



## ***Appendix E***

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### **Residential - Electric**

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### **Residential – Non Electric**

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# Residential Electric Model - Measure Assumptions

Electric Measure Assumptions (Initial Assumptions & Levelized Costs)

0.70

Admin

\$0.00

Discount Rate 5.00%

Measure	Measure Name	Home Type	Base Elec. Use (kWh)	% Savings	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr/Full)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)	
<b>Electric Appliances - Single Family/Multi Family</b>																	
1	Second Freezer Turn In	SF	1,051.00	100%	1,051.00	5	\$45.00	Homes w/ more than one freezer	1.98%	M	0.00%			\$10.39	\$0.010	\$0.010	
2	Energy Star Compliant Bottom Freezer Refrigerator	SF	579.29	15%	86.89	13	\$30.00	Homes w/ Bottom Freezer Refrigerators	8.21%	M	35.18%			\$3.19	\$0.037	\$0.037	
3	Energy Star Compliant Chest Freezer	SF	519.73	10%	51.97	13	\$33.00	Homes w/ Chest Freezers	19.15%	M	19.42%			\$3.51	\$0.068	\$0.068	
4	Energy Star Dehumidifier	SF	801.53	15%	117.37	12	0.01	Homes w/ Dehumidifiers	26.88%	M	31.88%			\$0.00	\$0.000	\$0.000	
5	Second Refrigerator Turn In	SF	847.00	100%	847.00	5	\$45.00	Homes w/ more than one refrigerator	29.25%	M	0.00%			\$10.39	\$0.012	\$0.012	
6	Energy Star Compliant Side by Side Refrigerator	SF	653.01	15%	97.95	13	30.00	Homes w/ Side By Side Refrigerators	25.95%	M	35.18%			\$3.19	\$0.033	\$0.033	
7	Energy Star Compliant Top Freezer Refrigerator	SF	577.50	15%	86.63	13	30.00	Homes w/ Top Freezer Refrigerators	65.84%	M	35.18%			\$3.19	\$0.037	\$0.037	
8	Energy Star Compliant Upright Freezer	SF	545.65	10%	54.57	13	\$33.00	Homes w/ Upright Freezers	21.56%	M	19.42%			\$3.51	\$0.064	\$0.064	
	Energy Star office equipment including monitors, copiers, multi-function machines.	SF	464.00	27%	124.00	4	0.01	Homes w/1 or more computers	81.42%	M	22.92%			\$0.00	\$0.000	\$0.000	
9	Induction Cooktop vs Electric Coil Cooktop	SF	222.90	39%	86.93	20	\$900.00	Homes w/electric coil range	87.00%	M	0.00%			\$72.22	\$0.831	\$0.831	
10	TVs - Energy Star over standard	SF	222.00	12%	27.51	8	0.01	Homes with 1 or more TVs	100.00%	M	51.00%			\$0.00	\$0.000	\$0.000	
11	Second Freezer Turn In	MF	1,051.00	100%	1,051.00	5	\$45.00	Homes w/ more than one freezer	0.79%	M	0.00%			\$10.39	\$0.010	\$0.010	
12	Energy Star Compliant Bottom Freezer Refrigerator	MF	579.29	15%	86.89	13	\$30.00	Homes w/ Bottom Freezer Refrigerators	8.21%	M	14.96%			\$3.19	\$0.037	\$0.037	
13	Energy Star Compliant Chest Freezer	MF	519.73	10%	51.97	13	\$33.00	Homes w/ Chest Freezers	8.89%	M	8.00%			\$3.51	\$0.068	\$0.068	
14	Energy Star Dehumidifier	MF	801.53	15%	117.37	12	\$0.01	Homes w/ Dehumidifiers	10.24%	M	53.85%			\$0.00	\$0.000	\$0.000	
15	Second Refrigerator Turn In	MF	847.00	100%	847.00	5	\$45.00	Homes w/ more than one refrigerator	3.94%	M	0.00%			\$10.39	\$0.012	\$0.012	
16	Energy Star Compliant Side by Side Refrigerator	MF	653.01	15%	97.95	13	30.00	Homes w/ Side By Side Refrigerators	25.95%	M	14.96%			\$3.19	\$0.033	\$0.033	
17	Energy Star Compliant Top Freezer Refrigerator	MF	577.50	15%	86.63	13	30.00	Homes w/ Top Freezer Refrigerators	65.84%	M	14.96%			\$3.19	\$0.037	\$0.037	
18	Energy Star Compliant Upright Freezer	MF	545.65	10%	54.57	13	\$33.00	Homes w/ Upright Freezers	10.01%	M	8.00%			\$3.51	\$0.064	\$0.064	
	Energy Star office equipment including monitors, copiers, multi-function machines.	MF	464.00	27%	124.00	4	\$0.01	Homes w/1 or more computers	68.50%	M	15.75%			\$0.00	\$0.000	\$0.000	
19	Induction Cooktop vs Electric Coil Cooktop	MF	222.90	39%	86.93	20	\$900.00	Homes w/electric coil range	51.18%	M	0.00%			\$72.22	\$0.831	\$0.831	
20	TVs - Energy Star over standard	MF	222.00	12%	27.51	8	\$0.01	Homes with 1 or more TVs	100.00%	M	51.00%			\$0.00	\$0.000	\$0.000	
21	<b>Phantom Power - Single Family/Multi Family</b>																
22	Phantom Power	SF	440.00	60%	265.00	7	\$150.00	All Homes	100.00%	EU	15.00%			\$25.92	\$0.098	\$0.098	
23	Phantom Power	MF	330.00	60%	198.75	7	\$112.50	All Homes	100.00%	EU	15.00%			\$19.44	\$0.098	\$0.098	
24	<b>Pools - Single Family</b>																
25	Pool Pump and Motor	SF	1,500.00	40%	600.00	15	\$313.00	Homes with Pools	0.80%	EU	0.00%			\$30.16	\$0.050	\$0.050	
26	<b>Lighting - Single Family /Multi Family</b>																
27	LED options, inc. MR 16, R16, R20, R30, R38 & G25	SF	-	-	51.00	20	\$58.00	All Homes	100.00%	EU	0.00%	-0.1		\$4.65	\$0.091	\$0.091	
28	CFL Bulbs (Homes w/ no CFL bulbs installed)-Low Use	SF	-	-	24.00	12	\$2.62	Homes w/ no CFL bulbs	25.00%	EU	0.00%	-0.1		\$0.30	\$0.012	\$0.012	
29	CFL Bulbs (Homes w/ no CFL bulbs installed)-High Use	SF	-	-	48.00	6	\$2.62	Homes w/ no CFL bulbs	25.00%	EU	0.00%	-0.3		\$0.52	\$0.011	\$0.011	
30	Timers/Motion/Photo cell controlled outdoor lighting	SF	-	-	117.00	10	\$108.00	Homes with Exterior Lighting	100.00%	EU	15.00%	0.0		\$13.99	\$0.120	\$0.120	
31	CFL Bulbs (Homes w/ partial CFL installation)-Low Use	SF	-	-	24.00	12	\$2.62	Homes with Partial CFL installation	75.00%	EU	37.34%	-0.1		\$0.30	\$0.012	\$0.012	
32	CFL Bulbs (Homes w/ partial CFL installation)-High Use	SF	-	-	48.00	6	\$2.62	Homes with Partial CFL installation	75.00%	EU	37.34%	-0.3		\$0.52	\$0.011	\$0.011	
33	LED options, inc. MR 16, R16, R20, R30, R38 & G25	MF	-	-	51.00	20	\$58.00	All Homes	100.00%	EU	0.00%	-0.1		\$4.65	\$0.091	\$0.091	
34	CFL Bulbs (Homes w/ no CFL bulbs installed)-Low Use	MF	-	-	24.00	12	\$2.62	Homes w/ no CFL bulbs	34.45%	EU	0.00%	-0.1		\$0.30	\$0.012	\$0.012	
35	CFL Bulbs (Homes w/ no CFL bulbs installed)-High Use	MF	-	-	48.00	6	\$2.62	Homes w/ no CFL bulbs	34.45%	EU	0.00%	-0.3		\$0.52	\$0.011	\$0.011	
36	Timers/Motion/Photo cell controlled outdoor lighting	MF	-	-	117.00	10	\$108.00	Homes with Exterior Lighting	100.00%	EU	15.00%	0.0		\$13.99	\$0.120	\$0.120	
37	CFL Bulbs (Homes w/ partial CFL installation)-Low Use	MF	-	-	24.00	12	\$2.62	Homes with Partial CFL installation	65.55%	EU	34.90%	-0.1		\$0.30	\$0.012	\$0.012	
38	CFL Bulbs (Homes w/ partial CFL installation)-High Use	MF	-	-	48.00	6	\$2.62	Homes with Partial CFL installation	65.55%	EU	34.90%	-0.3		\$0.52	\$0.011	\$0.011	
39	<b>Space Heating and Space Cooling - Single Family Homes</b>																
40	Programmable Thermostats (Electric Heat)	SF	16,373.00	9%	1,473.57	10	89.24	Homes w/ Electric Heat	1.19%	EU	54.55%			\$11.56	\$0.008	\$0.008	
41	Energy Efficient Windows (Electric Heat)	SF	16,373.00	8%	1,348.18	25	375.00	Homes w/ Electric Heat	1.19%	EU	17.00%			\$26.61	\$0.020	\$0.020	
42	Duct Sealing (Electric Heat)	SF	16,373.00	5%	818.65	20	300.00	Homes w/ Electric Heat	1.19%	EU	54.55%			\$24.07	\$0.029	\$0.029	
43	High Efficiency Heat Pump (Tier 2)	SF	13,414.00	14%	1,926.00	18	1200.00	Homes w/ Electric Heat	1.19%	EU	1.00%			\$102.66	\$0.053	\$0.053	
44	High Efficiency Heat Pump (Tier 1)	SF	13,414.00	6%	829.00	18	1000.00	Homes w/ Electric Heat	1.19%	EU	13.90%			\$85.55	\$0.103	\$0.103	
45	Ground Source Heat Pump	SF	13,414.00	21%	2,816.94	18	9000.00	Homes w/ Electric Heat	1.19%	EU	2.00%			\$759.48	\$0.270	\$0.270	
46	Insulation & Weatherization Package (Electric Heat) Good	SF	23,547.77	7%	1,748.24	20	3409.40	Homes w/ Electric Heat - Combination	1.19%	EU	50.00%			\$273.58	\$0.156	\$0.156	
47	Insulation & Weatherization Package (Electric Heat) Better	SF	23,547.77	16%	3,824.74	20	14011.40	Homes w/ Electric Heat - Combination	1.19%	EU	16.67%			\$1,124.31	\$0.294	\$0.294	

## Residential Electric Model - Measure Assumptions

Electric Measure Assumptions (Initial Assumptions & Levelized Costs)

0.70

Admin

\$0.00

Discount Rate

5.00%

Measure	Measure Name	Home Type	Base Elec. Use (kWh)	% Savings	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr/Full)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)
46	Insulation & Weatherization Package (Electric Heat) Best	SF	23,547.77	25%	5,816.24	20	36853.81	Homes w/ Electric Heat - Combination	1.19%	EU	16.67%			\$2,957.25	\$0.508	\$0.508
47	Energy Star Room A/C	SF	785.71	9%	72.75	12	30.00	Homes w/ Electric Room AC (C )	59.68%	EU	50.33%			\$3.38	\$0.047	\$0.047
51	Duct Sealing - gas (Heating + Central Air)	SF	1,139.00	7%	79.12	20	150.00	Homes w/ Gas Heat & Central Air	7.51%	EU	25.00%	4.3		\$12.04	\$0.152	\$0.152
48	Programmable Thermostats - gas (Heating + Central Air)	SF	1,139.00	13%	145.22	10	\$46.00	Homes w/ Gas Heat & Central Air	2.77%	EU	76.50%	7.70		\$5.96	\$0.041	\$0.041
49	Energy Efficient Windows - gas (Heating + Central Air)	SF	1,139.00	11%	125.29	25	187.50	Homes w/ Gas Heat & Central Air	13.04%	EU	14.70%	4.60		\$13.30	\$0.106	\$0.106
50	Tree Shading - gas (Heating + Central Air)	SF	1,139.00	7%	79.73	30	90.00	Homes w/ Gas Heat & Central Air	14.23%	EU	50.40%	14.97		\$5.85	\$0.073	\$0.073
52	Insulation/weatherization package - Good (Improved Base Home) - Gas Heat + Central Air	SF	9,565.00	11%	1,054.00	20	1652.47	Homes w/ Gas Heat & Central Air - Combination	13.04%	EU	30.90%	26.2		\$132.60	\$0.126	\$0.126
53	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat + Central Air	SF	9,565.00	31%	3,006.00	20	21601.19	Homes w/ Gas Heat & Central Air - Combination	13.04%	EU	0.00%	74		\$1,733.33	\$0.577	\$0.577
54	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat + Central Air	SF	9,565.00	13%	1,223.00	20	8516.71	Homes w/ Gas Heat & Central Air - Combination	13.04%	EU	10.30%	49		\$683.40	\$0.559	\$0.559
55	Insulation/weatherization package - Good (Improved Base Home) - LPG Heat + Central Air	SF	9,565.00	11%	1,054.00	20	1652.47	Homes w/ LP Heat & Central Air - Combination	13.04%	EU	39.45%	26.6		\$132.60	\$0.126	\$0.126
56	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat + Central Air	SF	9,565.00	13%	1,223.00	20	8516.71	Homes w/ LP Heat & Central Air - Combination	14.23%	EU	13.15%	49.7		\$683.40	\$0.559	\$0.559
57	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat + Central Air	SF	9,565.00	28%	2,687.00	20	21601.19	Homes w/ LP Heat & Central Air - Combination	14.23%	EU	0.00%	73.6		\$1,733.33	\$0.645	\$0.645
58	Energy Efficient Windows - oil (Heating + Central Air)	SF	1,139.00	11%	125.29	25	187.50	Homes w/ Oil Heat & Central Air	56.52%	EU	18.60%	10.04		\$13.30	\$0.106	\$0.106
59	Duct Sealing - oil (Heating + Central Air)	SF	1,139.00	7%	79.12	20	150.00	Homes w/ Oil Heat & Central Air	24.51%	EU	0.00%	4.57		\$12.04	\$0.152	\$0.152
60	Programmable Thermostats - oil (Heating + Central Air)	SF	1,139.00	8%	146.93	10	\$46.00	Homes w/ Oil Heat & Central Air	7.91%	EU	51.30%	8.85		\$5.96	\$0.041	\$0.041
61	Tree Shading - oil (Heating + Central Air)	SF	1,139.00	7%	79.73	30	90.00	Homes w/ Oil Heat & Central Air	1.22%	EU	50.40%	15.16		\$5.85	\$0.073	\$0.073
62	Insulation/weatherization package - Good (Improved Base Home) - Oil Heat + Central Air	SF	13,837.00	7%	1,015.00	20	1652.47	Homes w/ Oil Heat & Central Air - Combination	56.52%	EU	37.73%	26.73		\$132.60	\$0.131	\$0.131
63	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat + Central Air	SF	13,837.00	23%	3,183.00	20	21601.19	Homes w/ Oil Heat & Central Air - Combination	56.52%	EU	0.00%	62.32		\$1,733.33	\$0.545	\$0.545
64	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat + Central Air	SF	13,837.00	8%	1,157.00	20	8516.71	Homes w/ Oil Heat & Central Air - Combination	56.52%	EU	12.58%	50.28		\$683.40	\$0.591	\$0.591
65	Tree Shading (Room AC)	SF	785.71	7%	55.00	30	\$90.00	Homes w/ Room A/C	59.68%	EU	50.40%	14.97		\$5.85	\$0.106	\$0.106
66	Energy Efficient Windows (Room AC)	SF	785.71	9%	72.75	25	375.00	Homes w/ Room A/C	59.68%	EU	14.70%			\$26.61	\$0.366	\$0.366
67	HVAC Tune-Up	SF	1,139.00	7%	79.73	5	\$175.00	Homes with Electric Central Air	1.19%	EU	68.38%			\$40.42	\$0.507	\$0.507
68	High Efficiency Central AC (Tier 1)	SF	1,139.00	7%	79.12	18	\$500.00	Homes with Electric Central Air	15.42%	EU	12.82%			\$42.77	\$0.541	\$0.541
69	High Efficiency Central AC (Tier 2)	SF	1,139.00	13%	147.69	18	\$1,209.25	Homes with Electric Central Air	15.42%	EU	12.82%			\$103.45	\$0.700	\$0.700
70	Efficient Furnace Fan (Non-Electric Furnace)	SF	913.75	43%	393.00	18	\$400.00	Homes with Non-Elec. SH Furnace (H)	39.13%	M	28.85%			\$34.22	\$0.087	\$0.087
Space Heating and Space Cooling - Multi Family Homes																
71	Programmable Thermostats (Electric Heat)	MF	11,594.00	9%	1,043.46	10	\$89.24	Homes w/ Electric Heat	9.45%	EU	42.90%			\$11.56	\$0.011	\$0.011
72	Duct Sealing (Electric Heat)	MF	11,594.00	5%	579.70	20	\$300.00	Homes w/ Electric Heat	8.60%	EU	25.00%			\$24.07	\$0.042	\$0.042
73	Energy Efficient Windows (Electric Heat)	MF	11,594.00	7%	808.35	25	\$150.00	Homes w/ Electric Heat	9.45%	EU	14.30%			\$10.64	\$0.013	\$0.013
74	Ground Source Heat Pump	MF	13,414.00	21%	2,816.94	18	\$9,000.00	Homes w/ Electric Heat	9.45%	EU	1.00%			\$759.48	\$0.270	\$0.270
75	High Efficiency Heat Pump (Tier 2)	MF	13,414.00	14%	1,926.00	18	\$1,200.00	Homes w/ Electric Heat	9.45%	EU	4.00%			\$102.66	\$0.053	\$0.053
76	High Efficiency Heat Pump (Tier 1)	MF	13,414.00	6%	829.00	18	\$1,000.00	Homes w/ Electric Heat	9.45%	EU	3.00%			\$85.55	\$0.103	\$0.103
77	Insulation & Weatherization Package (Electric Heat) Good	MF	16,562.86	14%	2,333.70	20	\$2,762.60	Homes w/ Electric Heat - Combination	9.45%	EU	12.50%			\$221.68	\$0.095	\$0.095
78	Insulation & Weatherization Package (Electric Heat) Best	MF	16,562.86	34%	5,674.80	20	\$22,224.86	Homes w/ Electric Heat - Combination	9.45%	EU	0.00%			\$1,783.38	\$0.314	\$0.314

## Residential Electric Model - Measure Assumptions

Electric Measure Assumptions (Initial Assumptions & Levelized Costs)

0.70

Admin

\$0.00

Discount Rate 5.00%

Measure	Measure Name	Home Type	Base Elec. Use (kWh)	% Savings	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr/Full)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)
79	Insulation & Weatherization Package (Electric Heat) Better	MF	16,562.86	25%	4,139.80	20	\$8,836.60	Homes w/ Electric Heat - Combination	9.45%	EU	4.17%			\$709.07	\$0.171	\$0.171
80	Energy Star Room A/C	MF	785.71	9%	72.75	12	30.00	Homes w/ Electric Room AC (C )	9.45%	EU	37.33%			\$3.38	\$0.047	\$0.047
84	Tree Shading - gas (Heating + Central Air)	MF	538.07	7%	37.38	30	\$90.00	Homes w/ Gas Heat & Central Air	11.02%	EU	50.40%	6.4		\$5.85	\$0.157	\$0.157
81	Programmable Thermostats - gas (Heating + Central Air)	MF	538.07	13%	69.41	10	46	Homes w/ Gas Heat & Central Air	11.02%	EU	43.80%	5.47		\$5.96	\$0.086	\$0.086
82	Energy Efficient Windows - gas (Heating + Central Air)	MF	538.07	11%	59.19	25	\$75.00	Homes w/ Gas Heat & Central Air	11.02%	EU	14.30%	1.84		\$5.32	\$0.090	\$0.090
83	Duct Sealing - gas (Heating + Central Air)	MF	538.07	7%	37.66	20	\$150.00	Homes w/ Gas Heat & Central Air	11.02%	EU	50.00%	4.30		\$12.04	\$0.320	\$0.320
85	Insulation/weatherization package - Good (Improved Base Home) - Gas Heat + Central Air	MF	5,992.00	12%	736.90	20	\$1,532.02	Homes w/ Gas Heat & Central Air - Combination	11.02%	EU	10.89%	11.74		\$122.93	\$0.167	\$0.167
86	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat + Central Air	MF	5,992.00	27%	1,589.00	20	\$12,109.35	Homes w/ Gas Heat & Central Air - Combination	11.02%	EU	0.00%	49.3		\$971.69	\$0.612	\$0.612
87	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat + Central Air	MF	5,992.00	0.13	788.00	20	\$3,971.03	Homes w/ Gas Heat & Central Air - Combination	11.02%	EU	3.63%	28.7		\$318.65	\$0.404	\$0.404
88	Insulation/weatherization package - Good (Improved Base Home) - LPG Heat + Central Air	MF	5,922.00	1%	87.25	20	\$1,532.02	Homes w/ LP Heat & Central Air - Combination	2.66%	EU	20.00%	13.3		\$122.93	\$1.409	\$1.409
89	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat + Central Air	MF	5,922.00	13%	771.60	20	\$3,971.03	Homes w/ LP Heat & Central Air - Combination	2.66%	EU	6.67%	28.7		\$318.65	\$0.413	\$0.413
90	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat + Central Air	MF	5,922.00	22%	1,327.00	20	\$12,109.35	Homes w/ LP Heat & Central Air - Combination	2.66%	EU	0.00%	49.3		\$971.69	\$0.732	\$0.732
92	Energy Efficient Windows - oil (Heating + Central Air)	MF	538.07	11%	59.19	25	\$150.00	Homes w/ Oil Heat & Central Air	2.36%	EU	9.75%	1.8		\$10.64	\$0.180	\$0.180
91	Programmable Thermostats - oil (Heating + Central Air)	MF	538.07	4%	23.68	25	\$46.00	Homes w/ Oil Heat & Central Air	2.36%	EU	13.80%	4.4		\$3.26	\$0.138	\$0.138
93	Duct Sealing - oil (Heating + Central Air)	MF	538.07	11%	59.19	20	\$150.00	Homes w/ Oil Heat & Central Air	2.36%	EU	50.00%	4.6		\$12.04	\$0.203	\$0.203
94	Tree Shading - oil (Heating + Central Air)	MF	538.07	7%	37.66	30	\$90.00	Homes w/ Oil Heat & Central Air	2.36%	EU	50.40%	6.5		\$5.85	\$0.155	\$0.155
95	Insulation/weatherization package - Good (Improved Base Home) - Oil Heat + Central Air	MF	9,796.00	1%	81.50	20	\$1,532.02	Homes w/ Oil Heat & Central Air - Combination	2.36%	EU	24.14%	12.4		\$122.93	\$1.508	\$1.508
96	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat + Central Air	MF	9,796.00	18%	1,797.00	20	\$12,109.35	Homes w/ Oil Heat & Central Air - Combination	2.36%	EU	4.17%	28.3		\$971.69	\$0.541	\$0.541
97	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat + Central Air	MF	9,796.00	13%	1,246.00	20	\$3,971.03	Homes w/ Oil Heat & Central Air - Combination	2.36%	EU	12.50%	23.3		\$318.65	\$0.256	\$0.256
98	Tree Shading (Room AC)	MF	371.18	7%	25.98	30	\$90.00	Homes w/ Room A/C	59.06%	EU	50.40%	6.4		\$5.85	\$0.225	\$0.225
99	Energy Efficient Windows (Room AC)	MF	371.18	11%	40.83	25	\$150.00	Homes w/ Room A/C	59.06%	EU	12.60%			\$10.64	\$0.261	\$0.261
100	Insulation & Weatherization Package (Room AC)	MF	371.18	13%	47.21	20	\$3,064.05	Homes w/ Room A/C	59.06%	EU	18.10%			\$245.87	\$5.208	\$5.208
101	HVAC Tune-Up	MF	538.07	7%	37.66	5	175.00	Homes with Electric Central Air	44.40%	EU	44.40%			\$40.42	\$1.073	\$1.073
102	High Efficiency Central AC (Tier 1)	MF	538.07	7%	37.38	18	500.00	Homes with Electric Central Air	15.42%	EU	18.52%			\$42.77	\$1.144	\$1.144
103	High Efficiency Central AC (Tier 2)	MF	538.07	13%	69.77	18	1,209.25	Homes with Electric Central Air	15.42%	EU	18.52%			\$103.45	\$1.483	\$1.483
104	Efficient Furnace Fan (Non-Electric Furnace)	MF	685.31	43%	294.75	18	400.00	Homes with Non-Elec. SH Furnace (H)	46.26%	M	14.17%			\$34.22	\$0.116	\$0.116
<b>Water Heating - Single Family/Multi Family</b>																
105	Energy Star Dishwasher (w/ Electric DHW)	SF	467.39	29%	136.62	11	\$27.00	Homes w/ Dishwashers & Electric WH	17.99%	M	38.10%	430		\$3.25	\$0.024	\$0.024
106	Beyond Energy Star Dishwasher (w/Electric DHW)	SF	467.39	32%	151.21	11	\$50.00	Homes w/ Dishwashers & Electric WH	17.99%	M	38.10%	430		\$6.02	\$0.040	\$0.040
107	Energy Star Dishwasher (w/Gas DHW)	SF	264.13	29%	77.05	11	\$13.50	Homes w/ Dishwashers & Gas WH	14.81%	M	38.10%	1.3	430	\$1.63	\$0.021	\$0.021
108	Beyond Energy Star Dishwasher (w/Gas DHW)	SF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Gas WH	14.81%	M	38.10%	1.3	430	\$3.01	\$0.035	\$0.035
109	Energy Star Dishwasher (w/Oil DHW)	SF	264.13	29%	77.05	11	\$13.50	Homes w/ Dishwashers & Oil WH	40.21%	M	38.10%	2.1	430	\$1.63	\$0.021	\$0.021

## Residential Electric Model - Measure Assumptions

Electric Measure Assumptions (Initial Assumptions & Levelized Costs)

0.70

Admin

\$0.00

Discount Rate 5.00%

Measure	Measure Name	Home Type	Base Elec. Use (kWh)	% Savings	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr./Full)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)
110	Beyond Energy Star Dishwasher (w/Oil DHW)	SF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Oil WH	40.21%	M	38.10%	2.2	430	\$3.01	\$0.035	\$0.035
111	Energy Star Dishwasher (w/Propane DHW)	SF	264.13	29%	77.05	11	\$13.50	Homes w/ Dishwashers & Propane WH	24.34%	M	38.10%	1.3	430	\$1.63	\$0.021	\$0.021
112	Beyond Energy Star Dishwasher (w/Propane DHW)	SF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Propane WH	24.34%	M	38.10%	1.4	430	\$3.01	\$0.035	\$0.035
113	Low Flow Showerhead/Faucets	SF	2,139.51	8%	174.88	9	\$21.00	Homes w/ Electric WH	20.16%	EU	55.34%	0.0	4,937	\$2.95	\$0.017	\$0.017
114	Efficient Water Heater (EF=0.93)	SF	2,139.51	3%	59.91	13	\$20.00	Homes w/ Electric WH	20.16%	EU	24.10%	0.0	0	\$2.13	\$0.036	\$0.036
115	Pipe Wrap	SF	2,139.51	2%	33.00	15	\$15.00	Homes w/ Electric WH	20.16%	EU	10.00%	0.0	0	\$1.45	\$0.044	\$0.044
116	High efficiency water heater (EF=0.95)	SF	2,139.51	5%	103.52	13	\$50.00	Homes w/ Electric WH	20.16%	EU	24.10%	0.0	0	\$5.32	\$0.051	\$0.051
117	Water Heater Blanket	SF	2,139.51	5%	110.12	7	\$35.00	Homes w/ Electric WH	20.16%	EU	31.69%	0.0	0	\$6.05	\$0.055	\$0.055
118	Energy Star Clothes Washer (w/ Electric DHW)	SF	820.00	31%	258.00	11	\$200.00	Homes w/ Electric WH	20.00%	EU	39.59%		6978	\$24.08	\$0.093	\$0.093
119	Heat Pump Water Heater	SF	2,139.51	55%	1,172.61	10	\$850.00	Homes w/ Electric WH	20.16%	EU	4.41%			\$110.08	\$0.094	\$0.094
120	Whole-House Tankless Water Heater - Electric <=12 kW	SF	2,139.51	9%	185.89	20	\$850.00	Homes w/ Electric WH	20.16%	EU	24.10%			\$68.21	\$0.367	\$0.367
121	Solar Water Heating	SF	2,139.51	50%	1,069.53	20	\$7,500.00	Homes w/ Electric WH	20.16%	EU	1.00%			\$601.82	\$0.563	\$0.563
122	Energy Star Clothes Washer (w/ Gas DHW)	SF	82.00	31%	25.80	11	\$100.00	Homes w/ Gas Water Heater	13.88%	EU	39.59%	0.9	6978	\$12.04	\$0.467	\$0.467
123	Energy Star Clothes Washer (w/ Oil DHW)	SF	82.00	31%	25.80	11	\$100.00	Homes w/ Oil Water Heater	41.63%	EU	39.59%	1.0	6978	\$12.04	\$0.467	\$0.467
124	Energy Star Clothes Washer (w/ Propane DHW)	SF	82.00	31%	25.80	11	\$100.00	Homes w/ Propane Water Heater	22.45%	EU	39.59%	0.6	6978	\$12.04	\$0.467	\$0.467
125	Energy Star Dishwasher (w/ Electric DHW)	MF	467.39	29%	136.62	11	\$27.00	Homes w/ Dishwashers & Electric WH	33.33%	M	17.39%	0.0	430	\$3.25	\$0.024	\$0.024
126	Beyond Energy Star Dishwasher (w/Electric DHW)	MF	467.39	32%	151.21	11	\$50.00	Homes w/ Dishwashers & Electric WH	33.33%	M	17.39%	0.0	430	\$6.02	\$0.040	\$0.040
127	Energy Star Dishwasher (w/Gas DHW)	MF	264.13	29%	77.05	11	\$13.50	Homes w/ Dishwashers & Gas WH	36.23%	M	17.39%	1.3	430	\$1.63	\$0.021	\$0.021
128	Beyond Energy Star Dishwasher (w/Gas DHW)	MF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Gas WH	36.23%	M	17.39%	1.3	430	\$3.01	\$0.035	\$0.035
129	Energy Star Dishwasher (w/Oil DHW)	MF	264.13	29%	77.05	11	\$13.50	Homes w/ Dishwashers & Oil WH	8.70%	M	17.39%	2.1	430	\$1.63	\$0.021	\$0.021
130	Beyond Energy Star Dishwasher (w/Oil DHW)	MF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Oil WH	8.70%	M	17.39%	2.2	430	\$3.01	\$0.035	\$0.035
131	Energy Star Dishwasher (w/Propane DHW)	MF	264.13	29%	77.05	11	\$500.00	Homes w/ Dishwashers & Propane WH	8.70%	M	17.39%	1.3	430	\$60.19	\$0.781	\$0.781
132	Beyond Energy Star Dishwasher (w/Propane DHW)	MF	264.13	32%	85.01	11	\$25.00	Homes w/ Dishwashers & Propane WH	8.70%	M	17.39%	1.4	430	\$3.01	\$0.035	\$0.035
133	Low Flow Showerhead/Faucets	MF	2,139.51	8%	174.88	9	\$21.00	Homes w/ Electric WH	33.10%	EU	37.80%	0.0	4937	\$2.95	\$0.017	\$0.017
134	Efficient Water Heater (EF=0.93)	MF	2,139.51	3%	59.91	13	\$20.00	Homes w/ Electric WH	33.07%	EU	17.74%	0.0	0	\$2.13	\$0.036	\$0.036
135	Pipe Wrap	MF	2,139.51	2%	33.00	15	\$15.00	Homes w/ Electric WH	33.10%	EU	10.00%	0.0	0	\$1.45	\$0.044	\$0.044
136	High efficiency water heater (EF=0.95)	MF	2,139.51	5%	103.52	13	\$50.00	Homes w/ Electric WH	33.10%	EU	17.74%	0.0	0	\$5.32	\$0.051	\$0.051
137	Water Heater Blanket	MF	2,139.51	5%	110.12	7	\$35.00	Homes w/ Electric WH	33.10%	EU	25.97%	0.0	0	\$6.05	\$0.055	\$0.055
138	Energy Star Clothes Washer (w/ Electric DHW)	MF	820.00	31%	258.00	11	\$200.00	Homes w/ Electric WH	32.99%	EU	26.80%	0.0	6978	\$24.08	\$0.093	\$0.093
139	Heat Pump Water Heater	MF	2,139.51	55%	1,172.61	10	\$850.00	Homes w/ Electric WH	33.10%	EU	4.41%	0.0	0	\$110.08	\$0.094	\$0.094
140	Whole-House Tankless Water Heater - Electric <=12 kW	MF	2,139.51	9%	185.89	20	\$850.00	Homes w/ Electric WH	33.10%	EU	17.74%	0.0	0	\$68.21	\$0.367	\$0.367
141	Solar Water Heating	MF	2,139.51	50%	1,069.53	20	\$7,500.00	Homes w/ Electric WH	33.10%	EU	1.00%	0.0	0	\$601.82	\$0.563	\$0.563
142	Energy Star Clothes Washer (w/ Gas DHW)	MF	82.00	31%	25.80	11	\$100.00	Homes w/ Gas Water Heater	39.18%	EU	26.80%	0.9	6978	\$12.04	\$0.467	\$0.467
143	Energy Star Clothes Washer (w/ Oil DHW)	MF	82.00	31%	25.80	11	\$100.00	Homes w/ Oil Water Heater	7.22%	EU	26.80%	1.0	6978	\$12.04	\$0.467	\$0.467
144	Energy Star Clothes Washer (w/ Propane DHW)	MF	82.00	31%	25.80	11	\$100.00	Homes w/ Propane Water Heater	9.28%	EU	26.80%	0.6	6978	\$12.04	\$0.467	\$0.467
New Construction Homes - Single Family/Multi Family																
145	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Electric Heat	SF	21,800.00	20%	4,360.00	25	2568.00	Total Home Electric Use	1.19%	EU	20.00%			\$182.21	\$0.042	\$0.042
146	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - Electric Heat	SF	21,800.00	35%	7,630.00	25	9576.00	Total Home Electric Use	1.19%	EU	20.00%			\$679.44	\$0.089	\$0.089
147	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Electric Heat	SF	21,800.00	50%	10,900.00	25	45776.00	Total Home Electric Use	1.19%	EU	20.00%			\$3,247.92	\$0.298	\$0.298
148	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Gas Heat	SF	10,138.00	17%	1,688.00	25	11546.96	Total Home Gas Use	13.04%	EU	20.00%	76		\$819.29	\$0.485	\$0.485

## Residential Electric Model - Measure Assumptions

Electric Measure Assumptions (Initial Assumptions & Levelized Costs)

0.70

Admin

\$0.00

Discount Rate

5.00%

Measure	Measure Name	Home Type	Base Elec. Use (kWh)	% Savings	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr./Full)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)
149	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Gas Heat	SF	10,138.00	17%	1,675.00	25	6332.84	Total Home Gas Use	13.04%	EU	20.00%	58		\$449.33	\$0.268	\$0.268
150	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - Gas Heat	SF	10,138.00	1%	147.00	25	1328.41	Total Home Gas Use	13.04%	EU	20.00%	31		\$94.25	\$0.641	\$0.641
151	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - LPG Heat	SF	10,138.00	1%	113.00	25	1328.41	Total Home LPG Use	14.23%	EU	20.00%	30.5		\$94.25	\$0.834	\$0.834
152	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - LPG Heat	SF	10,138.00	17%	1,702.00	25	11546.96	Total Home LPG Use	14.23%	EU	20.00%	76.2		\$819.29	\$0.481	\$0.481
153	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - LPG Heat	SF	10,138.00	17%	1,675.00	25	6332.84	Total Home LPG Use	14.23%	EU	20.00%	57.4		\$449.33	\$0.268	\$0.268
154	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - Oil Heat	SF	12,258.00	48%	5,846.00	25	10946.96	Total Home Oil Use	56.52%	EU	20.00%	52.35		\$776.71	\$0.133	\$0.133
155	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Oil Heat	SF	12,258.00	47%	5,728.00	25	6332.84	Total Home Oil Use	56.52%	EU	20.00%	33.4		\$449.33	\$0.078	\$0.078
156	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - Oil Heat	SF	12,258.00	39%	4,795.00	25	1328.41	Total Home Oil Use	56.52%	EU	20.00%	19.25		\$94.25	\$0.020	\$0.020
157	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - Electric Heat	MF	14,228.00	4%	632.60	25	\$1,149.72	Total Home Electric Use	9.45%	EU	20.00%	0		\$81.58	\$0.129	\$0.129
158	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - Electric Heat	MF	14,228.00	39%	5,582.04	25	\$16,050.01	Total Home Electric Use	9.45%	EU	20.00%	0		\$1,138.79	\$0.204	\$0.204
159	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Electric Heat	MF	14,228.00	22%	3,068.86	25	\$11,750.01	Total Home Electric Use	9.45%	EU	20.00%	0		\$833.69	\$0.272	\$0.272
160	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Gas Heat	MF	5,990.13	12%	740.00	25	\$1,875.00	Total Home Gas Use	48.82%	EU	20.00%	35		\$133.04	\$0.180	\$0.180
161	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - Gas Heat	MF	5,990.13	21%	1,241.75	25	\$3,502.44	Total Home Gas Use	48.82%	EU	20.00%	42		\$248.51	\$0.200	\$0.200
162	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - Gas Heat	MF	5,990.13	2%	94.25	25	\$574.86	Total Home Gas Use	48.82%	EU	20.00%	20		\$40.79	\$0.433	\$0.433
163	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - LPG Heat	MF	5,785.13	18%	1,016.00	25	\$3,502.44	Total Home LPG Use	11.81%	EU	20.00%	41.8		\$248.51	\$0.245	\$0.245
164	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - LPG Heat	MF	5,785.13	9%	535.50	25	\$1,875.00	Total Home LPG Use	11.81%	EU	20.00%	34.7		\$133.04	\$0.248	\$0.248
165	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - LPG Heat	MF	5,785.13	2%	106.50	25	\$574.86	Total Home LPG Use	11.81%	EU	20.00%	19.6		\$40.79	\$0.383	\$0.383
166	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Oil Heat	MF	10,491.38	50%	5,218.00	25	\$1,875.00	Total Home Oil Use	22.83%	EU	20.00%	15.1		\$133.04	\$0.025	\$0.025
167	Integrated Building Design - Best (ENERGY STAR Home ~50% Savings) - Oil Heat	MF	10,491.38	55%	5,763.75	25	\$3,502.44	Total Home Oil Use	22.83%	EU	20.00%	22.2		\$248.51	\$0.043	\$0.043
168	Integrated Building Design - Good (ENERGY STAR Home ~20% Savings) - Oil Heat	MF	10,491.38	9%	896.75	25	\$574.86	Total Home Oil Use	22.83%	EU	20.00%	20.1		\$40.79	\$0.045	\$0.045

\* Low Income measures are being included in SF/MF measures above

Residential Electric Model - Data Sources (Appliances)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/10/2008

Measure Assumptions		Measure Life and Cost Values			Electric Savings Assumptions			Water	
Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Water savings, gallons per year	
<b>Appliances</b>									
101	E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	13	\$30	2	479	15.00%	72	0.0100	0
102	E-Star Compliant Top Mount Freezer without through-the-door ice	13	\$30	2	532	15.00%	80	0.0111	0
103	E-Star Compliant Side Mount Freezer without through-the-door ice	13	\$30	2	636	15.00%	95	0.0133	0
104	E-Star Compliant Bottom Mount Freezer without through-the-door ice	13	\$30	2	579	15.00%	87	0.0121	0
105	E-Star Compliant Top Mount Freezer with through-the-door ice	13	\$30	2	623	15.00%	93	0.0130	0
106	E-Star Compliant Side Mount Freezer with through-the-door ice	13	\$30	2	670	15.00%	101	0.0140	0
107	E-Star Compliant Compact Top Mount and Refrigerator only	13	\$20	2	460	20.00%	92	0.0128	0
108	Wine refrigerators (Informational)				Max Annual Energy Consumption (kWh):		13.7V + 267 (w/ manual defrost)		
109	E-Star Compliant Upright Freezers with Manual Defrost	13	\$33	2	546	10.00%	55	0.0076	0
110	E-Star Compliant Upright Freezers with Automatic Defrost	13	\$33	2	799	10.00%	80	0.0111	0
111	E-Star Compliant Chest Freezers	13	\$33	2	520	10.00%	52	0.0072	0
112	Energy Star Dehumidifer	12	\$0	2	802	14.64%	117	0.0724	0
113	Second Refrigerator Turn In	5	\$45	1	847	100.00%	847	0.1180	0
114	Second Freezer Turn In	5	\$45	1	1051	100.00%	1051	0.1464	0
115	Induction Cooktop vs Electric Coil Cooktop	20	\$900	2	222.9	39.00%	87	0.1587	0
116	Energy Star office equipment including monitors, copiers, multi-function machines.	4	\$0	2	464.00	26.72%	124	0.023	0
117	TVs - Energy Star over standard	8	\$0	2	222	12.39%	28	0.004	0

\*Measures to be modeled for Single and Multifamily Applications in Existing and New Construction, where applicable

## Residential Electric Model - Data Sources (Appliances)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Water		Notes
	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kW demand savings - Summer Coincident (1)	Water savings, gallons per year		
<b>Appliances</b>										
101	E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
102	E-Star Compliant Top Mount Freezer without through-the-door ice	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
103	E-Star Compliant Side Mount Freezer without through-the-door ice	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
104	E-Star Compliant Bottom Mount Freezer without through-the-door ice	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
105	E-Star Compliant Top Mount Freezer with through-the-door ice	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
106	E-Star Compliant Side Mount Freezer with through-the-door ice	47	ES Calc-Fridge	ES Calc-Fridge	ES Calc-Fridge	GDS	ES Calc-Fridge	AR RDS: 87	-	Avg. Total Volume= 23 cubic ft.
107	E-Star Compliant Compact Top Mount and Refrigerator only	47	ES Calc-MFridge	ES Calc-MFridge	ES Calc-MFridge	GDS	ES Calc-MFridge	AR RDS: 87	-	Avg. Total Volume= 7 cubic ft.
108	Wine refrigerators (Informational)									CEC: 2007 Appliance Efficiency Standards. California Energy Commission. Pg. 107.
109	E-Star Compliant Upright Freezers with Manual Defrost	47	ES Calc-Freeze	ES Calc-Freeze	ES Calc-Freeze	GDS	ES Calc-Freeze	AR RDS: 87	-	Avg. Total Volume= 22 cubic ft.
110	E-Star Compliant Upright Freezers with Automatic Defrost	47	ES Calc-Freeze	ES Calc-Freeze	ES Calc-Freeze	GDS	ES Calc-Freeze	AR RDS: 87	-	Avg. Total Volume= 22 cubic ft.
111	E-Star Compliant Chest Freezers	47	ES Calc-Freeze	ES Calc-Freeze	ES Calc-Freeze	GDS	ES Calc-Freeze	AR RDS: 87	-	Avg. Total Volume= 22 cubic ft.
112	Energy Star Dehumidifier	48	ES Calc-Dhum	ES Calc-Dhum	ES Calc-Dhum	GDS	ES Calc-Dhum	GDS	-	30 pint capacity ; runs 1,620 hrs/yr.
113	Second Refrigerator Turn In	ES Calc - RRS 49		DEER/GDS	ES Calc - RRS	GDS	ES Calc - RRS	AR RDS: 87	-	Assumed second appliance had 5 years remaining useful life Top mount freezer; Mfr date 1993-2000 ; Size 19.0 - 21.4 cubic feet Cost: \$97.75 for recycling and pick-up (DEER) ; \$50 Incentive (GDS)
114	Second Freezer Turn In	ES Calc - RRS 49		DEER/GDS	ES Calc - RRS	GDS	ES Calc - RRS	AR RDS: 87	-	Assumed second appliance had 5 years remaining useful life Upright freezer; Mfr date 1993-2000 ; Size 19.0 - 21.4 cubic feet Cost: \$97.75 for recycling and pick-up (DEER) ; \$50 Incentive (GDS)
115	Induction Cooktop vs Electric Coil Cooktop	GDS	DOE OCS	DOE OCS	DOE OCS	GDS		GDS	-	Two 6-inch 1250 W and two 8-inch 2100 W coils with reflective surfaces
116	Energy Star office equipment including monitors, copiers, multi-function machines.	ES Calc-CPU	ES Calc-CPU	ES Calc-CPU	ES Calc-CPU	GDS	ES Calc-CPU	ES Calc-CPU	-	
117	TVs - Energy Star over standard	TIAX	TIAX	TIAX	TIAX	GDS	TIAX	Estar TVs	-	Estar: max off-mode consumption <1 W. TIAX: Avg analog off-mode consumption = 5 W, 6878 hrs/yr

Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs



## Residential Electric Model - Data Sources (Appliances)

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- 4 AR RDS: Residential Deem Savings, Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 5 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 6 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV1. California Energy Commission. December 2007.
- 7 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 8 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cookqtsd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cookqtsd.pdf))
- 9 DOE/EERE A&E: Appliances and Electronics, "Estimating Appliance and Home Electronic Energy Use" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 10 DOE/EERE WH: Water Heating, "Swimming Pool Heating" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 11 EES Tbl 32: 2005 Intrusive Residential Standby Survey Report. Prepared by Energy Efficient Strategies P/L, 2005. Tbl 32.
- 12 EIA D1-1: Table D1-1: Electricity Consumption by End Use in New England Households, 2001 by EIA
- 13 EIA/GDS: GDS Calculation based on information in EIA's REC 2001 Data.
- 14 ES Analysis-ResDWH: ENERGY STAR® Residential Water Heaters: Final Criteria Analysis ([www.energystar.gov](http://www.energystar.gov)). April 2008.
- 15 ES Calc- CPU: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Home Computer (.xls)
- 16 ES Calc- Dhum: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Dehumidifiers (.xls)
- 17 ES Calc- RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&mode=&screen=2>)
- 18 ES Calc-ASHP: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Air Source Heat Pump (.xls)
- 19 ES Calc-Blr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Boiler (.xls)
- 20 ES Calc-CAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Central Air Conditioning (.xls)
- 21 ES Calc-CF: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Ceiling Fan (.xls)
- 22 ES Calc-CIWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 23 ES Calc-DWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 24 ES Calc-Freeze: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Freezer Savings (.xls)
- 25 ES Calc-Fridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 26 ES Calc-Furn: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Furnace (.xls)
- 27 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 28 ES Calc-PSlat: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Programmable Thermostat (.xls)
- 29 ES Calc-RAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Room Air Conditioner (.xls)
- 30 EStar TVs: [www.energystar.gov](http://www.energystar.gov)
- 31 EVT: Efficiency Vermont Technical Reference User Manual. No. 2007-47.
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- 34 GDS: GDS Associates Estimate/Calculation
- 35 HE Mag 4-1995: Home Energy Magazine Online March/April 1995 Shade Trees as a Demand-Side Resource with assumptions based on age of housing stock and other key factors
- 36 KED: KED New Hampshire Low Income Program Year 3 actual annual expenditures.
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- 39 RECS CE2: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE2-9c: Space-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
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- 41 RECS CE4: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE4-9c: Water-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 42 RERC: 'Investing in a Solar Hot Water System' Renewable Energy Resource Center: A Project of the Vermont Energy Investment Corporation. ([www.rerc-vt.org/shw\\_investing.htm](http://www.rerc-vt.org/shw_investing.htm))
- 43 SECI 2005: Country Kilowatts Newsletter 2005 Southern Energy Conservation Initiative and [www.EIA.DOE.GOV](http://www.EIA.DOE.GOV) and [www.NYSERDA\\_Energysavings.org](http://www.NYSERDA_Energysavings.org)
- 44 SIPS: [www.sips.org](http://www.sips.org)
- 45 SmartHome: [www.smarthomeusa.com](http://www.smarthomeusa.com)
- 46 TIAX: K. Roth et al. 'Energy Consumption by Consumer Electronics in U.S. Residences.' TIAX LLC. Cambridge, MA. January 2007.
- 47 NH specific measure lives - Low Income 19 years; non Low Income 7 years - average measure life 13 years
- 48 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.
- 49 NH Specific value: Used Higher of two quotes --\$25 City of Manchester and \$45 CoCo Plum

## Residential Electric Model - Data Sources (Water Heating)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/10/2008

Measure Assumptions		Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water
Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year
<b>Water Heating</b>														
201	Energy Star Dishwasher (Residential-w/Electric DHW)	11	\$27	2	467	29.23%	137	0.192	0	0	0	0	0	430
202	Energy Star Dishwasher (Residential-w/Gas DHW)	11	\$27	2	264	29.17%	77	0.108	1.91	67%	1.27	0	0	430
203	Energy Star Dishwasher (Residential-w/Propane DHW)	11	\$27	2	264	29.17%	77	0.108	2.02	67%	0	1.34	0	430
204	Energy Star Dishwasher (Residential-w/Oil DHW)	11	\$27	2	264	29.17%	77	0.108	3.22	67%	0	0	2.14	430
205	Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	11	\$50	2	467	32.35%	151	0.212	0	0	0	0	0	430
206	Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	11	\$50	2	264	32.18%	85	0.119	1.91	68%	1.30	0	0	430
207	Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	11	\$50	2	264	32.18%	85	0.119	2.02	68%	0	1.37	0	430
208	Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	11	\$50	2	264	32.18%	85	0.119	3.22	68%	0	0	2.19	430
209	Energy Star Clothes Washer (w/ Electric DHW)	11	\$200	2	820	31.46%	258	0.336	0	0	0	0	0	6978
210	Energy Star Clothes Washer (w/ Gas DHW)	11	\$200	2	82	31.46%	25.8	0.034	2.95	30%	0.88	0	0	6978
211	Energy Star Clothes Washer (w/ Propane DHW)	11	\$200	2	82	31.46%	25.8	0.034	2.02	30%	0	0.60	0	6978
212	Energy Star Clothes Washer (w/ Oil DHW)	11	\$200	2	82	31.46%	25.8	0.034	3.22	30%	0	0	0.96	6978
213	Natural Gas Clothes Dryer Fuel Switch	14	\$260	2	977	100%	977	1.273	-	0.0	-3.33	0	0	0
214	Propane Clothes Dryer Fuel Switch	14	\$260	2	977	100%	977	1.273	-	0.0	-3.33	0	0	0
215	Efficient Water Heater (EF=0.93)	13	\$20	2	2140	3%	60	-	0	0	0	0	0	0
216	High efficiency water heater (EF=0.95)	13	\$50	2	2140	5%	104	-	0	0	0	0	0	0
217	High Efficiency Water Heater - Natural Gas (EF=0.62)	10	\$81	2	0	0%	0	0	18	10.0%	1.80	0	0	0
218	High Efficiency Water Heater - Natural Gas (EF=0.67)	10	\$400	2	0	0%	0	0	18	14.2%	2.57	0	0	0
219	High Efficiency Water Heater - Propane (EF=0.67)	10	\$400	2	0	0%	0	0	19	14.2%	0	2.71	0	0
220	High Efficiency Water Heater - Oil (EF=0.66)	10	\$450	2	0	0%	0	0	31	13.0%	0	0	3.97	0
221	Gas-Condensing Water Heater - Natural Gas (EF=0.80)	15	\$685	2	0	0%	0	0	18	28.4%	5.13	0	0	0
222	Gas-Condensing Water Heater - Propane (EF=0.80)	15	\$685	2	0	0%	0	0	19	28.4%	0	5.42	0	0
223	Whole-House Tankless Water Heater - Nat Gas <=200 KBTU/H	15	\$1,000	2	0	0%	0	0	18	43.1%	7.80	0	0	0
224	Whole-House Tankless Water Heater - Electric <=12 kW	20	\$850	2	2140	9%	186	0.02	0	0	0	0	0	0
225	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	15	\$850	2	0	0%	0	0	18	44%	7.9	0	0	0
226	Heat Pump Water Heater	10	\$850	2	2140	55%	1173	-	0	0	0	0	0	0
227	Solar Water Heating - Active, w/ Elec Backup	20	\$7,500	1	2140	50%	1070	0.2	0	0	0	0	0	0
228	Solar Water Heating - Active, w/ Gas Backup	20	\$7,500	1	0	0%	0	0	18	60%	11	0	0	0
229	Solar Water Heating - Active, w/ Propane Backup	20	\$7,500	1	0	0%	0	0	19	60%	0	11	0	0
230	Solar Water Heating - Active, w/ Oil Backup	20	\$7,500	1	0	0%	0	0	31	60%	0	0	18.3	0
231	Low Flow Showerhead/Faucets - electric	9	\$21	2	2140	8%	175	-	0	0	0	0	0	4937
232	Low Flow Showerhead/Faucets - gas	9	\$21	2	0	0%	0	0	18	2.0%	0.36	0	0	0
233	Low Flow Showerhead/Faucets - LPG	9	\$21	2	0	0%	0	0	19	1.9%	0	0.36	0	0
234	Low Flow Showerhead/Faucets - oil	9	\$21	2	0	0%	0	0	31	4.1%	0	0	1.24	0
235	Pipe Wrap - electric DHW	15	\$15	2	2140	2%	33	-	0	0	0	0	0	0
236	Pipe Wrap - gas DHW	15	\$15	2	0	0%	0	0	18	0.17%	0.03	0	0	0
237	Pipe Wrap - LPG DHW	15	\$15	2	0	0%	0	0	19	0.2%	0	0.03	0	0
238	Pipe Wrap - oil DHW	15	\$15	2	0	0%	0	0	31	0.3%	0	0	0.1	0
239	Water Heater Blanket/Tank Insulation - electric only	7	\$35	2	2140	5%	110	-	0	0	0	0	0	0
240	Horizontal Axis Washer-Dryer Combination Unit (informational)	n/a	n/a	n/a	GDS research found that models sold in U.S. today use ventless, vapor-condensing dryers for niche markets: small apartments, RVs, luxury boats and other space-constrained applications. Typical dryer times last 1.5 to 2 hours, making them unappealing to most U.S. consumers. Potential applications for load control opps									
241	Built-in Interior Clothes Lines in new construction (informational)	20	\$15	1	977	10%	98	-	-	-	0.28	0.25	0	0

## Residential Electric Model - Data Sources (Water Heating)

Sources		Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	Notes	
Measure Name*	Measure Life	Installed Cost	Cost Type: 1-Full 2-Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kW demand savings - Summer Coincident (1)	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year		
<b>Water Heating</b>																
201	Energy Star Dishwasher (Residential-w/Electric DHW)	ES Calc-DW	EVT 251	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	ES Calc-DWashr	-	-	-	ES Calc-DW	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
202	Energy Star Dishwasher (Residential-w/Gas DHW)	ES Calc-DW	EVT 251	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	ES Calc-DWashr	-	-	-	ES Calc-DW	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
203	Energy Star Dishwasher (Residential-w/Propane DHW)	ES Calc-DW	EVT 251	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	-	GDS	-	-	ES Calc-DWashr	
204	Energy Star Dishwasher (Residential-w/Oil DHW)	ES Calc-DW	EVT 251	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	-	GDS	-	-	ES Calc-DWashr	
205	Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	ES Calc-DW	GDS/www.b	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	ES Calc-DWashr	-	-	-	ES Calc-DW	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
206	Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	ES Calc-DW	GDS/www.b	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	ES Calc-DWashr	-	-	-	ES Calc-DW	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
207	Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	ES Calc-DW	GDS/www.b	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	-	GDS	-	-	ES Calc-DWashr	
208	Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	ES Calc-DW	GDS/www.b	ES Calc-DWashr	ES Calc-DWash	GDS	ES Calc-DW	NYSERDA Dema	ES Calc-DWashr	ES Calc-DW	-	GDS	-	-	ES Calc-DWashr	
209	Energy Star Clothes Washer (w/ Electric DHW)	ES Calc-CIW	ES Calc-CIW	ES Calc-CIWashr	ES Calc-CIWash	GDS	ES Calc-CIW	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CIWashr	-	-	-	ES Calc-CIW	Assumed 392 loads per year, 12768 gallons water per year - base consumption
210	Energy Star Clothes Washer (w/ Propane DHW)	ES Calc-CIW	ES Calc-CIW	ES Calc-CIWashr	ES Calc-CIWash	GDS	ES Calc-CIW	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CIWashr	-	-	-	ES Calc-CIW	Assumed 392 loads per year, 12768 gallons water per year - base consumption
211	Energy Star Clothes Washer (w/ Oil DHW)	ES Calc-CIW	ES Calc-CIW	ES Calc-CIWashr	ES Calc-CIWash	GDS	ES Calc-CIW	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIW	-	GDS	-	-	ES Calc-CIWashr	
212	Energy Star Clothes Washer (w/ Gas DHW)	ES Calc-CIW	ES Calc-CIW	ES Calc-CIWashr	ES Calc-CIWash	GDS	ES Calc-CIW	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIW	-	GDS	-	-	ES Calc-CIWashr	
213	Natural Gas Clothes Dryer Fuel Switch	EVT 366	EVT 367	EVT 366	EVT 366	EVT 366	EVT 366	NYSERDA Dema	-	-	EVT 366	-	-	-	-	
214	Propane Clothes Dryer Fuel Switch	EVT 366	EVT 367	EVT 366	EVT 366	EVT 366	EVT 366	NYSERDA Dema	-	-	EVT 366	-	-	-	-	
215	Efficient Water Heater (EF=0.93)	ES Analysis-GDS	GDS	ES Analysis-Rest	RECS CE4	ES Analysis-GDS	-	-	-	-	-	-	-	-	-	
216	High efficiency water heaters (EF=0.95)	ES Analysis-GDS	GDS	ES Analysis-Rest	RECS CE4	ES Analysis-GDS	-	-	-	-	-	-	-	-	-	
217	High Efficiency Water Heater - Natural Gas (EF=0.62)	51	51	ES Analysis-Rest	-	-	-	51	51	51	-	-	-	-	-	System EF = 0.62
218	High Efficiency Water Heater - Natural Gas (EF=0.67)	51	ES Analysis-Rest	-	-	-	-	RECS CE4	ES Analysis-Rest	ES Analysis-Rest	-	-	-	-	-	System EF = 0.67
219	High Efficiency Water Heater - Propane (EF=0.67)	51	ES Analysis-Rest	-	-	-	-	RECS CE4	ES Analysis-Rest	ES Analysis-Rest	-	-	-	-	-	System EF = 0.67
220	High Efficiency Water Heater - Oil (EF=0.66)	ACEEE T6.6	ACEEE T6.6	ACEEE T6.6	-	-	-	RECS CE4	GDS	-	-	ACEEE T6.6	-	-	-	System EF = 0.66
221	Gas-Condensing Water Heater - Natural Gas (EF=0.80)	ES Analysis-Rest	ES Analysis-Rest	ES Analysis-Rest	-	-	-	RECS CE5	ES Analysis-Rest	ES Analysis-Rest	-	-	-	-	-	
222	Gas-Condensing Water Heater - Propane (EF=0.80)	ES Analysis-Rest	ES Analysis-Rest	ES Analysis-Rest	-	-	-	RECS CE6	ES Analysis-Rest	ES Analysis-Rest	-	-	-	-	-	
223	Whole-House Tankless Water Heater - Nat Gas <=200 kBtu/h	51	51	ES Analysis-Rest	-	-	-	RECS CE4	51	-	-	-	-	-	-	System EF = 0.82
224	Whole-House Tankless Water Heater - Electric <=12 kW	ES Analysis-Rest	ES Analysis-Rest	ES Analysis-Rest	RECS CE4	ES Analysis-GDS	NYSERDA Dema	-	-	-	-	-	-	-	-	System EF = 0.99
225	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	51	51	ACEEE T6.6	-	-	-	RECS CE4	51	-	-	-	-	-	-	
226	Heat Pump Water Heater	ES Analysis-Rest	ES Analysis-Rest	ES Analysis-Rest	RECS CE4	ES Analysis-GDS	-	-	-	-	-	-	-	-	-	System EF = 2.0
227	Solar Water Heating - Active, w/ Elec Backup	ES Analysis-50	ES Analysis-50	ES Analysis-Rest	RECS CE4	ES Analysis-GDS	NREL Analysis	-	-	-	-	-	-	-	-	System EF = 1.8; elec backup EF = 0.9
228	Solar Water Heating - Active, w/ Gas Backup	RERC-50	ACEEE T6.6	-	-	-	-	RECS CE4	RERC	RERC	-	-	-	-	-	
229	Solar Water Heating - Active, w/ Propane Backup	RERC-50	ACEEE T6.6	-	-	-	-	RECS CE4	RERC	-	RERC	-	-	-	-	
230	Solar Water Heating - Active, w/ Oil Backup	RERC-50	ACEEE T6.6	-	-	-	-	RECS CE4	RERC	-	-	RERC	-	-	-	GDS calculation based on information from RERC (VEIC)
231	Low Flow Showerhead/Faucets - electric	EVT	EVT	EVT	RECS CE4	GDS	EVT	-	-	-	-	-	-	-	-	
232	Low Flow Showerhead/Faucets - gas	EVT	EVT	EVT	-	-	-	RECS CE4	EVT	EVT	-	-	-	-	-	
233	Low Flow Showerhead/Faucets - LPG	EVT	EVT	EVT	-	-	-	RECS CE4	EVT	-	EVT	-	-	-	-	
234	Low Flow Showerhead/Faucets - oil	EVT	EVT	EVT	-	-	-	RECS CE4	EVT	-	-	EVT	-	-	-	
235	Pipe Wrap - electric DHW	49	EVT	EVT	RECS CE4	GDS	EVT	EVT	-	-	-	-	-	-	-	
236	Pipe Wrap - gas DHW	49	EVT	EVT	-	-	-	RECS CE4	EVT	EVT	-	-	-	-	-	
237	Pipe Wrap - LPG DHW	49	EVT	EVT	-	-	-	RECS CE4	EVT	-	EVT	-	-	-	-	
238	Pipe Wrap - oil DHW	49	EVT	EVT	-	-	-	RECS CE4	EVT	-	-	EVT	-	-	-	
239	Water Heater Blanket/Tank Insulation - electric only	EVT	EVT	EVT	RECS CE4	GDS	EVT	EVT	-	-	-	-	-	-	-	
240	Horizontal Axis Washer-Dryer Combination Unit (informational)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CEE Super-Efficient Home Appliances Initiative, CEE1.org; Manufacturer websites and brochures from LG, Splendide, Asko.
241	Built-in Interior Clothes Lines in new construction (informational)	GDS	GDS	GDS	DOE/EERE A&E	-	-	-	-	GDS	GDS	-	-	-	-	GDS assumption: indoor clothesline will result in 10% overall reduction in clothes dryer use.

Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

## Residential Electric Model - Data Sources (Water Heating)

- 1 ACEEE A042: Emerging Energy Saving Technologies & Practices for the Buildings Sector as of 2004. ACEEE Report# A042. October 2004. Pg. 84.
- 2 ACEEE E061: N. Elliott et al. 'Reducing Oil Use Through Energy Efficiency: Opportunities Beyond Cars and Light Trucks.' Report E061. ACEEE. Washington D.C. January 2006.
- 3 ACEEE T6.6: 'Consumer Guide to Home Energy Savings' 8th ed. ACEEE. 2003. Table 6.6
- 4 AR RDS: Residential Demand Savings, Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 5 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 6 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV1. California Energy Commission. December 2007.
- 7 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 8 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cookgtstd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cookgtstd.pdf))
- 9 DOE/EERE A&E: Appliances and Electronics, "Estimating Appliance and Home Electronic Energy Use" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 10 DOE/EERE WH: Water Heating, "Swimming Pool Heating" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 11 ES Tbl 32: 2005 Intrusive Residential Standby Survey Report. Prepared by Energy Efficient Strategies P/L. 2005. Tbl 32.
- 12 EIA D1-1: Table D1-1: Electricity Consumption by End Use in New England Households, 2001 by EIA
- 13 EIA/GDS: GDS Calculation based on information in EIA's REC 2001 Data.
- 14 ES Analysis-ResDWH: ENERGY STAR® Residential Water Heaters: Final Criteria Analysis ([www.energystar.gov](http://www.energystar.gov)). April 2008.
- 15 ES Calc- CPU: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Home Computer (.xls)
- 16 ES Calc- Dhum: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Dehumidifiers (.xls)
- 17 ES Calc- RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&model=&screen=2>)
- 18 ES Calc-ASHP: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Air Source Heat Pump (.xls)
- 19 ES Calc-Blr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Boiler (.xls)
- 20 ES Calc-CAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Central Air Conditioning (.xls)
- 21 ES Calc-CF: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Ceiling Fan (.xls)
- 22 ES Calc-CiWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 23 ES Calc-DWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 24 ES Calc-Freeze: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Freezer Savings (.xls)
- 25 ES Calc-Fridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 26 ES Calc-Furn: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Furnace (.xls)
- 27 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 28 ES Calc-PSat: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Programmable Thermostat (.xls)
- 29 ES Calc-RAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Room Air Conditioner (.xls)
- 30 EStar TVs: [www.energystar.gov](http://www.energystar.gov)
- 31 EVT: Efficiency Vermont Technical Reference User Manual. No. 2007-47.
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- 33 FORMS: [www.forms.org](http://www.forms.org)
- 34 GDS: GDS Associates Estimate/Calculation
- 35 HE Mag 4-1995: Home Energy Magazine Online March/April 1995 Shade Trees as a Demand-Side Resource with assumptions based on age of housing stock and other key factors
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- 41 RECS CE2: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE2-9c: Space-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
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- 43 RECS CE4: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE4-9c: Water-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 44 RERC: 'Investing in a Solar Hot Water System' Renewable Energy Resource Center: A Project of the Vermont Energy Investment Corporation. ([www.rerc-vt.org/shw\\_investing.htm](http://www.rerc-vt.org/shw_investing.htm))
- 45 SECI 2005: Country Kilowatts Newsletter 2005 Southern Energy Conservation Initiative and [www.EIA.DOE.GOV](http://www.EIA.DOE.GOV) and [www.NYSERDA\\_Energysavings.org](http://www.NYSERDA_Energysavings.org)
- 46 SIPS: [www.sips.org](http://www.sips.org)
- 47 SmartHome: [www.smarthomeusa.com](http://www.smarthomeusa.com)
- 48 TIAX: K. Roth et al. 'Energy Consumption by Consumer Electronics in U.S. Residences.' TIAX LLC. Cambridge, MA. January 2007.
- 49 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.
- 50 Solar Hot Water installation cost - Mark Weisflog, KW Management 10/18/08
- 51 Gas Networks Residential Sector Programs - Measure Lives, Cost, Savings, REVISED August 27, 2008 - Appendix A

# Residential Electric Model - Data Sources (Building Envelope)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/22/2008

Measure Assumptions		Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water
Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year
<b>Building Envelope</b>														
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Electric Heat	25	\$2,568	1	21,800.00	20.00%	4,360.00	1.651	0	0	0	0	0	0
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Electric Heat	25	\$9,576	1	21,800.00	35.00%	7,630.00	2.889	0	0	0	0	0	0
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Electric Heat	25	\$45,776	1	21,800.00	50.00%	10,900.00	4.127	0	0	0	0	0	0
404	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Gas Heat	25	\$2,657	1	10,138.00	1.45%	147.00	0.056	131	24%	31	0	0	0
405	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Gas Heat	25	\$12,666	1	10,138.00	16.52%	1,675.00	0.634	131	44%	58	0	0	0
406	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Gas Heat	25	\$23,094	1	10,138.00	16.65%	1,688.00	0.639	131	58%	76	0	0	0
407	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - LPG Heat	25	\$2,657	1	10,138.00	1.11%	113.00	0.043	131	23%	30.5	0	0	0
408	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - LPG Heat	25	\$12,666	1	10,138.00	16.52%	1,675.00	0.634	131	44%	57.4	0	0	0
409	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - LPG Heat	25	\$23,094	1	10,138.00	16.79%	1,702.00	0.644	131	58%	76.2	0	0	0
410	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Oil Heat	25	\$2,657	1	12,258.00	39.12%	4,795.00	1.816	109	18%	0	19.3	0	0
411	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Oil Heat	25	\$12,666	1	12,258.00	46.73%	5,728.00	2.169	109	31%	0	33.4	0	0
412	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Oil Heat	25	\$21,894	1	12,258.00	47.69%	5,846.00	2.214	109	48%	0	52.4	0	0
413	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Electric Heat	25	\$1,150	1	14,228.00	20.00%	632.60	0.240	0	0	0	0	0	0
414	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Electric Heat	25	\$11,750	1	14,228.00	35.00%	3,068.86	1.162	0	0	0	0	0	0
415	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Electric Heat	25	\$16,050	1	14,228.00	50.00%	5,582.04	2.114	0	0	0	0	0	0
416	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Gas Heat	25	\$1,150	1	5,990.13	1.57%	94.25	0.036	68	30%	20	0	0	0
417	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Gas Heat	25	\$3,750	1	5,990.13	12.35%	740.00	0.280	68	52%	35	0	0	0
418	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Gas Heat	25	\$7,005	1	5,990.13	20.73%	1,241.75	0.470	68	62%	42	0	0	0
419	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - LPG Heat	25	\$1,150	1	5,785.13	1.84%	106.50	0.040	68	29%	19.6	0	0	0
420	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - LPG Heat	25	\$3,750	1	5,785.13	9.26%	535.50	0.203	68	51%	34.7	0	0	0
421	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - LPG Heat	25	\$7,005	1	5,785.13	17.56%	1,016.00	0.385	68	62%	41.8	0	0	0
422	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Oil Heat	25	\$1,150	1	10,491.38	8.55%	896.75	0.340	49	41%	0	20.1	0	0
423	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Oil Heat	25	\$3,750	1	10,491.38	49.74%	5,218.00	1.976	49	31%	0	15.1	0	0
424	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Oil Heat	25	\$7,005	1	10,491.38	54.94%	5,763.75	2.182	49	46%	0	22.2	0	0
425	Energy Efficient Windows (SF) - electric heat	25	\$375	2	16,373	8%	1348	0.446	0	0	0	0	0	0
426	Energy Efficient Windows (SF) - gas heat	25	\$375	2	0	0	0	0	86	5%	5	0	0	0
427	Energy Efficient Windows (SF) - LPG heat	25	\$375	2	0	0	0	0	85	5%	0	5	0	0
428	Energy Efficient Windows (SF) - oil heat	25	\$375	2	0	0	0	0	91	5%	0	0	4.6	0
429	Energy Efficient Windows (MF) - electric heat	25	\$150	2	7,735	7%	539	0.178	0	0	0	0	0	0
430	Energy Efficient Windows (MF) - gas heat	25	\$150	2	0	0	0	0	40	5%	2	0	0	0
431	Energy Efficient Windows (MF) - LPG heat	25	\$150	2	0	0	0	0	40	5%	0	2	0	0
432	Energy Efficient Windows (MF) - oil heat	25	\$150	2	0	0	0	0	43	4%	0	0	1.8	0
433	Interior Storm Windows (Low-e or double clear film)													
434	Cool roofing/white roof/green roof (Central AC)	20	\$200	2	1,139	6.6%	75	0.195	0	0	0	0	0	0
435	Exterior Door Insulation (New, Replacement, Retrofit)													
436	Tree Shading (Central Air)	30	\$90	2	1,139	7.0%	80	0.207	0	10%	15.0	15.2	15.2	0.0
437	Tree Shading (Room AC)	30	\$90	2	786	7.0%	55	0.143	0	10%	15.0	15.2	15.2	0.0
438	Tree Shading (Central Air)	30	\$90	2	538	7.0%	38	0.098	0	10%	6.4	6.4	6.5	0.0
439	Tree Shading (Room AC)	30	\$90	2	371	7.0%	26	0.067	0	10%	6.4	6.4	6.5	0.0
440	Insulation/weatherization package - electric heat - single family - good	20	\$3,409	1 & 2	23,548	7.4%	1748	0.662	0	0	0	0	0	0
441	Insulation/weatherization package - electric heat - single family - better	20	\$14,011	1 & 2	23,548	16.2%	3825	1.448	0	0	0	0	0	0
442	Insulation/weatherization package - electric heat - single family - best	20	\$36,854	1 & 2	23,548	24.7%	5816	2.202	0	0	0	0	0	0
443	Insulation/weatherization package - electric heat - multi family - good	20	\$2,763	1 & 2	16,563	14.1%	2334	0.884	0	0	0	0	0	0
444	Insulation/weatherization package - electric heat - multi family - better	20	\$8,837	1 & 2	16,563	25.0%	4140	1.568	0	0	0	0	0	0
445	Insulation/weatherization package - electric heat - multi family - best	20	\$22,225	1 & 2	16,563	34.3%	5675	2.149	0	0	0	0	0	0
446	Insulation/weatherization package - Good (Improved Base Home) - Gas Heat & Central Air	20	\$3,305	1 & 2	9,565	11.0%	1,054	0.399	146	18%	26.2	0	0	0
447	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat & Central Air	20	\$17,033	1 & 2	9,565	12.8%	1,223	0.463	146	34%	49	0	0	0
448	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat & Central Air	20	\$43,202	1 & 2	9,565	31.4%	3,006	1.138	146	51%	74	0	0	0
449	Insulation/weatherization package - multi family - Good (Improved Base Home) - Gas Heat + Central Air	20	\$3,064	1 & 2	5,992	12.3%	737	0.279	88	13%	11.7	0	0	0
450	Insulation/weatherization package - multi family - Better (Improved Base Home to Current NH Code) - Gas Heat + Central Air	20	\$7,942	1 & 2	5,992	13.2%	788	0.298	88	33%	28.7	0	0	0

## Residential Electric Model - Data Sources (Building Envelope)

451	Insulation/weatherization package - multi family - Best (Major Renovation to ES Home Levels) - Gas Heat + Central Air	20	\$24,219	1 & 2	5,992	26.5%	1589	0.602	88	56%	49.3	0	0	0	0
452	Insulation/weatherization package - Good (Improved Base Home) - LPG Heat & Central Air	20	\$3,305	1 & 2	9,565	11.0%	1054	0.399	146	18%	0	26.6	0	0	0
453	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat & Central Air	20	\$17,033	1 & 2	9,565	12.8%	1223	0.463	146	34%	0	49.7	0	0	0
454	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat & Central Air	20	\$43,202	1 & 2	9,565	28.1%	2687	1.017	146	50%	0	73.6	0	0	0
455	Insulation/weatherization package - multi family - Good (Improved Base Home) - LP Heat + Central Air	20	\$3,064	1 & 2	5,922	1.5%	87	0.033	88	15%	0.0	13.3	0	0	0
456	Insulation/weatherization package - multi family - Better (Improved Base Home to Current NH Code) - LP Heat + Central Air	20	\$7,942	1 & 2	5,922	13.0%	772	0.292	88	33%	0.0	28.7	0	0	0
457	Insulation/weatherization package - multi family - Best (Major Renovation to ES Home Levels) - LP Heat + Central Air	20	\$24,219	1 & 2	5,922	22.4%	1327	0.502	88	56%	0.0	49.3	0	0	0
458	Insulation/weatherization package - Good (Improved Base Home) - Oil Heat & Central Air	20	\$3,305	1 & 2	13837	7.3%	1015	0.384	125	21%	0	0	26.73	0	0
459	Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat & Central Air	20	\$17,033	1 & 2	13837	8.4%	1157	0.438	125	40%	0	0	50.28	0	0
460	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat & Central Air	20	\$43,202	1 & 2	13837	23.0%	3183	1.205	125	50%	0	0	62.32	0	0
461	Insulation/weatherization package - multi family - Good (Improved Base Home) - Oil Heat + Central Air	20	\$3,064	1 & 2	9,796	0.8%	82	0.031	69	18%	0.0	0.0	12.4	0	0
462	Insulation/weatherization package - multi family - Better (Improved Base Home to Current NH Code) - Oil Heat + Central Air	20	\$7,942	1 & 2	9,796	12.7%	1246	0.472	69	34%	0.0	0.0	23.3	0	0
463	Insulation/weatherization package - multi family - Best (Major Renovation to ES Home Levels) - Oil Heat + Central Air	20	\$24,219	1 & 2	9,796	18.3%	1797	0.680	69	41%	0.0	0.0	28.3	0	0
464	Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	100	\$2,132	2	16,373	3.75%	614	0	0	0	0	0	0	0	0
465	Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	100	\$2,132	2	0	0	0	0	86	3.0%	2.6	0	0	0	0
466	Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	100	\$2,132	2	0	0	0	0	85	3.0%	0	2.6	0	0	0
467	Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	100	\$2,132	2	0	0	0	0	91	3.0%	0	0	2.7	0	0
468	Structural Insulated Panels (SIPs) for renovations/additions - electric heat	100	\$0	2	16,373	3.90%	639	0	0	0	0	0	0	0	0
469	Structural Insulated Panels (SIPs) for renovations/additions - gas heat	100	\$0	2	0	0	0	0	86	3.10%	2.7	0	0	0	0
470	Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	100	\$0	2	0	0	0	0	85	3.10%	0	2.6	0	0	0
471	Structural Insulated Panels (SIPs) for renovations/additions - oil heat	100	\$0	2	0	0	0	0	91	3.10%	0	0	2.8	0	0
472	New Construction (standard) - Electric Heat	20	\$1,500	2	16,373	3.6%	591	0	0	0	0	0	0	0	0
473	New Construction (standard) - Natural Gas Heat	20	\$1,500	2	0	0	0	0	86	4.3%	3.68	0	0	0	0
474	New Construction (standard) - Propane Heat	20	\$1,500	2	0	0	0	0	85	3.6%	0	3.08	0	0	0
475	New Construction (standard) - Oil Heat	20	\$1,500	2	0	0	0	0	91	3.6%	0	0	3.29	0	0
476	New Construction (BPI) - Electric Heat	20	\$3,000	2	16,373	3.6%	591	0	0	0	0	0	0	0	0
477	New Construction (BPI) - Natural Gas Heat	20	\$3,000	2	0	0	0	0	86	4.3%	3.68	0	0	0	0
478	New Construction (BPI) - Propane Heat	20	\$3,000	2	0	0	0	0	85	3.6%	0	3.08	0	0	0
479	New Construction (BPI) - Oil Heat	20	\$3,000	2	0	0	0	0	91	3.6%	0	0	3.29	0	0
480	LI Insulation & Weatherization (Electrically Heated)	20	\$1,741	2	16,373	25.60%	4191	0	0	0	0	0	0	0	0
481	LI Insulation & Weatherization (Natural Gas Heated)	20	\$1,741	2	0	0	0	0	86	50%	43.05	0	0	0	0
482	LI Insulation & Weatherization (Propane Heated)	20	\$1,741	2	0	0	0	0	85	42%	0	36.00	0	0	0
483	LI Insulation & Weatherization (Gas Heated)	20	\$1,741	2	0	0	0	0	91	42%	0	0	38.53	0	0
484	LI Insulation & Weatherization (Central AC)	20	\$1,741	2	1,139	25.60%	292	0	0	0	0	0	0	0	0
485	LI Insulation & Weatherization (Room AC)	20	\$1,741	2	786	25.60%	201	0	0	0	0	0	0	0	0
486	LI Insulation & Weatherization (Electrically Heated) MF	20	\$1,741	2	7,735	25.60%	1980	0	0	0	0	0	0	0	0
487	LI Insulation & Weatherization (Natural Gas Heated) MF	20	\$1,741	2	0	0	0	0	40	57%	23.16	0	0	0	0
488	LI Insulation & Weatherization (Propane Heated) MF	20	\$1,741	2	0	0	0	0	40	45%	0	18.30	0	0	0
489	LI Insulation & Weatherization (Gas Heated) MF	20	\$1,741	2	0	0	0	0	43	45%	0	0	19.59	0	0
490	LI Insulation & Weatherization (Central AC) MF	20	\$1,741	2	538	25.60%	138	0	0	0	0	0	0	0	0
491	LI Insulation & Weatherization (Room AC) MF	20	\$1,741	2	371	25.60%	95	0	0	0	0	0	0	0	0



# Residential Electric Model - Data Sources (Building Envelope)

## Building Envelope

- 1 ACEEE AO42: Emerging Energy Saving Technologies & Practices for the Buildings Sector as of 2004. ACEEE Report# AO42. October 2004. Pg. 84.
- 2 ACEEE E061: N. Elliott et al. 'Reducing Oil Use Through Energy Efficiency: Opportunities Beyond Cars and Light Trucks.' Report E061. ACEEE. Washington D.C. January 2006.
- 3 ACEEE T6.6: 'Consumer Guide to Home Energy Savings' 8th ed. ACEEE. 2003. Table 6.6
- 4 AR RDS: Residential Demand Savings, Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 5 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 6 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV1. California Energy Commission. December 2007.
- 7 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 8 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cookgtsd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cookgtsd.pdf))
- 9 DOE/EERE A&E: Appliances and Electronics, "Estimating Appliance and Home Electronic Energy Use" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 10 DOE/EERE WH: Water Heating, "Swimming Pool Heating" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 11 EES Tbl 32: 2005 Intrusive Residential Standby Survey Report. Prepared by Energy Efficient Strategies P/L, 2005. Tbl 32.
- 12 EIA D1-1: Table D1-1: Electricity Consumption by End Use in New England Households, 2001 by EIA
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- 14 ES Analysis-ResDWH: ENERGY STAR® Residential Water Heaters: Final Criteria Analysis ([www.energystar.gov](http://www.energystar.gov)). April 2008.
- 15 ES Calc- CPU: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Home Computer (.xls)
- 16 ES Calc- Dhum: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Dehumidifiers (.xls)
- 17 ES Calc- RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&model=&screen=2>)
- 18 ES Calc-ASHP: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Air Source Heat Pump (.xls)
- 19 ES Calc-Blr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Boiler (.xls)
- 20 ES Calc-CAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Central Air Conditioning (.xls)
- 21 ES Calc-CF: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Ceiling Fan (.xls)
- 22 ES Calc-CWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 23 ES Calc-DWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 24 ES Calc-Freeze: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Freezer Savings (.xls)
- 25 ES Calc-Fridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 26 ES Calc-Furn: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Furnace (.xls)
- 27 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 28 ES Calc-PSat: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Programmable Thermostat (.xls)
- 29 ES Calc-RAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Room Air Conditioner (.xls)
- 30 EStar TVs: [www.energystar.gov](http://www.energystar.gov)
- 31 EVT: Efficiency Vermont Technical Reference User Manual. No. 2007-47.
- 32 Findsolar.com: Solar estimator for spa/pool heating in New Hampshire. Viewed July 2, 2008.
- 33 FORMS: [www.forms.org](http://www.forms.org)
- 34 GDS: GDS Associates Estimate/Calculation
- 35 HE Mag 4-1995: Home Energy Magazine Online March/April 1995 Shade Trees as a Demand-Side Resource with assumptions based on age of housing stock and other key factors
- 36 KED: KED New Hampshire Low Income Program Year 3 actual annual expenditures.
- 37 MA/RI/VT: Impact Evaluation of the Massachusetts, Rhode Island, & Vermont 2003 Residential Lighting Programs. Nexus Market Research. October 2004.
- 38 ORNL: Estimating the National Effects of the US Department of Energy's Weatherization Assistance Program with State-Level Data: A Metaevaluation Using Studies from 1993 to 2005. ORNL. Sept. 2005
- 39 RECS CE2: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE2-9c: Space-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 40 RECS CE3: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE3-9c: Electric Air-conditioning Energy Consumption in US Households by Northeast Census Region, 2001.
- 41 RECS CE4: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE4-9c: Water-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 42 RERC: 'Investing in a Solar Hot Water System' Renewable Energy Resource Center: A Project of the Vermont Energy Investment Corporation. ([www.rerc-vt.org/shw\\_investing.htm](http://www.rerc-vt.org/shw_investing.htm))
- 43 SECI 2005: Country Kilowatts Newsletter 2005 Southern Energy Conservation Initiative and [www.EIA.DOE.GOV](http://www.EIA.DOE.GOV) and [www.NYSERDA\\_Energysavings.org](http://www.NYSERDA_Energysavings.org)
- 44 SIPS: [www.sips.org](http://www.sips.org)
- 45 SmartHome: [www.smarthomeusa.com](http://www.smarthomeusa.com)
- 46 TIAX: K. Roth et al. 'Energy Consumption by Consumer Electronics in U.S. Residences.' TIAX LLC. Cambridge, MA. January 2007.
- 47 Online tracking tool for energy retrofits (OTTER) <https://www.nh-otter.com/cc/default.aspx>
- 48 Hoefgen report: Lynn Hoefgen, Nexus Market Research, Inc.: "How Much More Does It Cost to Build an ENERGY STAR® Home? Incremental Cost Estimation Process"
- 49 Santamouris, Matheos. "Environmental Design of Urban Buildings"
- 49 REM Rate: Residential Energy Analysis and Rating Software V12.6, Architectural Energy Corporation, Boulder, Colorado
- 50 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.
- 51 GasNetworks Residential Sector Programs- Measure Lives, Costs, Savings, REVISED August 27, 2008



## Residential Electric Model - Data Sources (Lighting)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/10/2008

Measure Assumptions	Measure Life and Cost Values			Electric Savings Assumption:				Fuel Savings Assumption:					Water	
	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year
<b>Lighting</b>														
301	CFL Bulbs (Homes w/ partial CFL installation) - High Use	6	\$3	2	-	-	48	0.040	0	0	(0.3)	0	0	0
302	CFL Bulbs (Homes w/ partial CFL installation) - Low Use	12	\$3	2	-	-	24	0.040	0	0	(0.1)	0	0	0
303	CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	6	\$3	2	-	-	48	0.040	0	0	(0.3)	0	0	0
304	CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	12	\$3	2	-	-	24	0.040	0	0	(0.1)	0	0	0
305	LED options, inc. MR 16, R16, R20, R30, R38 & G25	20	\$58	2	-	-	51	0.005	0	0	(0.1)	0	0	0
306	LED Exit Signs	13	\$58	2	-	-	332	0.038	0	0	(0.1)	0	0	0
307	CFL Torchiere (residential)	8	\$20	2	-	-	105	0.096	0	0	0	0	0	0
308	CFL Torchiere (commercial)	8	\$20	2	-	-	215	0.150	0	0	0.453	0	0	0
309	CFL fixtures- exterior (high use)	4	\$19	1	-	-	105	0.080	0	0	0	0	0	0
310	Occupancy sensors	10	\$25	1	-	-			0	0	(0.8)	0	0	0
311	Timers/Motion/Photocell controlled outdoor lighting	10	\$108	1	-	-	117	0.009	0	0	0	0	0	0
312	Daylighting options, including retrofit & light tubes (informational)				-	-			0	0	0	0	0	0
313	Cold Cathode Bulbs (informational)	12	\$20	2	Emerging technology. GDS research found that cold cathode lightbulbs have relatively low lumens per Watt and cost multiple times more than standard CFLs and can be difficult to obtain, despite other advantages over standard CFLs (e.g. dimmable, longer life, "flashable").									

## Residential Electric Model - Data Sources (Lighting)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	Notes
	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kW demand savings - Summer Coincident (1)	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	
<b>Lighting</b>														
301 CFL Bulbs (Homes w/ partial CFL installation) - High Use	50	Home Depot	Home Depot	-	-	MA/RI/VT	National Grid			MA/RI/VT	-	-	-	-
302 CFL Bulbs (Homes w/ partial CFL installation) - Low Use	50	Home Depot	Home Depot	-	-	MA/RI/VT	National Grid			MA/RI/VT	-	-	-	-
303 CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	50	Home Depot	Home Depot	-	-	MA/RI/VT	National Grid			MA/RI/VT	-	-	-	-
304 CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	50	Home Depot	Home Depot	-	-	MA/RI/VT	National Grid			MA/RI/VT	-	-	-	-
305 LED options, inc. MR 16, R16, R20, R30, R38 & G25	PSNH	ACEEE A042	ACEEE A042	-	-	ACEEE A042	RDA Demand Calculator			ACEEE A042	-	-	-	-
306 LED Exit Signs	ACEEE A042	ACEEE A042	ACEEE A042	-	-	Alliant Energy	RDA Demand Calculator			ACEEE A042	-	-	-	-
307 CFL Torchiers (residential)	50	EVT	EVT	-	-	EVT	EVT			EVT	-	-	-	-
308 CFL Torchiers (commercial)	50	EVT	EVT	-	-	National Grid	National Grid			EVT	-	-	-	-
309 CFL fixtures- exterior (high use)	EVT	EVT	EVT	-	-	National Grid	National Grid			EVT	-	-	-	-
310 Occupancy sensors	50	SmartHome	DEER											
311 Timers/Motion/Photozell controlled outdoorlighting	50	DEER	DEER			49	RDA Demand Calculator							
312 Daylighting options, including retrofit & light tubes	1000bulbs	1000bulbs	1000bulbs											
313 Cold Cathode Bulbs (informational)	1000bulbs	1000bulbs	1000bulbs											

Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

## Residential Electric Model - Data Sources (Lighting)

- 1 ACEEE AO42: Emerging Energy Saving Technologies & Practices for the Buildings Sector as of 2004. ACEEE Report# AO42. October 2004. Pg. 84.
- 2 ACEEE E061: N. Elliott et al. 'Reducing Oil Use Through Energy Efficiency: Opportunities Beyond Cars and Light Trucks.' Report E061. ACEEE. Washington D.C. January 2006.
- 3 ACEEE T6.6: 'Consumer Guide to Home Energy Savings' 8th ed. ACEEE. 2003. Table 6.6
- 4 Alliant Energy: Lighting: LED Exit Signs (<http://www.alliantenergy.com/docs/groups/public/documents/pub/p012397.hcsp>)
- 5 AR RDS: Residential Deemed Savings. Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 6 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 7 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV1. California Energy Commission. December 2007.
- 8 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 9 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cookgtsd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cookgtsd.pdf))
- 10 DOE/EERE A&E: Appliances and Electronics. "Estimating Appliance and Home Electronic Energy Use" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 11 DOE/EERE WH: Water Heating, "Swimming Pool Heating" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 12 EES Tbl 32: 2005 Intrusive Residential Standby Survey Report. Prepared by Energy Efficient Strategies P/L, 2005. Tbl 32.
- 13 EIA D1-1: Table D1-1: Electricity Consumption by End Use in New England Households, 2001 by EIA
- 14 EIA/GDS: GDS Calculation based on information in EIA's REC 2001 Data.
- 15 ES Analysis-ResDWH: ENERGY STAR® Residential Water Heaters: Final Criteria Analysis ([www.energystar.gov](http://www.energystar.gov)). April 2008.
- 16 ES Calc- CPU: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Home Computer (.xls)
- 17 ES Calc- Dhum: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Dehumidifiers (.xls)
- 18 ES Calc- RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&model=&screen=2>)
- 19 ES Calc-ASHP: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Air Source Heat Pump (.xls)
- 20 ES Calc-Bir: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Boiler (.xls)
- 21 ES Calc-CAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Central Air Conditioning (.xls)
- 22 ES Calc-CF: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Ceiling Fan (.xls)
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- 24 ES Calc-DWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 25 ES Calc-Freeze: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Freezer Savings (.xls)
- 26 ES Calc-Fridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 27 ES Calc-Furn: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Furnace (.xls)
- 28 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 29 ES Calc-PStat: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Programmable Thermostat (.xls)
- 30 ES Calc-RAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Room Air Conditioner (.xls)
- 31 EStar TVs: [www.energystar.gov](http://www.energystar.gov)
- 32 EVT: Efficiency Vermont Technical Reference User Manual. No. 2007-47.
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- 35 GDS: GDS Associates Estimate/Calculation
- 36 HE Mag 4-1995: Home Energy Magazine Online March/April 1995 Shade Trees as a Demand-Side Resource with assumptions based on age of housing stock and other key factors
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- 38 MA/RI/VT: Impact Evaluation of the Massachusetts, Rhode Island, & Vermont 2003 Residential Lighting Programs. Nexus Market Research, October 2004.
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- 40 NYSERDA Demand Calculator: System Peak Coincident Demand Savings Calculator. Version 2.0. July 2008
- 41 ORNL: Estimating the National Effects of the US Department of Energy's Weatherization Assistance Program with State-Level Data: A Metaevaluation Using Studies from 1993 to 2005. ORNL. Sept. 2005
- 42 RECS CE2: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE2-9c: Space-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 43 RECS CE3: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE3-9c: Electric Air-conditioning Energy Consumption in US Households by Northeast Census Region, 2001.
- 44 RECS CE4: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE4-9c: Water-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 45 RECC: 'Investing in a Solar Hot Water System' Renewable Energy Resource Center: A Project of the Vermont Energy Investment Corporation. ([www.recc-vt.org/shw\\_investing.htm](http://www.recc-vt.org/shw_investing.htm))
- 46 SECI 2005: Country Kilowatts Newsletter 2005 Southern Energy Conservation Initiative and [www.EIA.DOE.GOV](http://www.EIA.DOE.GOV) and NYSERDA\_Energysavings.org
- 47 SIPS: [www.sips.org](http://www.sips.org)
- 48 SmartHome: [www.smarthomeusa.com](http://www.smarthomeusa.com)
- 49 TIAX: K. Roth et al. 'Energy Consumption by Consumer Electronics in U.S. Residences.' TIAX LLC. Cambridge, MA. January 2007.
- 50 EVT: Efficiency Vermont Technical Reference User Manual. No. 2007-51.
- 51 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.

## Residential Electric Model - Data Sources (Space Conditioning)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/22/2008

Measure Assumptions	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	
	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil		Annual MMBtu savings, Other Fuel
<b>Space Conditioning (Heating and Cooling)</b>														
501 Programmable Thermostats (SF) - electric (Heating only)	10	\$89	1	11,665	9.0%	1049.8	0.000	0	#DIV/0!	0	0	0	0	0
502 Programmable Thermostats (SF) - electric (Heating + Central Air)	10	\$89	1	12,804	12.8%	1632.9	1.514	0	#DIV/0!	0	0	0	0	0
503 Programmable Thermostats (SF) - gas furnace (Heating only)	10	\$92	1	0	#DIV/0!	0	0	100	8%	7.7	0	0	0	0
504 Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	10	\$92	1	1,139	12.8%	145.22	0.377	100	8%	7.7	0	0	0	0
505 Programmable Thermostats (SF) - gas boiler (Heating only)	10	\$92	1	0	#DIV/0!	0	0	75	10%	7.7	0	0	0	0
506 Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	75	10%	7.7	0	0	0	0
507 Programmable Thermostats (SF) - oil furnace (Heating only)	10	\$92	1	0	#DIV/0!	0	0	100	9%	0	0	8.7	0	0
508 Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	100	9%	0	0	8.7	0	0
509 Programmable Thermostats (SF) - oil boiler (Heating only)	10	\$92	1	0	#DIV/0!	0	0	75	12%	0	0	9.0	0	0
510 Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	75	12%	0	0	9.0	0	0
511 Programmable Thermostats (MF) - electric (Heating only)	10	\$89	1	24,011	9.0%	2,160.99	0.000	0	0	0	0	0	0	0
512 Programmable Thermostats (MF) - electric (Heating + Central Air)	10	\$89	1	24,549	12.9%	3,166.83	2.613	0	0	0	0	0	0	0
513 Programmable Thermostats (MF) - gas furnace (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	71	8%	5.5	0	0	0	0
514 Programmable Thermostats (MF) - gas furnace (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	71	8%	5.5	0	0	0	0
515 Programmable Thermostats (MF) - gas boiler (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	53	10%	5.5	0	0	0	0
516 Programmable Thermostats (MF) - gas boiler (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	53	10%	5.5	0	0	0	0
517 Programmable Thermostats (MF) - oil furnace (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	71	6%	0	0	4.3	0	0
518 Programmable Thermostats (MF) - oil furnace (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	71	6%	0	0	4.3	0	0
519 Programmable Thermostats (MF) - oil boiler (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	55	8%	0	0	4.5	0	0
520 Programmable Thermostats (MF) - oil boiler (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	55	8%	0	0	4.5	0	0
521 Efficient Furnace Fan (Non-Electric Furnace)	18	\$400	1	914	43%	393	0.258	0	0	0	0	0	0	0
522 HVAC Tune-Up (Electric Heat)	5	\$175	2	11,665	7.0%	3,709	1.226	0	0%	0	0	0	0	0
523 HVAC Tune-Up (Gas Heat)	5	\$175	2	1,139	7.0%	80	0.026	100	7%	7.0	0	0	0	0
524 HVAC Tune-Up (Oil Heat)	5	\$175	2	1,139	7.0%	80	0.026	100	7%	0	0	7.0	0	0
525 Energy Star Room A/C	12	\$30	2	786	9.3%	73	0.189	0	0	0	0	0	0	0
526 Energy Star ceiling fans	10	\$86	2	283	62.5%	177	0	0	0	0	0	0	0	0
527 High Efficiency Central AC (Tier 1)	18	\$500	2	1,139	6.9%	79	0.198	0	0	0	0	0	0	0
528 High Efficiency Central AC (Tier 2)	18	\$1,209	2	1,139	13.0%	148	0.369	0	0	0	0	0	0	0
529 High Efficiency Heat Pump (Tier 1)	18	\$1,000	2	13,414	6.2%	829	0.274	0	0	0	0	0	0	0
530 High Efficiency Heat Pump (Tier 2)	18	\$1,200	2	13,414	14.4%	1,926	0.636	0	0	0	0	0	0	0
531 Ground Source Heat Pump	18	\$9,000	2	13,414	21.0%	2,817	0.931	0	0	0	0	0	0	0
532 HE Whole House Fans	20	\$250	2	580	30.7%	178	0.304	0	0	0	0	0	0	0
533 High Efficiency Furnace - Natural Gas	18	\$320	2	0	0	0	0	100	21%	21.1	0	0	0	0
534 High Efficiency Furnace - Propane	18	\$320	2	0	0	0	0	100	12%	0	12.2	0	0	0
535 High Efficiency Furnace - Oil	17	\$320	2	0	0	0	0	101	3%	0	0	3.2	0	0
536 High Efficiency Boiler - Natural Gas	20	\$1,500	2	0	0	0	0	75	15%	11.4	0	0	0	0
537 High Efficiency Boiler - Propane	20	\$1,500	2	0	0	0	0	75	15%	0	11.4	0	0	0
538 High Efficiency Boiler - Oil	20	\$900	2	0	0	0	0	77	5%	0	0	3.8	0	0
539 Improved Steam Vents (SF) - gas	20	\$450	2	0	0	0	0	86	6.0%	5.1	0	0	0	0
540 Improved Steam Vents (SF) - LPG	20	\$450	2	0	0	0	0	85	6.0%	0	5.1	0	0	0
541 Improved Steam Vents (SF) - oil	20	\$450	2	0	0	0	0	91	6.0%	0	0	5.5	0	0
542 Mainline Air vent (MF) - gas	30	\$69	2	0	0	0	0	40	10.0%	4.0	0	0	0	0
543 Mainline Air vent (MF) - LPG	30	\$69	2	0	0	0	0	40	10.0%	0	4.0	0	0	0
544 Mainline Air vent (MF) - oil	30	\$69	2	0	0	0	0	43	10.0%	0	0	4.3	0	0
545 Thermostatic vents (MF) - gas	20	\$239	2	0	0	0	0	40	6.0%	2.4	0	0	0	0
546 Thermostatic vents (MF) - LPG	20	\$239	2	0	0	0	0	40	6.0%	0	2.4	0	0	0
547 Thermostatic vents (MF) - oil	20	\$239	2	0	0	0	0	43	6.0%	0	0	2.6	0	0
548 Efficient Steam Boiler (SF) - gas	25	\$890	2	0	0	0	0	86	2.3%	2.0	0	0	0	0
549 Efficient Steam Boiler (SF) - LPG	25	\$890	2	0	0	0	0	85	2.3%	0	2.0	0	0	0
550 Efficient Steam Boiler (SF) - oil	25	\$642	2	0	0	0	0	91	2.4%	0	0	2.2	0	0
551 Efficient Steam Boiler (MF) - gas	25	\$445	2	0	0	0	0	40	2.3%	0.9	0	0	0	0
552 Efficient Steam Boiler (MF) - LPG	25	\$445	2	0	0	0	0	40	2.3%	0	0.9	0	0	0
553 Efficient Steam Boiler (MF) - oil	25	\$321	2	0	0	0	0	43	2.4%	0	0	1.0	0	0
554 Duct Sealing - electric	20	\$300	2	22,626	5.0%	818.7	0.2705	0	0	0	0	0	0	0
555 Duct Sealing - gas	20	\$300	2	0	5.0%	0	0	100	4%	4.3	0	0	0	0
556 Duct Sealing - LPG	20	\$300	2	0	5.0%	0	0	100	4%	0	4.3	0	0	0
557 Duct Sealing - oil	20	\$300	2	0	0	0	0	101	5%	0	0.0	4.565	0	0
558 Off Peak Cooling w/ Thermal Energy Storage (Informational)														
559 Combo Systems (Informational)														

## Residential Electric Model - Data Sources (Space Conditioning)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	Notes		
	Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kWh demand savings - Summer Coincident (1)	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG			Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel
501	Programmable Thermostats (SF) - electric (Heating only)	53	52	ACEEE E04	REMRate	-	-	-	-	-	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$142.
502	Programmable Thermostats (SF) - electric (Heating + Central Air)	53	52	ACEEE E06	REMRate	-	-	-	-	-	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$142.
503	Programmable Thermostats (SF) - gas furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
504	Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
505	Programmable Thermostats (SF) - gas boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
506	Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
507	Programmable Thermostats (SF) - oil furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
508	Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
509	Programmable Thermostats (SF) - oil boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
510	Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
511	Programmable Thermostats (MF) - electric (Heating only)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$142.
512	Programmable Thermostats (MF) - electric (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$142.
513	Programmable Thermostats (MF) - gas furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
514	Programmable Thermostats (MF) - gas furnace (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
515	Programmable Thermostats (MF) - gas boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
516	Programmable Thermostats (MF) - gas boiler (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	52.00	-	-	-	-	
517	Programmable Thermostats (MF) - oil furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
518	Programmable Thermostats (MF) - oil furnace (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
519	Programmable Thermostats (MF) - oil boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
520	Programmable Thermostats (MF) - oil boiler (Heating + Central Air)	51	52	ACEEE E06	REMRate	-	-	-	REM Rate	ES Calc-PStat	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
521	Efficient Furnace Fan (Non-Electric Furnace)	EVT		ENERGYSmart	EVT	EVT	EVT	EVT	EVT	EVT	-	-	-	-	-	Non-electric heating, no central AC
522	HVAC Tune-Up (Electric Heat)	51	51	COOL SMART	SECI2005	GDS/EIA	SECI2005	SECI2005	SECI2005	SECI2005	-	-	-	-	-	Homes with Electric Central Air
523	HVAC Tune-Up (Gas Heat)	51	51	COOL SMART	SECI2005	GDS/EIA	SECI2005	SECI2005	SECI2005	ES Calc-PStat	SECI2005	-	-	-	-	Homes with Electric Central Air
524	HVAC Tune-Up (Oil Heat)	51	51	COOL SMART	SECI2005	GDS/EIA	SECI2005	SECI2005	SECI2005	ES Calc-PStat	SECI2005	-	-	SECI2005	-	Homes with Electric Central Air
525	Energy Star Room A/C	51	51	ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	-	-	-	-	-	Replace three 60 W bulbs with 20 W bulbs
526	Energy Star ceiling fans	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	ES Calc-CF	-	-	-	-	-	Base: SEER - 13 / EE: SEER - 14 (3 Ton Unit). 400 full-load cooling hours per year.
527	High Efficiency Central AC (Tier 1)	51	National Grid	ES Calc-CA	REMRate	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	-	-	-	-	-	Base: SEER - 13 / EE: SEER - 15 (3 Ton Unit). 400 full-load cooling hours per year.
528	High Efficiency Central AC (Tier 2)	51	National Grid	ES Calc-CA	REMRate	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	-	-	-	-	-	Base: SEER - 13 / EE: SEER - 15 (3 Ton Unit). 400 full-load cooling hours per year.
529	High Efficiency Heat Pump (Tier 1)	51	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	-	-	-	-	-	(3.0 Ton Unit)
530	High Efficiency Heat Pump (Tier 2)	51	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	-	-	-	-	-	(3.0 Ton Unit)
531	Ground Source Heat Pump	ACEEE A042	Geothermal	ACEEE A04	ES Calc-ASHP	ACEEE A042	GDS	ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	-	-	-	-	-	(3.0 Ton Unit)
532	HE Whole House Fans	Connecticut	Connecticut	Connecticut	ES Calc-PStat	Connecticut	Connecticut	Connecticut	Connecticut	Connecticut	-	-	-	-	-	Compared to 1.5 ton window AC unit
533	High Efficiency Furnace - Natural Gas	52	52	ES Calc-Fur	-	-	-	-	REMRate	52 ES Calc-Furn	ES Calc-Furn	ES Calc-Furn	ES Calc-Furn	-	-	Based on 80 kBtu and furnace with AFUE >= 90
534	High Efficiency Furnace - Propane	52	52	ES Calc-Fur	-	-	-	-	REMRate	52 ES Calc-Furn	ES Calc-Furn	ES Calc-Furn	ES Calc-Furn	-	-	Based on 80 kBtu and furnace with AFUE >= 90
535	High Efficiency Furnace - Oil	51	51	ES Calc-Furn	ES Calc-Fur	-	-	-	REMRate	GDS	ES Calc-Furn	ES Calc-Furn	ES Calc-Furn	-	-	Base AFUE = 80%; HE AFUE = 83%; 2100 s.f. home; no programmable thermostat
536	High Efficiency Boiler - Natural Gas	52	52	ES Calc-Blr	-	-	-	-	REMRate	GDS	ES Calc-Blr	ES Calc-Blr	ES Calc-Blr	-	-	Average of 88% and 84% AFUE data from Appliances and Commercial Equipment Standards
537	High Efficiency Boiler - Propane	52	52	ES Calc-Blr	-	-	-	-	REMRate	GDS	ES Calc-Blr	ES Calc-Blr	ES Calc-Blr	-	-	Average of 88% and 84% AFUE data from Appliances and Commercial Equipment Standards

## Residential Electric Model - Data Sources (Space Conditioning)

538	High Efficiency Boiler - Oil	ES Calc-Blr	ES Calc-Blr	ES Calc-Blr	-	-	-	REMRate	GDS	ES Calc-Blr	ES Calc-Blr	ES Calc-Blr	-	-	Base AFUE = 80%; HE AFUE = 85%; 2100 s.f. home; no programmable thermostat
539	Improved Steam Vents (SF) - gas	ACEEE E061	ACEEE E061:41	ACEEE E061	-	-	-	REMRate	ACEEE E061:41	ACEEE E061:41	-	-	-	-	
540	Improved Steam Vents (SF) - LPG	ACEEE E061	ACEEE E061:41	ACEEE E061	-	-	-	REMRate	ACEEE E061:41	-	ACEEE E061:41	-	-	-	
541	Improved Steam Vents (SF) - oil	ACEEE E061	ACEEE E061:41	ACEEE E061	-	-	-	REMRate	ACEEE E061:41	-	-	ACEEE E061:41	-	-	
542	Mainline Air vent (MF) - gas	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	ACEEE E061:42	-	-	-	-	
543	Mainline Air vent (MF) - LPG	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	-	ACEEE E061:42	-	-	-	
544	Mainline Air vent (MF) - oil	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	-	-	ACEEE E061:42	-	-	
545	Thermostatic vents (MF) - gas	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	ACEEE E061:42	-	-	-	-	
546	Thermostatic vents (MF) - LPG	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	-	ACEEE E061:42	-	-	-	
547	Thermostatic vents (MF) - oil	ACEEE E061	ACEEE E061:42	ACEEE E061	-	-	-	REMRate + RECS	ACEEE E061:42	-	-	ACEEE E061:42	-	-	
548	Efficient Steam Boiler (SF) - gas	EVT	EVT	EVT	-	-	-	REMRate	EVT	EVT	-	-	-	-	
549	Efficient Steam Boiler (SF) - LPG	EVT	EVT	EVT	-	-	-	REMRate	EVT	-	EVT	-	-	-	
550	Efficient Steam Boiler (SF) - oil	EVT	EVT	EVT	-	-	-	REMRate	EVT	-	-	EVT	-	-	
551	Efficient Steam Boiler (MF) - gas	EVT	EVT	EVT	-	-	-	REMRate + RECS	EVT	EVT	-	-	-	-	
552	Efficient Steam Boiler (MF) - LPG	EVT	EVT	EVT	-	-	-	REMRate + RECS	EVT	-	EVT	-	-	-	
553	Efficient Steam Boiler (MF) - oil	EVT	EVT	EVT	-	-	-	REMRate + RECS	EVT	-	-	EVT	-	-	
554	Improved Duct Sealing - electric	EVT	EVT	EVT	REMRate	EVT	EVT	ES Calc-ASHP	-	-	-	-	-	-	
555	Improved Duct Sealing - gas	EVT	EVT	EVT	-	-	-	REMRate	EVT	EVT	-	-	-	-	
556	Improved Duct Sealing - LPG	EVT	EVT	EVT	-	-	-	REMRate	EVT	-	EVT	-	-	-	
557	Improved Duct Sealing - oil	EVT	EVT	EVT	-	-	-	REMRate	EVT	-	-	EVT	-	-	

\*Measures to be modeled for Single and Multifamily Applications in Existing and New Construction, where applicable  
 Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

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- 17 ES Calc-CPU: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Home Computer (.xls)
- 18 ES Calc-Dhum: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Dehumidifiers (.xls)
- 19 ES Calc-RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&model=&screen=2>)
- 20 ES Calc-ASHP: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Air Source Heat Pump (.xls)
- 21 ES Calc-Blr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Boiler (.xls)
- 22 ES Calc-CAC: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Central Air Conditioning (.xls)
- 23 ES Calc-CF: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Ceiling Fan (.xls)
- 24 ES Calc-CiWashr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 25 ES Calc-DWashr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 26 ES Calc-Freeze: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Freezer Savings (.xls)
- 27 ES Calc-Fridge: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 28 ES Calc-Furn: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Furnace (.xls)
- 29 ES Calc-MFridge: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 30 ES Calc-PStat: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Programmable Thermostat (.xls)
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- 36 GDS: GDS Associates Estimate/Calculation
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- 48 SIPS: www.sips.org
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- 51 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.
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## Residential Electric Model - Single Family Saturations

Single Family Household:										
All Utilities										
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
<b>Appliances</b>										
E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	Refrigerator					100.0%		66.6%	Homes in service area	This measure is redundant. Other measures cover replacement of all refrigerator/freezer combinations with E-Star compliant models
E-Star Compliant Top Mount Freezer	Refrigerator	65.8%	Tab 1 - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all top mount freezers (with and without through-the-door ice)
E-Star Compliant Side Mount Freezer	Refrigerator	26.0%	Tab 1 - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all side mount freezers (with and without through-the-door ice)
E-Star Compliant Bottom Mount Freezer	Refrigerator	8.2%	Tab 1 - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all bottom mount freezers (with and without through-the-door ice)
Wine refrigerators (Informational)	Informational					100.0%		66.6%		
E-Star Compliant Upright Freezers	Freezer	21.6%	Tab 1 - R2 (breakdown by freezer type from GDS -VT Tech Potential Study)	19.4%	Tab 1 - PP7A_5, PP7B_5	80.6%		66.6%	Homes in service area which contain a freezer	
E-Star Compliant Chest Freezers	Freezer	19.2%	Tab 1 - R2 (breakdown by freezer type from GDS -VT Tech Potential Study)	19.4%	Tab 1 - PP7A_5, PP7B_5	80.6%		66.6%	Homes in service area which contain a freezer	
Energy Star Dehumidifier	Dehumidifier	26.9%	Tab 1 - DH1	31.9%	Tab 1 - PP7A_8, PP7B_8	68.1%		66.6%	Homes in service area with a dehumidifier	
Second Refrigerator Turn In	Refrigerator	29.2%	Tab 1 - R1			100.0%		66.6%	Homes in service area with 2+ refrigerators	Average 2.1 refrigerators in home with more than 1 refrigerator
Second Freezer Turn In	Freezer	2.0%	Tab 1 - R2			100.0%		66.6%	Homes in service area with 2+ freezers	Average 2.4 freezers in homes with more than 1 freezer
Induction Cooktop vs. Electric Coil Cooktop	Range	87.0%	Tab 1 - SH2 (See Comments)	0.0%	See Comments	100.0%		66.6%		End Use saturation is assumed to equal the percentage of homes not heated with gas. Could not find any saturation data for induction cooktops, but According to a recent Washington Post article (The Next Hot Thing? Well maybe, by Denise Di Fulco, May 8,2008), this is a new technology that was a novelty just a few years ago, but sales have picked up in 2008. Given that sales have only recently picked up, we assumed that their overall market penetration is approximately 0%.
Energy Star office equipment including monitors, copiers, multi-function machines.	Office Equipment	81.4%	Tab 1 - TC2	22.9%	Tab 1 - PP7A_11, PP7B_11	77.1%		66.6%	Homes in service area with 1 or more computers	Average 1.6 computers per home with 1 or more computers
TVs - Energy Star over standard	Television	100.0%	Tab 1 - TC1A, B, C	51.0%		49.0%		66.6%	Homes in service area	There are an average of 2.5 TVs per home. No survey data available on fraction of TVs that are Energy Star labeled. Based EE Saturation on Historical Energy Star market penetration data for the years 1999-2006 as reported by EStar and in a 2007 report by Tiax for the Consumer Electronics Association.
<b>Water Heating</b>										
Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	18.0%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and natural gas DHW	
Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	14.8%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and electric DHW	
Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	24.3%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and propane DHW	
Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	40.2%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and oil DHW	
Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	18.0%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and electric DHW	
Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	14.8%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and natural gas DHW	
Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	24.3%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and propane DHW	
Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	40.2%	Tab 2 - WH1, D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and oil DHW	
Energy Star Clothes Washer (w/ Electric DHW)	Clothes Washer	20.0%	Tab 2 - WH1, CW1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer and electric DHW	
Energy Star Clothes Washer (w/ Gas DHW)	Clothes Washer	13.9%	Tab 2 - WH1, CW1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer and natural gas DHW	
Energy Star Clothes Washer (w/ Propane DHW)	Clothes Washer	22.4%	Tab 2 - WH1, CW1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer and propane DHW	
Energy Star Clothes Washer (w/ Oil DHW)	Clothes Washer	41.6%	Tab 2 - WH1, CW1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer and oil DHW	
Natural Gas Clothes Dryer Fuel Switch	Electric Clothes Dryer	78.3%	Tab 1 - CW3, CW4	0.0%		100.0%		66.6%	Homes in service area with an electric dryer	
Propane Clothes Dryer Fuel Switch	Electric Clothes Dryer	78.3%	Tab 1 - CW3, CW4	0.0%		100.0%		66.6%	Homes in service area with an electric dryer	

## Residential Electric Model - Single Family Saturations

Single Family Household:		All Utilities									
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment	
Efficient Water Heater (EF=0.93)	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an electric water heater	There is a question in the survey that asks if the water heater that was purchased in the last five years has an Energy Star Logo. However, Energy Star does not label water heaters. I used the response to this question as a proxy for the number of water heaters purchased in the last five years that are energy efficient.	
High efficiency water heater (EF=0.95)	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an electric water heater		
High Efficiency Water Heater - Natural Gas (EF=0.62)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
High Efficiency Water Heater - Natural Gas (EF=0.67)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
High Efficiency Water Heater - Propane (EF=0.67)	Water Heating	22.9%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a propane water heater		
High Efficiency Water Heater - Oil (EF=0.66)	Water Heating	40.7%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an oil water heater		
Gas-Condensing Water Heater - Natural Gas (EF=0.80)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
Gas-Condensing Water Heater - Propane (EF=0.80)	Water Heating	22.9%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a propane water heater		
Whole-House Tankless Water Heater - Nat Gas <=200 kBTUH	Water Heating	2.8%	Tab 3 - SH2, SH3, SH4	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas boiler		
Whole-House Tankless Water Heater - Electric <=12 kW	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with electric water heater		
Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	Water Heating	2.8%	Tab 3 - SH2, SH3, SH4	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas boiler		
Heat Pump Water Heater	Water Heating	20.2%	Tab 1 - WH1	4.4%		RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=2.0)		95.6%		Homes in service area with electric water heater	
Solar Water Heating - Active, w/ Elec Backup	Water Heating	20.2%	Tab 1 - WH1	1.0%		RMLD Tech Potential (RECS HC5: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)		99.0%		66.6%	Homes in service area with electric water heater
Solar Water Heating - Active, w/ Gas Backup	Water Heating	13.8%	Tab 1 - WH1	1.0%		RMLD Tech Potential (RECS HC5: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)		99.0%		66.6%	Homes in service area with natural gas water heater
Solar Water Heating - Active, w/ Propane Backup	Water Heating	22.9%	Tab 1 - WH1	1.0%		RMLD Tech Potential (RECS HC5: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)		99.0%		66.6%	Homes in service area with propane water heater



## Residential Electric Model - Single Family Saturations

Single Family Household:										
All Utilities										
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
Solar Water Heating - Active, w/ Oil Backup	Water Heating	40.7%	Tab 1 - WH1	1.0%	RMLD Tech Potential (RECS HC5: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)	99.0%		66.6%	Homes in service area with oil water heater	
Low Flow Showerhead/Faucets - electric	Water Heating	20.2%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with electric water heater	
Low Flow Showerhead/Faucets - gas	Water Heating	13.8%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with natural gas water heater	
Low Flow Showerhead/Faucets - LPG	Water Heating	22.9%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with propane water heater	
Low Flow Showerhead/Faucets - oil	Water Heating	40.7%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with oil water heater	
Pipe Wrap - electric DHW	Water Heating	20.2%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		66.6%	Homes in service area with electric water heater	Not included in survey
Pipe Wrap - gas DHW	Water Heating	13.8%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		66.6%	Homes in service area with natural gas water heater	
Pipe Wrap - LPG DHW	Water Heating	22.9%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		66.6%	Homes in service area with propane water heater	
Pipe Wrap - oil DHW	Water Heating	40.7%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		66.6%	Homes in service area with oil water heater	
Water Heater Blanket/Tank Insulation - electric only	Water Heating	20.2%	Tab 1 - WH1	31.7%	Tab 1a - PP7A.3, RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	68.3%		66.6%	Homes in service area with electric water heater	This measure is being phased out in many locales. Heaters last 10 years on average and most new machines have the additional insulation once provided by wraps. Many warranties are void with added insulation.
Horizontal Axis Washer-Dryer Combination Unit (informational)	Informational					100.0%		66.6%		
Built-in Interior Clothes Lines in new construction (informational)	Informational					100.0%		66.6%		
<b>Lighting</b>										
CFL Bulbs (Homes w/ partial CFL installation) - High Use	Lighting	75.0%	Tab 1 - L3	37.3%	Tab 1 - Weighted number (L4A) and % (L4B) responses	62.7%		66.6%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ partial CFL installation) - Low Use	Lighting	75.0%	Tab 1 - L3	37.3%	Tab 1 - Weighted number (L4A) and % (L4B) responses	62.7%		66.6%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	Lighting	25.0%	Tab 1 - L3	0.0%		100.0%		66.6%	Homes in service area	
CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	Lighting	25.0%	Tab 1 - L3	0.0%		100.0%		66.6%	Homes in service area	
LED options, inc. MR 16, R16, R20, R30, R38 & G25	Lighting	100.0%				100.0%		66.6%	Homes in service area	Not included in survey
LED Exit Signs	Commercial Measure					100.0%		66.6%		Commercial Measure
CFL Torchiere (residential)	Lighting					100.0%		66.6%		Included in CFL Bulbs
CFL Torchiere (commercial)	Commercial Measure					100.0%		66.6%		Commercial Measure
CFL fixtures- exterior (high use)	Lighting					100.0%		66.6%		Included in CFL Bulbs
Occupancy sensors	Lighting					100.0%		66.6%	Homes in service area	Not included in survey
Timers/Motion/PhotoCell controlled outdoor lighting	Lighting	100.0%		15.0%	2003 CA Study by Architectural Energy Corp for CA Energy Comm.	85.0%		66.6%	Homes in service area with outdoor lighting	Not included in survey. Assumed 100% of homes have at least 1 outdoor socket
Daylighting options, including retrofit & light tubes (informational)	Lighting					100.0%		66.6%		
Cold Cathode Bulbs (informational)	Informational					100.0%		66.6%		
<b>Space Conditioning (Heating and Cooling)</b>										
Programmable Thermostats (SF) - electric (Heating only)	Space Heating	1.2%	Tab 1 - SH2	54.5%	Tab 1 - SH14	45.5%		66.6%	Homes in service area with electric heat & no central air	Small N (N=4). Due to low N, use fuel neutral response to base case factor for programmable thermostats (Tab 1)
Programmable Thermostats (SF) - electric (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH4			100.0%		66.6%	Homes in service area with electric heat & central air	This measure should be deleted because saturation of electrically heated homes with central air is 0%
Programmable Thermostats (SF) - gas furnace (Heating only)	Space Heating	4.7%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas furnace & no central air	
Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	Space Heating/Cooling	2.8%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas furnace & central air	

## Residential Electric Model - Single Family Saturations

Single Family Household:										
All Utilities										
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
Programmable Thermostats (SF) - gas boiler (Heating only)	Space Heating	3.2%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas boiler & no central air	
Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas boiler & central air	This measure should be deleted because the percentage of homes with natural gas boilers & central air is zero.
Programmable Thermostats (SF) - oil furnace (Heating only)	Space Heating	19.0%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil furnace & no central air	
Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	Space Heating/Cooling	5.5%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil furnace & central air	
Programmable Thermostats (SF) - oil boiler (Heating only)	Space Heating	27.3%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil boiler & no central air	
Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	Space Heating/Cooling	2.4%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil boiler & central air	
Efficient Furnace Fan (Non-Electric Furnace)	Space Heating	39.1%	Tab 1 - SH3	28.9%	Tab 1 - SH7, SH8	71.1%		66.6%	Homes in service area with non-electric furnace	This measure was not specifically addressed in the survey. Base case factor is based on fairly new (<=10 yrs. old) systems that respondents said are energy efficient
HVAC Tune-Up (Electric Heat)	Space Heating	1.2%	Tab 1 - SH2	68.4%	Tab 1 - SH6	31.6%		66.6%	Homes in service area with electric heat	Small N (N=4). Due to low N, use fuel neutral response to base case factor for HVAC Tuneup (Tab 1)
HVAC Tune-Up (Gas Heat)	Space Heating	13.0%	Tab 1 - SH2	55.2%	Tab 1b - SH6	44.8%		66.6%	Homes in service area with gas heat	
HVAC Tune-Up (Oil Heat)	Space Heating	56.5%	Tab 1 - SH2	83.9%	Tab 1b - SH6	16.1%		66.6%	Homes in service area with oil heat	
Energy Star Room A/C	Room AC	59.7%	Tab 1 - SC7	50.3%	Tab 1 - PP7A_2, PP7B_2	49.7%		66.6%	Homes in service area with one or more window A/C units	Average of 2 plugged in room air conditioners per home with at least 1 room air conditioner
Energy Star ceiling fans	Impacts Heating & Cooling					100.0%		66.6%		Not included in survey
High Efficiency Central AC (Tier 1)	Central AC	15.4%	Tab 1 - SC1	12.8%	Tab 1 - PP7A_1, PP7B_1	87.2%		66.6%	Homes in service area with central AC	
High Efficiency Central AC (Tier 2)	Central AC	15.4%	Tab 1 - SC1	12.8%	Tab 1 - PP7A_1, PP7B_1	87.2%		66.6%	Homes in service area with central AC	
High Efficiency Heat Pump (Tier 1)	Heating/Cooling	100.0%		13.9%	RMLD Tech Potential (NEEA: Northwest Energy Efficiency Alliance Residential Existing Construction Stock Assessment)	86.1%		66.6%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
High Efficiency Heat Pump (Tier 2)	Heating/Cooling	100.0%		1.0%	RMLD Tech Potential (GDS/EPRI: GDS assumptions based on information from Residential HVAC Data, Assumptions and Methodology for end use forecasting with EPRI REEPS 2.1 1994)	99.0%		66.6%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
Ground Source Heat Pump	Heating/Cooling	100.0%		2.0%	RMLD Tech Potential (NWAAlliance: NWAAlliance.org Market Research Report on Ground Source Heat Pump Market Assessment 9/2000)	98.0%		66.6%	Homes in service area	
HE Whole House Fans	Air Conditioning	100.0%				100.0%		66.6%	Homes in service area	
High Efficiency Furnace - Natural Gas	Space Heating	7.5%	Tab 3 - SH2, SH3	30.3%	Tab 1 - SH2; Tab 3 - SH8, SH2;	69.7%		66.6%	Homes in service area with natural gas furnace	
High Efficiency Furnace - Propane	Space Heating	6.7%	Tab 3 - SH2, SH3	36.1%	Tab 1 - SH2; Tab 3 - SH8, SH2;	63.9%		66.6%	Homes in service area with propane furnace	
High Efficiency Furnace - Oil	Space Heating	24.5%	Tab 3 - SH2, SH3	28.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	72.0%		66.6%	Homes in service area with oil furnace	
High Efficiency Boiler - Natural Gas	Space Heating	3.2%	Tab 3 - SH2, SH3	30.3%	Tab 1 - SH2; Tab 3 - SH8, SH2;	69.7%		66.6%	Homes in service area with natural gas boiler	
High Efficiency Boiler - Propane	Space Heating	5.9%	Tab 3 - SH2, SH3	36.1%	Tab 1 - SH2; Tab 3 - SH8, SH2;	63.9%		66.6%	Homes in service area with propane boiler	
High Efficiency Boiler - Oil	Space Heating	29.6%	Tab 3 - SH2, SH3	28.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	72.0%		66.6%	Homes in service area with oil boiler	
Improved Steam Vents (SF) - gas	Space Heating	0.4%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with natural gas steam boiler	Should consider dropping this measure or combining all steam trap measures because the percentage of homes with natural gas steam boilers is less than 1%
Improved Steam Vents (SF) - LPG	Space Heating	0.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all steam trap measures because the percentage of homes with natural gas steam boilers is less than 1%
Improved Steam Vents (SF) - oil	Space Heating	2.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with oil steam boiler	Might want to combine all of the steam trap measures because of low saturation of steam boilers
Efficient Steam Boiler (SF) - gas	Space Heating	0.4%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with natural gas steam boiler	Should consider dropping this measure or combining all efficient steam boiler measures because the percentage of homes with natural gas steam boilers is less than 1%
Efficient Steam Boiler (SF) - LPG	Space Heating	0.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all efficient steam boiler measures because the percentage of homes with natural gas steam boilers is less than 1%
Efficient Steam Boiler (SF) - oil	Space Heating	2.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 - SH8, SH2;	60.0%		66.6%	Homes in service area with oil steam boiler	Might want to combine all of the efficient steam boiler measures because of low saturation of steam boilers

## Residential Electric Model - Single Family Saturations

Single Family Household:		All Utilities								
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
Duct Sealing - electric	Heating/Cooling	8.6%	RMLD Residential Tech Potential (RECS HC3: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC3-9b. Space Heating by Northeast Census Region, Percent of U.S. Households.)	25.0%	RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	75.0%		66.6%	Homes in service area with electric heat - forced hot air	Small N (N=3) Forced Hot Air/Electric is not specified
Duct Sealing - gas	Heating/Cooling	7.5%	Tab 3 - SH2, SH3	25.0%	RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Assumes 3Ton Unit, with 500 Full Load Cooling Hrs. SEER 10)	75.0%		66.6%	Homes in service area with natural gas heat - forced hot air	Duct sealing not addressed in survey
Duct Sealing - LPG	Heating/Cooling	6.7%	Tab 3 - SH2, SH3			100.0%		66.6%	Homes in service area with LPG heat - forced hot air	Duct sealing not addressed in survey
Duct Sealing - oil	Heating/Cooling	24.5%	Tab 3 - SH2, SH3			100.0%		66.6%	Homes in service area with oil heat - forced hot air	Duct sealing not addressed in survey
Off Peak Cooling w/ Thermal Energy Storage (Informational)	Informational					100.0%		66.6%		
Combo Systems (Informational)	Informational					100.0%		66.6%		
<b>Building Envelope</b>										
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Electric Heat	Total Home Electric Use	100.0%	RMLD Tech Potential (Average kWh and Gas Consumption for all existing homes + 1,204 New Homes: Existing Homes ratio of energy consumption, based on EIA data.)			100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) -Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) -Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Energy Efficient Windows (SF) - electric heat	Heating/Cooling	1.2%		17.0%	Tab 1 - PP7A_10, PP7B_10	83.0%		66.6%	Homes in service area with electric heat	Small N (N=4). Due to low N, use fuel neutral response to base case factor (Tab 1)
Energy Efficient Windows (SF) - gas heat	Heating/Cooling	13.0%		14.7%	Tab 1 - PP7A_10, PP7B_10	85.3%		66.6%	Homes in service area with natural gas heat	
Energy Efficient Windows (SF) - LPG heat	Heating/Cooling	14.2%		29.0%	Tab 1 - PP7A_10, PP7B_10	71.0%		66.6%	Homes in service area with LPG heat	
Energy Efficient Windows (SF) - oil heat	Heating/Cooling	56.5%		18.6%	Tab 1 - PP7A_10, PP7B_10	81.4%		66.6%	Homes in service area with oil heat	
Interior Storm Windows (Low-e or double clear film)	Heating/Cooling	100.0%		36.0%	Tab 1 - BE1_1	64.0%		66.6%	Homes in service area	
Cool roofing/white roof/green roof (Central AC)	Central AC	100.0%				100.0%		66.6%	Homes in service area	Not included in the survey
Exterior Door Insulation (New, Replacement Retrofit)	Heating/Cooling	100.0%				100.0%		66.6%	Homes in service area	Is this a storm door? Not included in survey

## Residential Electric Model - Single Family Saturations

Single Family Household:		All Utilities								
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
Tree Shading (Central Air)	Central AC	15.4%	Tab 1 - SC1	50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 3Ton Unit, with 500 Full Load Cooling Hrs. SEER 10)	49.6%		66.6%	Homes in service area with central AC	Tree shading not addressed in survey
Tree Shading (Room AC)	Central AC	59.7%	Tab 1 - SC7	50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 11,000 BTU, 8.8 EER, and 1.5 Units/Hr)	49.6%		66.6%	Homes in service area with Room AC	Tree shading not addressed in survey
Tree Shading (Central Air)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 3Ton Unit, with 500 Full Load Cooling Hrs. SEER 10)	49.6%		66.6%		Duplicate measure
Tree Shading (Room AC)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 11,000 BTU, 8.8 EER, and 1.5 Units/Hr)	49.6%		66.6%		Duplicate measure
Insulation/weatherization package - electric heat - single family	Space Heating	1.2%	Tab 1 - SH2	66.7%	Tab 3 - SH2, BE3	33.3%		66.6%	Homes in service area with electric heat	Which insulation weatherization measures will be included? These combined measures or the detailed good/better/best (note Small N =3 for electric heat)
Insulation/weatherization package - gas heat	Space Heating	13.0%	Tab 1 - SH2	41.2%	Tab 1b - SH2, BE3	58.8%		66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation
Insulation/weatherization package - LPG heat	Space Heating	14.2%	Tab 1 - SH2	52.6%	Tab 1b - SH2, BE3	47.4%		66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation
Insulation/weatherization package - oil heat	Space Heating	56.5%	Tab 1 - SH2	50.3%	Tab 1b - SH2, BE3	49.7%		66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation
Insulation/weatherization package - Good (Improved Base Home) - Electric Heat	Space Heating	1.2%	Tab 1 - SH2	50.0%	Tab 3 - SH2, BE3	50.0%		66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) Electric Heat	Space Heating	1.2%	Tab 1 - SH2	16.7%	Tab 3 - SH2, BE3	83.3%		66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Electric Heat	Space Heating	1.2%	Tab 1 - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Gas Heat	Space Heating	13.0%	Tab 1 - SH2	30.9%	Tab 1b - SH2, BE3	69.1%		66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) Gas Heat	Space Heating	13.0%	Tab 1 - SH2	10.3%	Tab 1b - SH2, BE3	89.7%		66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat	Space Heating	13.0%	Tab 1 - SH2	0.0%	Tab 1b - SH2, BE3	100.0%		66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - LPG Heat	Space Heating	13.0%	Tab 1 - SH2	39.5%	Tab 1b - SH2, BE3	60.6%		66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) LPG Heat	Space Heating	14.2%	Tab 1 - SH2	13.2%	Tab 1b - SH2, BE3	86.9%		66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat	Space Heating	14.2%	Tab 1 - SH2	0.0%	Tab 1b - SH2, BE3	100.0%		66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Oil Heat	Space Heating	56.5%	Tab 1 - SH2	37.7%	Tab 1b - SH2, BE3	62.3%		66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) Oil Heat	Space Heating	56.5%	Tab 1 - SH2	12.6%	Tab 1b - SH2, BE3	87.4%		66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)

## Residential Electric Model - Single Family Saturations

Single Family Household:										
All Utilities										
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment
Insulation/Weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat	Space Heating	56.5%	Tab 1 - SH2	0.0%	Tab 1b - SH2, BE3	100.0%		66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	Space Heating	1.2%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with electric heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	Space Heating	13.0%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with natural gas heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	Space Heating	14.2%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with LPG heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	Space Heating	56.5%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with oil heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - electric heat	Space Heating	1.2%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with electric heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - gas heat	Space Heating	13.0%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with natural gas heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	Space Heating	14.2%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with LPG heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - oil heat	Space Heating	56.5%	Tab 1 - SH2			100.0%		66.6%	Homes in service area with oil heat	Included in new construction
New Construction (standard) - Electric Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Natural Gas Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Propane Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Oil Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (BPI) - Electric Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Natural Gas Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Propane Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Oil Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
LI Insulation & Weatherization (Electrically Heated)	Space Heating	9.1%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with electric heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating	24.2%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with natural gas heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Propane Heated)	Space Heating	12.1%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with propane heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Gas Heated)	Space Heating	36.4%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with oil heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Central AC)	Central AC	9.1%	Tab 5-SC1	30.3%		69.7%		66.6%	Low income homes in service area with central AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Room AC)	Room AC	78.8%	Tab 5-SC7	30.3%		69.7%		66.6%	Low income homes in service area with room AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Electrically Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Propane Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Gas Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Central AC)	Central AC					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Room AC)	Room AC					100.0%		66.6%		Duplicate measure
<b>Standby Power and Automation</b>										
Standby Power (ES Plug loads including battery chargers, cordless phones, TV/DVD combo units, DVD, External Power adapters, home Audio)	Appliances	100.0%		15.0%		85.0%		66.6%	Homes in service area	Not addressed in the survey. Used data from GDS VT study
Energy Efficient "Smart" Power Strip for PC/Monitor/Printer	Computers/Printers	81.4%	Tab 1 - TC2			100.0%		66.6%	Homes in service area with 1 or more computers	Average 1.6 computers per home with 1 or more computers. This measure is not addressed in the survey. Similar savings are assumed to be included in Energy Star office equipment.
Home Automation & SMART Controls	Appliances	100.0%				100.0%		66.6%	Homes in service area	Not addressed in the survey
<b>Pools</b>										
Pool Pump and Motor	Pool					100.0%		66.6%	Homes in service area with a pool	Survey question only asked about heated pools
High efficiency spas/hot tubs	Spa/Hot Tub	5.9%	Tab 1 - HT1			100.0%		66.6%	Homes in service area with outdoor spa/hot tub	What is a high efficiency Spa/Hot Tub? Survey asks about covers and timers for the heater.
Solar Pool Heater	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Electric (EF=0.95)	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Natural Gas Propane (EF=0.67)	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Propane (EF=0.67)	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Temperature control	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Pool Cover	Pool	0.8%	Tab 1 - HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Outdoor ponds / fountains	Ponds/Fountains					100.0%		66.6%		Very low saturation: May want to consider dropping

## Residential Electric Model - Multi Family Saturation

Multi Family Households										
All Utilities										
Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
<b>Appliances</b>										
E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	Refrigerator					100.0%		33.4%	Homes in service area	This measure is redundant. Other measures cover replacement of all refrigerator/freezer combinations with E-Star compliant models
E-Star Compliant Top Mount Freezer	Refrigerator	65.8%	Tab 1a - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	Saturation estimate is for all top mount freezers (with and without through-the-door ice)
E-Star Compliant Side Mount Freezer	Refrigerator	26.0%	Tab 1a - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	Saturation estimate is for all side mount freezers (with and without through-the-door ice)
E-Star Compliant Bottom Mount Freezer	Refrigerator	8.2%	Tab 1a - R1 (breakdown by freezer type from GDS -VT Tech Potential Study)	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	Saturation estimate is for all bottom mount freezers (with and without through-the-door ice)
Wine refrigerators (Informational)	Informational					100.0%		33.4%		
E-Star Compliant Upright Freezers	Freezer	10.0%	Tab 1a - R2 (breakdown by freezer type from GDS -VT Tech Potential Study)	8.0%	Tab 1a - PP7A_5, PP7B_5	92.0%		33.4%	Homes in service area which contain a freezer	
E-Star Compliant Chest Freezers	Freezer	8.9%	Tab 1a - R2 (breakdown by freezer type from GDS -VT Tech Potential Study)	8.0%	Tab 1a - PP7A_5, PP7B_5	16.0%		33.4%	Homes in service area which contain a freezer	
Energy Star Dehumidifier	Dehumidifier	10.2%	Tab 1a - DH1	53.8%	Tab 1a - PP7A_8, PP7B_8	46.2%		33.4%	Homes in service area with a dehumidifier	
Second Refrigerator Turn In	Refrigerator	3.9%	Tab 1a - R1			100.0%		33.4%	Homes in service area with 2+ refrigerators	Average 2 refrigerators in home with more than 1 refrigerator
Second Freezer Turn In	Freezer	0.8%	Tab 1a - R2			100.0%		33.4%	Homes in service area with 2+ freezers	Average 2 freezers in homes with more than 1 freezer
Induction Cooktop vs. Electric Coil Cooktop	Range	51.2%	Tab 1a - SH2 (See Comments)	0.0%	See Comments	100.0%		33.4%		End Use saturation is assumed to equal the percentage of homes not heated with gas. Could not find any saturation data for induction cooktops, but According to a recent Washington Post article (The Next Hot Thing? Well maybe, by Denise Di Fulco, May 8,2008), this is a new technology that was a novelty just a few years ago, but sales have picked up in 2008. Given that sales have only recently picked up, we assumed that their overall market penetration is approximately 0%.
Energy Star office equipment including monitors, copiers, multi-function machines.	Office Equipment	68.5%	Tab 1a - TC2	15.7%	Tab 1a - PP7A_11, PP7B_11	84.3%		33.4%	Homes in service area with 1 or more computers	Average 1.5 computers per home with 1 or more computers
TVs - Energy Star over standard	Television	100.0%	Tab 1a - TC1A, B, C	51.0%		49.0%		33.4%	Homes in service area	There are an average of 2.1 TVs per home. No survey data available on fraction of TVs that are Energy Star labeled. Based EE Stauration on Historical Energy Star market penetration data for the years 1999-2006 as reported by Estar and in a 2007 report by Tiax for the Consumer Electronics Association.
<b>Water Heating</b>										
Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	33.3%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and natural gas DHW	
Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	36.2%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and electric DHW	
Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and propane DHW	
Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and oil DHW	
Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	33.3%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and electric DHW	

Residential Electric Model - Multi Family Saturation

Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	36.2%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and natural gas DHW	
Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and propane DHW	
Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and oil DHW	
Energy Star Clothes Washer (w/ Electric DHW)	Clothes Washer	33.0%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and electric DHW	
Energy Star Clothes Washer (w/ Gas DHW)	Clothes Washer	39.2%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and natural gas DHW	
Energy Star Clothes Washer (w/ Propane DHW)	Clothes Washer	9.3%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and propane DHW	
Energy Star Clothes Washer (w/ Oil DHW)	Clothes Washer	7.2%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and oil DHW	
Natural Gas Clothes Dryer Fuel Switch	Electric Clothes Dryer	68.5%	Tab 1a - CW3, CW4	0.0%		100.0%		33.4%	Homes in service area with an electric dryer	
Propane Clothes Dryer Fuel Switch	Electric Clothes Dryer	68.5%	Tab 1a - CW3, CW4	0.0%		100.0%		33.4%	Homes in service area with an electric dryer	
Efficient Water Heater (EF=0.93)	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an electric water heater	There is a question in the survey that asks if the water heater that was purchased in the last five years has an Energy Star Logo. However, Energy Star does not label water heaters. I used the response to this question as a proxy for the number of water heaters purchased in the last five years that are energy efficient.
High efficiency water heater (EF=0.95)	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an electric water heater	
High Efficiency Water Heater - Natural Gas (EF=0.62)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
High Efficiency Water Heater - Natural Gas (EF=0.67)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
High Efficiency Water Heater - Propane (EF=0.67)	Water Heating	8.7%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a propane water heater	
High Efficiency Water Heater - Oil (EF=0.66)	Water Heating	7.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an oil water heater	
Gas-Condensing Water Heater - Natural Gas (EF=0.80)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
Gas-Condensing Water Heater - Propane (EF=0.80)	Water Heating	8.7%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a propane water heater	
Whole-House Tankless Water Heater - Nat Gas <=200 kBtUH	Water Heating	15.7%	Tab 3 - SH2, SH3, SH4	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas boiler	
Whole-House Tankless Water Heater - Electric <=12 kW	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with electric water heater	
Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	Water Heating	15.7%	Tab 3 - SH2, SH3, SH4	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas boiler	
Heat Pump Water Heater	Water Heating	33.1%	Tab 1a - WH1	4.4%		95.6%		33.4%	Homes in service area with electric water heater	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=2.0)
Solar Water Heating - Active, w/ Elec Backup	Water Heating	33.1%	Tab 1a - WH1	1.0%		99.0%		33.4%	Homes in service area with electric water heater	RMLD Tech Potential (RECS HCS: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region. Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)

## Residential Electric Model - Multi Family Saturation

Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
Solar Water Heating - Active, w/ Gas Backup	Water Heating	39.4%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)	99.0%		33.4%	Homes in service area with natural gas water heater	
Solar Water Heating - Active, w/ Propane Backup	Water Heating	8.7%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)	99.0%		33.4%	Homes in service area with propane water heater	
Solar Water Heating - Active, w/ Oil Backup	Water Heating	7.1%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC5-9b. Appliances by Northeast Census Region, Percent of U.S. Households, Assumes Base: Medium Size Tank (40-49gal.) ; EF=.90 EE: Medium Size Tank (40-49 gal.) ; EF=1.8)	99.0%		33.4%	Homes in service area with oil water heater	
Low Flow Showerhead/Faucets - electric	Water Heating	33.1%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with electric water heater	
Low Flow Showerhead/Faucets - gas	Water Heating	39.4%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with natural gas water heater	
Low Flow Showerhead/Faucets - LPG	Water Heating	8.7%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with propane water heater	
Low Flow Showerhead/Faucets - oil	Water Heating	7.1%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with oil water heater	
Pipe Wrap - electric DHW	Water Heating	33.1%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		33.4%	Homes in service area with electric water heater	Not included in survey
Pipe Wrap - gas DHW	Water Heating	39.4%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		33.4%	Homes in service area with natural gas water heater	
Pipe Wrap - LPG DHW	Water Heating	8.7%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		33.4%	Homes in service area with propane water heater	
Pipe Wrap - oil DHW	Water Heating	7.1%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	90.0%		33.4%	Homes in service area with oil water heater	
Water Heater Blanket/Tank Insulation - electric only	Water Heating	33.1%	Tab 1a - WH1	26.0%	Tab 1a - PP7A_3, RMLD Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors)	74.0%		33.4%	Homes in service area with electric water heater	This measure is being phased out in many locales. Heaters last 10 years on average and most new machines have the additional insulation once provided by wraps. Many warranties are void with added insulation.
Horizontal Axis Washer-Dryer Combination Unit (informational)	Informational					100.0%		33.4%		
Built-in Interior Clothes Lines in new construction (informational)	Informational					100.0%		33.4%		
<b>Lighting</b>										
CFL Bulbs (Homes w/ partial CFL installation) - High Use	Lighting	64.7%	Tab 1a - L3	34.9%	Tab 1a - Weighted number (L4A) and % (L4B) responses	65.1%		33.4%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ partial CFL installation) - Low Use	Lighting	64.7%	Tab 1a - L3	34.9%	Tab 1a - Weighted number (L4A) and % (L4B) responses	65.1%		33.4%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	Lighting	34.5%	Tab 1a - L3	0.0%		100.0%		33.4%	Homes in service area	
CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	Lighting	34.5%	Tab 1a - L3	0.0%		100.0%		33.4%	Homes in service area	
LED options, inc. MR 16, R16, R20, R30, R38 & G25	Lighting	100.0%				100.0%		33.4%	Homes in service area	Not included in survey



## Residential Electric Model - Multi Family Saturation

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LED Exit Signs	Commercial Measure					100.0%		33.4%		Commercial Measure
CFL Torchiere (residential)	Lighting					100.0%		33.4%		Included in CFL Bulbs
CFL Torchiere (commercial)	Commercial Measure					100.0%		33.4%		Commercial Measure
CFL fixtures- exterior (high use)	Lighting					100.0%		33.4%		Included in CFL Bulbs
Occupancy sensors	Lighting					100.0%		33.4%	Homes in service area	Not included in survey
Timers/Motion/Photozell controlled outdoor lighting	Lighting	100.0%		15.0%	2003 CA Study by Architectural Energy Corp for CA Energy Comm.	85.0%		33.4%	Homes in service area with outdoor lighting	Not included in survey. Assumed 100% of homes have at least 1 outdoor socket
Daylighting options, including retrofit & light tubes (informational)	Lighting					100.0%		33.4%		
Cold Cathode Bulbs (informational)	Informational					100.0%		33.4%		
<b>Space Conditioning (Heating and Cooling)</b>										
Programmable Thermostats (SF) - electric (Heating only)	Space Heating	9.4%	Tab 1a - SH2	42.9%	Tab 1c - SH14	57.1%		33.4%	Homes in service area with electric heat & no central air	
Programmable Thermostats (SF) - electric (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH4			100.0%		33.4%	Homes in service area with electric heat & central air	This measure should be deleted because saturation of electrically heated homes with central air is 0%
Programmable Thermostats (SF) - gas furnace (Heating only)	Space Heating	12.6%	Tab 3 - SH2, SH3	43.8%	Tab 1c - SH14	56.2%		33.4%	Homes in service area with natural gas furnace & no central air	
Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	Space Heating/Cooling	10.2%	Tab 3 - SH2, SH3	43.8%	Tab 1c - SH14	56.2%		33.4%	Homes in service area with natural gas furnace & central air	
Programmable Thermostats (SF) - gas boiler (Heating only)	Space Heating	16.5%	Tab 3 - SH2, SH3	43.8%	Tab 1c - SH14	56.2%		33.4%	Homes in service area with natural gas boiler & no central air	
Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	Space Heating/Cooling	0.8%	Tab 3 - SH2, SH3	43.8%	Tab 1c - SH14	56.2%		33.4%	Homes in service area with natural gas boiler & central air	
Programmable Thermostats (SF) - oil furnace (Heating only)	Space Heating	14.2%	Tab 3 - SH2, SH3	13.8%	Tab 1c - SH14	86.2%		33.4%	Homes in service area with oil furnace & no central air	
Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	Space Heating/Cooling	2.4%	Tab 3 - SH2, SH3	13.8%	Tab 1c - SH14	86.2%		33.4%	Homes in service area with oil furnace & central air	
Programmable Thermostats (SF) - oil boiler (Heating only)	Space Heating	4.7%	Tab 3 - SH2, SH3	13.8%	Tab 1c - SH14	86.2%		33.4%	Homes in service area with oil boiler & no central air	
Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH3	13.8%	Tab 1c - SH14	86.2%		33.4%	Homes in service area with oil boiler & central air	
Efficient Furnace Fan (Non-Electric Furnace)	Space Heating	49.6%	Tab 1a - SH3	14.2%	Tab 1a - SH7, SH8	85.8%		33.4%	Homes in service area with non-electric furnace	This measure was not specifically addressed in the survey. Base case factor is based on fairly new (<=10 yrs. old) systems that respondents said are energy efficient
HVAC Tune-Up (Electric Heat)	Space Heating	9.4%	Tab 1a - SH2	44.4%	Tab 1c - SH6	55.6%		33.4%	Homes in service area with electric heat	Due to low # of respondents, use average across all fuel types
HVAC Tune-Up (Gas Heat)	Space Heating	48.8%	Tab 1a - SH2	53.8%	Tab 1c - SH6	46.2%		33.4%	Homes in service area with gas heat	
HVAC Tune-Up (Oil Heat)	Space Heating	22.8%	Tab 1a - SH2	83.3%	Tab 1c - SH6	16.7%		33.4%	Homes in service area with oil heat	
Energy Star Room A/C	Room AC	59.1%	Tab 1a - SC7	37.3%	Tab 1a - PP7A_2, PP7B_2	62.7%		33.4%	Homes in service area with one or more window A/C units	Average of 1.6 plugged in room air conditioners per home with at least 1 room air conditioner
Energy Star ceiling fans	Impacts Heating & Cooling					100.0%		33.4%		Not included in survey
High Efficiency Central AC (Tier 1)	Central AC	21.3%	Tab 1a - SC1	18.5%	Tab 1a - PP7A_1, PP7B_1	81.5%		33.4%	Homes in service area with central AC	
High Efficiency Central AC (Tier 2)	Central AC	21.3%	Tab 1a - SC1	18.5%	Tab 1a - PP7A_1, PP7B_1	81.5%		33.4%	Homes in service area with central AC	
High Efficiency Heat Pump (Tier 1)	Heating/Cooling	100.0%		3.0%	RMLD Tech Potential (GDS/EPRI: GDS assumptions based on information from Residential HVAC Data, Assumptions and Methodology for end use forecasting with EPRI REEPS 2.1 1994)	97.0%		33.4%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
High Efficiency Heat Pump (Tier 2)	Heating/Cooling	100.0%		4.0%	RMLD Tech Potential (GDS/EPRI: GDS assumptions based on information from Residential HVAC Data, Assumptions and Methodology for end use forecasting with EPRI REEPS 2.1 1994)	96.0%		33.4%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
Ground Source Heat Pump	Heating/Cooling	100.0%		1.0%	RMLD Tech Potential (NWAlliance: NWAlliance.org Market Research Report on Ground Source Heat Pump Market Assessment 9/2000)	99.0%		33.4%	Homes in service area	
HE Whole House Fans	Air Conditioning	100.0%				100.0%		33.4%	Homes in service area	
High Efficiency Furnace - Natural Gas	Space Heating	22.8%	Tab 3 - SH2, SH3	12.9%	Tab 1a - SH2; Tab 3 - SH8, SH2	87.1%		33.4%	Homes in service area with natural gas furnace	

## Residential Electric Model - Multi Family Saturation

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High Efficiency Furnace - Propane	Space Heating	4.7%	Tab 3 - SH2, SH3	26.7%	Tab 1a - SH2; Tab 3 - SH8, SH2;	73.3%		33.4%	Homes in service area with propane furnace	
High Efficiency Furnace - Oil	Space Heating	16.5%	Tab 3 - SH2, SH3	13.8%	Tab 1a - SH2; Tab 3 - SH8, SH2;	86.2%		33.4%	Homes in service area with oil furnace	
High Efficiency Boiler - Natural Gas	Space Heating	17.3%	Tab 3 - SH2, SH3	12.9%	Tab 1a - SH2; Tab 3 - SH8, SH2;	87.1%		33.4%	Homes in service area with natural gas boiler	
High Efficiency Boiler - Propane	Space Heating	5.9%	Tab 3 - SH2, SH3	26.7%	Tab 1a - SH2; Tab 3 - SH8, SH2;	73.3%		33.4%	Homes in service area with propane boiler	
High Efficiency Boiler - Oil	Space Heating	4.7%	Tab 3 - SH2, SH3	13.8%	Tab 1a - SH2; Tab 3 - SH8, SH2;	86.2%		33.4%	Homes in service area with oil boiler	
Improved Steam Vents (SF) - gas	Space Heating	0.8%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with natural gas steam boiler	Should consider dropping this measure or combining all steam trap measures because the percentage of homes with natural gas steam boilers is less than 1%
Improved Steam Vents (SF) - LPG	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all steam trap measures because the percentage of homes with natural gas steam boilers is less than 1%
Improved Steam Vents (SF) - oil	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with oil steam boiler	Might want to combine all of the steam trap measures because of low saturation of steam boilers
Efficient Steam Boiler (SF) - gas	Space Heating	0.8%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with natural gas steam boiler	Should consider dropping this measure or combining all efficient steam boiler measures because the percentage of homes with natural gas steam boilers is less than 1%
Efficient Steam Boiler (SF) - LPG	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all efficient steam boiler measures because the percentage of homes with natural gas steam boilers is less than 1%
Efficient Steam Boiler (SF) - oil	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%	Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%		33.4%	Homes in service area with oil steam boiler	Might want to combine all of the efficient steam boiler measures because of low saturation of steam boilers
Duct Sealing - electric	Heating/Cooling	8.6%	RMLD Residential Tech Potential (RECS HC3: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC3-9b. Space Heating by Northeast Census Region, Percent of U.S. Households.)	25.0%	RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Base: Assumes 2 Ton Unit with SEER 10 & HSPF 6.8 (Boston MA))	75.0%		33.4%	Homes in service area with electric heat - forced hot air	Small N (N=3) Forced Hot Air/Electric is not specified
Duct Sealing - gas	Heating/Cooling	22.8%	Tab 3 - SH2, SH3	50.0%	RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Assumes 2Ton Unit, with 500 Full Load Cooling Hrs. SEER 10)	50.0%		33.4%	Homes in service area with natural gas heat - forced hot air	Duct sealing not addressed in survey
Duct Sealing - LPG	Heating/Cooling	4.7%	Tab 3 - SH2, SH3			100.0%		33.4%	Homes in service area with LPG heat - forced hot air	Duct sealing not addressed in survey
Duct Sealing - oil	Heating/Cooling	16.5%	Tab 3 - SH2, SH3	50.0%	RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing, measure assumptions and other key factors, Assumes 2Ton Unit, with 500 Full Load Cooling Hrs. SEER 10)	50.0%		33.4%	Homes in service area with oil heat - forced hot air	Duct sealing not addressed in survey
Off Peak Cooling w/ Thermal Energy Storage (Informational)	Informational					100.0%		33.4%		
Combo Systems (Informational)	Informational					100.0%		33.4%		
<b>Building Envelope</b>										
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes

## Residential Electric Model - Multi Family Saturation

Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		33.4%	New Homes	No question in the survey regarding Energy Star Homes
Energy Efficient Windows (SF) - electric heat	Heating/Cooling	9.4%		14.3%	Tab 1c - PP7A_10, PP7B_10	85.7%		33.4%	Homes in service area with electric heat	
Energy Efficient Windows (SF) - gas heat	Heating/Cooling	48.8%		14.1%	Tab 1c - PP7A_10, PP7B_10	85.9%		33.4%	Homes in service area with natural gas heat	
Energy Efficient Windows (SF) - LPG heat	Heating/Cooling	11.8%		11.1%	Tab 1c - PP7A_10, PP7B_10	88.9%		33.4%	Homes in service area with LPG heat	
Energy Efficient Windows (SF) - oil heat	Heating/Cooling	22.8%		9.8%	Tab 1c - PP7A_10, PP7B_10	90.3%		33.4%	Homes in service area with oil heat	
Interior Storm Windows (Low-e or double clear film)	Heating/Cooling	100.0%		29.9%	Tab 1a - BE1_1	70.1%		33.4%	Homes in service area	
Cool roofing/white roof/green roof (Central AC)	Central AC	100.0%				100.0%		33.4%	Homes in service area	Not included in the survey
Exterior Door Insulation (New, Replacement, Retrofit)	Heating/Cooling	100.0%				100.0%		33.4%	Homes in service area	Is this a storm door? Not included in survey
Tree Shading (Central Air)	Central AC	21.3%	Tab 1a - SC1	50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 2Ton Unit, with 500 Full Load Cooling Hrs, SEER 10)	49.6%		33.4%	Homes in service area with central AC	Tree shading not addressed in survey
Tree Shading (Room AC)	Central AC	59.1%	Tab 1a - SC7	50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Base: Assumes 1200 sq ft. house)	49.6%		33.4%	Homes in service area with Room AC	Tree shading not addressed in survey
Tree Shading (Central Air)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Assumes 2Ton Unit, with 500 Full Load Cooling Hrs, SEER 10)	49.6%		33.4%		Duplicate measure
Tree Shading (Room AC)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential Energy Consumption Survey 2001 (RECS) Table HC4-9b. Air Conditioning by Northeast Census Region, Percent of U.S. Households, Base: Assumes 1200 sq ft. house)	49.6%		33.4%		Duplicate measure
Insulation/weatherization package - electric heat multi family	Space Heating	9.4%	Tab 1a - SH2	16.7%	Tab 3 - SH2, BE3	83.3%		33.4%	Homes in service area with electric heat	Which insulation weatherization measures will be included? These combined measures or the detailed good/better/best (note Small N =3 for electric heat)
Insulation/weatherization package - gas heat	Space Heating	48.8%	Tab 1a - SH2	14.5%	Tab 3 - SH2, BE3	85.5%		33.4%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation
Insulation/weatherization package - LPG heat	Space Heating	11.8%	Tab 1a - SH2	26.7%	Tab 3 - SH2, BE3	73.3%		33.4%	Homes in service area with LPG heat	base case = respondents that said they have added insulation
Insulation/weatherization package - oil heat	Space Heating	22.8%	Tab 1a - SH2	24.1%	Tab 3 - SH2, BE3	75.9%		33.4%	Homes in service area with oil heat	base case = respondents that said they have added insulation
Insulation/weatherization package - Good (Improved Base Home) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	12.5%	Tab 3 - SH2, BE3	87.5%		33.4%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	4.2%	Tab 3 - SH2, BE3	95.8%		33.4%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	10.9%	Tab 3 - SH2, BE3	89.1%		33.4%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)

## Residential Electric Model - Multi Family Saturation

Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	3.6%	Tab 3 - SH2, BE3	96.4%		33.4%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	20.0%	Tab 3 - SH2, BE3	80.0%		33.4%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	6.7%	Tab 3 - SH2, BE3	93.3%		33.4%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	18.1%	Tab 3 - SH2, BE3	81.9%		33.4%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	6.0%	Tab 3 - SH2, BE3	94.0%		33.4%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	Space Heating	9.4%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with electric heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	Space Heating	48.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with natural gas heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	Space Heating	11.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with LPG heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	Space Heating	22.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with oil heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPs) for renovations/additions - electric heat	Space Heating	9.4%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with electric heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPs) for renovations/additions - gas heat	Space Heating	48.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with natural gas heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	Space Heating	11.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with LPG heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPs) for renovations/additions - oil heat	Space Heating	22.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with oil heat	This level of insulation detail not included in the survey
New Construction (standard) - Electric Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Natural Gas Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Propane Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Oil Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (BPI) - Electric Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Natural Gas Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Propane Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Oil Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
LI Insulation & Weatherization (Electrically Heated)	Space Heating	9.1%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with electric heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating	24.2%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with natural gas heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Propane Heated)	Space Heating	12.1%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with propane heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Oil Heated)	Space Heating	36.4%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with oil heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Central AC)	Central AC	9.1%	Tab 5-SC1	30.3%		69.7%		33.4%	Low income homes in service area with central AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Room AC)	Room AC	78.8%	Tab 5-SC7	30.3%		69.7%		33.4%	Low income homes in service area with room AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Electrically Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Propane Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Gas Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Central AC)	Central AC					100.0%		33.4%		Duplicate measure

## Residential Electric Model - Multi Family Saturation

Measure Name	End Use Affected	End Use Saturation (Percentage of total homes that contain the electric end use or the measure)	Saturation Source (Survey Question)	EE Penetration (Fraction of the end use energy that is already energy efficient)	EE Penetration Source (Survey Question)	Remaining Factor (In how many homes can this be installed)	Convertibility Factor	Single-/Multi-Family Fraction (Q. HC2)	Type of home where applicable	Comment
LI Insulation & Weatherization (Room AC)	Room AC					100.0%		33.4%		Duplicate measure
<b>Standby Power and Automation</b>										
Standby Power (ES Plug loads including battery chargers, cordless phones, TV/DVD combo units, DVD, External Power adapters, home Audio)	Appliances	100.0%		15.0%		85.0%		33.4%	Homes in service area	Not addressed in the survey. Used data from GDS VT study
Energy Efficient "Smart" Power Strip for PC/Monitor/Printer	Computers/Printers	68.5%	Tab 1a - TC2			100.0%		33.4%	Homes in service area with 1 or more computers	Average 1.6 computers per home with 1 or more computers. This measure is not addressed in the survey. Similar savings are assumed to be included in Energy Star office equipment.
Home Automation & SMART Controls	Appliances	100.0%				100.0%		33.4%	Homes in service area	Not addressed in the survey
<b>Pools</b>										
Pool Pump and Motor	Pool					100.0%		33.4%	Homes in service area with a pool	Survey question only asked about heated pools
High efficiency spas/hot tubs	Spa/Hot Tub	5.9%	Tab 1a - HT1			100.0%		33.4%	Homes in service area with outdoor spa/hot tub	What is a high efficiency Spa/Hot Tub? Survey asks about covers and timers for the heater.
Solar Pool Heater	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Electric (EF=0.95)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Natural Gas Propane (EF=0.67)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Propane (EF=0.67)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Temperature control	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Pool Cover	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Outdoor ponds / fountains	Ponds/Fountains					100.0%		33.4%		Very low saturation: May want to consider dropping







## Residential Non Electric Model - Measure Assumptions

Measure Assumptions (Initial Assumptions & Levelized Costs)														Admin	\$0.00	Discount Rate				5.00%
Measure	Measure Name	Home Type	Base MMBTU Use (MMBTU)	% Savings	MMBTU Savings (MMBTU)	BaseElec Use (kWh)	Elec. Savings (kWh)	Useful Life	Measure Cost (Incr/Fall)	End Use Description	Base End Use Saturation	End Use or Measure?	EE Penetration	Annual (MMBTU) Savings	Annual Water Savings (gal.)	Annual Amortized Cost Per Unit	Levelized Cost (- Admin)	Levelized Cost (+ Admin)		
<b>New Construction Homes - Single Family/Multi Family</b>																				
138	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Gas Heat	SF	131.20	23.55%	30.90	10,138.00	147.00	25.00	1328.41	Total Home Gas Use	13.04%	EU	20.00%	30.9		\$94.25	\$3,050	\$3,050		
139	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - Gas Heat	SF	131.20	43.83%	57.50	10,138.00	1,675.00	25.00	6332.84	Total Home Gas Use	13.04%	EU	20.00%	57.5		\$449.33	\$7,814	\$7,814		
140	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Gas Heat	SF	131.20	58.16%	76.30	10,138.00	1,688.00	25.00	11546.96	Total Home Gas Use	13.04%	EU	20.00%	76.3		\$819.29	\$10,738	\$10,738		
141	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - LPG Heat	SF	131.20	23.25%	30.50	10,138.00	113.00	25.00	1328.41	Total Home LPG Use	14.23%	EU	20.00%	30.5		\$94.25	\$3,090	\$3,090		
142	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - LPG Heat	SF	131.20	43.75%	57.40	10,138.00	1,675.00	25.00	6332.84	Total Home LPG Use	14.23%	EU	20.00%	57.4		\$449.33	\$7,828	\$7,828		
143	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - LPG Heat	SF	131.20	58.08%	76.20	10,138.00	1,702.00	25.00	11546.96	Total Home LPG Use	14.23%	EU	20.00%	76.2		\$819.29	\$10,752	\$10,752		
144	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Oil Heat	SF	109.40	17.60%	19.25	12,258.00	4,795.00	25.00	1328.41	Total Home Oil Use	56.52%	EU	20.00%	19.3		\$94.25	\$4,896	\$4,896		
145	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - Oil Heat	SF	109.40	30.53%	33.40	12,258.00	5,728.00	25.00	6332.84	Total Home Oil Use	56.52%	EU	20.00%	33.4		\$449.33	\$13,453	\$13,453		
146	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Oil Heat	SF	109.40	47.85%	52.35	12,258.00	5,846.00	25.00	10946.96	Total Home Oil Use	56.52%	EU	20.00%	52.4		\$776.71	\$14,837	\$14,837		
147	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Gas Heat	MF	67.88	29.67%	20.14	5,990.13	94.25	25.00	\$574.86	Total Home Gas Use	48.82%	EU	20.00%	20.1		\$40.79	\$2,025	\$2,025		
148	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - Gas Heat	MF	67.88	51.53%	34.98	5,990.13	740.00	25.00	\$1,875.00	Total Home Gas Use	48.82%	EU	20.00%	35.0		\$133.04	\$3,804	\$3,804		
149	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Gas Heat	MF	67.88	61.55%	41.78	5,990.13	1,241.75	25.00	\$3,502.44	Total Home Gas Use	48.82%	EU	20.00%	41.8		\$248.51	\$5,949	\$5,949		
150	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - LPG Heat	MF	67.66	28.90%	19.55	5,785.13	106.50	25.00	\$574.86	Total Home LPG Use	11.81%	EU	20.00%	19.6		\$40.79	\$2,086	\$2,086		
151	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - LPG Heat	MF	67.66	51.33%	34.73	5,785.13	535.50	25.00	\$1,875.00	Total Home LPG Use	11.81%	EU	20.00%	34.7		\$133.04	\$3,831	\$3,831		
152	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - LPG Heat	MF	67.66	61.75%	41.78	5,785.13	1,016.00	25.00	\$3,502.44	Total Home LPG Use	11.81%	EU	20.00%	41.8		\$248.51	\$5,948	\$5,948		
153	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Oil Heat	MF	48.77	41.11%	20.05	10,491.38	896.75	25.00	\$574.86	Total Home Oil Use	22.83%	EU	20.00%	20.1		\$40.79	\$2,034	\$2,034		
154	Integrated Building Design - Better (ENERGY STAR Home ~ 35% Savings) - Oil Heat	MF	48.77	30.92%	15.08	10,491.38	5,218.00	25.00	\$1,875.00	Total Home Oil Use	22.83%	EU	20.00%	15.1		\$133.04	\$8,821	\$8,821		
155	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Oil Heat	MF	48.77	45.56%	22.22	10,491.38	5,763.75	25.00	\$3,502.44	Total Home Oil Use	22.83%	EU	20.00%	22.2		\$248.51	\$11,183	\$11,183		



## Residential Non Electric Model - Data Sources (Water Heating)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/10/2008

Measure Assumptions			Measure Life and Cost Values			Electric Savings Assumptions					Fuel Savings Assumptions					Water
Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year		
<b>Water Heating</b>																
201 Energy Star Dishwasher (Residential-w/Electric DHW)	11	\$27	2	467	29.23%	137	0.192	0	0	0	0	0	0	430		
202 Energy Star Dishwasher (Residential-w/Gas DHW)	11	\$27	2	264	29.17%	77	0.108	1.91	67%	1.27	0	0	0	430		
203 Energy Star Dishwasher (Residential-w/Propane DHW)	11	\$27	2	264	29.17%	77	0.108	2.02	67%	0	1.34	0	0	430		
204 Energy Star Dishwasher (Residential-w/Oil DHW)	11	\$27	2	264	29.17%	77	0.108	3.22	67%	0	0	2.14	0	430		
205 Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	11	\$50	2	467	32.35%	151	0.212	0	0	0	0	0	0	430		
206 Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	11	\$50	2	264	32.18%	85	0.119	1.91	68%	1.30	0	0	0	430		
207 Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	11	\$50	2	264	32.18%	85	0.119	2.02	68%	0	1.37	0	0	430		
208 Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	11	\$50	2	264	32.18%	85	0.119	3.22	68%	0	0	2.19	0	430		
209 Energy Star Clothes Washer (w/ Electric DHW)	11	\$200	2	820	31.46%	258	0.336	0	0	0	0	0	0	6978		
210 Energy Star Clothes Washer (w/ Gas DHW)	11	\$200	2	82	31.46%	25.8	0.034	2.95	30%	0.88	0	0	0	6978		
211 Energy Star Clothes Washer (w/ Propane DHW)	11	\$200	2	82	31.46%	25.8	0.034	2.02	30%	0	0.60	0	0	6978		
212 Energy Star Clothes Washer (w/ Oil DHW)	11	\$200	2	82	31.46%	25.8	0.034	3.22	30%	0	0	0.96	0	6978		
213 Natural Gas Clothes Dryer Fuel Switch	14	\$260	2	977	100%	977	1.273	-	0.0	-3.33	0	0	0	0		
214 Propane Clothes Dryer Fuel Switch	14	\$260	2	977	100%	977	1.273	-	0.0	0	-3.33	0	0	0		
215 Efficient Water Heater (EF=0.93)	13	\$20	2	2140	3%	60	-	0	0	0	0	0	0	0		
216 High efficiency water heater (EF=0.95)	13	\$50	2	2140	5%	104	-	0	0	0	0	0	0	0		
217 High Efficiency Water Heater - Natural Gas (EF=0.62)	10	\$81	2	0	0%	0	0	18	10.0%	1.81	0	0	0	0		
218 High Efficiency Water Heater - Natural Gas (EF=0.67)	10	\$400	2	0	0%	0	0	18	14.2%	2.57	0	0	0	0		
219 High Efficiency Water Heater - Propane (EF=0.67)	10	\$400	2	0	0%	0	0	19	14.2%	0	2.71	0	0	0		
220 High Efficiency Water Heater - Oil (EF=0.66)	10	\$450	2	0	0%	0	0	31	13.0%	0	0	3.97	0	0		
221 Gas-Condensing Water Heater - Natural Gas (EF=0.80)	15	\$685	2	0	0%	0	0	18	28.4%	5.13	0	0	0	0		
222 Gas-Condensing Water Heater - Propane (EF=0.80)	15	\$685	2	0	0%	0	0	19	28.4%	0	5.42	0	0	0		
223 Whole-House Tankless Water Heater - Nat Gas <=200 kBtuH	15	\$1,000	2	0	0%	0	0	18	43.1%	7.80	0	0	0	0		
224 Whole-House Tankless Water Heater - Electric <=12 kW	20	\$850	2	2140	9%	186	0.02	0	0	0	0	0	0	0		
225 Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	15	\$850	2	0	0%	0	0	18	23%	4.1	0	0	0	0		
226 Heat Pump Water Heater	10	\$850	2	2140	55%	1173	-	0	0	0	0	0	0	0		
227 Solar Water Heating - Active, w/ Elec Backup	20	\$7,500	1	2140	50%	1070	0.2	0	0	0	0	0	0	0		
228 Solar Water Heating - Active, w/ Gas Backup	20	\$7,500	1	0	0%	0	0	18	60%	11	0	0	0	0		
229 Solar Water Heating - Active, w/ Propane Backup	20	\$7,500	1	0	0%	0	0	19	60%	0	11	0	0	0		
230 Solar Water Heating - Active, w/ Oil Backup	20	\$7,500	1	0	0%	0	0	31	60%	0	0	18.3	0	0		
231 Low Flow Showerhead/Faucets - electric	9	\$21	2	2140	8%	175	-	0	0	0	0	0	0	4937		
232 Low Flow Showerhead/Faucets - gas	9	\$21	2	0	0%	0	0	18	2.0%	0.36	0	0	0	0		
233 Low Flow Showerhead/Faucets - LPG	9	\$21	2	0	0%	0	0	19	1.9%	0	0.36	0	0	0		
234 Low Flow Showerhead/Faucets - oil	9	\$21	2	0	0%	0	0	31	4.1%	0	0	1.24	0	0		
235 Pipe Wrap - electric DHW	15	\$15	2	2140	2%	33	-	0	0	0	0	0	0	0		
236 Pipe Wrap - gas DHW	15	\$15	2	0	0%	0	0	18	0.17%	0.03	0	0	0	0		
237 Pipe Wrap - LPG DHW	15	\$15	2	0	0%	0	0	19	0.2%	0	0.03	0	0	0		
238 Pipe Wrap - oil DHW	15	\$15	2	0	0%	0	0	31	0.3%	0	0	0.1	0	0		
239 Water Heater Blanket/Tank Insulation - electric only	7	\$35	2	2140	5%	110	-	0	0	0	0	0	0	0		
240 Horizontal Axis Washer-Dryer Combination Unit (informational)	n/a	n/a	n/a	GDS research found that models sold in U.S. today use ventless, vapor-condensing dryers for niche markets: small apartments, RVs, luxury boats and other space-constrained applications. Typical dryer times last 1.5 to 2 hours, making them unappealing to most U.S. consumers. Potential applications for load control opps												
241 Built-in Interior Clothes Lines in new construction (informational)	20	\$15	1	977	10%	98	-	-	-	0.28	0.25	0	0	0		

## Residential Non Electric Model - Data Sources (Water Heating)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions				Water	Notes		
	Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kWh demand savings - Summer Coincident (1)	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas			Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil
<b>Water Heating</b>															
201	Energy Star Dishwasher (Residential-w/Electric DHW)	ES Calc-DWashr	EVT 251	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
202	Energy Star Dishwasher (Residential-w/Gas DHW)	ES Calc-DWashr	EVT 251	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
203	Energy Star Dishwasher (Residential-w/Propane DHW)	ES Calc-DWashr	EVT 251	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
204	Energy Star Dishwasher (Residential-w/Oil DHW)	ES Calc-DWashr	EVT 251	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.65. Assumed 215 loads per year, 1290 gallons water per year - base consumption
205	Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	ES Calc-DWashr	GDS/www	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
206	Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	ES Calc-DWashr	GDS/www	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
207	Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	ES Calc-DWashr	GDS/www	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
208	Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	ES Calc-DWashr	GDS/www	ES Calc-D	ES Calc-DWashr	GDS		ES Calc-DWashr	NYSERDA Dema	ES Calc-DWashr	ES Calc-DWashr			ES Calc-DWashr	EF = 0.68. Assumed 215 loads per year, 1290 gallons water per year - base consumption
209	Energy Star Clothes Washer (w/ Electric DHW)	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CI	ES Calc-CIWashr	GDS		ES Calc-CIWashr	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIWashr			ES Calc-CIWashr	year - base consumption
210	Energy Star Clothes Washer (w/ Gas DHW)	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CI	ES Calc-CIWashr	GDS		ES Calc-CIWashr	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIWashr			ES Calc-CIWashr	year - base consumption
211	Energy Star Clothes Washer (w/ Propane DHW)	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CI	ES Calc-CIWashr	GDS		ES Calc-CIWashr	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIWashr			ES Calc-CIWashr	year - base consumption
212	Energy Star Clothes Washer (w/ Oil DHW)	ES Calc-CIWashr	ES Calc-CIW	ES Calc-CI	ES Calc-CIWashr	GDS		ES Calc-CIWashr	NYSERDA Dema	ES Calc-CIWashr	ES Calc-CIWashr			ES Calc-CIWashr	year - base consumption
213	Natural Gas Clothes Dryer Fuel Switch	EVT 366	EVT 367	EVT 366	EVT 366	EVT 366		EVT 366	NYSERDA Dema						
214	Propane Clothes Dryer Fuel Switch	EVT 366	EVT 367	EVT 366	EVT 366	EVT 366		EVT 366	NYSERDA Dema						
215	Efficient Water Heater (EF=0.93)	ES Analysis-Res	GDS	ES Analysis-Res	RECS CE4	ES Analysis-ResD		GDS							
216	High efficiency water heaters (EF=0.95)	ES Analysis-Res	ES Analysis-Res	ES Analysis-Res	RECS CE4	ES Analysis-ResD		GDS							
217	High Efficiency Water Heater - Natural Gas (EF=0.62)	51	ES Analysis-Res	ES Analysis-Res				51							System EF = 0.62
218	High Efficiency Water Heater - Natural Gas (EF=0.67)	51	ES Analysis-Res	ES Analysis-Res				RECS CE4	ES Analysis-ResDWH Tbl 2/GDS	ES Analysis-ResDWH Tbl 2/GDS					System EF = 0.67
219	High Efficiency Water Heater - Propane (EF=0.67)	51	ES Analysis-Res	ES Analysis-Res				RECS CE4	ES Analysis-ResDWH Tbl 2/GDS		ES Analysis-ResD				System EF = 0.67
220	High Efficiency Water Heater - Oil (EF=0.66)	ACEEE T6.6	ACEEE T6.6	ACEEE T6.6				RECS CE4	GDS			ACEEE T6.6			System EF = 0.66
221	Gas-Condensing Water Heater - Natural Gas (EF=0.80)	ES Analysis-Res	ES Analysis-Res	ES Analysis-Res				RECS CE5	ES Analysis-ResDWH Tbl 2/GDS	ES Analysis-ResDWH Tbl 2/GDS					
222	Gas-Condensing Water Heater - Propane (EF=0.80)	ES Analysis-Res	ES Analysis-Res	ES Analysis-Res				RECS CE6	ES Analysis-ResDWH Tbl 2/GDS		ES Analysis-ResD				
223	Whole-House Tankless Water Heater - Nat Gas <=200 kBTHU	51	ES Analysis-Res	ES Analysis-Res				RECS CE4			51				System EF = 0.82
224	Whole-House Tankless Water Heater - Electric <=12 kW	ES Analysis-Res	ES Analysis-Res	ES Analysis-Res	RECS CE4	ES Analysis-ResD		GDS	NYSERDA Dema						System EF = 0.99
225	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	51	ACEEE T6.6	ACEEE T6.6				RECS CE4		REM/Rate					
226	Heat Pump Water Heater	ES Analysis-Res	ES Analysis-Res	ES Analysis-Res	RECS CE4	ES Analysis-ResD		GDS							System EF = 2.0
227	Solar Water Heating - Active, w/ Elec Backup	ES Analysis-Res	50	ES Analysis-Res	RECS CE4	ES Analysis-ResD		GDS	NREL Analysis						System EF = 1.8; elec backup EF = 0.9
228	Solar Water Heating - Active, w/ Gas Backup	RERC	50	ACEEE T6.6					RECS CE4	RERC	RERC				
229	Solar Water Heating - Active, w/ Propane Backup	RERC	50	ACEEE T6.6					RECS CE4	RERC	RERC				
230	Solar Water Heating - Active, w/ Oil Backup	RERC	50	ACEEE T6.6					RECS CE4	RERC	RERC				GDS calculation based on information from RERC (VEIC)
231	Low Flow Showerhead/Faucets - electric	EVT	EVT	EVT	RECS CE4	GDS		EVT	EVT						
232	Low Flow Showerhead/Faucets - gas	EVT	EVT	EVT					RECS CE4	EVT					
233	Low Flow Showerhead/Faucets - LPG	EVT	EVT	EVT					RECS CE4	EVT	EVT				
234	Low Flow Showerhead/Faucets - oil	EVT	EVT	EVT					RECS CE4	EVT	EVT				
235	Pipe Wrap - electric DHW	49	EVT	EVT	RECS CE4	GDS		EVT	EVT						
236	Pipe Wrap - gas DHW	49	EVT	EVT					RECS CE4	EVT					
237	Pipe Wrap - LPG DHW	49	EVT	EVT					RECS CE4	EVT	EVT				
238	Pipe Wrap - oil DHW	49	EVT	EVT					RECS CE4	EVT	EVT				
239	Water Heater Blanket/Tank Insulation - electric only	EVT	EVT	EVT	RECS CE4	GDS		EVT	EVT						
240	Horizontal Axis Washer-Dryer Combination Unit (informational)	-	-	-	CEE Super-Efficient Home Appliances Initiative, CEE/Log; Manufacturer websites and brochures from LG, Splendide, Asko.										
241	Built-in Interior Clothes Lines in new construction (informational)	GDS	GDS	GDS	DOE/EERE A&E										GDS assumption: indoor clothesline will result in 10% overall reduction in clothes dryer use.

Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

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- 3 ACEEE T6.6: 'Consumer Guide to Home Energy Savings' 8th ed. ACEEE. 2003. Table 6.6
- 4 AR RDS: Residential Deem Savings, Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 5 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 6 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV1. California Energy Commission. December 2007.
- 7 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 8 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cookingstd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cookingstd.pdf))
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- 14 ES Analysis-ResDWH: ENERGY STAR® Residential Water Heaters: Final Criteria Analysis (www.energystar.gov). April 2008.
- 15 ES Calc- CPU: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Home Computer (.xls)
- 16 ES Calc- Dhwm: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Dehumidifiers (.xls)
- 17 ES Calc- RRS: Online calculator for Second Refrigerator Recycling (<http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator&which=1&rate=0.102&models=&screen=2>)
- 18 ES Calc-ASHP: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Air Source Heat Pump (.xls)
- 19 ES Calc-Blr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Boiler (.xls)
- 20 ES Calc-CAC: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Central Air Conditioning (.xls)
- 21 ES Calc-CF: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Ceiling Fan (.xls)
- 22 ES Calc-CIWashr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 23 ES Calc-DWashr: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 24 ES Calc-Freeze: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Freezer Savings (.xls)
- 25 ES Calc-Fridge: Energy Star Calculation (www.energystar.gov) Energy Star Calculator - Residential Refrigerator Savings (.xls)

## Residential Non Electric Model - Data Sources (Water Heating)

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- 27 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
- 28 ES Calc-PStat: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Programmable Thermostat (.xls)
- 29 ES Calc-RAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Room Air Conditioner (.xls)
- 30 EStar TVs: [www.energystar.gov](http://www.energystar.gov)
- 31 EYT: Efficiency Vermont Technical Reference User Manual. No. 2007-47.
- 32 Findsolar.com: Solar estimator for spa/pool heating in New Hampshire. Viewed July 2, 2008.
- 33 FORMS: [www.forms.org](http://www.forms.org)
- 34 GDS: GDS Associates Estimate/Calculation
- 35 HE Mag 4-1995: Home Energy Magazine Online March/April 1995 Shade Trees as a Demand-Side Resource with assumptions based on age of housing stock and other key factors
- 36 KED: KED New Hampshire Low Income Program Year 3 actual annual expenditures.
- 37 MA/RV/VT: Impact Evaluation of the Massachusetts, Rhode Island, & Vermont 2003 Residential Lighting Programs. Nexus Market Research. October 2004.
- 38 NREL Analysis: Deemed Savings for Solar Water Heating. Tim Merrigan, NREL 2001 (<http://www.puc.state.tx.us/electric/projects/22241/22241arc/022801solarheat.pdf>)
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- 43 RECS CE4: Residential Energy Consumption Survey, 2001. Energy Information Administration. Table CE4-9c: Water-Heating Energy Consumption in US Households by Northeast Census Region, 2001.
- 44 RERC: 'Investing in a Solar Hot Water System' Renewable Energy Resource Center: A Project of the Vermont Energy Investment Corporation. ([www.rerc-vt.org/shw\\_investing.htm](http://www.rerc-vt.org/shw_investing.htm))
- 45 SECI 2005: Country Kilowatts Newsletter 2005 Southern Energy Conservation Initiative and [www.EIA.DOE.GOV](http://www.EIA.DOE.GOV) and NYSERDA\_Energysavings.org
- 46 SIPS: [www.sips.org](http://www.sips.org)
- 47 SmartHome: [www.smarthomeusa.com](http://www.smarthomeusa.com)
- 48 TIAx: K. Roth et al. 'Energy Consumption by Consumer Electronics in U.S. Residences.' TIAx LLC, Cambridge, MA, January 2007.
- 49 Measure Life Report, Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group (SPWG). For use as an Energy Efficiency Measures/Programs Reference Document for the ISO Forward Capacity Market (FCM). Prepared by GDS Associates. June 2007.
- 50 Solar Hot Water installation cost - Mark Weisflog, KW Management 10/18/08
- 51 Gas Networks Residential Sector Programs - Measure Lives, Cost, Savings, REVISED August 27, 2008 - Appendix A

## Residential Non Electric Model - Data Sources (Space Conditioning)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/22/2008

Measure Assumptions	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water		
	Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year
<b>Space Conditioning (Heating and Cooling)</b>															
501	Programmable Thermostats (SF) - electric (Heating only)	10	\$89	1	11,665	9.0%	1049.8	0.000	0	#DIV/0!	0	0	0	0	0
502	Programmable Thermostats (SF) - electric (Heating + Central Air)	10	\$89	1	12,804	12.8%	1632.9	1.514	0	#DIV/0!	0	0	0	0	0
503	Programmable Thermostats (SF) - gas furnace (Heating only)	10	\$92	1	0	#DIV/0!	0	0	100	8%	7.7	0	0	0	0
504	Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	10	\$92	1	1,139	12.8%	145.22	0.377	100	8%	7.7	0	0	0	0
505	Programmable Thermostats (SF) - gas boiler (Heating only)	10	\$92	1	0	#DIV/0!	0	0	75	10%	7.7	0	0	0	0
506	Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	75	10%	7.7	0	0	0	0
507	Programmable Thermostats (SF) - oil furnace (Heating only)	10	\$92	1	0	#DIV/0!	0	0	100	9%	0	0	8.7	0	0
508	Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	100	9%	0	0	8.7	0	0
509	Programmable Thermostats (SF) - oil boiler (Heating only)	10	\$92	1	0	#DIV/0!	0	0	75	12%	0	0	9.0	0	0
510	Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	75	12%	0	0	9.0	0	0
	Programmable Thermostats (SF) - propane furnace (Heating only)	10	\$92	1	0	#DIV/0!	0	0.000	100	8%	0	7.7	0	0	0
	Programmable Thermostats (SF) - propane furnace (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	100	8%	0	7.7	0	0	0
	Programmable Thermostats (SF) - propane boiler (Heating only)	10	\$92	1	0	#DIV/0!	0	0.000	75	10%	0	7.7	0	0	0
	Programmable Thermostats (SF) - propane boiler (Heating + Central Air)	10	\$92	1	1,139	12.9%	146.93	0.382	75	10%	0	7.7	0	0	0
511	Programmable Thermostats (MF) - electric (Heating only)	10	\$89	1	24,011	9.0%	2,160.99	0.000	0	0	0	0	0	0	0
512	Programmable Thermostats (MF) - electric (Heating + Central Air)	10	\$89	1	24,549	12.9%	3,166.83	2.613	0	0	0	0	0	0	0
513	Programmable Thermostats (MF) - gas furnace (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	71	8%	5.5	0	0	0	0
514	Programmable Thermostats (MF) - gas furnace (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	71	8%	5.5	0	0	0	0
515	Programmable Thermostats (MF) - gas boiler (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	53	10%	5.5	0	0	0	0
516	Programmable Thermostats (MF) - gas boiler (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	53	10%	5.5	0	0	0	0
517	Programmable Thermostats (MF) - oil furnace (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	71	6%	0	0	4.3	0	0
518	Programmable Thermostats (MF) - oil furnace (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	71	6%	0	0	4.3	0	0
519	Programmable Thermostats (MF) - oil boiler (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	55	8%	0	0	4.5	0	0
520	Programmable Thermostats (MF) - oil boiler (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	55	8%	0	0	4.5	0	0
	Programmable Thermostats (MF) - propane furnace (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	71	8%	0	5.5	0	0	0
	Programmable Thermostats (MF) - propane furnace (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	71	8%	0	5.5	0	0	0
	Programmable Thermostats (MF) - propane boiler (Heating only)	10	\$92	1	0	#DIV/0!	0.00	0	53	10%	0	5.5	0	0	0
	Programmable Thermostats (MF) - propane boiler (Heating + Central Air)	10	\$92	1	538	12.9%	69.41	0.180	53	10%	0	5.5	0	0	0
521	Efficient Furnace Fan (Non-Electric Furnace)	18	\$400	1	914	43%	393	0.258	0	#DIV/0!	0	0	0	0	0
522	HVAC Tune-Up (Electric Heat)	5	\$175	2	11,665	7.0%	3,709	1.226	0	#DIV/0!	0	0	0	0	0
523	HVAC Tune-Up (Gas Heat)	5	\$175	2	1,139	7.0%	80	0.026	100	7%	6.7	0	0	0	0
524	HVAC Tune-Up (Oil Heat)	5	\$175	2	1,139	7.0%	80	0.026	100	7%	0	0	6.7	0	0
525	Energy Star Room A/C	12	\$30	2	786	9.3%	73	0.189	0	#DIV/0!	0	0	0	0	0
526	Energy Star ceiling fans	10	\$86	2	283	62.5%	177		0	#DIV/0!	0	0	0	0	0

Residential Non Electric Model - Data Sources (Space Conditioning)

527	High Efficiency Central AC (Tier 1)	18	\$500	2	1,139	6.9%	79	0.198	0	#DIV/0!	0	0	0	0	0
528	High Efficiency Central AC (Tier 2)	18	\$1,209	2	1,139	13.0%	148	0.369	0	#DIV/0!	0	0	0	0	0
529	High Efficiency Heat Pump (Tier 1)	18	\$1,000	2	13,414	6.2%	829	0.274	0	#DIV/0!	0	0	0	0	0
530	High Efficiency Heat Pump (Tier 2)	18	\$1,200	2	13,414	14.4%	1,926	0.636	0	#DIV/0!	0	0	0	0	0
531	Ground Source Heat Pump	18	\$9,000	2	13,414	21.0%	2,817	0.931	0	#DIV/0!	0	0	0	0	0
532	HE Whole House Fans	10	\$250	2	580	30.7%	178	0.304	0	#DIV/0!	0	0	0	0	0
533	High Efficiency Furnace - Natural Gas	20	\$320	2	0	0	0	0	100	21%	21.1	0	0	0	0
534	High Efficiency Furnace - Propane	20	\$320	2	0	0	0	0	100	21%	0	21.1	0	0	0
535	High Efficiency Furnace - Oil	20	\$320	2	0	0	0	0	101	3%	0	0	3.2	0	0
536	High Efficiency Boiler - Natural Gas	20	\$1,500	2	0	0	0	0	75	15%	11.4	0	0	0	0
537	High Efficiency Boiler - Propane	20	\$1,500	2	0	0	0	0	75	15%	0	11.4	0	0	0
538	High Efficiency Boiler - Oil	20	\$900	2	0	0	0	0	77	5%	0	0	3.8	0	0
539	Improved Steam Vents (SF) - gas	20	\$450	2	0	0	0	0	86	6%	5.1	0	0	0	0
540	Improved Steam Vents (SF) - LPG	20	\$450	2	0	0	0	0	85	6%	0	5.1	0	0	0
541	Improved Steam Vents (SF) - oil	20	\$450	2	0	0	0	0	91	6%	0	0	5.5	0	0
542	Mainline Air vent (MF) - gas	30	\$69	2	0	0	0	0	40	10%	4.0	0	0	0	0
543	Mainline Air vent (MF) - LPG	30	\$69	2	0	0	0	0	40	10%	0	4.0	0	0	0
544	Mainline Air vent (MF) - oil	30	\$69	2	0	0	0	0	43	10%	0	0	4.3	0	0
545	Thermostatic vents (MF) - gas	20	\$239	2	0	0	0	0	40	6%	2.4	0	0	0	0
546	Thermostatic vents (MF) - LPG	20	\$239	2	0	0	0	0	40	6%	0	2.4	0	0	0
547	Thermostatic vents (MF) - oil	20	\$239	2	0	0	0	0	43	6%	0	0	2.6	0	0
548	Efficient Steam Boiler (SF) - gas	25	\$890	2	0	0	0	0	86	2%	2.0	0	0	0	0
549	Efficient Steam Boiler (SF) - LPG	25	\$890	2	0	0	0	0	85	2%	0	2.0	0	0	0
550	Efficient Steam Boiler (SF) - oil	25	\$642	2	0	0	0	0	91	2%	0	0	2.2	0	0
551	Efficient Steam Boiler (MF) - gas	25	\$445	2	0	0	0	0	40	2%	0.9	0	0	0	0
552	Efficient Steam Boiler (MF) - LPG	25	\$445	2	0	0	0	0	40	2%	0	0.9	0	0	0
553	Efficient Steam Boiler (MF) - oil	25	\$321	2	0	0	0	0	43	2%	0	0	1.0	0	0
554	Duct Sealing - electric	20	\$300	2	22,626	5.0%	818.7	0.2705	0	#DIV/0!	0	0	0	0	0
555	Duct Sealing - gas	20	\$300	2	0	0	0	0	100	4%	4.3	0	0	0	0
556	Duct Sealing - LPG	20	\$300	2	0	0	0	0	100	4%	0	4.3	0	0	0
557	Duct Sealing - oil	20	\$300	2	0	0	0	0	101	5%	0	0.0	4.565	0	0
558	Off Peak Cooling w/ Thermal Energy Storage (Informational)									#DIV/0!					
559	Combo Systems (Informational)									#DIV/0!					

## Residential Non Electric Model - Data Sources (Space Conditioning)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	Notes		
	Measure Name*	Measure Life	Installed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh Savings	kWh demand savings - Summer Coincident (1)	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG			Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel
<b>Space Conditioning (Heating and Cooling)</b>																
501	Programmable Thermostats (SF) - electric (Heating only)	53	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	-	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$142.
502	Programmable Thermostats (SF) - electric (Heating + Central Air)	53	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	-	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$142.
503	Programmable Thermostats (SF) - gas furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	52	-	-	
504	Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	ES Calc-PStat	52	-	-	
505	Programmable Thermostats (SF) - gas boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	52	-	-	
506	Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	ES Calc-PStat	52	-	-	
507	Programmable Thermostats (SF) - oil furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
508	Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
509	Programmable Thermostats (SF) - oil boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
510	Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
	Programmable Thermostats (SF) - propane furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (SF) - propane furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (SF) - propane boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (SF) - propane boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
511	Programmable Thermostats (MF) - electric (Heating only)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$142.
512	Programmable Thermostats (MF) - electric (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$142.
513	Programmable Thermostats (MF) - gas furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	52	-	-	
514	Programmable Thermostats (MF) - gas furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	ES Calc-PStat	52	-	-	
515	Programmable Thermostats (MF) - gas boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	52	-	-	
516	Programmable Thermostats (MF) - gas boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	ES Calc-PStat	52	-	-	
517	Programmable Thermostats (MF) - oil furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
518	Programmable Thermostats (MF) - oil furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
519	Programmable Thermostats (MF) - oil boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	-	-	-	REM Rate	ES Calc-PStat	-	-	-	Savings per Degree of Setback (Heating Season) adjusted from 3% to 1.5% (9.0% heating savings assumed). 2641 full-load heating hours/year. Installed cost = \$92.
520	Programmable Thermostats (MF) - oil boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	-	-	-	Savings per Degree of Setback (Cooling Season) adjusted from 6% to 3% (12.75% cooling savings assumed). 385 full-load cooling hours/year. Installed cost = \$92.
	Programmable Thermostats (MF) - propane furnace (Heating only)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (MF) - propane furnace (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (MF) - propane boiler (Heating only)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
	Programmable Thermostats (MF) - propane boiler (Heating + Central Air)	51	52	ACEEE E04	REMRate	-	-	ES Calc-Pstat/GD	ES Calc-PStat	GDS	REM Rate	-	52	-	-	
521	Efficient Furnace Fan (Non-Electric Furnace)	EVT		ENERGYSmart	EVT			EVT	EVT	EVT	-	-	-	-	-	Non-electric heating, no central AC
522	HVAC Tune-Up (Electric Heat)	51		COOL SMART	SECI2005	GDS/EIA		SECI2005	SECI2005	SECI2005	-	-	-	-	-	Homes with Electric Central Air
523	HVAC Tune-Up (Gas Heat)	51		COOL SMART	SECI2005	GDS/EIA		SECI2005	SECI2005	SECI2005	ES Calc-PStat	SECI2005	-	-	-	Homes with Electric Central Air
524	HVAC Tune-Up (Oil Heat)	51		COOL SMART	SECI2005	GDS/EIA		SECI2005	SECI2005	SECI2005	ES Calc-PStat	SECI2005	-	SECI2005	-	Homes with Electric Central Air
525	Energy Star Room A/C	51		ES Calc-RAC	ES Calc-RAC	ES Calc-RAC		ES Calc-RAC	ES Calc-RAC	ES Calc-RAC	-	-	-	-	-	Base: EER - 9.8 / EE: EER - 10.8 (1000 btu/hr). 385 full-load cooling hours per year.
526	Energy Star ceiling fans	ES Calc-CF		ES Calc-CF	ES Calc-CF	ES Calc-CF		ES Calc-CF	ES Calc-CF	ES Calc-CF	-	-	-	-	-	Replace three 60 W bulbs with 20 W bulbs
527	High Efficiency Central AC (Tier 1)	51		National Grid	ES Calc-CAC	REMRate		ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	-	-	-	-	-	Base: SEER - 13 / EE: SEER - 14 (3 Ton Unit). 400 full-load cooling hours per year.
528	High Efficiency Central AC (Tier 2)	51		National Grid	ES Calc-CAC	REMRate		ES Calc-CAC	ES Calc-CAC	ES Calc-CAC	-	-	-	-	-	Base: SEER - 13 / EE: SEER - 15 (3 Ton Unit). 400 full-load cooling hours per year.
529	High Efficiency Heat Pump (Tier 1)	51		ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP		ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	-	-	-	-	-	(Ton Unit)
530	High Efficiency Heat Pump (Tier 2)	51		ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP		ES Calc-ASHP	ES Calc-ASHP	ES Calc-ASHP	-	-	-	-	-	(Ton Unit)

## Residential Non Electric Model - Data Sources (Space Conditioning)

	ACEEE A042	Geothermal	ACEEE A042	ES Calc-ASHP	ACEEE A042	GDS	ES Calc-ASHP												(Ton Unit)
531	Ground Source Heat Pump	Connecticut	Connecticut	Connecticut	Connecticut	Connecticut	Connecticut												Compared to 1.5 ton window AC unit
532	HE Whole House Fans																		Base AFUE = 78%; HE AFUE = 90%; 2100 s.f. home; no programmable thermostat
533	High Efficiency Furnace - Natural Gas	51	52	52				REMRate					52						Base AFUE = 78%; HE AFUE = 90%; 2100 s.f. home; no programmable thermostat
534	High Efficiency Furnace - Propane	51	52	52				REMRate						52					Base AFUE = 78%; HE AFUE = 90%; 2100 s.f. home; no programmable thermostat
535	High Efficiency Furnace - Oil	51	ES Calc-Furn	ES Calc-Fur				REMRate							ES Calc-Blr				Base AFUE = 80%; HE AFUE = 85%; 2100 s.f. home; no programmable thermostat
536	High Efficiency Boiler - Natural Gas	52	52	52				REMRate						52					Base AFUE = 80%; HE AFUE = 85%; 2100 s.f. home; no programmable thermostat
537	High Efficiency Boiler - Propane	52	52	52				REMRate						52					Base AFUE = 80%; HE AFUE = 85%; 2100 s.f. home; no programmable thermostat
538	High Efficiency Boiler - Oil	ES Calc-Blr	ES Calc-Blr	ES Calc-Blr				REMRate							ES Calc-Blr				Base AFUE = 80%; HE AFUE = 85%; 2100 s.f. home; no programmable thermostat
539	Improved Steam Vents (SF) - gas	ACEEE E061:4	ACEEE E061:41	ACEEE E061:41				REMRate	ACEEE E061:41	ACEEE E061:41									
540	Improved Steam Vents (SF) - LPG	ACEEE E061:4	ACEEE E061:41	ACEEE E061:41				REMRate	ACEEE E061:41	ACEEE E061:41					ACEEE E061:41				
541	Improved Steam Vents (SF) - oil	ACEEE E061:4	ACEEE E061:41	ACEEE E061:41				REMRate	ACEEE E061:41	ACEEE E061:41					ACEEE E061:41				
542	Mainline Air vent (MF) - gas	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42									
543	Mainline Air vent (MF) - LPG	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42					ACEEE E061:42				
544	Mainline Air vent (MF) - oil	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42					ACEEE E061:42				
545	Thermostatic vents (MF) - gas	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42									
546	Thermostatic vents (MF) - LPG	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42					ACEEE E061:42				
547	Thermostatic vents (MF) - oil	ACEEE E061:4	ACEEE E061:42	ACEEE E061:42				REMRate + RECS	ACEEE E061:42	ACEEE E061:42					ACEEE E061:42				
548	Efficient Steam Boiler (SF) - gas	EVT	EVT	EVT				REMRate	EVT	EVT									
549	Efficient Steam Boiler (SF) - LPG	EVT	EVT	EVT				REMRate	EVT	EVT					EVT				
550	Efficient Steam Boiler (SF) - oil	EVT	EVT	EVT				REMRate	EVT	EVT					EVT				
551	Efficient Steam Boiler (MF) - gas	EVT	EVT	EVT				REMRate + RECS	EVT	EVT									
552	Efficient Steam Boiler (MF) - LPG	EVT	EVT	EVT				REMRate + RECS	EVT	EVT					EVT				
553	Efficient Steam Boiler (MF) - oil	EVT	EVT	EVT				REMRate + RECS	EVT	EVT					EVT				
554	Improved Duct Sealing - electric	51	EVT	EVT	REMRate	EVT	EVT	ES Calc-ASHP											
555	Improved Duct Sealing - gas	51	EVT	EVT				REMRate	EVT	EVT									
556	Improved Duct Sealing - LPG	51	EVT	EVT				REMRate	EVT	EVT				EVT					
557	Improved Duct Sealing - oil	51	EVT	EVT				REMRate	EVT	EVT				EVT					

\*Measures to be modeled for Single and Multifamily Applications in Existing and New Construction, where applicable  
 Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

- 1 ACEEE A042: Emerging Energy Saving Technologies & Practices for the Buildings Sector as of 2004. ACEEE Report# A042. October 2004. Pg. 84.
- 2 ACEEE E061: N. Elliott et al. "Reducing Oil Use Through Energy Efficiency. Opportunities Beyond Cars and Light Trucks." Report E061. ACEEE. Washington D.C. January 2006.
- 3 ACEEE T6.6: 'Consumer Guide to Home Energy Savings' 8th ed. ACEEE. 2003. Table 6.6
- 4 AR RDS: Residential Demand Savings, Installation & Efficiency Standards. Prepared by Frontier Associates. January 11, 2008.
- 5 CA-NGStudy: California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Vol. 2, pgs. C.1-1, C.4-6.
- 6 CEC: 2007 Appliance Efficiency Standards. Report CEC-400-2007-016-REV.1. California Energy Commission. December 2007.
- 7 Connecticut: Table B-7 (Database of Energy Efficiency Measures) in Appendix B of "Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region," June, 2004, by GDS Associates
- 8 COOL SMART: Quality Installation Verification Services. 2007. ([http://www.mycoolsmart.com/media/QIV\\_Requirements\\_2007.pdf](http://www.mycoolsmart.com/media/QIV_Requirements_2007.pdf))
- 9 DOE OCS: Cooking Products TSD vol. 2 ([http://www.eere.energy.gov/buildings/appliance\\_standards/residential/pdfs/cooksgtd.pdf](http://www.eere.energy.gov/buildings/appliance_standards/residential/pdfs/cooksgtd.pdf))
- 10 DOE/EERE A&E: Appliances and Electronics, "Estimating Appliance and Home Electronic Energy Use" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 11 DOE/EERE WH: Water Heating, "Swimming Pool Heating" ([http://www.eere.energy.gov/consumer/your\\_home/](http://www.eere.energy.gov/consumer/your_home/))
- 12 EES Tbl 32: 2005 Intrusive Residential Standby Survey Report. Prepared by Energy Efficient Strategies P/L, 2005. Tbl 32.
- 13 EIA D1-1: Table D1-1: Electricity Consumption by End Use in New England Households, 2001 by EIA
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- 21 ES Calc-Blr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Boiler (.xls)
- 22 ES Calc-CAC: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Central Air Conditioning (.xls)
- 23 ES Calc-CF: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Ceiling Fan (.xls)
- 24 ES Calc-CWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Clothes Washer Savings (.xls)
- 25 ES Calc-DWashr: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Dishwasher Savings (.xls)
- 26 ES Calc-Freeze: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Freezer Savings (.xls)
- 27 ES Calc-Fridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Refrigerator Savings (.xls)
- 28 ES Calc-Furn: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Furnace (.xls)
- 29 ES Calc-MFridge: Energy Star Calculation ([www.energystar.gov](http://www.energystar.gov)) Energy Star Calculator - Residential Compact Refrigerator Savings (.xls)
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## Residential Non Electric Model - Data Sources (Building Envelope)

NH Additional Energy Efficiency Opportunities - Current/Potential Technologies/Measure Assumptions - Residential Sector

7/22/2008

Measure Assumptions			Measure Life and Cost Value			Electric Savings Assumptions				Fuel Savings Assumptions					Water
Measure Name*	Life	Install ed Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG	Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel	Water savings, gallons per year	
<b>Building Envelope</b>															
401	25	\$2,568	1	21,800.00	20.00%	4,360.00	1.651	0	0	0	0	0	0	0	
402	25	\$9,576	1	21,800.00	35.00%	7,630.00	2.889	0	0	0	0	0	0	0	
403	25	\$45,776	1	21,800.00	50.00%	10,900.00	4.127	0	0	0	0	0	0	0	
404	25	\$2,657	1	10,138.00	1.45%	147.00	0.056	131	24%	31	0	0	0	0	
405	25	\$12,666	1	10,138.00	16.52%	1,675.00	0.634	131	44%	58					
406	25	\$23,094	1	10,138.00	16.65%	1,688.00	0.639	131	58%	76					
407	25	\$2,657	1	10,138.00	1.11%	113.00	0.043	131	23%		30.5				
408	25	\$12,666	1	10,138.00	16.52%	1,675.00	0.634	131	44%	57.4					
409	25	\$23,094	1	10,138.00	16.79%	1,702.00	0.644	131	58%	76.2					
410	25	\$2,657	1	12,258.00	39.12%	4,795.00	1.816	109	18%			19.3			
411	25	\$12,666	1	12,258.00	46.73%	5,728.00	2.169	109	31%			33.4			
412	25	\$21,894	1	12,258.00	47.69%	5,846.00	2.214	109	48%			52.4			
413	25	\$1,150	1	14,228.00	20.00%	632.60	0.240	0	0	0	0	0	0	0	
414	25	\$11,750	1	14,228.00	35.00%	3,068.86	1.162	0	0	0	0	0	0	0	
415	25	\$16,050	1	14,228.00	50.00%	5,582.04	2.114	0	0	0	0	0	0	0	
416	25	\$1,150	1	5,990.13	1.57%	94.25	0.036	68	30%	20	0	0	0	0	
417	25	\$3,750	1	5,990.13	12.35%	740.00	0.280	68	52%	35	0	0	0	0	
418	25	\$7,005	1	5,990.13	20.73%	1,241.75	0.470	68	62%	42					
419	25	\$1,150	1	5,785.13	1.84%	106.50	0.040	68	29%		19.6				
420	25	\$3,750	1	5,785.13	9.26%	535.50	0.203	68	51%		34.7				
421	25	\$7,005	1	5,785.13	17.56%	1,016.00	0.385	68	62%	41.8					
422	25	\$1,150	1	10,491.38	8.55%	896.75	0.340	49	41%			20.1			
423	25	\$3,750	1	10,491.38	49.74%	5,218.00	1.976	49	31%			15.1			
424	25	\$7,005	1	10,491.38	54.94%	5,763.75	2.182	49	46%			22.2			
425	25	\$375	2	16,373	8%	1348	0.446	0	0	0	0	0	0	0	
426	25	\$375	2	0	0	0	0	86	5%	5	0	0	0	0	
427	25	\$375	2	0	0	0	0	85	5%	0	5	0	0	0	
428	25	\$375	2	0	0	0	0	91	5%	0	0	4.6	0	0	
429	25	\$150	2	7,735	7%	539	0.178	0	0	0	0	0	0	0	
430	25	\$150	2	0	0	0	0	40	5%	2	0	0	0	0	
431	25	\$150	2	0	0	0	0	40	5%	0	2	0	0	0	
432	25	\$150	2	0	0	0	0	43	4%	0	0	1.8	0	0	
433															
434	20	\$200	2	1,139	6.6%	75	0.195	0	0	0	0	0	0	0	
435															
436	30	\$90	2	1,139	7.0%	80	0.207	0	10%	15.0	15.2	15.2	0.0	0	
437	30	\$90	2	786	7.0%	55	0.143	0	10%	15.0	15.2	15.2	0.0	0	
438	30	\$90	2	538	7.0%	38	0.098	0	10%	6.4	6.4	6.5	0.0	0	
439	30	\$90	2	371	7.0%	26	0.067	0	10%	6.4	6.4	6.5	0.0	0	
440	20	\$3,409	1 & 2	23,548	7.4%	1,748	0.662	0	0	0	0	0	0	0	
441	20	\$14,011	1 & 2	23,548	16.2%	3,825	1.448	0	0	0	0	0	0	0	
442	20	\$36,854	1 & 2	23,548	24.7%	5,816	2.202	0	0	0	0	0	0	0	
443	20	\$2,763	1 & 2	16,563	14.1%	2,334	0.884	0	0	0	0	0	0	0	
444	20	\$8,837	1 & 2	16,563	25.0%	4,140	1.568	0	0	0	0	0	0	0	
445	20	\$22,225	1 & 2	16,563	34.3%	5,675	2.149	0	0	0	0	0	0	0	
446	20	\$3,305	1 & 2	9,565	11.0%	1,054	0.399	146	18%	26.2	0	0	0	0	
447	20	\$17,033	1 & 2	9,565	12.8%	1,223	0.463	146	34%	49	0	0	0	0	
448	20	\$43,202	1 & 2	9,565	31.4%	3,006	1.138	146	51%	74	0	0	0	0	
449	20	\$3,064	1 & 2	5,922	12.3%	737	0.279	88	13%	11.7	0	0	0	0	
450	20	\$7,942	1 & 2	5,922	13.2%	788	0.298	88	33%	28.7	0	0	0	0	
451	20	\$24,219	1 & 2	5,922	26.5%	1,589	0.602	88	56%	49.3	0	0	0	0	
452	20	\$3,305	1 & 2	9,565	11.0%	1,054	0.399	146	18%	0	26.6	0	0	0	
453	20	\$17,033	1 & 2	9,565	12.8%	1,223	0.463	146	34%	0	49.7	0	0	0	
454	20	\$43,202	1 & 2	9,565	28.1%	2,687	1.017	146	50%	0	73.6	0	0	0	
455	20	\$3,064	1 & 2	5,922	1.5%	87	0.033	88	15%	0.0	13.3	0	0	0	
456	20	\$7,942	1 & 2	5,922	13.0%	772	0.292	88	33%	0.0	28.7	0	0	0	
457	20	\$24,219	1 & 2	5,922	22.4%	1,327	0.502	88	56%	0.0	49.3	0	0	0	
458	20	\$3,305	1 & 2	13,837	7.3%	1,015	0.384	125	21%	0	0	26.73	0	0	
459	20	\$17,033	1 & 2	13,837	8.4%	1,157	0.438	125	40%	0	0	50.28	0	0	
460	20	\$43,202	1 & 2	13,837	23.0%	3,183	1.205	125	50%	0	0	62.32	0	0	
461	20	\$3,064	1 & 2	9,796	0.8%	82	0.031	69	18%	0.0	0.0	12.4	0	0	
462	20	\$7,942	1 & 2	9,796	12.7%	1,246	0.472	69	34%	0.0	0.0	23.3	0	0	
463	20	\$24,219	1 & 2	9,796	18.3%	1,797	0.680	69	41%	0.0	0.0	28.3	0	0	

## Residential Non Electric Model - Data Sources (Building Envelope)

464	Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	100	\$2,132	2	16,373	3.75%	614	0	0	0	0	0	0	0	0	0
465	Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	100	\$2,132	2	0	#DIV/0!	0	0	86	3.0%	2.6	0	0	0	0	0
466	Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	100	\$2,132	2	0	#DIV/0!	0	0	85	3.0%	0	2.6	0	0	0	0
467	Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	100	\$2,132	2	0	#DIV/0!	0	0	91	3.0%	0	0	2.7	0	0	0
468	Structural Insulated Panels (SIPs) for renovations/additions - electric heat	100	\$0	2	16,373	3.90%	639	0	0	0	0	0	0	0	0	0
469	Structural Insulated Panels (SIPs) for renovations/additions - gas heat	100	\$0	2	0	#DIV/0!	0	0	86	3.10%	2.7	0	0	0	0	0
470	Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	100	\$0	2	0	#DIV/0!	0	0	85	3.10%	0	2.6	0	0	0	0
471	Structural Insulated Panels (SIPs) for renovations/additions - oil heat	100	\$0	2	0	#DIV/0!	0	0	91	3.10%	0	0	2.8	0	0	0
472	New Construction (standard) - Electric Heat	20	\$1,500	2	16,373	3.61%	591	0	0	0	0	0	0	0	0	0
473	New Construction (standard) - Natural Gas Heat	20	\$1,500	2	0	#DIV/0!	0	0	86	4.3%	3.68	0	0	0	0	0
474	New Construction (standard) - Propane Heat	20	\$1,500	2	0	#DIV/0!	0	0	85	3.6%	0	3.08	0	0	0	0
475	New Construction (standard) - Oil Heat	20	\$1,500	2	0	#DIV/0!	0	0	91	3.6%	0	0	3.29	0	0	0
476	New Construction (BPI) - Electric Heat	20	\$3,000	2	16,373	3.61%	591	0	0	0	0	0	0	0	0	0
477	New Construction (BPI) - Natural Gas Heat	20	\$3,000	2	0	#DIV/0!	0	0	86	4.3%	3.68	0	0	0	0	0
478	New Construction (BPI) - Propane Heat	20	\$3,000	2	0	#DIV/0!	0	0	85	3.6%	0	3.08	0	0	0	0
479	New Construction (BPI) - Oil Heat	20	\$3,000	2	0	#DIV/0!	0	0	91	3.6%	0	0	3.29	0	0	0
480	LI Insulation & Weatherization (Electrically Heated)	20	\$1,741	2	16,373	25.60%	4191	0	0	0	0	0	0	0	0	0
481	LI Insulation & Weatherization (Natural Gas Heated)	20	\$1,741	2	0	#DIV/0!	0	0	86	50%	43.05	0	0	0	0	0
482	LI Insulation & Weatherization (Propane Heated)	20	\$1,741	2	0	#DIV/0!	0	0	85	42%	0	36.00	0	0	0	0
483	LI Insulation & Weatherization (Gas Heated)	20	\$1,741	2	0	#DIV/0!	0	0	91	42%	0	0	38.53	0	0	0
484	LI Insulation & Weatherization (Central AC)	20	\$1,741	2	1,139	25.64%	292	0	0	0	0	0	0	0	0	0
485	LI Insulation & Weatherization (Room AC)	20	\$1,741	2	786	25.58%	201	0	0	0	0	0	0	0	0	0
486	LI Insulation & Weatherization (Electrically Heated)	20	\$1,741	2	7,735	25.60%	1980	0	0	0	0	0	0	0	0	0
487	LI Insulation & Weatherization (Natural Gas Heated)	20	\$1,741	2	0	#DIV/0!	0	0	40	57%	23.16	0	0	0	0	0
488	LI Insulation & Weatherization (Propane Heated)	20	\$1,741	2	0	#DIV/0!	0	0	40	45%	0	18.30	0	0	0	0
489	LI Insulation & Weatherization (Gas Heated)	20	\$1,741	2	0	#DIV/0!	0	0	43	45%	0	0	19.59	0	0	0
490	LI Insulation & Weatherization (Central AC)	20	\$1,741	2	538	25.65%	138	0	0	0	0	0	0	0	0	0
491	LI Insulation & Weatherization (Room AC)	20	\$1,741	2	371	25.59%	95	0	0	0	0	0	0	0	0	0

## Residential Non Electric Model - Data Sources (Building Envelope)

Sources	Measure Life and Cost Values			Electric Savings Assumptions				Fuel Savings Assumptions					Water	Notes		
	Measure Name*	Life	Install Cost	Cost Type: 1=Full 2=Inc.	Base Elec. Use (kWh)	% Savings	Annual kWh savings	kW demand savings - Summer Coincident	Base Fuel Use (MMBtu)	% Savings	Annual MMBtu savings, Natural Gas	Annual MMBtu savings, LPG			Annual MMBtu savings, Heating Oil	Annual MMBtu savings, Other Fuel
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								Baseboard
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								Baseboard + Instant DWH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								GSPH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Instant DWH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Instant DWH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Single Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Hydroatr + Integrated DWH
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Single Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Hydroatr + Integrated DWH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Single Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Hydroatr + Integrated DWH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								ASHP
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								GSPH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Electric Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH								GSPH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Integrated DWH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Gas Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Integrated DWH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Furnace
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Integrated DWH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - LPG Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate					Hydroatr + Integrated DWH
401	Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Multi Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Furnace + Elec DWH
402	Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Multi Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Boiler + Integrated DWH
403	Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Multi Family - Oil Heat	51	Hoefgen	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLCH, NH	REMRate		REMRate		REMRate			Boiler + Integrated DWH
404	Energy Efficient Windows (SF) - electric heat	50	ACEEE	E051	REMRate	ACEEE E061: 41	GDS	GDS: FLHH + FLC	-	-	-	-	-	-	-	SF-Based on 250 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
405	Energy Efficient Windows (SF) - gas heat	50	ACEEE	E051	-	-	-	-	REMRate		51	-	-	-	-	SF-Based on 250 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
406	Energy Efficient Windows (SF) - LPG heat	50	ACEEE	E051	-	-	-	-	REMRate			51	-	-	-	SF-Based on 250 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
407	Energy Efficient Windows (SF) - oil heat	50	ACEEE	E051	-	-	-	-	REMRate				51	-	-	SF-Based on 250 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
408	Energy Efficient Windows (MF) - electric heat	50	ACEEE	E051	REMRate + RECS CE1	ACEEE E061: 42	GDS	GDS: FLHH + FLC	-	-	-	-	-	-	-	MF-Based on 100 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
409	Energy Efficient Windows (MF) - gas heat	50	ACEEE	E051	-	-	-	-	REMRate + RECS CE1		51	-	-	-	-	MF-Based on 100 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
410	Energy Efficient Windows (MF) - LPG heat	50	ACEEE	E051	-	-	-	-	REMRate + RECS CE1			51	-	-	-	MF-Based on 100 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
411	Energy Efficient Windows (MF) - oil heat	50	ACEEE	E051	-	-	-	-	REMRate + RECS CE1				51	-	-	MF-Based on 100 sq ft of windows savings of .23 MMBTU per 12.5 sq ft; cost \$1.5 per sq ft
412	Interior Storm Windows (Low-e or double clear film)															
413	Cool roofing/white roof/green roof (Central AC)	ACEEE A042	ACEEE A	ACEEE A042	REMRate	ACEEE A042: 1R2	GDS	GDS: FLCH, NH	-	-	-	-	-	-	-	Incr. cost \$0.10 per square foot
414	Exterior Door Insulation (New, Replacement, Retrofit)															
415	Tree Shading (Central Air)	HE Mag 4/19	HE Mag 4	HE Mag 4/1	REMRate	HE Mag 4/1995	GDS	GDS: FLCH, NH	-	49	REM Rate	REM Rate	REM Rate	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
416	Tree Shading (Room AC)	HE Mag 4/19	HE Mag 4	HE Mag 4/1	ES Calc-RAC	HE Mag 4/1996	GDS	GDS: FLCH, NH	-	49	REM Rate	REM Rate	REM Rate	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
417	Tree Shading (Central Air)	HE Mag 4/19	HE Mag 4	HE Mag 4/1	REMRate + RECS CE1	HE Mag 4/1997	GDS	GDS: FLCH, NH	-	49	REM Rate	REM Rate	REM Rate	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
418	Tree Shading (Room AC)	HE Mag 4/19	HE Mag 4	HE Mag 4/1	ES Calc-RAC + RECS CE1	HE Mag 4/1998	GDS	GDS: FLCH, NH	-	49	REM Rate	REM Rate	REM Rate	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
419	Insulation/weatherization package - electric heat - single family - good	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
420	Insulation/weatherization package - electric heat - single family - better	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
421	Insulation/weatherization package - electric heat - single family - best	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
422	Insulation/weatherization package - electric heat - multi family - good	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
423	Insulation/weatherization package - electric heat - multi family - better	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
424	Insulation/weatherization package - electric heat - multi family - best	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	-	-	-	-	-	-	-	Full-Load Cooling Hours = 385; Full-Load Heating Hours = 2,641 for NH (EPA 2002)
428	Insulation/weatherization package - Good (Improved Base Home) - Gas Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
429	Insulation/weatherization package - better (Improved Base Home to Current NH Code) - Gas Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
430	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
431	Insulation/weatherization package - Good (Improved Base Home) - LPG Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
432	Insulation/weatherization package - better (Improved Base Home to Current NH Code) - LPG Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
433	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate					
434	Insulation/weatherization package - Good (Improved Base Home) - Oil Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate		RemRate			
435	Insulation/weatherization package - better (Improved Base Home to Current NH Code) - Oil Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate		RemRate			
436	Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat	50	OtherGDS	ACEEE E061	RemRate	RemRate	RemRate	GDS: FLHH, NH	RemRate		RemRate		RemRate			
437	Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	FORMS	FORMS	FORMS	REMRate	REMRate/GDS	REMRate/GDS	GDS	-	-	-	-	-	-	-	15' x 30' addition to 2000 s.f. house, \$2.03/s.f. ICF incr. cost (wall + ceiling area); incr. savings over fiberglass
438	Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	FORMS	FORMS	FORMS	-	-	-	-	REMRate	REMRate/GDS	GDS	-	-	-	-	15' x 30' addition to 2000 s.f. house, \$2.03/s.f. ICF incr. cost (wall + ceiling area); incr. savings over fiberglass
439	Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	FORMS	FORMS	FORMS	-	-	-	-	REMRate	REMRate/GDS	-	GDS	-	-	-	15' x 30' addition to 2000 s.f. house, \$2.03/s.f. ICF incr. cost (wall + ceiling area); incr. savings over fiberglass
440	Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	FORMS	FORMS	FORMS	-	-	-	-	REMRate	REMRate/GDS	-	-	GDS	-	-	15' x 30' addition to 2000 s.f. house, \$2.03/s.f. ICF incr. cost (wall + ceiling area); incr. savings over fiberglass
441	Structural Insulated Panels (SIPs) for renovations/additions - electric heat	SIPS	SIPS	SIPS	REMRate	REMRate/GDS	REMRate/GDS	GDS	-	-	-	-	-	-	-	15' x 30' addition to 2000 s.f. house, \$0.54/SIP incr. cost (wall + ceiling area); incr. savings over fiberglass

## Residential Non Electric Model - Data Sources (Building Envelope)

442	Structural Insulated Panels (SIPs) for renovations/additions - gas heat	SIPS	SIPS	SIPS	-	-	-	-	-	REMRate	REMRate/GDS	GDS	-	-	-	-	-	15' x 30' addition to 2000 s.f. house, \$0/s.f.SIP incr. cost (wall + ceiling area); incr. savings over fiberglass
443	Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	SIPS	SIPS	SIPS	-	-	-	-	-	REMRate	REMRate/GDS	-	GDS	-	-	-	-	15' x 30' addition to 2000 s.f. house, \$0/s.f.SIP incr. cost (wall + ceiling area); incr. savings over fiberglass
444	Structural Insulated Panels (SIPs) for renovations/additions - oil heat	SIPS	SIPS	SIPS	-	-	-	-	-	REMRate	REMRate/GDS	-	-	GDS	-	-	-	15' x 30' addition to 2000 s.f. house, \$0/s.f.SIP incr. cost (wall + ceiling area); incr. savings over fiberglass
445	New Construction (standard) - Electric Heat	ORNL: 12	KED	KED	REMRate	KED/GDS	-	-	-	-	-	-	-	-	-	-	-	-
446	New Construction (standard) - Natural Gas Heat	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	KED	-	-	-	-	-	-
447	New Construction (standard) - Propane Heat	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	KED/GDS	-	-	-	-	-
448	New Construction (standard) - Oil Heat	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	-	KED/GDS	-	-	-	-
449	New Construction (BP) - Electric Heat	ORNL: 12	KED	KED	REMRate	KED/GDS	-	-	-	-	-	-	-	-	-	-	-	-
450	New Construction (BP) - Natural Gas Heat	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	KED	-	-	-	-	-	-
451	New Construction (BP) - Propane Heat	ORNL: 13	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	KED/GDS	-	-	-	-	-
452	New Construction (BP) - Oil Heat	ORNL: 14	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	-	KED/GDS	-	-	-	-
453	LI Insulation & Weatherization (Electrically Heated)	ORNL: 12	KED	KED	REMRate	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-
454	LI Insulation & Weatherization (Natural Gas Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	KED	-	-	-	-	-	-
455	LI Insulation & Weatherization (Propane Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	KED/GDS	-	-	-	-	-
456	LI Insulation & Weatherization (Gas Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate	KED/GDS	-	-	KED/GDS	-	-	-	-
457	LI Insulation & Weatherization (Central AC)	ORNL: 12	KED	KED	REMRate	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-
458	LI Insulation & Weatherization (Room AC)	ORNL: 12	KED	KED	ES Calc-RAC	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-
459	LI Insulation & Weatherization (Electrically Heated)	ORNL: 12	KED	KED	REMRate + RECS CE1	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-
460	LI Insulation & Weatherization (Natural Gas Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate + RECS C	KED/GDS	KED	-	-	-	-	-	-
461	LI Insulation & Weatherization (Propane Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate + RECS C	KED/GDS	-	KED/GDS	-	-	-	-	-
462	LI Insulation & Weatherization (Gas Heated)	ORNL: 12	KED	KED	-	-	-	-	-	REMRate + RECS C	KED/GDS	-	-	KED/GDS	-	-	-	-
463	LI Insulation & Weatherization (Central AC)	ORNL: 12	KED	KED	REMRate + RECS CE1	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-
464	LI Insulation & Weatherization (Room AC)	ORNL: 12	KED	KED	ES Calc-RAC + RECS CE	ORNL: 29	-	-	-	-	-	-	-	-	-	-	-	-

Note (1) All interior lighting retrofit measures, except for daylight dimming, are assumed to increase fuel costs

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## Residential Non Electric Model - Single Family Saturations

Single Family Households											
All Utilities											
Measure Name	Electric End Use Affected	End Use Saturation (Percentage of total)	Saturation Source	Base Case Factor	Base Case Factor Source (Survey)	Remaining Factor (In how)	Convertibility Factor	Single-/Multi- Family Fraction (Q, HC2)	Type of home where applicable	Comment	
<b>Appliances</b>											
E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	Refrigerator					100.0%		66.6%	Homes in service area	This measure is redundant. Other measures cover replacement of all refrigerator/freezer combinations	
E-Star Compliant Top Mount Freezer	Refrigerator	65.8%	Tab 1 - R1	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all top mount freezers (with and without through-the-door ice)	
E-Star Compliant Side Mount Freezer	Refrigerator	26.0%	Tab 1 - R1	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all side mount freezers (with and without through-the-door ice)	
E-Star Compliant Bottom Mount Freezer	Refrigerator	8.2%	Tab 1 - R1	35.2%	Tab 1 - PP7A_4, PP7B_4	64.8%		66.6%	Homes in service area	Saturation estimate is for all bottom mount freezers (with and without through-the-door ice)	
Wine refrigerators (Informational)	Informational					100.0%		66.6%			
E-Star Compliant Upright Freezers	Freezer	21.6%	Tab 1 - R2	19.4%	Tab 1 - PP7A_5, PP7B_5	80.6%		66.6%	Homes in service area which contain a freezer		
E-Star Compliant Chest Freezers	Freezer	19.2%	Tab 1 - R2	19.4%	Tab 1 - PP7A_5, PP7B_5	80.6%		66.6%	Homes in service area which contain a freezer		
Energy Star Dehumidifier	Dehumidifier	26.9%	Tab 1 - DH1	31.9%	Tab 1 - PP7A_8, PP7B_8	68.1%		66.6%	Homes in service area with a dehumidifier		
Second Refrigerator Turn In	Refrigerator	29.2%	Tab 1 - R1			100.0%		66.6%	Homes in service area with 2+ refrigerators	Average 2.1 refrigerators in home with more than 1 refrigerator	
Second Freezer Turn In	Freezer	2.0%	Tab 1 - R2			100.0%		66.6%	Homes in service area with 2+ freezers	Average 2.4 freezers in homes with more than 1 freezer	
Induction Cooktop vs. Electric Coil Cooktop	Range	87.0%	Tab 1 - SH2 (See TC2)	0.0%	See Comments	100.0%		66.6%		End Use saturation is assumed to equal the percentage of homes not heated with gas. Could not	
Energy Star office equipment including monitors, copiers, multi-function machines.	Office Equipment	81.4%	Tab 1 - TC2	22.9%	Tab 1 - PP7A_11, PP7B_11	77.1%		66.6%	Homes in service area with 1 or more computers	Average 1.6 computers per home with 1 or more computers	
TVs - Energy Star over standard	Television	100.0%	Tab 1 - TC1A, B	51.0%		49.0%		66.6%	Homes in service area	There are an average of 2.5 TVs per home. No survey data available on fraction of TVs that are Energy Star	
<b>Water Heating</b>											
Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	18.0%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	14.8%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	24.3%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	40.2%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and oil		
Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	18.0%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	14.8%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	24.3%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and		
Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	40.2%	Tab 2 - WH1_D1	38.1%	Tab 1 - PP7A_9, PP7B_9	61.9%		66.6%	Homes in service area with a dishwasher and oil		
Energy Star Clothes Washer (w/ Electric DHW)	Clothes Washer	20.0%	Tab 2 - WH1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer		
Energy Star Clothes Washer (w/ Gas DHW)	Clothes Washer	13.9%	Tab 2 - WH1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer		
Energy Star Clothes Washer (w/ Propane DHW)	Clothes Washer	22.4%	Tab 2 - WH1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer		
Energy Star Clothes Washer (w/ Oil DHW)	Clothes Washer	41.6%	Tab 2 - WH1	39.6%	Tab 1 - PP7A_6, PP7B_6	60.4%		66.6%	Homes in service area with a clothes washer		
Natural Gas Clothes Dryer Fuel Switch	Electric Clothes Dryer	78.3%	Tab 1 - CW3	0.0%		100.0%		66.6%	Homes in service area with an electric dryer		
Propane Clothes Dryer Fuel Switch	Electric Clothes Dryer	78.3%	Tab 1 - CW3	0.0%		100.0%		66.6%	Homes in service area with an electric dryer		
Efficient Water Heater (EF=0.93)	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an electric water heater that was purchased in the last five years has an	There is a question in the survey that asks if the water heater that was purchased in the last five years has an	
High efficiency water heater (EF=0.95)	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an electric water heater		
High Efficiency Water Heater - Natural Gas (EF=0.62)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
High Efficiency Water Heater - Natural Gas (EF=0.67)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
High Efficiency Water Heater - Propane (EF=0.67)	Water Heating	22.9%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a propane water heater		
High Efficiency Water Heater - Oil (EF=0.66)	Water Heating	40.7%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with an oil water heater		
Gas-Condensing Water Heater - Natural Gas (EF=0.80)	Water Heating	13.8%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas water heater		
Gas-Condensing Water Heater - Propane (EF=0.80)	Water Heating	22.9%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a propane water heater		

## Residential Non Electric Model - Single Family Saturations

Whole-House Tankless Water Heater - Nat Gas <=200 kBTHU	Water Heating	2.8%	Tab 3 - SH2	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas boiler	
Whole-House Tankless Water Heater - Electric <=12 kW	Water Heating	20.2%	Tab 1 - WH1	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with electric water heater	
Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	Water Heating	2.8%	Tab 3 - SH2	24.1%	Tab 1 - PP7A_3	75.9%		66.6%	Homes in service area with a natural gas boiler	
Heat Pump Water Heater	Water Heating	20.2%	Tab 1 - WH1	4.4%	RMLD Tech Potential (GDS:	95.6%		66.6%	Homes in service area with electric water heater	
Solar Water Heating - Active, w/ Elec Backup	Water Heating	20.2%	Tab 1 - WH1	1.0%	RMLD Tech Potential (RECS	99.0%		66.6%	Homes in service area with electric water heater	
Solar Water Heating - Active, w/ Gas Backup	Water Heating	13.8%	Tab 1 - WH1	1.0%	RMLD Tech Potential (RECS	99.0%		66.6%	Homes in service area with natural gas water	
Solar Water Heating - Active, w/ Propane Backup	Water Heating	22.9%	Tab 1 - WH1	1.0%	RMLD Tech Potential (RECS	99.0%		66.6%	Homes in service area with propane water	
Solar Water Heating - Active, w/ Oil Backup	Water Heating	40.7%	Tab 1 - WH1	1.0%	RMLD Tech Potential (RECS	99.0%		66.6%	Homes in service area with oil water heater	
Low Flow Showerhead/Faucets - electric	Water Heating	20.2%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with electric water heater	
Low Flow Showerhead/Faucets - gas	Water Heating	13.8%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with natural gas water	
Low Flow Showerhead/Faucets - LPG	Water Heating	22.9%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with propane water	
Low Flow Showerhead/Faucets - oil	Water Heating	40.7%	Tab 1 - WH1	55.3%	Tab 1 - WH4	44.7%		66.6%	Homes in service area with oil water heater	
Pipe Wrap - electric DHW	Water Heating	20.2%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS:	90.0%		66.6%	Homes in service area with electric water heater	Not included in survey
Pipe Wrap - gas DHW	Water Heating	13.8%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS:	90.0%		66.6%	Homes in service area with natural gas water	
Pipe Wrap - LPG DHW	Water Heating	22.9%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS:	90.0%		66.6%	Homes in service area with propane water	
Pipe Wrap - oil DHW	Water Heating	40.7%	Tab 1 - WH1	10.0%	RMLD Tech Potential (GDS:	90.0%		66.6%	Homes in service area with oil water heater	
Water Heater Blanket/Tank Insulation - electric only	Water Heating	20.2%	Tab 1 - WH1	31.7%	Tab 1a - PP7A_3, RMLD Tech	68.3%		66.6%	Homes in service area with electric water heater	This measure is being phased out in many locales. Heaters last 10 years on average and most new
Horizontal Axis Washer-Dryer Combination Unit (informational)	Informational					100.0%		66.6%		
Built-in Interior Clothes Lines in new construction (informational)	Informational					100.0%		66.6%		
<b>Lighting</b>										
CFL Bulbs (Homes w/ partial CFL installation) - High Use	Lighting	75.0%	Tab 1 - L3	37.3%	Tab 1 - Weighted number (L4A) and	62.7%		66.6%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ partial CFL installation) - Low Use	Lighting	75.0%	Tab 1 - L3	37.3%	Tab 1 - Weighted number (L4A) and	62.7%		66.6%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	Lighting	25.0%	Tab 1 - L3	0.0%		100.0%		66.6%	Homes in service area	
CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	Lighting	25.0%	Tab 1 - L3	0.0%		100.0%		66.6%	Homes in service area	
LED options, inc. MR 16, R16, R20, R30, R38 & G25	Lighting	100.0%				100.0%		66.6%	Homes in service area	Not included in survey
LED Exit Signs	Commercial Measure					100.0%		66.6%		Commercial Measure
CFL Torchiere (residential)	Lighting					100.0%		66.6%		Included in CFL Bulbs
CFL Torchiere (commercial)	Commercial Measure					100.0%		66.6%		Commercial Measure
CFL fixtures- exterior (high use)	Lighting					100.0%		66.6%		Included in CFL Bulbs
Occupancy sensors	Lighting					100.0%		66.6%	Homes in service area	Not included in survey
Timers/Motion/PhotoCell controlled outdoor lighting	Lighting	100.0%		15.0%	2003 CA Study by Architectural	85.0%		66.6%	Homes in service area with outdoor lighting	Not included in survey. Assumed 100% of homes have at least 1 outdoor socket
Daylighting options, including retrofit & light tubes (informational)	Lighting					100.0%		66.6%		
Cold Cathode Bulbs (informational)	Informational					100.0%		66.6%		
<b>Space Conditioning (Heating and Cooling)</b>										
Programmable Thermostats (SF) - electric (Heating only)	Space Heating	1.2%	Tab 1 - SH2	54.5%	Tab 1 - SH14	45.5%		66.6%	Homes in service area with electric heat & no	Small N (N=4). Due to low N, use fuel neutral response to base case factor for programmable
Programmable Thermostats (SF) - electric (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH4			100.0%		66.6%	Homes in service area with electric heat &	This measure should be deleted because saturation of electrically heated homes with central air is 0%
Programmable Thermostats (SF) - gas furnace (Heating only)	Space Heating	4.7%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas furnace	
Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	Space Heating/Cooling	2.8%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas furnace	
Programmable Thermostats (SF) - gas boiler (Heating only)	Space Heating	3.2%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas boiler &	
Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH3	76.5%	Tab 1b - SH14	23.5%		66.6%	Homes in service area with natural gas boiler &	This measure should be deleted because the percentage of homes with natural gas boilers & central
Programmable Thermostats (SF) - propane furnace (Heating only)	Space Heating	4.7%	Tab 3 - SH2, SH3	68.4%	Tab 1b - SH14	31.6%		66.6%	Homes in service area with propane furnace &	
Programmable Thermostats (SF) - propane furnace (Heating + Central Air)	Space Heating/Cooling	2.0%	Tab 3 - SH2, SH3	68.4%	Tab 1b - SH14	31.6%		66.6%	Homes in service area with propane furnace &	
Programmable Thermostats (SF) - propane boiler (Heating only)	Space Heating	5.1%	Tab 3 - SH2, SH3	68.4%	Tab 1b - SH14	31.6%		66.6%	Homes in service area with propane boiler & no	
Programmable Thermostats (SF) - propane boiler (Heating + Central Air)	Space Heating/Cooling	0.8%	Tab 3 - SH2, SH3	68.4%	Tab 1b - SH14	31.6%		66.6%	Homes in service area with propane boiler &	

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Programmable Thermostats (SF) - oil furnace (Heating only)	Space Heating	19.0%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil furnace & no	
Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	Space Heating/Cooling	5.5%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil furnace & central	
Programmable Thermostats (SF) - oil boiler (Heating only)	Space Heating	27.3%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil boiler & no centra	
Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	Space Heating/Cooling	2.4%	Tab 3 - SH2, SH3	51.3%	Tab 1b - SH14	48.7%		66.6%	Homes in service area with oil boiler & central air	
Efficient Furnace Fan (Non-Electric Furnace)	Space Heating	39.1%	Tab 1 - SH3	28.9%	Tab 1 - SH7, SH8	71.1%		66.6%	Homes in service area with non-electric furnace	This measure was not specifically addressed in the survey. Base case factor is based on fairly new (<=10
HVAC Tune-Up (Electric Heat)	Space Heating	1.2%	Tab 1 - SH2	68.4%	Tab 1 - SH6	31.6%		66.6%	Homes in service area with electric heat	Small N (N=4). Due to low N, use fuel neutral response to base case factor for HVAC Tuneup (Tab
HVAC Tune-Up (Gas Heat)	Space Heating	13.0%	Tab 1 - SH2	55.2%	Tab 1b - SH6	44.8%		66.6%	Homes in service area with gas heat	
HVAC Tune-Up (Oil Heat)	Space Heating	56.5%	Tab 1 - SH2	83.9%	Tab 1b - SH6	16.1%		66.6%	Homes in service area with oil heat	
Energy Star Room A/C	Room AC	59.7%	Tab 1 - SC7	50.3%	Tab 1 - PP7A_2, PP7B_2	49.7%		66.6%	Homes in service area with one or more window	Average of 2 plugged in room air conditioners per home with at least 1 room air conditioner
Energy Star ceiling fans	Impacts Heating & Cooling					100.0%		66.6%		Not included in survey
High Efficiency Central AC (Tier 1)	Central AC	15.4%	Tab 1 - SC1	12.8%	Tab 1 - PP7A_1, PP7B_1	87.2%		66.6%	Homes in service area with central AC	
High Efficiency Central AC (Tier 2)	Central AC	15.4%	Tab 1 - SC1	12.8%	Tab 1 - PP7A_1, PP7B_1	87.2%		66.6%	Homes in service area with central AC	
High Efficiency Heat Pump (Tier 1)	Heating/Cooling	100.0%		13.9%	RMLD Tech Potential (NEEA)	86.1%		66.6%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
High Efficiency Heat Pump (Tier 2)	Heating/Cooling	100.0%		1.0%	RMLD Tech Potential	99.0%		66.6%	Homes in service area	Primarily a moderate climate technology. Not included in survey.
Ground Source Heat Pump	Heating/Cooling	100.0%		2.0%	RMLD Tech Potential	98.0%		66.6%	Homes in service area	
HE Whole House Fans	Air Conditioning	100.0%				100.0%		66.6%	Homes in service area	
High Efficiency Furnace - Natural Gas	Space Heating	7.5%	Tab 3 - SH2, SH3	30.3%	Tab 1 - SH2; Tab 3 SH8, SH2;	69.7%		66.6%	Homes in service area with natural gas furnace	
High Efficiency Furnace - Propane	Space Heating	6.7%	Tab 3 - SH2, SH3	36.1%	Tab 1 - SH2; Tab 3 SH8, SH2;	63.9%		66.6%	Homes in service area with propane furnace	
High Efficiency Furnace - Oil	Space Heating	24.5%	Tab 3 - SH2, SH3	28.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	72.0%		66.6%	Homes in service area with oil furnace	
High Efficiency Boiler - Natural Gas	Space Heating	3.2%	Tab 3 - SH2, SH3	30.3%	Tab 1 - SH2; Tab 3 SH8, SH2;	69.7%		66.6%	Homes in service area with natural gas boiler	
High Efficiency Boiler - Propane	Space Heating	5.9%	Tab 3 - SH2, SH3	36.1%	Tab 1 - SH2; Tab 3 SH8, SH2;	63.9%		66.6%	Homes in service area with propane boiler	
High Efficiency Boiler - Oil	Space Heating	29.6%	Tab 3 - SH2, SH3	28.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	72.0%		66.6%	Homes in service area with oil boiler	
Improved Steam Vents (SF) - gas	Space Heating	0.4%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with natural gas steam	Should consider dropping this measure or combining all steam trap measures because the percentage of
Improved Steam Vents (SF) - LPG	Space Heating	0.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all steam trap measures because the percentage of
Improved Steam Vents (SF) - oil	Space Heating	2.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with oil steam boiler	Might want to combine all of the steam trap measures because of low saturation of steam boilers
Efficient Steam Boiler (SF) - gas	Space Heating	0.4%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with natural gas steam	Should consider dropping this measure or combining all efficient steam boiler measures because the
Efficient Steam Boiler (SF) - LPG	Space Heating	0.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with LPG steam boiler	Should consider dropping this measure or combining all efficient steam boiler measures because the
Efficient Steam Boiler (SF) - oil	Space Heating	2.8%	Tab 3 - SH2, SH3	40.0%	Tab 1 - SH2; Tab 3 SH8, SH2;	60.0%		66.6%	Homes in service area with oil steam boiler	Might want to combine all of the efficient steam boiler measures because of low saturation of steam boilers
Duct Sealing - electric	Heating/Cooling	8.6%	RMLD Residenti	25.0%	RMLD Residential Tech Potential	75.0%		66.6%	Homes in service area with electric heat - forced	Small N (N=3) Forced Hot Air/Electric is not specified
Duct Sealing - gas	Heating/Cooling	7.5%	Tab 3 - SH2, SH3	25.0%	RMLD Residential Tech Potential	75.0%		66.6%	Homes in service area with natural gas heat -	Duct sealing not addressed in survey
Duct Sealing - LPG	Heating/Cooling	6.7%	Tab 3 - SH2, SH3			100.0%		66.6%	Homes in service area with LPG heat - forced	Duct sealing not addressed in survey
Duct Sealing - oil	Heating/Cooling	24.5%	Tab 3 - SH2, SH3			100.0%		66.6%	Homes in service area with oil heat - forced hot	Duct sealing not addressed in survey
Off Peak Cooling w/ Thermal Energy Storage (Informational)	Informational					100.0%		66.6%		
Combo Systems (Informational)	Informational					100.0%		66.6%		
<b>Building Envelope</b>										
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Electric Heat	Total Home Electric Use	100.0%	RMLD Tech			100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Electric Heat	Total Home Electric Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Gas Heat	Total Home Gas Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - LPG Heat	Total Home LPG Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes



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Integrated Building Design - Good (ENERGY STAR Home ~ 20% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home ~35% Savings) -Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home ~ 50% Savings) - Oil Heat	Total Home Oil Use	100.0%				100.0%		66.6%	New Homes	No question in the survey regarding Energy Star Homes
Energy Efficient Windows (SF) - electric heat	Heating/Cooling	1.2%	17.0%	Tab 1 - PP7A, 10, PP7B_10	83.0%			66.6%	Homes in service area with electric heat	Small N (N=4). Due to low N, use fuel neutral response to base case factor (Tab 1)
Energy Efficient Windows (SF) - gas heat	Heating/Cooling	13.0%	14.7%	Tab 1b - PP7A, 10, PP7B_10	85.3%			66.6%	Homes in service area with natural gas heat	
Energy Efficient Windows (SF) - LPG heat	Heating/Cooling	14.2%	29.0%	Tab 1b - PP7A, 10, PP7B_10	71.0%			66.6%	Homes in service area with LPG heat	
Energy Efficient Windows (SF) - oil heat	Heating/Cooling	56.5%	18.6%	Tab 1b - PP7A, 10, PP7B_10	81.4%			66.6%	Homes in service area with oil heat	
Interior Storm Windows (Low-e or double clear film)	Heating/Cooling	100.0%	36.0%	Tab 1 - BE1_1	64.0%			66.6%	Homes in service area	
Cool roofing/white roof/green roof (Central AC)	Central AC	100.0%				100.0%		66.6%	Homes in service area	Not included in the survey
Exterior Door Insulation (New, Replacement, Retrofit)	Heating/Cooling	100.0%				100.0%		66.6%	Homes in service area	Is this a storm door? Not included in survey
Tree Shading (Central Air)	Central AC	15.4%	50.4%	Tab 1 - SC1	RMLD Tech Potential (RECS) 49.6%			66.6%	Homes in service area with central AC	Tree shading not addressed in survey
Tree Shading (Room AC)	Central AC	59.7%	50.4%	Tab 1 - SC7	RMLD Tech Potential (RECS) 49.6%			66.6%	Homes in service area with Room AC	Tree shading not addressed in survey
Tree Shading (Central Air)	Central AC		50.4%		RMLD Tech Potential (RECS) 49.6%			66.6%		Duplicate measure
Tree Shading (Room AC)	Central AC		50.4%		RMLD Tech Potential (RECS) 49.6%			66.6%		Duplicate measure
Insulation/weatherization package - electric heat - single family	Space Heating	1.2%	66.7%	Tab 1 - SH2	Tab 3 - SH2, BE3 33.3%			66.6%	Homes in service area with electric heat	Which insulation weatherization measures will be included? These combined measures or the detailed base case = respondents that said they have added insulation
Insulation/weatherization package - gas heat	Space Heating	13.0%	41.2%	Tab 1 - SH2	Tab 1b - SH2, BE3 58.8%			66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation
Insulation/weatherization package - LPG heat	Space Heating	14.2%	52.6%	Tab 1 - SH2	Tab 1b - SH2, BE3 47.4%			66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation
Insulation/weatherization package - oil heat	Space Heating	56.5%	50.3%	Tab 1 - SH2	Tab 1b - SH2, BE3 49.7%			66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation
Insulation/weatherization package - Good (Improved Base Home) - Electric Heat	Space Heating	1.2%	50.0%	Tab 1 - SH2	Tab 3 - SH2, BE3 50.0%			66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Electric Heat	Space Heating	1.2%	16.7%	Tab 1 - SH2	Tab 3 - SH2, BE3 83.3%			66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Electric Heat	Space Heating	1.2%	0.0%	Tab 1 - SH2	Tab 3 - SH2, BE3 100.0%			66.6%	Homes in service area with electric heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Gas Heat	Space Heating	13.0%	30.9%	Tab 1 - SH2	Tab 1b - SH2, BE3 69.1%			66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat	Space Heating	13.0%	10.3%	Tab 1 - SH2	Tab 1b - SH2, BE3 89.7%			66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat	Space Heating	13.0%	0.0%	Tab 1 - SH2	Tab 1b - SH2, BE3 100.0%			66.6%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - LPG Heat	Space Heating	14.2%	39.5%	Tab 1 - SH2	Tab 1b - SH2, BE3 60.6%			66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat	Space Heating	14.2%	13.2%	Tab 1 - SH2	Tab 1b - SH2, BE3 86.9%			66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat	Space Heating	14.2%	0.0%	Tab 1 - SH2	Tab 1b - SH2, BE3 100.0%			66.6%	Homes in service area with LPG heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Oil Heat	Space Heating	56.5%	37.7%	Tab 1 - SH2	Tab 1b - SH2, BE3 62.3%			66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat	Space Heating	56.5%	12.6%	Tab 1 - SH2	Tab 1b - SH2, BE3 87.4%			66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat	Space Heating	56.5%	0.0%	Tab 1 - SH2	Tab 1b - SH2, BE3 100.0%			66.6%	Homes in service area with oil heat	base case = respondents that said they have added insulation (assume 75%-good, 25% better, 0% best)
Insulating Concrete Forms (ICFs) for renovations/additions - electric heat	Space Heating	1.2%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with electric heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - gas heat	Space Heating	13.0%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with natural gas heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - LPG heat	Space Heating	14.2%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with LPG heat	Included in new construction
Insulating Concrete Forms (ICFs) for renovations/additions - oil heat	Space Heating	56.5%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with oil heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - electric heat	Space Heating	1.2%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with electric heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - gas heat	Space Heating	13.0%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with natural gas heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - LPG heat	Space Heating	14.2%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with LPG heat	Included in new construction
Structural Insulated Panels (SIPs) for renovations/additions - oil heat	Space Heating	56.5%		Tab 1 - SH2		100.0%		66.6%	Homes in service area with oil heat	Included in new construction
New Construction (standard) - Electric Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Natural Gas Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Propane Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (standard) - Oil Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	This is a baseline not a measure
New Construction (BPI) - Electric Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Natural Gas Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?



## Residential Non Electric Model - Single Family Saturations

New Construction (BPI) - Propane Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
New Construction (BPI) - Oil Heat	Space Heating	100.0%				100.0%		66.6%	New Homes	Isn't BPI a builder/contractor accreditation organization.?
LI Insulation & Weatherization (Electrically Heated)	Space Heating	9.1%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with electric insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating	24.2%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with natural insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Propane Heated)	Space Heating	12.1%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with oil heat insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Oil Heated)	Space Heating	36.4%	Tab 5-SH2	30.3%		69.7%		66.6%	Low income homes in service area with central insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Central AC)	Central AC	9.1%	Tab 5-SC1	30.3%		69.7%		66.6%	Low income homes in service area with room insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Room AC)	Room AC	78.8%	Tab 5-SC7	30.3%		69.7%		66.6%	Low income homes in service area with room insulation	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Electrically Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Propane Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Gas Heated)	Space Heating					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Central AC)	Central AC					100.0%		66.6%		Duplicate measure
LI Insulation & Weatherization (Room AC)	Room AC					100.0%		66.6%		Duplicate measure
<b>Standby Power and Automation</b>										
Standby Power (ES Plug loads including battery chargers, cordless phones, TV/DVD combo units, DVD, External Power adapters, home Audio)	Appliances	100.0%		15.0%		85.0%		66.6%	Homes in service area	Not addressed in the survey. Used data from GDS VT study
Energy Efficient "Smart" Power Strip for PC/Monitor/Printer	Computers/Printers	81.4%	Tab 1-TC2			100.0%		66.6%	Homes in service area with 1 or more computers.	Average 1.6 computers per home with 1 or more computers. This measure is not addressed in the
Home Automation & SMART Controls	Appliances	100.0%				100.0%		66.6%	Homes in service area	Not addressed in the survey
<b>Pools</b>										
Pool Pump and Motor	Pool					100.0%		66.6%	Homes in service area with a pool	Survey question only asked about heated pools
High efficiency spas/hot tubs	Spa/Hot Tub	5.9%	Tab 1-HT1			100.0%		66.6%	Homes in service area with outdoor spa/hot tub	What is a high efficiency Spa/Hot Tub? Survey asks about covers and timers for the heater.
Solar Pool Heater	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Electric (EF=0.95)	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Natural Gas Propane (EF=0.67)	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Propane (EF=0.67)	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Temperature control	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Pool Cover	Pool	0.8%	Tab 1-HT6			100.0%		66.6%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Outdoor ponds / fountains	Ponds/Fountains					100.0%		66.6%		What is this measure?

# Residential Non Electric Model - Multi Family Saturations

Multi Family Households										
All Utilities										
Measure Name	Electric End Use Affected	End Use Saturation	Saturation Source (Survey)	Base Case Factor	Base Case Factor Source (Survey Question)	Remaining Factor (m)	Convertibility Factor	Single-Multi	Type of home where applicable	Comment
<b>Appliances</b>										
E-Star Compliant Manual or Partial Automatic Defrost Refrigerators	Refrigerator		Tab 1a - R1 (breakdown by	15.0%	Tab 1a - PP7A_4, PP7B_4	100.0%		33.4%	Homes in service area	measures cover replacement of all refrigerator/freezer combinations with E-freezers (with and without through-the-door ice
E-Star Compliant Top Mount Freezer	Refrigerator	65.8%	Tab 1a - R1 (breakdown by	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	freezers (with and without through-the-door ice
E-Star Compliant Side Mount Freezer	Refrigerator	26.0%	Tab 1a - R1 (breakdown by	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	mount freezers (with and without through-the-door ice
E-Star Compliant Bottom Mount Freezer	Refrigerator	8.2%	Tab 1a - R1 (breakdown by	15.0%	Tab 1a - PP7A_4, PP7B_4	85.0%		33.4%	Homes in service area	mount freezers (with and without through-the-door ice
Wine refrigerators (Informational)	Informational					100.0%		33.4%		
E-Star Compliant Upright Freezers	Freezer	10.0%	Tab 1a - R2 (breakdown by	8.0%	Tab 1a - PP7A_5, PP7B_5	92.0%		33.4%	Homes in service area which contain a freezer	
E-Star Compliant Chest Freezers	Freezer	8.9%	Tab 1a - R2 (breakdown by	8.0%	Tab 1a - PP7A_5, PP7B_5	16.0%		33.4%	Homes in service area which contain a freezer	
Energy Star Dehumidifier	Dehumidifier	10.2%	Tab 1a - DH1	53.8%	Tab 1a - PP7A_8, PP7B_8	46.2%		33.4%	Homes in service area with a dehumidifier	
Second Refrigerator Turn In	Refrigerator	3.9%	Tab 1a - R1			100.0%		33.4%	Homes in service area with 2+ refrigerators	Average 2 refrigerators in home with more than 1 refrigerator
Second Freezer Turn In	Freezer	0.8%	Tab 1a - R2			100.0%		33.4%	Homes in service area with 2+ freezers	Average 2 freezers in homes with more than 1 freezer
Induction Cooktop vs. Electric Coil Cooktop	Range	51.2%	Tab 1a - SH2 (See Comments)	0.0%	See Comments	100.0%		33.4%		the percentage of homes not heated with gas. Could not find any saturation data for
Energy Star office equipment including monitors, copiers, multi-function machines.	Office Equipment	68.5%	Tab 1a - TC2	15.7%	Tab 1a - PP7A_11, PP7B_11	84.3%		33.4%	Homes in service area with 1 or more computers	Average 1.5 computers per home with 1 or more computers
TVs - Energy Star over standard	Television	100.0%	Tab 1a - TC1A, B, C	51.0%		49.0%		33.4%	Homes in service area	home. No survey data available on fraction of TVs that are Energy Star
<b>Water Heating</b>										
Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	33.3%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and natural gas DHW	
Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	36.2%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and electric DHW	
Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and propane DHW	
Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and oil DHW	
Beyond Energy Star Dishwasher (Residential-w/Electric DHW)	Dishwasher	33.3%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and electric DHW	
Beyond Energy Star Dishwasher (Residential-w/Gas DHW)	Dishwasher	36.2%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and natural gas DHW	
Beyond Energy Star Dishwasher (Residential-w/Propane DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and propane DHW	
Beyond Energy Star Dishwasher (Residential-w/Oil DHW)	Dishwasher	8.7%	Tab 2 - WH1, D1	17.4%	Tab 1a - PP7A_9, PP7B_9	82.6%		33.4%	Homes in service area with a dishwasher and oil DHW	
Energy Star Clothes Washer (w/ Electric DHW)	Clothes Washer	33.0%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and electric DHW	
Energy Star Clothes Washer (w/ Gas DHW)	Clothes Washer	39.2%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and natural gas DHW	
Energy Star Clothes Washer (w/ Propane DHW)	Clothes Washer	9.3%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and propane DHW	
Energy Star Clothes Washer (w/ Oil DHW)	Clothes Washer	7.2%	Tab 2 - WH1, CW1	26.8%	Tab 1a - PP7A_6, PP7B_6	73.2%		33.4%	Homes in service area with a clothes washer and oil DHW	
Natural Gas Clothes Dryer Fuel Switch	Electric Clothes Dryer	68.5%	Tab 1a - CW3, CW4	0.0%		100.0%		33.4%	Homes in service area with an electric dryer	
Propane Clothes Dryer Fuel Switch	Electric Clothes Dryer	68.5%	Tab 1a - CW3, CW4	0.0%		100.0%		33.4%	Homes in service area with an electric dryer	
Efficient Water Heater (EF=0.93)	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an electric water heater	if the water heater that was purchased in the last five years has an Energy Star
High efficiency water heater (EF=0.95)	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an electric water heater	
High Efficiency Water Heater - Natural Gas (EF=0.62)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
High Efficiency Water Heater - Natural Gas (EF=0.67)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
High Efficiency Water Heater - Propane (EF=0.67)	Water Heating	8.7%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a propane water heater	
High Efficiency Water Heater - Oil (EF=0.66)	Water Heating	7.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with an oil water heater	
Gas-Condensing Water Heater - Natural Gas (EF=0.80)	Water Heating	39.4%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas water heater	
Gas-Condensing Water Heater - Propane (EF=0.80)	Water Heating	8.7%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a propane water heater	
Whole-House Tankless Water Heater - Nat Gas <=200 kBtu/h	Water Heating	15.7%	Tab 3 - SH2, SH3, SH4	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas boiler	
Whole-House Tankless Water Heater - Electric <=12 kW	Water Heating	33.1%	Tab 1a - WH1	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with electric water heater	
Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	Water Heating	15.7%	Tab 3 - SH2, SH3, SH4	17.7%	Tab 1a - PP7A_3	82.3%		33.4%	Homes in service area with a natural gas boiler	
Heat Pump Water Heater	Water Heating	33.1%	Tab 1a - WH1	4.4%	RMLD Tech Potential (GDS; GDS Estimate based on age of housing, measure assumptions	95.6%		33.4%	Homes in service area with electric water heater	
Solar Water Heating - Active, w/ Elec Backup	Water Heating	33.1%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS; GDS Calculation based on Data in the Residential	99.0%		33.4%	Homes in service area with electric water heater	
Solar Water Heating - Active, w/ Gas Backup	Water Heating	39.4%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS; GDS Calculation based on Data in the Residential	99.0%		33.4%	Homes in service area with natural gas water heater	
Solar Water Heating - Active, w/ Propane Backup	Water Heating	8.7%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS; GDS Calculation based on Data in the Residential	99.0%		33.4%	Homes in service area with propane water heater	
Solar Water Heating - Active, w/ Oil Backup	Water Heating	7.1%	Tab 1a - WH1	1.0%	RMLD Tech Potential (RECS HCS; GDS Calculation based on Data in the Residential	99.0%		33.4%	Homes in service area with oil water heater	
Low Flow Showerhead/Faucets - electric	Water Heating	33.1%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with electric water heater	
Low Flow Showerhead/Faucets - gas	Water Heating	39.4%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with natural gas water heater	
Low Flow Showerhead/Faucets - LPG	Water Heating	8.7%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with propane water heater	
Low Flow Showerhead/Faucets - oil	Water Heating	7.1%	Tab 1a - WH1	37.8%	Tab 1a - WH4	62.2%		33.4%	Homes in service area with oil water heater	
Pipe Wrap - electric DHW	Water Heating	33.1%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS; GDS Estimate based on age of housing, measure assumptions	90.0%		33.4%	Homes in service area with electric water heater	Not included in survey
Pipe Wrap - gas DHW	Water Heating	39.4%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS; GDS Estimate based on age of housing, measure assumptions	90.0%		33.4%	Homes in service area with natural gas water heater	
Pipe Wrap - LPG DHW	Water Heating	8.7%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS; GDS Estimate based on age of housing, measure assumptions	90.0%		33.4%	Homes in service area with propane water heater	
Pipe Wrap - oil DHW	Water Heating	7.1%	Tab 1a - WH1	10.0%	RMLD Tech Potential (GDS; GDS Estimate based on age of housing, measure assumptions	90.0%		33.4%	Homes in service area with oil water heater	
Water Heater Blanket/Tank Insulation - electric only	Water Heating	33.1%	Tab 1a - WH1	26.0%	Tab 1a - PP7A_3, RMLD Tech Potential (GDS; GDS Estimate based on age of housing,	74.0%		33.4%	Homes in service area with electric water heater	many locales. Heaters last 10 years on average and most new machines have the
Horizontal Axis Washer-Dryer Combination Unit (Informational)	Informational					100.0%		33.4%		
Built-in Interior Clothes Lines in new construction (Informational)	Informational					100.0%		33.4%		
<b>Lighting</b>										
CFL Bulbs (Homes w/ partial CFL installation) - High Use	Lighting	64.7%	Tab 1a - L3	34.9%	Tab 1a - Weighted number (L4A) and % (L4B) responses	65.1%		33.4%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ partial CFL installation) - Low Use	Lighting	64.7%	Tab 1a - L3	34.9%	Tab 1a - Weighted number (L4A) and % (L4B) responses	65.1%		33.4%	Homes in service area	High Use/Low Use breakdown not available in the survey
CFL Bulbs (Homes w/ no CFL bulbs installed) - High Use	Lighting	34.5%	Tab 1a - L3	0.0%		100.0%		33.4%	Homes in service area	
CFL Bulbs (Homes w/ no CFL bulbs installed) - Low Use	Lighting	34.5%	Tab 1a - L3	0.0%		100.0%		33.4%	Homes in service area	
LED options, inc. MR 16, R16, R20, R30, R38 & G25	Lighting	100.0%				100.0%		33.4%	Homes in service area	Not included in survey
LED Exit Signs	Commercial Measure					100.0%		33.4%		Commercial Measure
CFL Torchiers (residential)	Lighting					100.0%		33.4%		Included in CFL Bulbs
CFL Torchiers (commercial)	Commercial Measure					100.0%		33.4%		Commercial Measure

## Residential Non Electric Model - Multi Family Saturations

CFL fixtures - exterior (high use)	Lighting						100.0%			33.4%			
Occupancy sensors	Lighting						100.0%			33.4%	Homes in service area		Not included in survey
Timers/Motion Photocell controlled outdoor lighting	Lighting	100.0%		15.0%		2003 CA Study by Architectural Energy Corp for CA Energy Comm.	85.0%			33.4%	Homes in service area with outdoor lighting		Not included in survey. Assumed 100% of homes have at least 1 outdoor socket
Daylighting options, including retrofit & light tubes (informational)	Lighting						100.0%			33.4%			
Cold Cathode Bulbs (informational)	Informational						100.0%			33.4%			
<b>Space Conditioning (Heating and Cooling)</b>													
Programmable Thermostats (SF - electric (Heating only))	Space Heating	9.4%	Tab 1a - SH2	42.9%		Tab 1c - SH14	57.1%			33.4%	Homes in service area with electric heat & no central air		
Programmable Thermostats (SF) - electric (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH4				100.0%			33.4%	Homes in service area with electric heat & central air		saturation of electrically heated homes with central air is 0%
Programmable Thermostats (SF) - gas furnace (Heating only)	Space Heating	12.6%	Tab 3 - SH2, SH3	43.8%		Tab 1c - SH14	56.2%			33.4%	Homes in service area with natural gas furnace & no central air		
Programmable Thermostats (SF) - gas furnace (Heating + Central Air)	Space Heating/Cooling	10.2%	Tab 3 - SH2, SH3	43.8%		Tab 1c - SH14	56.2%			33.4%	Homes in service area with natural gas furnace & central air		
Programmable Thermostats (SF) - gas boiler (Heating only)	Space Heating	16.5%	Tab 3 - SH2, SH3	43.8%		Tab 1c - SH14	56.2%			33.4%	Homes in service area with natural gas boiler & no central air		
Programmable Thermostats (SF) - gas boiler (Heating + Central Air)	Space Heating/Cooling	0.8%	Tab 3 - SH2, SH3	43.8%		Tab 1c - SH14	56.2%			33.4%	Homes in service area with natural gas boiler & central air		
Programmable Thermostats (MF) - propane furnace (Heating only)	Space Heating	2.4%	Tab 3 - SH2, SH3	83.3%		Tab 1c - SH14	16.7%			33.4%	Homes in service area with natural gas furnace & no central air		
Programmable Thermostats (MF) - propane furnace (Heating + Central Air)	Space Heating/Cooling	2.4%	Tab 3 - SH2, SH3	83.3%		Tab 1c - SH14	16.7%			33.4%	Homes in service area with natural gas furnace & central air		
Programmable Thermostats (MF) - propane boiler (Heating only)	Space Heating	3.9%	Tab 3 - SH2, SH3	83.3%		Tab 1c - SH14	16.7%			33.4%	Homes in service area with natural gas boiler & no central air		
Programmable Thermostats (MF) - propane boiler (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH3	83.3%		Tab 1c - SH14	16.7%			33.4%	Homes in service area with natural gas boiler & central air		
Programmable Thermostats (SF) - oil furnace (Heating only)	Space Heating	14.2%	Tab 3 - SH2, SH3	13.8%		Tab 1c - SH14	86.2%			33.4%	Homes in service area with oil furnace & no central air		
Programmable Thermostats (SF) - oil furnace (Heating + Central Air)	Space Heating/Cooling	2.4%	Tab 3 - SH2, SH3	13.8%		Tab 1c - SH14	86.2%			33.4%	Homes in service area with oil furnace & central air		
Programmable Thermostats (SF) - oil boiler (Heating only)	Space Heating	4.7%	Tab 3 - SH2, SH3	13.8%		Tab 1c - SH14	86.2%			33.4%	Homes in service area with oil boiler & no central air		
Programmable Thermostats (SF) - oil boiler (Heating + Central Air)	Space Heating/Cooling	0.0%	Tab 3 - SH2, SH3	13.8%		Tab 1c - SH14	86.2%			33.4%	Homes in service area with oil boiler & central air		
Efficient Furnace Fan (Non-Electric Furnace)	Space Heating	49.6%	Tab 1a - SH3	14.2%		Tab 1a - SH7, SH8	85.8%			33.4%	Homes in service area with non-electric furnace		addressed in the survey. Base case factor is based on fairly new (<10 yrs. old)
HVAC Tune-Up (Electric Heat)	Space Heating	9.4%	Tab 1a - SH2	44.4%		Tab 1c - SH6	55.6%			33.4%	Homes in service area with electric heat		Due to low # of respondents, use average across all fuel types
HVAC Tune-Up (Gas Heat)	Space Heating	48.8%	Tab 1a - SH2	53.8%		Tab 1c - SH6	46.2%			33.4%	Homes in service area with gas heat		
HVAC Tune-Up (Oil Heat)	Space Heating	22.8%	Tab 1a - SH2	83.3%		Tab 1c - SH6	16.7%			33.4%	Homes in service area with oil heat		
Energy Star Room A/C	Room AC	59.1%	Tab 1a - SC7	37.3%		Tab 1a - PP7A, 2, PP7B, 2	62.7%			33.4%	Homes in service area with one or more window A/C units		conditioners per home with at least 1 room air conditioner
Energy Star ceiling fans	Impacts Heating & Cooling						100.0%			33.4%			Not included in survey
High Efficiency Central AC (Tier 1)	Central AC	21.3%	Tab 1a - SC1	18.5%		Tab 1a - PP7A, 1, PP7B, 1	81.5%			33.4%	Homes in service area with central AC		
High Efficiency Central AC (Tier 2)	Central AC	21.3%	Tab 1a - SC1	18.5%		Tab 1a - PP7A, 1, PP7B, 1	81.5%			33.4%	Homes in service area with central AC		
High Efficiency Heat Pump (Tier 1)	Heating/Cooling	100.0%		3.0%		RMLD Tech Potential (GDS/EPRF: GDS assumptions based on information from RMLD Tech Potential (GDS/EPRF: GDS assumptions based on information from	97.0%			33.4%	Homes in service area		Primarily a moderate climate technology. Not included in survey.
High Efficiency Heat Pump (Tier 2)	Heating/Cooling	100.0%		4.0%		RMLD Tech Potential (GDS/EPRF: GDS assumptions based on information from	96.0%			33.4%	Homes in service area		Primarily a moderate climate technology. Not included in survey.
Ground Source Heat Pump	Heating/Cooling	100.0%		1.0%		RMLD Tech Potential (NWAliance: NWAliance.org Market Research Report on	99.0%			33.4%	Homes in service area		
HE Whole House Fans	Air Conditioning	100.0%					100.0%			33.4%	Homes in service area		
High Efficiency Furnace - Natural Gas	Space Heating	22.8%	Tab 3 - SH2, SH3	12.9%		Tab 1a - SH2; Tab 3 - SH8, SH2;	87.1%			33.4%	Homes in service area with natural gas furnace		
High Efficiency Furnace - Propane	Space Heating	4.7%	Tab 3 - SH2, SH3	26.7%		Tab 1a - SH2; Tab 3 - SH8, SH2;	73.3%			33.4%	Homes in service area with propane furnace		
High Efficiency Furnace - Oil	Space Heating	16.5%	Tab 3 - SH2, SH3	13.8%		Tab 1a - SH2; Tab 3 - SH8, SH2;	86.2%			33.4%	Homes in service area with oil furnace		
High Efficiency Boiler - Natural Gas	Space Heating	17.3%	Tab 3 - SH2, SH3	12.9%		Tab 1a - SH2; Tab 3 - SH8, SH2;	87.1%			33.4%	Homes in service area with natural gas boiler		
High Efficiency Boiler - Propane	Space Heating	5.9%	Tab 3 - SH2, SH3	26.7%		Tab 1a - SH2; Tab 3 - SH8, SH2;	73.3%			33.4%	Homes in service area with propane boiler		
High Efficiency Boiler - Oil	Space Heating	4.7%	Tab 3 - SH2, SH3	13.8%		Tab 1a - SH2; Tab 3 - SH8, SH2;	86.2%			33.4%	Homes in service area with oil boiler		
Improved Steam Vents (SF) - gas	Space Heating	0.8%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with natural gas steam boiler		combining all steam trap measures because the percentage of homes with
Improved Steam Vents (SF) - LPG	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with LPG steam boiler		combining all steam trap measures because the percentage of homes with
Improved Steam Vents (SF) - oil	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with oil steam boiler		combining all steam trap measures because the percentage of homes with
Efficient Steam Boiler (SF) - gas	Space Heating	0.8%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with natural gas steam boiler		combining all efficient steam boiler measures because the percentage of
Efficient Steam Boiler (SF) - LPG	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with LPG steam boiler		combining all efficient steam boiler measures because the percentage of
Efficient Steam Boiler (SF) - oil	Space Heating	0.0%	Tab 3 - SH2, SH3	0.0%		Tab 1a - SH2; Tab 3 - SH8, SH2;	100.0%			33.4%	Homes in service area with oil steam boiler		combining all efficient steam boiler measures because the percentage of
Duct Sealing - electric	Heating/Cooling	8.6%	RMLD Residential Tech	25.0%		RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing.	75.0%			33.4%	Homes in service area with electric heat - forced hot air		Small N (N=3) Forced Hot Air/Electric is not specified
Duct Sealing - gas	Heating/Cooling	22.8%	Tab 3 - SH2, SH3	50.0%		RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing.	50.0%			33.4%	Homes in service area with natural gas heat - forced hot air		Duct sealing not addressed in survey
Duct Sealing - LPG	Heating/Cooling	4.7%	Tab 3 - SH2, SH3			RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing.	100.0%			33.4%	Homes in service area with LPG heat - forced hot air		Duct sealing not addressed in survey
Duct Sealing - oil	Heating/Cooling	16.5%	Tab 3 - SH2, SH3	50.0%		RMLD Residential Tech Potential (GDS: GDS Estimate based on age of housing.	50.0%			33.4%	Homes in service area with oil heat - forced hot air		Duct sealing not addressed in survey
Off Peak Cooling w/ Thermal Energy Storage (Informational)	Informational						100.0%			33.4%			
Combo Systems (Informational)	Informational						100.0%			33.4%			
<b>Building Envelope</b>													
Integrated Building Design - Good (ENERGY STAR Home - 20% Savings) - Electric Heat	Total Home Electric Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home - 35% Savings) - Electric Heat	Total Home Electric Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home - 50% Savings) - Electric Heat	Total Home Electric Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home - 20% Savings) - Gas Heat	Total Home Gas Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home - 35% Savings) - Gas Heat	Total Home Gas Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home - 50% Savings) - Gas Heat	Total Home Gas Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home - 20% Savings) - LPG Heat	Total Home LPG Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home - 35% Savings) - LPG Heat	Total Home LPG Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home - 50% Savings) - LPG Heat	Total Home LPG Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Good (ENERGY STAR Home - 20% Savings) - Oil Heat	Total Home Oil Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Better (ENERGY STAR Home - 35% Savings) - Oil Heat	Total Home Oil Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Integrated Building Design - Best (ENERGY STAR Home - 50% Savings) - Oil Heat	Total Home Oil Use	100.0%					100.0%			33.4%	New Homes		No question in the survey regarding Energy Star Homes
Energy Efficient Windows (SF) - electric heat	Heating/Cooling	9.4%		14.3%		Tab 1c - PP7A, 10, PP7B, 10	85.7%			33.4%	Homes in service area with electric heat		
Energy Efficient Windows (SF) - gas heat	Heating/Cooling	48.8%		14.1%		Tab 1c - PP7A, 10, PP7B, 10	85.9%			33.4%	Homes in service area with natural gas heat		
Energy Efficient Windows (SF) - LPG heat	Heating/Cooling	11.8%		11.1%		Tab 1c - PP7A, 10, PP7B, 10	88.9%			33.4%	Homes in service area with LPG heat		
Energy Efficient Windows (SF) - oil heat	Heating/Cooling	22.8%		9.8%		Tab 1c - PP7A, 10, PP7B, 10	90.3%			33.4%	Homes in service area with oil heat		
Interior Storm Windows (Low-e or double clear film)	Heating/Cooling	100.0%		29.9%		Tab 1a - BE1, 1	70.1%			33.4%	Homes in service area		
Cool roofing/white roof/green roof (Central AC)	Central AC	100.0%					100.0%			33.4%	Homes in service area		Not included in the survey
Exterior Door Insulation (New, Replacement, Retrofit)	Heating/Cooling	100.0%					100.0%			33.4%	Homes in service area		Is this a storm door? Not included in survey
Tree Shading (Central Air)	Central AC	21.3%	Tab 1a - SC1	50.4%		RMLD Tech Potential (RECS HCA: GDS Calculation based on Data in the Residential	49.6%			33.4%	Homes in service area with central AC		Tree shading not addressed in survey
Tree Shading (Room AC)	Central AC	59.1%	Tab 1a - SC7	50.4%		RMLD Tech Potential (RECS HCA: GDS Calculation based on Data in the Residential	49.6%			33.4%	Homes in service area with Room AC		Tree shading not addressed in survey

# Residential Non Electric Model - Multi Family Saturations

Tree Shading (Central Air)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential)	49.6%		33.4%		Duplicate measure
Tree Shading (Room AC)	Central AC			50.4%	RMLD Tech Potential (RECS HC4: GDS Calculation based on Data in the Residential)	49.6%		33.4%		Duplicate measure
Insulation/weatherization package - electric heat - single family	Space Heating	9.4%	Tab 1a - SH2	16.7%	Tab 3 - SH2, BE3	83.3%		33.4%	Homes in service area with electric heat	measures will be included? These combined measures or the detailed measures will be included?
Insulation/weatherization package - gas heat	Space Heating	48.8%	Tab 1a - SH2	14.9%	Tab 3 - SH2, BE3	85.5%		33.4%	Homes in service area with natural gas heat	base case = respondents that said they have added insulation
Insulation/weatherization package - LPG heat	Space Heating	11.8%	Tab 1a - SH2	26.7%	Tab 3 - SH2, BE3	73.3%		33.4%	Homes in service area with LPG heat	base case = respondents that said they have added insulation
Insulation/weatherization package - oil heat	Space Heating	22.8%	Tab 1a - SH2	24.1%	Tab 3 - SH2, BE3	75.9%		33.4%	Homes in service area with oil heat	base case = respondents that said they have added insulation
Insulation/weatherization package - Good (Improved Base Home) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	12.5%	Tab 3 - SH2, BE3	87.5%		33.4%	Homes in service area with electric heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	4.2%	Tab 3 - SH2, BE3	95.8%		33.4%	Homes in service area with electric heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Electric Heat	Space Heating	9.4%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with electric heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	10.9%	Tab 3 - SH2, BE3	89.1%		33.4%	Homes in service area with natural gas heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	3.6%	Tab 3 - SH2, BE3	96.4%		33.4%	Homes in service area with natural gas heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Gas Heat	Space Heating	48.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with natural gas heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	20.0%	Tab 3 - SH2, BE3	80.0%		33.4%	Homes in service area with LPG heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	6.7%	Tab 3 - SH2, BE3	93.3%		33.4%	Homes in service area with LPG heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - LPG Heat	Space Heating	11.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with LPG heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Good (Improved Base Home) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	18.1%	Tab 3 - SH2, BE3	81.9%		33.4%	Homes in service area with oil heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Better (Improved Base Home to Current NH Code) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	6.0%	Tab 3 - SH2, BE3	94.0%		33.4%	Homes in service area with oil heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulation/weatherization package - Best (Major Renovation to ES Home Levels) - Oil Heat	Space Heating	22.8%	Tab 1a - SH2	0.0%	Tab 3 - SH2, BE3	100.0%		33.4%	Homes in service area with oil heat	have added insulation (assume 75%-good, 25% better, 0% best)
Insulating Concrete Forms (ICF) for renovations/additions - electric heat	Space Heating	9.4%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with electric heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICF) for renovations/additions - gas heat	Space Heating	48.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with natural gas heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICF) for renovations/additions - LPG heat	Space Heating	11.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with LPG heat	This level of insulation detail not included in the survey
Insulating Concrete Forms (ICF) for renovations/additions - oil heat	Space Heating	22.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with oil heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPa) for renovations/additions - electric heat	Space Heating	9.4%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with electric heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPa) for renovations/additions - gas heat	Space Heating	48.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with natural gas heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPa) for renovations/additions - LPG heat	Space Heating	11.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with LPG heat	This level of insulation detail not included in the survey
Structural Insulated Panels (SIPa) for renovations/additions - oil heat	Space Heating	22.8%	Tab 1a - SH2			100.0%		33.4%	Homes in service area with oil heat	This level of insulation detail not included in the survey
New Construction (standard) - Electric Heat	Space Heating	100.0%		RMLD Tech Potential		100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Natural Gas Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Propane Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (standard) - Oil Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	This is a baseline not a measure
New Construction (BPI) - Electric Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization?
New Construction (BPI) - Natural Gas Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization?
New Construction (BPI) - Propane Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization?
New Construction (BPI) - Oil Heat	Space Heating	100.0%				100.0%		33.4%	New Homes	Isn't BPI a builder/contractor accreditation organization?
LI Insulation & Weatherization (Electrically Heated)	Space Heating	9.1%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with electric heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating	24.2%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with natural gas heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Propane Heated)	Space Heating	12.1%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with propane heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Oil Heated)	Space Heating	36.4%	Tab 5-SH2	30.3%		69.7%		33.4%	Low income homes in service area with oil heat	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Central AC)	Central AC	9.1%	Tab 5-SC1	30.3%		69.7%		33.4%	Low income homes in service area with central AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Room AC)	Room AC	78.8%	Tab 5-SC7	30.3%		69.7%		33.4%	Low income homes in service area with room AC	base case = respondents that said they have added insulation
LI Insulation & Weatherization (Electrically Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Natural Gas Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Propane Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Gas Heated)	Space Heating					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Central AC)	Central AC					100.0%		33.4%		Duplicate measure
LI Insulation & Weatherization (Room AC)	Room AC					100.0%		33.4%		Duplicate measure
<b>Standby Power and Automation</b>										
chargers, cordless phones, TV/DVD combo units, DVD, External Power adapters, home Audio)	Appliances	100.0%		15.0%		85.0%		33.4%	Homes in service area	Not addressed in the survey. Used data from GDS VT study
Energy Efficient "Smart" Power Strip for PC/Monitor/Printer	Computers/Printers	68.5%	Tab 1a - TC2			100.0%		33.4%	Homes in service area with 1 or more computers	or more computers. This measure is not addressed in the survey. Similar savings
Home Automation & SMART Controls	Appliances	100.0%				100.0%		33.4%	Homes in service area	Not addressed in the survey
<b>Pools</b>										
Pool Pump and Motor	Pool					100.0%		33.4%	Homes in service area with a pool	Survey question only asked about heated pools
High efficiency spas/hot tubs	Spas/Hot Tub	5.9%	Tab 1a - HT1			100.0%		33.4%	Homes in service area with outdoor spa/hot tub	Survey asks about covers and timers for the heater.
Solar Pool Heater	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Electric (EF=0.95)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Natural Gas Propane (EF=0.67)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
HE Pool Water Heater - Propane (EF=0.67)	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Temperature control	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Pool Cover	Pool	0.8%	Tab 1a - HT6			100.0%		33.4%	Homes in service area with heated pool	Very low saturation: May want to consider dropping all pool heating measures.
Outdoor ponds / fountains	Ponds/Fountains					100.0%		33.4%		What is this measure?

## Residential Measures Not Included

<b>RESIDENTIAL MEASURES NOT MODELED</b>
<b>Measure Name</b>
Built-in Interior Clothes Lines in new construction (informational)
Cold Cathode Bulbs (informational)
Combo Systems (Informational)
Cool roofing/white roof/green roof (Central AC)
Daylighting options, including retrofit & light tubes (informational)
Energy Star ceiling fans
Exterior Door Insulation (New, Replacement, Retrofit)
HE Pool Water Heater - Electric (EF=0.95)
HE Pool Water Heater - Natural Gas Propane (EF=0.67)
HE Pool Water Heater - Propane (EF=0.67)
HE Whole House Fans
High efficiency spas/hot tubs
Home Automation & SMART Controls
Horizontal Axis Washer-Dryer Combination Unit (informational)
Insulating Concrete Forms (ICFs) for renovations/additions
Interior Storm Windows (Low-e or double clear film)
LED Exit Signs
Off Peak Cooling w/ Thermal Energy Storage (Informational)
Outdoor ponds / fountains
Pool Cover
Solar Pool Heater
Wine refrigerators (Informational)