Residential Analysis Appendix

This appendix presents the results of the residential analysis by measure and region of the state (tables 4a through 10). It also presents, by efficiency measure, the input assumptions used to estimate economic and program potential associated with all individually-metered residential buildings (Tables 2b, 3a, and 3b). Table 2a provides the key to identifying the measure classification types in these tables. Because master-metered, multi-family buildings were analyzed using the same methodology as used for commercial buildings, assumptions used to analyze master-metered multi-family buildings are presented in the Commercial Analysis Appendix. The basis for the assumptions used for individually-metered residential buildings is discussed in Section 4.2 and Section 5.1.4 of this report. What follows is a summary of that discussion.

Per Unit Savings

Savings estimates for efficient heating and water heating equipment were based on engineering calculations, calibrated to actual average per household gas consumption in the applicable region of the state. Savings assumptions for thermal envelope measures were also based on engineering calculations, adjusted downward by 35% based on the project team's experience. Savings assumptions for hot water conservation measures, pool covers, programmable thermostats, clothes washers and other measures were based on a variety of sources including U.S. Department of Energy documents, NYSERDA program data, the Efficiency Vermont technical reference manual and professional judgment.

Incremental Costs and Measure Lives

Incremental cost and measure life assumptions came from technical documents supporting U.S. Department of Energy rule-makings on minimum federal efficiency standards, NYSERDA data, information from retailers, the Efficiency Vermont technical reference manual and professional judgment.

Market Size

Assumptions about the size of the equipment replacement markets (*e.g.*, the number of homes purchasing a new furnace each year) was assumed to be equal to the number of households that currently have a particular appliance divided by the measure life of the appliance (e.g., if a furnace has a life of 20 years, one-twentieth – or 5% - of existing furnaces are assumed to be replaced each year. Assumptions regarding the number of homes with different types of gas consuming equipment were based on data from the U.S. Energy Information Administration's Residential Energy Consumption Survey, appliance saturation surveys conducted by Niagara Mohawk (2000) and National Fuel (2004), census data, and the project team's recent analysis of efficiency potential for the Con Edison service territory.

Assumptions about the size of the renovation and retrofit markets were based on the project team's direct program experience with homes in New York and professional judgment.

Assumptions about the size of the new construction market were based on forecasted sales growth, historical data on residential construction permits for the state, forecasts of affordable housing developments from the City of New York, LIPA's recent residential new construction baseline study, and professional judgment.

Baseline Market Penetrations

Estimates of baseline market penetrations – or the portion of homes that would install an efficiency measure without new market interventions – were based on data from key industry sources (e.g., data from GAMA on the percentage of furnace shipments to New York that are efficient furnaces); technical documents supporting U.S. Department of Energy's rule-makings on federal efficiency standards; LIPA's residential new construction baseline study, NEEP's Northeast market assessment for efficient windows and other similar evaluations; NYSERDA and LIPA estimates of growth in participation in electric efficiency programs that generate some gas savings; and professional judgment.

Program Market Penetrations

As noted in Chapter 4, assessments of economic potential are purely theoretical because they effectively assume that every cost-effective measure is installed. For the program scenario that was analyzed, assumptions about market penetration rates was largely based on what leading programs across the country, targeted to similar markets, have achieved.

Residential Analysis Appendix Tables

Base Tables

1	Measure Descriptions
2a	Measure Type Classification Key
2b	Measure Characterizations
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Economic Potential

4a	Cumulative Net Savings For Each Measure by Year - Upstate
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5a	Economic Potential by Measure - Upstate
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6	Economic Potential by Market Pie Chart- Upstate and Downstate
7	Economic Potential by End Use Pie Chart - Upstate and Downstate

Achievable Potential

8a	Cumulative Net Savings For Each Measure by Year - Upstate
8b	Cumulative Net Savings For Each Measure by Year - Downstate
9	Achievable Potential by Market Pie Chart - Upstate and Downstate
10	Achievable Potential by End Use Pie Chart - Upstate and Downstate

Table 1: Measure Descriptions

#	Candidate Residential Measure Name	Description	Building Type
1	.59 EF to .63 EF gas DHW	ugrade from base efficiency to high efficiency stand-alone water heater	SF
2	Air Sealing	reduce building envelope air leakage	Large Multifamily
3	atmospheric to DV fireplace	upgrade from atmospherically vented to direct vent fireplace	SF
4	attic R-11 to R-49	upgrade existing attic insulation from R-11 to R-49	SF
5	attic R-27 to R-49	upgrade existing attic insulation from R-27 to R-49	SF
6	base DG window to low-e	upgrade from base double-glazed window to low-e	SF
7	base door to insulated door	upgrade from base base exterior door to insulated door	SF
8	base hatch to insulated hatch	upgrade from base attic access hatch to insulated hatch	SF
9	base to condensing gas furnace	upgrade from efficiency furnace to condensing model	SF
10	base to Energy Star clothes washer	upgrade from base efficiency clothes washer to Energy Star model	SF
11	base to humidity sensor model	upgrade from base efficiency clothes dryer to humidity sensor model	SF
12	base to sealed/direct vent boiler	upgrade from atmospheric boiler to sealed combustion direct vent model	SF
13	Commissioning	ensure mechanical systems and controls operating per specifications	Large Multifamily
14	Energy Star washer	upgrade from base efficiency clothes washer to Energy Star model	Large Multifamily
15	Faucet aerator	install faucent aerator	Large Multifamily
16	GFX DHW heat recovery	install gravity film heat exchanger on shower drain	SF
17	Graywater heat exchanger/GFX	install gravity film heat exchanger on shower drain	Large Multifamily
18	Improved heating system condensing unit - Tier 2	upgrade to condensing heating system	Large Multifamily
19	Improved heating system high efficiency unit - Tier 1	upgrade to condensing heating system	Large Multifamily
20	insul/seal/balance ducts	insulate, seal and balance ducted distribution system	SF
21	Integrated Design - High Performance (30% > codes) - Tier 1	integrated building design to increase performance at least 30% beyond code	Large Multifamily
22	Integrated Design - High Performance (50% > codes) Tier 2	integrated building design to increase performance at least 50% beyond code	Large Multifamily
23	LI attic R-11 to R-49	upgrade existing attic insulation from R-11 to R-49	LI SF
24	LI base hatch to insulated hatch	insulate attic access hatch	LI SF
25	LI base to condensing gas furnace	upgrade from efficiency furnace to condensing model	LI SF
26	LI low-flow devices	install faucet aerator and low-flow showerheads as appropriate	LI SF
27	LI R-19 bsmt/crawl ceiling insulation	inssulate basement or crawl space ceiling to R-19	LI SF
28	LI seal/balance ducts	seal and balance ducted distribution system	LI SF
29	LI smart air sealing	reduce building envelope air leakage	LI SF
30	LI tank temp turn down	reduce tank temperature of water heater	LI SF
31	LI tub/pool cover	install cover for pools and hot tubs	LI SF
32	LI wall R-4 to R-15	insulate uninsulated wall	LI SF
33	LI wall R-4 to R-19	insulate uninsulated wall	LI SF
34	LI wall R-4 to R-21	insulate uninsulated wall	LI SF
35	low-flow devices	install faucet aerator and low-flow showerheads as appropriate	SF
36	Low-flow shower heads	install low-flow showerhead as appropriate	Large Multifamily
37	MF storage tank to on-demand	convert from storage tank water heat to on-demand model	MF
38	Oxygen Trim	tune boiler to optimize oxygen/fuel mix	Large Multifamily
39	Pipe insulation - space heating	insulate boiler water distribution piping	Large Multifamily
40	place ducts within thermal shell	install ducts within conditioned space	SF
41	Programmable Thermostat	install programmable thermostat	Large Multifamily
42	programmable t-stat	install programmable thermostat	SF
43	R-19 bsmt/crawl ceiling insulation	inssulate basement or crawl space ceiling to R-19	SF
44	Retrocommissioning	ensure mechanical systems and controls operating per specifications	Large Multifamily
45	seal/balance ducts	seal and balance ducted distribution system	SF
46	SF storage tank to on-demand	convert from storage tank water heat to on-demand model	MF
47	SG w/storms to base DG	upgrade from single-glazing w/storm windows to double-glazing	SF
48	smart air sealing	reduce building envelope air leakage	SF
49	Steam trap Maintenance	identify and seal steam trap leaks	Large Multifamily
50	Swimming pool/spa covers	install cover for pools and hot tubs	Large Multifamily
51	Tank insulation	insulate water heater storage tanks	Large Multifamily
52	tank temp turn down	reduce tank temperature of water heater	SF
53	tub/pool cover	install cover for pools and hot tubs	SF
54	wall R-11 to R-15	upgrade existing wall insulation from R-11 to R-15	SF
55	wall R-19 to R-21	upgrade existing wall insulation from R-19 to R-21	SF
56	wall R-4 to R-15	insulate uninsulated wall	SF
57	wall R-4 to R-19	insulate uninsulated wall	SF
58	wall R-4 to R-21	insulate uninsulated wall	SF

Table 2a: Measure Type Classification Key

Measure ID4 (e.g., Bldg type)	SF = single family; MF = multi-family (non-central heat); Multifamily = multi-family (central heat)
Measure ID5 (e.g., End Use)	DHW = domestic hot water; HVAC = heating, ventilation, air conditioning; LI = low income; all also used in combination with Bldg Type identifiers
Measure ID6 (e.g., Market: Retrofit, NC, ROB)	NC = new construction; RENO = renovation; RET = retrofit; RR = repair or replace

Table 2b: RESIDENTIAL MEASURE CHARACTERIZATIONS

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Measure Life (years)	Incremental Installed Cost or Full Cost for Retrofit (2005$)	Annual kWh Saved or Generated	Maximum Load Reduction or Generated (kW)	Summer Generation Capacity	Winter Generation Capacity	Annual N. Gas Savings (Increased usage is negative) (Dtherms/yr)	Peak Day N. Gas Savings (Increased usage is negative) (Dtherms/day)	Water (gal/yr)
54	base to Energy Star clothes washer	SF	SF_ClothesWasher	NC	13.0	$250	162	0.047	46.3%	57.6%	1	0	4,446
55	base to Energy Star clothes washer	SF	SF_ClothesWasher	RENO	13.0	$250	162	0.047	46.3%	57.6%	1	0	4,446
56	base to Energy Star clothes washer	SF	SF_ClothesWasher	RR	13.0	$250	162	0.047	46.3%	57.6%	1	0	4,446
57	.59 EF to .63 EF gas DHW	SF	DHW	NC	13.0	$45			0.0%	0.0%	1	0	
58	.59 EF to .63 EF gas DHW	SF	DHW	RENO	13.0	$45			0.0%	0.0%	1	0	
59	.59 EF to .63 EF gas DHW	SF	DHW	RR	13.0	$45			0.0%	0.0%	1	0	
60	smart air sealing	SF	SF_Envelope	RR	20.0	$350	99	0.063	49.4%	41.9%	7	0	
61	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	20.0	$864	92	0.058	49.4%	41.9%	6	0	
62	atmospheric to DV fireplace	SF	HVAC	NC	15.0	$400			0.0%	0.0%	7	0	
63	atmospheric to DV fireplace	SF	HVAC	RENO	15.0	$400			0.0%	0.0%	7	0	
64	atmospheric to DV fireplace	SF	HVAC	RR	15.0	$900			0.0%	0.0%	7	0	
65	base to condensing gas furnace	SF	HVAC	NC	20.0	$446			0.0%	0.0%	9	0	
66	base to condensing gas furnace	SF	HVAC	RET	20.0	$2,486			0.0%	0.0%	14	0	
67	wall R-4 to R-15	SF	SF_Envelope	RET	30.0	$2,688	378	0.240	49.4%	41.9%	27	0	
68	wall R-4 to R-19	SF	SF_Envelope	RET	30.0	$2,765	407	0.259	49.4%	41.9%	29	0	
69	wall R-4 to R-21	SF	SF_Envelope	RET	30.0	$2,803	417	0.265	49.4%	41.9%	30	0	
70	smart air sealing	SF	SF_Envelope	RET	20.0	$350	99	0.063	49.4%	41.9%	7	0	
71	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	20.0	$864	92	0.058	49.4%	41.9%	6	0	
72	base hatch to insulated hatch	SF	SF_Envelope	RET	20.0	$100	10	0.006	49.4%	41.9%	1	0	
73	programmable t-stat	SF	HVAC	RET	15.0	$50	5	0.003	49.4%	41.9%	0	0	
74	base to condensing gas furnace	SF	HVAC	RR	20.0	$684			0.0%	0.0%	9	0	
75	base to humidity sensor model	SF	ClothesDryer	NC	15.0	$50			0.0%	0.0%	1	0	
76	base to humidity sensor model	SF	ClothesDryer	RENO	15.0	$50			0.0%	0.0%	1	0	
77	base to humidity sensor model	SF	ClothesDryer	RR	15.0	$50			0.0%	0.0%	1	0	
78	base to sealed/direct vent boiler	SF	HVAC	NC	25.0	$109			0.0%	0.0%	3	0	
79	base to sealed/direct vent boiler	SF	HVAC	RR	25.0	$109			0.0%	0.0%	3	0	
80	GFX DHW heat recovery	SF	DHW	NC	20.0	$500			0.0%	0.0%	4	0	
81	GFX DHW heat recovery	SF	DHW	RENO	20.0	$500			0.0%	0.0%	4	0	
82	insul/seal/balance ducts	SF	HVAC	NC	15.0	$750	327	0.604	49.4%	41.9%	16	0	
83	SG w/storms to base DG	SF	SF_Envelope	RR	25.0	($1,500)	54	0.034	49.4%	41.9%	4	0	
84	base DG window to low-e	SF	SF_Envelope	RR	25.0	$500	63	0.040	49.4%	41.9%	2	0	
85	programmable t-stat	SF	HVAC	RR	15.0	$10	5	0.003	49.4%	41.9%	0	0	
86	low-flow devices	SF	DHW	RET	10.0	$25			0.0%	0.0%	2	0	
87	place ducts within thermal shell	SF	HVAC	NC	25.0	$1	436	0.805	49.4%	41.9%	21	0	
88	seal/balance ducts	SF	HVAC	RET	15.0	$400	142	0.262	49.4%	41.9%	10	0	
89	seal/balance ducts	SF	HVAC	RR	15.0	$400	123	0.226	49.4%	41.9%	9	0	
90	tank temp turn down	SF	DHW	RET	10.0	$25			0.0%	0.0%	1	0	
91	attic R-27 to R-49	SF	SF_Envelope	NC	30.0	$190	23	0.015	49.4%	41.9%	1	0	
92	wall R-11 to R-15	SF	SF_Envelope	NC	30.0	$77	74	0.047	49.4%	41.9%	4	0	
93	wall R-11 to R-19	SF	SF_Envelope	NC	30.0	$154	118	0.075	49.4%	41.9%	6	0	
94	wall R-19 to R-21	SF	SF_Envelope	NC	30.0	$38	15	0.010	49.4%	41.9%	1	0	
95	smart air sealing	SF	SF_Envelope	NC	20.0	$350	148	0.094	49.4%	41.9%	7	0	
96	base DG window to low-e	SF	SF_Envelope	NC	25.0	$500	110	0.070	49.4%	41.9%	2	0	
97	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	20.0	$864	136	0.087	49.4%	41.9%	6	0	
98	base door to insulated door	SF	SF_Envelope	NC	20.0	$0	0	0.000	49.4%	41.9%	0	0	
99	base hatch to insulated hatch	SF	SF_Envelope	NC	20.0	$25	15	0.010	49.4%	41.9%	1	0	
100	programmable t-stat	SF	HVAC	NC	15.0	$10	8	0.005	49.4%	41.9%	0	0	
101	tub/pool cover	SF	pools/spas	NC	10.0	$915			0.0%	0.0%	86	0	
102	tub/pool cover	SF	pools/spas	RENO	10.0	$915			0.0%	0.0%	86	0	
103	smart air sealing	SF	SF_Envelope	RENO	20.0	$350	99	0.063	49.4%	41.9%	7	0	
104	base DG window to low-e	SF	SF_Envelope	RENO	25.0	$500	63	0.040	49.4%	41.9%	2	0	
105	base door to insulated door	SF	SF_Envelope	RENO	20.0	$0	0	0.000	49.4%	41.9%	0	0	
106	base hatch to insulated hatch	SF	SF_Envelope	RENO	20.0	$25	10	0.006	49.4%	41.9%	1	0	
107	programmable t-stat	SF	HVAC	RENO	15.0	$10	5	0.003	49.4%	41.9%	0	0	
108	tub/pool cover	SF	pools/spas	RET	10.0	$915			0.0%	0.0%	86	0	
109	tub/pool cover	SF	pools/spas	RR	10.0	$915			0.0%	0.0%	86	0	
110	base to Energy Star clothes washer	MF	MF_ClothesWasher	NC	13.0	$250	141	0.041	46.5%	56.7%	1	0	3,048
111	base to Energy Star clothes washer	MF	MF_ClothesWasher	RENO	13.0	$250	141	0.041	46.5%	56.7%	1	0	3,048
112	base to Energy Star clothes washer	MF	MF_ClothesWasher	RR	13.0	$250	141	0.041	46.5%	56.7%	1	0	3,048
113	.59 EF to .63 EF gas DHW	MF	DHW	NC	13.0	$45			0.0%	0.0%	1	0	
114	.59 EF to .63 EF gas DHW	MF	DHW	RENO	13.0	$45			0.0%	0.0%	1	0	
115	.59 EF to .63 EF gas DHW	MF	DHW	RR	13.0	$45			0.0%	0.0%	1	0	
116	smart air sealing	MF	MF_Envelope	RR	20.0	$175	49	0.031	49.6%	41.3%	4	0	
117	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	20.0	$216	18	0.012	49.6%	41.3%	2	0	
118	base to condensing gas furnace	MF	HVAC	NC	20.0	$446			0.0%	0.0%	7	0	
119	wall R-4 to R-15	MF	MF_Envelope	RET	30.0	$1,648	185	0.118	49.6%	41.3%	16	0	
120	wall R-4 to R-19	MF	MF_Envelope	RET	30.0	$1,695	199	0.127	49.6%	41.3%	18	0	
121	wall R-4 to R-21	MF	MF_Envelope	RET	30.0	$1,719	204	0.130	49.6%	41.3%	18	0	

Table 2b: RESIDENTIAL MEASURE CHARACTERIZATIONS

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Measure Life (years)	Incremental Installed Cost or Full Cost for Retrofit (2005$)	Annual kWh Saved or Generated	Maximum Load Reduction or Generated (kW)	Summer Generation Capacity	Winter Generation Capacity	Annual N. Gas Savings (Increased usage is negative) (Dtherms/yr)	Peak Day N. Gas Savings (Increased usage is negative) (Dtherms/day)	Water (gal/yr)
122	smart air sealing	MF	MF_Envelope	RET	20.0	$175	49	0.031	49.6%	41.3%	4	0	
123	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	20.0	$216	18	0.012	49.6%	41.3%	2	0	
124	base hatch to insulated hatch	MF	MF_Envelope	RET	20.0	$100	8	0.005	49.6%	41.3%	1	0	
125	base to condensing gas furnace	MF	HVAC	RR	20.0	$684			0.0%	0.0%	7	0	
126	base to humidity sensor model	MF	ClothesDryer	NC	15.0	$50			0.0%	0.0%	1	0	
127	base to humidity sensor model	MF	ClothesDryer	RENO	15.0	$50			0.0%	0.0%	1	0	
128	base to humidity sensor model	MF	ClothesDryer	RR	15.0	$50			0.0%	0.0%	1	0	
129	base to sealed/direct vent boiler	MF	HVAC	NC	25.0	$109			0.0%	0.0%	2	0	
130	base to sealed/direct vent boiler	MF	HVAC	RR	25.0	$109			0.0%	0.0%	2	0	
131	GFX DHW heat recovery	MF	DHW	NC	20.0	$500			0.0%	0.0%	5	0	
132	GFX DHW heat recovery	MF	DHW	RENO	20.0	$500			0.0%	0.0%	5	0	
133	SG w/storms to base DG	MF	MF_Envelope	RR	25.0	($920)	26	0.017	49.6%	41.3%	2	0	
134	programmable t-stat	MF	HVAC	RR	15.0	$10	3	0.002	49.6%	41.3%	0	0	
135	low-flow devices	MF	DHW	RET	10.0	$25			0.0%	0.0%	2	0	
136	place ducts within thermal shell	MF	HVAC	NC	25.0	$1	104	0.191	49.6%	41.3%	8	0	
137	seal/balance ducts	MF	HVAC	RET	15.0	$400	45	0.082	49.6%	41.3%	4	0	
138	seal/balance ducts	MF	HVAC	RR	15.0	$400	45	0.082	49.6%	41.3%	4	0	
139	tank temp turn down	MF	DHW	RET	10.0	$25			0.0%	0.0%	1	0	
140	attic R-27 to R-49	MF	MF_Envelope	NC	30.0	$117	9	0.006	49.6%	41.3%	1	0	
141	wall R-11 to R-15	MF	MF_Envelope	NC	30.0	$47	29	0.018	49.6%	41.3%	2	0	
142	wall R-11 to R-19	MF	MF_Envelope	NC	30.0	$94	46	0.029	49.6%	41.3%	3	0	
143	wall R-19 to R-21	MF	MF_Envelope	NC	30.0	$24	6	0.004	49.6%	41.3%	0	0	
144	smart air sealing	MF	MF_Envelope	NC	20.0	$175	58	0.037	49.6%	41.3%	4	0	
145	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	20.0	$216	22	0.014	49.6%	41.3%	2	0	
146	base door to insulated door	MF	MF_Envelope	NC	20.0	$0	0	0.000	49.6%	41.3%	0	0	
147	base hatch to insulated hatch	MF	MF_Envelope	NC	20.0	$25	10	0.006	49.6%	41.3%	1	0	
148	programmable t-stat	MF	HVAC	NC	15.0	$10	4	0.002	49.6%	41.3%	0	0	
149	smart air sealing	MF	MF_Envelope	RENO	20.0	$175	49	0.031	49.6%	41.3%	4	0	
150	base door to insulated door	MF	MF_Envelope	RENO	20.0	$0	0	0.000	49.6%	41.3%	0	0	
151	base hatch to insulated hatch	MF	MF_Envelope	RENO	20.0	$25	8	0.005	49.6%	41.3%	1	0	
152	programmable t-stat	MF	HVAC	RENO	15.0	$10	3	0.002	49.6%	41.3%	0	0	
153	LI base to condensing gas furnace	LI SF	LI HVAC	RET	20.0	$2,486			0.0%	0.0%	14	0	
154	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	30.0	$2,688	378	0.240	49.4%	41.9%	27	0	
155	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	30.0	$2,765	407	0.259	49.4%	41.9%	29	0	
156	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	30.0	$2,803	417	0.265	49.4%	41.9%	30	0	
157	LI smart air sealing	LI SF	LI SF_Envelope	RET	20.0	$350	99	0.063	49.4%	41.9%	7	0	
158	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	20.0	$864	92	0.058	49.4%	41.9%	6	0	
159	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	20.0	$100	10	0.006	49.4%	41.9%	1	0	
160	LI programmable t-stat	LI SF	LI HVAC	RET	15.0	$50	5	0.003	49.4%	41.9%	0	0	
161	LI low-flow devices	LI SF	LI DHW	RET	10.0	$25			0.0%	0.0%	2	0	
162	LI seal/balance ducts	LI SF	LI HVAC	RET	15.0	$400	142	0.262	49.4%	41.9%	10	0	
163	LI tank temp turn down	LI SF	LI DHW	RET	10.0	$25			0.0%	0.0%	1	0	
164	LI tub/pool cover	LI SF	LI pools/spas	RET	10.0	$915			0.0%	0.0%	86	0	
165	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	30.0	$1,648	185	0.118	49.6%	41.3%	16	0	
166	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	30.0	$1,695	199	0.127	49.6%	41.3%	18	0	
167	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	30.0	$1,719	204	0.130	49.6%	41.3%	18	0	
168	LI smart air sealing	LI MF	LI MF_Envelope	RET	20.0	$175	49	0.031	49.6%	41.3%	4	0	
169	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	20.0	$216	18	0.012	49.6%	41.3%	2	0	
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	20.0	$100	8	0.005	49.6%	41.3%	1	0	
171	LI low-flow devices	LI MF	LI DHW	RET	10.0	$25			0.0%	0.0%	2	0	
172	LI seal/balance ducts	LI MF	LI HVAC	RET	15.0	$400	45	0.082	49.6%	41.3%	4	0	
173	LI tank temp turn down	LI MF	LI DHW	RET	10.0	$25			0.0%	0.0%	1	0	
174	SF storage tank to on-demand	SF	DHW	NC	20.0	$800			0.0%	0.0%	6	0	
175	SF storage tank to on-demand	SF	DHW	RR	20.0	$800			0.0%	0.0%	6	0	
176	MF storage tank to on-demand	MF	DHW	NC	20.0	$600			0.0%	0.0%	6	0	
177	MF storage tank to on-demand	MF	DHW	RR	20.0	$600			0.0%	0.0%	6	0	

Table 3a: Residential Existing Penetration Rates -- Upstate

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
54	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	0	0	0	0	0	0	0	0	0	
55	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	0	0	0	0	0	0	0	0	0	
56	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	0	0	0	0	0	0	0	0	0	
57	.59 EF to .63 EF gas DHW	SF	DHW	NC	0	0	0	0	0	0	0	0	0	
58	.59 EF to .63 EF gas DHW	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	
59	.59 EF to .63 EF gas DHW	SF	DHW	RR	0	0	0	0	0	0	0	0	0	
60	smart air sealing	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	
61	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	
62	atmospheric to DV fireplace	SF	HVAC	NC	18,437	18,700	18,964	19,227	19,490	19,754	20,017	20,281	20,544	20,807
63	atmospheric to DV fireplace	SF	HVAC	RENO	4,693	4,783	4,876	4,974	5,077	5,118	5,118	5,118	5,118	5,118
64	atmospheric to DV fireplace	SF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
65	base to condensing gas furnace	SF	HVAC	NC	22,792	22,792	22,792	22,792	22,792	22,792	22,792	22,792	22,792	22,792
66	base to condensing gas furnace	SF	HVAC	RET	702	756	813	873	935	1,001	1,070	1,142	1,219	1,301
67	wall R-4 to R-15	SF	SF_Envelope	RET	3,362	3,362	3,362	3,362	3,362	3,362	3,362	3,362	3,362	3,362
68	wall R-4 to R-19	SF	SF_Envelope	RET	98	120	144	168	194	221	250	280	312	345
69	wall R-4 to R-21	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
70	smart air sealing	SF	SF_Envelope	RET	370	456	545	638	736	838	946	1,060	1,181	1,308
71	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	55,585	55,585	55,585	55,585	55,585	55,585	55,585	55,585	55,585	55,585
72	base hatch to insulated hatch	SF	SF_Envelope	RET	19,457	20,013	20,569	21,125	21,680	22,236	22,792	23,348	23,904	24,460
73	programmable t-stat	SF	HVAC	RET	86,301	86,301	86,301	86,301	86,301	86,301	86,301	86,301	86,301	86,301
74	base to condensing gas furnace	SF	HVAC	RR	0	0	0	0	0	0	0	0	0	
75	base to humidity sensor model	SF	ClothesDryer	NC	370	456	545	638	736	838	946	1,060	1,181	1,308
76	base to humidity sensor model	SF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	
77	base to humidity sensor model	SF	ClothesDryer	RR	0	0	0	0	0	0	0	0	0	0
78	base to sealed/direct vent boiler	SF	HVAC	NC	0	0	0	0	0	0	0	0	0	
79	base to sealed/direct vent boiler	SF	HVAC	RR	2,257	2,483	2,718	2,964	3,222	3,493	3,777	4,078	4,396	4,732
80	GFX DHW heat recovery	SF	DHW	NC	3,059	3,172	3,289	3,412	3,541	3,677	3,819	3,969	4,128	4,297
81	GFX DHW heat recovery	SF	DHW	RENO	1,772	1,885	2,002	2,126	2,254	2,390	2,532	2,682	2,841	3,010
82	insul/seal/balance ducts	SF	HVAC	NC	549	662	780	903	1,032	1,167	1,310	1,460	1,619	1,787
83	SG w/storms to base DG	SF	SF_Envelope	RR	976	1,202	1,437	1,684	1,941	2,212	2,497	2,797	3,115	3,452
84	base DG window to low-e	SF	SF_Envelope	RR	5,474	5,700	5,935	6,181	6,439	6,710	6,995	7,295	7,613	7,950
85	programmable t-stat	SF	HVAC	RR	10,139	10,342	10,554	10,775	11,008	11,251	11,508	11,583	11,583	11,583
86	low-flow devices	SF	DHW	RET	25,105	25,557	25,739	25,739	25,739	25,739	25,739	25,739	25,739	25,739
87	place ducts within thermal shell	SF	HVAC	NC	7,405	7,630	7,866	8,112	8,370	8,640	8,925	9,226	9,544	9,880
88	seal/balance ducts	SF	HVAC	RET	11,594	11,874	12,166	12,472	12,792	13,128	13,482	13,855	14,250	14,668
89	seal/balance ducts	SF	HVAC	RR	166	171	176	182	188	194	200	207	214	221
90	tank temp turn down	SF	DHW	RET	0	0	0	0	0	0	0	0	0	0
91	attic R-27 to R-49	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
92	wall R-11 to R-15	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
93	wall R-11 to R-19	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
94	wall R-19 to R-21	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
95	smart air sealing	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
96	base DG window to low-e	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	
97	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
98	base door to insulated door	SF	SF_Envelope	NC	49	53	56	60	64	68	72	76	81	86
99	base hatch to insulated hatch	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
100	programmable t-stat	SF	HVAC	NC	155	164	172	181	190	198	207	216	224	233
101	tub/pool cover	SF	pools/spas	NC	67	67	67	67	67	67	67	67	67	67
102	tub/pool cover	SF	pools/spas	RENO	0	0	0	0	0	0	0	0	0	0
103	smart air sealing	SF	SF_Envelope	RENO	213	213	213	213	213	213	213	213	213	213
104	base DG window to low-e	SF	SF_Envelope	RENO	22	23	24	25	26	27	29	30	31	32
105	base door to insulated door	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	
106	base hatch to insulated hatch	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	
107	programmable t-stat	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	
108	tub/pool cover	SF	pools/spas	RET	0	0	0	0	0	0	0	0	0	
109	tub/pool cover	SF	pools/spas	RR	0	0	0	0	0	0	0	0	0	
110	base to Energy Star clothes washer	MF	MF_ClothesWash	NC	0	0	0	0	0	0	0	0	0	
111	base to Energy Star clothes washer	MF	MF_ClothesWash	RENO	0	0	0	0	0	0	0	0	0	
112	base to Energy Star clothes washer	MF	MF_ClothesWash	RR	204	207	209	212	215	218	221	224	227	230
113	.59 EF to .63 EF gas DHW	MF	DHW	NC	70	72	73	74	76	77	77	77	77	77
114	.59 EF to .63 EF gas DHW	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
115	.59 EF to .63 EF gas DHW	MF	DHW	RR	700	700	700	700	700	700	700	700	700	700
116	smart air sealing	MF	MF_Envelope	RR	32	34	37	39	42	45	48	51	55	58
117	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	310	310	310	310	310	310	310	310	310	310
118	base to condensing gas furnace	MF	HVAC	NC	1	2	2	3	3	3	4	4	5	5
119	wall R-4 to R-15	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
120	wall R-4 to R-19	MF	MF_Envelope	RET	1,707	1,707	1,707	1,707	1,707	1,707	1,707	1,707	1,707	1,707
121	wall R-4 to R-21	MF	MF_Envelope	RET	3,685	3,685	3,685	3,685	3,685	3,685	3,685	3,685	3,685	3,685
122	smart air sealing	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
123	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	2	2	3	3	4	5	5	6	6	7
124	base hatch to insulated hatch	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
125	base to condensing gas furnace	MF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
126	base to humidity sensor model	MF	ClothesDryer	NC	0	0	0	0	0	0	0	0	0	
127	base to humidity sensor model	MF	ClothesDryer	RENO	34	37	41	44	48	52	56	61	66	71
128	base to humidity sensor model	MF	ClothesDryer	RR	46	47	49	51	53	55	57	59	62	64
129	base to sealed/direct vent boiler	MF	HVAC	NC	26	28	30	32	34	36	38	40	42	45
130	base to sealed/direct vent boiler	MF	HVAC	RR	8	10	12	14	15	17	20	22	24	27
131	GFX DHW heat recovery	MF	DHW	NC	15	18	21	25	29	33	37	42	47	52
132	GFX DHW heat recovery	MF	DHW	RENO	152	155	158	161	165	168	172	173	173	173
133	SG w/storms to base DG	MF	MF_Envelope	RR	188	191	192	192	192	192	192	192	192	192
134	programmable t-stat	MF	HVAC	RR	111	114	118	121	125	129	133	138	143	148
135	low-flow devices	MF	DHW	RET	241	247	253	259	266	273	280	288	296	305
136	place ducts within thermal shell	MF	HVAC	NC	0	0	0	0	0	0	0	0	0	0
137	seal/balance ducts	MF	HVAC	RET	0	0	0	0	0	0	0	0	0	0
138	seal/balance ducts	MF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
139	tank temp turn down	MF	DHW	RET	0	0	0	0	0	0	0	0	0	0
140	attic R-27 to R-49	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
141	wall R-11 to R-15	MF	MF_Envelope	NC										
142	wall R-11 to R-19	MF	MF_Envelope	NC										

Table 3a: Residential Existing Penetration Rates -- Upstate

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
143	wall R-19 to R-21	MF	MF_Envelope	NC										
144	smart air sealing	MF	MF_Envelope	NC										
145	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC										
146	base door to insulated door	MF	MF_Envelope	NC										
147	base hatch to insulated hatch	MF	MF_Envelope	NC										
148	programmable t-stat	MF	HVAC	NC										
149	smart air sealing	MF	MF_Envelope	RENO										
150	base door to insulated door	MF	MF_Envelope	RENO										
151	base hatch to insulated hatch	MF	MF_Envelope	RENO										
152	programmable t-stat	MF	HVAC	RENO										
153	LI base to condensing gas furnace	LI SF	LI HVAC	RET										
154	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET										
155	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET										
156	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET										
157	LI smart air sealing	LI SF	LI SF_Envelope	RET										
158	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET										
159	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET										
160	LI programmable t-stat	LI SF	LI HVAC	RET										
161	LI low-flow devices	LI SF	LI DHW	RET										
162	LI seal/balance ducts	LI SF	LI HVAC	RET	15	19	22	26	30	34	38	43	47	52
163	LI tank temp turn down	LI SF	LI DHW	RET	390	468	546	624	702	781	859	937	1,015	1,093
164	LI tub/pool cover	LI SF	LI pools/spas	RET	15	19	22	26	30	34	38	43	47	52
165	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	4	5	6	7	8	9	9	10	11	12
166	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET										
167	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET										
168	LI smart air sealing	LI MF	LI MF_Envelope	RET										
169	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET										
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET										
171	LI low-flow devices	LI MF	LI DHW	RET										
172	LI seal/balance ducts	LI MF	LI HVAC	RET										
173	LI tank temp turn down	LI MF	LI DHW	RET										
174	SF storage tank to on-demand	SF	DHW	NC										
175	SF storage tank to on-demand	SF	DHW	RR										
176	MF storage tank to on-demand	MF	DHW	NC										
177	MF storage tank to on-demand	MF	DHW	RR										

Table 3b: Residential Existing Penetration Rates -- Downstate

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
54	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	960	1,082	1,205	1,330	1,458	1,588	1,723	1,861	2,004	2,154
55	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	0	0	0	0	0	0	0	0	0	0
56	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	7,342	8,246	9,150	10,054	10,957	11,861	12,765	13,668	14,572	15,476
57	.59 EF to .63 EF gas DHW	SF	DHW	NC	2,269	2,402	2,537	2,673	2,813	2,956	3,102	3,253	3,410	3,573
58	.59 EF to .63 EF gas DHW	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
59	.59 EF to .63 EF gas DHW	SF	DHW	RR	12,979	13,700	14,421	15,142	15,863	16,584	17,306	18,027	18,748	19,469
60	smart air sealing	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
61	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420	6,420
62	atmospheric to DV fireplace	SF	HVAC	NC	560	572	584	596	609	622	635	648	663	677
63	atmospheric to DV fireplace	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
64	atmospheric to DV fireplace	SF	HVAC	RR	7,722	7,722	7,722	7,722	7,722	7,722	7,722	7,722	7,722	7,722
65	base to condensing gas furnace	SF	HVAC	NC	3,312	3,412	3,514	3,618	3,724	3,832	3,943	4,058	4,176	4,300
66	base to condensing gas furnace	SF	HVAC	RET	0	0	0	0	0	0	0	0	0	
67	wall R-4 to R-15	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
68	wall R-4 to R-19	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
69	wall R-4 to R-21	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
70	smart air sealing	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
71	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
72	base hatch to insulated hatch	SF	SF_Envelope	RET	0	0	0	0	0	0	0	0	0	
73	programmable t-stat	SF	HVAC	RET	0	0	0	0	0	0	0	0	0	
74	base to condensing gas furnace	SF	HVAC	RR	17,033	17,276	17,519	17,763	18,006	18,249	18,493	18,736	18,979	19,223
75	base to humidity sensor model	SF	ClothesDryer	NC	2,562	2,594	2,627	2,661	2,695	2,730	2,766	2,803	2,842	2,882
76	base to humidity sensor model	SF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
77	base to humidity sensor model	SF	ClothesDryer	RR	21,056	21,056	21,056	21,056	21,056	21,056	21,056	21,056	21,056	21,056
78	base to sealed/direct vent boiler	SF	HVAC	NC	459	491	524	557	591	625	661	697	735	775
79	base to sealed/direct vent boiler	SF	HVAC	RR	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106
80	GFX DHW heat recovery	SF	DHW	NC	5	19	32	46	60	74	89	104	119	136
81	GFX DHW heat recovery	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
82	insul/seal/balance ducts	SF	HVAC	NC	20	70	121	173	226	280	336	393	452	514
83	SG w/storms to base DG	SF	SF_Envelope	RR	51,352	51,352	51,352	51,352	51,352	51,352	51,352	51,352	51,352	51,352
84	base DG window to low-e	SF	SF_Envelope	RR	17,975	18,489	19,002	19,516	20,029	20,543	21,056	21,570	22,084	22,597
85	programmable t-stat	SF	HVAC	RR	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728
86	low-flow devices	SF	DHW	RET	0	0	0	0	0	0	0	0	0	
87	place ducts within thermal shell	SF	HVAC	NC	20	70	121	173	226	280	336	393	452	514
88	seal/balance ducts	SF	HVAC	RET	0	0	0	0	0	0	0	0	0	
89	seal/balance ducts	SF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
90	tank temp turn down	SF	DHW	RET	0	0	0	0	0	0	0	0	0	
91	attic R-27 to R-49	SF	SF_Envelope	NC	1,281	1,414	1,549	1,685	1,825	1,968	2,114	2,265	2,422	2,585
92	wall R-11 to R-15	SF	SF_Envelope	NC	2,493	2,559	2,627	2,695	2,765	2,836	2,909	2,985	3,063	3,145
93	wall R-11 to R-19	SF	SF_Envelope	NC	1,258	1,324	1,392	1,460	1,530	1,601	1,675	1,750	1,828	1,910
94	wall R-19 to R-21	SF	SF_Envelope	NC	85	151	219	287	357	428	501	577	655	737
95	smart air sealing	SF	SF_Envelope	NC	52	185	320	457	596	739	885	1,036	1,193	1,356
96	base DG window to low-e	SF	SF_Envelope	NC	4,369	4,501	4,636	4,773	4,912	5,055	5,201	5,353	5,509	5,673
97	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	8,933	9,053	9,174	9,297	9,423	9,551	9,683	9,819	9,960	10,107
98	base door to insulated door	SF	SF_Envelope	NC	22,322	22,587	22,856	23,130	23,409	23,694	23,987	24,290	24,603	24,699
99	base hatch to insulated hatch	SF	SF_Envelope	NC	6,221	6,354	6,488	6,625	6,765	6,907	7,054	7,205	7,362	7,525
100	programmable t-stat	SF	HVAC	NC	10,027	10,192	10,359	10,529	10,702	10,879	11,061	11,249	11,443	11,646
101	tub/pool cover	SF	pools/spas	NC	139	142	145	148	152	155	158	161	165	169
102	tub/pool cover	SF	pools/spas	RENO	0	0	0	0	0	0	0	0	0	0
103	smart air sealing	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
104	base DG window to low-e	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
105	base door to insulated door	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
106	base hatch to insulated hatch	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
107	programmable t-stat	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
108	tub/pool cover	SF	pools/spas	RET	0	0	0	0	0	0	0	0	0	
109	tub/pool cover	SF	pools/spas	RR	0	0	0	0	0	0	0	0	0	0
110	base to Energy Star clothes washer	MF	MF_ClothesWas	NC	12	13	15	16	18	19	21	23	25	26
111	base to Energy Star clothes washer	MF	MF_ClothesWas	RENO	0	0	0	0	0	0	0	0	0	0
112	base to Energy Star clothes washer	MF	MF_ClothesWas	RR	170	191	212	233	254	275	295	316	337	358
113	.59 EF to .63 EF gas DHW	MF	DHW	NC	34	36	38	40	42	44	46	49	51	53
114	.59 EF to .63 EF gas DHW	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
115	.59 EF to .63 EF gas DHW	MF	DHW	RR	330	348	366	385	403	421	440	458	476	494
116	smart air sealing	MF	MF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
117	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	453	453	453	453	453	453	453	453	453	453
118	base to condensing gas furnace	MF	HVAC	NC	18	18	19	19	20	21	21	22	22	23
119	wall R-4 to R-15	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
120	wall R-4 to R-19	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
121	wall R-4 to R-21	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
122	smart air sealing	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
123	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
124	base hatch to insulated hatch	MF	MF_Envelope	RET	0	0	0	0	0	0	0	0	0	
125	base to condensing gas furnace	MF	HVAC	RR	433	439	445	451	457	464	470	476	482	488
126	base to humidity sensor model	MF	ClothesDryer	NC	38	39	39	40	40	41	41	42	42	43
127	base to humidity sensor model	MF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
128	base to humidity sensor model	MF	ClothesDryer	RR	1,487	1,487	1,487	1,487	1,487	1,487	1,487	1,487	1,487	1,487
129	base to sealed/direct vent boiler	MF	HVAC	NC	21	22	24	25	27	28	30	31	33	35
130	base to sealed/direct vent boiler	MF	HVAC	RR	659	659	659	659	659	659	659	659	659	659
131	GFX DHW heat recovery	MF	DHW	NC	0	0	0	1	1	1	1	2	2	2
132	GFX DHW heat recovery	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
133	SG w/storms to base DG	MF	MF_Envelope	RR	3,625	3,625	3,625	3,625	3,625	3,625	3,625	3,625	3,625	3,625
134	programmable t-stat	MF	HVAC	RR	7,828	7,828	7,828	7,828	7,828	7,828	7,828	7,828	7,828	7,828
135	low-flow devices	MF	DHW	RET	0	0	0	0	0	0	0	0	0	
136	place ducts within thermal shell	MF	HVAC	NC	0	0	1	1	1	2	2	2	2	3
137	seal/balance ducts	MF	HVAC	RET	0	0	0	0	0	0	0	0	0	
138	seal/balance ducts	MF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
139	tank temp turn down	MF	DHW	RET	0	0	0	0	0	0	0	0	0	
140	attic R-27 to R-49	MF	MF_Envelope	NC	19	21	23	25	27	29	32	34	36	39
141	wall R-11 to R-15	MF	MF_Envelope	NC	37	38	39	40	41	42	43	45	46	47
142	wall R-11 to R-19	MF	MF_Envelope	NC	19	20	21	22	23	24	25	26	27	29
143	wall R-19 to R-21	MF	MF_Envelope	NC	1	2	3	4	5	6	7	9	10	11
144	smart air sealing	MF	MF_Envelope	NC	1	3	5	7	9	11	13	15	18	20
145	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	133	135	137	139	141	143	145	147	149	151
146	base door to insulated door	MF	MF_Envelope	NC	167	169	171	173	175	177	179	181	184	185
147	base hatch to insulated hatch	MF	MF_Envelope	NC	93	95	97	99	101	103	105	108	110	112
148	programmable t-stat	MF	HVAC	NC	208	212	215	219	222	226	230	234	238	242
149	smart air sealing	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
150	base door to insulated door	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
151	base hatch to insulated hatch	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
152	programmable t-stat	MF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
153	LI base to condensing gas furnace	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0

Table 3b: Residential Existing Penetration Rates -- Downstate

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
154	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET										
155	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET										
156	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET										
157	LI smart air sealing	LI SF	LI SF_Envelope	RET										
158	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET										
159	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET										
160	LI programmable t-stat	LI SF	LI HVAC	RET										
161	LI low-flow devices	LI SF	LI DHW	RET										
162	LI seal/balance ducts	LI SF	LI HVAC	RET										
163	LI tank temp turn down	LI SF	LI DHW	RET										
164	LI tub/pool cover	LI SF	LI pools/spas	RET										
165	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET										
166	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET										
167	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET										
168	LI smart air sealing	LI MF	LI MF_Envelope	RET										
169	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET										
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET										
171	LI low-flow devices	LI MF	LI DHW	RET										
172	LI seal/balance ducts	LI MF	LI HVAC	RET										
173	LI tank temp turn down	LI MF	LI DHW	RET										
174	SF storage tank to on-demand	SF	DHW	NC	2	4	6	8	10	12	14	16	19	21
175	SF storage tank to on-demand	SF	DHW	RR	361	433	505	577	649	721	793	865	937	1,009
176	MF storage tank to on-demand	MF	DHW	NC	2	4	6	8	10	12	14	16	19	21
177	MF storage tank to on-demand	MF	DHW	RR	9	11	13	15	16	18	20	22	24	26

Table 4a: Economic Cumulative Net Savings by Measure by Year -- Upstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Faucet aerator	Multifamily	Water Heating	Retrofit	3	3	3	3	3	3	3	3	3	3
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	0	1	1	2	2	2	3	3	4	4
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	3	6	10	13	16	19	22	26	29	32
4	Low-flow shower heads	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
5	Low-flow shower heads	Multifamily	Water Heating	New construction	1	1	2	2	3	4	4	5	5	6
6	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	10	20	30	39	49	58	67	75	84	92
7	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	2
8	Pipe insulation - water heating	Multifamily	Water Heating	New construction	0	0	0	0	0	0	0	0	1	1
9	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	0	1	1	1	1	2	2	2	3	3
10	Tank insulation	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	1
11	Tank insulation	Multifamily	Water Heating	New construction	0	0	0	0	0	0	0	0	0	0
12	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	0	1	1	1	1	2	2	2	2	3
13	Air Sealing	Multifamily	Space Heating	Retrofit	291	291	291	291	291	291	291	291	291	291
14	Air Sealing	Multifamily	Space Heating	New construction	2	4	6	8	11	13	15	17	19	21
15	Air Sealing	Multifamily	Space Heating	Renovation	11	21	32	42	52	63	73	84	94	104
16	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	60
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	1	2	2	3	4	5	5	6	7	7
18	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	5	10	15	19	24	28	33	37	41	45
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	23
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	0	0	1	1	1	1	2	2	2	2
21	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	1	3	4	6	7	9	11	12	14	15
22	Programmable Thermostat	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
23	Programmable Thermostat	Multifamily	Space Heating	Renovation	0	0	0	0	0	0	0	0	0	0
24	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	0	0	0	0	1	1	1	1	1	1
25	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	3
26	Pipe insulation - space heating	Multifamily	Space Heating	New construction	0	0	0	0	0	0	0	1	1	1
27	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	0	1	1	1	2	2	2	3	3	3
28	Energy Star washer	Multifamily	Water Heating	New construction	0	0	0	0	0	0	0	0	0	0
29	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	0	1	1	1	1	2	2	2	2	2
30	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	0	0	0	0	0	0	0	0	0	0
31	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	2	4	6	8	10	9	9	9	8	8
32	Commissioning	Multifamily	Total	New construction	0	0	0	0	0	0	0	0	0	0
33	Commissioning	Multifamily	Total	Renovation	7	14	21	27	34	41	47	47	46	45
34	Commissioning	Multifamily	Total	Remodel/Replacment	31	63	94	126	157	187	217	215	212	207
35	Retrocommissioning	Multifamily	Total	Retrofit	109	109	109	109	109	109	109	0	0	0
36	Integrated Design - High Performance (30% > codes)	Multifamily	Total	New construction	0	0	0	0	0	0	0	1	1	1
37	Integrated Design - High Performance (50% > codes)	Multifamily	Total	New construction	0	0	0	0	0	0	0	0	0	0
38	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	32	0	0	0	0	0	0	0	0	0
39	Oxygen Trim	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
40	Oxygen Trim	Multifamily	Space Heating	New construction	0	1	1	1	1	2	2	2	3	3
41	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	3	7	10	14	17	20	24	27	30	33
42	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	8	15	23	30	37	44	51	57	63	69
43	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	0	0	0	0	0	0	0	0	0	0
44	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	70	140	208	276	343	410	476	540	604	668
45	.59 EF to .63 EF gas DHW	SF	DHW	NC	10	19	28	37	45	54	62	69	77	84
46	.59 EF to .63 EF gas DHW	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
47	.59 EF to .63 EF gas DHW	SF	DHW	RR	64	126	188	249	310	370	428	487	544	600
48	attic R-11 to R-49	SF	SF_Envelope	RENO	13	25	38	50	63	76	88	101	114	126
49	smart air sealing	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
50	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	57	113	170	226	283	339	396	452	509	565
51	atmospheric to DV fireplace	SF	HVAC	NC	3	6	10	12	15	18	20	22	24	26
52	atmospheric to DV fireplace	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
53	base to condensing gas furnace	SF	HVAC	NC	55	108	160	209	257	303	346	387	426	463
54	base to condensing gas furnace	SF	HVAC	RET	5,702	5,702	5,702	5,702	5,702	5,702	5,702	5,702	5,702	5,702
55	attic R-11 to R-49	SF	SF_Envelope	RET	1,767	1,767	1,767	1,767	1,767	1,767	1,767	1,767	1,767	1,767
56	wall R-4 to R-15	SF	SF_Envelope	RET	2,334	2,334	2,334	2,334	2,334	2,334	2,334	2,334	2,334	2,334
57	wall R-4 to R-19	SF	SF_Envelope	RET	502	502	502	502	502	502	502	502	502	502
58	wall R-4 to R-21	SF	SF_Envelope	RET	515	515	515	515	515	515	515	515	515	515

Table 4a: Economic Cumulative Net Savings by Measure by Year -- Upstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
59	smart air sealing	SF	SF_Envelope	RET	11,047	11,047	11,047	11,047	11,047	11,047	11,047	11,047	11,047	11,047
60	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	5,088	5,088	5,088	5,088	5,088	5,088	5,088	5,088	5,088	5,088
61	base hatch to insulated hatch	SF	SF_Envelope	RET	628	628	628	628	628	628	628	628	628	628
62	base to condensing gas furnace	SF	HVAC	RR	335	668	998	1,325	1,650	1,972	2,292	2,609	2,923	3,235
63	base to humidity sensor model	SF	ClothesDryer	NC	1	1	1	1	2	2	2	2	2	2
64	base to humidity sensor model	SF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
65	base to humidity sensor model	SF	ClothesDryer	RR	29	58	87	116	145	174	203	232	262	291
66	base to sealed/direct vent boiler	SF	HVAC	NC	9	17	25	33	41	49	56	63	70	76
67	base to sealed/direct vent boiler	SF	HVAC	RR	36	72	108	144	180	216	252	288	324	360
68	GFX DHW heat recovery	SF	DHW	NC	5	10	15	20	24	29	33	37	41	45
69	GFX DHW heat recovery	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
70	insul/seal/balance ducts	SF	HVAC	NC	72	143	212	280	346	411	474	535	594	651
71	SG w/storms to base DG	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
72	base DG window to low-e	SF	SF_Envelope	RR	103	205	306	404	501	597	691	783	874	963
73	programmable t-stat	SF	HVAC	RR	11	21	32	42	53	63	74	84	95	105
74	low-flow devices	SF	DHW	RET	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221	1,221
75	place ducts within thermal shell	SF	HVAC	NC	96	190	283	373	462	548	632	713	792	868
76	seal/balance ducts	SF	HVAC	RET	10,391	10,391	10,391	10,391	10,391	10,391	10,391	10,391	10,391	10,391
77	seal/balance ducts	SF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
78	tank temp turn down	SF	DHW	RET	419	419	419	419	419	419	419	419	419	419
79	attic R-27 to R-49	SF	SF_Envelope	NC	15	29	43	56	70	82	95	107	118	130
80	wall R-11 to R-15	SF	SF_Envelope	NC	15	29	43	57	70	82	94	105	115	124
81	wall R-11 to R-19	SF	SF_Envelope	NC	33	65	96	126	155	184	211	237	262	286
82	wall R-19 to R-21	SF	SF_Envelope	NC	5	11	16	21	26	31	35	40	44	49
83	smart air sealing	SF	SF_Envelope	NC	105	208	309	408	504	599	690	779	865	948
84	base DG window to low-e	SF	SF_Envelope	NC	21	42	62	81	99	117	134	149	165	179
85	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	12	22	30	37	41	44	45	45	45	45
86	base door to insulated door	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
87	base hatch to insulated hatch	SF	SF_Envelope	NC	5	10	14	18	23	26	30	33	36	39
88	programmable t-stat	SF	HVAC	NC	2	3	5	6	7	8	9	10	10	11
89	tub/pool cover	SF	pools/spas	NC	10	21	30	39	48	56	64	71	77	83
90	tub/pool cover	SF	pools/spas	RENO	0	0	0	0	0	0	0	0	0	0
91	smart air sealing	SF	SF_Envelope	RENO	153	307	460	614	767	921	1,074	1,227	1,381	1,534
92	base DG window to low-e	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
93	base door to insulated door	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
94	base hatch to insulated hatch	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
95	programmable t-stat	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
96	tub/pool cover	SF	pools/spas	RET	330	330	330	330	330	330	330	330	330	330
97	tub/pool cover	SF	pools/spas	RR	0	0	0	0	0	0	0	0	0	0
98	.59 EF to .63 EF gas DHW	MF	DHW	NC	0	0	0	1	1	1	1	1	1	1
99	.59 EF to .63 EF gas DHW	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
100	.59 EF to .63 EF gas DHW	MF	DHW	RR	1	1	2	3	3	4	5	5	6	7
101	attic R-11 to R-49	MF	MF_Envelope	RENO	0	1	1	2	2	2	3	3	3	4
102	smart air sealing	MF	MF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
103	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	0	1	1	2	2	3	3	3	4	4
104	base to condensing gas furnace	MF	HVAC	NC	0	0	1	1	1	1	1	1	2	2
105	attic R-11 to R-49	MF	MF_Envelope	RET	33	33	33	33	33	33	33	33	33	33
106	wall R-4 to R-15	MF	MF_Envelope	RET	9	9	9	9	9	9	9	9	9	9
107	wall R-4 to R-19	MF	MF_Envelope	RET	5	5	5	5	5	5	5	5	5	5
108	wall R-4 to R-21	MF	MF_Envelope	RET	5	5	5	5	5	5	5	5	5	5
109	smart air sealing	MF	MF_Envelope	RET	208	208	208	208	208	208	208	208	208	208
110	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	39	39	39	39	39	39	39	39	39	39
111	base hatch to insulated hatch	MF	MF_Envelope	RET	10	10	10	10	10	10	10	10	10	10
112	base to condensing gas furnace	MF	HVAC	RR	3	5	8	10	13	15	18	20	23	25
113	base to humidity sensor model	MF	ClothesDryer	NC	0	0	0	0	0	0	0	0	0	0
114	base to humidity sensor model	MF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
115	base to humidity sensor model	MF	ClothesDryer	RR	1	2	3	4	4	5	6	7	8	9
116	base to sealed/direct vent boiler	MF	HVAC	NC	0	1	1	1	1	2	2	2	2	2

Table 4a: Economic Cumulative Net Savings by Measure by Year -- Upstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
117	base to sealed/direct vent boiler	MF	HVAC	RR	2	5	7	9	12	14	16	19	21	23
118	GFX DHW heat recovery	MF	DHW	NC	0	0	0	0	0	0	1	1	1	1
119	GFX DHW heat recovery	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
120	SG w/storms to base DG	MF	MF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
121	programmable t-stat	MF	HVAC	RR	0	1	1	1	2	2	2	2	3	3
122	low-flow devices	MF	DHW	RET	38	38	38	38	38	38	38	38	38	38
123	place ducts within thermal shell	MF	HVAC	NC	0	0	1	1	1	1	1	1	2	2
124	seal/balance ducts	MF	HVAC	RET	34	34	34	34	34	34	34	34	34	34
125	seal/balance ducts	MF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
126	tank temp turn down	MF	DHW	RET	13	13	13	13	13	13	13	13	13	13
127	attic R-27 to R-49	MF	MF_Envelope	NC	0	0	0	1	1	1	1	1	1	1
128	wall R-11 to R-15	MF	MF_Envelope	NC	0	0	0	1	1	1	1	1	1	1
129	wall R-11 to R-19	MF	MF_Envelope	NC	0	1	1	1	1	2	2	2	2	3
130	wall R-19 to R-21	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
131	smart air sealing	MF	MF_Envelope	NC	1	2	3	4	5	5	6	7	8	9
132	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
133	base door to insulated door	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
134	base hatch to insulated hatch	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	1	1
135	programmable t-stat	MF	HVAC	NC	0	0	0	0	0	0	0	0	0	0
136	smart air sealing	MF	MF_Envelope	RENO	3	6	9	12	14	17	20	23	26	29
137	base door to insulated door	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
138	base hatch to insulated hatch	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
139	programmable t-stat	MF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
140	LI base to condensing gas furnace	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
141	LI attic R-11 to R-49	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
142	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
143	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
144	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
145	LI smart air sealing	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
146	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
147	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
148	LI low-flow devices	LI SF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
149	LI seal/balance ducts	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
150	LI tank temp turn down	LI SF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
151	LI tub/pool cover	LI SF	LI pools/spas	RET	0	0	0	0	0	0	0	0	0	0
152	LI attic R-11 to R-49	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
153	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
154	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
155	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
156	LI smart air sealing	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
157	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
158	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
159	LI low-flow devices	LI MF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
160	LI seal/balance ducts	LI MF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
161	LI tank temp turn down	LI MF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
162	SF storage tank to on-demand	SF	DHW	NC	1	2	3	4	5	6	7	8	9	10
163	SF storage tank to on-demand	SF	DHW	RR	478	955	1,432	1,908	2,383	2,859	3,333	3,808	4,282	4,755
164	MF storage tank to on-demand	MF	DHW	NC	1	2	3	4	5	6	7	8	8	9
165	MF storage tank to on-demand	MF	DHW	RR	5	10	15	20	25	30	35	40	45	49

Table 4b: Economic Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Faucet aerator	Multifamily	Water Heating	Retrofit	18	18	18	18	18	18	18	18	18	18
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	202
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	10	20	30	41	51	62	73	85	96	108
4	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	21	42	63	84	105	127	148	169	191	212
5	Low-flow shower heads	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
6	Low-flow shower heads	Multifamily	Water Heating	New construction	16	32	47	63	79	94	109	124	139	154
7	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	67	133	198	261	323	383	442	499	555	608
8	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	16
9	Pipe insulation - water heating	Multifamily	Water Heating	New construction	1	3	4	6	7	9	10	12	14	15
10	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	2	4	5	7	9	11	13	15	17	19
11	Tank insulation	Multifamily	Water Heating	Retrofit	0	0	0	0	0	0	0	0	0	8
12	Tank insulation	Multifamily	Water Heating	New construction	1	1	2	3	3	4	5	5	6	7
13	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	2	4	5	7	9	11	13	14	16	18
14	Air Sealing	Multifamily	Space Heating	Retrofit	1,982	1,982	1,982	1,982	1,982	1,982	1,982	1,982	1,982	1,982
15	Air Sealing	Multifamily	Space Heating	New construction	55	111	167	224	283	342	402	463	524	587
16	Air Sealing	Multifamily	Space Heating	Renovation	73	145	218	290	362	434	506	578	649	721
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	18	35	53	70	88	105	122	139	155	172
18	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	29	58	86	113	140	166	191	216	240	263
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	5	10	15	20	25	30	36	41	47	53
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	8	16	24	31	39	47	56	64	72	80
21	Programmable Thermostat	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
22	Programmable Thermostat	Multifamily	Space Heating	Renovation	3	7	10	14	17	21	25	28	32	35
23	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	11	22	33	44	56	67	79	90	102	114
24	Outdoor Air Reset	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
25	Outdoor Air Reset	Multifamily	Space Heating	New construction	8	15	15	15	15	15	15	15	14	14
26	Outdoor Air Reset	Multifamily	Space Heating	Remodel/Replacment	160	318	316	311	303	296	288	277	264	250
27	High Performance Glazing double pane, low-E, low c	Multifamily	Space Heating	New construction	12	24	36	48	60	71	82	93	103	113
28	High Performance Glazing double pane, low-E, low c	Multifamily	Space Heating	Renovation	16	32	47	62	76	90	104	117	128	139
29	High Performance Glazing triple pane, low-E, low cor	Multifamily	Space Heating	New construction	19	39	59	80	101	123	144	167	189	212
30	High Performance Glazing triple pane, low-E, low cor	Multifamily	Space Heating	Renovation	26	51	77	103	130	156	182	208	234	260
31	Improved roof insulation	Multifamily	Space Heating	New construction	5	9	14	19	24	29	34	40	45	51
32	Improved roof insulation	Multifamily	Space Heating	Renovation	6	12	18	24	30	37	43	49	56	62
33	Sensible Heat Recovery	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	370
34	Sensible Heat Recovery	Multifamily	Space Heating	New construction	56	112	169	226	282	339	395	450	503	556
35	Sensible Heat Recovery	Multifamily	Space Heating	Remodel/Replacment	153	306	456	604	749	892	1,030	1,164	1,293	1,415
36	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	18
37	Pipe insulation - space heating	Multifamily	Space Heating	New construction	1	3	4	6	7	9	10	12	13	14
38	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	2	4	6	7	9	11	13	14	16	18
39	Energy Star washer	Multifamily	Water Heating	New construction	1	1	2	2	3	3	3	3	3	3
40	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	3	5	6	8	9	10	10	10	10	10
41	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	0	0	0	0	0	0	0	0	0	0
42	Swimming pool/spa covers	Multifamily	Miscellaneous	New construction	2	3	5	6	7	7	7	7	7	7
43	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	13	25	36	48	59	56	54	52	50	48
44	Commissioning	Multifamily	Total	New construction	31	62	93	126	158	190	222	223	224	223
45	Commissioning	Multifamily	Total	Renovation	41	81	122	162	202	242	280	277	273	267
46	Commissioning	Multifamily	Total	Remodel/Replacment	186	372	558	743	926	1,106	1,282	1,267	1,249	1,223
47	Retrocommissioning	Multifamily	Total	Retrofit	643	643	643	643	643	643	643	0	0	0
48	Integrated Design - High Performance (30% > codes	Multifamily	Total	New construction	259	523	790	1,062	1,334	1,607	1,879	2,148	2,415	2,676
49	Integrated Design - High Performance (50% > codes	Multifamily	Total	New construction	19	39	60	80	101	123	145	167	190	213
50	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	153	0	0	0	0	0	0	0	0	0
51	Oxygen Trim	Multifamily	Space Heating	Retrofit	0	0	0	0	0	0	0	0	0	0
52	Oxygen Trim	Multifamily	Space Heating	New construction	6	12	18	24	31	37	43	50	57	63
53	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	17	35	52	69	86	103	119	136	153	169

Table 4b: Economic Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
54	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	8	16	24	32	39	47	55	62	69	76
55	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	0	0	0	0	0	0	0	0	0	0
56	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	65	129	193	255	317	379	439	499	558	617
57	.59 EF to .63 EF gas DHW	SF	DHW	NC	10	20	29	39	48	57	66	75	84	92
58	.59 EF to .63 EF gas DHW	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
59	.59 EF to .63 EF gas DHW	SF	DHW	RR	58	115	171	227	282	336	390	443	495	546
60	smart air sealing	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
61	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	42	83	125	166	208	250	291	333	374	416
62	atmospheric to DV fireplace	SF	HVAC	NC	4	7	11	14	17	21	24	27	30	33
63	atmospheric to DV fireplace	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
64	atmospheric to DV fireplace	SF	HVAC	RR	51	102	152	203	254	305	355	406	457	508
65	base to condensing gas furnace	SF	HVAC	NC	56	111	165	219	271	322	372	421	469	516
66	base to condensing gas furnace	SF	HVAC	RET	5,322	5,322	5,322	5,322	5,322	5,322	5,322	5,322	5,322	5,322
67	wall R-4 to R-15	SF	SF_Envelope	RET	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717
68	wall R-4 to R-19	SF	SF_Envelope	RET	370	370	370	370	370	370	370	370	370	370
69	wall R-4 to R-21	SF	SF_Envelope	RET	379	379	379	379	379	379	379	379	379	379
70	smart air sealing	SF	SF_Envelope	RET	8,128	8,128	8,128	8,128	8,128	8,128	8,128	8,128	8,128	8,128
71	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	3,743	3,743	3,743	3,743	3,743	3,743	3,743	3,743	3,743	3,743
72	base hatch to insulated hatch	SF	SF_Envelope	RET	462	462	462	462	462	462	462	462	462	462
73	programmable t-stat	SF	HVAC	RET	0	0	0	0	0	0	0	0	0	0
74	base to condensing gas furnace	SF	HVAC	RR	293	584	873	1,159	1,443	1,725	2,004	2,282	2,557	2,830
75	base to humidity sensor model	SF	ClothesDryer	NC	1	1	2	2	3	3	3	4	4	4
76	base to humidity sensor model	SF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
77	base to humidity sensor model	SF	ClothesDryer	RR	27	54	81	107	134	161	188	215	242	268
78	base to sealed/direct vent boiler	SF	HVAC	NC	9	17	25	34	42	50	58	65	73	80
79	base to sealed/direct vent boiler	SF	HVAC	RR	32	63	95	126	158	189	221	252	284	315
80	GFX DHW heat recovery	SF	DHW	NC	5	10	15	20	25	30	35	39	44	49
81	GFX DHW heat recovery	SF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
82	insul/seal/balance ducts	SF	HVAC	NC	72	144	215	285	354	423	490	557	623	688
83	SG w/storms to base DG	SF	SF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
84	base DG window to low-e	SF	SF_Envelope	RR	76	151	225	297	369	439	508	576	643	708
85	programmable t-stat	SF	HVAC	RR	10	20	29	39	49	59	69	79	88	98
86	low-flow devices	SF	DHW	RET	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112
87	place ducts within thermal shell	SF	HVAC	NC	97	192	287	380	473	564	654	743	830	917
88	seal/balance ducts	SF	HVAC	RET	9,792	9,792	9,792	9,792	9,792	9,792	9,792	9,792	9,792	9,792
89	seal/balance ducts	SF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
90	tank temp turn down	SF	DHW	RET	387	387	387	387	387	387	387	387	387	387
91	attic R-27 to R-49	SF	SF_Envelope	NC	12	24	36	47	59	70	81	92	103	114
92	wall R-11 to R-15	SF	SF_Envelope	NC	13	26	38	51	63	75	86	97	108	119
93	wall R-11 to R-19	SF	SF_Envelope	NC	27	55	81	108	134	159	184	209	233	257
94	wall R-19 to R-21	SF	SF_Envelope	NC	4	9	13	18	22	26	30	34	38	42
95	smart air sealing	SF	SF_Envelope	NC	87	172	257	340	423	505	585	665	743	821
96	base DG window to low-e	SF	SF_Envelope	NC	18	36	54	71	88	105	121	137	152	168
97	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	14	27	40	52	63	73	82	91	98	105
98	base door to insulated door	SF	SF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
99	base hatch to insulated hatch	SF	SF_Envelope	NC	4	9	13	17	21	25	29	33	36	40
100	programmable t-stat	SF	HVAC	NC	2	4	6	7	9	11	12	14	15	17
101	tub/pool cover	SF	pools/spas	NC	12	23	35	46	56	67	77	87	96	106
102	tub/pool cover	SF	pools/spas	RENO	0	0	0	0	0	0	0	0	0	0
103	smart air sealing	SF	SF_Envelope	RENO	113	226	339	452	564	677	790	903	1,016	1,129
104	base DG window to low-e	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
105	base door to insulated door	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
106	base hatch to insulated hatch	SF	SF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0

Table 4b: Economic Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
107	programmable t-stat	SF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
108	tub/pool cover	SF	pools/spas	RET	494	494	494	494	494	494	494	494	494	494
109	tub/pool cover	SF	pools/spas	RR	0	0	0	0	0	0	0	0	0	0
110	base to Energy Star clothes washer	MF	MF_ClothesWasl	NC	0	0	0	0	0	0	1	1	1	1
111	base to Energy Star clothes washer	MF	MF_ClothesWasl	RENO	0	0	0	0	0	0	0	0	0	0
112	base to Energy Star clothes washer	MF	MF_ClothesWasl	RR	1	3	4	5	6	8	9	10	11	12
113	.59 EF to .63 EF gas DHW	MF	DHW	NC	0	0	0	1	1	1	1	1	1	1
114	.59 EF to .63 EF gas DHW	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
115	.59 EF to .63 EF gas DHW	MF	DHW	RR	2	3	4	6	7	9	10	12	13	14
116	smart air sealing	MF	MF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
117	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	1	1	2	3	4	4	5	6	7	7
118	base to condensing gas furnace	MF	HVAC	NC	0	0	1	1	1	1	1	2	2	2
119	wall R-4 to R-15	MF	MF_Envelope	RET	15	15	15	15	15	15	15	15	15	15
120	wall R-4 to R-19	MF	MF_Envelope	RET	8	8	8	8	8	8	8	8	8	8
121	wall R-4 to R-21	MF	MF_Envelope	RET	8	8	8	8	8	8	8	8	8	8
122	smart air sealing	MF	MF_Envelope	RET	352	352	352	352	352	352	352	352	352	352
123	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	66	66	66	66	66	66	66	66	66	66
124	base hatch to insulated hatch	MF	MF_Envelope	RET	16	16	16	16	16	16	16	16	16	16
125	base to condensing gas furnace	MF	HVAC	RR	5	11	16	21	26	32	37	42	47	52
126	base to humidity sensor model	MF	ClothesDryer	NC	0	0	0	0	0	0	0	0	0	0
127	base to humidity sensor model	MF	ClothesDryer	RENO	0	0	0	0	0	0	0	0	0	0
128	base to humidity sensor model	MF	ClothesDryer	RR	2	4	6	8	9	11	13	15	17	19
129	base to sealed/direct vent boiler	MF	HVAC	NC	0	1	1	1	1	2	2	2	2	3
130	base to sealed/direct vent boiler	MF	HVAC	RR	5	10	14	19	24	29	34	39	43	48
131	GFX DHW heat recovery	MF	DHW	NC	0	0	0	0	0	0	1	1	1	1
132	GFX DHW heat recovery	MF	DHW	RENO	0	0	0	0	0	0	0	0	0	0
133	SG w/storms to base DG	MF	MF_Envelope	RR	0	0	0	0	0	0	0	0	0	0
134	programmable t-stat	MF	HVAC	RR	1	1	2	3	3	4	5	6	6	7
135	low-flow devices	MF	DHW	RET	80	80	80	80	80	80	80	80	80	80
136	place ducts within thermal shell	MF	HVAC	NC	0	0	1	1	1	1	1	1	2	2
137	seal/balance ducts	MF	HVAC	RET	0	0	0	0	0	0	0	0	0	0
138	seal/balance ducts	MF	HVAC	RR	0	0	0	0	0	0	0	0	0	0
139	tank temp turn down	MF	DHW	RET	27	27	27	27	27	27	27	27	27	27
140	attic R-27 to R-49	MF	MF_Envelope	NC	0	0	0	0	1	1	1	1	1	1
141	wall R-11 to R-15	MF	MF_Envelope	NC	0	0	0	0	1	1	1	1	1	1
142	wall R-11 to R-19	MF	MF_Envelope	NC	0	0	1	1	1	1	2	2	2	2
143	wall R-19 to R-21	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
144	smart air sealing	MF	MF_Envelope	NC	1	2	2	3	4	5	5	6	7	8
145	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
146	base door to insulated door	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	0	0
147	base hatch to insulated hatch	MF	MF_Envelope	NC	0	0	0	0	0	0	0	0	1	1
148	programmable t-stat	MF	HVAC	NC	0	0	0	0	0	0	0	0	0	0
149	smart air sealing	MF	MF_Envelope	RENO	5	10	15	20	24	29	34	39	44	49
150	base door to insulated door	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
151	base hatch to insulated hatch	MF	MF_Envelope	RENO	0	0	0	0	0	0	0	0	0	0
152	programmable t-stat	MF	HVAC	RENO	0	0	0	0	0	0	0	0	0	0
153	LI base to condensing gas furnace	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
154	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
155	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
156	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
157	LI smart air sealing	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
158	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
159	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	0	0	0	0	0	0	0	0	0	0

Table 4b: Economic Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
160	LI programmable t-stat	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
161	LI low-flow devices	LI SF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
162	LI seal/balance ducts	LI SF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
163	LI tank temp turn down	LI SF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
164	LI tub/pool cover	LI SF	LI pools/spas	RET	0	0	0	0	0	0	0	0	0	0
165	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
166	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
167	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
168	LI smart air sealing	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
169	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	0	0	0	0	0	0	0	0	0	0
171	LI low-flow devices	LI MF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
172	LI seal/balance ducts	LI MF	LI HVAC	RET	0	0	0	0	0	0	0	0	0	0
173	LI tank temp turn down	LI MF	LI DHW	RET	0	0	0	0	0	0	0	0	0	0
174	SF storage tank to on-demand	SF	DHW	NC	1	2	3	4	6	7	8	9	10	11
175	SF storage tank to on-demand	SF	DHW	RR	441	882	1,322	1,762	2,202	2,641	3,080	3,518	3,955	4,393
176	MF storage tank to on-demand	MF	DHW	NC	1	2	3	4	5	6	7	8	9	10
177	MF storage tank to on-demand	MF	DHW	RR	11	21	32	42	53	63	74	84	95	105

Table 5a: Residential Economics by Measure -- Upstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
1	Faucet aerator	Multifamily	Water Heating	Retrofit	9.972	-$3.38
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	1.177	$0.74
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	1.509	$0.58
4	Low-flow shower heads	Multifamily	Water Heating	Retrofit	9,999.000	-$2.44
5	Low-flow shower heads	Multifamily	Water Heating	New construction	6.032	-$0.76
6	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	7.730	-$0.84
7	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	27.340	$0.07
8	Pipe insulation - water heating	Multifamily	Water Heating	New construction	21.333	$0.04
9	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	21.333	$0.04
10	Tank insulation	Multifamily	Water Heating	Retrofit	2.018	$0.94
11	Tank insulation	Multifamily	Water Heating	New construction	1.575	$0.56
12	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	2.018	$0.43
13	Air Sealing	Multifamily	Space Heating	Retrofit	2.878	$1.03
14	Air Sealing	Multifamily	Space Heating	New construction	2.171	$0.55
15	Air Sealing	Multifamily	Space Heating	Renovation	2.171	$0.55
16	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Retrofit	0.786	$3.81
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	3.513	$0.34
18	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	4.362	$0.27
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Retrofit	6.471	$0.46
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	4.861	$0.25
21	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	6.036	$0.20
22	Programmable Thermostat	Multifamily	Space Heating	Retrofit	4.649	$0.57
23	Programmable Thermostat	Multifamily	Space Heating	Renovation	1.971	$0.60
24	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	2.527	$0.47
25	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	55.152	$0.05
26	Pipe insulation - space heating	Multifamily	Space Heating	New construction	44.353	$0.03
27	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	44.353	$0.03
28	Energy Star washer	Multifamily	Water Heating	New construction	1.904	-$2.51
29	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	2.255	-$3.09
30	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	4.109	$0.37
31	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	4.077	$0.22
32	Commissioning	Multifamily	Total	New construction	2.465	-$0.48
33	Commissioning	Multifamily	Total	Renovation	2.465	-$0.48
34	Commissioning	Multifamily	Total	Remodel/Replacment	3.159	-$0.73
35	Retrocommissioning	Multifamily	Total	Retrofit	3.406	-$0.39
36	Integrated Design - High Performance (30% > codes) - Tier	Multifamily	Total	New construction	1.602	$0.51
37	Integrated Design - High Performance (50% > codes) Tier 2	Multifamily	Total	New construction	0.481	$3.17
38	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	3.093	$0.38
39	Oxygen Trim	Multifamily	Space Heating	Retrofit	43.999	$0.06
40	Oxygen Trim	Multifamily	Space Heating	New construction	49.793	$0.02
41	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	47.575	$0.02
42	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	1.392	-$0.36
43	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	1.392	-$0.36
44	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	1.392	-$0.36
45	.59 EF to .63 EF gas DHW	SF	DHW	NC	1.953	$0.45
46	.59 EF to .63 EF gas DHW	SF	DHW	RENO	1.953	$0.45
47	.59 EF to .63 EF gas DHW	SF	DHW	RR	1.953	$0.45
48	attic R-11 to R-49	SF	SF_Envelope	RENO	1.040	$0.98
49	smart air sealing	SF	SF_Envelope	RR	3.912	$0.19
50	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	1.460	$0.67
51	atmospheric to DV fireplace	SF	HVAC	NC	1.968	$0.52
52	atmospheric to DV fireplace	SF	HVAC	RENO	1.968	$0.52
53	base to condensing gas furnace	SF	HVAC	NC	3.121	$0.33
54	base to condensing gas furnace	SF	HVAC	RET	1.142	$2.78
55	attic R-11 to R-49	SF	SF_Envelope	RET	1.040	$0.98
56	wall R-4 to R-15	SF	SF_Envelope	RET	2.474	$0.36
57	wall R-4 to R-19	SF	SF_Envelope	RET	2.589	$0.34
58	wall R-4 to R-21	SF	SF_Envelope	RET	2.618	$0.33
59	smart air sealing	SF	SF_Envelope	RET	3.912	$0.19
60	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	1.460	$0.67
61	base hatch to insulated hatch	SF	SF_Envelope	RET	1.401	$0.71
62	base to condensing gas furnace	SF	HVAC	RR	2.035	$0.50
63	base to humidity sensor model	SF	ClothesDryer	NC	2.388	$0.35
64	base to humidity sensor model	SF	ClothesDryer	RENO	2.388	$0.35
65	base to humidity sensor model	SF	ClothesDryer	RR	2.388	$0.35
66	base to sealed/direct vent boiler	SF	HVAC	NC	5.358	$0.19

Table 5a: Residential Economics by Measure -- Upstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
67	base to sealed/direct vent boiler	SF	HVAC	RR	5.358	$0.19
68	GFX DHW heat recovery	SF	DHW	NC	1.024	$0.85
69	GFX DHW heat recovery	SF	DHW	RENO	1.024	$0.85
70	insul/seal/balance ducts	SF	HVAC	NC	3.058	$0.18
71	SG w/storms to base DG	SF	SF_Envelope	RR	9,999.000	-$2.07
72	base DG window to low-e	SF	SF_Envelope	RR	1.103	$0.91
73	programmable t-stat	SF	HVAC	RR	4.649	$0.15
74	low-flow devices	SF	DHW	RET	5.248	$0.17
75	place ducts within thermal shell	SF	HVAC	NC	4,311.877	-$0.24
76	seal/balance ducts	SF	HVAC	RET	3.319	$0.20
77	seal/balance ducts	SF	HVAC	RR	2.729	$0.28
78	tank temp turn down	SF	DHW	RET	1.801	$0.48
79	attic R-27 to R-49	SF	SF_Envelope	NC	1.488	$0.64
80	wall R-11 to R-15	SF	SF_Envelope	NC	11.933	-$0.05
81	wall R-11 to R-19	SF	SF_Envelope	NC	9.421	-$0.02
82	wall R-19 to R-21	SF	SF_Envelope	NC	4.935	$0.09
83	smart air sealing	SF	SF_Envelope	NC	4.070	$0.15
84	base DG window to low-e	SF	SF_Envelope	NC	1.230	$0.77
85	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	1.519	$0.63
86	base door to insulated door	SF	SF_Envelope	NC	9,999.000	$0.00
87	base hatch to insulated hatch	SF	SF_Envelope	NC	5.831	$0.06
88	programmable t-stat	SF	HVAC	NC	4.832	$0.11
89	tub/pool cover	SF	pools/spas	NC	6.729	$0.13
90	tub/pool cover	SF	pools/spas	RENO	6.729	$0.13
91	smart air sealing	SF	SF_Envelope	RENO	3.912	$0.19
92	base DG window to low-e	SF	SF_Envelope	RENO	1.103	$0.91
93	base door to insulated door	SF	SF_Envelope	RENO	9,999.000	$0.00
94	base hatch to insulated hatch	SF	SF_Envelope	RENO	5.605	$0.11
95	programmable t-stat	SF	HVAC	RENO	4.649	$0.15
96	tub/pool cover	SF	pools/spas	RET	6.729	$0.13
97	tub/pool cover	SF	pools/spas	RR	6.729	$0.13
98	.59 EF to .63 EF gas DHW	MF	DHW	NC	1.979	$0.44
99	.59 EF to .63 EF gas DHW	MF	DHW	RENO	1.979	$0.44
100	.59 EF to .63 EF gas DHW	MF	DHW	RR	1.979	$0.44
101	attic R-11 to R-49	MF	MF_Envelope	RENO	1.667	$0.58
102	smart air sealing	MF	MF_Envelope	RR	4.716	$0.16
103	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	1.435	$0.69
104	base to condensing gas furnace	MF	HVAC	NC	2.183	$0.47
105	attic R-11 to R-49	MF	MF_Envelope	RET	1.022	$1.00
106	wall R-4 to R-15	MF	MF_Envelope	RET	2.430	$0.38
107	wall R-4 to R-19	MF	MF_Envelope	RET	2.543	$0.36
108	wall R-4 to R-21	MF	MF_Envelope	RET	2.572	$0.35
109	smart air sealing	MF	MF_Envelope	RET	4.716	$0.16
110	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	1.435	$0.69
111	base hatch to insulated hatch	MF	MF_Envelope	RET	1.378	$0.72
112	base to condensing gas furnace	MF	HVAC	RR	1.423	$0.72
113	base to humidity sensor model	MF	ClothesDryer	NC	2.388	$0.35
114	base to humidity sensor model	MF	ClothesDryer	RENO	2.388	$0.35
115	base to humidity sensor model	MF	ClothesDryer	RR	2.388	$0.35
116	base to sealed/direct vent boiler	MF	HVAC	NC	3.747	$0.27
117	base to sealed/direct vent boiler	MF	HVAC	RR	3.747	$0.27
118	GFX DHW heat recovery	MF	DHW	NC	1.093	$0.80
119	GFX DHW heat recovery	MF	DHW	RENO	1.093	$0.80
120	SG w/storms to base DG	MF	MF_Envelope	RR	9,999.000	-$2.05
121	programmable t-stat	MF	HVAC	RR	3.152	$0.28
122	low-flow devices	MF	DHW	RET	5.292	$0.16
123	place ducts within thermal shell	MF	HVAC	NC	1,498.671	-$0.15
124	seal/balance ducts	MF	HVAC	RET	1.274	$0.78
125	seal/balance ducts	MF	HVAC	RR	1.274	$0.78
126	tank temp turn down	MF	DHW	RET	1.801	$0.48
127	attic R-27 to R-49	MF	MF_Envelope	NC	1.421	$0.70
128	wall R-11 to R-15	MF	MF_Envelope	NC	11.391	$0.01
129	wall R-11 to R-19	MF	MF_Envelope	NC	8.993	$0.03
130	wall R-19 to R-21	MF	MF_Envelope	NC	4.710	$0.15
131	smart air sealing	MF	MF_Envelope	NC	4.774	$0.15
132	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	1.453	$0.68

Table 5a: Residential Economics by Measure -- Upstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
133	base door to insulated door	MF	MF_Envelope	NC	9,999.000	$0.00
134	base hatch to insulated hatch	MF	MF_Envelope	NC	5.578	$0.11
135	programmable t-stat	MF	HVAC	NC	3.189	$0.26
136	smart air sealing	MF	MF_Envelope	RENO	4.716	$0.16
137	base door to insulated door	MF	MF_Envelope	RENO	9,999.000	$0.00
138	base hatch to insulated hatch	MF	MF_Envelope	RENO	5.510	$0.13
139	programmable t-stat	MF	HVAC	RENO	3.152	$0.28
140	LI base to condensing gas furnace	LI SF	LI HVAC	RET	1.142	$2.78
141	LI attic R-11 to R-49	LI SF	LI SF_Envelope	RET	1.040	$0.00
142	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	2.474	$0.36
143	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	2.589	$0.34
144	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	2.618	$0.33
145	LI smart air sealing	LI SF	LI SF_Envelope	RET	3.912	$0.19
146	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	1.460	$0.67
147	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	1.401	$0.71
148	LI low-flow devices	LI SF	LI DHW	RET	5.248	$0.17
149	LI seal/balance ducts	LI SF	LI HVAC	RET	3.319	$0.20
150	LI tank temp turn down	LI SF	LI DHW	RET	1.801	$0.48
151	LI tub/pool cover	LI SF	LI pools/spas	RET	6.729	$0.13
152	LI attic R-11 to R-49	LI MF	LI MF_Envelope	RET	1.022	$1.00
153	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	2.430	$0.38
154	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	2.543	$0.36
155	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	2.572	$0.35
156	LI smart air sealing	LI MF	LI MF_Envelope	RET	4.716	$0.16
157	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	1.435	$0.69
158	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	1.378	$0.72
159	LI low-flow devices	LI MF	LI DHW	RET	5.292	$0.16
160	LI seal/balance ducts	LI MF	LI HVAC	RET	1.274	$0.78
161	LI tank temp turn down	LI MF	LI DHW	RET	1.801	$0.48
162	SF storage tank to on-demand	SF	DHW	NC	1.228	$2.68
163	SF storage tank to on-demand	SF	DHW	RR	1.228	$2.68
164	MF storage tank to on-demand	MF	DHW	NC	1.156	$2.85
165	MF storage tank to on-demand	MF	DHW	RR	1.156	$2.85

Added Cost Effective Measures -- Upstate -- High Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
	Cooling system chilled water reset	Multifamily	Cooling	New construction	1.1615	$0.80
	Cooling system water side economizer	Multifamily	Cooling	New construction	1.0919	$0.76
	Improved roof insulation	Multifamily	Space Heating	New construction	1.0917	$1.37
	Improved roof insulation	Multifamily	Space Heating	Renovation	1.0917	$1.37

Subtracted Cost Effective Measures -- Upstate -- Low Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	0.883	$0.74
16	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Retrofit	0.590	$3.81
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Retrofit	4.853	$0.46
37	Integrated Design - High Performance (50% > codes) Tier 2	Multifamily	Total	New construction	0.402	$3.17
48	attic R-11 to R-49	SF	SF_Envelope	RENO	0.803	$0.98
54	base to condensing gas furnace	SF	HVAC	RET	0.856	$2.70
55	attic R-11 to R-49	SF	SF_Envelope	RET	0.803	$0.98
68	GFX DHW heat recovery	SF	DHW	NC	0.768	$0.85
69	GFX DHW heat recovery	SF	DHW	RENO	0.768	$0.85

Table 5a: Residential Economics by Measure -- Upstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
72	base DG window to low-e	SF	SF_Envelope	RR	0.870	$0.91
84	base DG window to low-e	SF	SF_Envelope	NC	0.997	$0.77
92	base DG window to low-e	SF	SF_Envelope	RENO	0.870	$0.91
105	attic R-11 to R-49	MF	MF_Envelope	RET	0.784	$1.00
118	GFX DHW heat recovery	MF	DHW	NC	0.819	$0.80
119	GFX DHW heat recovery	MF	DHW	RENO	0.819	$0.80
124	seal/balance ducts	MF	HVAC	RET	0.990	$0.67
125	seal/balance ducts	MF	HVAC	RR	0.990	$0.67
140	LI base to condensing gas furnace	LI SF	LI HVAC	RET	0.856	$2.70
141	LI attic R-11 to R-49	LI SF	LI SF_Envelope	RET	0.803	$0.00
152	LI attic R-11 to R-49	LI MF	LI MF_Envelope	RET	0.784	$1.00
160	LI seal/balance ducts	LI MF	LI HVAC	RET	0.990	$0.67
162	SF storage tank to on-demand	SF	DHW	NC	0.921	$2.68
163	SF storage tank to on-demand	SF	DHW	RR	0.921	$2.68
164	MF storage tank to on-demand	MF	DHW	NC	0.867	$2.85
165	MF storage tank to on-demand	MF	DHW	RR	0.867	$2.85

Table 5b: Residential Economics by Measure -- Downstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
1	Faucet aerator	Multifamily	Water Heating	Retrofit	10.4	($3.38)
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	Retrofit	1.7	$1.44
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	1.3	$0.74
4	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	1.7	$0.58
5	Low-flow shower heads	Multifamily	Water Heating	Retrofit	9,999.0	($2.44)
6	Low-flow shower heads	Multifamily	Water Heating	New construction	6.3	($0.76)
7	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	8.1	($0.84)
8	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	30.3	$0.07
9	Pipe insulation - water heating	Multifamily	Water Heating	New construction	23.6	$0.04
10	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	23.6	$0.04
11	Tank insulation	Multifamily	Water Heating	Retrofit	2.2	$0.94
12	Tank insulation	Multifamily	Water Heating	New construction	1.7	$0.56
13	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	2.2	$0.43
14	Air Sealing	Multifamily	Space Heating	Retrofit	3.6	$1.12
15	Air Sealing	Multifamily	Space Heating	New construction	2.9	$0.55
16	Air Sealing	Multifamily	Space Heating	Renovation	2.9	$0.55
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	4.4	$0.37
18	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	5.4	$0.30
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	3.8	$0.42
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	4.8	$0.34
21	Programmable Thermostat	Multifamily	Space Heating	Retrofit	2.9	$1.23
22	Programmable Thermostat	Multifamily	Space Heating	Renovation	2.7	$0.60
23	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	3.5	$0.47
24	Outdoor Air Reset	Multifamily	Space Heating	Retrofit	2.2	$1.57
25	Outdoor Air Reset	Multifamily	Space Heating	New construction	1.7	$0.98
26	Outdoor Air Reset	Multifamily	Space Heating	Remodel/Replacment	2.2	$0.76
27	High Performance Glazing double pane, low-E, low conductivity frame - Tier 1	Multifamily	Space Heating	New construction	10.1	$0.16
28	High Performance Glazing double pane, low-E, low conductivity frame - Tier 1	Multifamily	Space Heating	Renovation	10.1	$0.16
29	High Performance Glazing triple pane, low-E, low conductivity frame - Tier 2	Multifamily	Space Heating	New construction	1.6	$0.97
30	High Performance Glazing triple pane, low-E, low conductivity frame - Tier 2	Multifamily	Space Heating	Renovation	1.6	$0.97
31	Improved roof insulation	Multifamily	Space Heating	New construction	1.0	$1.53
32	Improved roof insulation	Multifamily	Space Heating	Renovation	1.0	$1.53
33	Sensible Heat Recovery	Multifamily	Space Heating	Retrofit	6.1	$0.72
34	Sensible Heat Recovery	Multifamily	Space Heating	New construction	5.5	$0.36
35	Sensible Heat Recovery	Multifamily	Space Heating	Remodel/Replacment	6.8	$0.31
36	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	74.4	$0.05
37	Pipe insulation - space heating	Multifamily	Space Heating	New construction	59.9	$0.03
38	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	59.9	$0.03
39	Energy Star washer	Multifamily	Water Heating	New construction	1.9	($2.51)
40	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	2.3	($3.09)
41	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	4.6	$0.37
42	Swimming pool/spa covers	Multifamily	Miscellaneous	New construction	4.3	$0.23
43	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	4.5	$0.22
44	Commissioning	Multifamily	Total	New construction	4.3	($2.09)
45	Commissioning	Multifamily	Total	Renovation	4.3	($2.09)
46	Commissioning	Multifamily	Total	Remodel/Replacment	5.5	($2.34)
47	Retrocommissioning	Multifamily	Total	Retrofit	7.0	($1.92)
48	Integrated Design - High Performance (30% > codes) - Tier 1	Multifamily	Total	New construction	2.4	($0.03)
49	Integrated Design - High Performance (50% > codes) Tier 2	Multifamily	Total	New construction	2.4	($0.03)
50	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	3.7	$0.44
51	Oxygen Trim	Multifamily	Space Heating	Retrofit	51.6	$0.07
52	Oxygen Trim	Multifamily	Space Heating	New construction	68.3	$0.02
53	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	59.5	$0.03
54	base to Energy Star clothes washer	SF	SF_ClothesWash	NC	1.4	($0.36)
55	base to Energy Star clothes washer	SF	SF_ClothesWash	RENO	1.4	($0.36)
56	base to Energy Star clothes washer	SF	SF_ClothesWash	RR	1.4	($0.36)
57	.59 EF to .63 EF gas DHW	SF	DHW	NC	2.1	$0.45
58	.59 EF to .63 EF gas DHW	SF	DHW	RENO	2.1	$0.45
59	.59 EF to .63 EF gas DHW	SF	DHW	RR	2.1	$0.45
60	smart air sealing	SF	SF_Envelope	RR	3.7	$0.26
61	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RENO	1.4	$0.87
62	atmospheric to DV fireplace	SF	HVAC	NC	2.3	$0.54
63	atmospheric to DV fireplace	SF	HVAC	RENO	2.3	$0.54
64	atmospheric to DV fireplace	SF	HVAC	RR	1.0	$1.21
65	base to condensing gas furnace	SF	HVAC	NC	3.5	$0.35
66	base to condensing gas furnace	SF	HVAC	RET	1.4	$2.75
67	wall R-4 to R-15	SF	SF_Envelope	RET	2.3	$0.47
68	wall R-4 to R-19	SF	SF_Envelope	RET	2.4	$0.44
69	wall R-4 to R-21	SF	SF_Envelope	RET	2.5	$0.44
70	smart air sealing	SF	SF_Envelope	RET	3.7	$0.26
71	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	RET	1.4	$0.87
72	base hatch to insulated hatch	SF	SF_Envelope	RET	1.3	$0.91
73	programmable t-stat	SF	HVAC	RET	1.1	$1.10
74	base to condensing gas furnace	SF	HVAC	RR	2.3	$0.53
75	base to humidity sensor model	SF	ClothesDryer	NC	2.6	$0.35
76	base to humidity sensor model	SF	ClothesDryer	RENO	2.6	$0.35
77	base to humidity sensor model	SF	ClothesDryer	RR	2.6	$0.35
78	base to sealed/direct vent boiler	SF	HVAC	NC	6.0	$0.20
79	base to sealed/direct vent boiler	SF	HVAC	RR	6.0	$0.20

Table 5b: Residential Economics by Measure -- Downstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
80	GFX DHW heat recovery	SF	DHW	NC	1.1	$0.87
81	GFX DHW heat recovery	SF	DHW	RENO	1.1	$0.87
82	insul/seal/balance ducts	SF	HVAC	NC	3.5	$0.18
83	SG w/storms to base DG	SF	SF_Envelope	RR	9,999.0	($2.58)
84	base DG window to low-e	SF	SF_Envelope	RR	1.0	$1.19
85	programmable t-stat	SF	HVAC	RR	5.6	$0.15
86	low-flow devices	SF	DHW	RET	5.8	$0.17
87	place ducts within thermal shell	SF	HVAC	NC	4,862.8	($0.25)
88	seal/balance ducts	SF	HVAC	RET	4.0	$0.19
89	seal/balance ducts	SF	HVAC	RR	3.4	$0.24
90	tank temp turn down	SF	DHW	RET	2.0	$0.48
91	attic R-27 to R-49	SF	SF_Envelope	NC	1.4	$0.84
92	wall R-11 to R-15	SF	SF_Envelope	NC	11.1	($0.03)
93	wall R-11 to R-19	SF	SF_Envelope	NC	8.8	$0.01
94	wall R-19 to R-21	SF	SF_Envelope	NC	4.6	$0.15
95	smart air sealing	SF	SF_Envelope	NC	3.8	$0.22
96	base DG window to low-e	SF	SF_Envelope	NC	1.1	$1.04
97	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	1.4	$0.82
98	base door to insulated door	SF	SF_Envelope	NC	9,999.0	$0.00
99	base hatch to insulated hatch	SF	SF_Envelope	NC	5.5	$0.11
100	programmable t-stat	SF	HVAC	NC	5.8	$0.10
101	tub/pool cover	SF	pools/spas	NC	7.5	$0.13
102	tub/pool cover	SF	pools/spas	RENO	7.5	$0.13
103	smart air sealing	SF	SF_Envelope	RENO	3.7	$0.26
104	base DG window to low-e	SF	SF_Envelope	RENO	1.0	$1.19
105	base door to insulated door	SF	SF_Envelope	RENO	9,999.0	$0.00
106	base hatch to insulated hatch	SF	SF_Envelope	RENO	5.3	$0.16
107	programmable t-stat	SF	HVAC	RENO	5.6	$0.15
108	tub/pool cover	SF	pools/spas	RET	7.5	$0.13
109	tub/pool cover	SF	pools/spas	RR	7.5	$0.13
110	base to Energy Star clothes washer	MF	MF_ClothesWash	NC	1.1	$0.64
111	base to Energy Star clothes washer	MF	MF_ClothesWash	RENO	1.1	$0.64
112	base to Energy Star clothes washer	MF	MF_ClothesWash	RR	1.1	$0.64
113	.59 EF to .63 EF gas DHW	MF	DHW	NC	2.2	$0.44
114	.59 EF to .63 EF gas DHW	MF	DHW	RENO	2.2	$0.44
115	.59 EF to .63 EF gas DHW	MF	DHW	RR	2.2	$0.44
116	smart air sealing	MF	MF_Envelope	RR	4.4	$0.22
117	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RENO	1.4	$0.89
118	base to condensing gas furnace	MF	HVAC	NC	2.5	$0.48
119	wall R-4 to R-15	MF	MF_Envelope	RET	2.3	$0.49
120	wall R-4 to R-19	MF	MF_Envelope	RET	2.4	$0.47
121	wall R-4 to R-21	MF	MF_Envelope	RET	2.4	$0.46
122	smart air sealing	MF	MF_Envelope	RET	4.4	$0.22
123	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	RET	1.4	$0.89
124	base hatch to insulated hatch	MF	MF_Envelope	RET	1.3	$0.93
125	base to condensing gas furnace	MF	HVAC	RR	1.7	$0.74
126	base to humidity sensor model	MF	ClothesDryer	NC	2.6	$0.35
127	base to humidity sensor model	MF	ClothesDryer	RENO	2.6	$0.35
128	base to humidity sensor model	MF	ClothesDryer	RR	2.6	$0.35
129	base to sealed/direct vent boiler	MF	HVAC	NC	4.4	$0.28
130	base to sealed/direct vent boiler	MF	HVAC	RR	4.4	$0.28
131	GFX DHW heat recovery	MF	DHW	NC	1.2	$0.80
132	GFX DHW heat recovery	MF	DHW	RENO	1.2	$0.80
133	SG w/storms to base DG	MF	MF_Envelope	RR	9,999.0	($2.56)
134	programmable t-stat	MF	HVAC	RR	4.0	$0.26
135	low-flow devices	MF	DHW	RET	5.9	$0.17
136	place ducts within thermal shell	MF	HVAC	NC	1,710.5	($0.16)
137	seal/balance ducts	MF	HVAC	RET	1.5	$0.76
138	seal/balance ducts	MF	HVAC	RR	1.5	$0.76
139	tank temp turn down	MF	DHW	RET	2.0	$0.48
140	attic R-27 to R-49	MF	MF_Envelope	NC	1.3	$0.89
141	wall R-11 to R-15	MF	MF_Envelope	NC	10.7	$0.03
142	wall R-11 to R-19	MF	MF_Envelope	NC	8.4	$0.06
143	wall R-19 to R-21	MF	MF_Envelope	NC	4.4	$0.20
144	smart air sealing	MF	MF_Envelope	NC	4.5	$0.20
145	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	1.4	$0.87
146	base door to insulated door	MF	MF_Envelope	NC	9,999.0	$0.00
147	base hatch to insulated hatch	MF	MF_Envelope	NC	5.2	$0.16
148	programmable t-stat	MF	HVAC	NC	4.0	$0.24
149	smart air sealing	MF	MF_Envelope	RENO	4.4	$0.22
150	base door to insulated door	MF	MF_Envelope	RENO	9,999.0	$0.00
151	base hatch to insulated hatch	MF	MF_Envelope	RENO	5.2	$0.17
152	programmable t-stat	MF	HVAC	RENO	4.0	$0.26
153	LI base to condensing gas furnace	LI SF	LI HVAC	RET	1.4	$2.75
154	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	2.3	$0.47
155	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	2.4	$0.44
156	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	2.5	$0.44
157	LI smart air sealing	LI SF	LI SF_Envelope	RET	3.7	$0.26
158	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	1.4	$0.87

Table 5b: Residential Economics by Measure -- Downstate -- Reference Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
159	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	1.3	$0.91
160	LI programmable t-stat	LI SF	LI HVAC	RET	1.1	$1.10
161	LI low-flow devices	LI SF	LI DHW	RET	5.8	$0.17
162	LI seal/balance ducts	LI SF	LI HVAC	RET	4.0	$0.19
163	LI tank temp turn down	LI SF	LI DHW	RET	2.0	$0.48
164	LI tub/pool cover	LI SF	LI pools/spas	RET	7.5	$0.13
165	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	2.3	$0.49
166	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	2.4	$0.47
167	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	2.4	$0.46
168	LI smart air sealing	LI MF	LI MF_Envelope	RET	4.4	$0.22
169	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	1.4	$0.89
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	1.3	$0.93
171	LI low-flow devices	LI MF	LI DHW	RET	5.9	$0.17
172	LI seal/balance ducts	LI MF	LI HVAC	RET	1.5	$0.76
173	LI tank temp turn down	LI MF	LI DHW	RET	2.0	$0.48
174	SF storage tank to on-demand	SF	DHW	NC	1.4	$2.68
175	SF storage tank to on-demand	SF	DHW	RR	1.4	$2.68
176	MF storage tank to on-demand	MF	DHW	NC	1.9	$1.91
177	MF storage tank to on-demand	MF	DHW	RR	1.9	$1.91

Added Cost Effective Measures -- Downstate -- High Avoided Costs

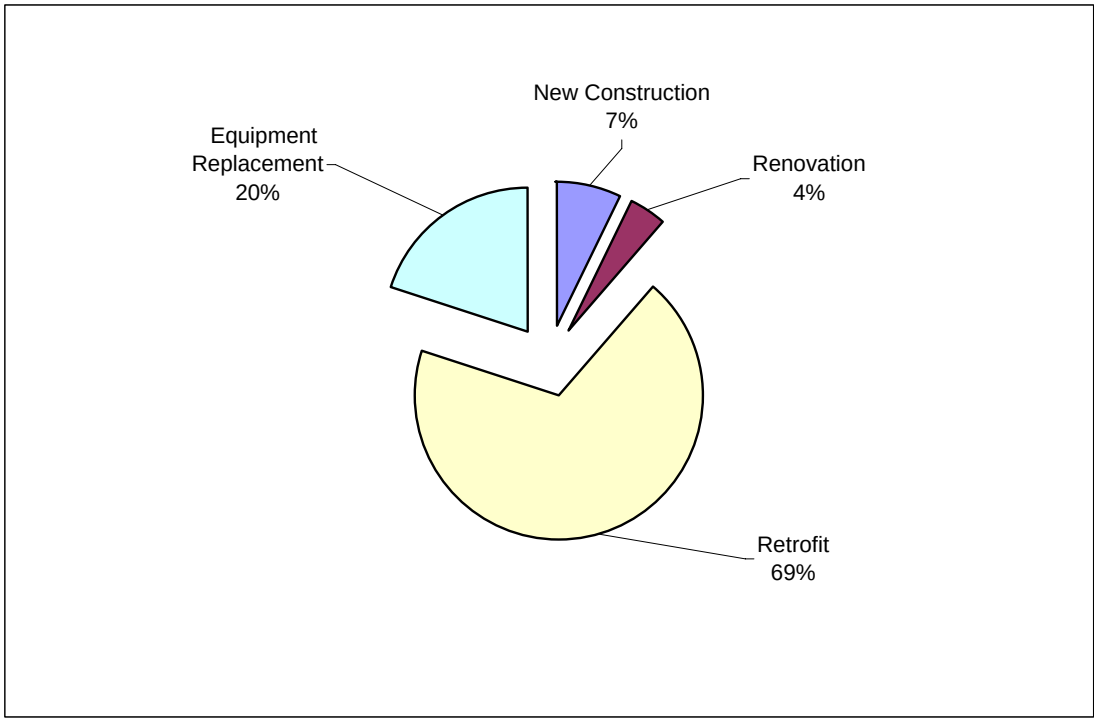
#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
	attic R-11 to R-49	MF	MF_Envelope	RENO	1.18	$0.58

Subtracted Cost Effective Measures -- Downstate -- Low Avoided Costs

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	Total Resource BCR	TRC Levelized Cost per Saved Therm ($/Therm)
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	0.975	$0.74
31	Improved roof insulation	Multifamily	Space Heating	New construction	0.789	$1.37
32	Improved roof insulation	Multifamily	Space Heating	Renovation	0.789	$1.37
64	atmospheric to DV fireplace	SF	HVAC	RR	0.761	$1.16
73	programmable t-stat	SF	HVAC	RET	0.968	$1.08
80	GFX DHW heat recovery	SF	DHW	NC	0.836	$0.85
81	GFX DHW heat recovery	SF	DHW	RENO	0.836	$0.85
84	base DG window to low-e	SF	SF_Envelope	RR	0.803	$0.91
96	base DG window to low-e	SF	SF_Envelope	NC	0.908	$0.77
104	base DG window to low-e	SF	SF_Envelope	RENO	0.803	$0.91
131	GFX DHW heat recovery	MF	DHW	NC	0.905	$0.80
132	GFX DHW heat recovery	MF	DHW	RENO	0.905	$0.80
160	LI programmable t-stat	LI SF	LI HVAC	RET	0.968	$1.08
170	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	0.992	$0.72

Table 6: Economic Potential by Market

Economic Potential by Market -- Upstate



Economic Potential by Market -- Downstate

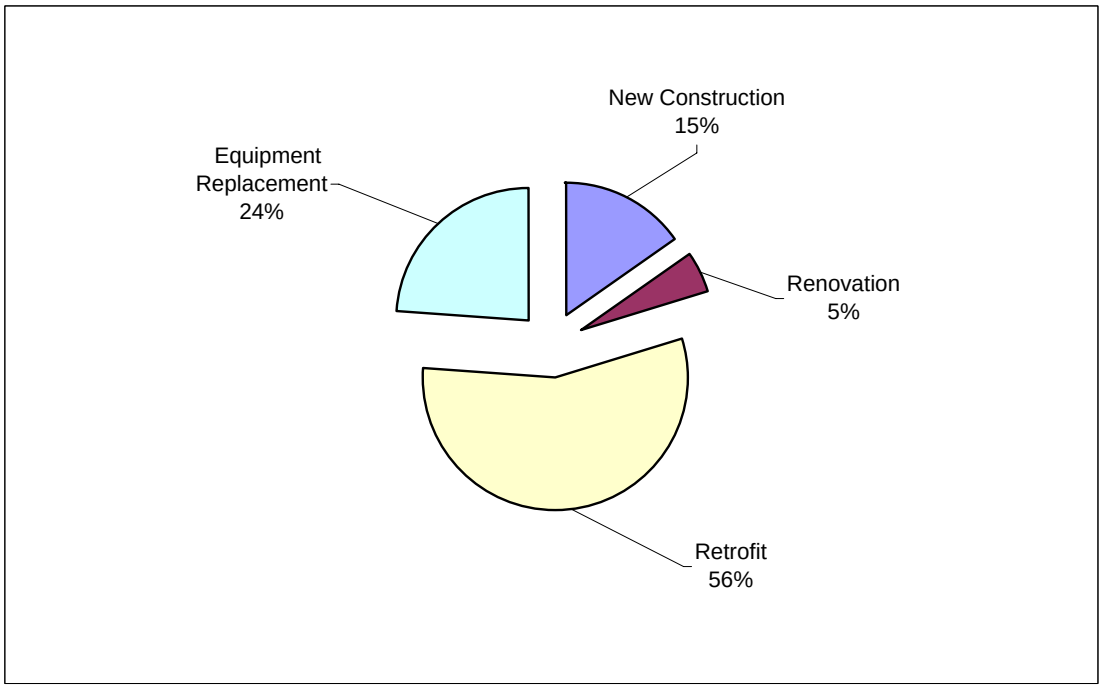
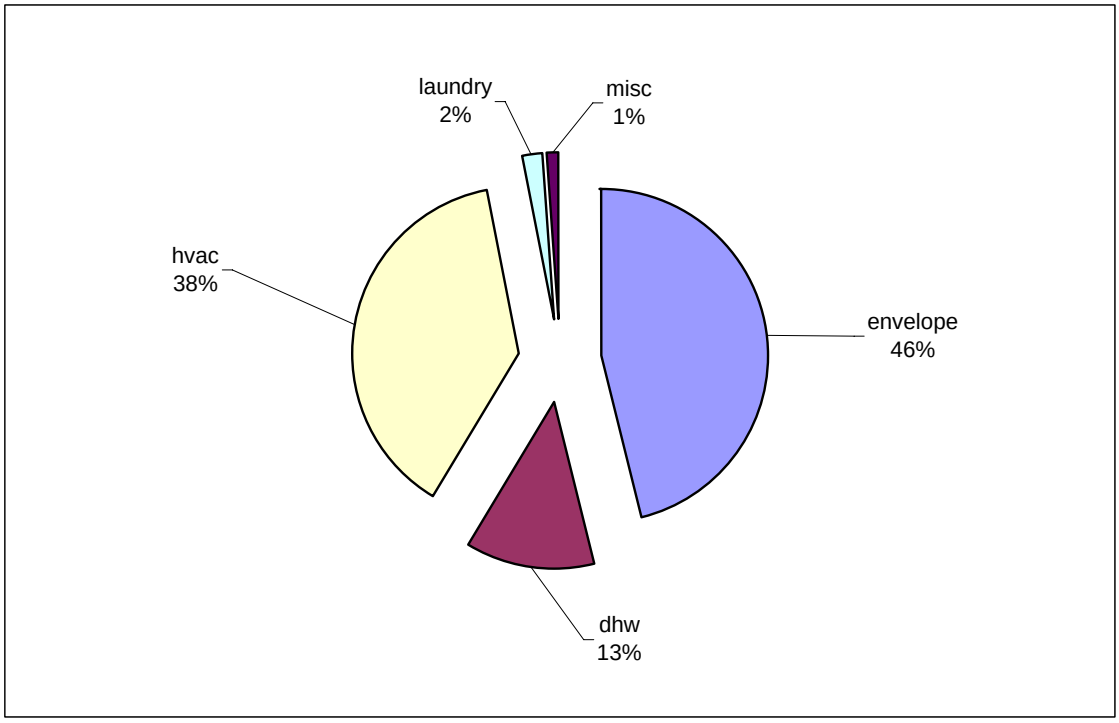


Table 7: Economic Potential by End Use

Economic Potential by End Use -- Upstate



Economic Potential by End Use -- Downstate

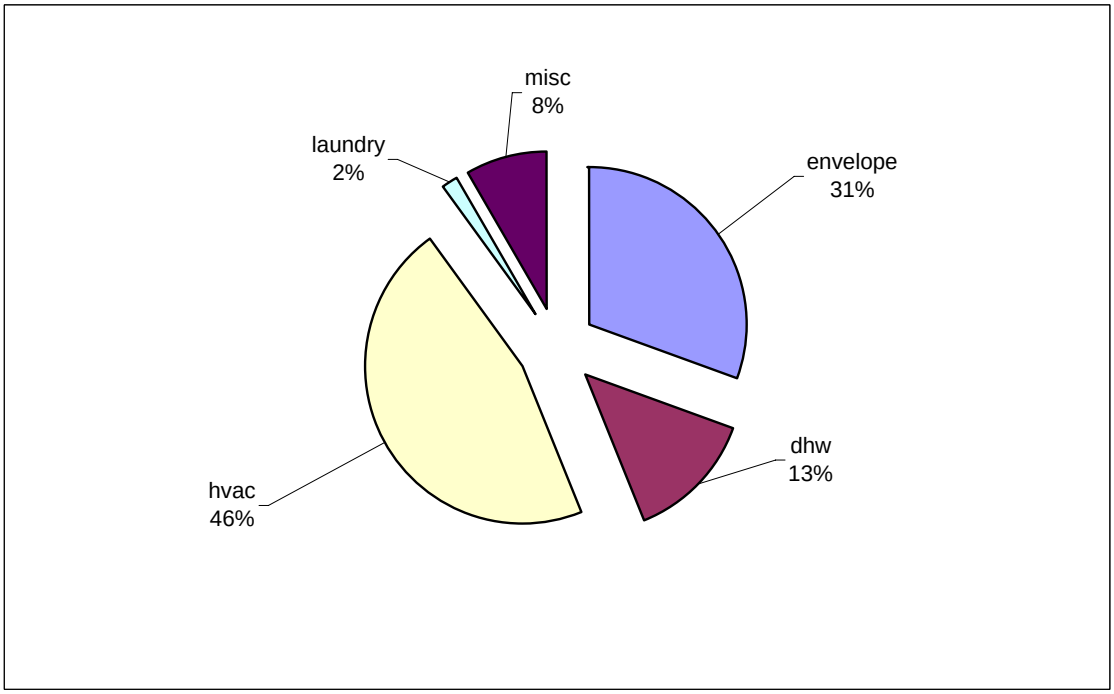


Table 8a: Achievable Cumulative Net Savings by Measure by Year -- Upstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Faucet aerator	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
4	Low-flow shower heads	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Low-flow shower heads	Multifamily	Water Heating	New construction	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
6	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	0.1	0.3	0.6	1.0	1.6	1.8	2.0	2.3	2.6	2.9
7	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Pipe insulation - water heating	Multifamily	Water Heating	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
10	Tank insulation	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Tank insulation	Multifamily	Water Heating	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2
13	Air Sealing	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Air Sealing	Multifamily	Space Heating	New construction	0.0	0.1	0.2	0.4	0.6	0.7	0.8	0.9	1.0	1.2
15	Air Sealing	Multifamily	Space Heating	Renovation	0.1	0.3	0.6	1.0	1.5	1.7	1.9	2.1	2.4	2.7
16	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	0.0	0.1	0.3	0.5	0.8	0.9	1.0	1.2	1.4	1.5
18	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5
21	Programmable Thermostat	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Programmable Thermostat	Multifamily	Space Heating	Renovation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
24	Improved roof insulation	Multifamily	Space Heating	New construction	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
25	Improved roof insulation	Multifamily	Space Heating	Renovation	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
26	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	Pipe insulation - space heating	Multifamily	Space Heating	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
28	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3
29	Energy Star washer	Multifamily	Water Heating	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
31	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
33	Commissioning	Multifamily	Total	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	Commissioning	Multifamily	Total	Renovation	0.0	0.1	0.2	0.3	0.5	0.5	0.5	0.6	0.6	0.6
35	Commissioning	Multifamily	Total	Remodel/Replacment	0.1	0.3	0.6	1.1	1.6	1.8	1.9	2.0	2.1	2.1
36	Retrocommissioning	Multifamily	Total	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	Integrated Design - High Performance (30% > codes) - Tier 1	Multifamily	Total	New construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	Oxygen Trim	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	Oxygen Trim	Multifamily	Space Heating	New construction	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
41	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	0.0	0.1	0.2	0.3	0.5	0.6	0.6	0.7	0.8	0.9
42	base to Energy Star clothes washer	SF	SF_ClothesWasher	NC	0.9	2.0	3.4	4.9	6.5	7.8	9.3	10.9	12.7	14.5
43	.59 EF to .63 EF gas DHW	SF	DHW	NC	1.0	2.2	3.6	5.2	7.0	8.4	10.0	11.7	13.5	15.4
44	base to condensing gas furnace	SF	HVAC	NC	6.8	15.3	25.4	36.4	48.2	57.8	68.2	79.3	91.0	103.2
45	base to condensing gas furnace	SF	HVAC	RR	100.5	264.6	458.9	683.3	937.9	1,055.1	1,175.7	1,299.6	1,426.9	1,557.5
46	base to sealed/direct vent boiler	SF	HVAC	NC	1.1	2.4	4.0	5.8	7.7	9.3	11.0	12.9	15.0	17.1
47	base to sealed/direct vent boiler	SF	HVAC	RR	3.1	9.4	18.7	31.2	46.8	50.0	53.1	56.2	59.3	62.4
48	GFX DHW heat recovery	SF	DHW	NC	0.5	1.2	1.9	2.8	3.7	4.5	5.4	6.3	7.3	8.4
49	insul/seal/balance ducts	SF	HVAC	NC	7.9	17.8	29.8	43.0	57.4	69.3	82.5	96.9	112.6	129.4
50	place ducts within thermal shell	SF	HVAC	NC	10.5	23.7	39.7	57.3	76.5	92.4	110.0	129.2	150.1	172.5
51	attic R-27 to R-49	SF	SF_Envelope	NC	1.4	3.1	5.2	7.6	10.1	12.1	14.4	16.9	19.6	22.5
52	wall R-11 to R-15	SF	SF_Envelope	NC	1.4	3.2	5.3	7.6	10.1	12.0	14.2	16.4	18.8	21.2
53	wall R-11 to R-19	SF	SF_Envelope	NC	3.1	7.0	11.7	16.9	22.5	27.0	32.1	37.5	43.3	49.5

Table 8a: Achievable Cumulative Net Savings by Measure by Year -- Upstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
54	smart air sealing	SF	SF_Envelope	NC	10.0	22.7	37.9	54.8	73.1	88.3	105.2	123.6	143.5	164.9
55	base DG window to low-e	SF	SF_Envelope	NC	2.0	4.5	7.5	10.8	14.3	17.2	20.2	23.5	27.0	30.7
56	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	1.1	2.4	3.6	4.7	5.6	6.1	6.2	6.2	6.2	6.2
57	base hatch to insulated hatch	SF	SF_Envelope	NC	0.5	1.1	1.7	2.5	3.2	3.9	4.5	5.2	5.9	6.6
58	programmable t-stat	SF	HVAC	NC	0.2	0.5	0.7	1.0	1.3	1.5	1.8	2.0	2.2	2.3
59	.59 EF to .63 EF gas DHW	MF	DHW	NC	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
60	base to condensing gas furnace	MF	HVAC	NC	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
61	base to condensing gas furnace	MF	HVAC	RR	0.7	1.8	3.1	4.6	6.4	7.1	8.0	8.8	9.7	10.5
62	base to sealed/direct vent boiler	MF	HVAC	NC	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
63	base to sealed/direct vent boiler	MF	HVAC	RR	0.2	0.5	1.1	1.8	2.7	2.8	3.0	3.2	3.4	3.5
64	GFX DHW heat recovery	MF	DHW	NC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
65	insul/seal/balance ducts	MF	HVAC	NC	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
66	place ducts within thermal shell	MF	HVAC	NC	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
67	attic R-27 to R-49	MF	MF_Envelope	NC	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
68	wall R-11 to R-15	MF	MF_Envelope	NC	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
69	wall R-11 to R-19	MF	MF_Envelope	NC	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5
70	smart air sealing	MF	MF_Envelope	NC	0.1	0.2	0.3	0.5	0.7	0.8	1.0	1.1	1.3	1.5
71	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	base hatch to insulated hatch	MF	MF_Envelope	NC	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
73	programmable t-stat	MF	HVAC	NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74	LI base to condensing gas furnace	LI SF	LI HVAC	RET	14.4	28.8	43.2	57.6	72.0	72.0	72.0	72.0	72.0	72.0
75	LI attic R-11 to R-49	LI SF	LI SF_Envelope	RET	4.6	9.2	13.8	18.4	23.0	23.0	23.0	23.0	23.0	23.0
76	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	5.3	10.6	15.9	21.3	26.6	26.6	26.6	26.6	26.6	26.6
77	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	1.1	2.3	3.4	4.6	5.7	5.7	5.7	5.7	5.7	5.7
78	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	1.2	2.3	3.5	4.7	5.9	5.9	5.9	5.9	5.9	5.9
79	LI smart air sealing	LI SF	LI SF_Envelope	RET	16.8	33.5	50.3	67.1	83.9	83.9	83.9	83.9	83.9	83.9
80	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	11.6	23.2	34.8	46.3	57.9	57.9	57.9	57.9	57.9	57.9
81	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	1.4	2.9	4.3	5.7	7.2	7.2	7.2	7.2	7.2	7.2
82	LI programmable t-stat	LI SF	LI HVAC	RET	0.6	1.3	1.9	2.6	3.2	3.2	3.2	3.2	3.2	3.2
83	LI low-flow devices	LI SF	LI DHW	RET	2.1	4.1	6.2	8.2	10.3	10.3	10.3	10.3	10.3	10.3
84	LI seal/balance ducts	LI SF	LI HVAC	RET	21.9	43.9	65.8	87.7	109.7	109.7	109.7	109.7	109.7	109.7
85	LI tank temp turn down	LI SF	LI DHW	RET	0.7	1.3	2.0	2.6	3.3	3.3	3.3	3.3	3.3	3.3
86	LI tub/pool cover	LI SF	LI pools/spas	RET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
88	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
89	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
90	LI smart air sealing	LI MF	LI MF_Envelope	RET	0.2	0.5	0.7	1.0	1.2	1.2	1.2	1.2	1.2	1.2
91	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
92	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
93	LI low-flow devices	LI MF	LI DHW	RET	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
94	LI seal/balance ducts	LI MF	LI HVAC	RET	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
95	LI tank temp turn down	LI MF	LI DHW	RET	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
96	SF storage tank to on-demand	SF	DHW	NC	2.0	6.3	13.6	24.9	40.0	47.1	54.9	63.5	72.7	82.7
97	SF storage tank to on-demand	SF	DHW	RR	7.2	23.5	49.0	88.3	141.6	160.8	181.9	205.0	229.9	256.8
98	MF storage tank to on-demand	MF	DHW	NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	MF storage tank to on-demand	MF	DHW	RR	0.1	0.2	0.5	0.9	1.5	1.7	1.9	2.1	2.4	2.7

Table 8b: Achievable Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

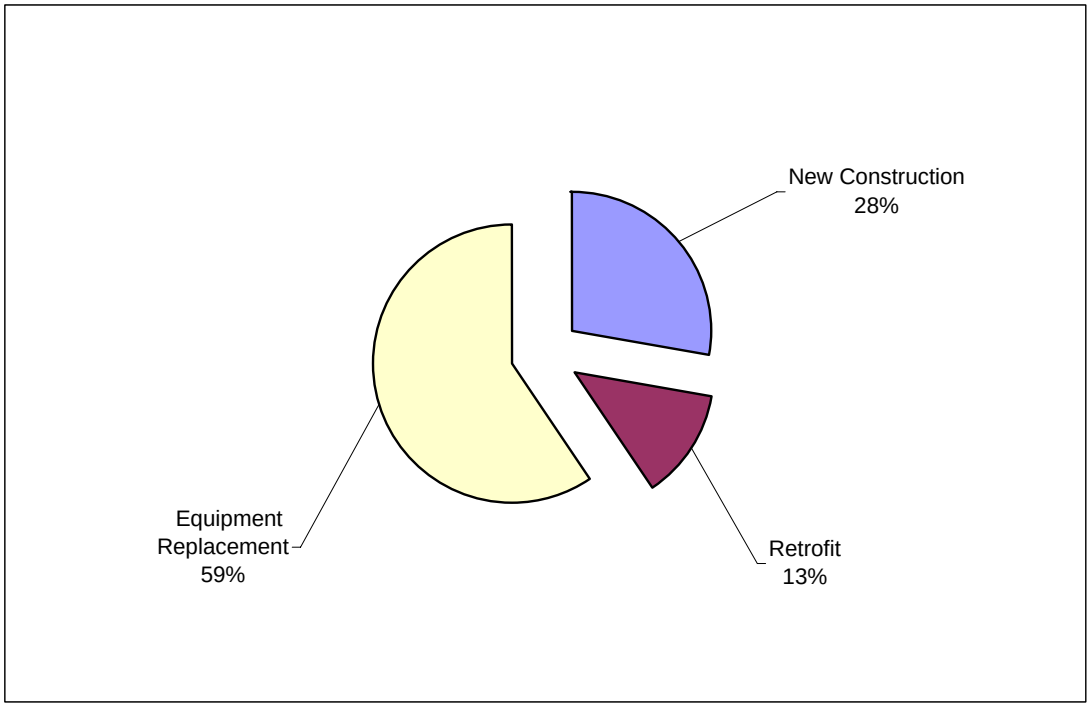
#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Faucet aerator	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Graywater heat exchanger/GFX	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Graywater heat exchanger/GFX	Multifamily	Water Heating	New construction	0.3	0.8	1.6	2.7	4.1	4.7	5.3	6.1	6.9	7.9
4	Graywater heat exchanger/GFX	Multifamily	Water Heating	Remodel/Replacment	0.2	0.5	1.0	1.6	2.5	2.6	2.9	3.2	3.6	4.2
5	Low-flow shower heads	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Low-flow shower heads	Multifamily	Water Heating	New construction	0.6	1.8	3.8	6.4	9.7	11.1	12.6	14.4	16.5	18.8
7	Low-flow shower heads	Multifamily	Water Heating	Remodel/Replacment	1.5	4.6	9.2	15.5	23.4	26.5	30.1	34.2	38.6	43.5
8	Pipe insulation - water heating	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Pipe insulation - water heating	Multifamily	Water Heating	New construction	0.1	0.2	0.5	0.9	1.4	1.7	2.0	2.3	2.7	3.1
10	Pipe insulation - water heating	Multifamily	Water Heating	Renovation	0.1	0.2	0.4	0.7	1.0	1.2	1.4	1.6	1.9	2.2
11	Tank insulation	Multifamily	Water Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Tank insulation	Multifamily	Water Heating	New construction	0.0	0.1	0.2	0.4	0.6	0.8	0.9	1.1	1.3	1.5
13	Tank insulation	Multifamily	Water Heating	Remodel/Replacment	0.1	0.2	0.4	0.7	1.0	1.2	1.5	1.7	2.0	2.3
14	Air Sealing	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	Air Sealing	Multifamily	Space Heating	New construction	1.8	5.6	11.7	20.8	32.8	39.1	45.8	53.2	61.3	70.0
16	Air Sealing	Multifamily	Space Heating	Renovation	1.5	4.4	8.9	15.0	22.6	25.6	29.1	33.0	37.3	42.1
17	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	New construction	0.6	1.7	3.6	6.4	10.2	12.1	14.2	16.5	19.0	21.7
18	Improved heating system high efficiency unit - Tier 1	Multifamily	Space Heating	Remodel/Replacment	0.6	1.7	3.6	6.3	9.8	11.6	13.5	15.5	17.7	20.0
19	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	New construction	0.2	0.5	1.0	1.8	2.9	3.4	4.0	4.7	5.4	6.1
21	Improved heating system condensing unit - Tier 2	Multifamily	Space Heating	Remodel/Replacment	0.2	0.5	1.0	1.8	2.8	3.3	3.8	4.4	5.0	5.7
22	Programmable Thermostat	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Programmable Thermostat	Multifamily	Space Heating	Renovation	0.2	0.6	1.2	2.0	2.9	3.5	4.2	4.9	5.8	6.6
24	Programmable Thermostat	Multifamily	Space Heating	Remodel/Replacment	0.6	1.6	2.9	4.9	7.3	8.8	10.5	12.4	14.4	16.5
25	Outdoor Air Reset	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Outdoor Air Reset	Multifamily	Space Heating	New construction	0.4	1.2	2.1	3.3	4.6	4.0	2.8	3.1	3.4	3.6
27	Outdoor Air Reset	Multifamily	Space Heating	Remodel/Replacment	5.0	15.1	26.4	39.8	54.6	46.6	32.4	34.8	37.2	39.7
28	High Performance Glazing double pane, low-E, low conductivity frame - Tier 1	Multifamily	Space Heating	New construction	0.5	1.7	3.5	6.2	9.7	11.6	13.6	15.8	18.2	20.8
29	High Performance Glazing double pane, low-E, low conductivity frame - Tier 1	Multifamily	Space Heating	Renovation	0.5	1.6	3.4	6.0	9.4	11.1	12.9	14.9	17.0	19.2
30	High Performance Glazing triple pane, low-E, low conductivity frame - Tier 2	Multifamily	Space Heating	New construction	0.3	0.8	1.7	2.8	4.3	4.6	5.1	5.7	6.5	7.5
31	High Performance Glazing triple pane, low-E, low conductivity frame - Tier 2	Multifamily	Space Heating	Renovation	0.3	0.8	1.6	2.7	4.1	4.4	4.8	5.4	6.1	7.0
32	Improved roof insulation	Multifamily	Space Heating	New construction	0.1	0.2	0.4	0.7	1.0	1.1	1.2	1.3	1.5	1.7
33	Improved roof insulation	Multifamily	Space Heating	Renovation	0.0	0.1	0.2	0.3	0.5	0.5	0.6	0.7	0.8	1.0
34	Sensible Heat Recovery	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	Sensible Heat Recovery	Multifamily	Space Heating	New construction	1.8	5.4	11.0	18.6	28.4	32.4	37.0	42.3	48.2	54.9
36	Sensible Heat Recovery	Multifamily	Space Heating	Remodel/Replacment	3.0	9.0	18.0	30.2	45.5	51.7	58.7	66.6	75.3	84.9
37	Pipe insulation - space heating	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	Pipe insulation - space heating	Multifamily	Space Heating	New construction	0.1	0.3	0.6	1.0	1.5	1.8	2.2	2.6	3.1	3.6
39	Pipe insulation - space heating	Multifamily	Space Heating	Renovation	0.1	0.3	0.6	1.0	1.5	1.8	2.1	2.5	2.9	3.3
40	Energy Star washer	Multifamily	Water Heating	New construction	0.0	0.1	0.2	0.4	0.6	0.7	0.7	0.7	0.7	0.7
41	Energy Star washer	Multifamily	Water Heating	Remodel/Replacment	0.1	0.2	0.5	0.8	1.3	1.5	1.5	1.5	1.5	1.5
42	Swimming pool/spa covers	Multifamily	Miscellaneous	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	Swimming pool/spa covers	Multifamily	Miscellaneous	New construction	0.1	0.2	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.8
44	Swimming pool/spa covers	Multifamily	Miscellaneous	Remodel/Replacment	0.3	0.8	1.6	2.7	4.0	4.3	4.4	4.3	4.1	3.7
45	Commissioning	Multifamily	Total	Renovation	0.4	1.2	2.4	4.0	6.1	6.5	7.1	7.6	7.8	7.9
46	Commissioning	Multifamily	Total	Remodel/Replacment	1.4	4.3	8.6	14.4	21.7	23.2	25.4	27.0	27.9	28.2
47	Retrocommissioning	Multifamily	Total	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48	Steam trap Maintenance	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	Oxygen Trim	Multifamily	Space Heating	Retrofit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50	Oxygen Trim	Multifamily	Space Heating	New construction	0.2	0.5	1.0	1.7	2.6	2.9	3.4	3.8	4.4	5.0
51	Oxygen Trim	Multifamily	Space Heating	Remodel/Replacment	0.4	1.2	2.4	4.1	6.2	7.0	8.0	9.0	10.2	11.5
52	base to Energy Star clothes washer	SF	SF_ClothesWasher	NC	0.4	1.3	2.7	4.6	7.3	8.5	9.8	11.2	12.6	14.1
53	.59 EF to .63 EF gas DHW	SF	DHW	NC	0.6	1.7	3.5	6.1	9.6	11.2	12.9	14.7	16.5	18.5
54	base to condensing gas furnace	SF	HVAC	NC	3.9	11.2	23.4	40.9	64.2	74.6	85.7	97.2	109.3	121.9
55	base to condensing gas furnace	SF	HVAC	RR	86.7	228.2	395.8	589.3	808.8	909.9	1,013.9	1,120.8	1,230.6	1,343.3
56	base to sealed/direct vent boiler	SF	HVAC	NC	0.6	1.7	3.6	6.3	9.9	11.5	13.3	15.1	17.0	19.0
57	base to sealed/direct vent boiler	SF	HVAC	RR	2.7	8.1	16.2	26.9	40.4	43.1	45.8	48.5	51.2	53.9
58	GFX DHW heat recovery	SF	DHW	NC	0.3	0.9	1.8	3.2	5.0	5.9	6.8	7.7	8.7	9.7
59	insul/seal/balance ducts	SF	HVAC	NC	4.4	12.9	26.9	47.2	74.5	86.8	99.9	113.7	128.3	143.6
60	place ducts within thermal shell	SF	HVAC	NC	5.9	17.2	35.9	63.0	99.3	115.7	133.2	151.6	171.0	191.5

Table 8b: Achievable Cumulative Net Savings by Measure by Year -- Downstate -- Thousand DecaTherms (Net of Freeriders)

#	Measure Name	Measure ID4 (e.g., Bldg type)	Measure ID5 (e.g., End Use)	Measure ID6 (e.g., Market: Retrofit, NC, ROB)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
61	attic R-27 to R-49	SF	SF_Envelope	NC	0.6	1.9	4.0	7.0	10.9	12.8	14.7	16.7	18.8	21.0
62	wall R-11 to R-15	SF	SF_Envelope	NC	0.7	2.0	4.2	7.4	11.6	13.5	15.4	17.5	19.7	21.9
63	wall R-11 to R-19	SF	SF_Envelope	NC	1.5	4.3	9.0	15.7	24.8	28.8	33.1	37.7	42.4	47.4
64	smart air sealing	SF	SF_Envelope	NC	4.6	13.6	28.4	49.9	78.6	91.7	105.5	120.1	135.4	151.6
65	base DG window to low-e	SF	SF_Envelope	NC	1.0	2.8	5.9	10.4	16.3	18.9	21.7	24.6	27.7	30.9
66	R-19 bsmt/crawl ceiling insulation	SF	SF_Envelope	NC	0.8	2.2	4.4	7.4	11.2	12.8	14.4	15.9	17.4	18.8
67	base hatch to insulated hatch	SF	SF_Envelope	NC	0.2	0.7	1.4	2.5	3.9	4.5	5.2	5.8	6.5	7.3
68	programmable t-stat	SF	HVAC	NC	0.1	0.4	0.8	1.4	2.2	2.5	2.9	3.2	3.6	4.0
69	base to Energy Star clothes washer	MF	MF_ClothesWasher	NC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
70	.59 EF to .63 EF gas DHW	MF	DHW	NC	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3
71	base to condensing gas furnace	MF	HVAC	NC	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4
72	base to condensing gas furnace	MF	HVAC	RR	1.4	3.6	6.3	9.4	12.9	14.5	16.2	17.9	19.6	21.4
73	base to sealed/direct vent boiler	MF	HVAC	NC	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5
74	base to sealed/direct vent boiler	MF	HVAC	RR	0.4	1.1	2.2	3.6	5.4	5.7	6.1	6.5	6.8	7.2
75	GFX DHW heat recovery	MF	DHW	NC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
76	insul/seal/balance ducts	MF	HVAC	NC	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
77	place ducts within thermal shell	MF	HVAC	NC	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4
78	attic R-27 to R-49	MF	MF_Envelope	NC	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
79	wall R-11 to R-15	MF	MF_Envelope	NC	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2
80	wall R-11 to R-19	MF	MF_Envelope	NC	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4
81	smart air sealing	MF	MF_Envelope	NC	0.0	0.1	0.3	0.5	0.7	0.8	1.0	1.1	1.2	1.4
82	R-19 bsmt/crawl ceiling insulation	MF	MF_Envelope	NC	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
83	base hatch to insulated hatch	MF	MF_Envelope	NC	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
84	programmable t-stat	MF	HVAC	NC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
85	LI base to condensing gas furnace	LI SF	LI HVAC	RET	5.2	10.4	15.7	20.9	26.1	26.1	26.1	26.1	26.1	26.1
86	LI wall R-4 to R-15	LI SF	LI SF_Envelope	RET	1.6	3.1	4.7	6.2	7.8	7.8	7.8	7.8	7.8	7.8
87	LI wall R-4 to R-19	LI SF	LI SF_Envelope	RET	0.3	0.7	1.0	1.3	1.7	1.7	1.7	1.7	1.7	1.7
88	LI wall R-4 to R-21	LI SF	LI SF_Envelope	RET	0.3	0.7	1.0	1.4	1.7	1.7	1.7	1.7	1.7	1.7
89	LI smart air sealing	LI SF	LI SF_Envelope	RET	4.9	9.8	14.7	19.6	24.5	24.5	24.5	24.5	24.5	24.5
90	LI R-19 bsmt/crawl ceiling insulation	LI SF	LI SF_Envelope	RET	3.4	6.8	10.2	13.6	16.9	16.9	16.9	16.9	16.9	16.9
91	LI base hatch to insulated hatch	LI SF	LI SF_Envelope	RET	0.4	0.8	1.3	1.7	2.1	2.1	2.1	2.1	2.1	2.1
92	LI programmable t-stat	LI SF	LI HVAC	RET	0.2	0.5	0.7	0.9	1.2	1.2	1.2	1.2	1.2	1.2
93	LI low-flow devices	LI SF	LI DHW	RET	0.8	1.5	2.3	3.0	3.8	3.8	3.8	3.8	3.8	3.8
94	LI seal/balance ducts	LI SF	LI HVAC	RET	7.7	15.5	23.2	30.9	38.6	38.6	38.6	38.6	38.6	38.6
95	LI tank temp turn down	LI SF	LI DHW	RET	0.2	0.5	0.7	1.0	1.2	1.2	1.2	1.2	1.2	1.2
96	LI tub/pool cover	LI SF	LI pools/spas	RET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	LI base to condensing gas furnace	LI MF	LI HVAC	RET	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
98	LI wall R-4 to R-15	LI MF	LI MF_Envelope	RET	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
99	LI wall R-4 to R-19	LI MF	LI MF_Envelope	RET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	LI wall R-4 to R-21	LI MF	LI MF_Envelope	RET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	LI smart air sealing	LI MF	LI MF_Envelope	RET	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
102	LI R-19 bsmt/crawl ceiling insulation	LI MF	LI MF_Envelope	RET	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
103	LI base hatch to insulated hatch	LI MF	LI MF_Envelope	RET	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
104	LI low-flow devices	LI MF	LI DHW	RET	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
105	LI seal/balance ducts	LI MF	LI HVAC	RET	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
106	LI tank temp turn down	LI MF	LI DHW	RET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107	SF storage tank to on-demand	SF	DHW	NC	1.9	6.0	13.1	23.9	38.4	45.2	52.7	60.9	69.8	79.4
108	SF storage tank to on-demand	SF	DHW	RR	6.7	21.7	45.2	81.6	130.8	148.6	168.1	189.4	212.4	237.3
109	MF storage tank to on-demand	MF	DHW	NC	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.9	1.0	1.1
110	MF storage tank to on-demand	MF	DHW	RR	0.2	0.5	1.1	2.0	3.1	3.6	4.0	4.5	5.1	5.7

Table 9: Achievable Potential by Market -- Upstate

Achievable Potential by Market -- Upstate



Achievable Potential by Market -- Downstate

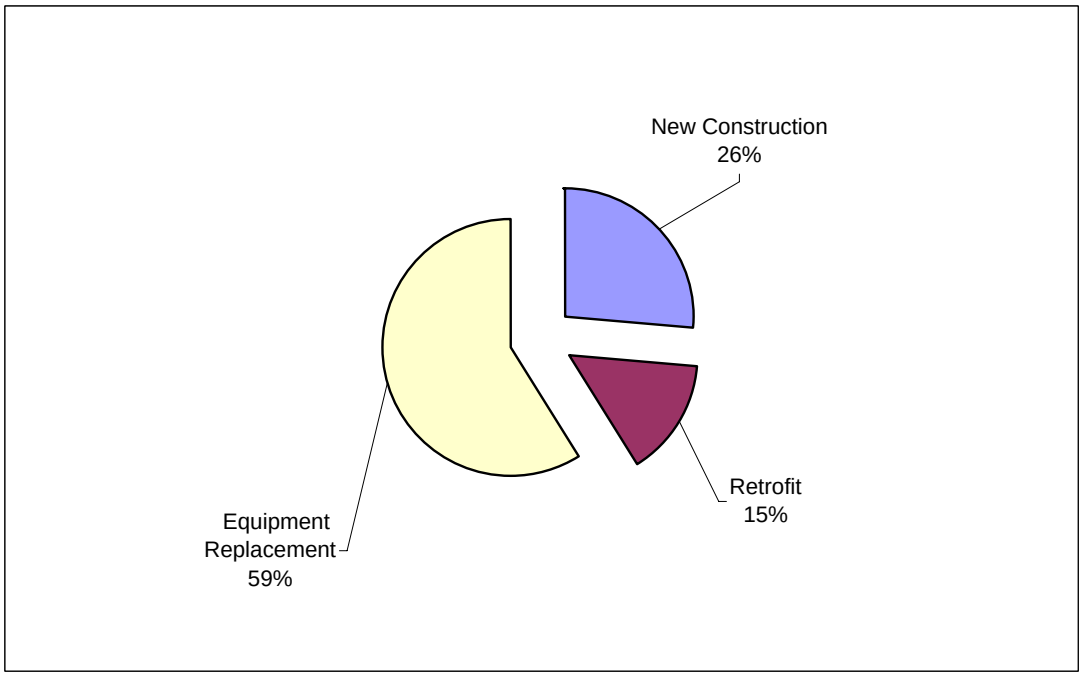
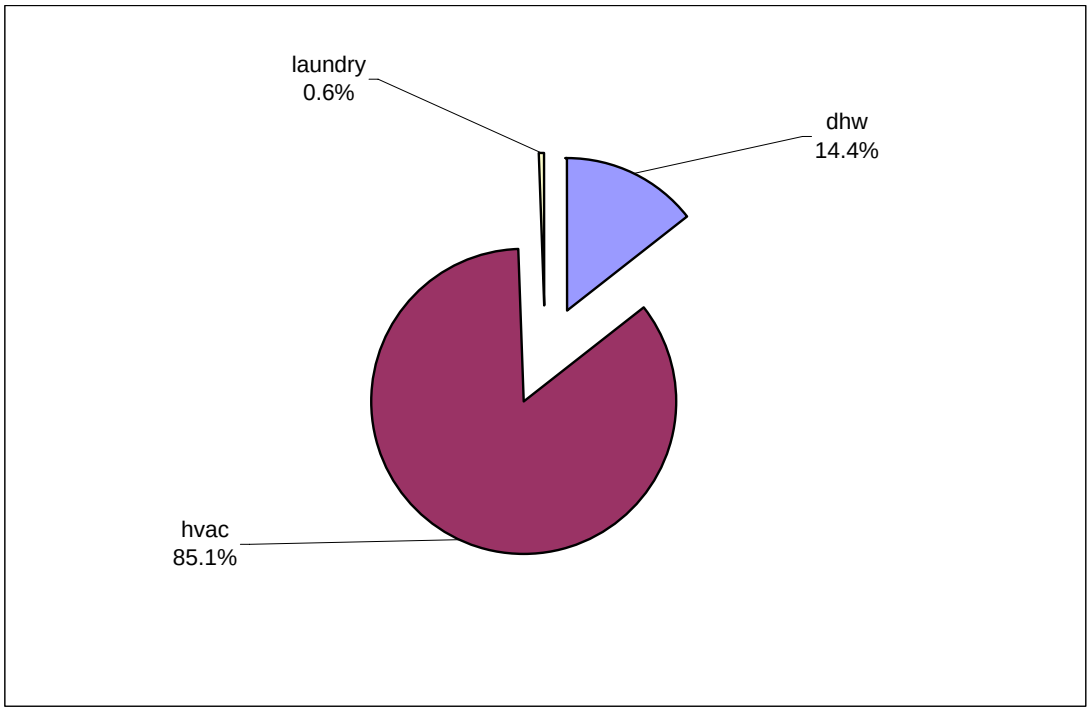
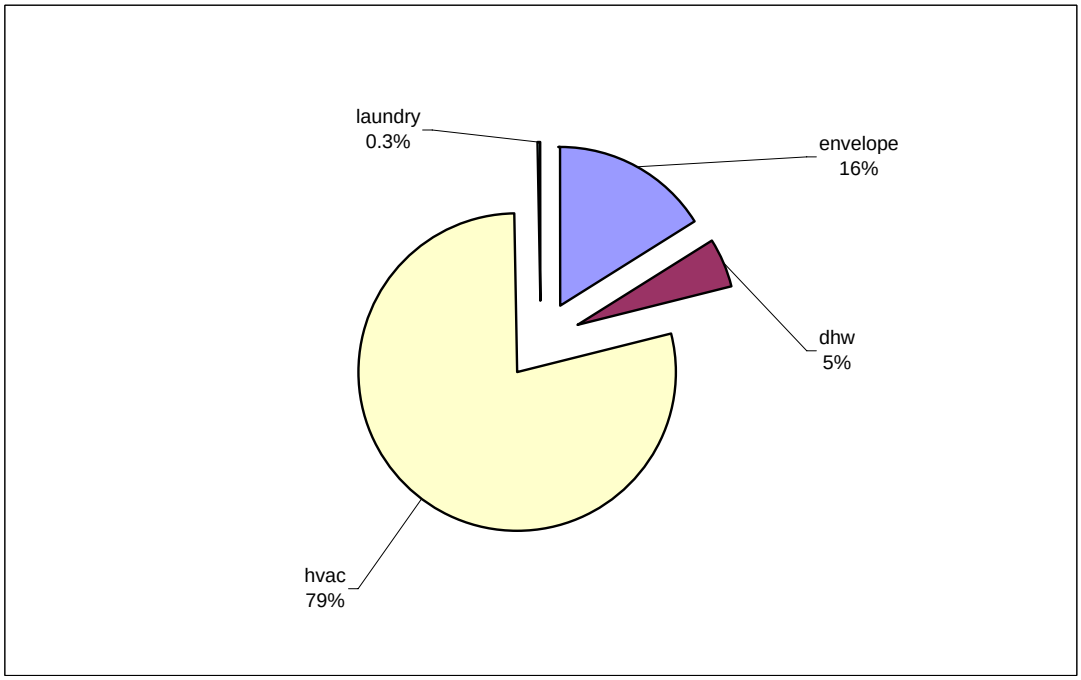


Table 10: Achievable Potential by End Use

Achievable Potential by End Use -- Upstate



Achievable Potential by End Use-- Downstate