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**

APPENDIX | B

Research on Behavioral Savings

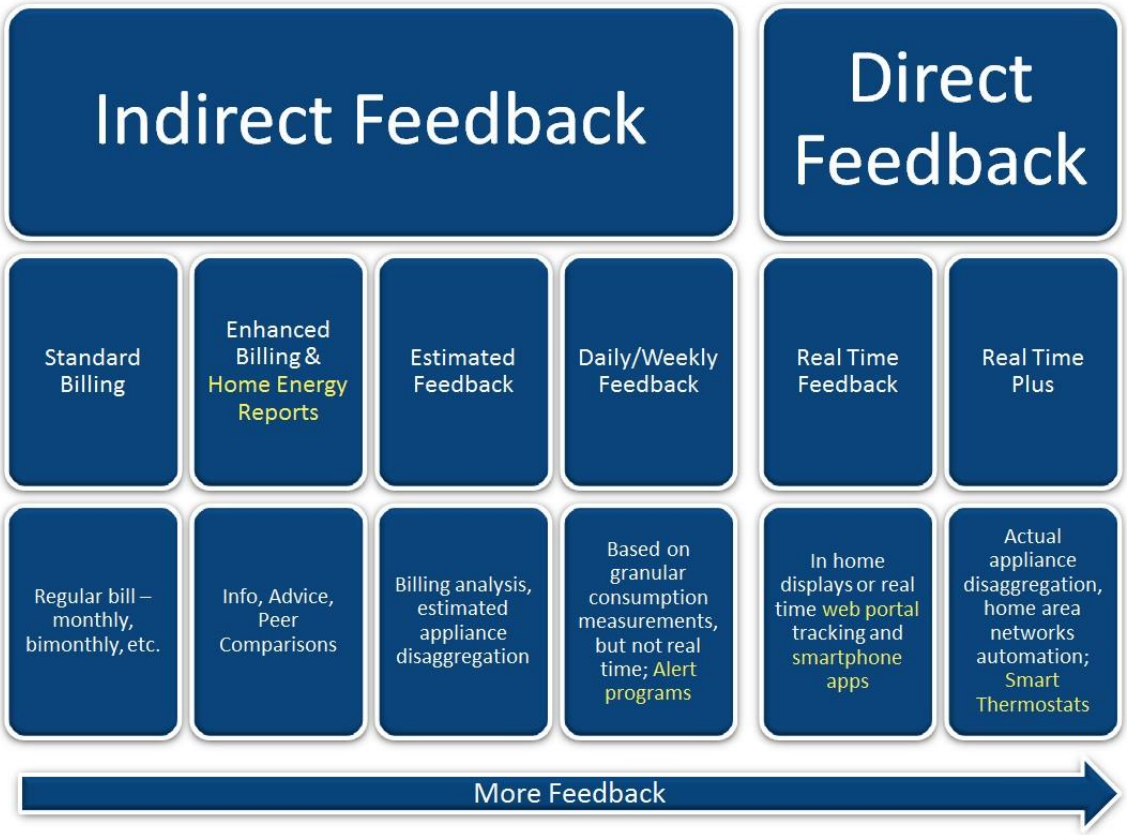
This appendix summarizes research on behavioral savings and initiatives as conducted by The Brattle Group. There is a brief overview of energy feedback programs as well as new technologies and programs that are being used to nudge customers towards energy conserving behaviors. The structure is as follows:

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

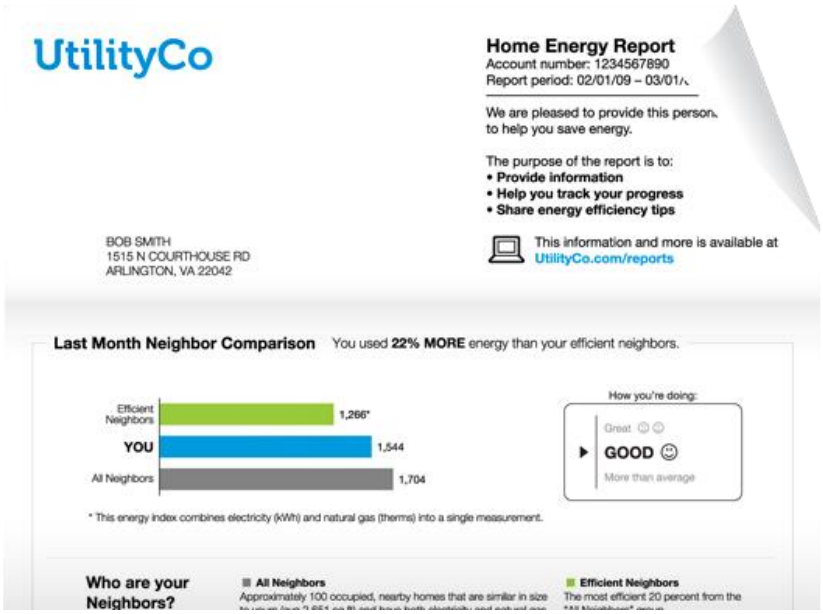
[4] Levitt, S and J. List (2007): "What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?", *The Journal of Economic Perspectives*, 21(2), pp. 153-174

[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:

[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

APPENDIX | C

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%