE, OTHERWISE SKIP TO Q73.****

Q71. Have you received a rebate or incentive payment from Ameren Illinois, or a third-party state organization, for installing one or more energy efficiency measures in the last two years?

1. Yes, we received a rebate for a single purchase
2. Yes, we received rebates for more than one purchase
3. Yes, we received rebates for all of our purchases
4. No, there are rebates available to us, but we have not used them
5. No, we are not eligible to receive rebates

****PROGRAMMER NOTE: IF Q71 NE 3 OR 5, CONTINUE, OTHERWISE SKIP TO Q73.****

Q72. Why have you not used rebates from Ameren Illinois [**PROGRAMMER: IF Q71=1 OR 2, INSERT "more often"**] for any new equipment or appliances~~,~~ you might have purchased, or other energy efficiency actions you might have taken in the last two years? **[PLEASE SELECT ALL THAT APPLY]**

1. We have not taken any actions that would have qualified for a rebate [**PROGRAMMER: EXCLUSIVE**]
2. It just did not occur to us to apply for a rebate
3. Rebates were not available at the time we applied
4. It seemed like too much trouble
5. Something else (Please specify: _____)

Q73. Although the purchase price of high efficiency light bulbs (CFLs or LEDs) is slightly higher than for standard incandescent bulbs, the real cost of a bulb is not just what it costs to buy, but also what it costs to use. Since high efficiency bulbs use a fraction of the electricity used by incandescent bulbs to produce the same amount of light, your electricity savings will pay back the initial price difference over time. And, with discounts that Ameren Illinois could provide, it would cost you even less to start using less and spending less on energy.

Two examples of discounts that Ameren Illinois could provide would be:

Purchase a High Efficiency Bulb that Produces the Same Amount of Light as a Standard 60 watt Incandescent bulb	**Instead of a Standard Bulb**
An 8 watt dimmable **LED** bulb, regularly $8, reduced to $3 with an Ameren discount	60 watt incandescent bulb at $1
A 15 watt dimmable **CFL** bulb, regularly $3, reduced to $2 with an Ameren discount	60 watt incandescent bulb at $1

If Ameren Illinois were to offer you discounts like this right now, how likely would you be to install at least some of these new LED or CFL bulbs in your home?

Not At All Likely To Do This									**Extremely Likely to Do This**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

****PROGRAMMER NOTE: RANDOMIZE STATEMENTS.****

Q76. Please tell us how much you agree or disagree with each of the following statements about Ameren Illinois's energy efficiency programs, and about energy efficient appliances and equipment in general.

[RANDOMIZE 1-3]	Strongly Disagree									Strongly agree
	1	2	3	4	5	6	7	8	9	10
1. I feel comfortable that we know exactly how to use Ameren Illinois's rebate programs effectively	○	○	○	○	○	○	○	○	○	○
2. We are well informed about the benefits of Ameren Illinois's energy efficiency programs	○	○	○	○	○	○	○	○	○	○
3. We really believe in the value of energy efficiency	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: RANDOMIZE EQUIPMENT.****

Q77. For each of the following types of equipment, please tell us how likely you are to replace that equipment or appliance with highly energy efficient / ENERGY STAR-qualified equipment the next time you need to do so, **regardless of whether or not** there are rebates available to reduce the cost of that equipment?

[RANDOMIZE 1-5]	Not at all likely to replace with highly energy efficient option								Extremely likely to replace with highly energy efficient option		Not Applicable
	1	2	3	4	5	6	7	8	9	10	
1. Existing incandescent lights	○	○	○	○	○	○	○	○	○	○	○
2. Existing heating system	○	○	○	○	○	○	○	○	○	○	○
3. Existing cooling system	○	○	○	○	○	○	○	○	○	○	○
4. Existing water heater	○	○	○	○	○	○	○	○	○	○	○
5. Existing personal computer	○	○	○	○	○	○	○	○	○	○	○

The next section of the survey asks for your reaction to energy efficiency programs that Ameren Illinois may be able to offer to residential customers like you.

Q26. Please assume that Ameren Illinois would offer you a rebate to take an action to become more energy efficient. As an example, consider that you can purchase a new primary HVAC system (heating, ventilation, and air-conditioning) that is "standard" efficiency or is "higher than standard" efficiency (sometimes labelled as ENERGY STAR). Higher efficiency systems typically cost more, but they use less energy. Often, the energy saved by using a more energy efficient piece of equipment can pay for the higher cost of that equipment within a few years.

Ameren Illinois might be able to offer a rebate to people that opt to purchase a higher efficiency heating and / or cooling system, or other types of appliances or pieces of equipment. Because these rebates would reduce the cost difference between a highly energy efficient unit and a standard unit, the rebate would mean that it would take less time to save on electricity, or natural gas, costs to make up for the higher initial cost of the more efficient unit. And remember that you would continue to save money on electricity costs, even after the energy efficient unit "paid for itself."

Please assume for now that Ameren Illinois could provide a rebate that meant you would save enough on electricity costs to pay for the additional cost of a more efficient heating or cooling system within **3 years**. Please use the scale below to indicate how likely you would be -- If you were going to acquire a new HVAC system -- to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency system?

Not At All Likely To Do This **Extremely Likely to Do This**

Not applicable/ Not our decision

1 2 3 4 5 6 7 8 9 10 11

****PROGRAMMER NOTE: IF Q26=7 TO 10, CONTINUE, OTHERWISE SKIP TO Q28.****

Q27b. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on gas or electricity to pay for the additional cost to buy a "higher than standard efficiency" HVAC system in **5 years**. If this were true, and you were going to acquire a new HVAC system, how likely would you be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely To Do This **Extremely Likely to Do This**

Not applicable/ Not our decision

1 2 3 4 5 6 7 8 9 10 11

****PROGRAMMER NOTE: IF Q26 =1-6, CONTINUE, OTHERWISE SKIP TO Q28A.****

Q28. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a "higher than standard efficiency" HVAC system in **1 year**. If this were true, and you were going to acquire a new cooling system, how likely

would you be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely **Extremely Likely**
Not applicable/
To Do This **to Do This**
Not our decision
1 2 3 4 5 6 7 8 9 10
11

****PROGRAMMER NOTE: ASK ALL RESPONDENTS.****

Q28a. Another alternative would be a situation in which the impact of the rebate from Ameren Illinois was that the initial cost of a "higher efficiency" / ENERGY STAR heating or cooling system was the same as the "Standard efficiency" system. In other words, there would be no incremental cost for the higher efficiency system, and in addition, all of the energy savings going forward would be savings that you would realize. If this were the case, and you were going to acquire a new heating or cooling system, how likely would you be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely **Extremely Likely**
Not applicable/
To Do This **to Do This**
Not our decision
1 2 3 4 5 6 7 8 9 10
11

****PROGRAMMER NOTE: IF Q28a =1-8, CONTINUE, OTHERWISE SKIP TO Q33.****

Q28b. Why would you not be extremely likely to select the higher efficiency / ENERGY STAR system? *(Please be as detailed as possible)*

_____

Q33. Now, for each of the other equipment listed below, let's assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **3 years** to pay for the higher cost associated with the higher efficiency / ENERGY STAR model. If this were true, how likely would you be to acquire the higher efficiency model if you needed to replace that equipment?

How likely would you be to…?

	Not at all likely to do this							**Extremely likely to do this**			**Not applicable/ Not our decision**
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
1. Install a high efficiency / ENERGY STAR refrigerator	○	○	○	○	○	○	○	○	○	○	○

2. Purchase high efficiency / energy star personal computer	○	○	○	○	○	○	○	○	○	○	○

Q130. In addition to offering programs that would help you buy more energy efficient equipment, Ameren Illinois might also be able to offer your household a rebate or other financial incentives to install a variety of control systems that could optimize the operational efficiency of your *existing* home's heating and cooling systems. For example, they might provide a rebate to help you install or upgrade an advanced programmable thermostat on your heating / cooling system to provide automation for this system. Once this smart, wifi enabled thermostat is installed, the energy saved could potentially make up for the cost of installing it within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the advanced programmable thermostat within **3 years**, how likely would you be to install this device (and take the rebate)?

	Not at all likely to do this									**Extremely likely to do this**	**Not our decision**	**Already have / do this**
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: ASK IF Q130=7 TO 10, OTHERWISE SKIP TO Q132.****

Q131. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing an advanced programmable thermostat. In this case, how likely would you be to install the thermostat, and take the rebate?

	Not at all likely to do this									**Extremely likely to do this**	**Not our decision**	**Already have / do this**
5 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: IF Q130 =1-6, CONTINUE, OTHERWISE SKIP TO Q140.****

Q132. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost of installing the advanced programmable thermostat in **1 year**. In this case, how likely would you be to install the thermostat, and take the rebate?

	Not at all likely to do this									**Extremely likely to do this**	**Not our decision**	**Already have / do this**
1 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: ASK ALL RESPONDENTS.****

Q140. Another alternative is that the rebate from Ameren Illinois would pay for the entire cost of purchasing and installing the advanced programmable thermostat so that there would be no initial cost to you. In this case, how likely would you be to take the rebate and install the thermostat?

	Not at all likely to do this									**Extremely likely to do this**	**Not our decision**	**Already have / do this**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: IF Q140 =1-8, CONTINUE, OTHERWISE SKIP TO Q151.****

Q141. Why would you not be extremely likely to install the advanced thermostat even if there were no initial cost to you?

_____

Q151. Finally, if Ameren Illinois offered rebates to purchase and install **higher than standard efficiency light bulbs** (higher than standard efficiency light bulbs could include compact fluorescents (CFLs) or LEDs). The energy saved from installing these higher efficiency bulbs could potentially make up for the associated cost of installing them within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing higher efficiency light bulbs within **3 years**, how likely would you be to install one or more of these bulbs (and take the rebate)?

Not At All Likely To Do This **Extremely Likely to Do This**

1 2 3 4 5 6 7 8 9 10

****PROGRAMMER NOTE: ASK IF Q151=7 TO 10; OTHERWISE SKIP TO Q153.****

Q152. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing the higher efficiency light bulbs. In this case, how likely would you be to install the one or more of these bulbs, and take the rebate?

Not At All Likely To Do This **Extremely Likely to Do This**

1 2 3 4 5 6 7 8 9 10

****PROGRAMMER NOTE: ASK IF Q151=1-6; OTHERWISE SKIP TO Q154.****

Q153. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **1 year** to pay for the cost of installing the higher efficiency

light bulbs. In this case, how likely would you be to install one or more of the bulbs, and take the rebate?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

Q154. Another alternative is that the rebate from Ameren Illinois would pay for the entire cost of purchasing and installing new, higher efficiency light bulbs, so that there would be no incremental cost to you compared to a standard efficiency light. In this case, how likely would you be to take the rebate and install the higher efficiency light bulbs?

Not At All Likely To Do This									Extremely Likely to Do This
1	2	3	4	5	6	7	8	9	10

****PROGRAMMER NOTE: IF Q154 =1-8, CONTINUE, OTHERWISE SKIP TO Q50.****

Q155. Why would you not be extremely likely to install the higher efficiency light bulbs?

_____

****PROGRAMMER NOTE: EACH RESPONDENT ONLY RECEIVES ONE OF Q50, Q51, Q52; RANDOMLY ROTATE.****

****PROGRAMMER NOTE: RANDOMIZE OPTIONS.****

Q50. We know that the rebate amount that Ameren Illinois might provide to you may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency light bulbs, like those we just discussed.

First, please indicate below how likely you would be to use a rebate and install new, higher efficiency light bulbs if you would save enough in 3 years to pay for the incremental cost of the bulbs, given the processes outlined below that would be involved in your receiving that rebate.

	Not at all likely to do this									**Extremely likely to do this**
[RANDOMIZE OPTIONS 1-5]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. The rebate is mailed to you as a check after you complete a rebate application that is submitted through the mail	○	○	○	○	○	○	○	○	○	○
2. The rebate is mailed to you as a check after you complete an online form	○	○	○	○	○	○	○	○	○	○
3. The rebate is credited to your bill after you complete an online form	○	○	○	○	○	○	○	○	○	○
4. An "instant rebate" is applied as a discount to the cost of the bulbs at the point of sale	○	○	○	○	○	○	○	○	○	○
5. A utility representative would come to your home and install the lights at no cost to you beyond what standard efficiency lights would cost	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: RANDOMIZE OPTIONS.****

Q51. We know that the amount of the rebate that Ameren Illinois might provide to you may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency light bulbs, like those we just discussed.

First, please indicate below how likely you would be to use a rebate and install new, higher efficiency light bulbs if you would save enough in 3 years to pay for the incremental cost of the bulbs, given the additional considerations outlined below.

	Not at all likely to do this									**Extremely likely to do this**
[PROGRAMMER: ROTATE OPTIONS 1-2]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Your household income is better than you expected for several months in a row, generating unexpected disposable income	○	○	○	○	○	○	○	○	○	○
2. You have unexpected expenses for several months in a row, meaning you have less money in your household budget than expected	○	○	○	○	○	○	○	○	○	○

****PROGRAMMER NOTE: RANDOMIZE 1-2 AND 3-4 AND RANDOMIZE 1-2 AND 3-4 AS BLOCKS.****

Q52. We know that the amount of the rebate that Ameren Illinois might provide to you may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency equipment, like those we just discussed.

Please indicate below how likely you would be to use a rebate and install new, higher efficiency equipment of the different types identified below if you would save enough in 3 years to pay for the incremental cost of the equipment, given the additional considerations outlined below.

	Not at all likely to do this									**Extremely likely to do this**
[PROGRAMMER: ROTATE OPTIONS 1 & 2, AND 3 & 4 SEPARATELY]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Install higher efficiency lights if:										
1. The color rendering provided by the bulbs is unfamiliar relative to that of traditional incandescent bulbs	○	○	○	○	○	○	○	○	○	○
2. Bulb designs are sleek, stylish, and clearly communicate a "green" concern to friends and neighbors	○	○	○	○	○	○	○	○	○	○
Install advanced programmable thermostat if:										
3. The thermostat's programmed schedule may occasionally override individual settings that people select	○	○	○	○	○	○	○	○	○	○
4. The thermostat also provides a companion website that allows you to view usage history and control thermostat settings in real time	○	○	○	○	○	○	○	○	○	○

ADDITIONAL HOUSEHOLD DEMOGRAPHICS

In order to help us classify your responses, the last few questions are on demographics.

Q56. What is your gender?

1. Male
2. Female

Q57. What is the highest level of education you have completed?

1. Less than a high school degree
2. High school degree
3. Technical/trade school program
4. Associates degree or some college
5. Bachelor's degree
6. Graduate / professional degree, e.g., J.D., MBA, MD, etc.
7. Professional certification, e.g., CPA, CNP, etc.

Q58. What is your current work status?

1. Employed full-time
2. Employed part-time
3. Not currently employed
4. Retired

990. Other **[SPECIFY]**

Q59. Which of the following categories includes your household's total annual income before taxes in 2014? Please include the income of **all** people living in your home in this figure.

1. Less than $60,000
2. $60,000 or more

****PROGRAMMER NOTE: IF Q59=1, DISPLAY OPTIONS 1-7 AND 13; IF Q59=2, DISPLAY OPTIONS 8-13]**

Q59a. Which of the following categories includes your household's total annual income before taxes in 2014? Please include the income of **all** people living in your home in this figure.

1. Less than $10,000
2. $10,000 – $14,999
3. $15,000 – $19,999
4. $20,000 – $29,999
5. $30,000 – $39,999
6. $40,000 –$49,999
7. $50,000 – $59,999
8. $60,000 – $74,999
9. $75,000 – $99,999
10. $100,000 – $124,999
11. $125,000 – $149,999
12. $150,000 or more
13. Prefer not to say

Q63. Which of the following best describes your race or ethnic background?

1. White, Caucasian
2. Black, African American, Caribbean American
3. American Indian (Native American), Alaska Native
4. Asian
6. Hispanic, Latino
5. Native Hawaiian, Pacific Islander

990. Other **[SPECIFY]**

7. Prefer not to say

CONCLUSION

****PROGRAMMER NOTE: IF S2B= 2, CONTINUE, OTHERWISE SKIP TO INSTRUCTION BEFORE Q66.****

Q64. You mentioned earlier that you are a tenant living in this home. It would be very helpful for us to also speak to your landlord about some of the issues associated with energy use at this property. Would you be willing to provide us with a name and telephone number for your landlord?

1. Yes
2. No

Q65. What is the name and telephone number for that person?

1. [Name]
2. [Telephone number]

****PROGRAMMER NOTE: IF S2B = 4, CONTINUE, OTHERWISE SKIP TO INCENTIVE NAME/ADDRESS COLLECTION SCREEN.****

Q66. You mentioned earlier that you are a landlord for this property, but living elsewhere. It would be very helpful for us to also speak to your tenant, or one of your tenants, about some of the issues associated with energy use at this property. Would you be willing to provide us with a name and telephone number for your tenant, or one of your tenants?

1. Yes
2. No

Q67b. What is the name and telephone number for that person?

1. [Name]
2. [Telephone number]

[INCENTIVE NAME/ADDRESS COLLECTION SCREEN]
Those are all the questions we have for you today. Thanks for your participation!

Q63b. To receive the $20 thank you payment you earned by completing our survey, please provide your name and address below.

A. Full name
C. Mailing Address Line #1
D. Mailing Address Line #2 (optional)
E. City
F. State
G. ZIP Code

****PROGRAMMER: INCLUDE OPTION FOR "**I would prefer not to receive the $20 thank you payment**"; IF SELECTED, SKIP TO INCENTIVE CONFIRMATION / GOODBYE SCREEN]**

****PROGRAMMER NOTE: CONFIRM CONTACT INFORMATION ON NEXT SCREEN.****

[INCENTIVE CONFIRMATION / GOODBYE SCREEN]
****PROGRAMMER NOTE: IF CHOOSE TO RECEIVE AN INCENTIVE, DISPLAY:** You have successfully submitted the information we need so we can send you your $20 thank you payment. This payment will be in the form of a check that will be mailed within 3-4 weeks to the address you provided.

If you would like information on how your home can save money on your energy bills, please visit us at http://www.actonenergy.com/.

Thank you very much for your help with our research. It is greatly appreciated! Have a nice day!

SURVEY CLOSED MESSAGE

We truly appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.

In order to achieve a representative sample for this survey, quotas with specific criteria needed to be designated. Because these quotas have now been filled, we are not accepting any more responses.

If you would like information on how your home can save money on your energy bills, please visit us at http://www.actonenergy.com/.

Thank you. Have a nice day!

DEFINITIONS

[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

<table>
<tr><th>Word / Phrase</th><th>Definitions</th></tr>
<tr><td>Advanced programmable thermostat</td><td>A programmable thermostat is used to automatically set times for energy saving modes; for example to decrease temperature set points during winter nights or increase temperatures during summer afternoons. An advanced programmable thermostat uses new technologies to automate this process or make it easier and more accessible. Examples are remote access to controls, dashboards, and reports over wifi and the internet; learning algorithms that can automate and customize your system's response based on preferences input over time; and communication from your utility and appliances through emails, text messages, and your mobile device.</td></tr>
<tr><td>Air-source heat pump</td><td>A single system that draws in outside air to use in both heating and cooling your home</td></tr>
<tr><td>Attic fan</td><td>A ventilation fan which regulates the heat level of a home's attic by exhausting hot air. Unlike a whole-house fan, which removes heat from the entire home, an attic fan only removes heat from the attic area of the home.</td></tr>
<tr><td>Central boiler with hot water/steam radiators or baseboards in individual rooms</td><td>A furnace that sends either hot water or steam to individual room radiators or baseboards to heat your home</td></tr>
<tr><td>Central warm air furnace with ducts/vents to individual rooms</td><td>A furnace that sends warm air to ducts or vents to heat your home</td></tr>
<tr><td>Combination refrigerator / freezer units</td><td>Units that contain both a refrigerator and a freezer.

This kind of unit comes in multiple configurations, such as:

<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Side-by-side freezer refrigerator</td><td>  </td><td>The freezer and refrigerator sections are adjacent to one another, allowing portions of both sections to appear at eye-level.</td></tr>
<tr><td>Top-mount freezer refrigerator</td><td>  </td><td>The freezer section of the unit appears at eye level, mounted above the refrigerator section.</td></tr>
<tr><td>Traditional bottom-mount freezer refrigerator</td><td>  </td><td>The freezer section of the unit is mounted below the refrigerator section of the unit, allowing the refrigerator section to be at eye-level. Sometimes the freezer consists of one or more pull-out freezer drawers.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>French door bottom-mount freezer refrigerator</td><td>  </td><td>The refrigerator section of the unit has dual / twin doors. The freezer section of the unit is mounted below the refrigerator section of the unit, allowing the refrigerator section to be more at eye-level. The freezer consists of one or more pull-out freezer drawers.</td></tr>
</table>
</td></tr>
<tr><td>Compact fluorescent lamp (CFL)</td><td>A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional shape for a light bulb</td></tr>
<tr><td>Conventional bulb / Incandescent lamp</td><td>A traditional screw-in light bulb that may range from 15 – 100 watts or more</td></tr>
<tr><td>Conventional water heater with storage tank</td><td>A traditional water heater that heats a tank of hot water, and keeps that tank of water hot at all times. Most tanks range from 30-80 gallons in size.</td></tr>
<tr><td>Dimming switches</td><td>Light switches that can work to dim lights, rather than simply turning them on and off</td></tr>
<tr><td>Double pane windows or better</td><td>Window systems that have two or more layers of glass with an insulating layer of air (or special gas) added between the glass layers</td></tr>
<tr><td>Dusk-to-dawn sensors</td><td>Electronic devices that use a light sensor (photocell) to automatically turn on outside lights at dusk and turn them off at dawn</td></tr>
<tr><td>Electric baseboard or electric coil radiant heating</td><td>Devices that use electricity directly to produce heat for your home from baseboards or under-floor heating.</td></tr>
<tr><td>ENERGY STAR</td><td>A label for some new appliances that indicate that the appliance meets the standards for high efficiency appliances</td></tr>
<tr><td>Freezer-only units</td><td>Units that function only as freezers (i.e., do NOT function as refrigerators).

This kind of unit comes in multiple configurations, such as:
<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Chest freezer</td><td>  </td><td>A freezer unit that opens from the top and often contains storage baskets.</td></tr>
<tr><td>Upright freezer</td><td>  </td><td>A freezer unit that opens from the front and contains shelf storage.</td></tr>
</table>
</td></tr>
<tr><td>Geothermal heat pump</td><td>A single system that uses water or fluid that circulates through underground piping to provide both heating and cooling for your home</td></tr>
</table>

<table>
<tr><td>Halogen/Advanced incandescent lamp</td><td>A type of lamp which uses filaments like a traditional incandescent bulb, but is also filled with inert gas and a small amount of halogen. Compared to traditional incandescent bulbs, halogen lamps get hotter, give off light of a brighter / whiter quality, and have a longer life span.</td></tr>
<tr><td>Heat pump water heater</td><td>A system that uses a refrigeration cycle in reverse to draw heat out of the surrounding air to provide hot water in a traditional water heater storage tank</td></tr>
<tr><td>H.I.D. lamp (mercury vapor, metal halide, sodium vapor)</td><td>High power outside lights with special bulbs that are typically only used for outside lighting</td></tr>
<tr><td>LED lamp</td><td>A "light emitting diode" lamp is an electronic form of lighting that does not use filaments like traditional incandescent bulbs, but instead, uses solid state electronics.</td></tr>
<tr><td>Low voltage lighting</td><td>Low power lights (often used under counters or in other similar situations) that use a much lower wattage than do most traditional incandescent lights</td></tr>
<tr><td>Motion detectors</td><td>Electronic devices that are used to control lights in a room so that when someone is moving in a room, the lights are on, but when there is no motion in the room for several minutes, the lights are turned off</td></tr>
<tr><td>Occupancy sensors</td><td>Electronic devices that are used to control lights in a room so that when someone is present the lights are on, but where there is no one in the room for several minutes, the lights are turned off</td></tr>
<tr><td>Refrigerator-only units</td><td>Units that have only a refrigerator function (i.e., do NOT have a freezer function). They are much less common than freezer-only units.

This kind of unit, which is sometimes called a freezerless refrigerator, comes in multiple configurations, such as:

<table>
<tr><th colspan="2">Unit Type</th><th>Description</th></tr>
<tr><td>Chest refrigerator</td><td>  </td><td>An all-refrigerator unit that opens from the top and often contains storage baskets.</td></tr>
<tr><td>Upright refrigerator</td><td>  </td><td>An all-refrigerator unit that opens from the front and contains shelf storage.</td></tr>
</table>
</td></tr>
<tr><td>Single pane windows</td><td>Traditional windows that have only a single pane of glass, without any insulating layer of air, or anything else inserted inside the glass. Note that single pane windows may have reflective film or other additions applied to the single layer of glass.</td></tr>
<tr><td>Smart strip</td><td>Controlled Power Strips (or Smart Strips) which are multi-plug power strips with the ability to automatically disconnect specific connected</td></tr>
</table>

	loads depending upon the power draw of a "control" load, also plugged into the strip. For example, if a desktop computer is the control load, when it shuts down it might also disconnect an associated monitor, printer, and scanner, thereby reducing standby power loads. The same can be true for a television controlling a DVD, DVR, and audio system. Uncontrolled outlets are also provided on the strip that are not affected by the control device and so are always providing power to any device plugged into it.
Tankless (instantaneous/on demand) water heater	A water heater that only heats water for delivery to your home when you ask for it by using hot water. These systems do not keep a tank of water hot at all times.
Timers	Timers are typically used to control lights, turning them on and off at specific times of the day
Tubular fluorescent lamp	Traditional fluorescent lights are generally tubes of 3 or more feet in length and are installed in special fixtures made specifically for these tubes
Wall furnace	A furnace that works "through the wall," meaning that it is a box that draws air directly from the outside and then warms it before sending the resulting warm air into a room.
Whole-house fan	A ventilation fan mounted in the ceiling of a central part of a home that removes heat from the *entire* home. It does this by first drawing that heat from the living areas of the home into the home's attic, and then pushing the heat trapped in the attic to the outside through vents. Unlike an attic fan, which only removes heat from a home's attic, a whole-house fan removes heat from the entire home.

Non-Residential Market Research Questionnaire

QUALIFYING CRITERIA AND QUOTAS

Qualifying Criteria

- The respondent must be familiar with the energy-related aspects of their business's operations at that location
- Utility bills must be paid for that location

Hard Quotas

- Total: n=800
- Other hard / soft quotas TBD based on sample design

Welcome. This survey is sponsored by Ameren Illinois.

Thank you for inquiring about this important survey about energy use. Information from the survey will assist Ameren Illinois in its efforts to develop energy efficiency programs that are best suited to helping our customers save money.

The information you provide will be kept confidential. Your completed survey will go directly to an independent research company, which will collect and analyze the results. If you have any concerns about the legitimacy of this survey, please call Ameren Illinois at 1-800-232-2477.

We are hoping that you, or someone else who is familiar with the energy operations at the facility located at the address that was listed on the invitation postcard you received, will be able to complete the survey. As a gesture of gratitude for your time, we will send a $75 thank you payment **only to the FIRST 800** qualifying business respondents who complete the survey.

To complete this survey you will need the 5-digit Survey ID # printed above your address on the postcard we sent to you. Enter it in the box below to begin the survey.

[PROGRAMMER: VERIFY VALID CODE AND READ IN ALL VARIABLES FROM SAMPLE FILE]

As you complete the survey, please do **NOT** use the ***Back*** button of your browser. If you mistakenly click the ***Back*** button you will need to click the ***Refresh*** button to continue the survey. If you need to go back during the survey use the ***Previous*** button located at the bottom of the survey.

Please click "Next" to begin.

[PROGRAMMER: IF OVERQUOTA, SHOW THE FOLLOWING MESSAGE]

Thank you for responding to our survey, however, at this time we have reached the limit for responses. Thank you again for your time.

RESPONDENT SCREENING

S1. Which of the following best describes your familiarity with the energy-related aspects of your business operations at **[READ IN ADDRESS FROM SAMPLE]**?

1. You are **very familiar** with the energy-related aspects of your operations at this location
2. You are **fairly familiar** with the energy-related aspects of your operations at this location
3. You are **not very familiar** with the energy-related aspects of your operations at this location **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**
4. Don't know **[REQUEST REFERRAL TO DECISION MAKER AND THEN TERMINATE VIA S2]**

[IF S1=1-2, SKIP TO S3; OTHERWISE SHOW S2 AND TERMINATE WITHOUT SHOWING STANDARD TERMINATE LANGUAGE]

S2. Thank you for taking the time to see if you are eligible to participate in this survey. At this time we need responses from someone in your organization who is more familiar with the energy-related aspects of your business operations at this location.

We would appreciate it if you would provide that person with the invitation postcard you received or refer them to the following link so that they may complete this survey:

Link: **[INSERT URL THAT INCLUDES SURVEY ID#]**

[PROGRAMMER NOTE: IF A RESPONDENT TERMINATES VIA S2. DELETE DATA COLLECTED AND RESET SURVEY REENTRY POSITION FOR THAT SURVEY ID# BACK TO THE BEGINNING OF THE SURVEY. RECORD THE DATA DELETED FOR THAT SURVEY ID# ELSEWHERE SO WE CAN TRACK THE NUMBER OF TIMES AND REASONS RESPONDENTS DISQUALIFY AT S2 AS WELL AS THE NUMBER OF TIMES THESE PREVIOUSLY USED SURVEY ID#'S ARE RE-USED. FOR ALL RESPONDENTS THAT DO NOT TERMINATE VIA S5R, DO NOT ALLOW SURVEY ID# TO BE USED AGAIN.]

{NOTE: THIS WILL ALLOW A RESPONDENT WHO DOES NOT PERSONALLY QUALIFY TO FORWARD THEIR SURVEY ID# TO A CO-WORKER WHO MAY BE BETTER QUALIFIED TO ANSWER THE SURVEY.}

S3. Which of the following best describes how your business is billed for electricity at **[READ IN ADDRESS FROM SAMPLE]**?

1. We are **billed directly by Ameren Illinois** for the electricity we use
2. We are **NOT billed directly by Ameren Illinois** for the electricity we use; our electric **bill is handled by another part of our company or by a third party service provider** (e.g., City and Village Tax Office, etc.), but ultimately, our company is responsible for the cost of our electricity
3 We are **NOT billed directly by Ameren Illinois** for the electricity we use; the cost for our electricity is **included in our rent/lease**
4. We are **served by another electric utility; not Ameren Illinois**
5. Don't know

S3b. Which of the following best describes how your business is billed for natural gas at **[READ IN ADDRESS FROM SAMPLE]**?

1. We do not use natural gas
2. We are **billed directly by Ameren Illinois** for the natural gas we use
3. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; our natural gas **bill is handled by another part of our company or by a third party service provider** (e.g., City and Village Tax Office), but ultimately, our company is responsible for the cost of our natural gas
4. We are **NOT billed directly by Ameren Illinois** for the natural gas we use; the cost for our natural gas is **included in our rent/lease**
5. We are **served by another gas provider; not Ameren Illinois**
6. Don't know

[PROGRAMMER: DISPLAY DIRECTLY BELOW S3 ON SCREEN: "PLEASE NOTE THAT ALL OF OUR REMAINING QUESTIONS REFER SPECIFICALLY TO THE FACILITY AT THE LOCATION CITED ABOVE"]

[CREATE TRACKING VARIABLE:
(S3=1 OR 2 AND S3B NE 2 OR 3) = ELECTRIC ONLY
(S3B=2 OR-3 AND S3 NE 1 OR 2) = GAS ONLY]
(S3=1 OR 2 AND S3B=2 OR 3)=BOTH

[IF S3=1 OR 2, OR S3B=2 OR 3, CONTINUE; OTHERWISE TERMINATE]

S4. Does your business own or lease the building space at this location?

If you both lease some space, and own some space at this location, which accounts for the majority of the space?

1. Own (or in the process of buying it)
2. Lease / rent

S5. Does your operation at this location occupy any enclosed space, or is it an outdoor structure or operation, such as a billboard, a parking lot, a communications tower, or the like?

1. Occupies enclosed space
2. Is an outdoor structure or facility **[TERMINATE AFTER S6]**

[IF S5=2, ASK S6 AND THEN TERMINATE; OTHERWISE SKIP TO S7]

S6. What type of outdoor structure does your organization operate at this site?

1. Billboard
2. Communications / telecommunications tower or other facility
3. Pump
4. Parking lot
5. Traffic light or other type of outdoor lighting

990. Other **[SPECIFY]**

S7. Which of the following best describes the type of facility your organization occupies?

1. Office (finance, insurance, real estate, law, etc.)
2. Retail (department stores, services, boutiques, etc.)
3. Grocery (supermarkets, convenience store, market, etc.)
4. Restaurant (sit-down, fast food, coffee shop, etc.)
5. Warehouse
6. School (day care, pre-school, elementary, secondary)
7. College, university or trade school
8. Health Care (health practitioner office, hospital, urgent care center, etc.)
9. Nursing home / assisted living facility / residential treatment facility
10. Lodging facility (hotel, motel, bed and breakfast, etc.)
11. Not-for profit housing facility (shelter, prison, jail, etc.)
12. Entertainment / recreation facility (movie theater, bowling alley, health club/gym, library, museum, etc.)
13. Public assembly facility (convention / conference center, etc.)
14. Worship (church, temple, etc.)
15. Multi-use or shopping mall (i.e., mixed use of space for offices, restaurants, stores, service, apartments, etc.)
16. Manufacturing, production, or processing facility (including for-profit businesses and governmental facilities)

990. Other **[SPECIFY]**

S8. Which of the following best describes the activity in which your business is engaged at this location? *Please select the <u>one option</u> that best describes the activity.*

{NOTE TO TEAM: IF THE RESPONDENT SELECTS RESPONSE "15" ABOVE ("MIXED USE"), THEY ARE SHOWN ALL POSSIBLE OPTIONS FOR BUSINESS ACTIVITY EXCEPT HOSPITAL, WAREHOUSE, AND MANUFACTURING / PROCESSING}

<u>Traditional Office-Based Business</u> [IF S7=1 OR 15 OR 990, DISPLAY CODES 1-7]	
1. Finance	○
2. Insurance	○
4. Real estate / construction	○
5. Government	○
6. Other not-for-profit	○
7. Other office **[SPECIFY]**	○
<u>Retail</u> [IF S7=2 OR 15 OR 990, DISPLAY CODES 8-19]	
8. Major retail store	○
9. Department store	○
10. Small retail (boutique, store in strip mall)	○
11. Convenience store	○
12. Supermarket	○
13. Market	○
14. Laundry	○
15. Dry cleaning	○
16. Copy center	○
17. Barber / salon	○
18. Gas station / auto shop	○
19. Other retail **[SPECIFY]**	○
<u>Grocery</u> [IF S7=3 OR 15 OR 990, DISPLAY CODES 20-23]	
20. Supermarket	○

21. Convenience store	○
22. Market	○
23. Other grocery **[SPECIFY]**	○
Restaurant / Food Service [IF S7=4 OR 15 OR 990, DISPLAY CODES 24-28]	
24. Sit-down restaurant	○
25. Fast food diner	○
26. Bakery	○
27. Coffee shop	○
28. Other restaurant **[SPECIFY]**	○
Warehouse [IF S7=5 OR 990, DISPLAY CODES 29-32]	
29. Refrigerated warehouse	○
30. Non-refrigerated warehouse	○
31. Combination of refrigerated and non-refrigerated space	○
32. Other warehouse **[SPECIFY]**	○
School [IF S7=6 OR 15 OR 990, DISPLAY CODES 33-36]	
33. Preschool / daycare	○
34. Elementary school	○
35. Secondary school	○
36. Other pre-college **[SPECIFY]**	○
College, University or Trade School [IF S7=7 OR 15 OR 990, DISPLAY CODES 37-40]	
37. College	○
38. University	○
39. Trade school	○
40. Other post-secondary **[SPECIFY]**	○
Health Care [IF S7=8 OR 990, DISPLAY CODES 80-84; IF S7=15, DISPLAY CODES 80 AND 83-85]	
85. Medical / dental office or office for other health practitioners	○
80. General medical or surgical hospital	○
81. Veterinary hospital	○
82. Other hospital **[SPECIFY]**	○
83. Urgent care center	○
84. Other health care facility **[SPECIFY]**	○
Nursing Home / Assisted Living [IF S7=9 OR 15 OR 990, DISPLAY CODES 41-44]	
41. Nursing home	○
42. Assisted living facility	○
43. Residential treatment facility	○
44. Other care facility **[SPECIFY]**	○
Lodging [IF S7=10 OR 15 OR 990, DISPLAY CODES 45-48]	
45. Hotel	○
46. Motel	○
47. Bed & Breakfast	○
48. Other lodging **[SPECIFY]**	○
Not-For-Profit Housing [IF S7=11 OR 15 OR 990, DISPLAY CODES 49-51	
49. Shelter	○
50. Prison / jail	○
51. Other not-for-profit housing **[SPECIFY]**	○
Entertainment / Recreation [IF S7=12 OR 15 OR 990, DISPLAY CODES 52-58]	
52. Health club / gym	○
53. Movie theater	○
54. Theater	○

55. Library	○
56. Museum	○
57. Bowling alley	○
58. Other entertainment / recreation **[SPECIFY]**	○
Public Assembly [IF S7=13 OR 15 OR 990, DISPLAY CODES 59-61]	
59. Conference / convention center	○
60. Community center	○
61. Other public assembly **[SPECIFY]**	○
Worship [IF S7=14 OR 15 OR 990, DISPLAY CODES 62-65]	
62. Church	○
63. Temple	○
64. Synagogue	○
65. Other worship **[SPECIFY]**	○
Manufacturing / Production / Processing [IF S7=16 OR 990, DISPLAY CODES 66-79]	
66. Agricultural production or farming	○
67. Chemical processing	○
68. Electronics / technology	○
69. Food / beverage production or processing	○
70. General / light assembly or manufacturing	○
71. Glass production or processing	○
72. Metals production or processing or fabricated metal work	○
73. Machinery / appliance / equipment manufacturing	○
74. Paper products processing, printing or manufacturing	○
75. Petroleum Processing or Refining	○
76. Textiles / apparel production or processing	○
77. Water / wastewater treatment	○
78. Wood products manufacturing	○
79. Other manufacturing / processing **[SPECIFY]**	○
Something else [IF S7=15 OR 990, DISPLAY CODE 80]	
80. Something else **[SPECIFY]**	○

S9. Approximately how many people are employed full-time at this location?

1. Less than 5 employees
2. 5 – 9
3. 10 – 19
4. 20 – 49
5. 50 – 99
6. 100 – 199
7. 200 – 299
8. 300 – 399
9. 400 – 499
10. 500 – 999
11. 1,000 – 2,499
12. 2,500 – 4,999
13. 5,000 – 9,999
14. 10,000 – 24,999
15. 25,000 or more employees

S10. Does your electric and/or natural gas bill include the cost to…? *Select all that apply.*

1. Heat some or all of your space
2. Cool some or all of your space
3. Provide hot water for your use
4. Provide interior lighting
5. Provide exterior lighting

S11. Which of the following are present at this location? *Select all that apply.*

1. Propane service
2. Purchased steam or hot water
3. Steam we generate on-site
4. Fuel oil for one or more end uses
5. None of the above **[EXCLUSIVE]**

[IF NOT OVER-QUOTA, GO TO INVITATION LANGUAGE; OTHERWISE TERMINATE]

TERMINATE LANGUAGE FOR NON-QUALIFYING OR OVER-QUOTA RESPONDENTS

We appreciate the time and effort you have spent in responding to our survey invitation and answering these initial questions, which were designed to see if you are eligible to participate in this research study.

In order to achieve a representative sample, quotas with specific criteria have been designated. At this point, we have reached the number of respondents we can accept from individuals with your type of experience or background. Again, we would like to thank you for your time and effort.

If you would like information on how your business can save money on energy bills, please visit www.actonenergy.com.

Q76. Additionally, if you would like someone from Ameren Illinois energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. **Yes,** we would like to be contacted by someone from Ameren Illinois energy efficiency implementation team. *Please supply the appropriate contact information below.*

   Contact Name: _____

   Business Name: _____

   Preferred contact method(s) – *Select all that apply*:

   ☐ phone ☐ e-mail ☐ postal mail

   Daytime phone number: _____

   E-mail address: _____

   Postal address: _____

   _____

   _____

2. **No,** we would NOT like to be contacted

[IF Q76=1, GO TO CONTACT INFORMATION FOR AMEREN ILLINOIS VERIFICATION SCREEN; IF Q76=2, SKIP TO GOOD-BYE SCREEN]

INVITATION LANGUAGE FOR QUALIFYING RESPONDENTS

Thank you for your responses so far. You and your business have qualified to complete this survey.

The survey should take about 20 minutes to complete. Information about how to receive the $75 thank you payment will be provided at the end of the survey.

Your responses are important to us, so please press "Next" to begin answering the survey questions. All information provided in this survey will be kept strictly confidential, and at no time will you be asked to purchase anything.

Note that if you need to pause the survey at any time, you can come back later and begin again where you left off. Simply save the URL and the Survey ID# from your survey invitation to access your survey again. The survey will automatically take you to the point where you left off.

Please note: any word or phrase that appears in blue, underlined font will have a hyperlinked definition that pops-up in a separate browser window when you click on that word or phrase. Clicking on any of these hyperlinks will NOT make you navigate away from the survey site.

As you complete the survey, you will **not** be able to use your browser's "back" button. If you mistakenly press your browser's "back" button, you will need to press the "refresh" button to continue the survey.
[PROGRAMMER NOTE: THROUGHOUT THIS SURVEY, WORDS OR PHRASES WITH BLUE, UNDERLINED FONT WILL HAVE HYPERLINKED DEFINITIONS THAT POP-UP WHEN THE RESPONDENT CLICKS ON THE WORD OR PHRASE. HYPERLINKED DEFINITIONS ARE PROVIDED AT THE END OF THIS DOCUMENT.]

Q2. Using the scale below, please indicate how much your organization agrees or disagrees with each of the following statements about Ameren Illinois.

Note: If you don't feel like your organization is very familiar with Ameren Illinois on any of the following issues, please just give your best estimate.

Ameren Illinois is…

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 3-4]	Strongly disagree									Strongly agree
	1	2	3	4	5	6	7	8	9	10
3. …a credible information source on the kinds of things you can do to save energy	○	○	○	○	○	○	○	○	○	○
4. …a company that actively promotes programs to help its business customers save money	○	○	○	○	○	○	○	○	○	○

Q3. Overall, how satisfied would you say your organization is with Ameren Illinois as your utility?

[RECORD NUMBER; 1=NOT AT ALL SATISFIED, 10=EXTREMELY SATISFIED]

Not at all satisfied									Extremely satisfied
1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

The next several questions are about the building your organization uses or occupies at **[READ IN ADDRESS FROM SAMPLE].**

Q3. Has this facility been renovated or undergone any significant tenant improvements in the last 5 years?

1. Yes
2. No
3. Not sure

Q9. What is the approximate total square footage that your business occupies at this location?

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

Please enter a whole number rather than a range of numbers.

1. **[RECORD NUMBER]** square feet
2. Not sure

[IF Q9_1=0+, ASK Q9A IN ORDER TO VALIDATE Q9 RESPONSE; OTHERWISE SKIP TO Q10]

Q9A. You said the approximate total square footage that your business occupies at this location is…

[INSERT Q9_1 RESPONSE, USING COMMAS] square feet

Is this what you intended?

1. Yes
0. No, I would like to edit my response

[IF Q9A=1, SKIP TO Q11; OTHERWISE SKIP BACK TO Q9]

[IF Q9=2, ASK Q10; OTHERWISE SKIP TO Q11]

Q10. We understand you aren't sure, so using the ranges listed below, please just choose the best estimate of the total square footage of your business at this location.

Please give your best estimate, including only indoor or enclosed space. If your business shares the space with other companies / organizations, only list the space your business uses. If your business occupies several floors or buildings, add the square footage together.

	Typical Examples
1. Less than 1,000 sq. ft.	*Small Convenience Store*
2. 1,000 – 4,999	*Small Restaurant*
3. 5,000 – 9,999	*Large Restaurant*
4. 10,000 – 14,999	*Medium Retail*
5. 15,000 – 24,999	*Medium Grocery, Small Office*
6. 25,000 – 49,999	*Medium School*
7. 50,000 – 99,999	*Medium Warehouse*
8. 100,000 – 499,999	*Large Office Building*
9. 500,000 – 999,999	*Large Warehouse or Industrial Facility*
10. 1 million sq. ft. or more	*Very Large Facility*

Q11. What percentage of the total enclosed floor space your business occupies at this location can be characterized by each of the following area descriptions?

Your best estimate is fine, but please enter whole numbers that will add up to 100%.

Area description [SET DEFAULT RESPONSE AT 0]	**% of total enclosed floor space**
1. Office	**[RECORD NUM 0-100]%**
2. Data center / computer room	**[RECORD NUM 0-100]%**
3. Food preparation, food service or food sales (e.g., kitchen, cafeteria, restaurant, coffee shop, convenience store, supermarket, market, etc.)	**[RECORD NUM 0-100]%**
4. Retail (e.g., mall, department store, small retail/boutique etc.)	**[RECORD NUM 0-100]%**
5. Common areas (e.g., lobby, hallway, meeting room, auditorium, library, bathroom, workout area, worship area, etc.)	**[RECORD NUM 0-100]%**
6. Lodging (e.g., sleeping quarters, hotel room, bedroom in nursing home, etc.)	**[RECORD NUM 0-100]%**
7. Laboratory	**[RECORD NUM 0-100]%**
8. Warehouse/storage area	**[RECORD NUM 0-100]%**
9. Laundry facilities	**[RECORD NUM 0-100]%**
10. Health services (e.g., hospital, doctor's office, etc.)	**[RECORD NUM 0-100]%**
11. Manufacturing / processing / production	**[RECORD NUM 0-100]%**
12. Classroom	**[RECORD NUM 0-100]%**
13. Refrigerated Warehouse/storage area	**[RECORD NUM 0-100]%**
990. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
991. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
992. Other **[SPECIFY ONE AREA]**	**[RECORD NUM 0-100]%**
TOT. **Total**	**[CALCULATE TOTAL]%**

[PROGRAMMER: Q11TOT MUST EQUAL 100 IN ORDER TO CONTINUE TO NEXT SCREEN]

The following questions refer to the **total** building that your organization occupies, or uses, at this location, even if you only occupy a portion of the building.

Q12. How many floors are in the entire building? *Your best estimate is fine, but please enter a whole number rather than a range of numbers.*

If your business is located in several buildings across a campus/complex, enter the total number of floors across all the buildings.

[RECORD NUMBER 1-100] floors

Q13. What percent of the total space in the building does **your** organization occupy?

Your best estimate is fine, but please enter a whole number rather than a range of numbers.

[RECORD NUMBER 1-100]%

Q21. What single type of space heating system is used as the primary means of heating your space**?**

	Primary Space Heating System	
1.	Natural gas warm air furnace with ducts/vents to individual rooms	○
2.	Electric warm air furnace with ducts/vents to individual rooms	○
3.	Natural gas boiler with hot water/steam radiators or baseboards in individual rooms	○
4.	Electric boiler with hot water/steam radiators or baseboards in individual rooms	○
5.	Electric baseboard or electric coils radiant heating (no supply ducts or water/steam pipes)	○
6.	Air-source heat pump	○
7.	Geothermal heat pump (ground loop or water loop)	○
8.	Natural gas unit heater or wall furnace	○
9.	Electric unit heater or wall furnace	○
10.	None	○
999.	Not sure	○
990.	Other (please specify)	○

[IF S10=2, ASK Q26; OTHERWISE SKIP TO FILTER BEFORE Q33]

Q26. Approximately what percentage of the space your business occupies, or uses, at this location is cooled?

1. None
2. Less than 10%
3. 10-20%
4. 21-30%
5. 31-40%
6. 41-50%
7. 51-60%
8. 61-70%
9. 71-80%
10. 81-90%
11. More than 90%

[IF Q26=2-11, ASK Q27; OTHERWISE SKIP TO FILTER BEFORE Q33]

Q27. What single type of cooling system is your primary means to cool your space?

	Primary Cooling System	
1.	Air cooled chiller	○
2.	Water cooled chiller	○
3.	Packaged rooftop air conditioner units	○
4.	Floor-by-floor packaged water cooled DX (Direct Expansion) units	○
5.	Wall or window air conditioner units	○
6.	Air-source heat pump	○
7.	Geothermal heat pump	○
8.	**None**	○
999.	**Not sure**	○
990.	**Other (please specify)**	○

Q33. What type of temperature control is primarily used for your heating and/or cooling system(s)?

1. Manual thermostat
2. Programmable thermostat
3. "Smart" thermostat (interactive & web-enabled)
4. Energy management system
5. Always on
6. Manual on/off
7. None of the above

IF S10=4, ASK Q41; OTHERWISE SKIP TO FILTER BEFORE Q61]
The next few questions focus on the lighting used at this location.

Q41. How many of each of the following types of lamps / fixtures are used in the **interior** of the building(s) at your business, considering only the areas your business occupies?

Your best estimate is fine, but please enter a whole number for each type of lamp / fixture.

Lamp/fixture type	Example Images	Number of interior lamps / fixtures
1. Traditional fluorescent tube-style lamps		**[RECORD NUM 0-9999]**
2. Compact fluorescent bulbs		**[RECORD NUM 0-9999]**
3. Other fluorescent lamps (circuline, U-type, etc.)		**[RECORD NUM 0-9999]**
4. Incandescent bulbs		**[RECORD NUM 0-9999]**
5. Screw-in LED bulbs		**[RECORD NUM 0-9999]**
6. LEDs that replace Linear Fluorescent Lights ("Panel LEDs" or "Tube LEDs")		**RECORD NUM 0-9999]**
7. Other (all other lamps)		**[RECORD NUM 0-9999]**

Q46. Which of the following types of lighting controls are primarily used to control your interior lighting?

1. Manual – single switch
2. Manual – bi-level (dual) switch
3. Manual – circuit breaker
4. Occupancy sensor

5. Timers
6. Photocell
8. Daylighting sensor
9. Energy management system
990. Other **[SPECIFY]**
998. Not sure

Q18. Thinking about all of the fluorescent lamps in this facility, how many have been replaced in the last 2 years with either high efficiency or standard efficiency bulbs? *Your best estimate is fine.*

	% that were replaced with new standard efficiency lamps	% that were replaced with new HIGH EFFICIENCY lamps	% Not Replaced
1. Standard efficiency lamps that were in place two years ago	%	%	[AUTO-CALCULATE S0 TOTAL = 100%]
2. High efficiency lamps that were in place two years ago	%	%	AUTO-CALCULATE S0 TOTAL = 100%]

Q18a. Thinking about all of the fluorescent **ballasts** in this facility, how many have been replaced in the last 2 years with either high efficiency or standard efficiency ballasts? *Your best estimate is fine.*

	% that were replaced with new standard efficiency ballasts	% that were replaced with new HIGH EFFICIENCY ballasts	% Not Replaced
1. Standard efficiency ballasts that were in place two years ago	%	%	[AUTO-CALCULATE S0 TOTAL = 100%]
2. High efficiency ballasts that were in place two years ago	%	%	AUTO-CALCULATE S0 TOTAL = 100%]

IF Q11_11>1, ASK Q61; OTHERWISE SKIP TO Q67]
Now we would like to ask you some questions about your manufacturing / processing operations.

Q61. About what percentage of your facility's total electricity usage would you estimate is due to electric motors of one form or another (including stand-alone motors, as well as motors used in machines, fans, pumps, conveyors, and all other applications)?

1. 0%
2. Less than 5%
3. 5% to less than 25%
4. 25% to less than 50%
5. More than 50%

[IF Q61 NE 1, ASK Q61a; OTHERWISE SKIP TO Q67]
Q61a. About what percentage of all of the motors at your facility fall into each of the following types of use?

	Percentage accounted for
1. Fans & Blowers	%
2. Pumps	%

3. Compressed Air	**%**
4. Conveyors	**%**
5. Other	**%**
TOT. **Total**	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**

Q61b. What is the primary means of control for the motors in each type of application?
[PROGRAMMER NOTE: SHOW DROP DOWN BOX WITH 0%, 10%, 20%, ETC.]

	Manual Controls	VSD / VFD Controls	Something else	Total
1. Fans & Blowers	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**
2. Pumps	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**
3. Compressed Air	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**
4. Conveyors	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**
5. Other	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	[ENTER % (10% INCREMENTS)]	**[PROGRAMMER: CALCULATE TOTAL MUST EQUAL 100%]**

Q67. How many electric vehicle charging stations are there at this location?
[RECORD NUM 0-999] charging stations

[IF Q67=1 OR MORE, CONTINUE, OTHERWISE SKIP TO Q68a]

Q67b. Who pays for the charging stations?
1. Our company
2. The building management
3. Other (specify)
4. Not sure

Q68. Does your company use electric vehicles for business purposes? If so, how many electric vehicles are used at this location?
1. None
2. Number of Electric Vehicles **[RECORD NUM 0-999]**

Q68a. Are there any of the following electric generation systems operating at your facility currently? If so, what is the approximate installed capacity of each?

	Present at my facility	kW of installed capacity
1. Solar panels (PV)	○	**[ENTER NUMBER]**
2. Combined Heat & Power plant (CHP)	○	**[ENTER NUMBER]**
3. Wind turbine	○	**[ENTER NUMBER]**
4. Combined heat and power	○	**[ENTER NUMBER]**
4. Other generator	○	**[ENTER NUMBER]**

[IF Q68a_1=1, CONTINUE, OTHERWISE SKIP TO FILTER BEFORE Q68D]

Q68c. Approximately what percentage of your total electricity needs do the PV system(s) cover?

[**PROGRAMMER; SHOW DROP DOWN LIST OF PERCENTAGES FROM 0-100% IN 10% INCREMENTS]**

[PROGRAMMER: IF S3B=2-5; OTHERWISE SKIP TO Q14

Q68d. Which of the following things are fueled by natural gas?

1. Cooking
2. Hot water heating
3. Heating swimming pools / saunas / hot tubs
4. Something else (please specify _____)

Q14. At an organizational level, to what extent does your firm agree or disagree with each of the following statements? Please use a 10-point scale where '1' means your firm strongly disagrees, and '10' means your firm strongly agrees.

[ROTATE 1-8]	Strongly disagree									Strongly agree
	1	2	3	4	5	6	7	8	9	10
1. We care about the cost of the energy we use, but realistically, other issues take up much more of our management time	○	○	○	○	○	○	○	○	○	○
3. There is really very little our organization can do to save money on our energy bills	○	○	○	○	○	○	○	○	○	○
5. We would do more to make our facility more energy efficient, but we don't really know where to start, or what to do next	○	○	○	○	○	○	○	○	○	○
6. Our organization has made a public commitment to be a "greener" organization	○	○	○	○	○	○	○	○	○	○
7. Our organization believes that the long-term threat from global warming and climate change is real, and potentially devastating	○	○	○	○	○	○	○	○	○	○

Q21. Which of the following statements best describes your organization's approach to implementing energy efficiency actions **at this facility**? *Please select the **one** answer that best fits this facility.*

1. We don't really pay much attention to energy efficiency
2. We try and watch our energy use, and attempt to remind people about how they use lights and equipment, but we haven't actually done much in terms of changing out equipment for higher efficiency models
3. We have done some things to become more energy efficient (e.g., watch our energy use and have replaced some equipment), but I wouldn't say we have done everything we can
4. We make consistent and aggressive efforts to make our facility as energy efficient as possible

Q22. Has your organization noticed any energy or cost savings as a result of any of the actions your organization might have taken over the last few years to conserve energy or be more energy efficient at this facility?

1. Yes – the energy efficiency actions taken have had a **large impact** on energy or cost savings
2. Yes – the energy efficiency actions taken have had a **small or moderate impact** on energy or cost savings
3. No – the energy efficiency actions taken have had **no impact** on energy or cost savings
4. Not sure
5. Not applicable – We have not taken any actions to conserve energy or be more energy efficient at this facility over the last few years

Q15. Which, if any, of the following items have been purchased for this facility in the **last 2 years**, and if these purchases have been made, were any of new items specifically described as "high

energy efficiency," or ENERGY STAR-qualified purchases?" *Please select one response for each row.*

[ROTATE 1-7]	Did not Purchase	Purchased "Standard Efficiency"	Purchased Highly Energy Efficient
1. Heating equipment used in your facility	☐	☐	☐
2. Air conditioning equipment used in your facility	☐	☐	☐
3. Water heating equipment	☐	☐	☐
4. Refrigeration equipment	☐	☐	☐
5. Motors / drives	☐	☐	☐
6. Office equipment (computers, printers, copiers)	☐	☐	☐
7. Ventilation equipment	☐	☐	☐

Q69. Which of the following other **energy efficiency measures** have either been implemented at this location **within the last three years, or do you plan to implement in the next two years**?

Select all that apply for each time period. Select "Neither" in the appropriate column if you have not implemented / do not plan to implement any of the measures within that time period.

	Energy Efficiency Measures	Have implemented in last 3 years	Plan to implement in next 2 years	Neither
1.	Upgrading or renovating fluorescent lighting system(s)	☐	☐	☐
2.	Eliminating some fluorescent fixtures and adding reflectors to others to reduce the total number of lighting fixtures or lamps without reducing the total light available (this is sometimes called "delamping")	☐	☐	☐
3.	Replacing windows with windows designated as "low-e" glass and/or have a gas core that increases their energy efficiency	☐	☐	☐
4.	Adding or upgrading insulation on exterior doors, walls, ceilings, or roofs	☐	☐	☐

Q70. Some utilities offer business customers rebates or incentives to reduce the cost of highly efficient, or Energy Star, appliances. To the best of your knowledge, does Ameren Illinois offer any rebates or incentives of this type?

1. Yes
2. No
3. Not sure

[PROGRAMMER: IF Q70=1, CONTINUE, OTHERWISE SKIP TO Q73]

Q71. Have you received a rebate or incentive payment from Ameren Illinois, or a third-party state organization, for installing one or more energy efficiency measures in the last two years?

1. Yes, we received rebates for more than one project
2. Yes, we received rebates for all of our projects
3. Yes, we received rebates for a single project
4. No, there are rebates available to us, but we have not used them
5. No, we are not eligible to receive rebates

[PROGRAMMER: IF Q72=2 OR 5, SKIP TO Q73, OTHERWISE, CONTINUE]

Q72. Why have you not used rebates from Ameren Illinois [**PROGRAMMER: IF Q71=1 OR 3, INSERT "more often"**] for any new equipment or appliances, you might have installed, or other energy efficiency actions you might have taken in the last two years? **[PLEASE SELECT ALL THAT APPLY]**

1. We have not taken any actions that would have qualified for a rebate [**PROGRAMMER: EXCLUSIVE**]
2. It just did not occur to us to apply for a rebate
3. Rebates were not available at the time we applied
4. It seemed like too much trouble
5. Something else (Please specify: _____)

Q73. As you may know, traditional T12 fluorescent lamps will be phased out of production as a result of new Federal energy standards. Switching out any existing T12 fixtures with new high performance T8 lamps, or T5 lamps with electronic ballasts, could save you 33% or more on the electricity you use for lighting over time.

If Ameren Illinois were to offer you a rebate right now of 20 cents for each watt of electricity that you reduce your electric demand with these new lights, how likely would you be to install at least some of these new lamps and/or fixtures in your facility? (This rebate amount typically covers 10 to 30% of the upfront cost of these types of lighting upgrades.)

Not At All Likely Do Not Have To Do This Any T12 Lamps									**Extremely Likely to Do This**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
11									

[PROGRAMMER: IF Q73=4-10, CONTINUE, OTHERWISE SKIP TO Q75]

Q74. If the rebate just described (20 cents for each watt of electricity you reduced your demand for electricity with new, higher efficiency lights) was available, what percentage of all of your T12 lights would you replace within the next six months?
[**PROGRAMMER: PROVIDE DROP DOWN BOX WITH 0%, 10%, 20%, 30%, ETC. UP TO 100%]**

[PROGRAMMER: IF Q73=1-3, CONTINUE, OTHERWISE SKIP TO Q76]

Q75. Why would you not replace all of your eligible lamps / fixtures under this type of rebate program?

_____

Q76. **[TEAM: NOTE THAT THE QUESTIONS BELOW ARE INTENDED TO PROVIDE A MORE GRANULAR DEFINITION OF PROGRAM "AWARENESS." WE HAVE A SIMPLE REBATE PROGRAM AWARENESS QUESTION ABOVE, BUT THESE QUESTIONS DELVE DEEPER TO UNDERSTAND WHETHER PEOPLE REPORT BEING AWARE OF PROGRAM DETAILS AND / OR PROGRAM VALUE PROPOSITIONS.]**
Please tell us how much you agree or disagree with each of the following statements about Ameren Illinois's energy efficiency programs, and about energy efficient appliances and equipment in general.

[RECORD NUMBER; 1=STRONGLY DISAGREE, 10=STRONGLY AGREE]

[ROTATE 1-3]	Strongly Disagree									Strongly agree
	1	2	3	4	5	6	7	8	9	10
1. I feel comfortable that we know exactly how to use Ameren Illinois's rebate programs effectively	○	○	○	○	○	○	○	○	○	○
2. We are well informed about the benefits of Ameren Illinois's energy efficiency programs	○	○	○	○	○	○	○	○	○	○
3. We really believe in the value of energy efficiency	○	○	○	○	○	○	○	○	○	○

Q77. For each of the following types of equipment, please tell us how likely you are to replace that equipment with highly energy efficient / ENERGY STAR-qualified equipment the next time you need to do so, **regardless of whether or not** there are rebates available to reduce the cost of that equipment?

[ROTATE 1-5]	Not at all likely to replace with highly energy efficient option					Extremely likely to replace with highly energy efficient option					Not Applicable
	1	2	3	4	5	6	7	8	9	10	
1. Existing fluorescent lights	○	○	○	○	○	○	○	○	○	○	○
2. Existing high intensity lights	○	○	○	○	○	○	○	○	○	○	○
3. Existing HVAC system	○	○	○	○	○	○	○	○	○	○	○
4. Existing water heating system	○	○	○	○	○	○	○	○	○	○	○
5. Existing PCs / Servers	○	○	○	○	○	○	○	○	○	○	○

The next section of the survey asks for your reaction to energy efficiency programs that Ameren Illinois may be able to offer to businesses like yours.

Q26. Please assume that Ameren Illinois would offer your business a rebate to take an action to become more energy efficient. As an example, consider that you can purchase a new primary HVAC system (air conditioner, heat pump, chiller, heating system, or the like) that is "standard" efficiency or is "higher than standard" efficiency (sometimes labelled as ENERGY STAR). Higher efficiency HVAC systems typically cost more, but they use less energy. Often, the energy saved by using a more energy efficient piece of equipment can pay for the higher cost of that equipment within a few years.

Ameren Illinois might be able to offer a rebate to businesses that opt to purchase a higher efficiency HVAC system, or other types of appliances or pieces of equipment. Because these rebates would reduce the cost difference between a highly energy efficient unit and a standard unit, the rebate would mean that it would take less time to save on electricity costs to make up for the higher initial cost of the more efficient unit. And remember that you would continue to save money on electricity costs, even after the energy efficient unit "paid for itself."

Please assume for now that Ameren Illinois could provide a rebate that meant your business would save enough on electricity costs to pay for the additional cost of a more efficient HVAC system within **3 years**. Please use the scale below to indicate how likely you would be -- If you were going to acquire a new HVAC system -- to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency system?

Not At All Likely									Extremely Likely
									to Do This
Not applicable / To Do This Not our Decision									
1	2	3	4	5	6	7	8	9	10
11									

[IF Q26=7 TO 10, CONTINUE, OTHERWISE SKIP TO Q28]

Q27. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a "higher than standard efficiency" HVAC system in **5 years**. If this were true, and you were going to acquire a new HVAC system, how likely would your business be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely									Extremely Likely
									to Do This
Not Applicable/ To Do This Not our Decision									
1	2	3	4	5	6	7	8	9	10
11									

[IF Q26 =1-6, CONTINUE, OTHERWISE SKIP TO Q28a]

Q28. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the additional cost to buy a "higher than standard efficiency" HVAC system in **1 year**. If this were true, and you were going to acquire a new cooling system, how likely would your business be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely									Extremely Likely
									to Do This
Not Applicable/ To Do This Not our Decision									
1	2	3	4	5	6	7	8	9	10
11									

[**ASK ALL RESPONDENTS**]

Q28a. Another alternative would be a situation in which the impact of the rebate from Ameren Illinois was that the initial cost of a "higher efficiency" / ENERGY STAR HVAC system was the same as the "Standard efficiency" system. In other words, there would be no incremental cost for the higher efficiency system, and in addition, all of the energy savings going forward would be savings that you would realize. If this were the case, and you were going to acquire a new HVAC system, how likely would your business be to buy the higher efficiency / ENERGY STAR HVAC system (and take the rebate), rather than buying an equivalent standard efficiency cooling system?

Not At All Likely To Do This								**Extremely Likely to Do This**	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Not Applicable/ Not our Decision 11

[IF Q28a =1-8, CONTINUE, OTHERWISE SKIP TO Q33]

Q28b. Why would you not be extremely likely to select the higher efficiency / ENERGY STAR system?

_____

Q33. Now, for each of the other equipment listed below, let's assume that the impact of the rebate from Ameren Illinois was that your business would save enough on electricity in **3 years** to pay for the higher cost associated with the higher efficiency / ENERGY STAR model. If this were true, how likely would your organization be to acquire the higher efficiency model if you needed to replace that equipment?

How likely would your organization be to…?

	Not at all likely to do this								Extremely likely to do this		Not applicable/ Not our decision
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
1. Install a high efficiency / ENERGY STAR refrigeration unit	○	○	○	○	○	○	○	○	○	○	○
2. Install high efficiency / energy star computer servers	○	○	○	○	○	○	○	○	○	○	○
[DISPLAY ONLY IF Q61=2-5] 3. Replace an existing electric motor with a high efficiency motor	○	○	○	○	○	○	○	○	○	○	○

Q130. In addition to offering programs that would help your business buy more energy efficient equipment, Ameren Illinois might also be able to offer your business a rebate or other financial incentives to install a variety of control systems that could optimize the operational efficiency of your *existing* equipment. For example, they might provide a rebate to help you install or upgrade an advanced programmable thermostat on your HVAC system to provide automation for this system. Once this thermostat is installed, the energy saved could potentially make up for the cost of installing it within a few years.

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing the advanced programmable thermostat within **3 years**, how likely would you be to install this device (and take the rebate)?

	Not at all likely to do this								Extremely likely to do this		Not our decision	Already have / do this
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

[ASK IF Q130=7 TO 10, OTHERWISE SKIP TO Q132]

Q131. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing an advanced programmable thermostat. In this case, how likely would your business be to install the thermostat, and take the rebate?

	Not at all likely to do this									Extremely likely to do this	Not our decision	Already have / do this
5 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

[IF Q130 =1-6, CONTINUE, OTHERWISE SKIP TO Q140]

Q132. Now, please assume that the impact of the rebate from Ameren Illinois was that you would save enough on electricity to pay for the cost of installing the advanced programmable thermostat in **1 year**. In this case, how likely would your business be to install the thermostat, and take the rebate?

	Not at all likely to do this									Extremely likely to do this	Not our decision	Already have / do this
1 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

[**ASK ALL RESPONDENTS]**

Q140. Another alternative is that the rebate from Ameren Illinois would pay for the entire cost of purchasing and installing the advanced programmable thermostat so that there would be no initial cost to you. In this case, how likely would your business be to take the rebate and install the thermostat?

	Not at all likely to do this									Extremely likely to do this	Not our decision	Already have / do this
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Advanced programmable thermostat	○	○	○	○	○	○	○	○	○	○	○	○

[IF Q140 =1-8, CONTINUE, OTHERWISE SKIP TO Q150]

Q141. Why would you not be extremely likely to install the advanced thermostat even if there were no initial cost to you?

_____

Q150. Now, for each of the energy control system improvements below, let's assume that the impact of the rebate from Ameren Illinois was that your business would save enough on electricity in **3 years** to pay for the cost associated with each control system improvement. If this were true, how likely would your organization be to make each improvement?

How likely would your organization be to…?

	Not at all likely to do this									Extremely likely to do this	Not our decision (i.e., Someone else decides)	Already have / do this
3 Year Payback Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
1. Install an Energy Management System that is designed to optimize the performance of all of your facility's energy using systems	○	○	○	○	○	○	○	○	○	○	○	○
4. Install occupancy / motion sensors to turn lights off when rooms are not in use	○	○	○	○	○	○	○	○	○	○	○	○

Q151. Finally, if Ameren Illinois offered rebates to purchase and install **higher than standard efficiency light bulbs** (higher than standard efficiency light bulbs could include compact fluorescents, LEDs, T-5, T-8 or Super T-8 fluorescents). The energy saved from installing these higher efficiency lamps could potentially make up for the associated cost of installing them within a few years

Assuming that Ameren Illinois could provide a rebate that meant you would save enough on your electricity costs to pay for the cost of installing higher efficiency light bulbs within **3 years**, how likely would you be to install one or more of these bulbs (and take the rebate)?

Not At All Likely To Do This … **Extremely Likely to Do This**

1 2 3 4 5 6 7 8 9 10

[ASK IF Q151=7 TO 10; OTHERWISE SKIP TO Q153]

Q152. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **5 years** to pay for the cost of installing the higher efficiency light bulbs. In this case, how likely would your business be to install the one or more of these bulbs, and take the rebate?

Not At All Likely To Do This … **Extremely Likely to Do This**

1 2 3 4 5 6 7 8 9 10

[ASK IF Q151=1-6; OTHERWISE SKIP TO Q154]

Q153. Now, please think about a situation in which the impact of the rebate from Ameren Illinois was that you would save enough on electricity in **1 year** to pay for the cost of installing the higher efficiency light bulbs. In this case, how likely would your business be to install one or more of the bulbs, and take the rebate?

Not At All Likely … **Extremely Likely**

To Do This **to Do This**
1 2 3 4 5 6 7 8 9 10

Q154. Another alternative is that the rebate from Ameren Illinois would pay for the entire cost of purchasing and installing new, higher efficiency light bulbs, so that there would be no incremental cost to you compared to a standard efficiency light. In this case, how likely would your business be to take the rebate and install the higher efficiency light bulbs?

Not At All Likely To Do This **Extremely Likely to Do This**
1 2 3 4 5 6 7 8 9 10

[IF Q154 =1-8, CONTINUE, OTHERWISE SKIP TO Q50]
Q155. Why would you not be extremely likely to install the higher efficiency light bulbs?

_____

[**PROGRAMMER: EACH RESPONDENT ONLY RECEIVES ONE OF THE FOLLOWING THREE QUESTIONS; RANDOMLY ROTATE]**
Q50. We know that the amount of the rebate that Ameren Illinois might provide to your business may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency light bulbs, like those we just discussed.

First, please indicate below how likely you would be to use a rebate and install new, higher efficiency light bulbs if you would save enough in 3 years to pay for the incremental cost of the bulbs, given the processes outlined below that would be involved in your receiving that rebate.

	Not at all likely to do this									**Extremely likely to do this**
[RANDOMIZE ORDER OF ITEMS 1-5]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. The rebate is mailed to you as a check after you complete a rebate application that is submitted through the mail	○	○	○	○	○	○	○	○	○	○
2. The rebate is mailed to you as a check after you complete an online form	○	○	○	○	○	○	○	○	○	○
3. The rebate is credited to your bill after you complete an online form	○	○	○	○	○	○	○	○	○	○
4. An "instant rebate" is applied as a discount to the cost of the bulbs at the point of sale	○	○	○	○	○	○	○	○	○	○
5. A utility representative would come to your facility and install the lights at no cost to you beyond what standard efficiency lights would cost	○	○	○	○	○	○	○	○	○	○

Q51. We know that the amount of the rebate that Ameren Illinois might provide to your business may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency light bulbs, like those we just discussed.

First, please indicate below how likely you would be to use a rebate and install new, higher efficiency light bulbs if you would save enough in 3 years to pay for the incremental cost of the bulbs, given the additional considerations outlined below.

	Not at all likely to do this									**Extremely likely to do this**
[RANDOMIZE ORDER OF ITEMS 1-2]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Your business does better than expected for several months in a row, generating unexpected revenue and cash flow	○	○	○	○	○	○	○	○	○	○
2. Your business does not perform as expected for several months in a row, meaning you have less revenue than expected	○	○	○	○	○	○	○	○	○	○

Q52. We know that the amount of the rebate that Ameren Illinois might provide to your business may not be the only thing that matters to you in terms of your decisions on these issues. For this reason, we would like you to tell us how several other factors might affect your decision about whether or not to use a rebate to install new, higher efficiency equipment, like those we just discussed.

Please indicate below how likely you would be to use a rebate and install new, higher efficiency equipment of the different types identified below if you would save enough in 3 years to pay for the incremental cost of the equipment, given the additional considerations outlined below.

	Not at all likely to do this									**Extremely likely to do this**
[RANDOMIZE ORDER OF ITEMS 1 / 2, 3 / 4, AND 5/6 SEPARATELY, KEEPING 1 / 2 TOGETHER, 3 / 4 TOGETHER AND 5/ 6 TOGETHER]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Install higher efficiency lights if:										
1. The color rendering provided by the bulbs is unfamiliar relative to that of traditional incandescent bulbs	○	○	○	○	○	○	○	○	○	○

2. Bulb designs are sleek, stylish, receive customer compliments, and clearly communicate a "green" orientation to the public	○	○	○	○	○	○	○	○	○	○
Install advanced programmable thermostat if:										
3. The thermostat may occasionally override individual settings that people select based on a pre-programmed schedule	○	○	○	○	○	○	○	○	○	○
4. The thermostat also provides a companion website that allows you to view usage history and control thermostat settings in real time	○	○	○	○	○	○	○	○	○	○
Replace business personal computers with higher efficiency models when you replace them:[PROGRAMMER: ONLY SHOW ONE OF ITEMS 5 AND 6 TO EACH ELIGIBLE RESPONDENT; RANDOMLY ASSIGN]										
5. One of the high efficiency features (an "auto-sleep" function) may interfere with a central IT department pushing updates to remote PCs during off hours	○	○	○	○	○	○	○	○	○	○
6. The "auto-sleep" function may reduce the risk of unauthorized computer access during off hours	○	○	○	○	○	○	○	○	○	○

CONCLUSION

[INCENTIVE NAME/ADDRESS COLLECTION SCREEN]
Those are all the questions we have for you today. Thank you for your participation!

Q75. To receive the $75 thank you payment you earned by completing our survey, please provide your name and address below.

A. Full name
B. Business name (optional)
C. Mailing Address Line #1
D. Mailing Address Line #2 (optional)
E. Mailing Address Line #3 (optional)
F. City
G. State
H. ZIP Code

[PROGRAMMER: INCLUDE OPTIONS FOR "I would prefer not to receive the $75 thank you payment**"]**

[IF EITHER NAME/MAILING ADDRESS ENTERED, SHOW INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN; OTHERWISE SKIP TO INCENTIVE CONFIRMATION / GOODBYE SCREEN]

[INCENTIVE NAME/ADDRESS/EMAIL ADDRESS VERIFICATION SCREEN]
Please review the information you provided and verify that it is complete and correct:

[DISPLAY NAME/ADDRESS/EMAIL ADDRESS COLLECTED ON PREVIOUS SCREEN]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "Next" to submit your information.
[PROGRAMMER: INCLUDE BACK BUTTON FOR THIS SCREEN DURING LIVE VERSION]

[INCENTIVE CONFIRMATION / FOLLOW-UP REQUEST SCREEN]
[IF NAME/MAILING ADDRESS ENTERED, DISPLAY, "You have successfully submitted the information we need so we can send you your $75 thank you payment. This payment will be issued to the name you provided and will be mailed within 3-4 weeks to the address you provided.**"]**

[PROGRAMMER: DISPLAY ON SAME SCREEN AS ABOVE LANGUAGE]
Q76. If you would like information on how your business can save money on energy bills, please visit us at www.actonenergy.com.

Additionally, if you would like someone from the Ameren Illinois energy efficiency implementation team to contact you about further energy efficiency opportunities, please provide the appropriate contact information below:

(NOTE: All other information you have provided in this survey will continue to remain anonymous, even if you choose to be contacted. None of your prior responses will be communicated to the Ameren Illinois energy efficiency implementation team.)

1. Yes, we would like to be contacted by someone from the Ameren Illinois energy efficiency implementation team. *Please supply appropriate information.*

Contact Name:_____

Business Name:_____

Preferred contact method(s) – *Select all that apply*:

☐ phone ☐ e-mail ☐ postal mail

Daytime phone number:_____ **[ALLOW UP TO 20 CHARACTERS]**

E-mail address:_____

Postal address:_____

_____

_____

2. No, we would NOT like to be contacted

[IF Q76=1, GO TO FOLLOW-UP REQUEST VERIFICATION SCREEN; IF Q76=2, SKIP TO FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]

[FOLLOW-UP REQUEST VERIFICATION SCREEN]
Please review the contact information you provided and verify that it is complete and correct:

[DISPLAY PROVIDED INFORMATION]

If you would like to edit any of this information, please click the "Back" button to go to the previous screen, where you can make any needed changes.

Otherwise, please click "Next" to submit your information.

[PROGRAMMER NOTE: INCLUDE 'BACK' BUTTON ON THIS SCREEN WHEN SURVEY IS LIVE]

[FOLLOW-UP REQUEST CONFIRMATION / COMMENT SCREEN]
[IF Q76=1, DISPLAY, "You have successfully submitted your contact information! You will be contacted by a representative from the Ameren Illinois energy efficiency implementation team within 10 business days.**"]**

If, at this time, you'd like to make any general comments or provide feedback to Ameren Illinois, please use the following text box:
[RECORD TEXT; ALLOW A HIGH MAX NUMBER OF CHARACTERS FOR LONG COMMENTS]

(Note: Any comments you submit here **will <u>not</u>** be linked to your previous survey responses or to any other identifying information when communicated to Ameren Illinois.)

Please click "Next" to submit your comment or to proceed without leaving a comment.

[GOODBYE SCREEN]

[IF STATUS=C, DISPLAY, "Thank you very much for your help with our research. It is greatly appreciated! Have a nice day!**"]**

[IF STATUS=T OR O, DISPLAY, "Thank you. Have a nice day!**"]**
[INCLUDE "Close window**" BUTTON]**

SURVEY CLOSED MESSAGE

We appreciate your time and effort in responding to the survey invitation you received, but the survey sponsored by Ameren Illinois is now closed.

In order to achieve a representative sample for this survey, quotas with specific criteria needed to be designated. Because these quotas have now been filled, we are not accepting any more responses.

If you would like information on how your business can save money on energy bills, please visit us at http://www.actonenergy.com

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Thank you. Have a nice day!

DEFINITIONS

[THE DEFINITIONS IN THE TABLE BELOW WILL EACH BE SHOWN IN A POP-UP BOX THAT IS TRIGGERED BY A HYPERLINKED WORD OR PHRASE]

Heating systems	
Air-source heat pump	An air-source heat pump uses the difference between outdoor and indoor air temperatures to provide both cooling and heating.
Geothermal heat pump	Geothermal heat pumps are similar to ordinary heat pumps, but use the ground instead of outside air to provide heating, air conditioning and, in most cases, hot water.
Cooling systems/chillers	
District steam with chiller	A district steam system works by having a central steam plant that typically serves multiple clients, or in larger cities, even multiple city blocks or other areas; district steam with chiller systems use district steam to drive a local chiller system
Floor-by-floor packaged water-cooled DX units	Separate air conditioning units that serve each floor individually; these units are typically water-cooled, rather than air-cooled
Centrifugal	Compressor that uses centrifugal force to compress gas by feeding it into a wheel with radial vanes. The wheel is then sealed inside of a cylinder and spun. When the wheel rotates, the gas is thrown away from the wheel center. The outward spinning motion compresses the gas.
Reciprocating	Compressor that increases the pressure of a process gas by positive displacement, employing linear movement of the drive shaft
Rotary	The machine used to impart rotational power to the drill stem while permitting vertical movement of the pipe for rotary drilling
Scroll	Uses advanced engineering and flow dynamics to efficiently and smoothly compress gas refrigerant
Screw	A propeller with several angled blades that rotates to push against water or air
Absorption, hot water	Thermally driven chiller utilizing hot water
Absorption, steam	Indirect-fired chiller utilizing steam
Absorption, natural gas	Direct-fired chiller
Chiller, steam-driven turbine	Mechanical pump-driven refrigeration process powered by a steam turbine
Wall or window air conditioner units	Small, residential-style packaged air conditioning units. Are either installed directly in a window or through a short, flexible intake duct. Provide cooling to the immediate vicinity.
Air cooled chiller	Large units with multiple fans on top, typically located outside. Chillers provide cold water (around 40°F) to large air handling systems which cool all zones within the building.
Water cooled chiller	Large units with one compressor and two heat exchangers, typically located within a central plant. Pumps send warm water to water cooling towers located outdoors to reject heat. Chillers provide cold water (around 40°F) to large air handling systems which cool all zones within the building.
Packaged rooftop air conditioner units	Larger air conditioners located on the roof which heat and cool specific zones within a building. Each unit typically contains its own compressor, supply fans, and heat exchangers.

Lighting	
Standard fluorescent tubes (T12)	Traditional fluorescent tube lights with standard efficiency (T12) tubes
Higher than standard efficiency fluorescent tubes (T10)	Fluorescent tube lights that provide more light output than a T12. The T10 lights have a 1 ¼ inch diameter while the T12 lights have a larger diameter of 1 ½ inches.
High-efficiency fluorescent tubes (T8)	Newer fluorescent tubes (T8s) that fit into traditional fixtures, but which represent a more efficient (lower wattage) tube
Super high-efficiency fluorescent tubes (T5)	Fluorescent, super high efficiency (T5) tube lights
Compact fluorescent (CFL)	A newer type of light bulb that screws into a light socket, but which is a fluorescent light rather than a traditional incandescent light bulb, and which also often has a non-traditional, "swirly" shape for a light bulb
Incandescent	Traditional screw in light bulbs that typically range from around 25 watts to around 120 watts
Neon	Tube shaped lights that contain neon or other inert gases at low pressure. Applying a high voltage, makes the gas glow brightly. Typically used in commercial advertising or signage.
LED lamp	A "light emitting diode" lamp is an electronic form of lighting that does not use filaments like traditional incandescent bulbs, but instead, uses solid state electronics.
Induction	Electrodeless lamps that can last up to 20 years before burning out. Typically used in exterior lighting.
High/Low pressure sodium	A sodium vapor lamp is a gas discharge lamp which uses sodium in an excited state to produce light. They are used in generating yellow light for lighting streets and highways. The low-pressure sodium lamp has remarkably high luminous efficiency, or efficacy, producing as much as 200 lumens per watt of input power. High pressure sodium (HPS) lamps are smaller and contain additional elements such as mercury, and produce a dark pink glow when first struck, and a pinkish orange light when warmed.
Photocell	A light sensing device used to control luminaires and dimmers in response to detected light levels. Also known as photosensor lights. These are typically used in outdoor lighting so that lights are turned off during daylight.
Metal halide – standard	A discharge lamp in which metal halide salts are added to the contents of a discharge tube in which there is a high-pressure arc in mercury vapor; the added metals generate different wavelengths, to give substantially white light at an efficiency approximating that of high-pressure sodium lamps
Metal halide – pulse start	Pulse start metal halide lamps do not require a starting electrode, and instead use a special starting circuit referred to as an igniter to generate a high-voltage pulse to the operating electrodes. Pulse start metal halide offers better efficiency than standard.
Mercury vapor	Pressurized gas inside an arc tube ionized by current flowing between electrodes, resulting in light being emitted. Contains mercury and small amounts of argon, neon and krypton gas.
Induction	Electrodeless lamps that can last up to 20 years before burning out. Typically used in exterior lighting.

Quartz halogen	An incandescent light bulb in which the envelope is made of quartz instead of glass, and the filament is surrounded by an atmosphere of a halogen gas, usually iodine.
Occupancy sensors	An occupancy sensor is a motion detector that is integrated with a timing device. It senses when motion has stopped for a specified time period in order to trigger a light extinguishing signal.
Daylighting sensors	Electronic devices that are used to control lights in a room, so that when there is sufficient daylight / sunlight present, room lights are turned off
Manual – single switch	One switch controls one or more light fixtures
Manual – dual switch	Sometimes referred to as a "three-way switch"; two or more switches control one or more light fixtures. It is commonly used in locations with two different entrances/exits, such as at the top and bottom of a stairwell or in a classroom with doors in opposite corners.
Water Heater	
Tankless (instantaneous)	A water heater that only heats water for delivery to your application when you ask for it by using hot water. These systems do not keep a tank of water hot at all times.
Heat recovery	A water heater that uses heat "recovered" from another application (for example, by recovering "waste heat" from a process that heats another material) to heat water for different purposes
Domestic - type	A tank water heater similar to what you would find in a residential home.
Thermostat	
Standard	A traditional thermostat that you have to manually adjust and that has only one setting for the internal temperature you want
Programmable	A thermostat that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week
Energy management system	An electronic system that can be programmed to automatically turn on / off (or to otherwise operate) HVAC, lighting, and / or other building systems according to a schedule that a building operator has established ahead of time
Structural	
Glass curtain/spandrel	A non- load-bearing wall of glass, attached to a building's exterior structural frame.
Energy Efficiency Measures	
Delamping	Removing light bulbs (or fluorescent tubes) from a facility so that there is still sufficient light, but not more than is necessary
Economizers (air-side or water-side)	Heat exchanger used to pre-heat water before it enters boiler
Energy management / control system	An electronic system that can be programmed to automatically turn on / off (or to otherwise operate) HVAC, lighting, and / or other building systems according to a schedule that a building operator has established ahead of time

Measure Data

Please see measure-level assumptions and details in the following file:

- *AIC Measure Summary Tabs RCIS 2016-02-22 values.xlsx*

AIC Measure Summary Tabs RCIS

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