Large Filing Separator Sheet

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Projected Participants and Program Costs

Residential - Current Programs/Measures	UCT Result	Program Costs	Customer Incentive	Projected Participants 2006	2007	2008	2009	2010	Projected Program Costs 2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	1.80	$ -	$ 250	1,000	1,000	1,000	1,000	1,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000
Home Energy House Call	4.89	$ 250	$ -	3,250	3,750	4,250	4,750	4,750	$ 812,500	$ 937,500	$ 1,062,500	$ 1,187,500	$ 1,187,500
Ohio Energy Project (NEED)	1.76	$ 150	$ -	1,000	1,000	1,000	1,000	1,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Power Manager	1.58	$ 332	$ -	2,000	12,000	12,000	12,000	12,000	$ 1,055,743	$ 3,338,012	$ 3,617,970	$ 4,251,461	$ 4,339,625
Energy Star Products													
CFL's (Compact Fluorescent Lights)	12.55	$ -	$ 2	500,000	500,000	500,000	500,000	500,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
Torchieres (Floor lamps)	7.38	$ -	$ 20	1,800	1,800	1,800	1,800	1,800	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000
Energy Efficiency Web Site (Electric Impacts)	6.18	$ 17		6,000	7,200	8,400	10,400	12,000	$ 102,000	$ 122,400	$ 142,800	$ 176,800	$ 204,000
Room AC Turn-In	1.67	$ -	$ 50	1,000	1,500	2,000	2,500	2,500	$ 50,000	$ 75,000	$ 100,000	$ 125,000	$ 125,000
AC Check - Pilot	3.75	$ -	$ 100	250	500	1,000	1,500	2,000	$ 25,000	$ 50,000	$ 100,000	$ 150,000	$ 200,000
Smart Saver Heat Pump with ECM	1.94	$ -	$ 350	100	150	200	200	200	$ 35,000	$ 52,500	$ 70,000	$ 70,000	$ 70,000
Personalized Energy Report Pilot Program	10.19	$ -	$ 20.42	52,800	-	-	-	-	$ 1,078,176	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	4.70	$ 200	$ -	100	2,000	5,000	7,500	10,000	$ 277,000	$ 400,000	$ 1,000,000	$ 1,500,000	$ 2,000,000
Energy Star Products - Gas Furnace /ECM (Elec Impacts	5.52	$ -	$ -	500	600	750	1,000	1,000		$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)	3.23	$ -	$ -	5	20	50	100	150	$ 23,500	$ 49,000	$ 78,725	$ 142,450	$ 197,175
House Call Plus - Research (Gas Heated Homes)	2.54	$ -	$ -	20	80	200	400	600	$ 94,000	$ 196,000	$ 306,900	$ 559,800	$ 788,700
Energy Star Products - Gas Furnace	8.31	$ -	$ 300	5,000	6,000	7,500	10,000	10,000	$ 1,500,000	$ 1,800,000	$ 2,250,000	$ 3,000,000	$ 3,000,000
Energy Star Products - Gas Furnace with ECM	5.52	$ -	$ 550	500	600	750	1,000	1,000	$ 275,000	$ 330,000	$ 412,500	$ 550,000	$ 550,000
Direct Program Cost									$ 6,763,918	$ 8,786,412	$ 10,575,396	$ 13,159,011	$ 14,098,000
Administrative Costs				Administrative Cost Per Participant					Administrative Costs				
Summer Saver (Air-conditioner)									$ 67,500	$ 67,500	$ 67,500	$ 67,500	$ 67,500
Home Energy House Call									$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500
Ohio Energy Project (NEED)									$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Power Manager									$ -	$ -	$ -	$ -	$ -
Energy Star Products									$ 887,580	$ 887,580	$ 887,580	$ 887,580	$ 887,580
CFL's (Compact Fluorescent Lights)													
Torchieres (Floor lamps)													
Energy Efficiency Web Site (Electric Impacts)									$ 35,700	$ 42,840	$ 49,980	$ 61,880	$ 71,400
Room AC Turn-In				$ 55	$ 55	$ 55	$ 55	$ 55	$ 55,000	$ 82,500	$ 110,000	$ 137,500	$ 137,500
AC Check - Pilot				$ 30	$ 30	$ 30	$ 30	$ 30	$ 7,500	$ 15,000	$ 30,000	$ 45,000	$ 60,000
Smart Saver Heat Pump with ECM				$ 518	$ 229	$ 84	$ 84	$ 84	$ 51,800	$ 34,350	$ 16,800	$ 16,800	$ 16,800
Personalized Energy Report Pilot Program									$ -	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot				$ 100	$ 100	$ 100	$ 100	$ 100	$ 10,000	$ 200,000	$ 500,000	$ 750,000	$ 1,000,000
Energy Star Products - Gas Furnace /ECM (Elec Impacts)				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)									$ 3,000	$ 3,000	$ 10,493	$ 19,425	$ 26,888
House Call Plus - Research (Gas Heated Homes)				$ -	$ -	$ -	$ -	$ -	$ 12,000	$ 12,000	$ 41,850	$ 77,700	$ 107,550
Energy Star Products - Gas Furnace				$ 90	$ 90	$ 90	$ 90	$ 90	$ 450,000	$ 540,000	$ 675,000	$ 900,000	$ 900,000
Energy Star Products - Gas Furnace with ECM				$ 165	$ 165	$ 165	$ 165	$ 165	$ 82,500	$ 88,000	$ 123,750	$ 165,000	$ 165,000
Evaluation									$ 480,724	$ 426,168	$ 491,199	$ 610,934	$ 667,231
Program Administrative and Marketing Costs									$ 2,195,804	$ 2,462,438	$ 3,056,622	$ 3,791,819	$ 4,159,949
Total Cost									$ 8,959,723	$ 11,248,850	$ 13,632,017	$ 16,950,830	$ 18,257,949
Non-gas Program Administrative and Marketing Costs									$ 1,851,304				

Total Program Costs (Incentives, Marketing, & Administration)	2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	$ 317,500	$ 317,500	$ 317,500	$ 317,500	$ 317,500
Home Energy House Call	$ 850,000	$ 975,000	$ 1,100,000	$ 1,225,000	$ 1,225,000
Ohio Energy Project (NEED)	$ 165,000	$ 165,000	$ 165,000	$ 165,000	$ 165,000
Power Manager	$ 1,055,743	$ 3,338,012	$ 3,617,970	$ 4,251,461	$ 4,339,625
Energy Star Products	$ 887,580	$ 887,580	$ 887,580	$ 887,580	$ 887,580
CFL's (Compact Fluorescent Lights)	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
Torchieres (Floor lamps)	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000
Energy Efficiency Web Site (Electric Impacts)	$ 137,700	$ 165,240	$ 192,780	$ 238,680	$ 275,400
Room AC Turn-In	$ 105,000	$ 157,500	$ 210,000	$ 262,500	$ 262,500
AC Check - Pilot	$ 32,500	$ 65,000	$ 130,000	$ 195,000	$ 260,000
Smart Saver Heat Pump with ECM	$ 86,800	$ 86,850	$ 86,800	$ 86,800	$ 86,800
Personalized Energy Report Pilot Program	$ 1,078,176	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	$ 287,000	$ 600,000	$ 1,500,000	$ 2,250,000	$ 3,000,000
Energy Star Products - Gas Furnace /ECM (Elec Impacts)	$ -	$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)	$ 26,500	$ 52,000	$ 87,188	$ 161,875	$ 224,063
House Call Plus - Research (Gas Heated Homes)	$ 106,000	$ 208,000	$ 348,750	$ 647,500	$ 896,250
Energy Star Products - Gas Furnace	$ 1,950,000	$ 2,340,000	$ 2,925,000	$ 3,900,000	$ 3,900,000
Energy Star Products - Gas Furnace with ECM	$ 357,500	$ 429,000	$ 536,250	$ 715,000	$ 715,000
Evaluation	$ 480,724	$ 426,168	$ 491,199	$ 610,934	$ 667,231
Total Cost	$ 8,959,723	$ 11,248,850	$ 13,632,017	$ 16,950,830	$ 18,257,949
Evaluation for Gas DSM Programs	$ 120,675				
	25.10%				

Projected Electric and Gas Load Impacts

Residential - Current Programs/Measures	Projected Participants 2006	2007	2008	2009	2010	kwh Impact	kW Impact	Projected kWh Impacts 2006	2007	2008	2009	2010	Projected kW Impacts 2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	1,000	1,000	1,000	1,000	1,000	280	0.25	280,000	280,000	280,000	280,000	280,000	250.0	250.0	250.0	250.0	250.0
Home Energy House Call	3,250	3,750	4,250	4,750	4,750	998	0.31	3,243,500	3,742,500	4,241,500	4,740,500	4,740,500	1,007.5	1,162.5	1,317.5	1,472.5	1,472.5
Ohio Energy Project (NEED)	1,000	1,000	1,000	1,000	1,000	300	0.09	300,000	300,000	300,000	300,000	300,000	90.0	90.0	90.0	90.0	90.0
Power Manager	2,000	12,000	12,000	12,000	12,000	-	1.38	-	-	-	-	-	2,760.0	16,560.0	16,560.0	16,560.0	16,560.0
Energy Star Products																	
CFL's (Compact Fluorescent Lights)	500,000	500,000	500,000	500,000	500,000	66	0.02	33,000,000	33,000,000	33,000,000	33,000,000	33,000,000	10,000.0	10,000.0	10,000.0	10,000.0	10,000.0
Torchieres (Floor lamps)	1,800	1,800	1,800	1,800	1,800	388	0.12	698,400	698,400	698,400	698,400	698,400	216.0	216.0	216.0	216.0	216.0
Energy Efficiency Web Site (Electric Impacts)	6,000	7,200	8,400	10,400	12,000	205	0.06	1,230,000	1,476,000	1,722,000	2,132,000	2,460,000	360.0	432.0	504.0	624.0	720.0
Room AC Turn-In	1,000	1,500	2,000	2,500	2,500	175	0.16	175,000	262,500	350,000	437,500	437,500	160.0	240.0	320.0	400.0	400.0
AC Check - Pilot	250	500	1,000	1,500	2,000	394	0.35	98,500	197,000	394,000	591,000	788,000	87.5	175.0	350.0	525.0	700.0
Smart Saver Heat Pump with ECM	100	150	200	200	200	922	0.25	92,200	138,300	184,400	184,400	184,400	29.0	43.5	58.0	58.0	58.0
Personalized Energy Report Pilot Program	52,800	-	-	-	-	300	0.09	15,840,000	-	-	-	-	4,752.0	-	-	-	-
Pre-Paid Meter - Pilot	100	2,000	5,000	7,500	10,000	1,565	0.49	156,500	3,130,000	7,825,000	11,737,500	15,650,000	49.0	980.0	2,450.0	3,675.0	4,900.0
Energy Star Products - Gas Furnace /ECM (Elec Impacts)	500	600	750	1,000	1,000	772	0.24	386,000	463,200	579,000	772,000	772,000	120.0	144.0	180.0	240.0	240.0
House Call Plus - Research (Elec Heated Homes)	5	20	50	100	150	4,700	1.48	23,500	94,000	235,000	470,000	705,000	7.4	29.6	74.0	148.0	222.0
						CCF Impacts		Projected ccf Impacts									
House Call Plus - Research (Gas Heated Homes)	20	80	200	400	600	300		6,000	24,000	60,000	120,000	180,000					
Energy Star Products - Gas Furnace	5,000	6,000	7,500	10,000	10,000	451		2,255,000	2,706,000	3,382,500	4,510,000	4,510,000					
Energy Star Products - Gas Furnace with ECM	500	600	750	1,000	1,000	451		225,500	270,600	338,250	451,000	451,000					

	Projected kWh Impacts					Projected kW Impacts				
Total kWh or kW Impacts	55,523,600	43,761,900	49,809,300	55,343,300	60,015,800	19,888	30,323	32,370	34,259	35,829
Cumulative Annual Total					264,473,900					152,668
Cumulative Total					772,875,900					
Total ccf Impacts	2,486,500	3,000,800	3,760,750	5,081,000	5,141,000					
Cumulative Annual Total					18,488,850					
Cumulative Total					51,080,150					

Projected Net Lost Revenues

Residential - Current Programs/Measures	Projected kWh Impacts 2006	2007	2008	2009	2010	Net Lost Revenue Rate	Projected Net Lost Revenues 2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	280,000	280,000	280,000	280,000	280,000	$ 0.054320	$ 15,210	$ 15,210	$ 15,210	$ 15,210	$ 15,210
Home Energy House Call	3,243,500	3,742,500	4,241,500	4,740,500	4,740,500	$ 0.054320	$ 176,187	$ 203,293	$ 230,398	$ 257,504	$ 257,504
Ohio Energy Project (NEED)	300,000	300,000	300,000	300,000	300,000	$ 0.054320	$ 16,296	$ 16,296	$ 16,296	$ 16,296	$ 16,296
Power Manager	-	-	-	-	-	$ 0.054320	$ -	$ -	$ -	$ -	$ -
Energy Star Products											
CFL's (Compact Fluorescent Lights)	33,000,000	33,000,000	33,000,000	33,000,000	33,000,000	$ 0.054320	$ 1,792,560	$ 1,792,560	$ 1,792,560	$ 1,792,560	$ 1,792,560
Torchieres (Floor lamps)	698,400	698,400	698,400	698,400	698,400	$ 0.054320	$ 37,937	$ 37,937	$ 37,937	$ 37,937	$ 37,937
Energy Efficiency Web Site (Electric Impacts)	1,230,000	1,476,000	1,722,000	2,132,000	2,460,000	$ 0.054320	$ 66,814	$ 80,176	$ 93,539	$ 115,810	$ 133,627
Room AC Turn-In	175,000	262,500	350,000	437,500	437,500	$ 0.054320	$ 9,506	$ 14,259	$ 19,012	$ 23,765	$ 23,765
AC Check - Pilot	98,500	197,000	394,000	591,000	788,000	$ 0.054320	$ 5,351	$ 10,701	$ 21,402	$ 32,103	$ 42,804
Smart Saver Heat Pump with ECM	92,200	138,300	184,400	184,400	184,400	$ 0.054320	$ 5,008	$ 7,512	$ 10,017	$ 10,017	$ 10,017
Personalized Energy Report Pilot Program	15,840,000	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	156,500	3,130,000	7,825,000	11,737,500	15,650,000	$ 0.054320	$ 8,501	$ 170,022	$ 425,054	$ 637,581	$ 850,108
Energy Star Products - Gas Furnace /ECM (Elec Impacts)	386,000	463,200	579,000	772,000	772,000	$ 0.054320	$ 20,968	$ 25,161	$ 31,451	$ 41,935	$ 41,935
House Call Plus - Research (Elec Heated Homes)	23,500	94,000	235,000	470,000	705,000	$ 0.054320	$ 1,277	$ 5,106	$ 12,765	$ 25,530	$ 38,296
	Projected ccf Impacts										
House Call Plus - Research (Gas Heated Homes)	6,000	24,000	60,000	120,000	180,000	$ 0.185910	$ 1,115	$ 4,462	$ 11,155	$ 22,309	$ 33,464
Energy Star Products - Gas Furnace	2,255,000	2,706,000	3,382,500	4,510,000	4,510,000	$ 0.185910	$ 419,227	$ 503,072	$ 628,841	$ 838,454	$ 838,454
Energy Star Products - Gas Furnace with ECM	225,500	270,600	338,250	451,000	451,000	$ 0.185910	$ 41,923	$ 50,307	$ 62,884	$ 83,845	$ 83,845

	Projected kWh Impacts					Projected Net Lost Revenues				
Total kWh Impacts & Net Lost Revenues	55,523,600	43,781,900	49,809,300	55,343,300	60,015,800	$ 2,155,613	$ 2,378,233	$ 2,705,641	$ 3,006,248	$ 3,260,058
Cumulative Annual Lost Revenues							$ 4,533,846	$ 7,239,487	$ 10,245,735	$ 13,505,793
Cumulative Total Lost Revenues										$ 37,680,475
Total ccf Impacts & Net Lost Revenues	2,486,500	3,000,600	3,780,750	5,081,000	5,141,000	$ 462,265	$ 557,842	$ 702,879	$ 944,609	$ 955,763
Cumulative Annual Lost Revenues							$ 1,020,107	$ 1,722,986	$ 2,667,595	$ 3,623,358
Cumulative Total Lost Revenues										$ 9,496,311

Projected Shared Savings

		Projected Program Costs					Projected Program Savings				
Residential - Current Programs/Measures	UCT	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	1.8	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000
Home Energy House Call	4.89	$ 812,500	$ 937,500	$ 1,062,500	$ 1,187,500	$ 1,187,500	$ 3,160,625	$ 3,648,875	$ 4,133,125	$ 4,619,375	$ 4,619,375
Ohio Energy Project (NEED)	1.78	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 117,000	$ 117,000	$ 117,000	$ 117,000	$ 117,000
Power Manager	1.56	$ 1,055,743	$ 3,338,012	$ 3,617,970	$ 4,251,461	$ 4,339,625	$ 591,216	$ 1,869,287	$ 2,026,063	$ 2,380,818	$ 2,430,190
Energy Star Products											
CFL's (Compact Fluorescent Lights)	12.55	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$11,550,000	$11,550,000	$ 11,550,000	$11,550,000	$ 11,550,000
Torchieres (Floor lamps)	7.38	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 229,680	$ 229,680	$ 229,680	$ 229,680	$ 229,680
Energy Efficiency Web Site (Electric Impacts)	6.18	$ 102,000	$ 122,400	$ 142,800	$ 176,800	$ 204,000	$ 528,360	$ 634,032	$ 739,704	$ 915,824	$ 1,056,720
Room AC Turn-In	1.67	$ 50,000	$ 75,000	$ 100,000	$ 125,000	$ 125,000	$ 33,500	$ 50,250	$ 67,000	$ 83,750	$ 83,750
AC Check - Pilot	3.75	$ 25,000	$ 50,000	$ 100,000	$ 150,000	$ 200,000	$ 68,750	$ 137,500	$ 275,000	$ 412,500	$ 550,000
Smart Saver Heat Pump with ECM	1.94	$ 35,000	$ 52,500	$ 70,000	$ 70,000	$ 70,000	$ 32,900	$ 49,350	$ 65,800	$ 65,800	$ 65,800
Personalized Energy Report Pilot Program	10.19	$ 1,078,176	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	4.7	$ 277,000	$ 400,000	$ 1,000,000	$ 1,500,000	$ 2,000,000	$ 1,024,900	$ 1,480,000	$ 3,700,000	$ 5,550,000	$ 7,400,000
Energy Star Products - Gas Furnace /ECM (Elec Impacts	5.52	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)	3.23	$ 23,500	$ 49,000	$ 76,725	$ 142,450	$ 197,175	$ 52,405	$ 109,270	$ 171,097	$ 317,664	$ 439,700
House Call Plus - Research (Gas Heated Homes)	2.54	$ 94,000	$ 196,000	$ 306,900	$ 569,800	$ 788,700	$ 144,760	$ 301,840	$ 472,626	$ 877,492	$ 1,214,598
Energy Star Products - Gas Furnace	8.31	$ 1,500,000	$ 1,800,000	$ 2,250,000	$ 3,000,000	$ 3,000,000	$10,985,000	$13,158,000	$ 16,447,500	$21,930,000	$ 21,930,000
Energy Star Products - Gas Furnace with ECM	5.52	$ 275,000	$ 330,000	$ 412,500	$ 550,000	$ 550,000	$ 1,243,000	$ 1,491,600	$ 1,864,500	$ 2,488,000	$ 2,486,000
Total Measure Costs		$ 6,763,919	$ 8,786,412	$10,575,395	$13,159,011	$ 14,098,000					
Administrative and Marketing Costs		$ 2,195,804	$ 2,462,438	$ 3,056,622	$ 3,791,819	$ 4,159,949					
Total Program Costs		$ 8,959,723	$11,248,850	$13,632,017	$16,950,830	$ 18,257,949					
Total Program Savings Net of Measure Costs							$29,942,096	$35,024,684	$ 42,059,095	$51,735,903	$ 54,372,813
Marketing & Administration Costs							$ 2,195,804	$ 2,462,438	$ 3,056,622	$ 3,791,819	$ 4,159,949
Total Program Savings Net of All Costs							$27,746,292	$32,562,246	$ 39,002,473	$47,944,084	$ 50,212,865
10% Shared Savings							$ 2,774,629	$ 3,256,225	$ 3,900,247	$ 4,794,408	$ 5,021,286

Note: This includes gas savings.

Evaluation of the Benefits of the DSM Program

Residential - Current Programs/Measures	UCT	Total Program Benefits 2005	2007	2008	2009	2010	Total Program Costs 2005	2007	2008	2009	2010	Total Cost Revenues 2004	2007	2008	2009	2010	Projected Program Savings 2006	2007	2008	2009	2010	Program Savings Net of Administrative 2006	Shared Savings Net of Administrative 2006
Summit: Saver (Air-conditioner)	1.8	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 15,210	$ 15,210	$ 15,210	$ 15,210	$ 15,210	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 130,500	$ 13,250
Home Energy House Call	4.63	$ 3,973,126	$ 4,464,375	$ 5,189,625	$ 5,808,875	$ 6,308,875	$ 612,500	$ 907,500	$ 1,062,500	$ 1,187,500	$ 1,187,500	$ 178,187	$ 263,283	$ 280,309	$ 257,504	$ 257,504	$ 3,160,625	$ 3,649,875	$ 4,133,125	$ 4,451,375	$ 4,819,375	$ 3,125,125	$ 312,313
Ohio Energy Project (HEEP)	1.78	$ 267,000	$ 267,000	$ 267,000	$ 267,000	$ 267,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 16,296	$ 16,296	$ 16,296	$ 16,296	$ 16,296	$ 117,000	$ 117,000	$ 117,000	$ 117,000	$ 117,000	$ 102,000	$ 10,200
Power Manager	1.66	$ 1,846,958	$ 5,267,288	$ 5,644,033	$ 6,632,279	$ 6,788,815	$ 1,858,743	$ 3,336,513	$ 3,617,370	$ 4,251,461	$ 4,339,625	$ -	$ -	$ -	$ -	$ -	$ 591,296	$ 1,669,287	$ 2,008,065	$ 2,340,818	$ 2,430,180	$ 591,216	$ 58,122
Energy Star Products																							
CFL's (Compact Fluorescent Lights)	12.56	$ 12,550,000	$ 12,550,000	$ 12,550,000	$ 12,550,000	$ 12,550,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,792,560	$ 1,792,560	$ 1,792,560	$ 1,792,560	$ 1,792,560	$ 11,550,000	$ 11,550,000	$ 11,550,000	$ 11,550,000	$ 11,550,000	$ 10,662,420	$ 1,066,242
Torchiere (Floor lamps)	7.38	$ 269,640	$ 269,640	$ 269,640	$ 269,640	$ 269,640	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 37,837	$ 37,837	$ 37,837	$ 37,837	$ 37,837	$ 229,680	$ 229,680	$ 229,680	$ 229,680	$ 229,680	$ 229,680	$ 22,968
Energy Efficiency Web Site Electric Incents)	6.18	$ 630,360	$ 756,432	$ 882,504	$ 1,007,524	$ 1,260,720	$ 102,000	$ 122,400	$ 142,800	$ 178,500	$ 204,000	$ 66,814	$ 80,176	$ 93,538	$ 113,610	$ 130,927	$ 536,360	$ 654,032	$ 736,704	$ 915,624	$ 1,056,720	$ 492,880	$ 49,288
Room AC Turn-in	1.87	$ 63,500	$ 125,250	$ 187,000	$ 208,750	$ 208,750	$ 50,000	$ 75,000	$ 100,000	$ 125,000	$ 125,000	$ 8,904	$ 14,256	$ 19,012	$ 23,765	$ 23,765	$ 33,500	$ 50,250	$ 67,000	$ 83,750	$ 83,750	$ 21,500	$ (7,150)
AC Check - Pilot	3.75	$ 93,750	$ 187,500	$ 375,000	$ 562,500	$ 750,000	$ 25,000	$ 50,000	$ 100,000	$ 150,000	$ 200,000	$ 5,351	$ 10,701	$ 21,402	$ 32,103	$ 42,804	$ 68,750	$ 137,500	$ 275,000	$ 412,500	$ 550,000	$ 61,250	$ 6,125
Smart Saver Heat Pump with ECM	1.84	$ 67,900	$ 101,850	$ 135,800	$ 135,800	$ 135,800	$ 35,000	$ 52,500	$ 70,000	$ 70,000	$ 70,000	$ 5,008	$ 7,512	$ 10,017	$ 10,017	$ 10,017	$ 32,900	$ 49,350	$ 65,800	$ 65,800	$ 65,800	$ (18,800)	$ (1,880)
Personalized Energy Report Pilot Program	10.19	$ 10,998,913	$ -	$ -	$ -	$ -	$ 1,078,176	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	4.7	$ 1,301,900	$ 1,680,800	$ 4,700,000	$ 7,080,000	$ 9,400,000	$ 277,000	$ 400,000	$ 1,882,000	$ 1,500,000	$ 3,000,000	$ 6,561	$ 179,032	$ 425,054	$ 637,581	$ 850,108	$ 1,034,900	$ 1,480,000	$ 3,700,000	$ 5,550,000	$ 7,400,000	$ 1,014,900	$ 101,490
Energy Star Products - Gas Furnace HECM (Elec Impacts)	5.52	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 25,988	$ 25,181	$ 31,451	$ 41,935	$ 41,935	$ -	$ -	$ -	$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)	3.23	$ 78,905	$ 156,270	$ 247,522	$ 450,114	$ 636,675	$ 23,500	$ 46,000	$ 78,725	$ 142,450	$ 197,175	$ 1,277	$ 5,109	$ 12,765	$ 25,530	$ 38,296	$ 52,405	$ 105,270	$ 171,097	$ 317,684	$ 438,700	$ 48,405	$ 4,841
House Call Plus - Research (Gas Heated Homes)	2.34	$ 236,709	$ 467,340	$ 729,586	$ 1,447,292	$ 2,035,796	$ 64,000	$ 156,000	$ 306,900	$ 569,600	$ 788,700	$ 1,115	$ 4,462	$ 11,155	$ 22,309	$ 33,464	$ 144,780	$ 301,849	$ 472,824	$ 877,482	$ 1,214,598	$ 122,780	$ 6,638
Energy Star Products - Gas Furnace	6.31	$ 12,465,000	$ 14,958,000	$ 18,697,500	$ 24,930,000	$ 24,930,000	$ 1,500,000	$ 1,800,000	$ 2,250,000	$ 3,000,000	$ 3,000,000	$ 419,227	$ 503,072	$ 628,841	$ 838,454	$ 838,454	$ 10,965,000	$ 13,158,000	$ 16,447,500	$ 21,930,000	$ 21,930,000	$ 10,515,000	$ 525,750
Energy Star Products - Gas Furnace with ECM	5.52	$ 1,518,000	$ 1,821,600	$ 2,277,000	$ 3,036,000	$ 3,036,000	$ 275,000	$ 330,000	$ 412,500	$ 550,000	$ 550,000	$ 41,923	$ 50,307	$ 62,884	$ 83,845	$ 83,845	$ 1,243,000	$ 1,491,600	$ 1,864,500	$ 2,486,000	$ 2,486,000	$ 1,180,500	$ 59,025
Evaluation																						$ (480,724)	$ (48,072)
Total Program Costs							$ 6,783,919	$ 8,786,412	$ 10,873,296	$ 13,159,011	$ 14,096,000												
Administrative and Marketing Costs							$ 2,195,884	$ 2,462,438	$ 3,056,822	$ 3,791,819	$ 4,159,848												
Total Program Benefits, Cost Lost Revenues, Shared Savings Marketing & Administration Costs		$ 46,914,453	$43,811,998	$ 52,634,480	$ 64,884,814	$68,470,813	$ 8,980,725	$ 11,248,850	$ 13,832,317	$ 16,950,830	$ 18,257,848	$2,156,813	$2,578,233	$2,705,641	$ 3,005,246	$3,280,058	$ 29,942,696	$ 35,024,884	$ 42,559,085	$51,735,903	$ 54,572,613	$ 3,105,904	$ 2,462,438	$ 3,056,822	$ 3,791,819	$ 4,159,848
Total Program Savings Net of All Costs																	$ 27,748,292	$ 32,562,246	$ 39,502,263	$ 47,944,084	$ 50,312,465	$ 2,774,629	$ 3,256,225	$ 3,950,347	$ 4,794,408	$ 5,031,285
10% Shared Savings																										

	Electric 2006	Gas 2006
Total Program Benefits (Avoided Costs)	$ 32,382,883	$14,357,760
Residential Sales Forecast (MWH or CCF)	7,554,426	40,912,180
Rate Impact at Savings	$ 0.00429	$ 0.34782
Total Program Costs	$ 6,548,223	$ 2,413,350
Total Lost Revenues	$ 2,155,613	$ 462,265
Total Shared Savings	$ 1,553,803	$ 580,413
Total Rate Recovery	$ 10,785,639	$ 3,456,176
Residential Sales Forecast (MWH or CCF)	7,554,426	40,912,180
Rate Impact of Cost Recovery	$ 0.00136	$ 0.08306
Rate Savings	$ 0.00293	$ 0.34753

APPENDIX B

Cost-Effectiveness of Proposed Small Business DSM Programs

Small C&I Programs/Measures	Option Value UCT	UCT	TRC	RIM
High-Efficiency Incentive Program				
Lighting - Basic Measures	6.21	5.57	1.78	0.97
8 ft 1-2 Lamp T-8/ E Ballast				
8 ft HO 1&2 T-8/ EB				
4 ft 1-4 T-8 /EB				
3 ft 1-4 T-8 /EB				
2 ft 1-4 T-8 /EB				
Lighting - Additional Measures				
CFL Fixture	16.62	14.91	8.13	1.14
CFL Screw in	18.96	17.00	7.58	1.02
T-5 with Elec Ballast replacing T-12	7.56	6.79	1.89	0.93
T-5 HO with Elec Ballast replacing T-12	7.04	6.32	2.08	0.92
Occupancy Sensors under 500 ft2	21.23	19.03	10.61	1.16
Occupancy Sensors over 500 ft3	4.24	3.80	2.12	0.95
LED Auto Traffic Signals	13.53	12.14	3.38	1.05
LED Pedestrian Signals	4.53	4.06	1.13	0.94
Light Tube	4.78	4.29	1.20	0.99
Hi Bay Fluorescent 4LT5HO	4.04	3.63	2.02	0.84
Hi Bay Fluorescent 6LF32T8	4.57	4.11	2.29	0.86
Plug Load Occupancy Sensors Document Stations	17.43	15.64	2.91	1.06
Pulse Start Metal Halide (retrofit only)	11.65	10.44	1.94	1.06
HVAC - Basic Measures	2.89	2.59	2.12	0.86
Packaged Terminal AC				
Unitary AC Rooftop & HP Rooftop				
Unitary AC 1 phase < 65,000 BTUH				
Rooftop HP 1 phase < 65,000 BTUH				
AC 3 phase < 65,000 BTUH				
AC 3 phase 65,000 to 135,000 BTUH				
AC 3 phase 135,000 to 240,000 BTUH				
Rooftop AC 3 phase 240,000 to 760,000 BTUH				
Ground Source HP Closed Loop < 135,000 BTUH				
HVAC - Additional Measures				
ES Window AC under 14,000 Btu/hr	4.59	3.90	1.64	1.44
ES Window AC over 14,000 Btu/hr	6.06	5.16	3.03	1.56
ES Sleeve AC under 14,000 Btu/hr	5.24	4.46	1.87	1.50
ES Sleeve AC over 14,000 Btu/hr	6.22	5.30	3.11	1.57
HP Water Heater 500 gal/day	4.66	4.18	2.33	0.94
HP Water Heater 1000 gal/day	6.61	5.93	3.31	1.00
HP Water Heater 1500 gal/day	7.10	6.37	3.55	1.01

High-Efficiency Incentive Program (Continued)	Option Value UCT	UCT	TRC	RIM
Motors - Basic Measures	2.45	2.2	1.78	0.8
25-250 hp - avg for group				
Greater than 1500 hours per year				
Motors - Additional Measures				
1-5 HP motors - Incentives per HP	8.41	7.54	1.72	1.05
7.5-20 HP motors - Incentives per HP	31.88	28.59	6.71	1.16
High Efficiency Pumps HP 5	1.80	1.61	1.27	0.74
HP 7.5	2.59	2.32	1.30	0.85
HP 10	3.32	2.98	2.60	0.91
HP 15	4.32	3.87	2.22	0.97
HP 20	4.33	3.88	2.04	0.97
Variable Frequency Drive Pumps HP 5	4.06	3.64	2.03	0.96
VFD HP 7.5	4.86	4.36	2.43	1.00
VFD HP 10	6.16	5.53	3.08	1.04
VFD HP 15	7.47	6.70	3.73	1.70
VFD HP 20	8.85	7.93	4.42	1.10
VFD HP 25	9.05	8.11	4.52	1.10
VFD HP 30	9.44	8.46	4.72	1.10
VFD HP 40	11.98	10.74	5.99	1.13
VFD HP 50	11.95	10.71	5.97	1.13
Other Measures				
Setback/Programmable Thermostat	105.36	94.48	22.42	1.18
Engineered Nozzles - COMPRESS AIR	420.03	376.56	210.02	1.25
Zone Shutoff Valves -COMPRESSED AIR	4.24	3.80	2.12	0.94
Dew Point Controlled Desiccant Dryers - Compressed air	22.99	20.61	11.50	1.21
Moisture Traps - Condensate Drain Valve	14.23	12.76	7.12	1.15
Chilled Water Reset	9.94	8.91	4.97	1.11
Central Lighting Control	8.47	7.59	4.23	1.07
Switching Controls for Multilevel Lighting	9.94	8.91	2.98	1.09
Daylight Sensor controls	16.34	14.65	4.90	1.14
Trim Impellers/Reduce Throttling Pumps	3.32	2.97	1.66	0.91
Unoccupied Cycle - CONTROLS	588.12	527.26	294.06	1.25
Commercial Clothes Washers - Washer Only	7.01	6.29	1.08	1.03
Commercial Clothes Washers - Electric Dryer & Washer	16.65	14.93	2.56	1.12
Supply Air Reset -Controls	18.15	16.28	9.08	1.17
Ventilation Scheduling - Controls	2.23	2.00	1.12	0.80
Optimal Start /Stop - Controls	23.07	20.68	11.53	1.19
Economizer Cycle - Controls	7.60	6.81	3.80	1.08
Vending Equipment Controller	8.70	7.81	2.72	1.00
Barrel Wraps (Inj Mold & Extruders)	38.78	34.80	19.39	1.09
High Efficiency Units - Refrigeration Display Cases	3.38	3.03	1.69	0.92
Efficient condensor Refrigerator	12.90	11.57	6.45	1.16
Head Pressure Control	26.76	23.99	13.38	1.20
Night covers for displays	4.80	4.30	2.40	1.00
Window Film	5.27	4.73	1.76	0.98
Air Flow Restriction Curtains	12.14	0.88	6.07	1.11
Pellet Dryer Tanks & Ducts	4.15	3.72	2.07	0.96
HI-EFF Multiplex Compressor	2.88	2.58	1.44	0.87
Photovoltaic Systems	0.07	0.06	0.27	0.07

Small C&I DSM Program Summary]

Small C&I Programs/Measures	Projected Program Costs 2006	2007	2008	2009	2010	Projected Net Lost Revenues 2006	2007	2008	2009	2010	Projected Shared Savings 2006	2007	2008	2009	2010
High-Efficiency Incentive Program															
Lighting - Basic Measures	$ 319,000	$ 330,600	$ 342,200	$ 353,800	$ 365,400	$ 58,470	$ 60,596	$ 62,723	$ 64,849	$ 66,975	$ 1,661,990	$ 1,722,426	$ 1,782,862	$ 1,843,298	$ 1,903,734
8 ft 1-2 Lamp T-8/ E Ballast															
8 ft HO 1&2 T-8/ EB															
4 ft 1-4 T-8 /EB															
3 ft 1-4 T-8 /EB															
2 ft 1-4 T-8 /EB															
LED Exit Signs New/Electronic															
Lighting - Additional Measures															
CFL Fixture	$ 7,854	$ 9,174	$ 10,758	$ 12,650	$ 14,936	$ 2,538	$ 2,966	$ 3,478	$ 4,090	$ 4,830	$ 122,679	$ 143,298	$ 168,040	$ 197,593	$ 233,332
CFL Screw in	$ 6,000	$ 6,800	$ 7,760	$ 8,912	$ 10,294	$ 10,322	$ 11,698	$ 13,349	$ 15,331	$ 17,708	$ 107,760	$ 122 128	$ 139,370	$ 160,060	$ 184,860
T-5 with Elec Ballast replacing T-12	$ 330	$ 385	$ 451	$ 528	$ 627	$ 115	$ 134	$ 157	$ 184	$ 218	$ 2,165	$ 2,526	$ 2,959	$ 3,464	$ 4,113
T-5 HO with Elec Ballast replacing T-12	$ 195	$ 228	$ 267	$ 312	$ 371	$ 63	$ 74	$ 86	$ 101	$ 120	$ 1,176	$ 1,374	$ 1,610	$ 1,884	$ 2,238
Occupancy Sensors under 500 ft2	$ 6,500	$ 7,500	$ 8,700	$ 10,150	$ 11,850	$ 1,073	$ 1,238	$ 1,436	$ 1,675	$ 1,956	$ 131,495	$ 151,725	$ 176,001	$ 205,335	$ 239,726
Occupancy Sensors over 500 ft3	$ 7,000	$ 8,000	$ 9,200	$ 10,600	$ 12,400	$ 1,445	$ 1,651	$ 1,899	$ 2,188	$ 2,560	$ 22,680	$ 25,920	$ 29,808	$ 34,344	$ 40,176
LED Auto Traffic Signals	$ 12,500	$ 15,000	$ 18,000	$ 21,900	$ 25,825	$ 5,315	$ 6,379	$ 7,654	$ 9,185	$ 11,024	$ 156,625	$ 187,850	$ 225,540	$ 270,648	$ 324,840
LED Pedestrian Signals	$ 12,500	$ 15,000	$ 18,000	$ 21,500	$ 26,000	$ 1,450	$ 1,740	$ 2,088	$ 2,493	$ 3,015	$ 44,125	$ 52,950	$ 63,540	$ 75,895	$ 91,780
Light Tube	$ 2,500	$ 3,000	$ 3,500	$ 4,250	$ 5,000	$ 140	$ 167	$ 195	$ 237	$ 279	$ 9,450	$ 11,340	$ 13,230	$ 16,065	$ 18,900
HI Bay Fluorescent 4LT5HO	$ 10,560	$ 12,480	$ 14,784	$ 17,549	$ 20,867	$ 1,982	$ 2,319	$ 2,747	$ 3,261	$ 3,878	$ 32,102	$ 37,939	$ 44,943	$ 53,348	$ 63,434
HI Bay Fluorescent 6LF32T8	$ 8,800	$ 10,400	$ 12,320	$ 14,624	$ 17,389	$ 1,852	$ 2,189	$ 2,593	$ 3,078	$ 3,659	$ 31,416	$ 37,128	$ 43,982	$ 52,206	$ 62,076
Plug Load Occupancy Sensors Document Stations	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200	$ 1,552	$ 1,863	$ 2,235	$ 2,670	$ 3,228	$ 41,075	$ 49,290	$ 59,148	$ 70,649	$ 85,436
Pulse Start Metal Halide (retrofit only)	$ 7,500	$ 13,750	$ 20,000	$ 26,250	$ 26,250	$ 2,493	$ 4,571	$ 6,649	$ 8,727	$ 8,727	$ 79,875	$ 146,438	$ 213,000	$ 279,563	$ 279,563
HVAC - Basic Measures	$ 87,120	$ 102,960	$ 118,800	$ 142,560	$ 166,320	$ 3,306	$ 3,910	$ 4,511	$ 5,414	$ 8,316	$ 164,657	$ 194,594	$ 224,532	$ 269,438	$ 314,345
Packaged Terminal AC															
Packaged Terminal HP															
Unitary AC Rooftop & HP Rooftop															
<65,000 BTUH 1 Phase															
<65,000 BTUH 3 Phase															
65-135,000 BTUH															
135-760,000 BTUH															
760,000 + BTUH															
Ground Source HP Closed Loop															
Water Source HP Building Loop															
HVAC - Additional Measures															
ES Window AC under 14,000 Btu/hr	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 68	$ 81	$ 97	$ 116	$ 141	$ 4,488	$ 5,385	$ 6,462	$ 7,719	$ 9,334
ES Window AC over 14,000 Btu/hr	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200	$ 179	$ 215	$ 257	$ 308	$ 372	$ 12,850	$ 15,180	$ 18,216	$ 21,758	$ 26,312
ES Sleeve AC under 14,000 Btu/hr	$ 625	$ 750	$ 900	$ 1,075	$ 1,300	$ 36	$ 46	$ 56	$ 66	$ 80	$ 2,650	$ 3,180	$ 3,816	$ 4,558	$ 5,512
ES Sleeve AC over 14,000 Btu/hr	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 92	$ 110	$ 132	$ 158	$ 191	$ 6,525	$ 7,830	$ 9,396	$ 11,223	$ 13,572
HP Water Heater 500 gal/day	$ 52,500	$ 63,000	$ 77,000	$ 91,000	$ 112,000	$ 6,273	$ 7,527	$ 9,200	$ 10,873	$ 13,382	$ 192,150	$ 230,580	$ 281,820	$ 333,060	$ 409,920
HP Water Heater 1000 gal/day	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000	$ 4,217	$ 5,061	$ 5,904	$ 6,748	$ 7,591	$ 140,250	$ 168,300	$ 196,350	$ 224,400	$ 252,450
HP Water Heater 1500 gal/day	$ 35,000	$ 42,000	$ 49,000	$ 56,000	$ 63,000	$ 6,344	$ 7,612	$ 8,881	$ 10,150	$ 11,419	$ 213,500	$ 256,200	$ 298,900	$ 341,600	$ 384,300

High-Efficiency Incentive Program (Continued)	Projected Program Costs 2006	2007	2008	2009	2010	Projected Net Lost Revenues 2006	2007	2008	2009	2010	Projected Shared Savings 2006	2007	2008	2009	2010
Motors - Basic Measures	$ 25,700	$ 30,840	$ 37,008	$ 44,461	$ 53,199	$ 1,849	$ 1,979	$ 2,374	$ 2,852	$ 3,413	$ 37,265	$ 44,718	$ 53,662	$ 64,468	$ 77,139
20-250 hp - avg for group															
Greater than 1500 hours per year															
Motors - Additional Measures															
1-5 HP motors - Incentives per HP	$ 5,000	$ 6,000	$ 7,200	$ 8,640	$ 10,368	$ 828	$ 1,113	$ 1,336	$ 1,603	$ 1,924	$ 37,050	$ 44,460	$ 53,352	$ 64,022	$ 76,827
7.5-20 HP motors - Incentives per HP	$ 12,000	$ 14,400	$ 17,280	$ 20,736	$ 24,883	$ 8,437	$ 10,125	$ 12,149	$ 14,579	$ 17,495	$ 370,560	$ 444,672	$ 533,606	$ 640,328	$ 768,393
High Efficiency Pumps HP 5	$ 2,860	$ 3,456	$ 4,147	$ 4,977	$ 5,972	$ 88	$ 105	$ 126	$ 152	$ 182	$ 2,304	$ 2,765	$ 3,318	$ 3,981	$ 4,778
HP 7.5	$ 3,000	$ 3,600	$ 4,320	$ 5,184	$ 6,221	$ 132	$ 158	$ 189	$ 227	$ 273	$ 4,770	$ 5,724	$ 6,869	$ 8,243	$ 9,891
HP 10	$ 2,080	$ 2,496	$ 2,995	$ 3,594	$ 4,313	$ 117	$ 140	$ 168	$ 202	$ 242	$ 4,826	$ 5,791	$ 6,949	$ 8,339	$ 10,006
HP 15	$ 2,400	$ 2,880	$ 3,456	$ 4,147	$ 4,977	$ 176	$ 211	$ 253	$ 303	$ 364	$ 7,988	$ 9,582	$ 11,474	$ 13,769	$ 16,522
HP 20	$ 400	$ 400	$ 400	$ 400	$ 800	$ 29	$ 29	$ 29	$ 29	$ 58	$ 1,332	$ 1,332	$ 1,332	$ 1,332	$ 2,664
Variable Frequency Drive Pumps HP 5	$ 8,706	$ 10,447	$ 12,537	$ 15,044	$ 18,053	$ 597	$ 717	$ 860	$ 1,032	$ 1,239	$ 26,640	$ 31,968	$ 38,362	$ 46,035	$ 55,241
VFD HP 7.5	$ 11,006	$ 13,207	$ 15,849	$ 19,018	$ 22,822	$ 905	$ 1,086	$ 1,303	$ 1,564	$ 1,877	$ 42,483	$ 50,980	$ 61,176	$ 73,411	$ 88,093
VFD HP 10	$ 22,912	$ 27,494	$ 32,993	$ 39,592	$ 47,510	$ 2,389	$ 2,867	$ 3,441	$ 4,129	$ 4,955	$ 118,226	$ 141,871	$ 170,245	$ 204,294	$ 245,153
VFD HP 15	$ 28,644	$ 34,373	$ 41,247	$ 49,497	$ 59,396	$ 3,620	$ 4,344	$ 5,213	$ 6,256	$ 7,507	$ 185,327	$ 222,392	$ 266,870	$ 320,245	$ 384,293
VFD HP 20	$ 18,122	$ 19,346	$ 23,216	$ 27,859	$ 33,431	$ 2,413	$ 2,896	$ 3,475	$ 4,171	$ 5,005	$ 126,558	$ 151,869	$ 182,243	$ 218,692	$ 262,430
VFD HP 25	$ -	$ 4,706	$ 4,706	$ 4,706	$ 4,706	$ -	$ 754	$ 754	$ 754	$ 754	$ -	$ 37,879	$ 37,879	$ 37,879	$ 37,879
VFD HP 30	$ -	$ 5,414	$ 5,414	$ 5,414	$ 5,414	$ -	$ 905	$ 905	$ 905	$ 905	$ -	$ 45,694	$ 45,694	$ 45,694	$ 45,694
VFD HP 40	$ -	$ 5,685	$ 5,685	$ 5,685	$ 5,685	$ -	$ 1,207	$ 1,207	$ 1,207	$ 1,207	$ -	$ 62,421	$ 62,421	$ 62,421	$ 62,421
VFD HP 50	$ -	$ 7,128	$ 7,128	$ 7,128	$ 7,128	$ -	$ 1,508	$ 1,508	$ 1,508	$ 1,508	$ -	$ 78,052	$ 78,052	$ 78,052	$ 78,052
Other Measures															
Setback/Programmable Thermostat	$ 27,500	$ 32,250	$ 37,950	$ 44,600	$ 53,000	$ 58,474	$ 80,301	$ 94,494	$ 111,550	$ 131,988	$ 2,889,900	$ 3,366,610	$ 3,960,462	$ 4,675,328	$ 5,531,060
Engineered Nozzles - COMPRESS AIR	$ 10,000	$ 12,000	$ 14,400	$ 17,200	$ 20,640	$ 71,068	$ 85,281	$ 102,338	$ 122,237	$ 146,684	$ 4,190,300	$ 5,028,360	$ 6,034,032	$ 7,207,316	$ 8,648,779
Zone Shutoff Valves -COMPRESSED AIR	$ 11,800	$ 14,160	$ 16,992	$ 20,296	$ 24,544	$ 1,103	$ 1,323	$ 1,588	$ 1,897	$ 2,294	$ 38,232	$ 45,878	$ 55,054	$ 65,759	$ 79,523
Dew Point Controlled Desiccant Dryers - Compressed air	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000	$ 8,353	$ 10,024	$ 11,696	$ 13,365	$ 15,036	$ 549,750	$ 659,700	$ 769,650	$ 879,600	$ 989,550
Moisture Traps - Condensate Drain Valve	$ 21,875	$ 25,250	$ 31,500	$ 37,800	$ 45,325	$ 5,267	$ 6,321	$ 7,585	$ 9,102	$ 10,914	$ 289,406	$ 347,288	$ 416,745	$ 500,094	$ 599,650
Chilled Water Reset	$ 16,500	$ 19,250	$ 22,550	$ 26,850	$ 30,250	$ 2,774	$ 3,236	$ 3,791	$ 4,346	$ 5,088	$ 147,510	$ 172,095	$ 201,597	$ 231,099	$ 270,435
Central Lighting Control	$ 144,450	$ 171,450	$ 203,850	$ 242,730	$ 289,386	$ 23,784	$ 28,230	$ 33,565	$ 39,967	$ 47,649	$ 1,079,042	$ 1,280,732	$ 1,522,760	$ 1,813,193	$ 2,161,713
Switching Controls for Multilevel Lighting	$ 96,300	$ 114,300	$ 135,800	$ 161,820	$ 192,824	$ 18,614	$ 22,093	$ 26,268	$ 31,278	$ 37,290	$ 860,922	$ 1,021,842	$ 1,214,946	$ 1,448,671	$ 1,724,741
Daylight Sensor controls	$ 94,500	$ 112,500	$ 134,100	$ 160,020	$ 191,124	$ 30,037	$ 35,759	$ 42,624	$ 50,863	$ 60 750	$ 1,449,630	$ 1,725,750	$ 2,057,094	$ 2,454,707	$ 2,931,842
Trim Impellers/Reduce Throttling Pumps	$ 11,250	$ 13,500	$ 16,200	$ 18,900	$ 22,500	$ 631	$ 757	$ 909	$ 1,090	$ 1,282	$ 26,100	$ 31,320	$ 37,584	$ 43,848	$ 52,200
Unoccupied Cycle - CONTROLS	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 53,729	$ 63,679	$ 75,619	$ 87,559	$ 103,478	$ 3,170,448	$ 3,757,568	$ 4,462,112	$ 5,166,656	$ 6,106,048
Commercial Clothes Washers - Washer Only	$ 15,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104	$ 2,319	$ 2,783	$ 3,340	$ 4,008	$ 4,810	$ 90,150	$ 108,180	$ 129,816	$ 155,779	$ 186,935
Commercial Clothes Washers - Electric Dryer & Washer	$ 16,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104	$ 5,509	$ 6,611	$ 7,933	$ 9,518	$ 11,423	$ 234,750	$ 281,700	$ 338,040	$ 405,648	$ 486,778
Supply Air Reset -Controls	$ 5,000	$ 6,000	$ 7,200	$ 8,400	$ 10,000	$ 1,536	$ 1,843	$ 2,211	$ 2,580	$ 3,071	$ 85,750	$ 102,900	$ 123,480	$ 144,060	$ 171,500
Ventilation Scheduling - Controls	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 204	$ 242	$ 287	$ 333	$ 393	$ 6,642	$ 7,872	$ 9,348	$ 10,824	$ 12,782
Optimal Start /Stop - Controls	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 2,107	$ 2,498	$ 2,966	$ 3,434	$ 4,059	$ 119,178	$ 141,248	$ 167,732	$ 194,216	$ 229,528
Economizer Cycle - Controls	$ 21,000	$ 25,000	$ 29,800	$ 35,600	$ 42,400	$ 2,899	$ 3,213	$ 3,830	$ 4,576	$ 5,450	$ 138,600	$ 165,000	$ 196,680	$ 234,960	$ 279,840
Vending Equipment Controller	$ 22,500	$ 25,000	$ 28,000	$ 31,000	$ 35,000	$ 6,958	$ 7,732	$ 8,659	$ 9,587	$ 10,824	$ 173,250	$ 192,500	$ 215,600	$ 238,700	$ 269,500
Barrel Wraps (Inj Mold & Extruders)	$ 1,750	$ 2,100	$ 2,520	$ 3,010	$ 3,640	$ 2,417	$ 2,901	$ 3,481	$ 4,157	$ 5,028	$ 86,115	$ 79,338	$ 85,206	$ 113,718	$ 137,519
High Efficiency Units - Refrigeration Display Cases	$ 1,790	$ 2,148	$ 2,578	$ 3,093	$ 3,712	$ 102	$ 123	$ 148	$ 177	$ 212	$ 4,260	$ 5,112	$ 6,135	$ 7,362	$ 8,834
Efficient condensor Refrigerator	$ 4,200	$ 4,900	$ 5,740	$ 6,748	$ 7,958	$ 787	$ 918	$ 1,076	$ 1,265	$ 1,491	$ 49,980	$ 58,310	$ 68,306	$ 80,301	$ 94,695
Head Pressure Control	$ 17,600	$ 20,800	$ 24,640	$ 29,248	$ 34,778	$ 7,970	$ 9,419	$ 11,156	$ 13,245	$ 15,749	$ 453,376	$ 535,808	$ 634,726	$ 753,428	$ 895,871
Night covers for displays	$ 1,875	$ 2,250	$ 2,700	$ 3,240	$ 3,888	$ 152	$ 183	$ 219	$ 263	$ 316	$ 7,125	$ 8 550	$ 10,260	$ 12,312	$ 14,774
Window Film	$ 10,000	$ 12,000	$ 14,000	$ 16,000	$ 18,000	$ 1,160	$ 1,392	$ 1,624	$ 1,856	$ 2,088	$ 42,700	$ 51,240	$ 59,780	$ 68,320	$ 76,860
Air Flow Restriction Curtains	$ 12,000	$ 14,400	$ 16,800	$ 19,200	$ 21,600	$ 2,830	$ 3,396	$ 3,962	$ 4,528	$ 5,094	$ 133,880	$ 160 416	$ 187,152	$ 213,888	$ 240,624
Pellet Dryer Tanks & Ducts	$ 675	$ 810	$ 972	$ 1,134	$ 1,350	$ 47	$ 57	$ 68	$ 80	$ 95	$ 2,126	$ 2,552	$ 3,062	$ 3,572	$ 4,253
HI-EFF Multiplex Compressor	$ 47,480	$ 47,480	$ 71,220	$ 94,960	$ 118,700	$ 2,315	$ 2,315	$ 3,472	$ 4,629	$ 5,787	$ 89,262	$ 89,262	$ 133,894	$ 178,525	$ 223,156
Photovoltaic Systems	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 100	$ 100	$ 100	$ 100	$ 100	$ (69,750)	$ (69,750)	$ (69,750)	$ (69,750)	$ (69,750)
Total Measure Costs	$ 1,476,079	$1,710,647	$1,978,632	$2,288,630	$2,639,533										
Total Program Administration Costs	$ 490,378	$ 572,476	$ 666,271	$ 774,071	$ 897,587										
Savings Net of Measure Costs											$ 20,445,228	$ 24,312,211	$ 28,858,531	$ 33,599,447	$ 39,534,722
Savings Net of All Costs											$ 19,954,850	$ 23,739,735	$ 27,992,260	$ 32,825,376	$ 38,637,135
Total Program Costs, Lost Revenues, Shared Savings	$ 1,966,457	$2,283,123	$2,644,903	$3,060,701	$3,537,119	$ 453,839	$ 535,021	$ 626,632	$ 730,936	$ 854,977	$ 1,995,485	$ 2,373,973	$ 2,799,226	$ 3,262,536	$ 3,863,714

Small C&I DSM Program Summary

High Efficiency Program	Costs	Lost Revenues	Shared Savings	Total
Lighting	$ 545,048	$ 68,792	$ 230,331	$ 864,170
HVAC	$ 277,081	$ 20,519	$ 66,503	$ 364,103
Motors	$ 190,148	$ 21,480	$ 91,601	$ 303,229
Other	$ 879,181	$ 322,849	$1,614,025	$2,816,154
Photovoltaic Systems	$ 75,000	$ 100	$ (6,975)	$ 68,125
Total	$ 1,966,457	$ 453,839	$1,995,485	$4,415,781

Projected Participants and Program Costs

Small C&I Programs/Measures	UCT	Measure Cost	Incentive	Incentive Per Unit	Projected Participants 2006	2007	2008	2009	2010	Projected Customer Incentive Costs 2006	2007	2008	2009	2010
High-Efficiency Incentive Program														
Lighting - Basic Measures	6.21			$ 5.80	55,000	57,000	59,000	61,000	63,000	$ 319,000	$ 330,600	$ 342,200	$ 353,800	$ 365,400
8 ft 1-2 Lamp T-8/ E Ballast														
8 ft HO 1&2 T-8/ EB														
4 ft 1-4 T-8 /EB														
3 ft 1-4 T-8 /EB														
2 ft 1-4 T-8 /EB														
LED Exit Signs New/Electronic														
Lighting - Additional Measures														
CFL Fixture	16.62	$ 45	$ 22.00	$ 22.00	357	417	489	575	679	$ 7,854	$ 9,174	$ 10,758	$ 12,650	$ 14,938
CFL Screw in	18.96	$ 5	$ 2	$ 2.00	3,000	3,400	3,880	4,456	5,147	$ 6,000	$ 6,800	$ 7,760	$ 8,912	$ 10,294
T-5 with Elec Ballast replacing T-12	7.56	$ 22	$ 5.50	$ 5.50	60	70	82	96	114	$ 330	$ 385	$ 451	$ 528	$ 627
T-5 HO with Elec Ballast replacing T-12	7.04	$ 22	$ 6.50	$ 6.50	30	35	41	48	57	$ 195	$ 228	$ 267	$ 312	$ 371
Occupancy Sensors under 500 ft2	21.23	$ 100	50%	$ 50.00	130	150	174	203	237	$ 6,500	$ 7,500	$ 8,700	$ 10,150	$ 11,850
Occupancy Sensors over 500 ft3	4.24	$ 200	50%	$ 100.00	70	80	92	106	124	$ 7,000	$ 8,000	$ 9,200	$ 10,600	$ 12,400
LED Auto Traffic Signals	13.53	$ 50	$ 12.5	$ 12.50	1,000	1,200	1,440	1,728	2,074	$ 12,500	$ 15,000	$ 18,000	$ 21,600	$ 25,925
LED Pedestrian Signals	4.53	$ 100	$ 25	$ 25.00	500	600	720	860	1,040	$ 12,500	$ 15,000	$ 18,000	$ 21,500	$ 26,000
Light Tube	4.78	$ 500	$ 125	$ 125.00	20	24	28	34	40	$ 2,500	$ 3,000	$ 3,500	$ 4,250	$ 5,000
HI Bay Fluorescent 4LT5HO	4.04	$ 192	$ 96	$ 96.00	110	130	154	183	217	$ 10,560	$ 12,480	$ 14,784	$ 17,549	$ 20,867
HI Bay Fluorescent 6LF32T8	4.57	$ 160	$ 80	$ 80.00	110	130	154	183	217	$ 8,800	$ 10,400	$ 12,320	$ 14,624	$ 17,369
Plug Load Occupancy Sensors Document Stations	17.43	$ 150	$ 25	$ 25.00	100	120	144	172	208	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200
Pulse Start Metal Halide (retrofit only)	11.65	$ 150	$ 25	$ 25.00	300	550	800	1,050	1,050	$ 7,500	$ 13,750	$ 20,000	$ 26,250	$ 26,250
HVAC - Basic Measures	2.89			$ 396.00	220	260	300	360	420	$ 87,120	$ 102,960	$ 118,800	$ 142,560	$ 166,320
Packaged Terminal AC														
Packaged Terminal HP														
Unitary AC Rooftop & HP Rooftop														
<65,000 BTUH 1 Phase														
<65,000 BTUH 3 Phase														
65-135,000 BTUH														
135-760,000 BTUH														
760,000 + BTUH														
Ground Source HP Closed Loop														
Water Source HP Building Loop														
HVAC - Additional Measures														
ES Window AC under 14,000 Btu/hr	4.59	$ 70	$ 25	$ 25.00	50	60	72	86	104	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600
ES Window AC over 14,000 Btu/hr	6.06	$ 100	$ 50	$ 50.00	50	60	72	86	104	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200
ES Sleeve AC under 14,000 Btu/hr	5.24	$ 70	$ 25	$ 25.00	25	30	38	43	52	$ 625	$ 750	$ 900	$ 1,075	$ 1,300
ES Sleeve AC over 14,000 Btu/hr	6.22	$ 100	$ 50	$ 50.00	25	30	36	43	52	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600
HP Water Heater 500 gal/day	4.66	$ 7,000	50%	$ 3,500.00	15	18	22	26	32	$ 52,500	$ 63,000	$ 77,000	$ 91,000	$ 112,000
HP Water Heater 1000 gal/day	6.61	$ 10,000	50%	$ 5,000.00	5	6	7	8	9	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000
HP Water Heater 1500 gal/day	7.1	$ 14,000	50%	$ 7,000.00	5	6	7	8	9	$ 35,000	$ 42,000	$ 49,000	$ 56,000	$ 63,000

High-Efficiency Incentive Program (Continued)	UCT	Measure Cost	Incentive Per Unit	Incentive	Projected Participants 2006	2007	2008	2009	2010	Projected Customer Incentive Costs 2006	2007	2008	2009	2010
Motors - Basic Measures	2.45			$ 257.00	100	120	144	173	207	$ 25,700	$ 30,840	$ 37,008	$ 44,461	$ 53,199
20-250 hp - avg for group														
Greater than 1500 hours per year														
Motors - Additional Measures														
1-5 HP motors - incentives per HP	8.41		$ 10	$ 10.00	500	600	720	864	1,037	$ 5,000	$ 6,000	$ 7,200	$ 8,640	$ 10,368
7.5-20 HP motors - incentives per HP	31.88		$ 8	$ 8.00	1,500	1,800	2,160	2,592	3,110	$ 12,000	$ 14,400	$ 17,280	$ 20,736	$ 24,883
High Efficiency Pumps HP 5	1.8	$ 341	$ 240.00	$ 240.00	12	14	17	21	25	$ 2,880	$ 3,456	$ 4,147	$ 4,977	$ 5,972
HP 7.5	2.59	$ 488	$ 250.00	$ 250.00	12	14	17	21	25	$ 3,000	$ 3,600	$ 4,320	$ 5,184	$ 6,221
HP 10	3.32	$ 332	$ 260.00	$ 260.00	8	10	12	14	17	$ 2,080	$ 2,496	$ 2,995	$ 3,594	$ 4,313
HP 15	4.32	$ 585	$ 300.00	$ 300.00	8	10	12	14	17	$ 2,400	$ 2,880	$ 3,456	$ 4,147	$ 4,977
HP 20	4.33	$ 850	$ 400.00	$ 400.00	1	1	1	1	2	$ 400	$ 400	$ 400	$ 400	$ 800
Variable Frequency Drive Pumps HP 5	4.06	$ 4,353	50%	$ 2,176.50	4	5	6	7	8	$ 8,706	$ 10,447	$ 12,537	$ 15,044	$ 18,053
VFD HP 7.5	4.86	$ 5,503	50%	$ 2,751.50	4	5	6	7	8	$ 11,008	$ 13,207	$ 15,849	$ 19,018	$ 22,822
VFD HP 10	6.16	$ 5,728	50%	$ 2,864.00	8	10	12	14	17	$ 22,912	$ 27,494	$ 32,993	$ 39,592	$ 47,510
VFD HP 15	7.47	$ 7,161	50%	$ 3,580.50	8	10	12	14	17	$ 28,644	$ 34,373	$ 41,247	$ 49,497	$ 59,396
VFD HP 20	8.85	$ 8,061	50%	$ 4,030.50	4	5	6	7	8	$ 16,122	$ 19,346	$ 23,216	$ 27,859	$ 33,431
VFD HP 25	9.05	$ 9,411	50%	$ 4,705.50	-	1	1	1	1	$ -	$ 4,706	$ 4,706	$ 4,706	$ 4,706
VFD HP 30	9.44	$ 10,828	50%	$ 5,414.00	-	1	1	1	1	$ -	$ 5,414	$ 5,414	$ 5,414	$ 5,414
VFD HP 40	11.98	$ 11,370	50%	$ 5,685.00	-	1	1	1	1	$ -	$ 5,685	$ 5,685	$ 5,685	$ 5,685
VFD HP 50	11.95	$ 14,256	50%	$ 7,128.00	-	1	1	1	1	$ -	$ 7,128	$ 7,128	$ 7,128	$ 7,128
Other Measures														
Setback/Programmable Thermostat	105.4	$ 235	$ 50	$ 50.00	550	645	759	896	1,060	$ 27,500	$ 32,250	$ 37,950	$ 44,800	$ 53,000
Engineered Nozzles - COMPRESS AIR	420.0	$ 80	50%	$ 40.00	250	300	360	430	516	$ 10,000	$ 12,000	$ 14,400	$ 17,200	$ 20,640
Zone Shutoff Valves -COMPRESSED AIR	4.2	$ 472	50%	$ 236.00	50	60	72	86	104	$ 11,800	$ 14,160	$ 16,992	$ 20,296	$ 24,544
Dew Point Controlled Desiccant Dryers - Compressed air	23.0	$ 5,000	50%	$ 2,500.00	10	12	14	16	18	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000
Moisture Traps - Condensate Drain Valve	14.2	$ 175	50%	$ 87.50	250	300	360	432	518	$ 21,875	$ 26,250	$ 31,500	$ 37,800	$ 45,325
Chilled Water Reset	9.9	$ 1,100	50%	$ 550.00	30	35	41	47	55	$ 16,500	$ 19,250	$ 22,550	$ 25,850	$ 30,250
Central Lighting Control	8.5	$ 2,700	50%	$ 1,350.00	107	127	151	180	214	$ 144,450	$ 171,450	$ 203,850	$ 242,730	$ 289,386
Switching Controls for Multilevel Lighting	9.9	$ 3,000	30%	$ 900.00	107	127	151	180	214	$ 96,300	$ 114,300	$ 135,900	$ 161,820	$ 192,924
Daylight Sensor controls	16.3	$ 3,000	30%	$ 900.00	105	125	149	178	212	$ 94,500	$ 112,500	$ 134,100	$ 160,020	$ 191,124
Trim Impellers/Reduce Throttling Pumps	3.3	$ 900	50%	$ 450.00	25	30	38	42	50	$ 11,250	$ 13,500	$ 16,200	$ 18,900	$ 22,500
Unoccupied Cycle - CONTROLS	568.1	$ 400	50%	$ 200.00	27	32	36	44	52	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400
Commercial Clothes Washers - Washer Only	7.0	$ 325	$ 50.00	$ 50.00	300	360	432	518	622	$ 15,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104
Commercial Clothes Washers - Electric Dryer & Washer	16.7	$ 325	$ 50.00	$ 50.00	300	360	432	518	622	$ 15,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104
Supply Air Reset -Controls	18.2	$ 400	50%	$ 200.00	25	30	36	42	50	$ 5,000	$ 6,000	$ 7,200	$ 8,400	$ 10,000
Ventilation Scheduling - Controls	2.2	$ 400	50%	$ 200.00	27	32	38	44	52	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400
Optimal Start /Stop - Controls	23.1	$ 400	50%	$ 200.00	27	32	38	44	52	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400
Economizer Cycle - Controls	7.6	$ 400	50%	$ 200.00	105	125	149	178	212	$ 21,000	$ 25,000	$ 29,800	$ 35,600	$ 42,400
Vending Equipment Controller	8.7	$ 160	$ 50	$ 50.00	450	500	560	620	700	$ 22,500	$ 25,000	$ 28,000	$ 31,000	$ 35,000
Barrel Wraps (Inj Mold & Extruders)	38.8	$ 70	50%	$ 35.00	50	60	72	86	104	$ 1,750	$ 2,100	$ 2,520	$ 3,010	$ 3,640
High Efficiency Units - Refrigeration Display Cases	3.4	$ 179	50%	$ 89.50	20	24	29	35	41	$ 1,790	$ 2,148	$ 2,578	$ 3,093	$ 3,712
Efficient condensor Refrigerator	12.9	$ 1,400	50%	$ 700.00	6	7	8	10	11	$ 4,200	$ 4,900	$ 5,740	$ 6,748	$ 7,958
Head Pressure Control	26.8	$ 3,200	50%	$ 1,600.00	11	13	15	18	22	$ 17,600	$ 20,800	$ 24,640	$ 29,248	$ 34,778
Night covers for displays	4.8	$ 50	50%	$ 25.00	75	90	108	130	156	$ 1,875	$ 2,250	$ 2,700	$ 3,240	$ 3,888
Window Film	5.3	$ 6	$ 2	$ 2.00	5,000	6,000	7,000	8,000	9,000	$ 10,000	$ 12,000	$ 14,000	$ 16,000	$ 18,000
Air Flow Restriction Curtains	12.1	$ 2,400	50%	$ 1,200.00	10	12	14	16	18	$ 12,000	$ 14,400	$ 16,800	$ 19,200	$ 21,600
Pellet Dryer Tanks & Ducts	4.2	$ 54	50%	$ 27.00	25	30	36	42	50	$ 675	$ 810	$ 972	$ 1,134	$ 1,350
HI-EFF Multiplex Compressor	2.9	$ 47,480	50%	$ 23,740.00	2	2	3	4	5	$ 47,480	$ 47,480	$ 71,220	$ 94,960	$ 118,700
Photovoltaic Systems	0.1	$ 25,000	100%	$ 25,000.00	3	3	3	3	3	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000
Lighting Measure Costs										$ 403,739	$ 435,317	$ 469,540	$ 507,025	$ 542,510
Program Administration										$ 141,309	$ 152,361	$ 164,339	$ 177,459	$ 189,878
Lighting Program Costs										$ 545,048	$ 587,677	$ 633,878	$ 684,483	$ 732,388
HVAC Measure Costs										$ 205,245	$ 244,710	$ 287,900	$ 339,235	$ 398,020
Program Administration										$ 71,836	$ 85,649	$ 100,765	$ 118,732	$ 139,307
HVAC Program Costs										$ 277,081	$ 330,359	$ 388,665	$ 457,967	$ 537,327
Motors Measure Costs										$ 140,850	$ 191,873	$ 225,581	$ 266,082	$ 314,877
Program Administration										$ 49,298	$ 67,155	$ 78,953	$ 93,129	$ 110,207
Motors Program Costs										$ 190,148	$ 259,028	$ 304,534	$ 359,210	$ 425,084
Other Measure Costs										$ 651,245	$ 763,748	$ 920,612	$ 1,099,289	$ 1,309,126
Program Administration										$ 227,936	$ 267,312	$ 322,214	$ 384,751	$ 458,194
Other Program Costs										$ 879,181	$ 1,031,060	$ 1,242,828	$ 1,484,040	$ 1,767,320
Photovoltaic Systems										$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000
Total Program Costs										$ 1,966,457	$ 2,283,123	$ 2,644,903	$ 3,060,701	$ 3,537,119

Projected kWh and kW Load Impacts

Small C&I Programs/Measures	Projected Participants					kWh	kW	Projected kWh Impacts					Projected kW Impacts				
	2006	2007	2008	2009	2010	Impact	Impact	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
High-Efficiency Incentive Program																	
Lighting - Basic Measures	55,000	57,000	59,000	61,000	63,000	55	0.015	3,025,000	3,135,000	3,245,000	3,355,000	3,465,000	825	855	885	915	945
8 ft 1-2 Lamp T-8/ E Ballast																	
8 ft HO 1&2 T-8/ EB																	
4 ft 1-4 T-8 /EB																	
3 ft 1-4 T-8 /EB																	
2 ft 1-4 T-8 /EB																	
LED Exit Signs New/Electronic																	
Lighting - Additional Measures																	
CFL Fixture	357	417	488	575	679	368	0.10	131,376	153,456	179,952	211,600	249,872	36	42	49	58	68
CFL Screw in	3,000	3,400	3,860	4,456	5,147	178	0.05	534,000	605,200	690,640	793,168	916,166	150	170	194	223	257
T-5 with Elec Ballast replacing T-12	60	70	82	96	114	99	0.03	5,940	6,930	8,118	9,504	11,286	2	2	2	3	3
T-5 HO with Elec Ballast replacing T-12	30	35	41	48	57	109	0.03	3,270	3,815	4,469	5,232	6,213	1	1	1	1	2
Occupancy Sensors under 500 ft2	130	150	174	203	237	427	0.12	55,510	64,050	74,298	86,661	101,199	16	18	21	24	28
Occupancy Sensors over 500 ft3	70	80	92	106	124	1,068	0.29	74,760	85,440	98,256	113,208	132,432	20	23	27	31	36
LED Auto Traffic Signals	1,000	1,200	1,440	1,728	2,074	275	0.07	275,000	330,000	396,000	475,200	570,350	70	84	101	121	145
LED Pedestrian Signals	500	600	720	860	1,040	150	0.04	75,000	90,000	108,000	129,600	156,000	22	26	32	38	46
Light Tube	20	24	28	34	40	361	0.10	7,220	8,664	10,108	12,274	14,440	2	2	3	3	4
Hi Bay Fluorescent 4LT5HO	110	130	154	183	217	923	0.25	101,530	119,990	142,142	166,724	200,623	28	33	39	46	54
Hi Bay Fluorescent 6LF32T8	110	130	154	183	217	871	0.24	95,810	113,230	134,134	159,219	189,321	28	31	37	44	52
Plug Load Occupancy Sensors Document Stations	100	120	144	172	208	803	0.04	80,300	96,360	115,632	138,116	167,024	4	5	6	7	8
Pulse Start Metal Halide (retrofit only)	300	550	800	1,050	1,050	430	0.12	129,000	236,500	344,000	451,500	451,500	36	66	96	126	126
HVAC - Basic Measures	220	260	300	360	420	778	0.21	171,160	202,280	233,400	280,080	326,760	46	55	63	76	88
Packaged Terminal AC																	
Packaged Terminal HP																	
Unitary AC Rooftop & HP Rooftop																	
<65,000 BTUH 1 Phase																	
<65,000 BTUH 3 Phase																	
65-135,000 BTUH																	
135-760,000 BTUH																	
760,000 + BTUH																	
Ground Source HP Closed Loop																	
Water Source HP Building Loop																	
HVAC - Additional Measures																	
ES Window AC under 14,000 Btu/hr	50	60	72	86	104	70	0.06	3,500	4,200	5,040	6,020	7,280	3	3	4	4	5
ES Window AC over 14,000 Btu/hr	50	60	72	86	104	185	0.13	9,250	11,100	13,320	15,910	19,240	7	8	9	11	14
ES Sleeve AC under 14,000 Btu/hr	25	30	36	43	52	80	0.06	2,000	2,400	2,880	3,440	4,160	2	2	2	3	3
ES Sleeve AC over 14,000 Btu/hr	25	30	36	43	52	180	0.13	4,750	5,700	6,840	8,170	9,880	3	4	5	6	7
HP Water Heater 500 gal/day	15	18	22	26	32	21,635	5.87	324,525	389,430	475,970	562,510	692,320	88	106	129	153	188
HP Water Heater 1000 gal/day	5	6	7	8	9	43,637	11.84	218,185	261,822	305,459	349,096	392,733	59	71	83	95	107
HP Water Heater 1500 gal/day	5	6	7	8	9	65,839	17.81	329,195	393,834	459,473	525,112	590,751	89	107	125	142	160

High-Efficiency Incentive Program (Continued)	Projected Participants 2006	2007	2008	2009	2010	kWh Impact	kW Impact	Projected kWh Impacts 2006	2007	2008	2009	2010	Projected kW Impacts 2006	2007	2008	2009	2010
Motors - Basic Measures	100	120	144	173	207	853	0.23	85,300	102,360	122,832	147,569	176,571	23	28	33	40	48
20-250 hp - avg for group																	
Greater than 1500 hours per year																	
Motors - Additional Measures																	
1-5 HP motors - Incentives per HP	500	600	720	864	1,037	96	0.03	48,000	57,600	69,120	82,944	99,533	15	18	22	26	31
7.5-20 HP motors - Incentives per HP	1,500	1,800	2,160	2,592	3,110	291	0.08	436,500	523,800	628,560	754,272	905,126	120	144	173	207	249
High Efficiency Pumps HP 5	12	14	17	21	25	378	0.10	4,536	5,443	6,532	7,838	9,406	1	1	2	2	2
HP 7.5	12	14	17	21	25	567	0.15	6,804	8,165	9,798	11,757	14,109	2	2	3	3	4
HP 10	8	10	12	14	17	756	0.21	6,048	7,258	8,709	10,451	12,541	2	2	2	3	3
HP 15	8	10	12	14	17	1,135	0.31	9,080	10,896	13,075	15,690	18,828	2	3	4	4	5
HP 20	1	1	1	1	2	1,513	0.41	1,513	1,513	1,513	1,513	3,026	0	0	0	0	1
Variable Frequency Drive Pumps HP 5	4	5	6	7	8	7,726	2.10	30,904	37,085	44,502	53,402	64,083	8	10	12	15	17
VFD HP 7.5	4	5	6	7	8	11,706	3.18	46,824	56,189	67,427	80,912	97,094	13	15	18	22	26
VFD HP 10	8	10	12	14	17	15,452	4.19	123,616	148,339	178,007	213,608	256,330	34	40	48	58	70
VFD HP 15	8	10	12	14	17	23,412	6.30	187,296	224,755	269,706	323,647	388,377	50	60	73	87	105
VFD HP 20	4	5	6	7	8	31,216	8.47	124,864	149,837	179,804	215,765	258,918	34	41	49	59	70
VFD HP 25	-	1	1	1	1	39,020	10.59	-	39,020	39,020	39,020	39,020	-	11	11	11	11
VFD HP 30	-	1	1	1	1	46,824	12.71	-	46,824	46,824	46,824	46,824	-	13	13	13	13
VFD HP 40	-	1	1	1	1	62,432	16.94	-	62,432	62,432	62,432	62,432	-	17	17	17	17
VFD HP 50	-	1	1	1	1	78,041	21.18	-	78,041	78,041	78,041	78,041	-	21	21	21	21
Other Measures																	
Setback/Programmable Thermostat	550	645	759	896	1,060	6,441	1.75	3,542,550	4,154,445	4,888,719	5,771,136	6,827,460	963	1,129	1,328	1,568	1,855
Engineered Nozzles - COMPRESS AIR	250	300	360	430	518	14,707	3.99	3,676,750	4,412,100	5,294,520	6,324,010	7,588,812	998	1,197	1,436	1,716	2,059
Zone Shutoff Valves -COMPRESSED AIR	50	60	72	86	104	1,141	0.31	57,050	68,460	82,152	98,126	118,664	16	19	22	27	32
Dew Point Controlled Desiccant Dryers - Compressed air	10	12	14	16	18	43,217	11.73	432,170	518,604	605,038	691,472	777,906	117	141	164	188	211
Moisture Traps - Condensate Drain Valve	250	300	360	432	518	1,090	0.30	272,500	327,000	392,400	470,880	564,620	75	90	108	130	155
Chilled Water Reset	30	35	41	47	55	4,784	1.30	143,520	167,440	196,144	224,848	263,120	39	46	53	61	72
Central Lighting Control	107	127	151	180	214	11,500	3.12	1,230,500	1,460,500	1,738,500	2,067,700	2,465,140	334	396	471	561	669
Switching Controls for Multilevel Lighting	107	127	151	180	214	9,000	2.44	963,000	1,143,000	1,358,000	1,618,200	1,929,240	261	310	368	439	523
Daylight Sensor controls	105	125	149	178	212	14,800	4.02	1,554,000	1,850,000	2,205,200	2,631,440	3,142,928	422	503	599	715	854
Trim Impellers/Reduce Throttling Pumps	25	30	36	42	50	1,308	0.35	32,650	39,180	47,016	54,852	65,300	9	11	13	15	18
Unoccupied Cycle - CONTROLS	27	32	38	44	52	102,953	27.94	2,779,731	3,284,496	3,912,214	4,529,932	5,353,556	754	894	1,082	1,229	1,453
Commercial Clothes Washers - Washer Only	300	360	432	518	622	400	0.09	120,000	144,000	172,800	207,360	248,832	27	32	39	47	56
Commercial Clothes Washers - Electric Dryer & Washer	300	360	432	518	622	950	0.25	285,000	342,000	410,400	492,480	590,976	78	94	112	135	162
Supply Air Reset -Controls	25	30	36	42	50	3,176	0.86	79,450	95,340	114,408	133,476	158,900	22	26	31	36	43
Ventilation Scheduling - Controls	27	32	38	44	52	391	0.11	10,557	12,512	14,858	17,204	20,332	3	4	4	5	6
Optimal Start /Stop - Controls	27	32	38	44	52	4,038	1.10	109,026	129,216	153,444	177,672	209,976	30	36	42	48	57
Economizer Cycle - Controls	105	125	149	178	212	1,330	0.36	139,650	165,250	198,170	236,740	281,960	38	45	54	64	76
Vending Equipment Controller	450	500	560	620	700	800	0.22	360,000	400,000	448,000	496,000	560,000	99	110	123	135	154
Barrel Wraps (Inj Mold, & Extruders)	50	60	72	86	104	2,501	0.68	125,050	150,060	180,072	215,086	260,104	34	41	49	58	71
High Efficiency Units - Refrigeration Display Cases	20	24	29	35	41	255	0.07	5,300	6,360	7,632	9,158	10,990	1	2	2	2	3
Efficient condensor Refrigerator	6	7	8	10	11	6,787	1.84	40,722	47,509	55,853	65,427	77,155	11	13	15	18	21
Head Pressure Control	11	13	15	18	22	37,486	10.17	412,346	487,318	577,284	685,244	814,796	112	132	157	186	221
Night covers for displays	75	90	108	130	156	105	0.03	7,875	9,450	11,340	13,608	16,330	2	3	3	4	5
Window Film	5,000	6,000	7,000	8,000	9,000	12	-	60,000	72,000	84,000	96,000	108,000	-	-	-	-	-
Air Flow Restriction Curtains	10	12	14	16	18	14,640	3.97	146,400	175,680	204,960	234,240	263,520	40	48	56	64	71
Pellet Dryer Tanks & Ducts	25	30	36	42	50	98	0.03	2,450	2,940	3,528	4,116	4,900	0.8	0.9	1.1	1.3	1.5
Hi-EFF Multiplex Compressor	2	2	3	4	5	59,674	16.25	119,748	119,748	179,622	239,496	299,370	33	33	49	65	81
Photovoltaic Systems	3	3	3	3	3	1,716	0.54	5,148	5,148	5,148	5,148	5,148	2	2	2	2	2
Lighting Measure kWh & kW								4,583,716	5,048,535	5,550,749	6,108,428	6,831,426	1,237	1,358	1,492	1,639	1,776
HVAC Measure kWh & kW								1,061,585	1,270,786	1,502,382	1,750,338	2,043,124	296	355	419	489	571
Motors Measure kWh & kW								1,111,285	1,559,556	1,825,902	2,145,687	2,530,259	304	427	500	587	693
Other Measure kWh & kW								16,707,995	19,795,606	23,535,075	27,805,903	33,022,886	4,516	5,351	6,362	7,517	8,930
Photovoltaic Systems								5,148	5,148	5,148	5,148	5,148	2	2	2	2	2
Total Program kWh & kW								23,479,709	27,679,713	32,419,255	37,815,502	44,232,843	6,356	7,492	8,774	10,234	11,971
Cumulative Annual Total												165,627,023					
Cumulative Total												445,239,012					

Projected Net Lost Revenues

Small C&I Programs/Measures	Projected kWh Impacts 2006	2007	2008	2009	2010	Net Lost Revenue Rate	Projected Net Lost Revenues 2006	2007	2008	2009	2010
High-Efficiency Incentive Program											
Lighting - Basic Measures	3,025,000	3,135,000	3,245,000	3,355,000	3,465,000	$0.019329	$ 58,470	$ 60,596	$ 62,723	$ 64,849	$ 66,975
8 ft 1-2 Lamp T-8/ E Ballast											
8 ft HO 1&2 T-8/ EB											
4 ft 1-4 T-8 /EB											
3 ft 1-4 T-8 /EB											
2 ft 1-4 T-8 /EB											
LED Exit Signs New/Electronic											
Lighting - Additional Measures											
CFL Fixture	131,376	153,456	179,952	211,600	249,872	$0.019329	$ 2,539	$ 2,966	$ 3,478	$ 4,090	$ 4,830
CFL Screw in	534,000	605,200	690,640	793,168	916,166	$0.019329	$ 10,322	$ 11,698	$ 13,349	$ 15,331	$ 17,709
T-5 with Elec Ballast replacing T-12	5,940	6,930	8,118	9,504	11,286	$0.019329	$ 115	$ 134	$ 157	$ 184	$ 218
T-5 HO with Elec Ballast replacing T-12	3,270	3,815	4,469	5,232	6,213	$0.019329	$ 63	$ 74	$ 86	$ 101	$ 120
Occupancy Sensors under 500 ft2	55,510	64,050	74,298	86,681	101,199	$0.019329	$ 1,073	$ 1,238	$ 1,436	$ 1,675	$ 1,956
Occupancy Sensors over 500 ft3	74,760	85,440	98,256	113,208	132,432	$0.019329	$ 1,445	$ 1,651	$ 1,899	$ 2,188	$ 2,560
LED Auto Traffic Signals	275,000	330,000	396,000	475,200	570,350	$0.019329	$ 5,315	$ 6,379	$ 7,654	$ 9,185	$ 11,024
LED Pedestrian Signals	75,000	90,000	108,000	129,000	156,000	$0.019329	$ 1,450	$ 1,740	$ 2,088	$ 2,493	$ 3,015
Light Tube	7,220	8,664	10,108	12,274	14,440	$0.019329	$ 140	$ 167	$ 195	$ 237	$ 279
HI Bay Fluorescent 4LT5HO	101,530	119,990	142,142	168,724	200,623	$0.019329	$ 1,962	$ 2,319	$ 2,747	$ 3,261	$ 3,878
HI Bay Fluorescent 6LF32T8	95,810	113,230	134,134	159,219	189,321	$0.019329	$ 1,852	$ 2,189	$ 2,593	$ 3,076	$ 3,659
Plug Load Occupancy Sensors Document Stations	80,300	96,360	115,632	138,116	167,024	$0.019329	$ 1,552	$ 1,863	$ 2,235	$ 2,670	$ 3,228
Pulse Start Metal Halide (retrofit only)	129,000	236,500	344,000	451,500	451,500	$0.019329	$ 2,493	$ 4,571	$ 6,649	$ 8,727	$ 8,727
HVAC - Basic Measures	171,160	202,280	233,400	280,080	326,760	$0.019329	$ 3,308	$ 3,910	$ 4,511	$ 5,414	$ 6,316
Packaged Terminal AC											
Packaged Terminal HP											
Unitary AC Rooftop & HP Rooftop											
<65,000 BTUH 1 Phase											
<65,000 BTUH 3 Phase											
65-135,000 BTUH											
135-760,000 BTUH											
760,000 + BTUH											
Ground Source HP Closed Loop											
Water Source HP Building Loop											
HVAC - Additional Measures											
ES Window AC under 14,000 Btu/hr	3,500	4,200	5,040	6,020	7,280	$0.019329	$ 68	$ 81	$ 97	$ 116	$ 141
ES Window AC over 14,000 Btu/hr	9,250	11,100	13,320	15,910	19,240	$0.019329	$ 179	$ 215	$ 257	$ 308	$ 372
ES Sleeve AC under 14,000 Btu/hr	2,000	2,400	2,880	3,440	4,160	$0.019329	$ 39	$ 46	$ 56	$ 66	$ 80
ES Sleeve AC over 14,000 Btu/hr	4,750	5,700	6,840	8,170	9,880	$0.019329	$ 92	$ 110	$ 132	$ 158	$ 191
HP Water Heater 500 gal/day	324,525	389,430	475,970	562,510	692,320	$0.019329	$ 6,273	$ 7,527	$ 9,200	$ 10,873	$ 13,382
HP Water Heater 1000 gal/day	218,185	261,822	305,459	349,096	392,733	$0.019329	$ 4,217	$ 5,061	$ 5,904	$ 6,748	$ 7,591
HP Water Heater 1500 gal/day	328,195	393,834	459,473	525,112	590,751	$0.019329	$ 6,344	$ 7,612	$ 8,881	$ 10,150	$ 11,419

High-Efficiency Incentive Program (Continued)	Projected kWh Impacts 2006	2007	2008	2009	2010	Net Lost Revenue Rate	Projected Net Lost Revenues 2006	2007	2008	2009	2010
Motors - Basic Measures	85,300	102,360	122,832	147,569	176,571	$0.019329	$ 1,649	$ 1,979	$ 2,374	$ 2,852	$ 3,413
20-250 hp - avg for group											
Greater than 1500 hours per year											
Motors - Additional Measures											
1-5 HP motors - Incentives per HP	48,000	57,600	69,120	82,944	99,533	$0.019329	$ 928	$ 1,113	$ 1,336	$ 1,603	$ 1,924
7.5-20 HP motors - Incentives per HP	436,500	523,800	628,560	754,272	905,126	$0.019329	$ 8,437	$ 10,125	$ 12,149	$ 14,579	$ 17,495
High Efficiency Pumps HP 5	4,536	5,443	6,532	7,838	9,406	$0.019329	$ 88	$ 105	$ 126	$ 152	$ 182
HP 7.5	6,804	8,165	9,798	11,757	14,109	$0.019329	$ 132	$ 158	$ 189	$ 227	$ 273
HP 10	6,048	7,258	8,709	10,451	12,541	$0.019329	$ 117	$ 140	$ 168	$ 202	$ 242
HP 15	9,080	10,896	13,075	15,690	18,828	$0.019329	$ 176	$ 211	$ 253	$ 303	$ 364
HP 20	1,513	1,513	1,513	1,513	3,026	$0.019329	$ 29	$ 29	$ 29	$ 29	$ 58
Variable Frequency Drive Pumps HP 5	30,904	37,085	44,502	53,402	64,083	$0.019329	$ 597	$ 717	$ 860	$ 1,032	$ 1,239
VFD HP 7.5	46,824	56,189	67,427	80,912	97,094	$0.019329	$ 905	$ 1,086	$ 1,303	$ 1,564	$ 1,877
VFD HP 10	123,616	148,339	178,007	213,608	256,330	$0.019329	$ 2,389	$ 2,867	$ 3,441	$ 4,129	$ 4,955
VFD HP 15	187,296	224,755	269,706	323,647	388,377	$0.019329	$ 3,620	$ 4,344	$ 5,213	$ 6,256	$ 7,507
VFD HP 20	124,864	149,837	179,804	215,765	258,918	$0.019329	$ 2,413	$ 2,896	$ 3,475	$ 4,171	$ 5,005
VFD HP 25	-	39,020	39,020	39,020	39,020	$0.019329	$ -	$ 754	$ 754	$ 754	$ 754
VFD HP 30	-	46,824	46,824	46,824	46,824	$0.019329	$ -	$ 905	$ 905	$ 905	$ 905
VFD HP 40	-	62,432	62,432	62,432	62,432	$0.019329	$ -	$ 1,207	$ 1,207	$ 1,207	$ 1,207
VFD HP 50	-	78,041	78,041	78,041	78,041	$0.019329	$ -	$ 1,508	$ 1,508	$ 1,508	$ 1,508
Other Measures											
Setback/Programmable Thermostat	3,542,550	4,154,445	4,888,719	5,771,136	6,827,460	$0.019329	$ 68,474	$ 80,301	$ 94,494	$ 111,550	$ 131,968
Engineered Nozzles - COMPRESS AIR	3,676,750	4,412,100	5,294,520	6,324,010	7,588,812	$0.019329	$ 71,068	$ 85,281	$ 102,338	$ 122,237	$ 146,684
Zone Shutoff Valves -COMPRESSED AIR	57,050	68,460	82,152	98,126	118,664	$0.019329	$ 1,103	$ 1,323	$ 1,588	$ 1,897	$ 2,294
Dew Point Controlled Desiccant Dryers - Compressed air	432,170	518,604	605,038	691,472	777,906	$0.019329	$ 8,353	$ 10,024	$ 11,695	$ 13,365	$ 15,036
Moisture Traps - Condensate Drain Valve	272,500	327,000	392,400	470,880	564,620	$0.019329	$ 5,267	$ 6,321	$ 7,585	$ 9,102	$ 10,914
Chilled Water Reset	143,520	167,440	196,144	224,848	263,120	$0.019329	$ 2,774	$ 3,236	$ 3,791	$ 4,346	$ 5,086
Central Lighting Control	1,230,500	1,460,500	1,736,500	2,067,700	2,465,140	$0.019329	$ 23,784	$ 28,230	$ 33,565	$ 39,967	$ 47,649
Switching Controls for Multilevel Lighting	963,000	1,143,000	1,359,000	1,618,200	1,929,240	$0.019329	$ 18,614	$ 22,093	$ 26,268	$ 31,278	$ 37,290
Daylight Sensor controls	1,554,000	1,850,000	2,205,200	2,631,440	3,142,928	$0.019329	$ 30,037	$ 35,759	$ 42,624	$ 50,863	$ 60,750
Trim Impellers/Reduce Throttling Pumps	32,650	39,180	47,016	54,852	65,300	$0.019329	$ 631	$ 757	$ 909	$ 1,060	$ 1,262
Unoccupied Cycle - CONTROLS	2,779,731	3,294,496	3,912,214	4,529,932	5,353,556	$0.019329	$ 53,729	$ 63,679	$ 75,619	$ 87,559	$ 103,479
Commercial Clothes Washers - Washer Only	120,000	144,000	172,800	207,360	248,832	$0.019329	$ 2,319	$ 2,783	$ 3,340	$ 4,008	$ 4,810
Commercial Clothes Washers - Electric Dryer & Washer	285,000	342,000	410,400	492,480	590,976	$0.019329	$ 5,509	$ 6,611	$ 7,933	$ 9,519	$ 11,423
Supply Air Reset -Controls	79,450	95,340	114,408	133,476	158,900	$0.019329	$ 1,536	$ 1,843	$ 2,211	$ 2,580	$ 3,071
Ventilation Scheduling - Controls	10,557	12,512	14,858	17,204	20,332	$0.019329	$ 204	$ 242	$ 287	$ 333	$ 393
Optimal Start /Stop - Controls	109,026	129,216	153,444	177,672	209,976	$0.019329	$ 2,107	$ 2,498	$ 2,966	$ 3,434	$ 4,059
Economizer Cycle - Controls	139,650	166,250	198,170	236,740	281,960	$0.019329	$ 2,699	$ 3,213	$ 3,830	$ 4,576	$ 5,450
Vending Equipment Controller	360,000	400,000	448,000	496,000	560,000	$0.019329	$ 6,958	$ 7,732	$ 8,659	$ 9,587	$ 10,824
Barrel Wraps (Inj Mold & Extruders)	125,050	150,060	180,072	215,086	260,104	$0.019329	$ 2,417	$ 2,901	$ 3,481	$ 4,157	$ 5,028
High Efficiency Units - Refrigeration Display Cases	5,300	6,360	7,632	9,158	10,990	$0.019329	$ 102	$ 123	$ 148	$ 177	$ 212
Efficient condensor Refrigerator	40,722	47,509	55,653	65,427	77,155	$0.019329	$ 787	$ 918	$ 1,076	$ 1,265	$ 1,491
Head Pressure Control	412,346	487,318	577,284	685,244	814,796	$0.019329	$ 7,970	$ 9,419	$ 11,158	$ 13,245	$ 15,749
Night covers for displays	7,875	9,450	11,340	13,608	16,330	$0.019329	$ 152	$ 183	$ 219	$ 263	$ 316
Window Film	60,000	72,000	84,000	96,000	108,000	$0.019329	$ 1,160	$ 1,392	$ 1,624	$ 1,856	$ 2,088
Air Flow Restriction Curtains	146,400	175,680	204,960	234,240	263,520	$0.019329	$ 2,830	$ 3,396	$ 3,962	$ 4,528	$ 5,094
Pellet Dryer Tanks & Ducts	2,450	2,940	3,528	4,116	4,900	$0.019329	$ 47	$ 57	$ 68	$ 80	$ 95
HI-EFF Multiplex Compressor	119,748	119,748	179,622	239,496	299,370	$0.019329	$ 2,315	$ 2,315	$ 3,472	$ 4,629	$ 5,787
Photovoltaic Systems	5,148	5,148	5,148	5,148	5,148	$0.019329	$ 100	$ 100	$ 100	$ 100	$ 100
Lighting Measure kWh & Net Lost Revenues	4,593,716	5,048,635	5,550,749	6,108,426	6,631,426		$ 88,792	$ 97,585	$ 107,290	$ 118,070	$ 128,179
HVAC Measure kWh & Net Lost Revenues	1,061,565	1,270,766	1,502,382	1,750,338	2,043,124		$ 20,519	$ 24,563	$ 29,040	$ 33,832	$ 39,492
Motors Measure kWh & Net Lost Revenues	1,111,285	1,559,556	1,825,902	2,145,687	2,530,259		$ 21,480	$ 30,145	$ 35,293	$ 41,474	$ 48,907
Other Measure kWh & Net Lost Revenues	16,707,995	19,795,608	23,535,075	27,805,903	33,022,886		$ 322,949	$ 382,629	$ 454,909	$ 537,460	$ 638,299
Photovoltaic Systems	5,148	5,148	5,148	5,148	5,148		$ 100	$ 100	$ 100	$ 100	$ 100
Total Program kWh & Net Lost Revenues	23,479,709	27,679,713	32,419,255	37,815,502	44,232,843		$ 453,839	$ 535,021	$ 626,632	$ 730,936	$ 854,977
Cumulative Annual Lost Revenues								$ 988,860	$ 1,615,492	$ 2,346,428	$ 3,201,405
Cumulative Total Lost Revenues											$ 8,606,025

Projected Shared Savings

Small C&I Programs/Measures	Projected Measure Costs						Projected Program Savings				
	UCT	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
High-Efficiency Incentive Program											
Lighting - Basic Measures	6.21	$ 319,000	$ 330,600	$ 342,200	$ 353,800	$ 365,400	$ 1,661,990	$ 1,722,426	$ 1,782,862	$ 1,843,298	$ 1,903,734
8 ft 1-2 Lamp T-8/ E Ballast											
8 ft HO 1&2 T-8/ EB											
4 ft 1-4 T-8 /EB											
3 ft 1-4 T-8 /EB											
2 ft 1-4 T-8 /EB											
LED Exit Signs New/Electronic											
Lighting - Additional Measures											
CFL Fixture	18.82	$ 7,854	$ 9,174	$ 10,758	$ 12,858	$ 14,938	$ 122,979	$ 143,298	$ 168,048	$ 197,598	$ 233,332
CFL Screw In	18.96	$ 6,000	$ 6,800	$ 7,760	$ 8,912	$ 10,294	$ 107,760	$ 122,128	$ 139,370	$ 160,060	$ 184,880
T-5 with Elec Ballast replacing T-12	7.56	$ 330	$ 385	$ 451	$ 526	$ 627	$ 2,165	$ 2,526	$ 2,958	$ 3,484	$ 4,113
T-5 HO with Elec Ballast replacing T-12	7.04	$ 195	$ 228	$ 267	$ 312	$ 371	$ 1,178	$ 1,374	$ 1,610	$ 1,884	$ 2,238
Occupancy Sensors under 500 ft2	21.23	$ 6,500	$ 7,500	$ 8,700	$ 10,150	$ 11,850	$ 131,495	$ 151,725	$ 176,001	$ 205,335	$ 239,726
Occupancy Sensors over 500 ft3	4.24	$ 7,000	$ 8,000	$ 9,200	$ 10,600	$ 12,400	$ 22,660	$ 25,920	$ 29,508	$ 34,344	$ 40,176
LED Auto Traffic Signals	13.53	$ 12,500	$ 15,000	$ 18,000	$ 21,800	$ 25,925	$ 156,825	$ 187,950	$ 225,540	$ 270,648	$ 324,840
LED Pedestrian Signals	4.53	$ 12,500	$ 15,000	$ 18,000	$ 21,500	$ 26,000	$ 44,125	$ 52,950	$ 63,540	$ 75,895	$ 91,780
Light Tube	4.78	$ 2,500	$ 3,000	$ 3,500	$ 4,250	$ 5,000	$ 9,450	$ 11,340	$ 13,230	$ 16,065	$ 18,900
HI Bay Fluorescent 4LT5HO	4.04	$ 10,360	$ 12,480	$ 14,784	$ 17,549	$ 20,867	$ 32,102	$ 37,939	$ 44,945	$ 53,348	$ 63,434
HI Bay Fluorescent 6LF32T8	4.57	$ 8,800	$ 10,400	$ 12,320	$ 14,624	$ 17,389	$ 31,416	$ 37,128	$ 43,982	$ 52,208	$ 62,078
Plug Load Occupancy Sensors Document Stations	17.43	$ 2,500	$ 3,000	$ 3,500	$ 4,300	$ 5,200	$ 41,075	$ 49,290	$ 58,145	$ 70,649	$ 85,436
Pulse Start Metal Halide (retrofit only)	11.85	$ 7,500	$ 13,750	$ 20,000	$ 26,250	$ 26,250	$ 79,875	$ 148,438	$ 213,000	$ 279,563	$ 279,563
HVAC - Basic Measures	2.88	$ 57,120	$ 102,960	$ 118,800	$ 142,680	$ 166,520	$ 164,657	$ 194,594	$ 224,532	$ 269,438	$ 314,345
Packaged Terminal AC											
Packaged Terminal HP											
Unitary AC Rooftop & HP Rooftop											
<65,000 BTUH 1 Phase											
<65,000 BTUH 3 Phase											
65-135,000 BTUH											
135-760,000 BTUH											
760,000 + BTUH											
Ground Source HP Closed Loop											
Water Source HP Building Loop											
HVAC - Additional Measures											
ES Window AC under 14,000 Btu/hr	4.59	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 4,488	$ 5,385	$ 6,482	$ 7,719	$ 9,334
ES Window AC over 14,000 Btu/hr	6.06	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200	$ 12,650	$ 15,180	$ 18,216	$ 21,758	$ 26,312
ES Sleeve AC under 14,000 Btu/hr	5.24	$ 625	$ 750	$ 900	$ 1,075	$ 1,300	$ 2,850	$ 3,180	$ 3,816	$ 4,558	$ 5,512
ES Sleeve AC over 14,000 Btu/hr	6.22	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 6,525	$ 7,830	$ 9,396	$ 11,223	$ 13,572
HP Water Heater 500 gal/day	4.66	$ 52,500	$ 63,000	$ 77,000	$ 91,000	$ 112,000	$ 192,150	$ 230,580	$ 281,820	$ 333,060	$ 409,920
HP Water Heater 1000 gal/day	6.61	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000	$ 140,250	$ 168,300	$ 196,350	$ 224,400	$ 252,450
HP Water Heater 1500 gal/day	7.1	$ 35,000	$ 42,000	$ 49,000	$ 56,000	$ 63,000	$ 213,500	$ 256,200	$ 298,900	$ 341,600	$ 384,300

High-Efficiency Incentive Program (Continued)	Projected Measure Costs UCT	2006	2007	2008	2009	2010	Projected Program Savings 2006	2007	2008	2009	2010
Motors - Basic Measures	2.45	26,700	30,840	37,008	44,461	53,199	37,259	44,718	53,662	64,468	77,139
20-250 hp - avg for group											
Greater than 1500 hours per year											
Motors - Additional Measures											
1-5 HP motors - Incentives per HP	8.41	5,000	6,000	7,200	8,640	10,368	37,050	44,460	53,352	64,022	76,827
7.5-20 HP motors - Incentives per HP	31.88	12,000	14,400	17,280	20,736	24,883	370,560	444,672	533,606	640,328	768,393
High Efficiency Pumps HP 5	1.8	2,880	3,456	4,147	4,977	5,972	2,304	2,765	3,318	3,981	4,776
HP 7.5	2.59	3,000	3,600	4,320	5,184	6,221	4,770	5,724	6,869	8,243	9,891
HP 10	3.32	2,080	2,496	2,995	3,594	4,313	4,826	5,791	6,949	8,339	10,006
HP 15	4.32	2,400	2,880	3,456	4,147	4,977	7,968	9,562	11,474	13,769	16,522
HP 20	4.33	400	400	400	480	800	1,332	1,332	1,332	1,332	2,664
Variable Frequency Drive Pumps HP 5	4.08	8,706	10,447	12,537	15,044	18,053	26,640	31,968	38,362	46,035	55,241
VFD HP 7.5	4.66	11,006	13,207	15,849	19,018	22,822	42,483	50,980	61,176	73,411	88,093
VFD HP 10	6.16	22,912	27,494	32,993	39,592	47,510	118,228	141,871	170,245	204,294	245,153
VFD HP 15	7.47	28,644	34,373	41,247	49,497	59,396	185,327	222,392	266,870	320,245	384,295
VFD HP 20	8.85	16,122	19,346	23,216	27,859	33,431	126,558	151,869	182,243	218,692	262,430
VFD HP 25	9.05	-	4,706	4,706	4,706	4,706	-	37,879	37,879	37,879	37,879
VFD HP 30	9.44	-	5,414	5,414	5,414	5,414	-	45,694	45,694	45,694	45,694
VFD HP 40	11.98	-	5,685	5,685	5,685	5,685	-	62,421	62,421	62,421	62,421
VFD HP 50	11.95	-	7,128	7,128	7,128	7,128	-	78,052	78,052	78,052	78,052
Other Measures											
Setback/Programmable Thermostat	105.36	27,500	32,250	37,950	44,800	53,000	2,869,900	3,365,810	3,960,462	4,675,325	5,531,980
Engineered Nozzles - COMPRESS AIR	420.03	10,000	12,000	14,400	17,200	20,640	4,190,300	6,028,360	6,034,032	7,207,316	8,648,779
Zone Shutoff Valves -COMPRESSED AIR	4.24	11,800	14,160	18,992	20,296	24,544	38,232	45,878	55,054	65,759	79,523
Dew Point Controlled Desiccant Dryers - Compressed air	22.99	25,000	30,000	35,000	40,000	45,000	549,750	659,700	769,650	879,600	989,550
Moisture Traps - Condensate Drain Valve	14.23	21,875	26,250	31,500	37,800	45,325	289,406	347,288	416,745	500,094	599,650
Chilled Water Reset	9.94	18,500	19,250	22,550	25,850	30,250	147,510	172,095	201,597	231,099	270,435
Central Lighting Control	8.47	144,450	171,450	203,850	242,730	288,388	1,079,042	1,280,732	1,522,760	1,813,193	2,161,713
Switching Controls for Multilevel Lighting	9.94	96,300	114,300	135,900	161,820	192,924	860,922	1,021,642	1,214,946	1,446,671	1,724,744
Daylight Sensor controls	10.34	94,500	112,500	134,100	160,020	191,124	1,449,630	1,725,750	2,057,094	2,454,707	2,931,842
Trim Impellers/Reduce Throttling Pumps	3.32	11,250	13,500	16,200	18,900	22,500	26,100	31,320	37,584	43,848	52,200
Unoccupied Cycle - CONTROLS	588.12	8,400	8,400	7,800	8,800	10,400	3,170,448	3,757,968	4,462,172	5,166,856	6,108,048
Commercial Clothes Washers - Washer Only	7.01	15,000	18,000	21,600	25,920	31,104	90,150	108,180	129,816	155,779	186,935
Commercial Clothes Washers - Electric Dryer & Washer	16.85	15,000	18,000	21,600	25,920	31,104	234,750	281,700	338,040	405,648	486,778
Supply Air Reset -Controls	16.15	5,000	6,000	7,200	8,400	10,000	85,750	102,900	123,480	144,060	171,500
Ventilation Scheduling - Controls	2.23	5,400	6,400	7,600	8,800	10,400	6,842	7,872	9,348	10,824	12,792
Optimal Start /Stop - Controls	23.07	5,400	6,400	7,800	8,800	10,400	119,178	141,248	167,732	194,216	229,528
Economizer Cycle - Controls	7.6	21,000	25,000	29,800	35,600	42,400	136,500	165,000	196,680	234,960	279,840
Vending Equipment Controller	5.7	22,500	26,000	28,000	31,000	35,000	173,250	192,300	215,600	238,700	269,500
Barrel Wraps (inj Mold & Extruders)	38.78	1,750	2,100	2,520	3,010	3,840	66,115	79,338	95,206	113,719	137,519
High Efficiency Units - Refrigeration Display Cases	3.38	1,790	2,148	2,578	3,093	3,712	4,260	5,112	6,135	7,362	8,834
Efficient condensor Refrigerator	12.9	4,200	4,900	5,746	6,748	7,958	49,980	58,310	68,306	80,301	94,695
Head Pressure Control	26.76	17,600	20,800	24,640	29,248	34,778	453,376	536,808	634,726	753,428	895,871
Night covers for displays	4.8	1,875	2,250	2,700	3,240	3,888	7,125	8,550	10,260	12,312	14,774
Window Film	5.27	10,000	12,000	14,000	16,000	18,000	42,700	51,240	59,780	68,320	76,860
Air Flow Restriction Curtains	12.14	12,000	14,400	16,800	19,200	21,600	133,680	160,416	187,152	213,888	240,624
Pellet Dryer Tanks & Ducts	4.15	675	810	972	1,134	1,350	2,126	2,552	3,062	3,572	4,253
HI-EFF Multiplex Compressor	2.86	47,480	47,480	71,220	94,960	118,700	69,282	69,282	133,894	178,525	223,156
Photovoltaic Systems	0.07	75,000	75,000	75,000	75,000	75,000	(69,750)	(69,750)	(69,750)	(69,750)	(69,750)
Lighting Program Savings							2,444,515	2,692,451	2,984,033	3,284,353	3,534,229
HVAC Program Savings							736,869	881,249	1,039,492	1,213,756	1,415,745
Motors Program Savings							966,308	1,362,150	1,813,504	1,891,204	2,225,475
Other Program Savings							16,369,185	19,426,131	23,111,252	27,299,884	32,428,020
Photovoltaic Systems							(69,750)	(69,750)	(69,750)	(69,750)	(69,750)
Total Program Savings Net of Measure Costs							20,445,228	24,312,211	28,858,531	33,599,447	39,534,722
Program Administration Costs							490,378	572,476	686,271	774,071	897,587
Total Program Savings Net of All Costs							19,954,850	23,739,735	27,992,260	32,825,376	38,637,135
10% Shared Savings							1,995,485	2,373,973	2,799,226	3,282,538	3,863,714

Small C&I Programs/Measures	UCT	Total Program Benefits 2006	2007	2008	2009	2010	Total Program Costs 2006	2007	2008	2009	2010	Total Net Lost Revenues 2006	2007	2008	2009	2010	Total Shared Savings 2006	2007	2008	2009	2010
High-Efficiency Incentive Program																					
Lighting - Basic Measures	6.21	$ 1,980,960	$ 2,053,036	$ 2,125,092	$ 2,197,098	$ 2,269,134	$ 319,000	$ 330,500	$ 342,200	$ 353,800	$ 365,400	$ 58,470	$ 60,586	$ 62,729	$ 64,849	$ 66,975	$ 1,661,490	$ 1,722,436	$ 1,782,662	$ 1,843,298	$ 1,905,734
6 ft 1-2 Lamp T-8/ E Ballast																					
8 ft HO 1&2 T-8/ EB																					
4 ft 1-4 T-8 EB																					
3 ft 1-4 T-8 EB																					
2 ft 1-4 T-8 /EB																					
LED Exit Signs New/Recons																					
Lighting - Additional Measures																					
CFL Fixture	16.93	$ 130,533	$ 152,472	$ 179,798	$ 210,243	$ 246,270	$ 7,654	$ 9,174	$ 10,756	$ 12,950	$ 14,938	$ 2,536	$ 2,986	$ 3,476	$ 4,060	$ 4,630	$ 122,879	$ 143,298	$ 169,040	$ 197,293	$ 233,332
CFL Screw in	16.06	$ 113,760	$ 126,936	$ 147,120	$ 166,972	$ 195,174	$ 6,000	$ 6,600	$ 7,780	$ 8,912	$ 10,284	$ 10,322	$ 11,886	$ 13,946	$ 16,331	$ 17,706	$ 107,760	$ 120,336	$ 139,340	$ 160,060	$ 184,890
T-5 with Elec Ballast replacing T-12	7.98	$ 2,485	$ 2,811	$ 3,413	$ 3,992	$ 4,746	$ 350	$ 385	$ 451	$ 526	$ 627	$ 115	$ 134	$ 157	$ 184	$ 216	$ 2,135	$ 2,426	$ 2,959	$ 3,464	$ 4,113
T-5 HO with Elec Ballast replacing T-12	7.04	$ 1,373	$ 1,602	$ 1,878	$ 2,198	$ 2,608	$ 185	$ 228	$ 267	$ 312	$ 371	$ 63	$ 74	$ 86	$ 101	$ 120	$ 1,178	$ 1,374	$ 1,610	$ 1,884	$ 2,238
Occupancy Sensors under 500 ft2	21.29	$ 137,895	$ 159,225	$ 184,701	$ 215,485	$ 251,578	$ 6,500	$ 7,500	$ 8,700	$ 10,150	$ 11,860	$ 1,073	$ 1,236	$ 1,439	$ 1,675	$ 1,955	$ 131,495	$ 151,725	$ 176,001	$ 205,335	$ 239,128
Occupancy Sensors over 500 ft2	4.24	$ 29,880	$ 33,920	$ 39,008	$ 44,944	$ 52,576	$ 7,000	$ 8,000	$ 9,200	$ 10,600	$ 12,400	$ 1,445	$ 1,651	$ 1,888	$ 2,168	$ 2,560	$ 22,660	$ 25,920	$ 29,808	$ 34,344	$ 40,176
LED Auto Traffic Signals	13.53	$ 169,125	$ 202,950	$ 243,540	$ 292,248	$ 350,785	$ 12,000	$ 15,000	$ 18,000	$ 21,600	$ 25,926	$ 5,315	$ 6,379	$ 7,654	$ 9,185	$ 11,024	$ 156,825	$ 189,950	$ 225,540	$ 270,648	$ 324,840
LED Pedestrian Signals	4.63	$ 56,625	$ 67,950	$ 81,540	$ 97,395	$ 117,780	$ 12,500	$ 15,000	$ 18,000	$ 21,600	$ 26,000	$ 1,450	$ 1,740	$ 2,088	$ 2,493	$ 3,015	$ 44,125	$ 52,950	$ 63,540	$ 75,895	$ 91,780
Light Tube	4.76	$ 11,850	$ 14,340	$ 16,790	$ 20,319	$ 23,802	$ 2,500	$ 3,000	$ 3,500	$ 4,250	$ 5,000	$ 140	$ 167	$ 195	$ 237	$ 279	$ 9,450	$ 11,340	$ 13,295	$ 16,065	$ 18,802
Hi Bay Fluorescent 4LTB4IO	4.04	$ 42,042	$ 50,418	$ 59,127	$ 70,991	$ 84,364	$ 10,560	$ 12,480	$ 14,784	$ 17,549	$ 20,867	$ 1,962	$ 2,319	$ 2,747	$ 3,261	$ 3,878	$ 32,102	$ 37,938	$ 44,843	$ 53,441	$ 63,494
Hi Bay Fluorescent SLF32T8	4.57	$ 40,218	$ 47,526	$ 56,302	$ 66,632	$ 79,467	$ 6,800	$ 10,400	$ 12,320	$ 14,624	$ 17,388	$ 1,852	$ 2,189	$ 2,593	$ 3,078	$ 3,658	$ 31,416	$ 37,126	$ 43,952	$ 52,208	$ 62,078
Plug Load Occupancy Sensors Document Stations	17.43	$ 43,875	$ 52,290	$ 62,746	$ 74,949	$ 90,536	$ 2,500	$ 3,000	$ 3,600	$ 4,300	$ 5,200	$ 1,552	$ 1,883	$ 2,235	$ 2,670	$ 3,228	$ 41,875	$ 49,290	$ 58,146	$ 70,649	$ 85,308
Pulse Start Metal Halide (retrofit only)	11.65	$ 87,525	$ 165,188	$ 233,900	$ 305,813	$ 305,813	$ 7,500	$ 13,750	$ 20,000	$ 25,250	$ 25,250	$ 2,493	$ 4,571	$ 6,649	$ 8,727	$ 8,727	$ 79,875	$ 146,438	$ 213,000	$ 279,563	$ 279,563
HVAC - Basic Measures	2.88	$ 251,777	$ 297,564	$ 343,332	$ 411,998	$ 480,665	$ 67,120	$ 102,960	$ 118,800	$ 142,560	$ 166,320	$ 3,306	$ 3,510	$ 4,511	$ 5,414	$ 6,318	$ 184,997	$ 194,564	$ 224,532	$ 266,438	$ 314,345
Packaged Terminal AC																					
Packaged Terminal HP																					
Unitary AC Rooftop & HP Rooftop																					
<65,000 BTUH 1 Phase																					
<65,000 BTUH 3 Phase																					
65-135,000 BTUH																					
135-760,000 BTUH																					
760,000 + BTUH																					
Ground Source HP Closed Loop																					
Water Source HP Building Loop																					
HVAC - Additional Measures																					
ES Window AC under 14,000 Btu/hr	4.59	$ 5,736	$ 6,885	$ 8,260	$ 9,859	$ 11,934	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 68	$ 81	$ 97	$ 116	$ 141	$ 4,486	$ 5,385	$ 6,462	$ 7,719	$ 9,334
ES Window AC over 14,000 Btu/hr	8.06	$ 15,150	$ 18,180	$ 21,815	$ 26,054	$ 31,512	$ 2,600	$ 3,000	$ 3,600	$ 4,300	$ 5,200	$ 179	$ 215	$ 257	$ 308	$ 372	$ 12,650	$ 15,180	$ 18,216	$ 21,758	$ 26,312
ES Sleeve AC under 14,000 Btu/hr	5.24	$ 3,275	$ 3,930	$ 4,716	$ 5,633	$ 6,812	$ 625	$ 750	$ 900	$ 1,075	$ 1,300	$ 39	$ 46	$ 55	$ 66	$ 80	$ 2,650	$ 3,180	$ 3,816	$ 4,559	$ 5,512
ES Sleeve AC over 14,000 Btu/hr	8.23	$ 7,776	$ 9,330	$ 11,196	$ 13,373	$ 16,172	$ 1,250	$ 1,500	$ 1,800	$ 2,150	$ 2,600	$ 92	$ 110	$ 132	$ 158	$ 191	$ 6,525	$ 7,830	$ 9,396	$ 11,223	$ 13,572
HP Water Heater 500 gal/day	4.88	$ 244,650	$ 293,580	$ 352,320	$ 424,080	$ 521,820	$ 52,500	$ 63,000	$ 77,000	$ 91,000	$ 112,000	$ 6,279	$ 7,527	$ 9,205	$ 10,973	$ 13,382	$ 182,150	$ 218,580	$ 261,820	$ 313,080	$ 409,820
HP Water Heater 1000 gal/day	6.91	$ 185,250	$ 198,300	$ 221,350	$ 264,400	$ 297,450	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000	$ 4,217	$ 5,061	$ 6,104	$ 6,743	$ 7,591	$ 140,250	$ 168,300	$ 196,350	$ 224,400	$ 252,450
HP Water Heater 1500 gal/day	7.1	$ 246,500	$ 296,200	$ 347,900	$ 397,600	$ 447,300	$ 35,000	$ 42,000	$ 49,000	$ 56,000	$ 63,000	$ 6,344	$ 7,612	$ 8,881	$ 10,150	$ 11,419	$ 213,500	$ 256,200	$ 298,900	$ 341,600	$ 384,300

High-Efficiency Incentive Program (Continued)	UCT	Total Program Benefits 2006	2007	2008	2009	2010	Total Program Costs 2006	2007	2008	2009	2010	Total Net Lost Revenues 2006	2007	2008	2009	2010	Total Shared Savings 2006	2007	2008	2009	2010
Motors - Basic Measures	2.48	$ 32,965	$ 75,558	$ 90,670	$ 106,923	$ 130,338	$ 26,700	$ 30,840	$ 37,008	$ 44,461	$ 53,199	$ 1,649	$ 1,979	$ 2,374	$ 2,852	$ 3,413	$ 37,266	$ 44,718	$ 53,662	$ 64,466	$ 77,199
20-250 hp - avg for group																					
Greater than 1500 hours per year																					
Motors - Additional Measures																					
1-5 HP motors - Incentives per HP	8.41	$ 42,050	$ 50,460	$ 60,552	$ 72,662	$ 87,195	$ 5,000	$ 6,000	$ 7,200	$ 8,640	$ 10,368	$ 926	$ 1,113	$ 1,336	$ 1,603	$ 1,924	$ 37,050	$ 44,460	$ 53,352	$ 64,022	$ 76,827
7.5-20 HP motors - Incentives per HP	31.88	$ 382,560	$ 459,072	$ 550,886	$ 661,064	$ 793,276	$ 12,000	$ 14,400	$ 17,280	$ 20,736	$ 24,883	$ 6,497	$ 10,125	$ 12,148	$ 14,578	$ 17,495	$ 370,560	$ 444,672	$ 533,606	$ 640,328	$ 768,393
High Efficiency Pumps HP 5	1.80	$ 5,184	$ 6,221	$ 7,465	$ 8,958	$ 10,750	$ 2,880	$ 3,456	$ 4,147	$ 4,977	$ 5,972	$ 68	$ 105	$ 126	$ 152	$ 182	$ 2,304	$ 2,765	$ 3,318	$ 3,981	$ 4,778
HP 7.5	2.59	$ 7,770	$ 9,324	$ 11,189	$ 13,427	$ 16,112	$ 3,000	$ 3,600	$ 4,320	$ 5,184	$ 6,221	$ 132	$ 158	$ 189	$ 227	$ 273	$ 4,770	$ 5,724	$ 6,869	$ 8,243	$ 9,891
HP 10	3.32	$ 9,936	$ 9,936	$ 11,923	$ 14,308	$ 17,169	$ 2,400	$ 2,880	$ 3,456	$ 4,147	$ 4,977	$ 117	$ 140	$ 168	$ 202	$ 242	$ 7,536	$ 9,043	$ 10,852	$ 13,023	$ 15,622
HP 15	4.32	$ 12,960	$ 12,442	$ 14,930	$ 17,916	$ 21,495	$ 2,400	$ 2,880	$ 3,456	$ 4,147	$ 4,977	$ 176	$ 211	$ 253	$ 303	$ 364	$ 9,960	$ 11,952	$ 14,342	$ 17,209	$ 20,653
HP 20	4.33	$ 1,732	$ 1,732	$ 1,732	$ 3,464	$ 3,464	$ 400	$ 400	$ 400	$ 400	$ 800	$ 29	$ 29	$ 29	$ 29	$ 58	$ 1,332	$ 1,332	$ 1,332	$ 2,964	$ 2,964
Variable Frequency Drive Pumps HP 5	4.06	$ 35,348	$ 42,418	$ 50,888	$ 61,079	$ 73,294	$ 6,708	$ 10,447	$ 12,537	$ 15,044	$ 18,053	$ 597	$ 717	$ 860	$ 1,032	$ 1,239	$ 28,640	$ 31,968	$ 38,392	$ 46,035	$ 55,241
VFD HP 7.5	4.86	$ 59,488	$ 64,167	$ 77,024	$ 92,429	$ 110,915	$ 11,006	$ 18,207	$ 18,849	$ 19,018	$ 22,822	$ 906	$ 1,086	$ 1,303	$ 1,564	$ 1,877	$ 47,488	$ 50,986	$ 61,178	$ 73,411	$ 88,089
VFD HP 10	6.16	$ 141,138	$ 189,366	$ 203,236	$ 243,886	$ 292,664	$ 22,912	$ 27,494	$ 32,993	$ 39,592	$ 47,510	$ 2,388	$ 2,867	$ 3,441	$ 4,129	$ 4,955	$ 116,226	$ 141,871	$ 170,245	$ 204,294	$ 245,153
VFD HP 15	7.47	$ 213,971	$ 256,765	$ 308,118	$ 369,741	$ 443,690	$ 28,644	$ 34,373	$ 41,247	$ 49,497	$ 59,396	$ 3,630	$ 4,344	$ 5,213	$ 6,256	$ 7,507	$ 181,327	$ 222,392	$ 272,870	$ 332,945	$ 394,293
VFD HP 20	8.65	$ 142,682	$ 171,218	$ 205,459	$ 246,551	$ 295,861	$ 16,122	$ 19,346	$ 23,216	$ 27,858	$ 33,431	$ 2,413	$ 2,896	$ 3,475	$ 4,171	$ 5,006	$ 124,558	$ 151,889	$ 182,243	$ 218,692	$ 262,430
VFD HP 25	9.05	$ -	$ -	$ 42,565	$ 42,565	$ 42,565	$ -	$ 4,706	$ 4,706	$ 4,706	$ 4,706	$ -	$ 754	$ 754	$ 754	$ 754	$ -	$ 37,879	$ 37,879	$ 37,879	$ 37,879
VFD HP 30	9.44	$ -	$ -	$ 51,108	$ 51,108	$ 51,108	$ -	$ 5,414	$ 5,414	$ 5,414	$ 5,414	$ -	$ 905	$ 905	$ 905	$ 905	$ -	$ 45,894	$ 45,894	$ 45,894	$ 45,894
VFD HP 40	11.98	$ -	$ -	$ 68,106	$ 68,106	$ 68,106	$ -	$ 5,585	$ 5,585	$ 5,585	$ 5,585	$ -	$ 1,207	$ 1,207	$ 1,207	$ 1,207	$ -	$ 62,421	$ 62,421	$ 62,421	$ 62,421
VFD HP 50	11.95	$ -	$ -	$ 85,180	$ 85,180	$ 85,180	$ -	$ 7,128	$ 7,128	$ 7,128	$ 7,128	$ -	$ 1,508	$ 1,508	$ 1,508	$ 1,508	$ -	$ 76,052	$ 76,052	$ 76,052	$ 76,052
Other Measures																					
Setback/Programmable Thermostat	105.36	$ 2,897,400	$ 3,397,560	$ 3,999,412	$ 4,720,128	$ 5,584,080	$ 27,500	$ 32,250	$ 37,950	$ 44,800	$ 53,000	$ 66,474	$ 80,301	$ 94,494	$ 111,590	$ 131,965	$ 2,870,900	$ 3,395,610	$ 3,960,462	$ 4,675,328	$ 5,531,080
Engineered Nozzles - COMPRESS AIR	420.03	$ 4,200,300	$ 5,040,360	$ 6,048,432	$ 7,224,516	$ 8,669,419	$ 10,000	$ 12,000	$ 14,400	$ 17,280	$ 20,640	$ 71,068	$ 85,281	$ 102,338	$ 122,807	$ 146,884	$ 4,190,300	$ 5,026,360	$ 6,034,032	$ 7,207,516	$ 8,648,779
Zone Shutoff Valves -COMPRESSED AIR	4.24	$ 50,032	$ 60,038	$ 72,046	$ 86,055	$ 104,267	$ 11,000	$ 14,160	$ 16,992	$ 20,390	$ 24,544	$ 1,103	$ 1,323	$ 1,588	$ 1,887	$ 2,284	$ 38,232	$ 45,878	$ 55,054	$ 65,758	$ 79,523
Dew Point Controlled Desiccant Dryers - Compressed air	22.68	$ 574,760	$ 689,700	$ 804,650	$ 919,600	$ 1,034,550	$ 25,000	$ 30,000	$ 35,000	$ 40,000	$ 45,000	$ 8,353	$ 10,024	$ 11,665	$ 13,366	$ 15,038	$ 549,760	$ 659,700	$ 769,650	$ 879,600	$ 988,550
Moisture Traps - Condensate Drain Valve	14.23	$ 311,281	$ 373,538	$ 448,245	$ 537,894	$ 644,675	$ 21,675	$ 26,250	$ 31,500	$ 37,800	$ 45,325	$ 5,267	$ 6,321	$ 7,585	$ 9,102	$ 10,914	$ 285,406	$ 347,288	$ 416,746	$ 500,094	$ 599,850
Chilled Water Reset	9.94	$ 164,010	$ 191,345	$ 224,142	$ 268,949	$ 309,685	$ 16,500	$ 19,250	$ 22,550	$ 25,850	$ 30,250	$ 2,774	$ 3,239	$ 3,791	$ 4,346	$ 5,086	$ 147,510	$ 172,096	$ 201,597	$ 231,099	$ 270,435
Central Lighting Control	8.47	$ 1,223,482	$ 1,452,182	$ 1,739,810	$ 2,055,923	$ 2,451,098	$ 144,450	$ 171,450	$ 203,550	$ 242,730	$ 288,386	$ 23,784	$ 28,230	$ 33,505	$ 39,967	$ 47,646	$ 1,078,842	$ 1,280,732	$ 1,522,780	$ 1,813,190	$ 2,191,713
Switching Controls for Multilevel Lighting	9.64	$ 857,222	$ 1,136,142	$ 1,360,848	$ 1,608,491	$ 1,917,865	$ 98,200	$ 114,900	$ 136,900	$ 161,620	$ 192,924	$ 18,614	$ 22,093	$ 26,268	$ 31,276	$ 37,280	$ 740,922	$ 1,021,842	$ 1,214,948	$ 1,446,671	$ 1,724,241
Daylight Sensor controls	16.34	$ 1,544,150	$ 1,836,250	$ 2,181,194	$ 2,614,727	$ 3,122,466	$ 84,500	$ 112,500	$ 134,100	$ 160,020	$ 191,124	$ 30,037	$ 35,758	$ 42,624	$ 50,863	$ 60,750	$ 1,440,650	$ 1,725,750	$ 2,067,094	$ 2,454,702	$ 2,931,342
Trim Impellers/Reduce Throttling Pumps	3.32	$ 37,350	$ 44,820	$ 53,784	$ 62,748	$ 74,700	$ 11,250	$ 13,500	$ 16,200	$ 18,900	$ 22,500	$ 631	$ 757	$ 908	$ 1,060	$ 1,262	$ 25,100	$ 30,320	$ 37,584	$ 43,845	$ 52,200
Unoccupied Cycle - CONTROLS	566.12	$ 3,174,545	$ 3,793,998	$ 4,489,212	$ 5,175,456	$ 6,116,448	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 53,729	$ 63,679	$ 75,616	$ 87,569	$ 103,479	$ 3,170,448	$ 3,797,568	$ 4,482,112	$ 5,166,856	$ 6,108,048
Commercial Clothes Washers - Washer Only	7.01	$ 108,150	$ 126,180	$ 151,416	$ 181,698	$ 218,039	$ 15,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104	$ 2,319	$ 2,783	$ 3,340	$ 4,008	$ 4,810	$ 90,150	$ 108,180	$ 129,816	$ 155,779	$ 186,935
Commercial Clothes Washers - Electric Dryer & Washer	16.65	$ 249,750	$ 299,700	$ 359,640	$ 431,568	$ 517,882	$ 15,000	$ 18,000	$ 21,600	$ 25,920	$ 31,104	$ 5,569	$ 6,911	$ 7,933	$ 9,519	$ 11,423	$ 234,750	$ 281,700	$ 338,040	$ 405,648	$ 486,778
Supply Air Reset - Controls	18.15	$ 90,760	$ 108,900	$ 130,680	$ 152,460	$ 181,506	$ 5,000	$ 6,000	$ 7,200	$ 8,400	$ 10,000	$ 1,598	$ 1,843	$ 2,211	$ 2,580	$ 3,071	$ 85,760	$ 102,900	$ 123,480	$ 144,060	$ 171,506
Ventilation Scheduling - Controls	2.23	$ 12,042	$ 14,272	$ 16,948	$ 19,624	$ 23,192	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 204	$ 242	$ 287	$ 333	$ 393	$ 6,642	$ 7,872	$ 9,348	$ 10,824	$ 12,792
Optimal Start /Stop - Controls	23.07	$ 124,578	$ 147,848	$ 175,332	$ 203,016	$ 239,928	$ 5,400	$ 6,400	$ 7,600	$ 8,800	$ 10,400	$ 2,107	$ 2,498	$ 2,966	$ 3,434	$ 4,058	$ 119,178	$ 141,248	$ 167,732	$ 194,216	$ 229,528
Economizer Cycle - Controls	7.6	$ 159,600	$ 189,000	$ 226,480	$ 270,560	$ 322,240	$ 21,000	$ 25,000	$ 29,800	$ 35,600	$ 42,400	$ 2,688	$ 3,243	$ 3,830	$ 4,576	$ 5,496	$ 134,800	$ 159,000	$ 192,880	$ 230,960	$ 274,840
Vending Equipment Controller	8.7	$ 195,750	$ 217,500	$ 240,950	$ 268,750	$ 304,500	$ 22,500	$ 25,000	$ 28,000	$ 31,000	$ 35,000	$ 6,968	$ 7,732	$ 8,658	$ 9,567	$ 10,824	$ 173,250	$ 192,500	$ 215,800	$ 238,700	$ 269,500
Barrel Wraps (In Mold & Extruders)	38.78	$ 97,695	$ 61,435	$ 97,735	$ 118,726	$ 141,159	$ 1,750	$ 2,100	$ 2,520	$ 3,010	$ 3,640	$ 2,417	$ 2,801	$ 3,481	$ 4,167	$ 5,028	$ 86,116	$ 79,338	$ 96,206	$ 113,718	$ 137,519
High Efficiency Units - Refrigeration Display Cases	3.38	$ 6,090	$ 7,280	$ 8,712	$ 10,455	$ 12,546	$ 1,750	$ 2,148	$ 2,578	$ 3,093	$ 3,712	$ 102	$ 123	$ 148	$ 177	$ 212	$ 4,280	$ 5,112	$ 6,135	$ 7,362	$ 8,834
Efficient condenser Refrigerants	12.9	$ 54,180	$ 63,210	$ 74,046	$ 87,048	$ 102,859	$ 4,200	$ 4,800	$ 5,740	$ 6,748	$ 7,955	$ 787	$ 918	$ 1,076	$ 1,265	$ 1,491	$ 48,980	$ 56,310	$ 66,306	$ 80,301	$ 94,696
Head Pressure Control	26.76	$ 470,976	$ 556,908	$ 659,398	$ 782,676	$ 930,648	$ 17,800	$ 20,900	$ 24,840	$ 29,348	$ 34,778	$ 7,970	$ 9,418	$ 11,156	$ 13,245	$ 15,748	$ 453,378	$ 536,908	$ 634,728	$ 753,428	$ 888,871
Night covers for displays	4.5	$ 9,000	$ 10,800	$ 12,960	$ 15,552	$ 19,662	$ 1,575	$ 2,250	$ 2,700	$ 3,240	$ 3,888	$ 152	$ 180	$ 219	$ 263	$ 318	$ 7,125	$ 8,370	$ 10,260	$ 12,312	$ 14,774
Window Film	5.27	$ 52,700	$ 63,240	$ 73,780	$ 84,320	$ 94,860	$ 10,000	$ 12,000	$ 14,000	$ 16,000	$ 18,000	$ 1,160	$ 1,392	$ 1,624	$ 1,856	$ 2,088	$ 42,700	$ 51,240	$ 59,780	$ 68,320	$ 76,860
Air Flow Restriction Curtains	12.14	$ 145,680	$ 174,816	$ 203,952	$ 233,088	$ 262,224	$ 12,000	$ 14,400	$ 16,800	$ 19,200	$ 21,600	$ 2,880	$ 3,396	$ 3,962	$ 4,528	$ 5,094	$ 133,680	$ 160,416	$ 187,152	$ 213,888	$ 240,624
Pellet Dryer Tanks & Ducts	4.15	$ 2,801	$ 4,054	$ 4,709	$ 5,803	$ 6,525	$ 675	$ 810	$ 972	$ 1,134	$ 1,350	$ 47	$ 57	$ 68	$ 80	$ 95	$ 2,126	$ 2,562	$ 3,062	$ 3,572	$ 4,253
Hi-EFF Multiplex Compressor	2.86	$ -36,742	$ 136,742	$ 208,114	$ 273,485	$ 341,856	$ 47,480	$ 47,480	$ 71,220	$ 94,960	$ 118,700	$ 2,315	$ 2,915	$ 3,472	$ 4,029	$ 5,787	$ 86,282	$ 68,282	$ 93,894	$ 178,925	$ 223,196
Photovoltaic Systems	0.97	$ 5,250	$ 5,250	$ 5,250	$ 5,250	$ 5,250	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 100	$ 100	$ 100	$ 100	$ 100	$ (69,750)	$ (69,750)	$ (69,750)	$ (69,750)	$ (69,750)
Total Program Benefits		$ 21,921,307	$ 26,022,656	$ 30,637,192	$ 36,886,077	$ 42,174,254															
Total Program Measure Costs							$ 1,476,078	$ 1,716,647	$ 1,978,632	$ 2,286,630	$ 2,639,533										
Total Program Administration Costs							$ 480,305	$ 572,478	$ 666,271	$ 774,071	$ 897,587										
Total Program Costs							$ 1,956,457	$ 2,289,123	$ 2,644,903	$ 3,060,701	$ 3,537,119										
Total Lost Revenues												$ 463,740	$ 534,822	$ 626,532	$ 730,838	$ 854,677					
Total Program Savings																	$ 20,446,228	$ 24,312,211	$ 28,656,531	$ 33,580,447	$ 39,534,722
Total Program Savings Net of As Costs																	$ 19,964,850	$ 23,738,735	$ 27,982,260	$ 32,825,376	$ 38,637,135
10% Shared Savings																	$ 1,995,485	$ 2,373,973	$ 2,796,228	$ 3,282,536	$ 3,863,714

	2006
Total Program Benefits (Avoided Costs)	$ 21,921,307
Small C&I Sales Forecast (MWH)	10,588,987
Rate Impact of Savings	$ 0.002070
Total Program Costs	$ 1,956,457
Total Lost Revenues	$ 463,740
Total Shared Savings	$ 1,995,485
Total Rate Recovery	$ 4,415,681
Small C&I Sales Forecast (MWH)	10,588,987
Rate Impact of Cost Recovery	$ 0.000417
Rate Savings	$ 0.001653

APPENDIX C

RIDER DSMR

DEMAND SIDE MANAGEMENT COST RECOVERY RIDER

APPLICABILITY

Applicable to service rendered under the provisions of Rates RS and RFT (residential class).

CHARGES

The monthly amount computed under each of the rate schedules to which this rider is applicable shall be increased or decreased by the DSM Charge at a rate per hundred cubic feet (CCF) of monthly consumption in accordance with the following formula:

DSM Charge = PC + LR + PI + BA

Where: **PC = DSM PROGRAM COST RECOVERY**. For each twelve month period, the PC shall include all expected costs for demand-side management programs which have been approved by a collaborative process. Such program costs shall include the cost of planning, developing, implementing, monitoring, and evaluating DSM programs. Program costs will be assigned for recovery purposes to the rate classes whose customers are directly participating in the program. In addition, all costs incurred by or on behalf of the collaborative process, including but not limited to costs for consultants, employees and administrative expenses, will be recovered through the PC. Administrative costs that are allocable to more than one rate class will be recovered from those classes and allocated by rate class on the basis of the estimated avoided pipeline capacity and commodity costs resulting from each program.

The PC shall be determined by dividing the cost of approved programs allocated or assigned to the residential class by the expected CCF throughput for the upcoming twelve-month period.

LR = LOST REVENUE FROM DECREASED THROUGHPUT RECOVERY. The applicable LR shall be computed by 1) multiplying the amount of CCF throughput that will be lost for each twelve-month period as a result of the implementation of the approved programs times the CCF throughput charge for the applicable rate schedule, less the variable cost included in the charge; and, 2) dividing that product by the expected CCF throughput for the upcoming twelve-month period. Recovery of revenues from decreased throughput calculated for a twelve-month period for non-residential rate classes shall be included in the LR for three years from the implementation of the DSM measures or until terminated by the implementation of new rates pursuant to a general rate case, whichever comes first. Revenues from such decreased throughput will be assigned for recovery purposes to the rate classes whose programs resulted in the decreased throughput.

CHARGES (Contd.)

PI = DSM PROGRAM INCENTIVE RECOVERY. The DSM Program Incentive (PI) amount shall be computed by multiplying the net resource savings expected from the approved programs which are to be installed during the upcoming twelve-month period times ten (10) percent. Net resource savings are defined as program benefits less the cost of the program, where program benefits will be calculated on the basis of the present value of CG&E's avoided gas costs over the expected life of the program, and will include both capacity and commodity savings. The DSM incentive amount related to programs shall be divided by the expected CCF throughput for the upcoming twelve-month period to determine the PI. DSM incentive amounts will be assigned for recovery purposes to the rate classes whose programs created the incentive.

BA = DSM BALANCE ADJUSTMENT. The BA is used to reconcile the difference between the amount of revenues actually billed through the respective DSM Charge components; namely, the PC, LR, and PI and previous BA, and the revenues which should have been billed, as follows:

(1) For the PC, the balance adjustment amount will equal the difference between the amount billed in a twelve-month period from the application of the PC unit charge and the actual cost of the approved programs during the same twelve-month period.

(2) For the LR, the balance adjustment amount will equal the difference between the amount billed during the twelve-month period from the application of the LR unit charge and the LR amount established for the same twelve-month period.

(3) For the PI, the balance adjustment amount will equal the difference between the amount billed during the twelve-month period from application of the PI unit charge and the incentive amount determined for the actual DSM program, or measures implemented during the twelve-month period.

(4) For the BA, the balance adjustment amount will equal the difference between the amount billed during the twelve-month period from application of the BA and the balance adjustment amount established for the same twelve-month period.

The balance adjustment amounts determined above shall include interest. The interest applied to the monthly amounts, shall be calculated at a rate equal to the average of the "3-month Commercial Paper Rate" for the immediately preceding 12-month period. The total of balance adjustment amounts shall be divided by the expected CCF throughput for the upcoming twelve-month period to determine the BA. DSM balance adjustment amounts will be assigned for recovery purposes to the rate classes to which over or under-recoveries of DSM amounts were realized.

All costs recovered through the DSM Charge will be assigned or allocated to CG&E's electric or gas customers on the basis of the estimated net electric or gas resource savings resulting from each program.

CHARGES (Contd.)

DSM CHARGE FILINGS

The filing of modifications to the DSM Charge shall be made at least thirty days prior to the beginning of the effective period for billing. Each filing will include the following information as needed:

(1) A detailed description of each DSM program developed by the collaborative process, the total cost of each program over the twelve-month period, an analysis of expected resource savings, information concerning the specific DSM or efficiency measures to be installed, and any applicable studies which have been performed, as available.

(2) A statement setting forth the detailed calculation of each component of the DSM Charge.

Each change in the DSM Charge shall be applied to customers' bills with the first billing cycle of the revenue month which coincides with, or is subsequent to, the effective date of such change.

SERVICE REGULATIONS

The supplying of, and billing for, service and all conditions applying thereto, are subject to the jurisdiction of the Public Utilities Commission of Ohio, and to Company's Service Regulations currently in effect, as filed with the Public Utilities Commission of Ohio, as provided by law.

APPENDIX D

RIDER DSMR

DEMAND SIDE MANAGEMENT COST RECOVERY RIDER

APPLICABILITY

Applicable to service rendered under the provisions of Rates RS, ORH and TD (residential class), and Rates DS, DM, DP, EH, GS-FL, SFL-ADPL, and CUR (non-residential class) following the end of the Market Development Period.

CHARGES

The monthly amount computed under each of the rate schedules to which this rider is applicable shall be increased or decreased by the DSM Charge at a rate per kilowatt-hour of monthly consumption and, where applicable, a rate per kilowatt of monthly billing demand, in accordance with the following formula:

DSM Charge = PC + LR + PI + BA

Where: **PC = DSM PROGRAM COST RECOVERY**. For each twelve month period, the PC shall include all expected costs for demand-side management programs which have been approved by a collaborative process. Such program costs shall include the cost of planning, developing, implementing, monitoring, and evaluating DSM programs. Program costs will be assigned for recovery purposes to the rate classes whose customers are directly participating in the program. In addition, all costs incurred by or on behalf of the collaborative process, including but not limited to costs for consultants, employees and administrative expenses, will be recovered through the PC. Administrative costs that are allocable to more than one rate class will be recovered from those classes and allocated by rate class on the basis of the estimated avoided capacity and energy costs resulting from each program.

The PC applicable to each rate class shall be determined by dividing the cost of approved programs allocated or assigned to that class by the expected kilowatt-hour sales for the upcoming twelve-month period.

LR = LOST REVENUE FROM LOST SALES RECOVERY. The applicable LR shall be computed by 1) multiplying the amount of kilowatt-hour sales that will be lost for each twelve-month period as a result of the implementation of the approved programs times the energy charge for the applicable rate schedule, less the variable cost included in the charge, and, 2) dividing that product by the expected kilowatt-hour sales for the upcoming twelve-month period. Recovery of revenues from lost sales calculated for a twelve-month period for each rate class shall be included in the LR for three years from the implementation of the DSM measures or until terminated by the implementation of new rates pursuant to a general rate case, whichever comes first. Revenues from lost sales will be assigned for recovery purposes to the rate classes whose programs resulted in the lost sales.

CHARGES (Contd.)

PI = DSM PROGRAM INCENTIVE RECOVERY. The DSM Program Incentive (PI) amount shall be computed by multiplying the net resource savings expected from the approved programs which are to be installed during the upcoming twelve-month period times ten (10) percent. Net resource savings are defined as program benefits less the cost of the program, where program benefits will be calculated on the basis of the present value of Cinergy's avoided costs over the expected life of the program, and will include both capacity and energy savings. The DSM incentive amount related to programs for each rate class shall be divided by the expected kilowatt-hour sales for the upcoming twelve-month period to determine the PI for that rate class. DSM incentive amounts will be assigned for recovery purposes to the rate classes whose programs created the incentive.

BA = DSM BALANCE ADJUSTMENT. The BA is used to reconcile the difference between the amount of revenues actually billed through the respective DSM Charge components; namely, the PC, LR, and PI and previous application of the BA and the revenues which should have been billed, as follows:

(1) For the PC, the balance adjustment amount will be the difference between the amount billed in a twelve-month period from the application of the PC unit charge and the actual cost of the approved programs during the same twelve-month period.

(2) For the LR, the balance adjustment amount will be the difference between the amount billed during the twelve-month period from the application of the LR unit charge and the LR amount established for the same twelve-month period.

(3) For the PI, the balance adjustment amount will be the difference between the amount billed during the twelve-month period from application of the PI unit charge and the incentive amount determined for the actual DSM program, or measures implemented during the twelve-month period.

(4) For the BA, the balance adjustment amount will be the difference between the amount billed during the twelve-month period from application of the BA and the balance adjustment amount established for the same twelve-month period.

The balance adjustment amounts determined above shall include interest. The interest applied to the monthly amounts, shall be calculated at a rate equal to the average of the "3-month Commercial Paper Rate" for the immediately preceding 12-month period. The total of the energy-related balance adjustment amounts shall be divided by the expected kilowatt-hour sales for the upcoming twelve-month period to determine the energy-related BA. DSM balance adjustment amounts will be assigned for recovery purposes to the rate classes to which over or under-recoveries of DSM amounts were realized.

All costs recovered through the DSM Charge will be assigned or allocated to CG&E's electric customers on the basis of the estimated net electric resource savings resulting from each program.

CHARGES (Contd.)

DSM CHARGE FILINGS

The filing of modifications to the DSM Charge shall be made at least thirty days prior to the beginning of the effective period for billing. Each filing will include the following information as needed:

(1) A detailed description of each DSM program developed by the collaborative process, the total cost of each program over the twelve-month period, an analysis of expected resource savings, information concerning the specific DSM or efficiency measures to be installed, and any applicable studies which have been performed, as available.

(2) A statement setting forth the detailed calculation of each component of the DSM Charge.

Each change in the DSM Charge shall be applied to customers' bills with the first billing cycle of the revenue month which coincides with, or is subsequent to, the effective date of such change.

DEMAND RATCHETS

Customers served under the provisions of Rate DS or Rate DP may be eligible to have their billing demand re-determined in recognition of a permanent change in load due to the installation of load control equipment or other measures taken by the customer to permanently reduce the customer's demand.

SERVICE REGULATIONS

The supplying of, and billing for, service and all conditions applying thereto, are subject to the jurisdiction of the Public Utilities Commission of Ohio, and to Company's Service Regulations currently in effect, as filed with the Public Utilities Commission of Ohio, as provided by law.

APPENDIX E

Appendix E

OG&E DSM Rider

Comparison of Revenue Requirement to Rider Recovery

Residential Programs	(1) Projected Program Costs 7/2004 to 6/2005 (A)	(2) Projected Lost Revenues 7/2004 to 6/2005 (A)	(3) Projected Shared Savings 7/2004 to 6/2005 (A)	(4) Program Expenditures 7/04 through 6/05 (B)	(5) Program Expenditures (C) Gas	(6) Program Expenditures (C) Electric	(7) Lost Revenues 7/04 through 6/05 (B)	(8) Shared Savings 7/04 through 6/05 (B)	(9) 2004 Reconciliation Gas (D)	(10) 2004 Reconciliation Electric (E)	(11) Rider Collection (F) Gas	(12) Rider Collection (F) Electric	(13) (Over)/Under Collection Gas (G)	(14) (Over)/Under Collection Electric (H)
Summer Saver (Air-conditioner)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Home Energy House Call	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Residential Comprehensive Energy Education (NEED)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Power Manager	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Energy Star Products	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
CFL's (Compact Fluorescent Lights)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Torchieres (Floor lamps)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Clothes Washers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Energy Efficiency Web Site	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Room AC Turn-In	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
AC Check - Pilot	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Smart Saver Heat Pump with ECM	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Pre-Paid Meter - Pilot	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Energy Star Products - Gas Furnace /ECM (Elec Impacts)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
House Call Plus - Research (Elec Heated Homes)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
House Call Plus - Research (Gas Heated Homes)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Energy Star Products - Gas Furnace	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Energy Star Products - Gas Furnace with ECM	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -			NA	NA	NA	NA
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

(A) Amounts identified in a prior reconciliation filing. There are no values for this page since it is the initial year of the program.
(B) Actual program expenditures, lost revenues, and shared savings for the period.
(C) Allocation of program expenditures to gas and electric. Uses 82.9% gas based upon saturation of gas space heating.
(D) Recovery allowed in accordance with a Commission Order.
(E) Recovery allowed in accordance with aCommission Order.
(F) Revenues collected through the DSM Rider between July 1, 2004 and June 30, 2005.
(G) Column (5) + Column (9) - Column(11).
(H) Column (6) + Column (7) + Column (8) + Column (10) - Column(12).

Commercial Programs	(1) Projected Program Costs 7/2004 to 6/2005 (A)	(2) Projected Lost Revenues 7/2004 to 6/2005 (A)	(3) Projected Shared Savings 7/2004 to 6/2005 (A)	(4) Program Expenditures 7/04 through 6/05 (B)	(5) Lost Revenues 7/04 through 6/05 (B)	(6) Shared Savings 7/04 through 6/05 (B)	(7) 2004 Reconciliation (C)	(8) Rider Collection (D)	(9) (Over)/Under Collection (E)
High Efficiency Program									
Lighting	$ -	$ -	$ -	$ -	$ -	$ -			
HVAC	$ -	$ -	$ -	$ -	$ -	$ -			
Motors	$ -	$ -	$ -	$ -	$ -	$ -			
Other	$ -	$ -	$ -						
Photovoltaic Program	$ -	$ -	$ -	$ -	$ -	$ -			
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

(A) Amounts identified in a prior reconciliation filing.
(B) Actual program expenditures, lost revenues, and shared savings for the period.
(C) Recovery allowed in accordance with a Commission Order
(D) Revenues collected through the DSM Rider between July 1, 2004 and June 30, 2005.
(E) Column (4) + Column (5) + Column (6) + Column (7) - Column (8)

2006 Projected Program Costs, Lost Revenues, and Shared Savings

Residential Program Summary

	Costs	Lost Revenues	Shared Savings	Total	Allocation of Costs Electric	Allocation of Costs Gas	Total Costs	Budget (Costs, Lost Revenues, & Shared Savings) Electric	Budget (Costs, Lost Revenues, & Shared Savings) Gas Costs
Summer Saver (Air-conditioner)	$ 317,500	$ 15,210	$ 13,250	$ 345,960	100.0%	0.0%	$ 345,960	$ 345,960	$ -
Home Energy House Call	$ 850,000	$ 176,187	$ 312,313	$ 1,338,499	100.0%	0.0%	$ 1,338,499	$ 1,338,499	$ -
Residential Comprehensive Energy Education (NE	$ 165,000	$ 16,296	$ 10,200	$ 191,496	100.0%	0.0%	$ 191,496	$ 191,496	$ -
Power Manager	$ 1,055,743	$ -	$ 59,122	$ 1,114,865	100.0%	0.0%	$ 1,114,865	$ 1,114,865	$ -
Energy Star Products	$ 887,580			$ 887,580	100.0%	0.0%	$ 887,580	$ 887,580	$ -
CFL's (Compact Fluorescent Lights)	$ 1,000,000	$ 1,792,560	$ 1,066,242	$ 3,858,802	100.0%	0.0%	$ 3,858,802	$ 3,858,802	$ -
Torchieres (Floor lamps)	$ 36,000	$ 37,937	$ 22,968	$ 96,905	100.0%	0.0%	$ 96,905	$ 96,905	$ -
Energy Efficiency Web Site	$ 137,700	$ 66,814	$ 49,266	$ 253,780	100.0%	0.0%	$ 253,780	$ 253,780	$ -
Room AC Turn-In	$ 105,000	$ 9,506	$ (2,150)	$ 112,356	100.0%	0.0%	$ 112,356	$ 112,356	$ -
AC Check - Pilot	$ 32,500	$ 5,351	$ 6,125	$ 43,976	100.0%	0.0%	$ 43,976	$ 43,976	$ -
Smart Saver Heat Pump with ECM	$ 86,800	$ 5,008	$ (1,890)	$ 89,918	100.0%	0.0%	$ 89,918	$ 89,918	$ -
Personalized Energy Report Pilot	$ 1,078,176	$ -	$ -	$ 1,078,176	100.0%	0.0%	$ 1,078,176	$ 1,078,176	$ -
Pre-Paid Meter - Pilot	$ 287,000	$ 8,501	$ 101,490	$ 396,991	100.0%	0.0%	$ 396,991	$ 396,991	$ -
Energy Star Products - Gas Furnace /ECM (Elec Ir	$ -	$ 20,968	$ -	$ 20,968	100.0%	0.0%	$ 20,968	$ 20,968	$ -
House Call Plus - Research (Elec Heated Homes)	$ 26,500	$ 1,277	$ 4,941	$ 32,717	100.0%	0.0%	$ 32,717	$ 32,717	$ -
House Call Plus - Research (Gas Heated Homes)	$ 106,000	$ 1,115	$ 6,638	$ 113,753	0.0%	100.0%	$ 113,753	$ -	$ 113,753
Energy Star Products - Gas Furnace	$ 1,950,000	$ 419,227	$ 525,750	$ 2,894,977	0.0%	100.0%	$ 2,894,977	$ -	$ 2,894,977
Energy Star Products - Gas Furnace with ECM	$ 357,500	$ 41,923	$ 58,025	$ 457,448	0.0%	100.0%	$ 457,448	$ -	$ 457,448
Evaluation	$ 480,724		$ (48,072)	$ 432,652	100.0%	0.0%	$ 432,652	$ 432,652	$ -
Total Costs, Net Lost Revenues, Shared Savings	$ 8,959,723	$ 2,617,878	$ 2,184,216	$ 13,761,818			$ 13,761,818	$10,295,639	$ 3,466,178

Small C&I DSM Program Summary

High Efficiency Program	Costs	Lost Revenues	Shared Savings	Total	Allocations Electric	Allocations Gas	Total Costs	Budget (Costs, Lost Revenues, & Shared Savings) Electric	Budget (Costs, Lost Revenues, & Shared Savings) Gas
Lighting	$ 545,048	$ 88,792	$ 230,331	$ 864,170	100.0%	0.0%	$ 864,170	$ 864,170	NA
HVAC	$ 277,081	$ 20,519	$ 66,503	$ 364,103	100.0%	0.0%	$ 364,103	$ 364,103	NA
Motors	$ 190,148	$ 21,480	$ 91,601	$ 303,229	100.0%	0.0%	$ 303,229	$ 303,229	NA
Other	$ 879,181	$ 322,949	$ 1,614,025	$ 2,816,154	100.0%	0.0%	$ 2,816,154	$ 2,816,154	NA
Photovoltaic Program	$ 75,000	$ 100	$ (6,975)	$ 68,125	100.0%	0.0%	$ 68,125	$ 68,125	NA
Total	$ 1,966,457	$ 453,839	$ 1,995,485	$ 4,415,781			$ 4,415,781	$ 4,415,781	

The Cincinnati Gas & Electric Company
Demand Side Management Cost Recovery Rider (DSMR)
Summary of Calculations for 2006 Programs

January, 2006 through December, 2006

	Program Costs (A)
Electric Rider DSM	
Residential Rate RS	$ 10,295,639
Distribution Level Rates DS, DP, DT, GS-FL, EH & SP	$ 4,415,781
Gas Rider DSM	
Residential Rate RS	$ 3,466,178

(A) See Appendix E, page 2 of 5.

Appendix E Page 4 of 5

The Cincinnati Gas & Electric Company
Demand Side Management Cost Recovery Rider (DSMR)
Summary of Billing Determinants

Year	2006
Projected Annual Electric Sales MWH	
Rates RS	7,554,428
Rates DS, DP, DT, GS-FL, EH, & SP	10,588,967
Projected Annual Gas Sales MCF	
Rate RS	40,912,180

The Cincinnati Gas & Electric Company
Demand Side Management Cost Recovery Rider (DSMR)
Summary of Calculations

January, 2006 through December, 2006

Rate Schedule	True-Up Amount (A)	Expected Program Costs (B)	Total DSM Revenue Requirements	Estimated Billing Determinants (C)		DSM Cost Recovery Rider (DSMR)	
Electric Rider DSM							
Residential Rate RS	$ -	#########	$ 10,295,639	7,554,428	mWh	$ 0.001363	$/kWh
Distribution Level Rates							
DS, DP, DT, GS-FL, EH & SP	$ -	$ 4,415,781	$ 4,415,781	10,588,967	mWh	$ 0.000417	$/kWh
Gas Rider DSM							
Residential Rate RS	$ -	$ 3,466,178	$ 3,466,178	40,912,180	MCF	$ 0.084722	$/MCF
Total Recovery			$ 18,177,599				

(A) (Over)/Under of Appendix D page 1multiplied by 1.0237 for 2005 for the average three-month commercial paper rate to include interest on over or under-recovery.
(B) Appendix D, page 2.
(C) Appendix D, page 4.

APPENDIX F

Appendix F

The Cincinnati Gas & Electric Company
139 East Fourth Street
Cincinnati, Ohio 45202

P.U.C.O. Gas No. 18
Sheet No. 86
Page 1 of 1

(N)

RIDER DSMR

DEMAND SIDE MANAGEMENT RATE

The Demand Side Management Rate (DSMR) shall be determined in accordance with the provisions of Rider DSM, Demand Side Management Cost Recovery Rider, Sheet No. 61 of this Tariff.

The DSMR to be applied to residential customer bills beginning with the April 2006 revenue month is $0.0084722 per hundred cubic feet.

The DSMR to be applied to non-residential service customer bills beginning with the February 2006 revenue month is 0.00 cents per hundred cubic feet.

Issued by authority of an Order by the Public Utilities Commission of Ohio, dated in Case No.

Issued: Effective:

Issued by Gregory C. Ficke, President

APPENDIX G

The Cincinnati Gas & Electric Company
139 East Fourth Street
Cincinnati, Ohio 45202

P.U.C.O. Electric No. 19
Sheet No. 97
Page 1 of 1

RIDER DSMR (N)

DEMAND SIDE MANAGEMENT RATE

The Demand Side Management Rate (DSMR) shall be determined in accordance with the provisions of Rider DSM, Demand Side Management Cost Recovery Rider, Sheet No. 52 of this Tariff.

The DSMR to be applied to residential customer bills beginning with the April 2006 revenue month is $0.001363 per kilowatt-hour.

The DSMR to be applied to non-residential service customer bills beginning with the April 2006 revenue month is for distribution service is $0.000417 per kilowatt-hour, and $0.00000 per kilowatt-hours for transmission service.

Energy Impact Evaluation of the NEED Program in Ohio

Final Report

Reviewed for
Duke Energy
139 East Fourth Street
Cincinnati, OH 45201

September 15, 2008

Submitted by:

Johna Roth and Nick Hall
TecMarket Works
165 West Netherwood Road
Oregon, WI 53575
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Table of Contents

This study was conducted via a joint evaluation effort between Duke Energy and TecMarket Works. Duke Energy staff obtained the NEED student survey data and estimated the energy savings from the survey responses using the savings calculations developed by the TecMarket Works and Building Metrics analysis team. TecMarket Works reviewed the survey data and the energy estimation approach to confirm the objectivity and accuracy of the savings estimates and adjusted the findings to account for self selection bias. This report provides the results of that evaluation collaboration.

Introduction

As a part of the National Energy Education Development (NEED) program, the Ohio Energy Project (OEP) provides educational materials, lessons, and other learning opportunities for both teachers and students to learn about scientific, economic, and environmental impacts of energy.

As one part of the program, energy savings are encouraged through the distribution of an energy efficiency kit and encouragement for the students to work with their parents to install the measures in the kit. This is done as part of the classroom lessons on energy use and energy efficiency approaches. Kits are distributed to participating schools located within the service territory after the teachers enroll in the NEED program. The items included in the kit:

- One compact fluorescent light bulb,
- One low-flow showerhead,
- 12 outlet gaskets,
- One bathroom faucet aerator, and
- One kitchen faucet aerator.

Students are then given a short survey, implemented by the teacher, which is taken from the curriculum guide. Students are asked to answer questions about the items from the kit that they or their family have installed. The students then bring the survey back to school. The teacher returns the completed surveys to the NEED Coordinators, who tabulate the data. The survey data is then used to estimate the level of energy savings achieved by the installation of the measures as reported by the students or their parents on the survey instrument. The survey received by the students is found at the end of this report in Appendix A: Example of Questions on Ohio Kit Installation Student Survey.

Program Participation

For the 2007-2008 school year, the OEP program distributed 1,000 energy efficiency kits to students. Of these distributions, 100 surveys were returned, for a 10.0% response rate. The survey data was received from 4 schools: Loveland Intermediate, North College Hill High School, LaSalle High School, and Miamitown Elementary. The total number of responses from each school is presented in Table 1.

Table 1. OH Kit Surveys Returned.

School	Kit Survey Responses	Percent
Loveland Intermediate	20	20.0%
North College Hill High School	23	23.0%
LaSalle High School	30	30.0%
Miamitown Elementary	27	27.0%
Total	100	100.0%

Survey Response and Energy Savings

The CFL was the most frequently installed kit item. This may be due to ease of installation compared to the other kit items, since the installation of the CFL does not require the use of any tools, and can often be completed without or with less parental help/supervision than the other kit items. The rest of the kit items were installed in at levels less than the CFLS, however, installation rates for the non-CFL measures still remain somewhat high, falling above the 50% range. The following table provides the installation rates for the measures included in the kits. As presented in the following table, outlet gaskets were the next most frequently installed measure followed closely by the kitchen aerator, the bathroom aerator and the showerhead.

Table 2. Frequency of Kit Item Installation.

Kit Items	Installations	Total Responses	Percent Install
CFL (13W)	85	100	85.00%
Outlet Gaskets	54	79	68.35%
Kitchen Aerator	49	75	65.33%
Bath Aerator	44	69	63.77%
Showerhead	35	67	52.24%
Totals and average across all measures	267	390	68.46%

The student survey asks many follow-up questions regarding the installation and use conditions of each kit item, however, due to data collection issues, only the frequency of the installation of each kit item was captured from the survey. Thus, to estimate energy

savings from the kit items the evaluation used the survey results from a different program that collected installation and use conditions associated with the measures installed in residential homes by people receiving Duke's energy saving kits. The evaluation used to assess the installation and use conditions for the NEED program was taken from the survey of the people who received the kit via the Kentucky Personalized Energy Report. The items students receive in the energy efficiency kit through the OEP program are nearly identical to those received by customers as a part of the KY PER program. As a result, if the measures are used in the same way, the savings should be representative of the NEED program kit measure use. The calculation of the KY PER savings uses engineering algorithms developed from DOE-2 models, as well as standard engineering texts linked to questions about installation and use practices. These algorithms are presented in Appendix B: Impact Estimation Algorithms from KY PER Impact Evaluation.

The savings for each measure included in the kit and the average savings per install for the 100 responding participants are presented in Table 3, below. The CFL included in the kit is of a slightly lower wattage than the bulb included in the KY PER kits (13W instead of 15W), and therefore has slightly higher savings associated with it. To estimate the savings for installing the 13W bulb, the savings for the 15W bulb was increased by two times the average savings per watt to account for the two watt difference. That is:

$$13WCFLSavings = 15WCFLSavings + 2(\frac{15WCFLSavings}{15W})$$

In total, a savings of 1.25 kW, 17,402 kWh, and 322 Therms are realized for the kit measures installed by the 100 participants that returned the survey. Note that the Therm savings for the CFL bulb installation are negative, indicating an increase in natural gas consumption due to less heat being produced by the CFL compared to a standard incandescent. This loss of heat has to be captured via increased natural gas usage in the winter while saving air conditioning energy in the summer.

Table 3. Kit Item Savings.

		Average PER Savings			OH NEED Kit Installation Savings[1]		
	Installs	kW	kWh	Therm	kW	kWh	Therm
CFL (13W)	85	0.01	136.53	-0.20	0.53	11605.28	-11.60
Showerhead	53	0.01	127.09	12.80	0.49	4448.15	299.71
Bath Aerator	64	0.00	6.68	0.38	0.00	293.92	11.19
Kitchen Aerator	65	0.00	5.69	0.37	0.00	278.81	12.13
Outlet Gaskets	68	0.00	14.37	0.29	0.23	775.98	10.48
Total					1.25	17402.14	321.90

[1] Savings account for customer fuel type.

Adjusted Energy Impacts

This program is provided to students and their families without any enrollment requirements, under a condition in which the measures are given to participants. It is assumed that the measures in the kit represent additional items beyond what they would have obtained on their own if the measures were reported as installed. That is, each install is counted as an action that would not have occurred if the student did not bring home the kit and arrange for the measures to be installed. Therefore there is no freeridership calculated for this program. However, we do not know how representative the results of the 100 returned surveys are of the whole population of 1,000. That is, there is reason to believe that the students and parents returning the survey have more of an interest in the measures and in installing them because of their child's involvement in the program.

Self-Reporting Bias

There are substantial risks associated with relying on self-reported behavioral changes, because the foundation of the savings estimates are based solely on the participant's responses, with no means within the evaluation budget to verify that the respondent has installed the measures and are using them effectively or to document past installation or measure use behaviors. The 100 survey respondents are more likely to be interested in the kit's measures and the associated savings than those who did not respond. Likewise, they are also more likely to have a past behavior associated with saving energy than people who are less interested in the subject. In this analysis, the survey response rate of 10.0% is very low, leading TecMarket Works (as the reviewer of this analysis) to believe that the self-reporting bias may be somewhat high for this program. While we are unable to measure this bias, based on our evaluation experience and the literature regarding self selection, we estimate that the self-reporting bias is probably between 25 and 50 percent of the behavior change and associated savings when applied to the entire participant population.

Table 4 presents the total gross energy impact estimates for the installed measures for the population based on the results from the 100 returned surveys. Table 5 presents the savings after a 25% self-reporting bias is applied, and Table 6 presents the savings after a 50% self-reporting bias is applied.

The true energy savings from this program and its 1,000 participants is likely between the estimates provided in Table 5 and Table 6.

Table 4. Gross Energy Impacts of 1,000 Kits

	Percent Install	kW	kWh	Therm
CFL (13W)	85.00%	5.30	116052.77	-116.00

Showerhead	52.24%	7.28	66390.30	4473.31
Bath Aerator	63.77%	0.06	4259.71	162.11
Kitchen Aerator	65.33%	0.05	3717.47	161.72
Outlet Gaskets	68.35%	2.86	9822.53	132.61
Total		15.54	200242.77	4813.75

Table 5. Net Energy Impacts of 1,000 Kits; Adjusted for 25% Self-Reporting Bias

25% Bias	kW	kWh	Therm
CFL (13W)	3.97	87039.58	-87.00
Showerhead	5.46	49792.72	3354.99
Bath Aerator	0.04	3194.78	121.58
Kitchen Aerator	0.03	2788.10	121.29
Outlet Gaskets	2.15	7366.90	99.46
Total	11.66	150182.08	3610.32

Table 6. Net Energy Impacts of 1,000 Kits; Adjusted for 50% Self-Reporting Bias

50% Bias	kW	kWh	Therm
CFL (13W)	2.65	58026.38	-58.00
Showerhead	3.64	33195.15	2236.66
Bath Aerator	0.03	2129.86	81.06
Kitchen Aerator	0.02	1858.73	80.86
Outlet Gaskets	1.43	4911.27	66.31
Total	7.77	100121.39	2406.88

Using the average expected savings associated with the mid-point of the expected self selection bias provides a net energy savings for the total 1,000 participants in this program of 9.71 kW, 125,151.70 kWh, and 3008.60 Therms.

Effective Useful Life

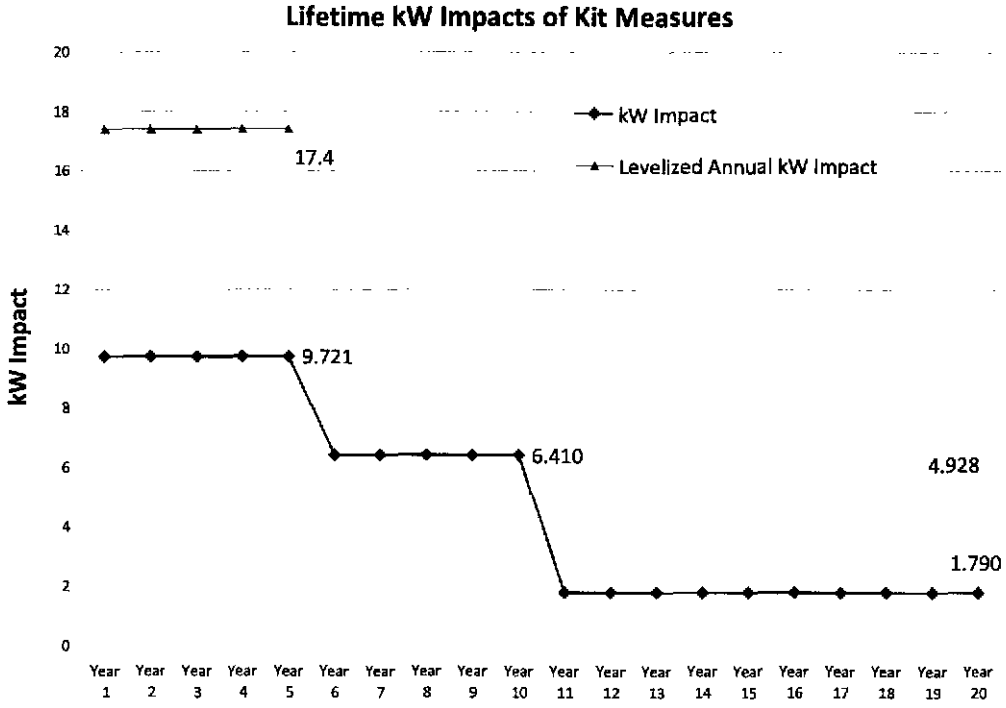
The energy impacts over the lifetime of the measures were calculated using the following lifespans:

Table 7. Lifetimes of Kit Measures.

Kit Measures	Effective Useful Life
13-watt CFL	5
Outlet gaskets	20
Showerhead	10
Bathroom aerator	10
Kitchen aerator	10

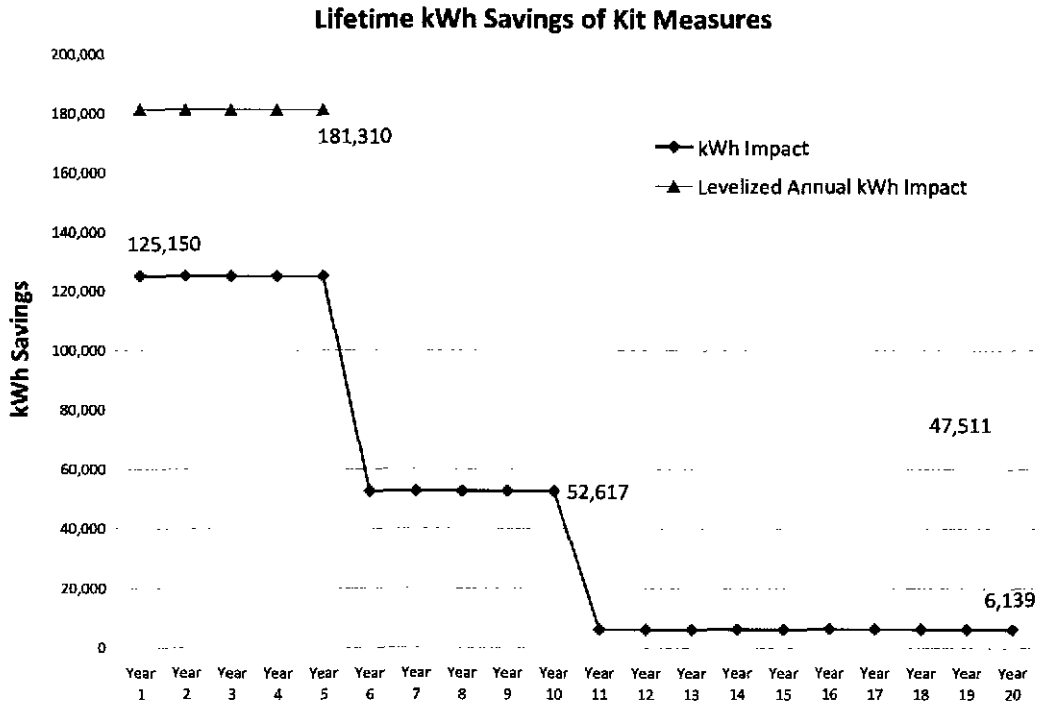
The kW impacts begin at 9.721 kW for the first 5 years, then drop to 6.410 starting at year 6. By year 11, kW impacts have dropped to 1.790 and remain there for the lifetime of the measures. The levelized annual kW impact over 5 years is 17.4 kW.

Table 8. Lifetime kW Impacts of Kit Measures.



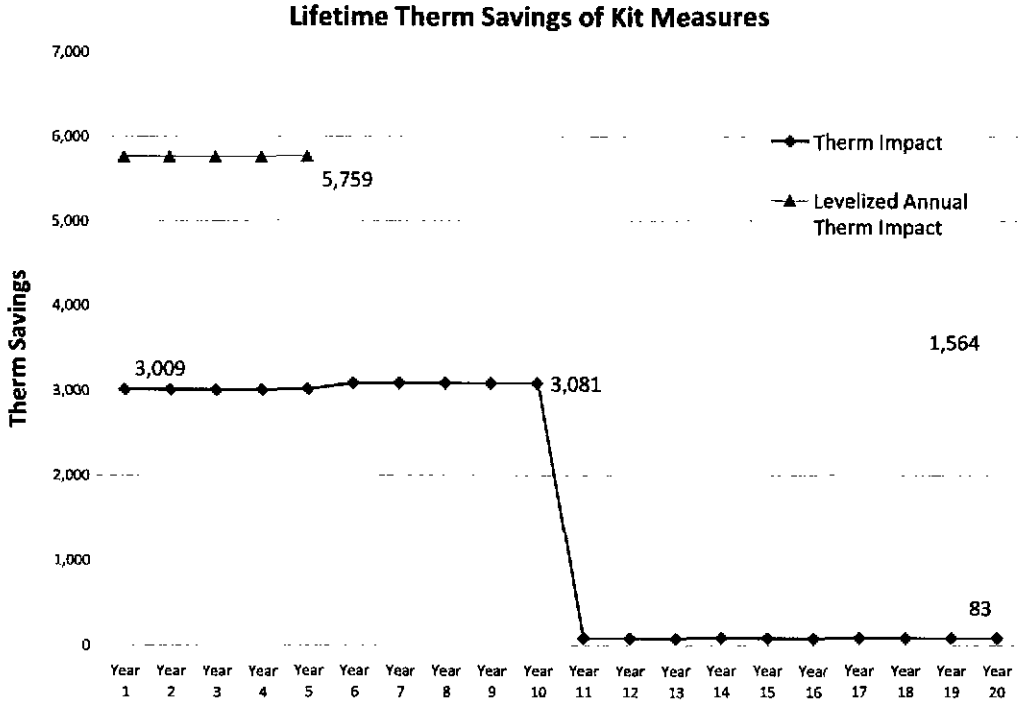
The kWh impacts begin at 125,150 kWh for the first 5 years, then drop to 52,617 starting at year 6. By year 11, kWh impacts have dropped to 6,139 kWh and remain there for the lifetime of the measures. The levelized annual kWh impact over 5 years is 181,310 kWh.

Table 9. Lifetime kWh Savings of Kit Measures.



The Therm impacts for the kit measures begin at 3,009 Therm through year 5. At year 6, the lifetime of the CFL bulb ends, and due to the CFL having negative Therm savings during its lifetime, savings rise slightly to 3,081 Therm. At year 11, kWh impacts have dropped significantly to 83 Therm and remain there for the lifetime of the measures. The levelized annual Therm impact over 5 years is 5,759 Therm.

Table 10. Lifetime Therm Savings of Kit Measures.



Recommendations

Improve Survey Approach Used to Estimate Savings

In order to more accurately account for energy savings for this program, participant installation and measure use conditions need to be collected and assessed. The NEED program needs to focus more attention on making sure the students and parents complete and return the survey used to document savings and program effects. The program needs to devise an approach for increasing the response rates for the student survey with a target of receiving 60% of the surveys distributed to the students. This survey should have the information necessary to calculate expected savings. That is, it needs to contain information about the measure baseline condition (type of measure replaced and measure use conditions) that can feed an impact estimation analysis.

These responses provide the utility and evaluators with the measure use detail needed to more accurately predict and assign reasonable evaluation estimates where students install the energy efficiency kit measures. Toward this end, the program manager should work with the schools and NEED coordinators to ensure that survey data is collected and provided to Duke Energy to cover as many of the energy efficiency kits distributed through this program as possible.

Increase Program Savings

In addition to the recommendation above, program managers should also work to increase energy savings for the program. Possible ways to increase savings include:

- Duke Energy should consider including clear participant-focused, easily accessible information on the effectiveness of installing the items that provide the highest level of savings so that participants see the benefit information as soon as they open the kit and look at that measure.

- Encourage the participants to install the CFLs in high-usage fixtures and/or offer more CFLs to boost the program savings for the program.

Appendix A: Example of Questions on Ohio Kit Installation Student Survey

Lesson 11

HOME ACTIVITY 11-2

INSTALLATION SURVEY

1. Did you install the compact fluorescent lightbulb (CFL) from the kit?

_____yes What was the wattage of the bulb you replaced? _____

In what room did you install it? _____

How many hours a day (on average) is that light used? _____

_____no Why not? _____

Do you plan to install the CFL? _____ yes _____ no

If yes, when and in which room? _____

2. Did you install the low-flow showerhead from the kit?

_____yes Flow BEFORE _____ Flow AFTER _____ (see page 41)

_____no Why not? _____

Do you plan to install the showerhead? _____ yes _____ no

3. Did you install the bathroom sink aerator from the kit?

_____yes Flow BEFORE _____ Flow AFTER _____ (see page 41)

_____no Why not? _____

Do you plan to install the bathroom aerator? _____ yes _____ no

4. Did you install the kitchen sink aerator from the kit?

_____yes Flow BEFORE _____ Flow AFTER _____ (see page 41)

_____no Why not? _____

Do you plan to install the kitchen aerator? _____ yes _____ no

5. Did you install the outlet and switch gaskets?

_____yes

_____no Why not? _____

Do you plan to install the gaskets? _____ yes _____ no

6. Did you adjust the temperature setting on the following?

Water Heater:

_____yes Temp BEFORE _____ Temp AFTER _____

_____no Why not? _____

Refrigerator:

_____yes Temp BEFORE _____ Temp AFTER _____

_____no Why not? _____

Freezer:

_____yes Temp BEFORE _____ Temp AFTER _____

_____no Why not? _____

7. Have you made any other changes to your home as a result of this unit (insulation, weatherstripping, etc)?

_____

Appendix B: Impact Estimation Algorithms from KY PER Impact Evaluation

CFLs

General Algorithm

Gross Summer Coincident Demand Savings

$$\Delta kW_S = units \times \left[\frac{(Watts \times DF_s)_{base} - (Watts \times DF_s)_{ee}}{1000}\right] \times CF_S \times (1 + HVAC_{d,\,s})$$

Gross Annual Energy Savings

$$\Delta kWh = units \times \left[\frac{(Watts \times DF)_{base} - (Watts \times DF)_{ee}}{1000}\right] \times FLH \times (1 + HVAC_c)$$

$$\Delta therm = \Delta kWh \times HVAC_g$$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
$\Delta therm$	= gross annual therm interaction
units	= number of units installed under the program
$Watts_{ee}$	= connected (nameplate) load of energy-efficient unit
$Watts_{base}$	= connected (nameplate) load of baseline unit(s) displaced
FLH	= full-load operating hours (based on connected load)
DF	= demand diversity factor
CF	= coincidence factor
$HVAC_c$	= HVAC system interaction factor for annual electricity consumption
$HVAC_d$	= HVAC system interaction factor for demand
$HVAC_g$	= HVAC system interaction factor for annual gas consumption

15 W CFL Measure

$Watts_{ee}$ = 15, which is the input power of program supplied CFL

$Watts_{base}$ - calculated from survey responses as shown below:

Wattage of bulb removed	$Watts_{base}$	Notes
<= 44	40	Most popular size < 44 W
45 - 70	60	Lumen equivalent of 15 W CFL

71 - 99	75	Most popular size in range
>= 100	100	Most popular size in range

FLH - calculated from survey responses as shown below:

Hours of use per day	FLH	Notes
<1	183	Average value over range
1-2	548	Average value over range
3-4	1278	Average value over range
5-10	2738	Average value over range
11-12	4198	Average value over range
13-24	6753	Average value over range

DF = 1.0 and CF = 0.10

The coincidence factor for this analysis was taken as the average of the coincidence factors estimated by PG&E and SCE for residential CFL program peak demand savings. The PG&E and SCE coincidence factors are combined factors that consider both coincidence and diversity, thus the diversity factor for this analysis was set to 1.0

$HVAC_C$ - the HVAC interaction factor for annual energy consumption depends on the HVAC system, heating fuel type, and location. The HVAC interaction factors for annual energy consumption were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix.

Covington, KY

Heating Fuel	Heating System	Cooling System	HVACc	HVACg
Other	Any except Heat Pump	Any except Heat Pump	0	0
Any	Heat Pump	Heat Pump	-0.16	0
Gas Propane Oil	Central Furnace	None	0	-0.0021
		Room/Window	0.079	-0.0021
		Central AC	0.079	-0.0021
	Other	None	0	-0.0021
		Room/Window	0.079	-0.0021
		Central AC	0.079	-0.0021
Electricity	Central furnace	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0
	Electric baseboard	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0

	Other	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0

$HVAC_d$ - the HVAC interaction factor for demand depends on the cooling system type. The HVAC interaction factors for summer peak demand were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix.

Covington, KY

Cooling System	HVACd
None	0
Room/Window	.17
Central AC	.17
Heat Pump	.17

Outlet Gaskets

Gross Summer Coincident Demand Savings

$\Delta kW_S = units \times (\Delta cfm/unit) \times (kW / cfm) \times DF_S \times CF_S$

Gross Annual Energy Savings

$\Delta kWh = units \times (\Delta cfm/unit) \times (kWh / cfm)$

$\Delta therm = units \times (\Delta cfm / unit) \times (therm / cfm)$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
units	= number of buildings sealed under the program
Δcfm/unit	= unit infiltration airflow rate (ft^3/min) reduction for each measure
DF	= demand diversity factor = 0.8
CF	= coincidence factor = 1.0
kW/cfm	= demand savings per unit cfm reduction
kWh/cfm	= electricity savings per unit cfm reduction
therm/cfm	= gas savings per unit cfm reduction

Unit cfm savings per measure

The cfm reductions for each measure were estimated from equivalent leakage area (ELA) change data taken from the ASHRAE Handbook of Fundamentals (ASHRAE, 2001).

The equivalent leakage area changes were converted to infiltration rate changes using the Sherman-Grimsrud equation:

$$Q = ELA \times \sqrt{A \times \Delta T + B \times v^2}$$

where:

A = stack coefficient ($ft^3/min\text{-}in^4\text{-}°F$)
= 0.015 for one-story house

ΔT = average indoor/outdoor temperature difference over the time interval of interest (°F)

B = wind coefficient ($ft^3/min\text{-}in^4\text{-}mph^2$)
= 0.0065 (moderate shielding)

v = average wind speed over the time interval of interest measured at a local weather station at a height of 20 ft (mph)

The location specific data are shown below:

Location	Average outdoor temp	Average indoor/outdoor temp difference	Average wind speed (mph)	Specific infiltration rate (cfm/in^2)
Covington	33	35	22	1.92

Measure ELA impact and cfm reductions are as follows:

Measure	Unit	ELA change (in^2/unit)	ΔCfm/unit (KY)
Outlet gaskets	Each	0.357	0.69

Unit energy and demand savings

The energy and peak demand impacts of reducing infiltration rates were calculated from infiltration rate parametric studies conducted using the DOE-2 residential building prototype models, as described at the end of this Appendix. The savings per cfm reduction by heating and cooling system type are shown below:

Heating Fuel	Heating System	Cooling System	kWh/cfm	kW/cfm	therm/cfm
Other	Any except Heat Pump	Any except Heat Pump	1.14	0.00000	0.000
Any	Heat Pump	Heat Pump	12.85	0.00248	0.000
Gas Propane Oil	Central Furnace	None	0	0	0.124
		Room/Window	1.14	0.00000	0.124
		Central AC	1.14	0.00000	0.124
	Other	None	0	0	0.124
		Room/Window	1.14	0.00000	0.124

		Central AC	1.14	0.00000	0.124
Electricity	Central furnace	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000
	Electric baseboard	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000
	Other	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000

Low-Flow Showerhead

Gross Summer Coincident Demand Savings

$$\Delta kW_S = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{3413_s} \times DF_s \times CF_s$$

Gross Annual Energy Savings

$$\Delta kWh = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{3413} \times 365$$

$$\Delta therm = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{\eta_{waterheater}} \times \frac{365}{100000}$$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
units	= number of units installed under the program
GPD_{base}	= daily hot water consumption before installation
GPD_{ee}	= daily hot water consumption after flow reducing measure installation
ΔT	= average difference between entering cold water temperature and the shower use temperature
DF	= demand diversity factor for electric water heating
CF	= coincidence factor
8.33	= conversion factor (Btu/gal-°F)
3413	= conversion factor (Btu/kWh)

24 = conversion factor (hr/day)
365 = conversion factor (days/yr)
100000 = conversion factor (Btu/therm)

Showerhead

GPD_{base} = showers/week / 7 x 3.1 gpm x 5 minutes/shower

GPD_{ee} = showers/week / 7 x 1.5 gpm x 5 minutes/shower

ΔT

City	Average cold water temperature	Shower use temperature	Average ΔT
Covington	53.9°F	100°F	46.1°F

Water heater efficiency

Combustion efficiency for residential gas water heater = 0.70

Demand diversity factor = 0.1

Coincidence factor = 0.4

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for the residential water heating end-use in a summer peaking utility.

Faucet Aerators

This measure used the Efficiency Vermont deemed savings (Efficiency Vermont, 2003) adjusted for entering water temperature:

Demand Savings
$\Delta kW = 0.0171\ kW \times \Delta T / \Delta T_{VT} \times DF \times CF$

Energy Savings
$\Delta kWh_i = 57\ kWh \times \Delta T / \Delta T_{VT}$
$\Delta therms = 2.0 \times \Delta T / \Delta T_{VT\,i}$

City	Average cold water temperature	Hot water use temperature	Average ΔT
Covington	53.9°F	100°F	46.1°F

Burlington VT	44.5	100°F	55.5

Demand diversity factor = 0.1

Coincidence factor = 0.4

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for the residential water heating end-use in a summer peaking utility.

Prototypical Building Model Description

The impact analysis for many of the HVAC related measures are based on DOE-2.2 simulations of a set of prototypical residential buildings. The prototypical simulation models were derived from the residential building prototypes used in the California Database for Energy Efficiency Resources (DEER) study (Itron, 2005), with adjustments make for local building practices and climate. The prototype "model" in fact contains 4 separate residential buildings; 2 one-story and 2 two-story buildings. The each version of the 1 story and 2 story buildings are identical except for the orientation, which is shifted by 90 degrees. The selection of these 4 buildings is designed to give a reasonable average response of buildings of different design and orientation to the impact of energy efficiency measures. A sketch of the residential prototype buildings is shown in Figure 1.

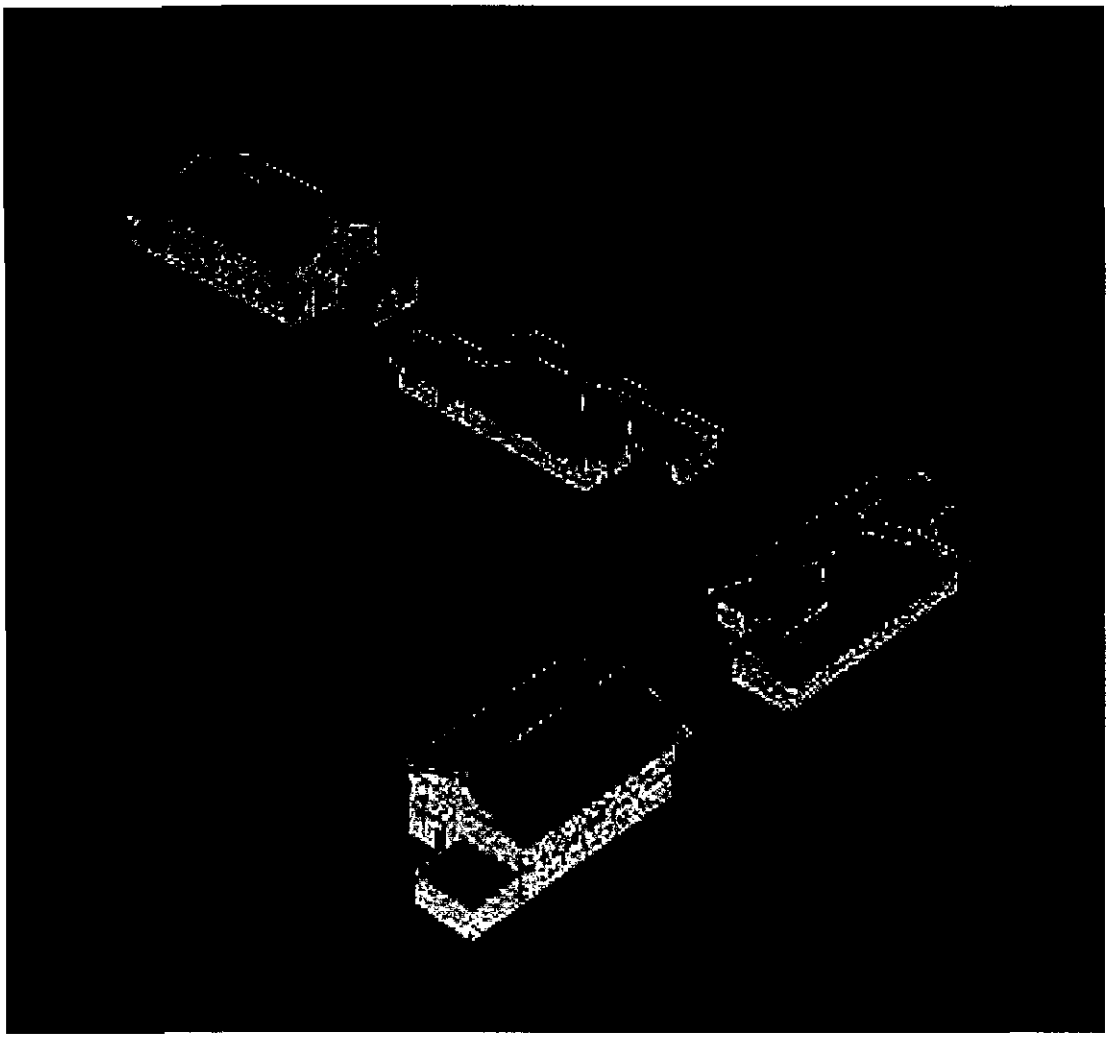


Figure 1. Computer Rendering of Residential Building Prototype Model

The general characteristics of the residential building prototype model are summarized below:

Residential Building Prototype Description

Characteristic	Value
Conditioned floor area	1 story house: 1465 SF 2 story house: 2930 SF
Wall construction and R-value	Wood frame with siding, R-11
Roof construction and R-value	Wood frame with asphalt shingles, R-19
Glazing type	Single pane clear
Lighting and appliance power density	0.51 W/SF average
HVAC system type	Packaged single zone AC or heat pump
HVAC system size	Based on peak load with 20% oversizing. Average 640 SF/ton

Characteristic	Value
HVAC system efficiency	SEER = 8.5
Thermostat setpoints	Heating: 70°F with setback to 60°F Cooling: 75°F with setup to 80°F
Duct location	Attic (unconditioned space)
Duct surface area	Single story house: 390 SF supply, 72 SF return Two story house: 505 SF supply, 290 SF return
Duct insulation	Uninsulated
Duct leakage	26%; evenly distributed between supply and return
Cooling season	Charlotte – April 17 to October 6 Covington
Natural ventilation	Allowed during cooling season when cooling setpoint exceeded and outdoor temperature < 65°F. 3 air changes per hour

References

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EPRI, 1993. Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2: Fundamental Equations for Residential and Commercial End-Uses, EPRI TR-100984 V2., Electric Power Research Institute, Palo Alto, CA. 1993.

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Process and Energy Impact Evaluation of the Home Energy House Call Program in Ohio

Final Report

Prepared for
Duke Energy
139 East Fourth Street
Cincinnati, OH 45201

September 15, 2008

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Summary of Findings

Energy Savings

The measures provided in the Energy Efficiency Starter Kits, when installed and used by program participants, provide significant energy savings to the participants and to Duke Energy. For the Ohio participants, the installation of the measures provided in the kit to the 1,680 participants provides an estimated net annual energy savings of 7,180 therms, 221,908 kWh and reduced peak load by 25.502 kilowatts.

	Gross Savings	Net Savings
Annual Savings for Kit Measure Installations		
kW	50.828	25.502
kWh	453,818.2	221,907.5
Therms	13,941.2	7,180.4
Annual Savings HEHC Recommendations Installs		
kW	102.9	20.783
kWh	249,863	50,222
Therms	9,771	1,964
Total Annual Savings for Kit Measures and Recommendations		
kW	153.728	46.285
kWh	703,681.2	272,129.5
Therms	23,712.2	9,144.4
Life Cycle Kit Measure Installs		
kWh		1,743,065
Therms		72,046
Life Cycle HEHC Recommendation Installs		
kWh		748,057
Therms		25,509
Total Life Cycle Kit and HEHC Recommendations Installs		
kWh		2,491,122
Therms		97,555

On a per-participant basis, this equals first year annual gross energy savings of 197 kWhs and .019 kW per person, with a net savings of 107 kWhs and .010 kWs for the energy efficiency kit. The home energy audit report provides gross first-year annual savings of 30 kWhs and .012 kW per person. The total first year net energy savings for the kit and the audit recommendations are 38 kWs, 230,184 kWhs and 6,980 therms.

The total net lifetime savings for the Home Energy House Call Program is 1,483 kWhs and 58 therms per participant.

The impact estimates are based on survey responses of what actions were taken and the use conditions associated with these actions for the weather zone in which the participants reside. The energy savings estimates are based on DOE-2 simulations of measure impact in residential buildings. This type of modeling and assessment approach is an industry standard and can be expected to provide accurate estimates of program impact that are consistent with the accuracy of the survey information provided by the program participants.

Energy Savings Distributions

The tables below present a summary of the total savings from the program participants. Table 1 presents the gross energy savings for each of the kit measures based on the randomly sampled participant survey responses extrapolated to the program population of 1,680. Table 2 presents the expected savings after the false-response and self-selection biases are factored into the calculations. These biases are described in Section 1, Savings Distributions. Table 3 presents the net savings, which factors in the estimated program freeridership.

Table 1. First Year Gross Energy Savings of Kit Measures, All Program Participants (n=1,680)

Kit Measures	kW	kWh	Therms
15-watt CFL	8.908	107,822	-160.4
20-watt CFL	7.564	87,330	-129.9
Weather stripping	0.156	532	10.5
Outlet gaskets	0.731	2,499	49.2
Window shrink kit	5.899	9,986	132.1
Showerhead	26.855	245,053	11,948.1
Bathroom aerator	0.343	286	1,004.0
Kitchen aerator	0.372	310	1,087.6

Table 2. First Year Energy Savings of Kit Measures, Net of False-Response and Self-Reporting Bias, All Program Participants (n=1,680)

Kit Measures	kW	kWh	Therms
15-watt CFL	5.354	64,801	-96.4
20-watt CFL	4.546	52,486	-78.1
Weather stripping	0.094	320	6.3
Outlet gaskets	0.439	1,502	29.6
Window shrink kit	3.545	6,001	79.4
Showerhead	13.454	122,772	5,986.0
Bathroom aerator	0.172	143	503.0
Kitchen aerator	0.186	155	544.9

Table 3. First Year Net Energy Savings of Kit Measures, Net of False-Response, Self-Reporting Bias and Freeridership, All Program Participants (n=1,680)

Kit Measures	kW	kWh	Therms
15-watt CFL	4.002	48,439	-72.1
20-watt CFL	3.398	39,233	-58.4
Weather stripping	0.082	278	5.5
Outlet gaskets	0.440	1,506	29.6
Window shrink kit	3.368	5,701	75.4
Showerhead	13.858	126,455	6,165.6

Bathroom aerator	0.170	142	496.7
Kitchen aerator	0.184	153	538.1

Program Operations

Third-party implementer changes have taken place since this program began operation, and the program is currently switching to a new implementation provider. With this change, program operations should improve with the use of program auditors who are expected to be better trained.

The program managers have obtained expert assistance to help improve the operations of the program, particularly in the areas of improved program design, marketing and quality control procedures. The program is currently meeting its objectives within budget.

Customer Satisfaction

Based on 100 surveys done of a random sample of the 1,680 participants in Ohio, the customer's satisfaction with the program is very high with an overall satisfaction score of 9.07 on a 10-point scale. They were satisfied with the audit (9.39 out of 10) and with the energy efficiency starter kit (8.98 out of 10).

Recommendations

1. The installation rate of the window shrink kit is very low (15%). This is expected because this measure is not one that everyone wants or needs and it requires installation expertise. Once installed, it renders the window non-functioning as a ventilation tool. The cost-effectiveness of this measure should be examined to determine the installation rate needed to reach the cost-effectiveness threshold. If this installation rate cannot be met, the item should be removed from the kit. In order to obtain the cost effectiveness threshold it may be necessary for the kit to be modified in a way that increases the installation rates. For example Duke should consider the following:
    a. Include clear customer-focused, easily accessible information on the effectiveness of installing the window shrink kit so that customers see the benefit information as soon as they open the kit and look at that measure.
    b. Make sure the kit includes clear, easy-to-follow instructions on how to install the kit.

    These messages need to be easy to find and easy to understand. The amount of time a customer will be exposed to this information might be only a few seconds. The message needs to be clear and be transmitted in a few seconds. If this does not increase installation rates above the cost effectiveness threshold, the measure should be discontinued as an item in the kit.

2. Duke should determine if the level of detail provided by the auditor can be cost-effectively enhanced. During the onsite visit, the auditors may be able to increase installation rates for needed changes by interacting with the customer about the

"areas of concern" in their home. We realize that this is not always possible because of the need to rapidly move in and out of the home for what is essentially a free service to the participant. However, the time interacting with the customer may well be the most valuable part of the audit in terms of getting customers to take needed actions. An increase in auditor training to include customer interaction and approaches should be considered. This effort must balance the cost of the service and the expected increase in savings.

3. The contract calls for the implementers to train their auditors. This requirement needs to be enforced. The auditors receive one week of classroom training before they accompany a fully trained and experienced auditor for 2-3 weeks. However, in some cases auditors have gone to the field before they were fully trained. The new contract with WECC may solve this issue by using only HERS certified raters to conduct the audits. However, this should be confirmed shortly after WECC assumes the role of implementer to ensure that the auditors are fully trained.

4. The incorporation of more testing technologies, such as the use of a blower door or infrared imaging would help some customers understand the energy saving opportunities better than a simple visual examination. However, this service is costly and could harm the participation rate and interest in the program if it's done by charging the customer. Within the current program, participants can request a blower door assessment for a cost of $125. To date, only one home has requested that test since the program started in 2003. However, as energy costs and environmental issues gain in importance; more customers may be interested in this service, so it is worth promoting this aspect of the program to identify the cost and benefits associated with increase testing promotion.

5. Having personal computers in the field with the auditors will allow them to upload and process the audit information in a more efficient manner, which will allow the reports to be delivered to the participant in a timelier manner. However, that approach should not distract from a well designed report. The report should be such that it is designed using state-of-the art behavior change theories that focus on presentation and education leading to an install decision. Duke should consider having color laser printers with the auditor so that the report can be delivered and reviewed with the customer while on site.

Introduction

This document presents the evaluation report for Duke Energy's Home Energy House Call (HEHC) Program as it was administered in Kentucky. An impact analysis was performed for each of the measures in the Energy Efficiency Starter Kit and for the measures that were installed as a result of the HEHC audit. The impacts are based on engineering analysis of the impacts associated with the self-reported measure installs identified through a participant survey. Additional analysis was performed using a billing analysis comparing the pre and post program energy consumption levels of program participants.

This report is structured to provide program energy savings impact estimations per measure via the engineering analysis, and program savings based on the billing analysis results. The impact tables reporting total savings are based on the savings identified from 100 surveyed participants extrapolated to the program's total participants. The study includes participants from January 2006 through September of 2007 (n=1,680). After each of the measures are discussed individually, the report presents the estimated energy savings achieved per distributed Energy Efficiency Starter Kit through the audit.

This impact evaluation of the measures with the kits is based on surveys conducted with customers who participated in the HEHC program and who have received the kits mailed by the program. The impact of the HEHC recommendations that were implemented is based on survey responses of the actions they have taken that were at least in part caused by the audit report. The study did not use on-site verification efforts to confirm if the survey information provided by the customer is accurate or if the measures taken were correctly installed or used. The impact analysis conducted for this study was systematically adjusted downward to account for self-selection bias and potential false response bias sometimes associated with survey research of socially acceptable behaviors documented via telephone surveys. As a result, the evaluation consultants consider this study a reasonable estimate of program-induced savings.

The evaluation was conducted by TecMarket Works and BuildingMetrics with assistance from Integral Analytics. The survey instruments were developed by TecMarket Works and BuildingMetrics. The survey was administered by TecMarket Works. Integral Analytics performed the billing analysis. BuildingMetrics developed the engineering algorithms to estimate energy impacts based on the survey responses.

Methodology

This section presents the approach for conducting this assessment.

Development of the Surveys

TecMarket Works and BuildingMetrics developed a customer survey for the Home Energy House Call (HEHC) Program participants to be implemented after they have had time to install at least some if not many of the actions in the kit and the recommendations offered during the home energy audit. The survey asked the customer for information specific to each of the measures included in the Energy Efficiency Starter Kit. In addition the participant was asked to report the actions that they had taken that were caused in whole or in part by the recommendations provided in the HEHC audit report. For each measure that was installed and for each recommendation taken, the participant was asked questions pertaining to their intentions to take that action without the intervention of the program. This information was used to estimate freeridership and to calculate net energy savings.

Because of evaluation budget limitations, the survey was restricted to 100 completed surveys with program participants, however the sample size obtained appears to be reasonable. These participants were surveyed by TecMarket Works. During the survey development process it was necessary to restrict questions so that the survey did not last longer than about 10 minutes. This approach helped control the evaluation cost, but also reduced the number of questions that could be asked in order to calculate energy savings. However, this procedure did not result in overly restrictive questions. To help focus the survey, the questions asked were based on key results of an earlier study employing an identical approach for similar measures. The experience from the previous study (PER Program) allowed this study to use those questions that were most informative to the energy impact estimation process and eliminate those questions that were found to have little impact on the results of the energy savings calculations. This allowed the HEHC survey to be shorter and more focused, yet still provide the information needed to estimate savings. The surveys can be found in Appendix C: Participant Survey Protocol.

Program Impact Estimation

Impact Estimates for Kit Measures

Using the measure-specific data collected from the customer surveys, we were able to extrapolate energy savings to the HEHC Program as a whole, and for each of the kit's eight measures individually. The energy savings for each of the measures was determined through a method in which TecMarket Works and BuildingMetrics assigned the estimates of energy savings for each of the measures included in the HEHC Energy Efficiency Starter Kit. The estimates were formed via engineering estimates of savings based on survey information and on modeling results in which the calculations for the actions taken follow DOE-II residential software modeling algorithms for the expected weather in which the actions are taken. Historical weather average daily conditions were used as the predictive weather. This approach allows for reliable energy savings estimates

consistent with accepted modeling approaches based on customer-provided installation and use conditions.

The items distributed in the kit include the following measures.

1. 15-watt CFL
2. 20-watt CFL
3. Weather stripping
4. Outlet gaskets
5. Window shrink kit
6. Showerhead
7. Bathroom aerator
8. Kitchen aerator

The algorithms used to calculate the impact estimates can be found in Appendix A: Impact Algorithms Used.

Freeridership and Spillover

Freeridership and spillover were calculated for each measure in the Energy Efficiency Starter Kit. The level of freeridership was determined by using the responses to three questions in the survey (found in Appendix C). The three questions and the level of freeridership and/or spillover that was applied to the energy savings are presented in the table below, using the CFL as an example measure. All other possible combinations of answers to the series of questions resulted in 0% freeridership and 0% spillover.

Table 4. Freeridership and Spillover Factors for Energy Efficiency Kit Measures

6a: Did you have any CFLs installed before you got the kit?	6b: Were you planning on buying <additional> CFLs before you got the kit?	6c: Have you purchased any CFLs since you got the kit?	% Freeridership	% Spillover
yes	yes	yes	100	
yes	yes	no	100	
yes	no	yes		75
no	no	yes		100
no	yes	no	50	
no	yes	yes	50	50
Don't Know	yes	yes	75	25
Don't Know	yes	no	50	
Don't Know	no	yes		100
yes	already installed in every place	yes	100	
yes	already installed in every place	no	100	
Don't Know	maybe	yes	25	50
yes	maybe	yes		25
yes	maybe	no	25	
no	maybe	yes		50
yes	don't know	yes		75
no	don't know	yes		100
yes	yes	don't know	100	

yes	already installed in every place	don't know	100	
don't know	yes	don't know	50	
no	yes	don't know	50	

Freeridership was also calculated for the home energy audit as an independent analysis to determine the level of participants that would have had their homes audited if the HEHC were not made available. All other possible responses to these questions were counted as 0% freeridership.

Table 5. Questions to Estimate Freeridership for the Home Energy Audit

Considering an audit before the program?	If not available through the program, would you still have purchased an audit?	If yes, would you have purchased it within a year?	% Freeridership
yes	yes	yes	100
yes	yes	no	50
yes	yes	don't know	25

Three participants responded in a manner that labeled them as a freerider, and they had a mean freeridership level of 50.00%. Over the 100 participants, the overall freeridership level for the program's audit is very low at 0.5%.

Impact Estimates for HEHC Audit and Recommendations

The participants of the Home Energy House Call Program each received an audit of their home followed up by a customized audit report with specific recommendations for improvements to their home that would increase their home's energy efficiency. In this report, we present the recommendations as they were reported to us by the random sample of 100 participants contacted during the telephone survey. We first asked them what, if any, improvements they had made to their home. We then ask if this was a recommendation that was in the audit report. If they said that yes, (it was in the audit report) we ask how influential the recommendation in the audit report was to their decision to install the item on a scale of 1 to 10.

Savings were calculated using engineering algorithms that can be found in Appendix A: Impact Algorithms Used. The gross savings are adjusted for the influence factor. For example, if they said that the influence of the audit report was a 10 on the scale, full energy impacts are presented. If they reported that the audit report had an influence factor of 8, then 80% of the energy impacts are counted as program-induced and contribute to the program energy savings estimates. Self-selection bias and false response bias are then factored in to calculate the final estimated net impact.

Billing Analysis

This analysis presents the results of the billing analysis of the Ohio Home Energy House Call (HEHC) Program. This analysis relies upon a statistical analysis of actual customer billed energy (both electricity and natural gas) consumption before and after participation in the PER program to estimate the impact of the program. Table 1 presents the results of this billing analysis.

Table 1: Ohio HEHC Average Annual Savings: Billing Analysis versus Engineering Analysis

	Billing Analysis	Engineering Analysis
kWh	468	227
Therm	36	6

For this analysis, data are available both across households (i.e., cross-sectional) and over time (i.e., time-series). With this type of data, known as "panel" data, it becomes possible to control, simultaneously, for differences across households as well as differences across periods in time through the use of a "fixed-effects" panel model specification. The fixed-effect refers to the model specification aspect that differences across homes that do not vary over the estimation period (such as square footage, heating system, etc.) can be explained, in large part, by customer-specific intercept terms that capture the net change in consumption due to the program, controlling for other factors that do change with time (e.g., the weather).

Because the consumption data in the panel model includes months before and after the installation of measures through the program, the period of program participation (or the participation window) may be defined specifically for each customer. This feature of the panel model allows for the pre-installation months of consumption to effectively act as controls for post-participation months. In addition, this model specification, unlike annual pre/post-participation models such as annual change models, does not require a full year of post-participation data. Effectively, the participant becomes their own control group, thus eliminating the need for a non-participant group. We know the exact month of participation in the program for each participant, and are able to construct customer specific models that measure the change in usage consumption immediately before and after the date of program participation, controlling for weather and customer characteristics.

The fixed effects model can be viewed as a type of differencing model in which all characteristics of the home, which (1) are independent of time and (2) determine the level of energy consumption, are captured within the customer-specific constant terms. In other words, differences in customer characteristics that cause variation in the level of energy consumption, such as building size and structure, are captured by constant terms representing each unique household.

Algebraically, the fixed-effect panel data model is described as follows:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it},$$

where:

y_{it} = energy consumption for home i during month t
α_i = constant term for site i
β = vector of coefficients
x = vector of variables that represent factors causing changes in energy consumption for home i during month t (i.e., weather and participation)
ε = error term for home i during month t.

With this specification, the only information necessary for estimation is those factors that vary month to month for each customer, and that will affect energy use, which effectively are weather conditions and program participation. Other non-measurable factors can be captured through the use of monthly indicator variables (e.g., to capture the effect of potentially seasonal energy loads).

The effect of the program, in this case the Personal Energy Report kit as well as recommended measures, is done by including a variable which is equal to one for all months after the customer received the kit and the report. The coefficient on this variable is the savings associated with the kit. In order to account for differences in billing days, the usage was normalized by days in the billing cycle. The estimated electric model is presented in Table 2.[1]

Table 2: Estimated Electricity Model – dependent variable is daily kWh usage, January 2005 through April 2008.

Independent Variable	Coefficient	t-value
Indicator variable for months after participation in program	-1.28	-2.3
Sample Size	6,345 obs (160 homes)	
R-Squared	75%	

This estimated model shows that the HEHC program (both kits and recommended measures) results in an annual savings of 468 kWh. This estimate is fairly well estimated, with the 90% confidence interval extending from savings of 140 kWh to 794 kWh per year.

The natural gas model is presented in Table 3 below.

[t] The model includes weather terms and monthly indicator terms as well as the terms presented in the variables presented in Table 1. These terms were not included in order make interpretation clearer.

Table 3: Estimated Natural Gas Model – dependent variable is daily Therm usage, January 2005 through April 2008.

Independent Variable	Coefficient	t-value
Indicator variable for months after participation in program	-0.099	-2.04
Sample Size	4,370 obs (113 homes)	
R-Squared	73%	

This estimated model shows that the HEHC program results in an annual savings of 36 Therms. This estimate has a 90% confidence interval extending from a savings of 7 Therms to 65 Therms.

Section 1: Use of the Kit

This section presents the energy impact approach and calculations for installation and use of the measures in the Energy Savings Kit that was distributed to all HEHC participants. Findings are estimated using the 100 survey responses extrapolated to the 1,680 participants of the Home Energy House Call Program.

Use of the Kit's Measures and Their Impacts

CFLs

The CFLs included in the HEHC kit were installed by more recipients than any other measure in the Energy Efficiency Starter Kit. 93% of the recipients installed the 15-watt CFL, but only 78% of them installed the 20-watt CFL. Table 6 below shows a summary of the responses to the questions about the 15-watt CFL. The same information can be found in Table 7 for the 20-watt CFL. This information indicates that only 7% of the participants had not installed their bulbs, and only 1% will not install them in the future.

Table 6. Frequency of Installation: 15-watt CFL

Installed 15w bulb	Surveyed participants (n=100)
Yes	93%
No	7%
Don't Know	0%
Plan to Install 15w bulb	
Yes	4%
No	1%
Don't Know	1%

Table 7. Frequency of Installation: 20-watt CFL

Installed 20w bulb	HEHC participants surveyed (n=100)
Yes	78%
No	18%
Don't Know	3%
Plan to Install 20w bulb	
Yes	9%
No	4%
Don't Know	2%

Using the information above and the algorithm for lighting impacts (which can be found in Appendix A), the estimate of savings for these 1,680 customers totals 12.55 kW and 148,470 kilowatt hours per year. However, the reduction in heat output from switching the incandescent to the CFL results in an increase in therm consumption of 220.9 therms per year total. Savings can be found in Table 8.

The savings per customer (as extrapolated from the surveyed participants) for either of the CFLs can also be found Table 8 below. For instance, each customer that installed the 15-watt CFL will save 69 kWhs per year (107,822 / 1,562 = 69.03). This is the average per customer savings. The real savings will of course depend on the other factors involved (the wattage of the bulb removed and hours of use). These hours of use data have been measured as part of the overall CFL analysis, and are reasonable to use and apply in this analysis

Table 9 presents the impact estimates from the planned installations of the CFLs included in the kit. These savings may or not be realized, depending on whether the customers install the items.

Table 8. Impact Estimates from the Installation of the CFL Bulbs

	Estimated Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
15-watt CFL	1562	8.908	107,822.0	-160.4
20-watt CFL	1310	7.564	87,330.2	-129.9
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
15-watt CFL		0.006	69.03	-0.1
20-watt CFL		0.006	66.66	-0.1

Table 9. Potential Impact Estimates from the Planned Installation of the CFL Bulbs

	Estimated Number Planning to Install	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings
15-watt CFL	67	0.431	5,217.2	-7.8
20-watt CFL	151	0.951	10,984.9	-16.3
	Per Install (when done) →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
15-watt CFL		0.006	77.87	-0.12
20-watt CFL		0.006	72.75	-0.11

Weather Stripping

Just over half of the kit recipients (53%) installed the weather stripping. Given this level of installations, the savings for this measure are somewhat modest, Table 11 below shows the energy savings from these estimated 890 installations, with only 532 kilowatt hours and 10.5 therms saved per year.

Table 10. Frequency of Installation: Weather Stripping

Installed weather stripping	HEHC participants surveyed (n=100)
Yes	53%

No	36%
Don't Know	11%
Plan to install	
Yes	11%
No	37%
Don't Know	3%

Table 11. Impact Estimates from the Installation of the Weather Stripping

	Estimated Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
Weather stripping	890	0.156	532.3	10.5
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
Weather stripping		0.0	0.6	0.01

Table 12. Potential Impact Estimates from the Planned Installation of the Weather Stripping

	Estimated Number Planning to Install	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings
Weather stripping	185	0.047	160.3	3.2
Per Install (when done) →		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
Weather stripping		0.0	0.87	0.02

Outlet Gaskets

About half of the recipients installed the outlet gaskets. The kilowatt hour savings from this measure are 2,500 kWh annually.

Table 13. Frequency of Installation: Outlet Gaskets

Installed the gaskets on outlets	HEHC participants surveyed (n=100)
Yes	45%
No	49%
Don't Know	6%
Plan to install	
Yes	14%
No	25%
Don't Know	10%

Table 14. Impact Estimates from the Installation of the Outlet Gaskets

	Estimated Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
Outlet gaskets	756	0.731	2,498.9	49.2
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.001	3.31	0.07

Table 15. Potential Impact Estimates from the Planned Installation of the Outlet Gaskets

	Estimated Number Planning to Install	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings
Outlet gaskets	235	0.289	989.1	19.5
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.001	4.21	0.08

Window Shrink Kit

Most of the kit recipients did not install the window film shrink kit. Only 15% of the population installed this measure.

Table 16. Frequency of Installation: Window Film Shrink Kit

Installed window shrink kit	HEHC participants surveyed (n=100)
Yes	15%
No	76%
Don't Know	9%
Plan to install	
Yes	5%
No	63%
Don't Know	5%

With the low numbers of installations combined with the fact that the PER study (conducted on the same set of measures) found that 38% of the kits were installed on double-pane windows, the savings for this measure are also quite low.

Table 17. Impact Estimates from the Installation of the Window Film Shrink Kit

	Estimated Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
Window shrink kit	252	5.899	9,985.6	132.1
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings

		0.023	39.63	0.52

Table 18. Potential Impact Estimates from the Planned Installation of the Window Shrink Kit

	Estimated Number Planning to Install	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings
Window shrink kit	84	2.269	3,840.6	50.8
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.027	45.72	0.6

Low-Flow Showerhead

A high percentage (41%) of the kit recipients installed the low-flow showerhead, with the resulting gross energy savings being high as well. Total energy savings are over 245,000 kilowatt-hours and almost 12,000 therms annually.

Table 19. Frequency of Installation: Low-Flow Showerhead

Installed the showerhead	HEHC participants surveyed (n=100)
Yes	41%
No	55%
Don't Know	4%
Plan to install	
Yes	12%
No	40%
Don't Know	4%

Table 20. Impact Estimates from the Installation of the Low-Flow Showerhead

	Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
Showerhead	689	26.855	245,053.1	11,948.1
	Per Install →	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.039	355.66	17.34

Table 21. Potential Impact Estimates from the Planned Installation of the Low-Flow Showerhead

	Estimated Number Planning to	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings

	Install			
Showerhead	202	8.744	79,784.7	3,890.1
	Per Install →	**Mean kW Savings**	**Mean kWh Savings**	**Mean Therm Savings**
		0.043	394.97	19.26

Faucet Aerators

The customers were somewhat likely to install the faucet aerators included in the Energy Efficiency Starter Kit. Less than half of the kit recipients installed both of the aerators.

Table 22. Frequency of Installation: Bathroom Faucet Aerator

Installed the bathroom aerator	HEHC participants surveyed (n=100)
Yes	32%
No	60%
Don't Know	8%
Plan to install	
Yes	13%
No	41%
Don't Know	6%

Table 23. Frequency of Installation: Kitchen Faucet Aerator

Installed the kitchen aerator	HEHC participants surveyed (n=100)
Yes	35%
No	57%
Don't Know	8%
Plan to install	
Yes	10%
No	45%
Don't Know	2%

The energy impacts for this measure are in the table below, and indicate overall savings of almost 600 kilowatt hours per year and over 2,000 therms per year.

Table 24. Impact Estimates from the Installation of the Bathroom and Kitchen Faucet Aerators

	Number Installed	Total kW Savings	Total kWh Savings	Total Therm Savings
Bathroom aerator	537	0.343	286.1	1,004.0
Kitchen aerator	588	0.372	310.0	1,087.6
	Per Install →	**Mean kW Savings**	**Mean kWh Savings**	**Mean Therm Savings**
Bathroom aerator		0.001	0.53	1.87

Kitchen aerator		0.001	0.53	1.85

Table 25. Potential Impact Estimates from the Planned Installation of the Faucet Aerators

	Estimated Number Planning to Install	Total Potential kW Savings	Total Potential kWh Savings	Total Potential Therm Savings
Bathroom aerator	218	0.153	127.2	446.2
Kitchen aerator	168	0.105	87.4	306.8
Per Install →		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
Bathroom aerator		0.001	0.58	2.05
Kitchen aerator		0.001	0.52	1.83

All Kit Measures

The Energy Efficiency Starter Kit is a kit of 8 energy efficient measures. The tables below show the relative "popularity" of each of the items for the recipients of the kits and the total savings for each of the measures based on those surveyed customers that indicated they installed the measure or plan to install the measure.

The CFLs are the most likely measure to be installed, with the kitchen aerator and outlet gaskets coming in second. Given the past responses from the PER evaluation in 2007, the customer-indicated behaviors and changes (such as number of showers, wattage of bulb replaced, etc.) means that the showerhead provides a greater amount of savings than the CFLs.

Table 26 below presents the estimated savings when the percent installation is applied to the total program population of 1,680. The total savings from those that received the kits and were randomly selected for the survey is estimated to be 453,818 kilowatt-hours and 13,941 therms annually. The kilowatt impact of the kits is estimated to be 50.828.

Table 26. Summary of Total Savings for All Installed Measures

Ohio Kits	Installed	Plan to Install	Total kW savings	Total kWh savings	Therm savings
15-watt CFL	1562	67	8.908	107,822.0	-160.4
20-watt CFL	1310	151	7.564	87,330.2	-129.9
Weather stripping	890	185	0.156	532.3	10.5
Outlet gaskets	756	235	0.731	2,498.9	49.2
Window shrink kit	252	84	5.899	9,985.6	132.1
Showerhead	689	202	26.855	245,053.1	11,948.1
Bathroom aerator	537	218	0.343	286.1	1,004.0
Kitchen aerator	588	168	0.372	310.0	1,087.6
Total Savings			**50.828**	**453,818.2**	**13,941.2**

Table 27 below shows the mean savings per measure installed. To obtain these values, the total savings for each measure was divided by the total installations, resulting in a

"per install" savings value. If a customer were to install each of the measures in the kit, the "Mean Total" amount at the bottom of each table would be the average energy savings based on the responses of that group.

Table 27. Summary of Mean Savings for All Measures

Kit Measures	Mean kW per install	Mean kWh per install	Mean Therms per install
15-watt CFL	0.006	69.03	-0.1
20-watt CFL	0.006	66.66	-0.1
Weather stripping	0	0.6	0.01
Outlet gaskets	0.001	3.31	0.07
Window shrink kit	0.023	39.63	0.52
Showerhead	0.039	355.66	17.34
Bathroom aerator	0.001	0.53	1.87
Kitchen aerator	0.001	0.53	1.85
Mean Total Savings, if all measures installed	**0.077**	**535.95**	**21.46**

Savings Distributions

There are some risks associated with relying on self-reported behavioral changes, because the foundation of the savings estimates are based solely on the participant's responses, with no means to verify that the respondent has installed the kit's measures and is using them effectively. There are two main sources of bias with these types of surveys that directly impact the conclusions drawn from the responses. These sources of bias are Self-Selection Bias and False Response Bias. There is also an issue regarding the accuracy of the baseline energy use conditions used by the evaluation contractor to estimate savings in that many of these conditions need to be based on assumptions about the participant population, rather than on measurements. These three conditions impact the evaluation contractor's ability to provide accurate estimates of energy impact. These issues are discussed in more detail in the following paragraphs.

Self-Selection Bias

For this evaluation, we are using the self selection bias value of 29.9%. This value was estimated during the previous PER evaluation done in Kentucky and is likely applicable for the HEHC study as well. The self-selection bias applied in this study is described below and is taken from the text of the PER evaluation report.

PER Self-Selection Bias

The survey was sent to 5,401 PER Program participants – 3,562 customers that did not receive the kit, and 1,839 customers that did receive the Energy Efficiency Starter Kit. The data collection efforts resulted in 1,879 responses from PER participants who only received the PER (response rate = 52.8%), and 741 responses (response rate = 40.3%) from Kentucky PER participants who received the Energy Efficiency Kit. The people that filled out and returned the survey are the participants that are more likely to install measures from the Energy Efficiency Kit and consider taking actions based on the recommendations from the Personalized Energy Report. That is, they self-selected themselves to return the survey because they have a higher interest in the subject matter than the people who did not. These individuals also will often respond to a survey in order to let it be known that they did the right thing, and that they are taking steps to be more energy efficient. The customers that did not return the survey are more likely to have a lower interest in the subject matter, and are less likely to take actions. Thus, the people who returned the survey are not the typical participant, but rather are the participant that is more likely to take actions. With 47.2% of the PER group and 59.7% of the Kit group not responding, we are setting the self-selection bias used to estimate the potential range of impacts at half of the non-response rate. As a result, all estimated energy impact estimates will be discounted 29.9%[2] for customers that received the Energy Efficiency Kit and the Personalized Energy Report, and 23.6% for those that only received the Personalized Energy Report. All impact estimates will be discounted by this percentage in order to calculate the low end of the range of savings estimates for each measure and recommendation to adjust for self-selection bias. The adjustment approach is an estimate because there is no way to assign an adjustment factor for the survey without on-site verification efforts to establish a reliable bias factor. We set the factor at

[2] (59.7% response rate / 2 = 29.9% self-selection rate)

half of the non-response rate based on professional judgment from conducting surveys and metering studies of energy efficiency programs for over 28 years and interacting with the evaluation community regarding reasonable expectations and experience.

False Response Bias

False Response Bias is a problem with many self-reporting surveys. The participants respond not with the truth, but with the socially acceptable answer. In short, they lie about what measures they installed or what actions they have taken as a result of the Home Energy House Call program. False response bias is typically not a high number, but ranges from a low of two or three percent to a high of 15 percent in our experience depending on the topic and the population being tested. The False Response Bias is set at 10% for this survey, unless otherwise indicated. A 10% discount will be applied to all impact-related measure estimates to calculate the low end of the range of savings estimates for each measure and recommendation.

Baseline Energy Use Assumptions

When a mail survey is used to conduct an evaluation, the evaluation contractors are unsure of the actual conditions in the home that have experienced a change. For example, while a new showerhead may have been installed, it is impossible to estimate precise savings unless the flow rates and use conditions associated with the previous showerhead are well understood. For this study we established our baseline assumptions based on the survey results and our past research and experience with programs and program evaluations that have taken measurements of baseline conditions. We have also used housing-type computer models to estimate baseline conditions and behaviors. As a result, we are not adjusting the baseline conditions applied in this study based on on-site pre-program inspections, but rather we are using the survey results, the literature, our past research and field experience to set what we think are typical baseline conditions. However, because these are not program-participant measured baseline conditions, it is important to let the reader know that the baselines used in this study are estimated.

Level of Discounting for False Response Bias

The level of discounting used to determine the ranges for each of the measures and recommendations can be found in the table below. The self-selection bias discount factor for all measures for HEHC is 29.9%.

Measure	False Response Bias
CFLs	10%
Weatherstripping	10%
Outlet gaskets	10%
Window shrink kit	10%
Showerhead	20%
Aerators	20%

Section 2: Savings Estimates

Each of the Kit measures' savings are recalculated here in order to provide probable ranges of energy savings associated with each item. The tables below provide the gross energy savings (as extrapolated to the whole population and reported above), the savings after the self-selection bias and false reporting bias are factored in, and then the net savings which factors in freeridership and spillover using the estimates adjusted for the biases.

Table 28. Ohio Participants' Range of Kilowatt Savings – Installed Items

Measure	Total kW Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	5.354	8.908	4.002
20-watt CFL	4.546	7.564	3.398
Weatherstripping	0.094	0.156	0.082
Outlet gaskets	0.439	0.731	0.440
Window shrink kit	3.545	5.899	3.368
Showerhead	13.454	26.855	13.858
Bathroom aerator	0.172	0.343	0.170
Kitchen aerator	0.186	0.372	0.184

Table 29. Ohio Participants' Range of Kilowatt-Hour Savings – Installed Items

Measure	Total kWh Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	64,801.0	107,822.00	48,439.3
20-watt CFL	52,485.5	87,330.20	39,233.3
Weatherstripping	319.9	532.3	278.3
Outlet gaskets	1,501.8	2,498.90	1,505.6
Window shrink kit	6,001.3	9,985.60	5,701.3
Showerhead	122,771.6	245,053.10	126,454.8
Bathroom aerator	143.3	286.1	141.5
Kitchen aerator	155.3	310	153.4

Table 30. Ohio Participants' Range of Therm Savings – Installed Items

Measure	Total Therm Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	-96.4	-160.4	-72.1
20-watt CFL	-78.1	-129.9	-58.4
Weatherstripping	6.3	10.5	5.5
Outlet gaskets	29.6	49.2	29.6
Window shrink kit	79.4	132.1	75.4

Showerhead	5,986.0	11,948.10	6,165.6
Bathroom aerator	503.0	1,004.00	496.7
Kitchen aerator	544.9	1,087.60	538.1

Table 31, Table 32, and Table 33 below present the potential gross and net savings from the program if those that indicated they planned to install the item do indeed install the item.

Table 31. Ohio Participants' Range of Kilowatt Savings – Planned Items

Measure	Total kW Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	0.259	0.431	0.194
20-watt CFL	0.572	0.951	0.427
Weatherstripping	0.028	0.047	0.025
Outlet gaskets	0.174	0.289	0.174
Window shrink kit	1.364	2.269	1.295
Showerhead	4.381	8.744	4.512
Bathroom aerator	0.077	0.153	0.076
Kitchen aerator	0.053	0.105	0.052

Table 32. Ohio Participants' Range of Kilowatt-Hour Savings – Planned Items

Measure	Total kW Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	3,135.5	5,217.20	2,343.8
20-watt CFL	6,601.9	10,984.90	4,935.0
Weatherstripping	96.3	160.3	83.8
Outlet gaskets	594.4	989.1	595.9
Window shrink kit	2,308.2	3,840.60	2,192.8
Showerhead	39,972.1	79,784.70	41,171.3
Bathroom aerator	63.7	127.2	62.9
Kitchen aerator	43.8	87.4	43.2

Table 33. Ohio Participants' Range of Therm Savings – Planned Items

Measure	Total Therm Savings		
	Self-Selection and False Response	Unadjusted Gross Savings	Net Savings
15-watt CFL	-4.7	-7.8	-3.5
20-watt CFL	-9.8	-16.3	-7.3
Weatherstripping	1.9	3.2	1.7
Outlet gaskets	11.7	19.5	11.7
Window shrink kit	30.5	50.8	29.0
Showerhead	1,948.9	3,890.10	2,007.4
Bathroom aerator	223.5	446.2	220.8
Kitchen aerator	153.7	306.8	151.8

Effective Useful Lifetime Impact Estimates

In order to calculate the estimated energy impacts over the lifetime of the measures of the kit, we used the following life-spans for each of the measures.

Kit Measures	Effective Useful Life
15-watt CFL	5
20-watt CFL	5
Weather stripping	5
Outlet gaskets	20
Window shrink kit	1
Showerhead	10
Bathroom aerator	10
Kitchen aerator	10

The peak program kilowatt impact of the installed measures in the kit remains high for the first five years at 25.5 kW, then, in year 6 the savings drop to about 14 kW. Then in year 11, kW savings drop to less than 0.5 kW for the remainder of the 20 year period.

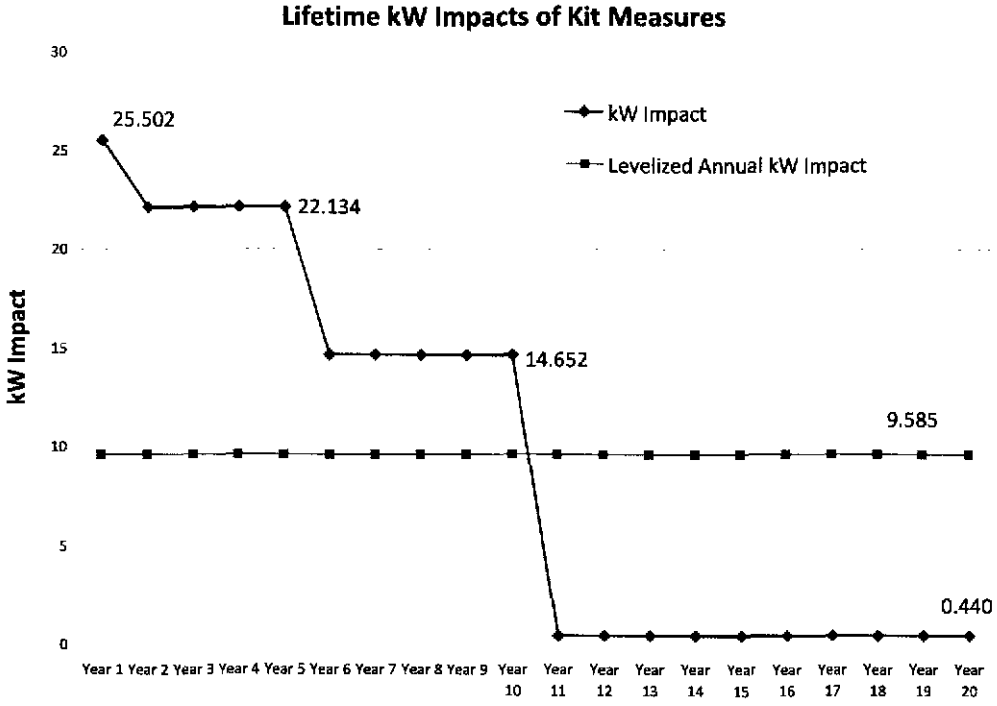

Figure 1. Lifetime kW Impacts of Kit Measures

The figure below presents the kilowatt hour savings that can be expected over the next 20 years based on the effective useful life of the installed measures. For the first five years, annual savings are close to 220,000 kilowatt hours for the 1,680 participants of the HEHC program. By year six, the savings drop to 128,000 kWhs, and in years eleven through twenty, annual kWh savings from the kit are just over 1,500 kWhs per year. The total kWh savings over the next twenty years for these 1,680 participants is 1,743,065 kWhs, a mean of 1,038 kWhs per participant.

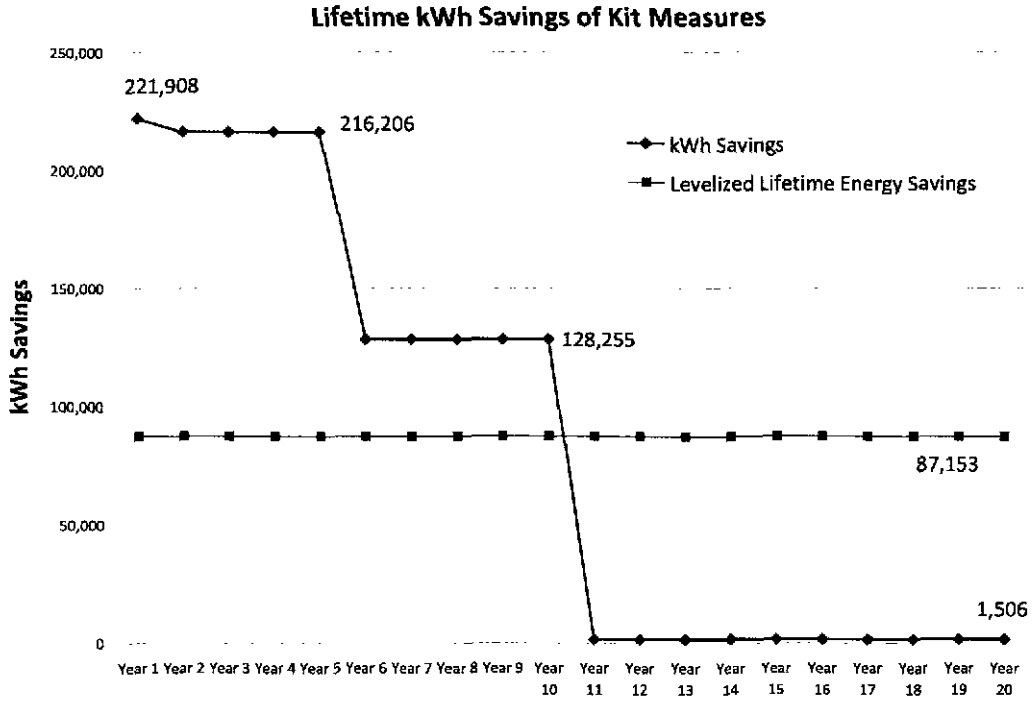

Figure 2. Lifetime kWh Savings of Kit Measures

The figure below presents the therm savings that can be expected over the next 20 years based on the effective useful life of the installed measures. For the first five years, annual savings are 7,180 therms for the 1,680 participants of the HEHC program. By year six, the savings increase slightly because the negative effect on natural gas usage caused as the gas impacts from CFLs use drops out of the equation (this assumes that the program is not the cause of continued CFL use), and in years eleven through twenty, annual therms drop drastically down to 30 therms per year. The total therm savings over the next twenty years for these 1,680 participants is 72,046 therms, a mean of 22 therms per participant. If the program causes the participant to permanently move to CFL use, the savings will continue. This savings would be market transformation savings and are not counted in this evaluation. As a result, these savings are less than what can actually be expected.

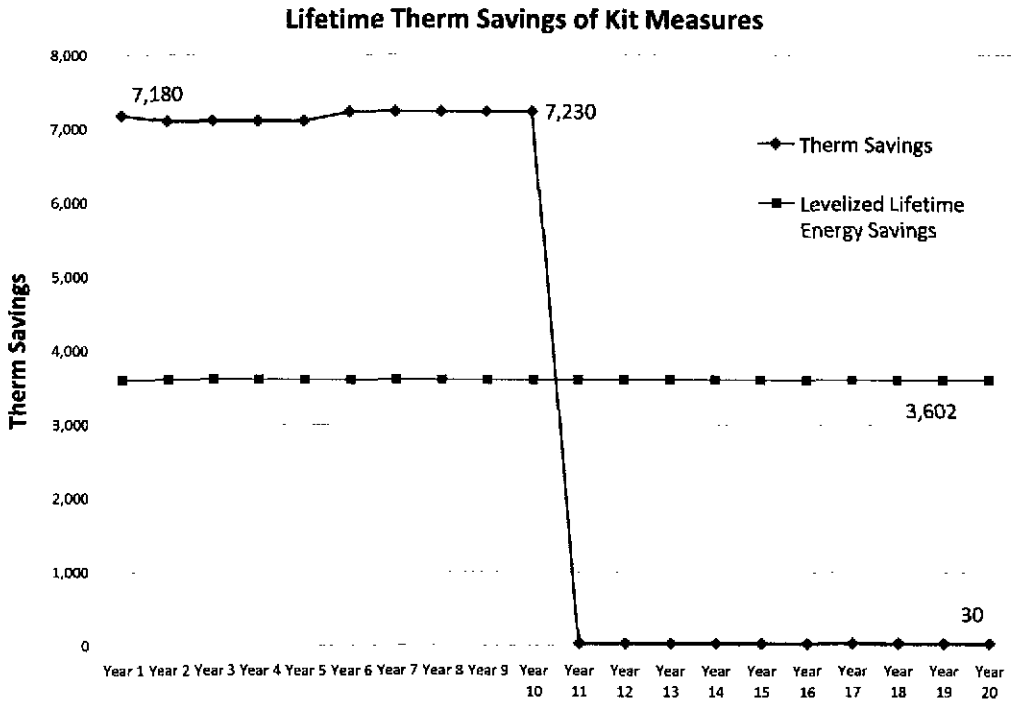

Figure 3. Lifetime Therm Savings of Kit Measures

Audit Freeridership

The Home Energy House Call audit had three (3%) participants as freeriders. To calculate freeridership, we used the following table:

Considering an audit before the program?	If not available through the program, would you still have purchased an audit?	If yes, would you have purchased it within a year?	% Freeridership
yes	yes	yes	100
yes	yes	no	50
yes	yes	don't know	25

These 3 participants had a mean freeridership level 50.00%. Over the 100 participants, the overall freeridership level for the program is 0.5%.

Savings from Audit Recommendations

The participants of the Home Energy House Call Program each received an audit of their home followed up by a customized audit report with specific recommendations for improvements to their home that would increase their home's energy efficiency. In this section, we present the recommendations as they were reported to us by the random sample of 100 participants contacted during the telephone survey. As noted in the

Methodology section above, we first asked them what, if any, improvements they made to their home. We then ask if this was a recommendation that was in the audit report. If they said that yes, it was in the audit report, we ask how influential the recommendation in the audit report was to their decision to install the item on a scale of 1 to 10.

Savings were calculated using engineering algorithms that can be found in Appendix A: Impact Algorithms Used. The gross savings are adjusted for the influence factor. For example, if they said that the influence of the audit report was a 10 on the scale, full energy impacts are presented. If they reported that the audit report had an influence factor of 8, then 80% of the energy impacts are presented and used to estimate energy savings resulting from the program. .

Table 34 below describes the actions taken by each of the respondents who indicated they took an action because of the recommendation in the audit report, the impact metrics used in calculated estimated savings, the influence factor as reported by the participant, and the program's adjusted net energy impacts without survey bias and false response adjustments.

Table 34. Actions Taken Because of the Audit Report and Net of Influence Energy Impacts

Respondent	Action Taken	Location	Algorithm Used	Influence	kW	kWh	Therms
1	Insulation	ducts	Duct insulation	9	0.152	359.3	4.6
2	UV film on windows	home	Window shrink kit	10	0.163	275.7	3.6
	Water heater blanket	basement	Insulated water heater	10	0.158	531.3	25.9
	New water heater	basement	Insulated water heater	10	0.158	531.3	25.9
	Seal duct work	home	Duct repair	10	0.219	454.7	5.4
3	New windows	home	High performance window	10	0.107	214.9	-7.3
	Insulation	home	Attic insulation	10	0.196	345.5	5.3
	Caulking	home	Window shrink kit	10	0.163	275.7	3.6
4	Water heater	basement	Insulated water heater	10	0.158	531.3	25.9
	Insulation	attic	Attic insulation	10	0.196	345.5	5.3
5	Insulation	attic	Attic insulation	9	0.176	311.0	4.8
6	Refrigerator	home	New refrigerator	10	0.210	1508.5	-1.9
	Insulation	home	Attic insulation	10	0.196	345.5	5.3
7	Water heater blanket	basement	Insulated water heater	10	0.158	531.3	25.9
8	Taped ducts	home	Duct Repair	10	0.219	454.7	5.4
9	Tighten doors	home	Weather Stripping	9	0.005	16.5	0.3
10	Insulation	home	Attic insulation	7	0.137	241.9	3.7
	Caulking	home	Window shrink kit	7	0.114	193.0	2.6

	Water heater blanket	basement	Insulated water heater	7	0.111	371.9	18.1
11	Insulated pipes	home	Pipe Wrap	8	0.153	694.5	80.0
12	New AC	outside	New AC	1	0.091	137.5	0.0
13	Insulation	attic	Attic insulation	10	0.196	345.5	5.3
14	Replaced door seal	home	Weather Stripping	10	0.005	18.3	0.4
15	Insulated water pipes	home	Pipe Wrap	10	0.191	868.1	100.0
17	Filled duct work	home	Duct Repair	10	0.219	454.7	5.4
18	Taped duct work	basement	Duct Repair	10	0.219	454.7	5.4
	Covered leaking coal chute	home	Fireplace closure	10	0.005	16.0	0.3
	Insulation	attic	Attic insulation	10	0.196	345.5	5.3
19	Taped duct work	home	Duct Repair	10	0.219	454.7	5.4
	Caulking	home	Window shrink kit	10	0.163	275.7	3.6
20	Insulation	attic	Attic insulation	10	0.196	345.5	5.3
22	Duct couples	home	Duct Repair	10	0.219	454.7	5.4
	Programmable thermostat	home	setback thermostat	10	-0.023	212.1	88.7
	Insulation	attic	Attic insulation	10	0.196	345.5	5.3
25	Sealed holes/leaks	home	Window shrink kit	10	0.163	275.7	3.6
26	Setback thermostat	home	setback thermostat	10	-0.023	212.1	88.7
	Taping duct work	home	Duct Repair	10	0.219	454.7	5.4
28	New furnace	basement	New furnace	10	0	0	16.3
	Replacement windows	home	High performance window	10	0.206	226.5	-6.9
30	Replacement windows	home	High performance window	10	0.206	226.5	-6.9
31	Caulking	home	Window shrink kit	5	0.082	137.9	1.8
34	Insulation	garage	Side wall insulation, 120ft^2	8	0.031	76.9	1.4
				Total for Sample of 100 Participants	6.125	14,872.8	581.6
				Mean per Participant	0.061	148.7	5.8
				Total if Extrapolated to Population of 1,680 Participants	102.9	249,863	9,771

The audit recommendations resulted in an estimated net of influence savings (adjusted for influence of the audit report) of 249,863 kWhs and almost 10,000 therms when the results are extrapolated to the HEHC population.

The following presents the effective useful life and false response bias that need to be applied to these estimates.

Table 35. Effective Useful Life and False Response Bias for Audit Recommendations

	Effective Useful Life (Years)	False Response Bias
Attic insulation	20	50%
basement wall insulation	20	50%
Dishwasher	9	50%
Dryer	11	50%
Duct insulation	20	50%
Duct repair	18	50%
Fireplace closure	5	50%
High performance window	20	50%
Insulated water heater	15	50%
New AC	15	50%
New furnace	20	50%
New heat pump	15	50%
New refrigerator	12	50%
Pipe Wrap	12	10%
setback thermostat	11	50%
Side wall insulation	20	50%
Washer (clothes)	12	50%
Weather Stripping	5	50%
Window shrink kit	1	50%

After the self-response bias (discussed in Self-Selection Bias section on page 23) and the above factors are applied, the total net energy impacts can be estimated.

The kilowatt impacts of the audit recommendations over their effective useful lives are presented in Figure 4 below. The impact of the installed audit recommendations remain strong over the 20 years due to a high number of long-term measures installed by the participants, such as attic and sidewall insulation.

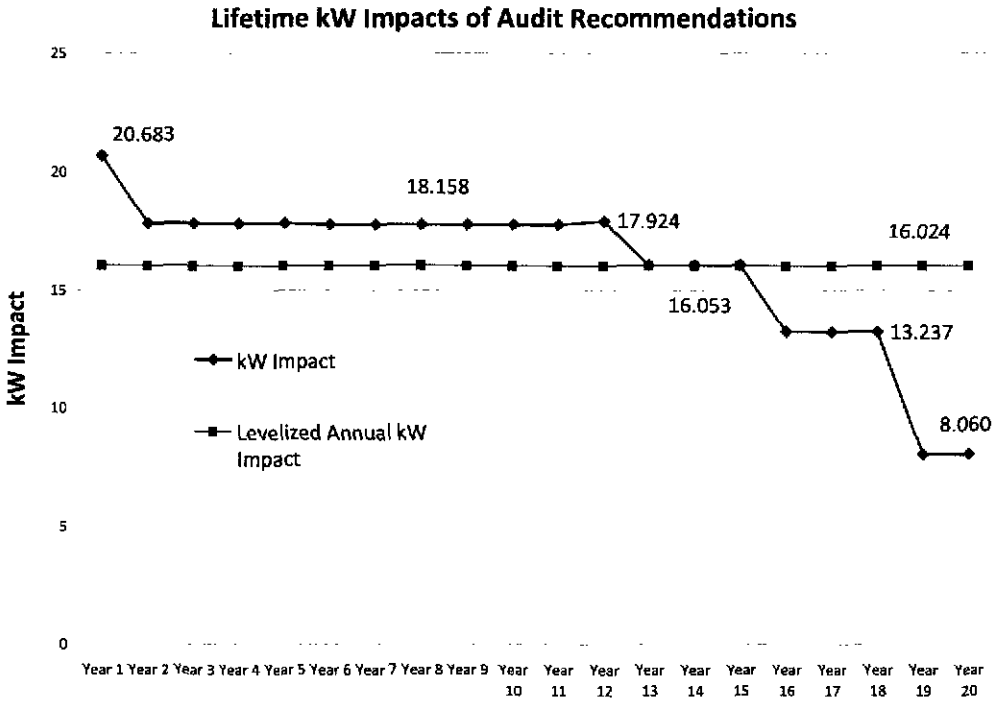

Figure 4. Lifetime kW Impacts of Audit Recommendations

The lifetime kilowatt-hour impacts are presented in Figure 5 below. The total and final net savings (net of influence, self-selection, and false-response) over the next 20 years for these installed audit recommendation is 748,057 kWhs.

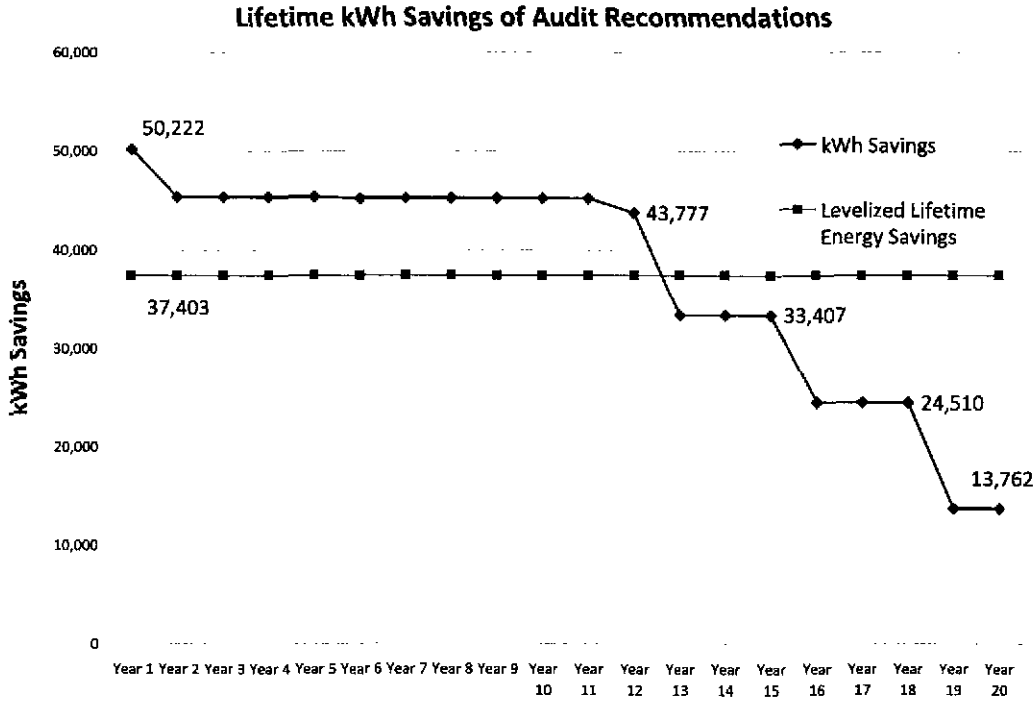

Figure 5. Lifetime kWh Savings of Audit Recommendations

Annual therm savings take a steep drop from 1,964 to 697 annual therms after twelve years, as presented below in Figure 6 below. However, the total net savings over the next twenty years for the installed measures recommended by the HEHC audit is 25,509 therms.

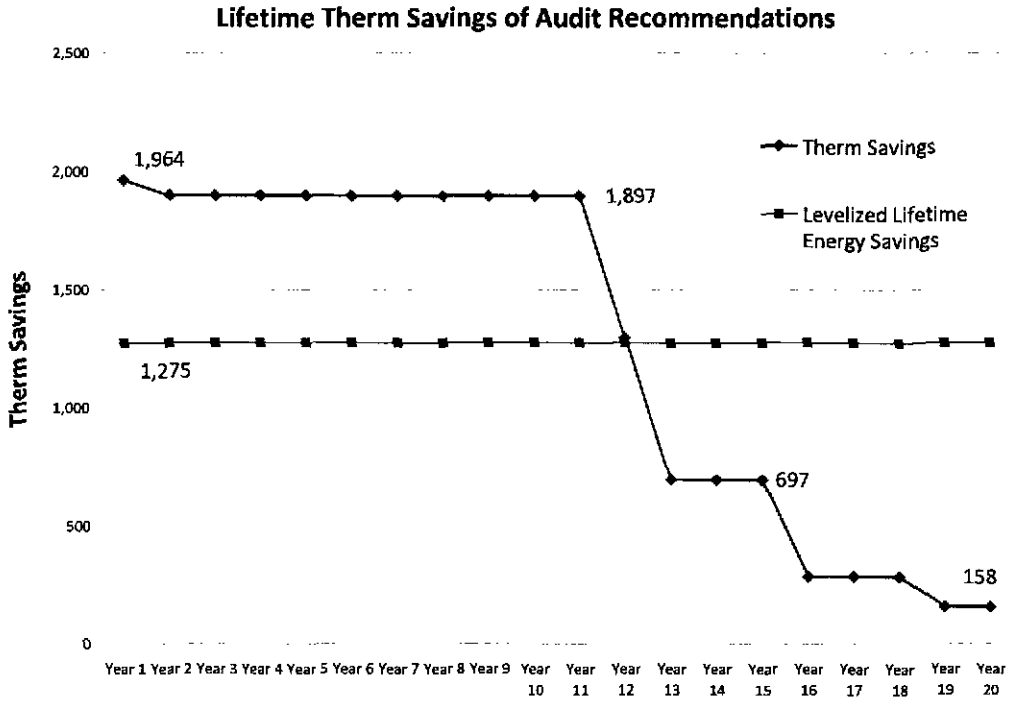

Figure 6. Lifetime Therm Savings of Audit Recommendations

Section 3: Program Operations and Customer Satisfaction

The program manager of Home Energy House Call was interviewed in July of 2008. The 100 customer surveys were performed in June-August of 2008. The interview protocol used during these interviews can be found in Appendices B and C. The results of the process interviews are report by the response categories presented below.

Program Objectives

One of the objectives of the HEHC Program is to raise customer awareness about how they use energy and to help them understand how they can affect their own bill with low cost or no cost actions, and that they can influence the environment with their activities.

This objective is being met, as customers are aware and they realize that taking the actions recommended by the audit and using the items in the kit do work to lower their energy consumption. However, according to a program manager, the level of detail provided by the auditors could be enhanced. Some auditors are better than others in the level of detail provided. In the interviews they are supposed to ask customers about "areas of concern" in their home, but sometimes they do not ask about it, or follow up on it because they forget, don't have time, or don't have the necessary knowledge to help address the issue.

A third-party contractor performs the audits. In order to minimize costs they allow 1 hour per audit and schedule 6 audits in a day. This schedule allows little time to move beyond a set of highly regimented activities, with little time for effectively communicating a complex message to customers. However, the program provides this service at no cost to the participant. As a result, the program does provide value to the participants and this value is recognized by a very high level of participant satisfaction with the program and the services provided.

From a cost effectiveness perspective, in which the program is to acquire energy savings below the avoided cost-of-supply option, the program is limited in the amount of service it can provide. Electricity (non-gas) customers have a small savings potential, providing little room for expanded services. As a result, the primary focus is on Duke's electric heat customers, or ones that use a significant amount of air conditioning (>12,000 kWh in the summer).

Program Operations

A third party contractor (GoodCents) implements the program currently. This includes operating the call center, hiring and training the auditors. The contractor has all the necessary software to collect and process the on-site audit information and translate the data into a custom report for the customers.

The program manager makes sure that the team is meeting expectations, conducts mock trainings, and sets up the on-sites visits for the auditors.

In conjunction with the contractor, the Duke program manager develops an annual marketing strategy. The marketing approach is organized by zip code targeting customers that have both electric and gas service from Duke or, in electric only territories, have high AC use in the summer.

The program enjoys a lot of media attention, especially in the fall and spring. The program manager assures that the information released about the program is accurate, coordinating messages with the contactors ability to serve.

The program has introduced the energy efficiency starter kits as a give-a-way item with the receipt of the audit. If requested, the auditor will install the items in the kit, but focuses on installing the CFL bulbs to make sure the savings are achieved.

Once the audit is completed, the report is developed and reviewed by the contractor and then mailed to the participant. The implementer reports program accomplishments and counts to Duke on a weekly basis.

Duke Energy performs periodic follow-ups and site verifications with the auditors, with assistance by Morgan Marketing Partners. There have been some adjustments to the program implementation approach as the program moved from the past contractor to a new provider (WECC).

Auditor Training

The contract calls for the implementers to train their auditors. The auditors receive one week of classroom training before they accompany a fully trained and experienced auditor for 2-3 weeks. The implementer wants to get their newly training auditing staff into the field as quickly as possible. However, in some cases auditors have gone to the field before they are fully trained. These auditors have needed additional training or coaching to develop the skills necessary to address the issues that will come up in any given house. The new contact with WECC may solve this issue by using only HERS certified raters to conduct the audits.

Implementation Changes

With the new implementation contactor moving to WECC, changes to the program are being planned. One of these changes is to make the HEHC report more user friendly and better able to convey the energy savings opportunity message to the participants. An additional change being planned is a shorter turn-around time between the audit and the delivery of the report.

Program Design

The current Home Energy House Call program was designed with input from Niagara Consulting (who helped design of the energy efficiency starter kit). Mr. Rick Morgan of Morgan Marketing Partners assists with quality review and auditor training planning. Internal Duke staff help with the development of the marketing information and manage the impact evaluation efforts.

Possible Program Improvements

The incorporation of more technologies like blower door testing or infrared imaging would help customers 'see' the energy saving opportunities; however this service is costly and could harm the participation rate and interest in the program by making it overly costly. Within the current program participants can request a blower door assessment for a cost of $125. To date, only one home has requested that test since the program started in 2003. However, as energy, energy costs and environmental issues gain in importance; more customers may be interested in this service.

Having PCs in the field with the auditors will allow them to upload and process the audit information in a more efficient manner, which will allow the reports to be delivered to the participant in a timelier manner. However, this may also be cost-prohibitive.

Participant Satisfaction Survey

One hundred of the 1,680 participants were selected at random for a telephone survey about the Home Energy House Call Program. The survey can be found in Appendix C: Participant Survey Protocol and the results of the survey are presented below.

Motivating Factors

The primary factor for participation is the customer's desire to reduce energy costs. Sixty-five percent provided this response as their primary motivating factor. The second most popular response (37% responding) was that they wanted to receive an energy audit of their home.

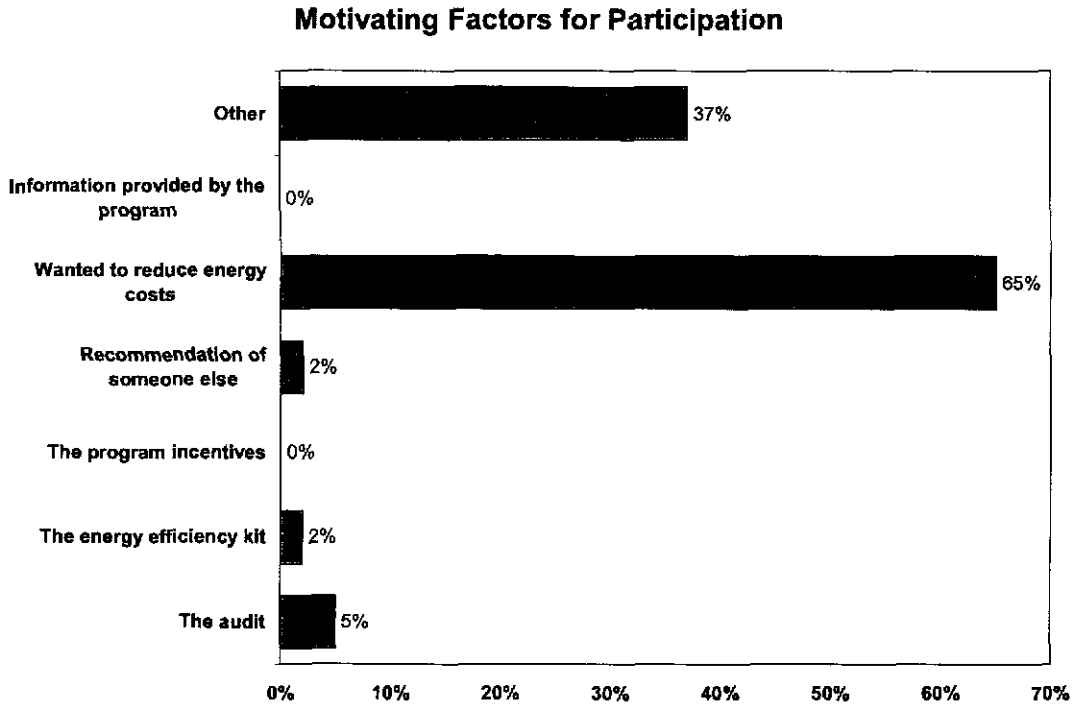

Figure 7. Motivating Factors for HEHC Participants

"Other" described:

- picked up a packet at the home show
- Big on recycling and energy saving
- conserve energy
- curious as how to save energy (n=4)
- duke asked her to
- duke shareholders
- easy
- economy
- flyer with the bill
- free and curious

- free item that was available, nothing to lose
- It was free
- look for possible improvements
- looking for something a little better
- make sure the house was efficient, get a professional opinion
- more environmental
- more responsible energy users
- New home, wanted to check heating and insulation
- new hot water heater and now water purifier
- not understanding delivery charges
- old house with leaks
- Received something in the mail
- reduce energy consumption
- Rising energy prices=primary, secondary=Audit several years from Cincinnati gas & electric. Registered professional engineer-wanted to see what level of information Duke was providing. Duke obtained a rate increase from public utility, therefore I was charged for it, consequently upset.
- save money
- see what improvements could be made
- Son is environmentalist, he told me about the program
- flyer in the bill
- Thought it might be a good deal
- To see what it was all about
- used to work for duke
- very concerned about the environment and carbon fuels

Audit Consideration

Almost a third (32%) of the surveyed participants were considering an audit of their home before enrolling in the program, but only 6% would have purchased one if they wouldn't have received one from through the program.

	Yes	No	DK/NS
Considered before HEHC	32	65	3
Purchased without HEHC	6	66	28
Purchased within a year without HEHC	2	0	4

However, as noted in Audit Consideration on page 40, only 3 of these responses resulted in the indication of any freeridership.

Energy Efficiency Purchases Since Enrollment in HEHC

Of the 100 participant surveyed, 36 indicated that they have made additional energy efficient upgrades since their enrollment in the HEHC program. These purchases are summarized in the table below.

The table shows that of the 60 improvements made by these 36 participants, 51 of them were suggested in the home audit report, and 9 were not suggested by the audit report. While the audit helps them make energy efficiency decisions, it is not the source of all of their energy efficiency actions. In order to gauge the influence of the audit in the actions taken by each home, we asked participants to rate the importance of the audit in their decision to take an action. The influence column presents the value associated with HEHC's influence on the decision to install the measure indicated. On a scale of 1 to 10, with 10 indicating that the decision was made with a very strong influence by their participation in the program, the mean response was 8.6, indicating that in most cases the program had an influence on the participant's decision to move forward and install energy efficient measures.

Respondent	Action Taken	Quantity	Location	Suggested In Audit?			How do you know it's efficient?	Influence
				Yes	No	DK/NS		
1	Insulation	1	ducts	X			Energy star rated	9
2	UV film on windows	1	home	X				10
	Water heater blanket	1	basement	X			Recommendation of auditor	10
	New water heater	1	basement	X			Energy star rated	10
	Seal duct work	1	home	X			Recommendation of auditor	10
3	New windows		home	X			Recommendation of auditor	10
	Insulation		home	X				10
	Caulking		home	X				10
4	Water heater	1	basement	X			Energy star rated	10
	Insulation	1	attic	X			Energy star rated	10
5	Insulation	1	attic	X			Recommendation of auditor	9
	Caulking	1	faucets	X			Recommendation of auditor	9
6	Refrigerator	1	home	X			Energy star rated	10
	Insulation	1	home	X			Energy star rated	10
7	Water heater blanket	1	basement	X			4 star rating	10
8	Taped ducts	1	home	X				10
	Sealed foundation	1	foundation	X				10
9	Tighten doors	1	home	X				9
	Check windows	1	home	X				9
10	Insulation	1	home	X			Energy star rated	7
	Caulking	1	home	X				7
	Water heater blanket	1	basement	X				7
11	Insulated pipes	1	home	X			Energy star rated	8
12	New AC	1	outside	X			Energy star rated	1
13	Insulation	1	attic	X			Energy star rated	10
14	Replaced door seal	1	home	X				10
15	Insulated water pipes	1	home	X			Recommendation of auditor	10
16	New furnace	1	basement	X			Energy star rated	
	New water heater	1	basement	X			Energy star rated	
17	Filled duct work	1	home	X				10

18	Taped duct work	1	basement	X				10
	Covered leaking coal chute	1	home	X				10
	Insulation	1	attic	X			Told us the height to go to	10
19	Taped duct work	1	home	X			Recommendation of auditor	10
	Caulking	1	home	X			Recommendation of auditor	10
20	Insulation	1	attic	X				
21	Air purifier w/ UV filter	1	home		X		Recommendation of Carrier	9
	Humidifier	1	home		X		Recommendation of Carrier	9
22	Duct couples	1	home	X				10
	Programmable thermostat	1	home	X				10
	Insulation	1	attic	X			Energy star rated	10
23	New furnace	1	basement	X			Recommendation of auditor	
	New heat pump	1	basement		X			
24	Removed drywall	1	basement	X				10
25	Sealed holes/leaks	1	home	X				10
26	Setback thermostat	1	home	X				10
	Taping duct work	1	home	X			Energy star rated	10
27	Storm door	1	home		X		Energy star rated	7
28	New furnace	1	basement	X			Energy star rated	10
	Replacement windows	1	home	X			Energy star rated	10
	New roof	1	roof	X			Energy star rated	10
29	Storm doors	2	home	X			Energy star rated	5
30	Replacement windows	3	home	X			Energy star rated	10
31	Insulation	1	home		X		Recommendation of auditor	5
	Caulking	1	home	X			Recommendation of auditor	5
32	Water heater	1	basement		X		Energy star rated	7
33	Front loading washer	1	laundry		X		Energy star rated	1
34	Insulation	1	garage	X			Energy star rated	8
35	Air conditioner	1	outside		X		Went from 8 to 13 SEER	1
36	Triple pane windows	8	home		X		Energy star rated	1

Program Satisfaction

The surveyed participants were very satisfied with the Home Energy House Call program. Figure 8 below shows the respondents' mean satisfaction scores with various aspects of the program.

Overall program satisfaction is very high at 9.07. Surveyed participants rated their satisfaction with the auditors who came to their homes and performed the audit. On a 1 to 10 scale, the auditors' friendliness, help and knowledge were rated a 9.35. The lowest satisfaction (7.51) was with the audit report providing new ideas for improving efficiency. These scores can be expected to improve with the new, more user friendly audit report currently being planned.

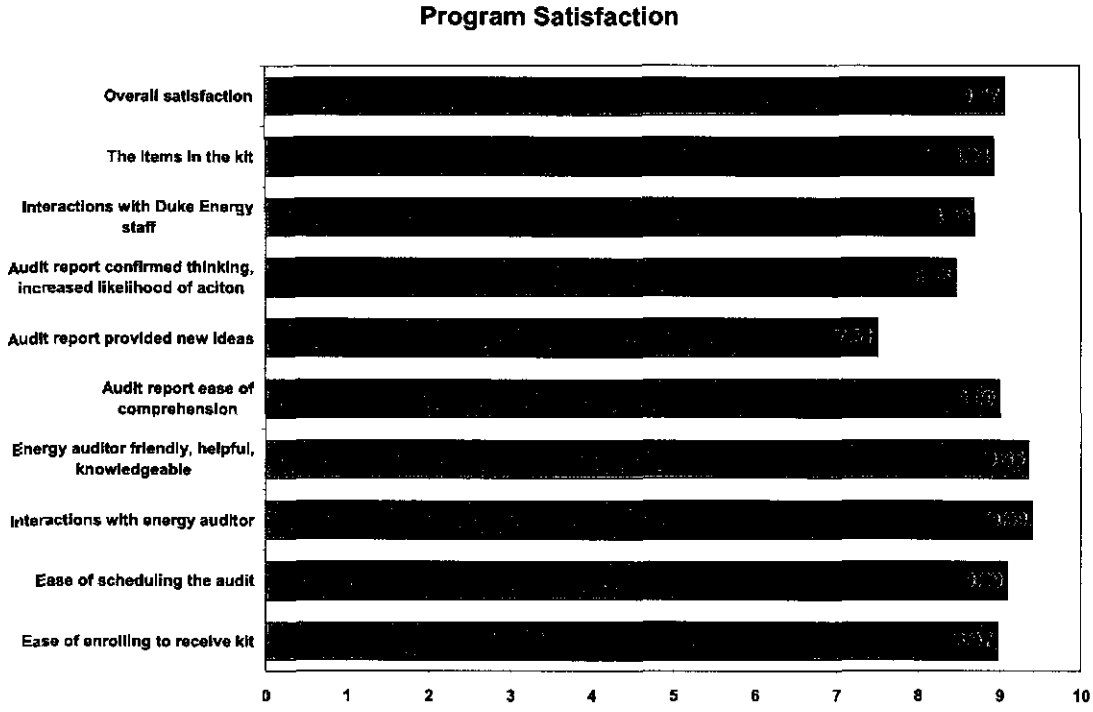

Figure 8. Program Satisfaction

Services and Program Changes Participants Would Like

We asked the 100 surveyed participants what other services they would see be a part of the HEHC program. Their responses are bulleted below:

- more information about alternative energy sources (n=5)
- cheaper electricity (n=3)
- Include a blower door test (n=2)
- have someone install the items for you (n=2)
- looking for something that would give an explanation as to why usage is so high

- windows insulation, handicap/elderly assistance
- more free perks
- more specific solutions
- provide names of places where items can be purchased or where people can be hired to do some of the work
- help with my bills
- A means of actually saving energy and money.
- If they'd provided a number for the Better Business Bureau or contractors for some of the work needed.
- Infrared camera to indicate missing insulation in walls
- New windows
- Give people information on how much it costs if they leave their computer or TV on.
- They need something for the handicapped and elderly. They should do this before winter and summer, extreme temperatures.
- A demonstration on things that are harder to visualize (techniques, products, etc)
- I'd like it to tell me in a larger way how to cut costs. Analyze my bill and see what might be wrong at certain times of the year
- more information on different programs offered through Duke
- Ability to download an electronic copy of my bill (PDF format for download)
- Research into how to reduce energy bills.
- It should be more widely promoted/advertised.
- information available for future questions or contact information in case new questions arise
- It would be helpful if they had a list of companies more friendly to people with fixed incomes.
- They could include some recommendations about behaviors or procedures to improve efficiency. Lifestyle changes.
- A follow up program to see what else can be done, make sure things were done correctly
- A follow-up audit because my bills continue to increase despite the measures I've taken
- At least provide the services they claim to provide. For example, when filling out with the auditor, there are options for additional services. One such is a blower door test, auditor was unaware of what this procedure was. Contacted Duke after the audit was received to inquire about blower test. Air infiltration is critical, and without this an energy audit is useless.
- Blower door test and infrared camera to show exactly where heat/cool air was lost
- Insulate garage underneath the house-no feedback.
- using an air infiltration test, hook up a fan to the front door and see how much air you can pull through
- Free labor to implement recommended changes
- thermal imaging camera to see where you're losing energy
- recommend someone to install the things in the kit or just do it for them, especially "dumb women" and elderly people

- IR imaging or whole house air infiltration test
- house pressure check, fan in the door test
- point out how you can get someone to take pictures and show where heat loss is
- have a fee or something to agree to an infrared house scan to see where losses are
- somebody showed you how to do some of the things in the kit

We also asked them if there were any changes they would like to see made to the program. Their responses are below:

- give averages to compare with similar homes. "Comparables."
- Bring a sheet showing how much energy different appliances use and if there is any drain when turned off.
- I'd like them to add a bill explanation specialist to explain delivery charges and explain the bill.
- perhaps some type of energy use comparison
- If they could have more auditors so people didn't have to wait as long, and they should confirm your request/approval and a time frame as to how long one must wait
- Overall thoroughness, or infrared cameras to check temperature
- ensure a reduction in my bill because the program hasn't helped me
- Funded by Duke rather than by the customers.
- decrease the time it took to get back to her about the appointment
- Information for customers on more energy efficient products and more options
- don't hire overweight auditors, get physically capable people
- letting people know about energy tax savings

We asked the surveyed participants what could be done to increase interest and participation in the program. Their suggestions are below:

- more advertisement (n=41)
- continue sending information with the bill (n=3)
- Emphasize the savings on utility bills
- watch the energy prices go up
- make them more aware of the savings
- Lower people's rates if they adopt the program
- Showing the savings
- Give discounts to those who participate
- semiannual newsletter with progress reports, promoting awareness
- Make phone calls - brochures with bills get thrown away
- If they keep raising their rates, many people will be interested
- get statements from satisfied customers
- Quit cutting down trees in Green Township
- Cost of electricity and gas doubling this winter will do it.
- a rebate for those who participate

- The rising energy costs should do that for you
- make them aware that it's a free audit
- emphasize the cost savings and the environmental impact
- show examples of before and after bills so they know how much they can save
- good PR and interaction with people
- show people where exactly they're losing their heat, would be a big selling point
- make a commercial telling people to call if they need help
- tell them how much money they can save
- Use examples to show savings from peoples' homes
- Testimonials

What Participants Liked Most

We asked the participants what they liked most about the program. Their responses are bulleted below.

- The program was free (n=15)
- The information it provided (n=12)
- The energy efficiency kit (n=10)
  - shower head
  - light bulbs
  - aerators and light bulbs
- suggestions previously not considered
- Willingness to actually come out, not just send a list of things to do
- The auditor was willing to talk and take his time and answer all questions and offered to help wherever necessary.
- savings of the light bulbs
- Duke is trying to lower energy usage free of charge.
- pretty thorough and friendly
- It was thorough and not very time consuming.
- the availability
- It was nice to get a second opinion and some new ideas
- Personal contact and personal service, and it was free
- energy audit, finding out things that I didn't know already, how to better insulate the house
- Finding out how the house rated in terms of efficiency
- The auditor was very professional and explained things very clearly and easily.
- relatively easy to set up and save some money
- It helps people save money, friendly people.
- auditor was nice, told what was needed and what wasn't
- That they made me more aware of things I can do to save money.
- The auditor.
- It shows Duke is interested in consumer consumption. It is helpful.
- I didn't expect them to come with a kit for me to implement right away

- Opportunity to have someone in my home to say specifically what to do and where.
- custom report
- Recommendations that are reasonable, it also helps new home owners take a look at what they can do to conserve energy.
- It was nice to have someone come to your home not trying to sell anything
- They supplied the items for free and helped implement them
- auditor was informative and agreeable
- Really liked the auditor. He was professional, helpful, and very polite.
- The ease of the whole thing. The report, the implementation.
- the representative was informative and nice to talk to
- It provided more energy saving ideas and methods.
- The auditor was thorough and polite and professional
- a person came out and individually looked at the house on a unique basis
- It gave a lot of people ideas they would not have thought of on their own.
- It was very efficient, they did it quickly and it was not very intrusive, it was effective.
- Nothing - it's an intentional effort to mislead the public.
- It came with some things (kit) to increase efficiency.
- Someone came and evaluated the house without trying to sell a product. Free help.
- Convenience of scheduling and availability, representative was very prompt. I also liked the distribution of efficient items.
- Pointed out things I wasn't aware of as well as insulation that could be added to improve efficiency.
- It was very educational, I learned a lot, it was pretty nice.
- Scheduled around my time and made good recommendations.
- Very helpful
- auditor gave information to save energy that they weren't familiar with
- Duke's getting out there to help people reduce their energy costs.
- It gave me some of the recommended items rather than just suggestions
- more knowledge about saving energy, ways to cut down on use
- It educates people and gives them some directions
- They were prompt
- more information on what you could do, think it will help some people
- the courtesy
- guy came out and walked through and talked about things
- concrete suggestions you could really go out and do and see immediate benefits that were quick and easy fixes
- knowing there is something you can do to improve your lifestyle and help everyone else at the same time
- the kit was nice and unexpected
- seemed very thorough
- very friendly and knowledgeable and helped save money

- got to get in pretty quickly

What Participants Liked Least

We also asked the surveyed participants what they liked least about the program. Their responses are below.

- How long it took to get the information (audit report)
- plastic over the windows
- Nothing other than still using the same amount of energy.
- When it came to reconsideration of the bill, I could not get any help from anyone for improvements needed.
- more knowledgeable staff would be desirable
- would have liked more energy savings
- The kit - most of it didn't get used.
- the report wasn't true. They wrote up the report to look good even though everything was already done.
- Getting the audit scheduled was difficult
- Followed all suggestions by the report/auditor and bills have not decreased.
- That I followed the program and my rates still increased!
- the light bulbs and the aerator-they are not aesthetically pleasing
- The fact that the changes were implemented but the rates went up which led to nothing in savings.
- All the repairs necessary.
- Limited availability.
- The duration it took to get the report and to get someone here.
- Time it took to get it done
- The time frame and not knowing if I was eligible. And they should let you know how often you can have an audit done.
- Timing. It was difficult to schedule around peoples' jobs.
- Not a significant change in the results.
- It wasn't as high tech as I expected (thorough)
- I haven't benefited from it at all yet.
- I was surprised by the follow-up letter's timing (almost a year after the audit)
- the light bulbs
- There was a lack of communication initially and we weren't sure how long the auditor would be here. They should describe the audit in more detail prior to coming out.
- That the personnel were so grossly lacking knowledge in regards to actual energy savings.
- Some of the technical jargon wasn't clear.
- It didn't provide me with any new information
- Not very well-known, it could have been advertised more widely.
- response time to the initial submission asking for an audit, took 3 months

- The auditor didn't demonstrate or explain everything.
- It's not advertised enough.
- Didn't realize the depth of the program
- The auditor
- wasn't anything they could do that wasn't thought of already
- could've gone further but don't know how
- mix-up with the mail in, didn't get a call from duke, had to call back
- got all the ideas and can't do them herself, needs some help installing them
- pretty cursory
- was hoping it would be more comprehensive, not much value added
- having to leave messages instead of getting to talk to the people
- wish they auditor was more personable; he just did his job, wasn't friendly

Appendix A: Impact Algorithms Used

The impact algorithms contained in this appendix are from the evaluation of the Personalized Energy Report done in 2007. This study included a mail-in survey with over 1,000 returned surveys. This evaluation of the Home Energy House Call Program included phone surveys of 100 participants and did not ask questions about heating and cooling fuels and systems in the home, size of windows, etc. Therefore, the values for these items are taken from the mean of the results of the PER results from 2007. These values are highlighted in these appendices whenever they were used.

CFLs

General Algorithm

Gross Summer Coincident Demand Savings

$$\Delta kW_S = \text{units} \times \left[\frac{(Watts \times DF_s)_{base} - (Watts \times DF_s)_{ee}}{1000} \right] \times CF_S \times (1 + HVAC_{d,\,s})$$

Gross Annual Energy Savings

$$\Delta kWh = \text{units} \times \left[\frac{(Watts \times DF)_{base} - (Watts \times DF)_{ee}}{1000} \right] \times FLH \times (1 + HVAC_c)$$

$$\Delta therm = \Delta kWh \times HVAC_g$$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
$\Delta therm$	= gross annual therm interaction
units	= number of units installed under the program
$Watts_{ee}$	= connected (nameplate) load of energy-efficient unit
$Watts_{base}$	= connected (nameplate) load of baseline unit(s) displaced
FLH	= full-load operating hours (based on connected load)
DF	= demand diversity factor
CF	= coincidence factor
$HVAC_c$	= HVAC system interaction factor for annual electricity consumption = 0.005443995
$HVAC_d$	= HVAC system interaction factor for demand =0.167018
$HVAC_g$	= HVAC system interaction factor for annual gas consumption = -0.00149

15 W CFL Measure

$Watts_{ee}$ = 15, which is the input power of program supplied CFL
$Watts_{base}$ - calculated from survey responses as shown below = **63.85514**

Wattage of bulb removed	$Watts_{base}$	Notes
<= 44	40	Most popular size < 44 W
45 – 70	60	Lumen equivalent of 15 W CFL
71 – 99	75	Most popular size in range
> = 100	100	Most popular size in range

FLH - calculated from survey responses as shown below: **= 1404.905 for 15-watt, 1340.106 For the 20-watt bulb.**

Hours of use per day	FLH	Notes
<1	183	Average value over range
1-2	548	Average value over range
3-4	1278	Average value over range
5-10	2738	Average value over range
11-12	4198	Average value over range
13-24	6753	Average value over range

DF = 1.0 and CF = 0.10

The coincidence factor for this analysis was taken as the average of the coincidence factors estimated by PG&E and SCE for residential CFL program peak demand savings. The PG&E and SCE coincidence factors are combined factors that consider both coincidence and diversity, thus the diversity factor for this analysis was set to 1.0

$HVAC_c$ - the HVAC interaction factor for annual energy consumption depends on the HVAC system, heating fuel type, and location. The HVAC interaction factors for annual energy consumption were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix.

Covington, KY

Heating Fuel	Heating System	Cooling System	HVACc	HVACg
Other	Any except Heat Pump	Any except Heat Pump	0	0
Any	Heat Pump	Heat Pump	-0.16	0
Gas Propane Oil	Central Furnace	None	0	-0.0021
		Room/Window	0.079	-0.0021
		Central AC	0.079	-0.0021
	Other	None	0	-0.0021
		Room/Window	0.079	-0.0021

		Central AC	0.079	-0.0021
Electricity	Central furnace	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0
	Electric baseboard	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0
	Other	None	-0.45	0
		Room/Window	-0.36	0
		Central AC	-0.36	0

$HVAC_d$ - the HVAC interaction factor for demand depends on the cooling system type. The HVAC interaction factors for summer peak demand were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix.

Covington, KY

Cooling System	HVACd
None	0
Room/Window	.17
Central AC	.17
Heat Pump	.17

20W CFL Measure

$Watts_{ee}$ = 20, which is the input power of program supplied CFL

$Watts_{base}$ - calculated from survey responses as shown below: = 68.52787

Wattage of bulb removed	$Watts_{base}$	Notes
<= 44	40	Most popular size < 44 W
45 – 70	60	Most popular size in range
71 – 99	75	Lumen equivalent of 20 W CFL
> = 100	100	Most popular size in range

Weatherstripping, Outlet Gaskets, and Fireplace Closure

Gross Summer Coincident Demand Savings

$\Delta kW_S = \text{units} \times (\Delta cfm/unit) \times (kW / cfm) \times DF_S \times CF_S$

Gross Annual Energy Savings

$\Delta kWh = \text{units} \times (\Delta cfm/unit) \times (kWh / cfm)$

$\Delta therm = units \times (\Delta cfm / unit) \times (therm / cfm)$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
units	= number of buildings sealed under the program
Δcfm/unit	= unit infiltration airflow rate (ft^3/min) reduction for each measure
DF	= demand diversity factor = 0.8
CF	= coincidence factor = 1.0
kW/cfm	= demand savings per unit cfm reduction = 0.00164264
kWh/cfm	= electricity savings per unit cfm reduction = 4.490984952
therm/cfm	= gas savings per unit cfm reduction = 0.088377565

Unit cfm savings per measure

The cfm reductions for each measure were estimated from equivalent leakage area (ELA) change data taken from the ASHRAE Handbook of Fundamentals (ASHRAE, 2001). The equivalent leakage area changes were converted to infiltration rate changes using the Sherman-Grimsrud equation:

$$Q = ELA \times \sqrt{A \times \Delta T + B \times v^2}$$

where:

A	= stack coefficient (ft^3/min-in^4-°F) = 0.015 for one-story house
ΔT	= average indoor/outdoor temperature difference over the time interval of interest (°F)
B	= wind coefficient (ft^3/min-in^4-mph^2) = 0.0065 (moderate shielding)
v	= average wind speed over the time interval of interest measured at a local weather station at a height of 20 ft (mph)

The location specific data are shown below:

Location	Average outdoor temp	Average indoor/outdoor temp difference	Average wind speed (mph)	Specific infiltration rate (cfm/in^2)

Covington	33	35	22	1.92

Measure ELA impact and cfm reductions are as follows:

Measure	Unit	ELA change (in^2/unit)	ΔCfm/unit (KY)
Outlet gaskets	Each	0.357	0.69
Weather strip	Foot	0.089	0.17
Fireplace	Each	1.86	3.57

Unit energy and demand savings

The energy and peak demand impacts of reducing infiltration rates were calculated from infiltration rate parametric studies conducted using the DOE-2 residential building prototype models, as described at the end of this Appendix. The savings per cfm reduction by heating and cooling system type are shown below:

Heating Fuel	Heating System	Cooling System	kWh/cfm	kW/cfm	therm/cfm
Other	Any except Heat Pump	Any except Heat Pump	1.14	0.00000	0.000
Any	Heat Pump	Heat Pump	12.85	0.00248	0.000
Gas Propane Oil	Central Furnace	None	0	0	0.124
		Room/Window	1.14	0.00000	0.124
		Central AC	1.14	0.00000	0.124
	Other	None	0	0	0.124
		Room/Window	1.14	0.00000	0.124
		Central AC	1.14	0.00000	0.124
Electricity	Central furnace	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000
	Electric baseboard	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000
	Other	None	23.27	0.01238	0.000
		Room/Window	23.84	0.01485	0.000
		Central AC	23.84	0.01485	0.000

Window Shrink Kit

Gross Summer Coincident Demand Savings

ΔkW_S = no. windows ×SF/window × (ΔkW/SF) × DF_S × CF_S

Gross Annual Energy Savings
ΔkWh = no. windows ×SF/window × (ΔkWh/SF)

Δtherm = no. windows ×SF/window × (Δtherm/SF)

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
No windows	= quantity of windows treated with window film from survey
SF/window	= window square feet based on window size = 19.90221
DF	= demand diversity factor
CF	= coincidence factor
ΔkW/SF	`= electricity demand savings per square foot of window treated =0.001131
ΔkWh/SF	`= electricity consumption savings per square foot of window treated = 1.531539
Δtherm/SF	`= gas consumption savings per square foot of window treated=0.020262

Coincidence and Diversity Factors:

DF = 0.8
CF = 1.0

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential cooling loads in summer peaking utilities.

Window area assumptions (per window):

Window Type	Size (SF)
Small	9
Average	18
Large	30

Unit energy and demand savings data

The unit energy savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. The basic simulation assumptions for window U-value and solar heat gain coefficient (SHGC) were taken from the ASHRAE Handbook of Fundamentals (ASHRAE, 2001), and are described below:

	Without window film		**With window film**	
Window type	**U-value (Btu/hr-SF-°F)**	**SHGC**	**U-value (Btu/hr-SF-°F)**	**SHGC**
Single	1.27	0.86	0.81	0.76

Single with storm	0.81	0.76	0.67	0.68
Double	0.81	0.76	0.67	0.68

The unit energy savings depend on the heating fuel, heating system, cooling system and window type:

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System None

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
All	0	0	0

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System Room/Window or Central AC

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	0.795	0.000853	0
Single with storm	0.566	0.000498	0
Double	0.566	0.000498	0

Heating Fuel Any
Heating System Heat Pump
Cooling System Heat Pump

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	4.757	0.001280	0.000
Single with storm	1.621	0.000711	0.000
Double	1.621	0.000711	0.000

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System None

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	0	0	0.039
Single with storm	0	0	0.011
Double	0	0	0.011

Heating Fuel Gas, propane or oil

Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	0.795	0.000853	0.039
Single with storm	0.566	0.000498	0.011
Double	0.566	0.000498	0.011

Heating Fuel	Electricity
Heating System	Any except Heat Pump
Cooling System	None

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	8.748	0.004979	0.000
Single with storm	2.431	0.001351	0.000
Double	2.431	0.001351	0.000

Heating Fuel	Electricity
Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

Window type	ΔkWh/SF	ΔkW/SF	Δtherm/SF
Single	9.335	0.005690	0.000
Single with storm	2.940	0.001849	0.000
Double	2.940	0.001849	0.000

Low-Flow Showerhead

Gross Summer Coincident Demand Savings

$$\Delta kW_S = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{3413_s} \times DF_x \times CF_s$$

Gross Annual Energy Savings

$$\Delta kWh = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{3413} \times 365$$

$$\Delta\text{therm} = units \times \frac{(GPD_{base} - GPD_{ee}) \times 8.33 \times \overline{\Delta T}}{\eta_{waterheater}} \times \frac{365}{100000}$$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
units	= number of units installed under the program
GPD_{base}	= daily hot water consumption before installation
GPD_{ee}	= daily hot water consumption after flow reducing measure installation
ΔT	= average difference between entering cold water temperature and the shower use temperature
DF	= demand diversity factor for electric water heating
CF	= coincidence factor
8.33	= conversion factor (Btu/gal-°F)
3413	= conversion factor (Btu/kWh)
24	= conversion factor (hr/day)
365	= conversion factor (days/yr)
100000	= conversion factor (Btu/therm)

Showerhead

GPD_{base} = showers/week / 7 x 3.1 gpm x 5 minutes/shower

GPD_{ee} = showers/week / 7 x 1.5 gpm x 5 minutes/shower

ΔT

City	Average cold water temperature	Shower use temperature	Average ΔT
Covington	53.9°F	100°F	46.1°F

Water heater efficiency

Combustion efficiency for residential gas water heater = 0.70

Demand diversity factor = 0.1

Coincidence factor = 0.4

Showers/week = 8.23

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for the residential water heating end-use in a summer peaking utility.

Faucet Aerators

This measure used the Efficiency Vermont deemed savings (Efficiency Vermont, 2003) adjusted for entering water temperature:

Demand Savings
$\Delta kW = 0.0171$ kW x $\Delta T / \Delta T_{VT}$ x DF x CF

Energy Savings
$\Delta kWh_i = 57$ kWh x $\Delta T / \Delta T_{VT}$
$\Delta therms = 2.0$ x $\Delta T / \Delta T_{VT\,i}$

City	Average cold water temperature	Hot water use temperature	Average ΔT
Covington	53.9°F	100°F	46.1°F
Burlington VT	44.5	100°F	55.5

Demand diversity factor = 0.1

Coincidence factor = 0.4

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for the residential water heating end-use in a summer peaking utility.

Insulated Water Heater

Gross Summer Coincident Demand Savings

$$\Delta kW_S = \text{units} \times \frac{(UA_{base} - UA_{ee}) \times \Delta T_s}{3413} \times DF_s \times CF_s$$

Gross Annual Energy Savings

$$\Delta kWh = \text{units} \times \frac{(UA_{base} - UA_{ee}) \times \overline{\Delta T}}{3413} \times 8760$$

$$\Delta therm = units \times \frac{(UA_{base} - UA_{ee}) \times \overline{\Delta T}}{\eta_{waterheater}} \times \frac{8760}{100000}$$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
units	= number of water heaters installed under the program
UA_{base}	= overall heat transfer coefficient of base water heater (Btu/hr-°F) =4.6817
UA_{ee} =1.9217	= overall heat transfer coefficient of improved water heater (Btu/hr-°F)
ΔT	= temperature difference between the tank and the ambient air (°F)
DF	= demand diversity factor
CF	= coincidence factor
3413	= conversion factor (Btu/kWh)
8760	= conversion factor (hr/yr)
100000	= conversion factor (Btu/therm)
$\eta_{waterheater}$	= water heater efficiency

Water heater tank UA

Water heater size (gal)	Electric		Gas	
	UAbase	UAee	UAbase	UAee
30	3.84	1.69	4.21	1.76
50	4.67	1.83	5.13	1.91
60	4.13	2.06	4.54	2.14
75	5.00	2.42	5.50	2.52
80+	5.72	2.53	6.28	2.64

ΔT = 140°F water setpoint temp – 65°F room temp = 75°F

DF = 1.0
CF= 1.0
$\eta_{waterheater}$ = 0.7

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential water heaters meeting standby losses.

Attic Insulation

Gross Summer Coincident Demand Savings
$\Delta kW_S = SF \times (kW/SF_{base} - kW/SF_{ee}) \times DF_S \times CF_S$

$kW/SF_{base} = 0.002142316076294$
$kW/SF_{ee} = 0.002005940054496$

Gross Annual Energy Savings

$\Delta kWh = SF \times (kWh/SF_{base} - kWh/SF_{ee})$

$kWh/SF_{base} = 2.506253405995$

$kWh/SF_{ee} = 2.313866485014$

$\Delta therm = SF \times (therm/SF_{base} - therm/SF_{ee})$

$therm/SF_{base} = 0.03055422343324$

$therm/SF_{ee} = 0.02760245231608$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
SF	= insulation square feet installed = 1796.49
DF	= demand diversity factor
CF	= coincidence factor
kW/SF	`= electricity demand per square foot of insulation installed
kWh/SF	`= electricity consumption per square foot of insulation installed
therm/SF	`= gas consumption per square foot of insulation installed

Coincidence and Diversity Factors:

DF = 0.8
CF = 1.0

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential cooling loads in summer peaking utilities.

Insulation square foot assumptions:

Average house size from site data (Carolinas), or estimated from number of rooms (Kentucky)

Size of house = number of rooms * 330 SF/room

Average ceiling area = house size / 1.2

If partial insulation, then reduce ceiling area by 50%

R value assumptions

Rbase: = 12.19

Base thickness	R_{base}
2	7

4	14
6	21
8	28
10	35

Assumes existing insulation is fiberglass or cellulose, at R-3.5 per inch. This assumption addresses insulation R-value only. The R-value assumptions for other materials within the ceiling construction are embedded in the simulation model.

Ree =31.6011

The R-value of the wall with added insulation depends on base thickness, added insulation thickness and insulation type: Fiberglass, cellulose and "other" insulation is assumed to have an R-value of 3.5 per inch. Foam insulation is assumed to have an R-value of 5.6 per inch.

Base thickness	Added thickness	Ree	
		fiberglass, cellulose or other	Foam
	2	14.00	18.20
	4	21.00	29.40
	6	28.00	40.60
	8	35.00	51.80
	10	42.00	63.00
2	12	49.00	74.20
	2	21.00	25.20
	4	28.00	36.40
	6	35.00	47.60
	8	42.00	58.80
	10	49.00	70.00
4	12	56.00	81.20
	2	28.00	32.20
	4	35.00	43.40
	6	42.00	54.60
	8	49.00	65.80
	10	56.00	77.00
6	12	63.00	88.20
	2	35.00	39.20
	4	42.00	50.40
	6	49.00	61.60
	8	56.00	72.80
	10	63.00	84.00
8	12	70.00	95.20
10	2	42.00	46.20

	4	49.00	57.40
	6	56.00	68.60
	8	63.00	79.80
	10	70.00	91.00
	12	77.00	102.20
	2	49.00	53.20
	4	56.00	64.40
	6	63.00	75.60
	8	70.00	86.80
	10	77.00	98.00
12	12	84.00	109.20

Unit energy and demand data

The unit energy savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. The unit energy and demand savings depend on the heating fuel, heating system, cooling system type and Rvalue

Heating Fuel	Other
Heating System	Any except Heat Pump
Cooling System	None

R-value	kWh/SF	kW/SF	therm/SF
All	0	0	0

Heating Fuel	Other
Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
7	1.339	0.00157	0
14	1.272	0.00149	0
21	1.245	0.00145	0
28	1.231	0.00143	0
35	1.220	0.00142	0
42	1.214	0.00141	0
49	1.210	0.00141	0
56	1.206	0.00140	0
63	1.203	0.00140	0
70	1.201	0.00140	0

77	1.200	0.00140	0
84	1.196	0.00139	0
109	1.194	0.00139	0

Heating Fuel Any
Heating System Heat Pump
Cooling System Heat Pump

R-value	kWh/SF	kW/SF	therm/SF
7	6.550	0.00387	0.00000
14	6.121	0.00378	0.00000
21	5.937	0.00374	0.00000
28	5.833	0.00371	0.00000
35	5.768	0.00370	0.00000
42	5.724	0.00368	0.00000
49	5.689	0.00368	0.00000
56	5.665	0.00367	0.00000
63	5.644	0.00366	0.00000
70	5.628	0.00366	0.00000
77	5.616	0.00366	0.00000
84	5.605	0.00366	0.00000
109	5.576	0.00365	0.00000

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System None

R-value	kWh/SF	kW/SF	therm/SF
7	0	0	0.04418
14	0	0	0.04058
21	0	0	0.03908
28	0	0	0.03828
35	0	0	0.03768
42	0	0	0.03738
49	0	0	0.03708
56	0	0	0.03688
63	0	0	0.03668
70	0	0	0.03658
77	0	0	0.03648
84	0	0	0.03638
109	0	0	0.03618

Heating Fuel Gas, propane or oil

Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
7	1.339	0.00157	0.04418
14	1.272	0.00149	0.04058
21	1.245	0.00145	0.03908
28	1.231	0.00143	0.03828
35	1.220	0.00142	0.03768
42	1.214	0.00141	0.03738
49	1.210	0.00141	0.03708
56	1.206	0.00140	0.03688
63	1.203	0.00140	0.03668
70	1.201	0.00140	0.03658
77	1.200	0.00140	0.03648
84	1.196	0.00139	0.03638
109	1.194	0.00139	0.03618

Heating Fuel	Electricity
Heating System	Any except Heat Pump
Cooling System	None

R-value	kWh/SF	kW/SF	therm/SF
7	9.063	0.00501	0.00000
14	8.254	0.00463	0.00000
21	7.915	0.00447	0.00000
28	7.728	0.00439	0.00000
35	7.610	0.00432	0.00000
42	7.528	0.00429	0.00000
49	7.468	0.00426	0.00000
56	7.423	0.00424	0.00000
63	7.387	0.00422	0.00000
70	7.358	0.00421	0.00000
77	7.334	0.00420	0.00000
84	7.313	0.00419	0.00000
109	7.262	0.00417	0.00000

Heating Fuel	Electricity

Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
7	10.184	0.00646	0.00000
14	9.327	0.00601	0.00000
21	8.969	0.00581	0.00000
28	8.773	0.00571	0.00000
35	8.645	0.00564	0.00000
42	8.560	0.00560	0.00000
49	8.497	0.00557	0.00000
56	8.448	0.00554	0.00000
63	8.410	0.00552	0.00000
70	8.380	0.00551	0.00000
77	8.356	0.00550	0.00000
84	8.331	0.00548	0.00000
109	8.279	0.00546	0.00000

Sidewall Insulation

Gross Summer Coincident Demand Savings

$\Delta kW_S = SF \times (kW/SF_{base} - kW/SF_{ee}) \times DF_S \times CF_S$

$kW/SF_{base} = 0.003607765957447$

$kW/SF_{ee} = 0.003208978723404$

Gross Annual Energy Savings

$\Delta kWh = SF \times (kWh/SF_{base} - kWh/SF_{ee})$

$kWh/SF_{base} = 4.66205106383$

$kWh/SF_{ee} = 3.860968085106$

$\Delta therm = SF \times (therm/SF_{base} - therm/SF_{ee})$

$therm/SF_{base} = 0.05971$

$therm/SF_{ee} = 0.04533334042553$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
SF	= insulation square feet installed = 1960.03
DF	= demand diversity factor
CF	= coincidence factor

kW/SF `= electricity demand per square foot of insulation installed

kWh/SF `= electricity consumption per square foot of insulation installed

therm/SF `= gas consumption per square foot of insulation installed

Coincidence and Diversity Factors:

DF = 0.8
CF = 1.0

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential cooling loads in summer peaking utilities.

Insulation square foot assumptions:

Average house size from site data (Carolinas), or estimated from number of rooms (KY)

Size of house = number of rooms * 330 SF/room

Number of walls	Wall area as a fraction of floor area
1	0.26
2	0.52
3	0.72
4+	0.92

R value assumptions

Rbase:

Base thickness	R_{base}
0	0.91

The base case assumes an uninsulated wall with 3.5 inch air gap. This assumption addresses "insulation" R-value only. The R-value assumptions for other materials within the wall construction are embedded in the simulation model.

Ree

The insulated wall R-value depends on added insulation thickness and insulation type. Fiberglass, cellulose and "other" insulation is assumed to have an R-value of 3.5 per inch. Foam insulation is assumed to have an R-value of 5.6 per inch.

Added thickness	Ree	
	fiberglass, cellulose or other	Foam
1-3	7.9	12.1
4-6	18.4	28.9
7-12	30.7	48.5

13+	46.4	73.7

Unit energy and demand data

The unit energy and demand savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. The unit energy and demand savings depend on the heating fuel, heating system, cooling system type and wall Rvalue:

Heating Fuel	Other
Heating System	Any except Heat Pump
Cooling System	None

R-value	kWh/SF	kW/SF	therm/SF
All	0	0	0

Heating Fuel	Other
Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
0.91	2.361	0.00273	0
7.9	2.046	0.00238	0
18.4	1.950	0.00227	0
30.7	1.908	0.00224	0
46.4	1.887	0.00220	0
12.1	1.988	0.00230	0
28.9	1.917	0.00224	0
48.5	1.886	0.00220	0
73.7	1.874	0.00220	0

Heating Fuel	Any
Heating System	Heat Pump
Cooling System	Heat Pump

R-value	kWh/SF	kW/SF	therm/SF
0.91	12.078	0.00655	0.00000
7.9	9.865	0.00605	0.00000
18.4	9.160	0.00588	0.00000
30.7	8.892	0.00581	0.00000
46.4	8.734	0.00578	0.00000

12.1	9.477	0.00597	0.00000
28.9	8.918	0.00583	0.00000
48.5	8.721	0.00578	0.00000
73.7	8.620	0.00575	0.00000

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System None

R-value	kWh/SF	kW/SF	therm/SF
0.91	0	0	0.08530
7.9	0	0	0.06565
18.4	0	0	0.05974
30.7	0	0	0.05751
46.4	0	0	0.05623
12.1	0	0	0.06230
28.9	0	0	0.05767
48.5	0	0	0.05623
73.7	0	0	0.05543

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
0.91	2.361	0.00273	0.08530
7.9	2.046	0.00238	0.06565
18.4	1.950	0.00227	0.05974
30.7	1.908	0.00224	0.05751
46.4	1.887	0.00220	0.05623
12.1	1.988	0.00230	0.06230
28.9	1.917	0.00224	0.05767
48.5	1.886	0.00220	0.05623
73.7	1.874	0.00220	0.05543

Heating Fuel Electricity
Heating System Any except Heat Pump
Cooling System None

R-value	kWh/SF	kW/SF	therm/SF
0.91	17.807	0.00963	0
7.9	13.354	0.00749	0
18.4	12.045	0.00685	0
30.7	11.552	0.00663	0
46.4	11.277	0.00650	0
12.1	12.616	0.00712	0
28.9	11.599	0.00665	0
48.5	11.254	0.00649	0
73.7	11.075	0.00641	0

Heating Fuel	Electricity
Heating System	Any except Heat Pump
Cooling System	Room/Window or Central AC

R-value	kWh/SF	kW/SF	therm/SF
0.91	12.078	0.00655	0.00000
7.9	9.865	0.00605	0.00000
18.4	9.160	0.00588	0.00000
30.7	8.892	0.00581	0.00000
46.4	8.734	0.00578	0.00000
12.1	9.477	0.00597	0.00000
28.9	8.918	0.00583	0.00000
48.5	8.721	0.00578	0.00000
73.7	8.620	0.00575	0.00000

Duct Insulation and Repair

Gross Summer Coincident Demand Savings
$\Delta kW_S = (\Delta kW/unit) \times DF_S \times CF_S \times LF$

Gross Annual Energy Savings
$\Delta kWh = (\Delta kWh/unit) \times LF$

$\Delta therm = (\Delta therm/unit) \times LF$

where:

ΔkW	= gross coincident demand savings
ΔkWh	= gross annual energy savings
DF	= demand diversity factor

CF = coincidence factor
LF = location factor = 0.43
ΔkWunit = electricity demand savings per dwelling
Insulate = 0.4898181818182
Repair = 0.6379347826087

ΔkWh/SF = electricity consumption savings per dwelling
Insulate = 928.438961039
Repair = 1057.532608696

Δtherm/SF = gas consumption savings dwelling
Insulate = 11.83695652174
Repair = 12.58181818182

Coincidence and Diversity Factors:

DF = 0.8
CF = 1.0

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential air conditioners and heat pumps in summer peaking utilities.

The location factors used are as follows:

Heated Area	Unheated Area	DK/No Response
0	1	.43

Unit energy and demand savings data

The unit energy and demand savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. The basic assumptions are listed below:

Assumption	Pre treatment	Post treatment	Notes
Duct insulation	Uninsulated	R-19	Consistent with Smart Saver program requirements
Duct sealing	26% leakage	8% leakage	Duct leakage assumptions used in CA for Title 24 and utility program design. Evenly distributed between

			supply and return

The unit energy and demand savings depend on the heating fuel, heating system, cooling system and duct treatment as follows:

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System None

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
All	0	0	0

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System Central AC

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	384	0.10	0
Seal	466	0.25	0

Heating Fuel Any
Heating System Heat Pump
Cooling System Heat Pump

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	1,520	0.48	0.0
Seal	2,422	0.78	0.0

Heating Fuel Gas, propane or oil
Heating System Furnace
Cooling System None

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	0.0	0.0	17.3
Seal	0.0	0.0	16.5

Heating Fuel Gas, propane or oil
Heating System Furnace
Cooling System Central AC

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	384	0.10	17.3
Seal	466	0.25	16.5

Heating Fuel Electricity
Heating System Furnace
Cooling System None

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	3,917	3.13	0.0
Seal	3,798	2.98	0.0

Heating Fuel Electricity
Heating System Furnace
Cooling System Central AC

Duct treatment	ΔkWh/unit	ΔkW/unit	Δtherm/unit
Insulate	4,285	3.18	0.0
Seal	4,211	3.18	0.0

Installed a New AC or Heat Pump

Gross Summer Coincident Demand Savings
$\Delta kW_S = (\Delta kW/unit) \times DF_S \times CF_S$
AC = 1.138835274542
Heatpump = 1.552048338369

Gross Annual Energy Savings
ΔkWh = (ΔkWh/unit)
AC = 1375.059900166
Heatpump = 2568.123867069

Δtherm = (Δtherm/unit
AC = 0
Heatpump = 0

where:

ΔkW = gross coincident demand savings
ΔkWh = gross annual energy savings
DF = demand diversity factor
CF = coincidence factor
ΔkWunit = electricity demand savings per dwelling
ΔkWh/SF = electricity consumption savings per dwelling
Δtherm/SF = gas consumption savings dwelling

Coincidence and Diversity Factors:

DF = 0.8
CF = 1.0

The diversity and coincidence factors were taken from *Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2* (EPRI, 1993). These values are typical for residential air conditioners and heat pumps in summer peaking utilities.

Unit energy and demand savings data

The unit energy and demand savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. Unit energy savings are based on replacement of an existing SEER 8.5 air conditioner or heat pump. The unit energy and demand savings depend on the heating fuel, heating system, cooling system and replacement efficiency.

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System None

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
All	0	0	0

Heating Fuel Other
Heating System Any except Heat Pump
Cooling System Central AC

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
<11	674	0.92	0
12	944	1.28	0
13	1,213	1.65	0
14+	1,346	1.80	0

Heating Fuel Any
Heating System Heat Pump
Cooling System Heat Pump

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
<11	2,941	1.36	0
12	2,941	1.36	0
13	5,294	2.45	0
14+	6,496	2.98	0

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System None

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
All	0.0	0.0	0

Heating Fuel Gas, propane or oil
Heating System Any except Heat Pump
Cooling System Central AC

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
<11	674	0.92	0
12	944	1.28	0
13	1,213	1.65	0
14+	1,346	1.80	0

0

Heating Fuel Electricity
Heating System Any except Heat Pump
Cooling System None

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
All	0.0	0.0	0

Heating Fuel Electricity
Heating System Any except Heat Pump

Cooling System Central AC

Replacement efficiency	ΔkWh/unit	ΔkW/unit	Δtherm/unit
<11	674	0.92	0
12	944	1.28	0
13	1,213	1.65	0
14+	1,346	1.80	0

Installed a New Furnace

Gross Annual Energy Savings
Δtherm = (Δtherm/unit)
=16.34529540481

where:

Δtherm/SF `= gas consumption savings dwelling

Unit energy and demand savings data

The unit energy and demand savings were taken from DOE-2 simulations of the residential prototype building described at the end of this Appendix. The basic assumptions are listed below:

Furnace Type	AFUE
Baseline	0.78
Standard efficiency (metal flue pipe) replacement	0.80
Condensing furnace (plastic flue pipe) replacement	0.90

The unit energy and demand savings depend on the heating fuel, heating system type, and replacement furnace type:

Heating Fuel Gas, propane or oil
Heating System Furnace

Replacement efficiency	Δtherm/unit
Standard (metal pipe)	3.0
Condensing (plastic pipe)	18.8

Otherwise 0

Prototypical Building Model Description

The impact analysis for many of the HVAC related measures are based on DOE-2.2 simulations of a set of prototypical residential buildings. The prototypical simulation models were derived from the residential building prototypes used in the California Database for Energy Efficiency Resources (DEER) study (Itron, 2005), with adjustments make for local building practices and climate. The prototype "model" in fact contains 4 separate residential buildings; 2 one-story and 2 two-story buildings. The each version of the 1 story and 2 story buildings are identical except for the orientation, which is shifted by 90 degrees. The selection of these 4 buildings is designed to give a reasonable average response of buildings of different design and orientation to the impact of energy efficiency measures. A sketch of the residential prototype buildings is shown in Figure 9.

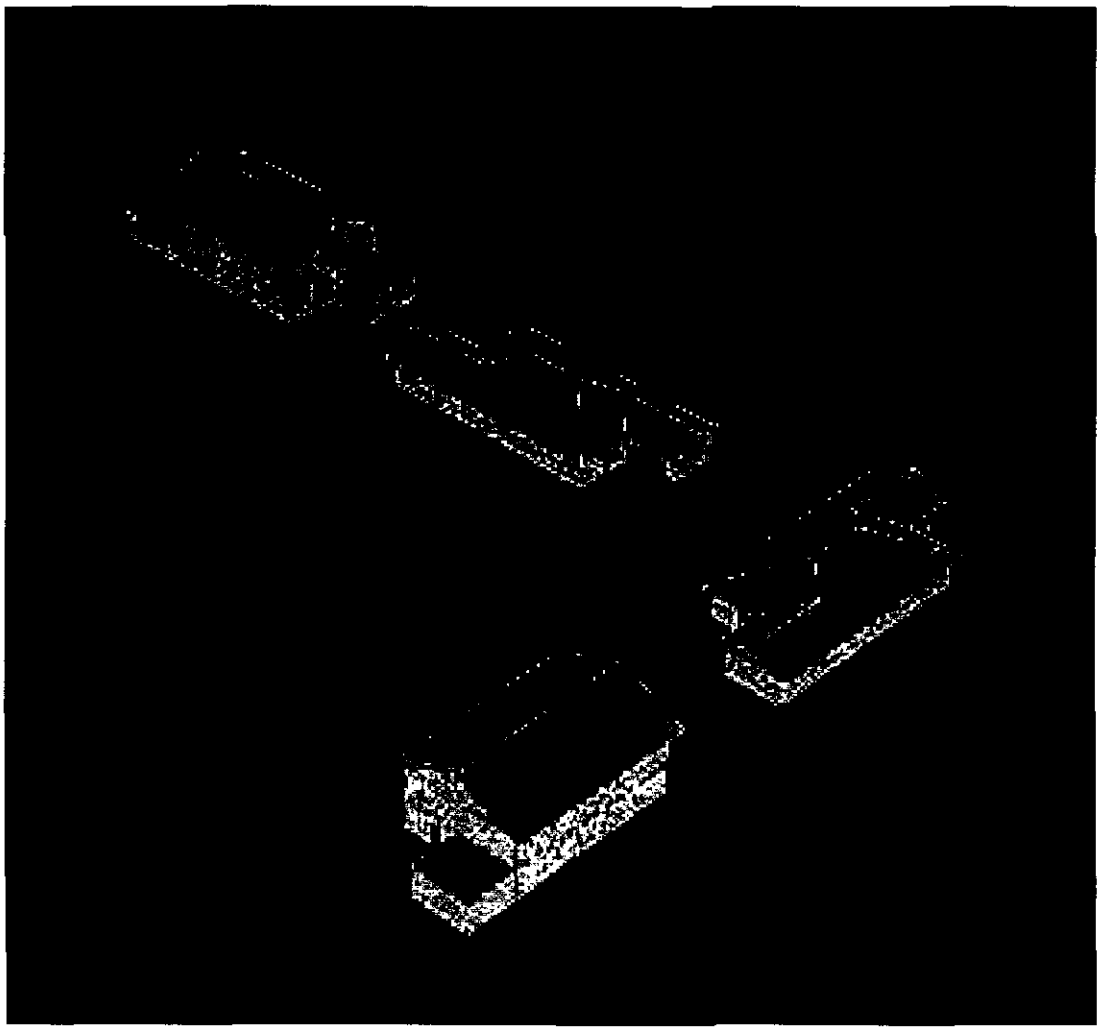

Figure 9. Computer Rendering of Residential Building Prototype Model

The general characteristics of the residential building prototype model are summarized below:

Residential Building Prototype Description

Characteristic	Value
Conditioned floor area	1 story house: 1465 SF 2 story house: 2930 SF
Wall construction and R-value	Wood frame with siding, R-11
Roof construction and R-value	Wood frame with asphalt shingles, R-19
Glazing type	Single pane clear
Lighting and appliance power density	0.51 W/SF average
HVAC system type	Packaged single zone AC or heat pump
HVAC system size	Based on peak load with 20% oversizing. Average 640 SF/ton
HVAC system efficiency	SEER = 8.5
Thermostat setpoints	Heating: 70°F with setback to 60°F Cooling: 75°F with setup to 80°F
Duct location	Attic (unconditioned space)
Duct surface area	Single story house: 390 SF supply, 72 SF return Two story house: 505 SF supply, 290 SF return
Duct insulation	Uninsulated
Duct leakage	26%; evenly distributed between supply and return
Cooling season	Charlotte – April 17 to October 6 Covington
Natural ventilation	Allowed during cooling season when cooling setpoint exceeded and outdoor temperature < 65°F. 3 air changes per hour

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Appendix B: Program Manager Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

_____

_____

_____

We are conducting this interview to obtain your opinions about and experiences with the Home Energy House Call program. We'll talk about the Home Energy House Call Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Home Energy House Call's current objectives. How have these changed over time?

2. In your opinion, which objectives do you think are best being met or will be met?

3. Are there any program objectives that are not being addressed or not being addressed as well as possible or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed?

4. Should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What program changes would you put into place as a result, and how would it affect the operations of the program?

Operational Efficiency

5. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program?

6. Please review with us how the Home Energy House Call operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

7. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

8. Describe the evolution of the Home Energy House Call Program. How has the program changed since it was it first started?

9. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?

10. Do you have suggestions for improving or increasing energy impacts?

11. Do you have suggestion for the making the program operate more smoothly or effectively?

Program Design & Implementation

12. *(If not captured earlier)* Please explain how the interactions between the auditors, customers and Home Energy House Call's management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?

13. Describe your quality control and tracking process.

14. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?

15. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support is obtained?

16. Describe Home Energy House Call's auditor program orientation training and development approach. Are auditors getting adequate program training and program information? What can be done that could help improve auditor effectiveness? Can we obtain training materials that are being used?

17. In your opinion, do the audits cover enough different kinds of energy efficient products or recommendations?

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 20b. What other products or equipment should be included? Why?

18. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?

19. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?

20. Overall, what about the Home Energy House Call program works well and why?

21. What doesn't work well and why? Do you think this discourages participation or interest?

22. Can you identify any market, operational or technical barriers that impede a more efficient program operation?

23. In what ways can these operations or operational efficiencies be improved?

24. In what ways can the program attract more participants?

25. How do you make sure that the best information and practices are being used in Home Energy House Call operations?

26. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

27. If you had a magic wand, what one thing would you change and why?

28. Are their any other issues or topics you think we should know about and discuss for this evaluation?

Appendix C: Participant Survey Protocol

The questions below require mostly short, scaled replies from the interviewee, and not all questions will be asked of all participants. This interview should take approximately 10 to 15 minutes.

Home Energy House Call Program

Participant Survey

Contact Module
SURVEY INTRODUCTION

If Home Energy House Call participant, then contact for survey. Use seven attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. (Sample size N =150-200)

SURVEY

Introduction

Note: Only read words in bold type.

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer survey about the Home Energy House Call Program. May I speak with _____ please?
If person talking, proceed. If person is called to the phone reintroduce.
If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 6:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 7:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after seventh attempt.

We are conducting this survey to obtain your opinions about the Home Energy House Call Program. Duke Energy's records indicate that you participated in the Home Energy House Call Program. We are not selling anything. The survey will take about 10 minutes and your answers will be confidential, and will help us to make improvements to the program to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. **Do you recall participating in the Home Energy House Call Program?**

1. ❑ Yes, *begin* → *Skip to Q3.*
2. ❑ No,
99. ❑ DK/NS

This program was provided through Duke Energy. In this program, you registered to receive a home energy audit. In return, the auditors provided you with custom energy-saving recommendations for you and your home, and you were provided with a free energy efficiency kit with 10 measures, such as a low-flow showerhead, CFLs, and outlet gaskets.

Do you remember participating in this program?

1. ❑ Yes, *begin* → *Go to Q2.*
2. ❑ No,
99. ❑ DK/NS

If No or DK/NS terminate interview and go to next participant.

2. Please think back to the time when you were deciding to participate in the Home Energy House Call program. What factors motivated you to participate? ***(do not read list, place a "1" next to the response that matches best)***

1. ____ The audit
2. ____ The energy efficiency kit
3. ____ The program incentives
4. ____ The technical assistance from the auditor
5. ____ Recommendation of someone else (*Probe*: **Who?**_____)
6. ____ Wanted to reduce energy costs
7. ____ The information provided by the Program
8. ____ Past experience with this program
9. ____ Because of past experience with another Duke Energy program
10. ____ Recommendation from other utility program

i. (*Probe*: **What program?** _____)

11. ____ Recommendation of family/friend/neighbor
12. ____ Advertisement in newspaper (*Probe:* **For what program?** _____)
13. ____ Radio advertisement (*Probe:* **For what program?** _____)
14. ____ Other (SPECIFY)

_____

15. ____ Don't know/don't remember/not sure (DK/NS)

If multiple responses: 2.a. **Were there any other reasons?** *(number responses above in the order they are provided - Repeat until 'no' response.)*

Free-Ridership Questions

3. **Before you heard about the Home Energy House Call from Duke Energy, had you already been considering getting a home energy audit?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

4. **If the audit from Duke Energy's Home Energy House Call Program had not been available, would you still have:**

4a. **Purchased an audit?**

1. ❑ Yes
2. ❑ No – *skip to question 5*
3. ❑ Don't Know – *skip to question 5*

4b. **Would you have purchased the audit within the next year?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

5. **Now I'd like to talk about the energy efficiency kit that you received for participating in the Home Energy House Call program. I'm going to read a list of the items included in the kit, and for each one, please tell me if you have installed the item. Are you using the…**

5a. **15-watt CFL** ❑ Yes – *triggers follow up questions 6a-6d.*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 6a-6d.*
❑ No ❑ Maybe/DK

❑ DK

5b. **20-watt CFL** ❑ Yes – *triggers follow up questions 6a-6d.*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 6a-6d.*
❑ No ❑ Maybe/DK

❑ DK

5c. **Low-flow showerhead** ❑ Yes – *triggers follow up questions 7a-7d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 7a-7d.*
❑ No ❑ Maybe/DK

❑ DK

5d. **kitchen faucet aerator** ❑ Yes – *triggers follow up questions 8a-8d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 8a-8d.*
❑ No ❑ Maybe/DK

❑ DK

5e. **bathroom faucet aerator** ❑ Yes – *triggers follow up questions 8a-8d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 8a-8d.*
❑ No ❑ Maybe/DK

❑ DK

5f. **outlet gaskets** ❑ Yes – *triggers follow up questions 9a-9d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 9a-9d.*
❑ No ❑ Maybe/DK

❑ DK

5g. **window shrink kit** ❑ Yes – *triggers follow up questions 10a-10d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 10a-10d.*
❑ No ❑ Maybe/DK

❑ DK

5h. **weather stripping** ❑ Yes – *triggers follow up questions 11a-11d*

❑ No **Do you plan on using this item?** ❑ Yes – *triggers 11a-11d.*
❑ No ❑ Maybe/DK

❑ DK

6a. **Did you have any CFLs installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

6b. **Were you planning on buying <additional> CFLs for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed in all available sockets – *skip to next series*

6c. **Have you purchased any CFLs since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 6d. **How many?** _____

7a. **Did you have any low-flow showerheads installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

7b. **Were you planning on buying a low-flow showerhead for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed in all showers – *skip to next series*

7c. **Have you purchased any additional low-flow showerheads since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 7d. **How many?** _____

8a. **Did you have any faucet aerators installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

8b. **Were you planning on buying any faucet aerators for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed in all available faucets – *skip to next series*

8c. **Have you purchased any additional faucet aerators since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 8d. **How many?** _____

9a. **Did you have any outlet gaskets installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

9b. **Were you planning on buying any outlet gaskets for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed in all available outlets – *skip to next series*

9c. **Have you purchased any additional outlet gaskets since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 9d. **How many?** _____

10a. **Did you have any window shrink kits installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

10b. **Were you planning on buying any window shrink kits for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed in all available windows – *skip to next series*

10c. **Have you purchased any additional window shrink kits since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 10d. **For how many windows?**

_____

11a. **Did you have any weather stripping installed in your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ DK

11b. **Were you planning on buying any weather stripping for your home before you received the kit from the Home Energy House Call program?**

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed around all available doors – *skip to next series*

11c. **Have you purchased any additional weather stripping since receiving the kit from Home Energy House Call?**

❑ Yes ❑ No ❑ DK

If yes, 11d. **For how many doors?**

_____

Spillover Questions

12. **Since you participated in the Home Energy House Call Program, have you purchased and installed any other type of energy efficiency equipment or made energy efficiency improvements in your home that were recommended by the audit report?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

13. **What type and quantity of high efficiency equipment did you install on your own?** *PROBE TO GET EXACT TYPE AND QUANTITY AND LOCATION*

Type 1: _____ Quantity 1: _____ Location 1: _____
Type 2: _____ Quantity 2: _____ Location 2: _____
Type 3: _____ Quantity 3: _____ Location 3: _____
Type 4: _____ Quantity 4: _____ Location 4: _____

14. **Was this improvement suggested by the home energy audit provided to you through the Home Energy House Call program?**

Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK

15. *For each type listed in 13 above,* **How do you know that this equipment is high efficiency? For example, was it Energy Star rated?**

Type 1: _____
Type 2: _____
Type 3: _____
Type 4: _____

I'm going to read a statement about this equipment that you purchased on your own. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

16. **My experience with the Home Energy House Call Program in** <2006, 2007, 2008> **influenced my decision to install** <Type 1/Type 2/Type 3/Type 4> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

17. **What other actions, if any, have you taken in your home to save energy and reduce utility bills at least in part as a result of what you learned in this program?**
Response:1 _____

Response:2 _____

Response:3 _____

Response:4 _____

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

18. **The web site's form for getting the kit was easy to understand and complete.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

19. **Scheduling the home energy audit was easy to do.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

20. **The interactions and communications I had with the energy auditor were satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

21. **The energy auditor was friendly, helpful, and knowledgeable.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

22. **The audit report was easy to read and understand.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

23. **The recommendations in the audit report provided new ideas that I was not previously considering.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

24. **The recommendations in the audit report confirmed by thinking and increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

25. **The interactions and communications I had with Duke Energy staff was satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

26. **The measures I installed from in the energy efficiency kit were of satisfactory quality.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

27. **Overall I am satisfied with the program.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

28. What additional services would you like the program to provide that it does not now provide?
Response:

_____

_____

29. Are there any other things that you would like to see changed about the program?

Response:

_____

30. **What do you think can be done to increase people's interest in participating in the Home Energy House Call Program?**

Response:1 _____
Response:2 _____
Response:3 _____
Response:4 _____

32. What do you like most about this program?

Response:

_____

33. What do you like least about this program?

Response:

_____

Energy Efficiency Website Program

Impact Evaluation

Reviewed for
Duke Energy
139 East Fourth Street
Cincinnati, OH 45201

September 15, 2008

Submitted by:
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TECMARKET Works

This study was conducted via a joint evaluation effort between Duke Energy and TecMarket Works. Duke Energy staff obtained the survey data and estimated the energy savings from the survey responses using the savings calculations developed by the TecMarket Works and Building Metrics analysis team.

TecMarket Works reviewed the survey data and the energy estimation approach to confirm the objectivity and accuracy of the savings estimates and adjusted the findings to account for self selection bias. This report provides the results of that evaluation collaboration.

Summary of Findings

Overall, customers are satisfied or very satisfied with the energy efficiency website (52.7% satisfied), energy efficiency kit (56.8% very satisfied), and the overall energy efficiency program (46.6% satisfied). Customers' reasons for visiting the site were most likely to learn how to reduce their energy costs or to obtain the energy efficiency kit. Suggestions for improving the energy efficiency website and overall program include having a website that is more adaptable to a particular customer's home characteristics, lifestyle and energy usage; making the website content more visible and transparent from the homepage; and add additional links to sections of the website to limit the need to move back through several webpages in order to click the next link in a list. Finally, customers would like to see additional tips and suggestions, and would also be interested in a do-it-yourself section for those customers who are more "handy" and could undertake more labor intensive energy saving measures on their own.

Customers were most likely to have installed the CFLs before receiving the energy efficiency kit, and were most likely to install the CFLs, along with the aerators, after receiving the energy efficiency kit. Customers were least likely to install the window shrink fit.

Of the actions and tips, customers were most likely to follow the "change your furnace filter" tip, although this item did not generate any savings. Customers were also more likely to manage their drapes in summer and winter, and lower their thermostat in winter for energy savings. The tips and actions customers were least likely to follow included installing a heat pump, installing dual heating, and installing doors on the fireplace.

Total savings for the energy efficiency kit installation and website tips and actions are presented in the table below, along with final savings. Total final savings accounting for freeridership and website usefulness are 138.71 kW; 1,253,297 kWh; and 38,152.1 Therm.

Table 1. Final Total Energy Efficiency Savings

	kW	kWh	Therm
Kit Savings	11.88	137,469	5479.2
Actions/Tips Savings	126.83	1,115,828	32,672.9
Total Savings	**138.71**	**1,253,297**	**38,152.1**

Recommendations

1. If cost considerations arise, consider offer kits to site visitors that fit into specific market segments that are more likely to install the kit's measures as the web site becomes more popular. Key demographics can be pinpointed using the information collected for this report.

2. Participation can be increased through advertising of the website. This can be done through bill inserts, targeted emails, or external advertising (radio, TV, newspapers).

Introduction

This document evaluates Duke Energy's Energy Efficiency website program, as administered in Ohio. The program provides energy savings tips through a website and allows the customer to request an energy efficiency starter kit. The program manager is responsible for looking at weekly activity on the website, and submits all requests for the energy efficiency kits to the vendor, and also verifies that the requests are from customers that are eligible to receive a kit.

The evaluation stems from a web-based survey emailed to customers who visited the Duke Energy Efficiency website and requested an energy efficiency kit. The report is divided into four sections: the overall website program, energy efficiency kit measures, installations and repairs made from website tips, and actions taken as a result of website tips.

One aspect of visiting the Energy Efficiency website is using the Home Energy Calculator. The Home Energy Calculator allows customers to input specific information about their home and read an output describing their energy usage. Customers can change their selections on the calculator to determine how lifestyle or technology changes could affect their energy usage. After using the Home Energy Calculator, customers see a link to request an energy efficiency kit to be sent to their home. Customers that used the Home Energy Calculator and then requested the energy efficiency kit were solicited for the online survey.

In the survey, customers were asked to describe their use of the measures from the energy efficiency kit and indicate which measures they installed. Customers were also asked questions regarding appliances they may have purchased, installations/repairs they may have made, or actions they may have taken after reading tips on the website. Customers were also asked questions to determine their overall satisfaction with the Energy Efficiency website and the Energy Efficiency website program.

The survey was developed by Duke Energy, using a sample survey provided by TecMarket Works, as well as a previous Duke Energy Energy Efficiency website survey used in Kentucky. The survey was administered by Duke Energy using an online survey host. Duke Energy also collected and analyzed the data, with assistance from Integral Analytics. TecMarket Works reviewed and approved the final evaluation written by Duke Energy.

Methodology

Survey

The online customer surveys were developed from a sample survey developed by TecMarket Works, as well as a previous Energy Efficiency website survey developed by

Duke Energy for use in Kentucky. The survey asked customers a series of questions about each of the items the customer received in the energy efficiency kit to determine how the customer has used the item as well as to determine energy savings as a result of using of the item. The survey also asks customers about any new appliances or installations they may have added to their home as a result of visiting the website and reading the energy efficiency tips. Customers were asked not only if they have installed the item, but also how influential the website was in their decision to install the item. Customers were asked similar questions about any actions they may have taken as a result of reading the energy efficiency tips on the website (such as managing their drapes or lowering their thermostat). Finally, the survey asked questions regarding the website content (including the Home Energy Calculator) as well as overall satisfaction with the Energy Efficiency website. The survey questions are found in a separate document, entitled "Appendix A. Energy Efficiency Website Survey".

Once the survey content was finalized, the survey and skip patterns were coded into Sawtooth software[1]. The survey was then uploaded to be emailed using silverPOP[2]. A random sample of 1000 customers who visited the website and requested the energy efficiency kit was obtained. The customers in the sample were emailed a link and a passcode which would allow them to access the online survey. The survey was "live" online and able to accept customer input for 14 consecutive days.

Survey Response

The survey access information was successfully emailed to 932 customers out of 2,613 that received the energy efficiency kits from September 2007 through end of June 2008, after bounce-backs, duplicates, etc. were removed. 154 surveys were returned, for a 16.5% response rate.

Data Analysis

The survey data was obtained from the software and cleaned and coded into SPSS[3] and Microsoft Excel.

Impact Estimation

Impacts were estimated using survey responses using engineering algorithms developed by TecMarket Works and BuildingMetrics for the Kentucky Personalized Energy Report (PER) impact evaluation. The Kentucky PER offers an identical energy efficiency kit as a part of the program, and the energy efficiency tips offered on the website are similar to those offered by the PER, so the Energy Efficiency kit impacts as well as the impacts of utilizing the tips and taking the actions recommended on the website are calculated directly using the algorithms developed by the TecMarket Works/BuildingMetrics Team and customer characteristics and responses from the Energy Efficiency website survey.

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[1] Sawtooth Software SSI Web version 6.
[2] silverPOP Marketer, version 7.
[3] Statistical Package for the Social Sciences, version 15.0.

The engineering algorithms developed by the TecMarket Works/BuildingMetrics Team are described in Appendix B, which is a separate document entitled "Appendix B. Impact Estimation Algorithms". The algorithms use DOE-II residential software modeling algorithms and location-based weather data[4].

[4] The weather data found in the Appendix references the city of Covington, KY for local weather data. This location is used for all local area weather data for Ohio and Kentucky and is an accurate source for weather data in the Ohio and Kentucky service territories.

Overall Website Program Satisfaction

Customers were asked to assess their overall experiences with the content of the Energy Efficiency website by answering questions both at the beginning and end of the survey. Overall, only 3.9% of customers did not recall visiting the Energy Efficiency website to request the energy efficiency kit. Reasons for not recalling receipt of the energy efficiency kit may be that the customer who received the survey was not the same person who installed the energy efficiency kit in their home, or that the customer did not request the energy efficiency kit. Customers who responded that they do not recall their visit to the website were directed by a skip pattern to answer only the Home Profile Questions at the end of the survey.

Do recall visiting the Duke Energy website to request an energy efficiency kit?

Yes	No	Total
148	6	154
96.1%	3.9%	100.0%

Overall Motivations

Motivations for visiting the website included wanting to reduce energy costs or to receive the energy efficiency kit offered (56.8% and 50.7%, respectively). The least motivating factor for consumers was recommendations from other utility programs (0.7%), followed closely by advertisement in newspaper and past experience with another Duke Energy program (2%). Other motivating factors that customers listed included other forms of advertisement (television, booth at an event/fair, another website) and wanting to "be green". Although the percentages for these other responses are also small compared to the most highly motivating factors, Duke Energy may want to consider addressing other forms of advertisement, as well as the other environmentally-related advantages of participating in the program to the consumer, besides reducing energy costs.

What factors motivated you to visit this site and request the energy efficiency kit?

Motivation	Motivating factor	Non-Motivating factor	Total
The energy efficiency kit offered	75	73	148
	50.7%	49.3%	100.0%
Wanted to reduce energy costs	84	64	148
	56.8%	43.2%	100.0%
The information provided by the website	32	116	148
	21.6%	78.4%	100.0%
Because of past experience with another Duke Energy program	3	145	148
	2.0%	98.0%	100.0%

Recommendation from other utility programs	1	147	148
	.7%	99.3%	100.0%
Recommendation of family/friend/neighbor	43	105	148
	29.1%	70.9%	100.0%
Advertisement in newspaper	3	145	148
	2.0%	98.0%	100.0%
Radio advertisement	2	146	148
	1.4%	98.6%	100.0%
Information from my bill	26	122	148
	17.6%	82.4%	100.0%
Don't know	4	144	148
	2.7%	97.3%	100.0%

Other motivating factors for visiting the website and requesting the energy efficiency kit:

Motivation	Count	Col %
None	145	94.2%
Another website	2	1.2%
Wanted to give as a gift	1	.6%
Interested in alternative energy/ sustainability/"being green"	3	1.8%
School project	1	.6%
Speaking of Women's Health booth info	1	.6%
Television program	1	.6%
Total	154	100.0%

Usefulness of Website Components

Customers overwhelmingly rated the usefulness of the Energy Efficiency website's information about energy use in their home at a 3 or above on a 5-point scale, with 68.3% of customers rating the Energy Efficiency website at a 4 or above in this category. The component of the website customers were least likely to visit was the "For Kids" section, while customers were most likely to visit the Home Energy Calculator, which was expected given that customers had to use the Home Energy Calculator in order to request the energy efficiency kit. Interestingly, however, only 86.5% of customers recall visiting the Home Energy Calculator, suggesting that customers may not associate the name "Home Energy Calculator" with the web tool they used to request their energy efficiency kit. The next most visited portion of the website was the Appliance Calculator, with 77.0% of customers visiting that component of the website.

The component of the website customers found the most useful were the Home Energy Calculator and the Appliance calculator (both 23.0% "very useful"). Most of the time, customers rated a component of the website they visited at least "somewhat useful" but not as high as "very useful".

Overall, how useful was the website in providing you with information about energy use in your home?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
0	4	43	60	41	148
.0%	2.7%	29.1%	40.5%	27.7%	100.0%

Which components in the website did you review and how useful were they?

Component	Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Did Not Visit	Total Visits to Component	Total
Home energy calculator	2	4	43	45	34	20	128	148
	1.4%	2.7%	29.1%	30.4%	23.0%	13.5%	86.5%	100.0%
Appliance calculator	2	5	42	31	34	34	114	148
	1.4%	3.4%	28.4%	20.9%	23.0%	23.0%	77.0%	100.0%
Lighting calculator	2	3	32	41	33	37	111	148
	1.4%	2.0%	21.6%	27.7%	22.3%	25.0%	75.0%	100.0%
Interactive home	3	13	31	29	15	57	91	148
	2.0%	8.8%	20.9%	19.6%	10.1%	38.5%	61.5%	100.0%
Energy library: Home energy system	4	9	24	36	10	65	83	148
	2.7%	6.1%	16.2%	24.3%	6.8%	43.9%	56.1%	100.0%
Energy library: Fundamentals of electricity	6	6	27	31	9	69	79	148
	4.1%	4.1%	18.2%	20.9%	6.1%	46.6%	53.9%	100.0%
For kids	17	6	17	11	3	94	54	148
	11.5%	4.1%	11.5%	7.4%	2.0%	63.5%	36.5%	100.0%

Home Energy Calculator Usefulness and Satisfaction

In order to receive the energy efficiency kit as a part of the website program, customers had to visit and use the Home Energy Calculator on the website. Customers were asked in more detail about their visit to the Home Energy Calculator. Most customers stated that they looked at the Home Energy Calculator report details and felt that the details reasonably reflected their usage. Similarly to the component as a whole, a majority of customers rated the Home Energy Calculator report at least somewhat useful, but not as

high as "very useful".

Did you look at the Home Energy calculator report details?	Yes	No	Total
	114	14	128
	89.1%	10.9%	100.0%
Did you feel that the estimate from the home energy calculator reasonably reflected your usage?	Yes	No	Total
	95	19	114
	83.3%	16.7%	100.0%

Was the [Home Energy Calculator] report very useful?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
4	5	44	37	24	114
3.5%	4.4%	38.6%	32.5%	21.1%	100.0%

Overall Website Usefulness and Satisfaction

Overall, customers found the Energy Efficiency website easy to navigate to get the information they wanted. Even so, a few customers had recommendations to make the energy efficiency website better. In general, the suggestions included content more generalized to the user, and some website navigation changes. These changes should be taken into consideration as future website upgrades and content updates are made.

Was the site easy to navigate to get to the information you wanted?

Yes	No	Total
142	6	148
95.9%	4.1%	100.0%

What changes would you recommend to make the site better? (Responses are summarized)

Changes	Count	%
None	150	87.00%
Relate site content directly to customers' energy consumption; inform how much energy each appliance/light is using each month.	1	0.60%
Links to programs across submenus; remove need to return to main menu and enter another submenu to find a	1	0.60%

different program		
More information with specific tips and actions to be taken.	1	0.60%
Would prefer highly visible navigator at Home Page.	1	0.60%
Total	154	100.00%

Overall, the website does a "satisfactory" job of causing consumers to take energy conservation actions that had not occurred to them in the past (41.2% rated the website as between "somewhat" and "very effective"), and over half of customers give the website a 4 or above (on a 5-point scale) in this category. Additionally, over half of customers stated that the website was "very effective" in confirming actions they had already taken were the correct thing to do. This suggests that the current Energy Efficiency website contains a good mix of tips and suggestions that customers have heard of through other sources of information and can confirm on Duke Energy's website, as well as tips that customers are interested in implementing but may not have heard of in the past.

Overall, how much did the website alone cause you to take energy conserving actions that you had not thought of prior to visiting the site?

Not at All 1	2	Somewhat 3	4	Very Much 5	Total
10	12	50	61	15	148
6.8%	8.1%	33.8%	41.2%	10.1%	100.0%

If you had energy conserving actions that you did before visiting the website, how effective was the website in confirming that these actions were the correct thing to do?

N/A	Not at all Effective 1	2	Somewhat 3	4	Very Effective 5	Total
3	4	2	19	46	74	148
2.0%	2.7%	1.4%	12.8%	31.1%	50.0%	100.0%

Did the website inspire you to take these actions sooner?

Yes	No	No, but plan to	N/A	Total
106	33	5	1	145
73.1%	22.8%	3.4%	.7%	100.0%

Customers found the kit to be similar in usefulness to the website, stating that the kit was between "somewhat" and "very much" an influence in customers taking actions they had not thought of in the past. Looking at the installation rates of the kit items in more detail

in the next section will determine which items consumers have most frequently not installed in the past, but did implement after receiving the kit.

How much did the addition of the kit cause you to take energy conserving actions that you had not thought of prior to visiting the site?

Not at All 1	2	Somewhat 3	4	Very Much 5	Total
6	8	33	60	41	148
4.1%	5.4%	22.3%	40.5%	27.7%	100.0%

Overall Satisfaction with Energy Efficiency website and kit

Overall, half of customers strongly agreed that the items from the energy efficiency kit were of satisfactory quality, while over 80% of consumers rated the kit items at a 4 or above.

The items I installed from the energy efficient website were of satisfactory quality?

Strongly Disagree 1	2	Somewhat 3	4	Strongly Agree 5	Total
4	3	15	52	74	148
2.7%	2.0%	10.1%	35.1%	50.0%	100.0%

Overall, a majority of the customers were satisfied with both components of the Energy Efficiency website program, as well as the overall energy efficiency program itself. The energy efficiency kit received the most "very satisfied" ratings, at 56.8%. The most frequent rating for the Energy Efficiency website was a 4 (52.7%), while the most frequent rating for the overall program was also a 4 (46.6%).

Overall, how satisfied are you with the following?

	Not Satisfied 1	2	Somewhat 3	4	Very Satisfied 5	Total
Energy efficiency website	3	3	26	78	38	148
	2.0%	2.0%	17.6%	52.7%	25.7%	100.0%
Energy efficiency kit	4	3	14	43	84	148
	2.7%	2.0%	9.5%	29.1%	56.8%	100.0%
Overall energy efficiency program	3	1	21	69	54	148
	2.0%	.7%	14.2%	46.6%	36.5%	100.0%

If a customer answered three or below for the website, kit, or program, they were asked to state why they were not satisfied and to identify additional factors that may make the website more useful or helpful to customers. They were also asked to state, overall, any

additional comments they had. Many customers had multiple comments/suggestions.

Please explain why you were not satisfied:

Comment	Count
Already knew website tips/website recommendations are common sense	3
Actions described on website I have already taken or do not apply to me	1
Availability of products described on site not in store	1
Kit items were broken/ kit was of unsatisfactory quality	7
Kit never received	3
Didn't like kit items	3
Website too general with actions/tips	2
Website layout is awkward or confusing	2
N/A	2

Please let us know if you have any additional comments:

Comments
Update the website with an advanced DIY section for those who are handy or have technical skills
Great program
I am interested in other programs Duke offers
Provide a list of companies who offer home energy audits
No comments

Energy Efficiency Kit Measures

The energy efficiency kit the customer received contained the following items to install:

- energy efficient showerhead,
- kitchen faucet aerator,
- bathroom faucet aerator,
- 15W mini compact fluorescent bulb,
- 20W mini compact fluorescent bulb,
- weather stripping,
- window shrink fit kit, and
- insulating gaskets for outlet boxes or wall switches.

Customers were asked if they had installed any of the measures included in the kit before visiting the website and receiving their kit. The most common items that customers had previously installed were the 15W and 20W bulbs (62.8% and 60.8%), while half of customers requesting the kit had installed weather stripping in the past. The higher incidence of CFL bulbs being installed previously compared to other items suggests more frequent exposure to CFLs as an energy saving item, whether through Duke Energy's EnergyStar programs or other information resources.

Table 2. Frequency of kit item pre-installation.

	Yes	No	Total
Energy efficient (low flow) showerhead	58 39.2%	90 60.8%	148 100.0%
Kitchen faucet aerator	65 43.9%	83 56.1%	148 100.0%
Bathroom faucet aerator	47 31.8%	101 68.2%	148 100.0%
15 Watt mini compact fluorescent lights	93 62.8%	55 37.2%	148 100.0%
20 Watt mini compact fluorescent lights	90 60.8%	58 39.2%	148 100.0%
Weather stripping	74 50.0%	74 50.0%	148 100.0%
Window shrink fit	25 16.9%	123 83.1%	148 100.0%
Insulating gaskets on outlet boxes or wall switches	56 37.8%	92 62.2%	148 100.0%

Installation of Kit Items

The following sections describe the installation and related savings for each kit item. As mentioned previously, savings are calculated using the engineering algorithms developed for the KY Energy Efficiency website and KY Personalized Energy Report programs. The table below summarizes the kit installations made by customers who visited the website. The most frequently installed item was the 15W bulb, followed by the 20W bulb, and the kitchen faucet aerator. The least installed item was the window shrink fit, with almost half of customers not installing. Most customers who planned to install items later planned to install the weather stripping or the insulating gaskets.

Table 3. Frequency of kit item installation.

	Yes	No	No, but plan to	N/A	Total
Energy efficient (low flow) showerhead	78 52.7%	35 23.6%	31 20.9%	4 2.7%	148 100.0%
Kitchen faucet aerator	89 60.1%	27 18.2%	25 16.9%	7 4.7%	148 100.0%
Bathroom faucet aerator	74 50.0%	35 23.6%	30 20.3%	9 6.1%	148 100.0%
15 Watt mini compact fluorescent lights	121 81.8%	7 4.7%	15 10.1%	5 3.4%	148 100.0%
20 Watt mini compact fluorescent lights	118 79.7%	8 5.4%	17 11.5%	5 3.4%	148 100.0%
Weather stripping	58 39.2%	38 25.7%	40 27.0%	12 8.1%	148 100.0%
Window shrink fit	30 20.3%	71 48.0%	32 21.6%	15 10.1%	148 100.0%
Insulating gaskets on outlet boxes or wall switches	73 49.3%	24 16.2%	40 27.0%	11 7.4%	148 100.0%

Kit Item Savings

Savings for kit items were calculated using the impact algorithms mentioned previously in the report. Savings were calculated for each install of the kit items that qualified for savings for that measure, taking into account HVAC characteristics and characteristics of the kit item installed. The estimated total savings for each of the kit items are described below.[5] Final savings are described in the summary table later in the report.

Low-Flow Showerhead

52.7% of customers installed the low-flow showerhead. For a majority of customers, 5 to 15 showers are taken per week using the low-flow showerhead, with most customers stating they take between 5 and 10 showers per week. Customers who stated they take zero showers per week were not included in the savings calculations. A majority of customers state that the length of their showers is about the same as before installing the low-flow unit. Nearly 75% of customers who installed the showerhead state that they were not planning on installing a low flow showerhead before receiving the kit, suggesting the showerhead is a useful kit item that generates new energy savings for the customer.

[5] Savings for the four customers who installed the dual heating system were not calculated due to lack of detail.

Installed Showerhead		
Yes	78	52.7%
No	35	23.6%
No, but plan to	31	20.9%
N/A	4	2.7%
Total	148	100.0%
Number of Showers		
0-4	10	12.8%
5-10	29	37.2%
11-15	26	33.3%
16-20	6	7.7%
21+	7	9.0%
Total	78	100.00%
Length of Showers		
Longer	4	5.1%
Shorter	8	10.3%
About the same	66	84.6%
Total	78	100.0%
Were you already planning on installing an energy efficient (low flow) showerhead before you visited the website to get your free kit?		
Yes	16	20.5%
No	58	74.4%
No, already have them installed in all showers	4	5.1%
Total	78	100.0%

Energy savings are presented below. Overall, installation of the showerhead created a total savings of over 15000 kWh and over 1300 therm. A savings of 1.72 kW was also realized. On average, the installations of this item produced first-year savings of 207.04 kWh and 17.46 Therm per install.

Table 4. Low Flow Showerhead Savings

Low-Flow showerhead	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	76	1.72	15734.87	1327.27
Mean (per install)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.02	207.04	17.46

Most customers (88.5%) have not purchased any additional energy efficient showerheads since receiving the kit from the website. Of those that have, two thirds have purchased 2 showerheads, while one third of customers have purchased 1 showerhead. The frequency

of additional showerhead purchases is likely to be dependent on the number of showers in the customer's home.

Have you purchased any additional energy efficient (low flow) showerheads since receiving the kit from the website?		
Yes	9	11.5%
No	69	88.5%
Don't know	0	0.0%
Total	78	100.0%
How Many?		
1	6	66.7%
2	3	33.3%
Total	9	100.0%

Kitchen and Bathroom Faucet Aerators

Of the customers who installed the kitchen faucet aerator, just over half of customers stated they had to remove an aerator to install the new one (50.6%), while just under half of customers installing the bathroom aerator had to remove an old one (47.3%). Most of these customers that installed both the kitchen and bathroom faucet aerators stated the aerators were working well when they removed them. About half of customers stated the amount of water coming out of either new aerator was less than the old unit (53.3% kitchen, 57.1% bathroom).

Was there an aerator on your faucet you had to remove?			
Kitchen Aerator	Yes	45	50.6%
	No	44	49.4%
	Total	89	100.0%
Bathroom Aerator	Yes	35	47.3%
	No	39	52.7%
	Total	74	100.0%
Was the old aerator working well when you removed it?			
Kitchen Aerator	Yes	33	73.3%
	No	12	26.7%
	Total	45	100.0%
Bathroom Aerator	Yes	26	74.3%
	No	9	25.7%
	Total	35	100.0%
Would you estimate that the amount of water coming through the new aerator is:			
Kitchen Aerator	Less than the old unit	24	53.3%
	About the same	17	37.8%

	More than the old unit	4	8.9%
	Total	45	100.0%
Bathroom Aerator	Less than the old unit	20	57.1%
	About the same	15	42.9%
	More than the old unit	0	0.0%
	Total	35	100.0%

A high majority of customers were not planning on installing a faucet aerator before receiving the kit, suggesting that customers were either satisfied with the aerator they already had, or had not considered an aerator as an energy efficiency item.

Were you already planning on installing a new faucet aerator before you visited the website?			
Kitchen Aerator	Yes	14	15.7%
	No	73	82.0%
	No, already have them installed in all available faucets	2	2.2%
	Total	89	100.0%
Bathroom Aerator	Yes	6	8.1%
	No	67	90.5%
	No, already have them installed in all available faucets	1	1.4%
	Total	74	100.0%

For both the kitchen and bathroom aerators, installations for which the customer had to remove an old aerator to install the new aerator are not counted in the energy savings estimates, unless the customer stated that the old aerator was not working well. Customers who had installed an aerator previously are included in the calculation, as long as they did not have to remove an aerator to install the new one. Overall, total first-year energy savings for the aerators are over 1600 kWh and about 90 Therm.

Table 5. Aerator Savings

	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
Kitchen Aerator	53	0.01	946.92	43.19
Bathroom Aerator	47	0.009	757.54	46.52
Mean (per install)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
Kitchen Aerator		0.0002	17.87	0.81
Bathroom Aerator		0.0002	16.12	0.99

Nearly all customers have not purchased additional kitchen faucet aerators since visiting the website. This may reflect that many kitchens only have one faucet. In addition, less

than 18% of customers have purchased additional bathroom faucet aerators since receiving the kit from the website.

Have you purchased any additional kitchen faucet aerators since receiving the kit from the web site?		
Yes	2	2.3%
No	84	96.6%
Don't Know	1	1.1%
Total	87	100.0%
How many kitchen faucet aerators?		
1	1	50.0%
3	1	50.0%
Total	2	100.0%
Have you purchased any additional bathroom faucet aerators since receiving the kit from the website?		
Yes	13	17.6%
No	61	82.4%
Total	74	100.0%
How many bathroom faucet aerators?		
1	6	46.2%
2	6	46.2%
3	1	7.7%
Total	13	100.0%

15W and 20W Mini CFL Light Bulbs

The tables below describe customers who installed the 15 and 20 watt CFL bulbs included in the kit. Customers installing the 15W and 20W CFL bulb from the kit most frequently removed a 45-70W bulb. Customers who installed the 15W bulb stated the bulb was used 5-10 hours per day (51.2%), and was still in place (97.5%). Customers installing the 20W bulb stated that they use the bulb 5-10 hours per day (48.3%) and that the bulb is still in place (94.1%).

15W CFL		
Wattage of bulb removed		
<= 44	7	5.8%
45 – 70	70	57.9%
71 – 99	28	23.1%
>= 100	16	13.2%
Total	121	100.0%
Hours of Use per Day		

1-2	17	14.1%
3-4	32	26.4%
5-10	62	51.2%
11-12	2	1.7%
13-24	8	6.6%
Total	121	100.0%
Is the 15W CFL still in place?		
Yes	118	97.5%
No	3	2.5%
Total	121	100.0%

20W CFL		
Wattage of bulb removed		
<= 44	4	3.4%
45 – 70	52	44.1%
71 – 99	34	28.8%
>= 100	28	23.7%
Total	118	100.0%
Hours of Use per Day		
1-2	17	14.4%
3-4	37	31.4%
5-10	57	48.3%
11-12	3	2.5%
13-24	4	3.4%
Total	118	100.0%
Is the 20W CFL still in place?		
Yes	111	94.1%
No	7	5.9%
Total	118	100.0%

Savings calculations for the 15 and 20 watt CFL bulbs are presented below. Customers who have removed the bulb are not included in the savings calculations. The total savings for the 15W CFL are nearly 12,300 kWh, while the total savings for the 20W CFL are just over 11,700 kWh.

Table 6. CFL Savings

15W CFL	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	102	0.56	12287.71	-17.94
Mean (per install)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.0055	120.47	-0.18
20W CFL	Number	Total kW Savings	Total kWh Savings	Total Therm Savings

	of Installs			
	95	0.58	11709.42	-17.63
Mean (per install)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.0061	123.26	-0.19

Overall, about 60% of customers were planning on purchasing a CFL before they received the kit from the website. Customers who installed the 15W CFL stated that they were most frequently planning on purchasing 6-10 CFL bulbs, while customers installing the 20W stated they were planning on purchasing 3-5 bulbs.

15W CFL: Were you already planning on purchasing a CFL before you received the kit from the website?		
Yes	77	63.6%
No	41	33.9%
No, already have them installed in all available sockets	3	2.5%
Total	121	100.0%
How many were you planning on purchasing?		
1-2	4	5.2%
3-5	23	29.9%
6-10	33	42.9%
11+	17	22.0%
Total	77	100.0%

20W CFL: Were you already planning on purchasing a CFL before you received the kit from the website?		
Yes	70	59.3%
No	42	35.6%
No, already have them installed in all available sockets	6	5.1%
Total	118	100.0%
How many were you planning on purchasing?		
1-2	7	10.0%
3-5	32	45.7%
6-10	22	31.4%
11+	9	12.9%
Total	70	100.0%

Additional CFLs:

Customers were also asked if they had purchased and installed any additional CFLs since installing the bulbs from the kit. Almost two-thirds of customers stated they had purchased and installed additional bulbs, with most customers purchasing and installing 6-10 bulbs. This statement is similar to the bulbs that customers estimated they were planning on purchasing before they received the energy efficiency kit. The statistics for number of bulbs purchased and hours of use are also similar to those of the kit bulbs installed. Finally, most customers did not install the additional CFLs as a part of a major renovation to their home.

Have you purchased and installed additional CFLs since receiving the kit from the website?		
Yes	84	71.2%
No	33	28.0%
Don't know	1	0.8%
Total	118	100.0%
How many did you purchase?		
1-2	11	13.1%
3-5	21	25.0%
6-10	52	61.9%
11+	0	0.0%
Total	84	100.0%
Wattage of bulb removed		
<=44	5	6.0%
45-70	41	48.8%
71-99	28	33.3%
>=100	10	11.9%
Total	84	100.0%
Hours of Use per Day		
1-2	8	9.5%
3-4	16	19.0%
5-10	50	59.5%
11-12	3	3.6%
13-24	7	8.4%
Total	84	100.0%
Did you do this as part of a major renovation of your home?		
Yes	15	17.9%
No	69	82.1%
Total	84	100.0%

Weather Stripping

Customers were asked to list the feet of weather stripping used and number of doors the weather stripping was installed on. Customers who installed the weather stripping and

stated feet used most of the roll (68.6%), and those who stated number of doors most frequently used it on one door. Some customers stated both feet and doors.

How many feet of the 17 feet of weather stripping did you use?		
0	2	3.9%
1-5	6	11.8%
6-10	8	15.7%
11-17	35	68.6%
Total	51	100.0%
How many doors did you install the weather stripping on?		
0	2	4.5%
1	28	62.2%
2	12	26.7%
3	1	2.2%
4	1	2.2%
10	1	2.2%
Total	45	100.0%

Savings were estimated using feet of weather stripping used. When customers listed only number of doors, the average feet installed per door by customers who listed both feet and doors was used to estimate the number of feet used. Total savings for weather stripping were over 600 kWh and nearly 10 Therm.

Table 7. Weather Stripping Savings

Weather Stripping	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	51	0.18	607.45	9.47
Mean (per install)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.0035	11.91	0.19

Customers were divided almost equally regarding whether or not they had planned on installing weather stripping before receiving the weather stripping in the kit. Exactly half of customers stated "yes", while 48.3% stated "no". 1.7% of customers had a qualified "no" response, stating that they were not planning to install because weather stripping was already installed on all doors.

Two thirds of customers (66.7%) stated that they have not purchased any additional weather stripping since installing the weather stripping from the kit. Those that did purchase additional tended to purchase between 1 and 20 feet, and installed it on one door.

Were you already going to install weather stripping before you visited the website?		
Yes	29	50.0%
No	28	48.3%

No, already have them installed around all available doors	1	1.7%
Total	58	100.0%
Have you purchased any additional weather stripping since receiving the kit from the website?		
Yes	19	33.3%
No	38	66.7%
Total	57	100.0%
Feet		
1-20	8	44.5%
21-40	4	22.2%
41-60	6	33.3%
Total	18	100.0%
Doors		
1	5	35.7%
2	4	28.6%
3	3	21.4%
4	2	14.3%
Total	14	100.0%

Window Shrink Fit

Window characteristics of customers installing the window shrink fit kit are described below. Nearly two thirds of customers installing the kit (63.3%) installed the shrink kit on an average sized window. This window was likely to be a double pane window, with over half of customers listing this window type (53.3%).

Size of window		
Small	7	23.3%
Average	19	63.3%
Large	4	13.3%
Total	30	100.0%
Type of window		
Single pane window	8	26.7%
Single pane window w/ storm	6	20.0%
Double pane window	16	53.3%
Total	30	100.0%

Customer savings for installing the window shrink fit kit are below. Total savings were over 650 kWh and over 4 Therm .

Table 8. Window Shrink Fit Savings

Window Shrink Fit	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	26	0.34	675.14	4.71
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.01	25.97	0.18

Customers were almost equally divided regarding whether or not they were planning on installing a window shrink fit kit previously, with slightly fewer customers saying they had been planning on installing a kit. Customers who did plan on installing a kit previously were planning to install it most frequently on one to two windows. Two-thirds of customers who installed the window kit have not purchased additional kits since installing the kit they received from the website, suggesting that customers who had not been planning on installing shrink fit before were not always persuaded to use additional kits after installing the shrink fit they received from the website.

Were you already planning to install a window shrink fit kit before you visited the website?		
Yes	14	46.7%
No	16	53.3%
No, already have them installed in all available windows	0	0.0%
Total	30	100.0%
For how many windows?		
1-2	5	35.7%
3-4	2	14.3%
5-6	2	14.3%
7-8	2	14.3%
9-10	3	21.4%
Total	14	100.0%
Have you purchased additional window shrink fit kits since receiving the kit from the website?		
Yes	10	33.3%
No	20	66.7%
Total	30	100.0%
For how many windows?		
1-2	1	10.0%
3-4	5	50.0%
5-6	1	10.0%
7-8	1	10.0%
9-10	2	20.0%

Total	10	100.0%

Insulating Gaskets

Customers received 8 gaskets in the energy efficiency kit. Most customers installed 1-2 gaskets (40.0%), but nearly all the customers installed the majority of gaskets received in the energy efficiency kit.

Number Installed		
1-2	26	40.0%
3-4	20	30.8%
5-6	14	21.5%
7-8	5	7.7%
Total	65	100.0%

Total savings for the gaskets are listed below, and include over 650 kWh savings and over 10 Therm savings.

Table 9. Insulating Gaskets Savings

Insulating Gaskets	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	64	0.23	658.65	13.18
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.0011	3.06	0.06

Over half of customers (57.5%) had not been planning on installing gaskets before visiting the website, suggesting that this item is useful for customers who are looking for new/additional ways to create energy savings. However, a majority of customers (80.6%) have not purchased any insulating gaskets since receiving the energy efficiency kit. Those that did purchase more purchased 10 in most cases, suggesting they were purchasing enough gaskets to use on the remaining outlets in their home.

Were you already planning on installing gaskets before visiting the website?		
Yes	25	34.2%
No	42	57.5%
No, already have them installed in all available outlets	6	8.2%
Total	73	100.0%
Have you purchased any additional insulating gaskets since receiving the kit from the website?		

Yes	13	19.4%
No	54	80.6%
Total	67	100.0%
How many did you purchase?		
4	1	7.7%
5	1	7.7%
10	11	84.6%
Total	13	100.0%

Website Tips – Installation and Repairs

The Energy Efficiency website also lists tips and suggestions for customers to install energy efficient items in their home, or to repair existing items to help them save energy. The most frequently installed or repaired item after visiting the website was the furnace filter (75% "yes"), while the least frequent install or repair was to install a heat pump (87.8% "no"). Customers were most likely to say they plan to install attic insulation at a later date (8.1%).

Table 10. Frequency of Installation or Repair
Have you installed any of the following since visiting the website?

	Yes	No	No, but plan to	N/A	Total
Natural gas furnace	2	127	3	16	148
	1.4%	85.8%	2.0%	10.8%	100.0%
Heat pump	4	130	4	10	148
	2.7%	87.8%	2.7%	6.8%	100.0%
Central air conditioning	5	123	4	16	148
	3.4%	83.1%	2.7%	10.8%	100.0%
Insulated sidewalls	6	129	1	12	148
	4.1%	87.2%	.7%	8.1%	100.0%
Attic insulation	12	112	12	12	148
	8.1%	75.7%	8.1%	8.1%	100.0%
Heating or cooling duct insulation	6	122	7	13	148
	4.1%	82.4%	4.7%	8.8%	100.0%
Repaired or fixed holes in heating or cooling ducts	25	103	4	16	148
	16.9%	69.6%	2.7%	10.8%	100.0%
Furnace filter replacement	111	25	6	6	148
	75.0%	16.9%	4.1%	4.1%	100.0%
New refrigerator	17	114	8	9	148
	11.5%	77.0%	5.4%	6.1%	100.0%

Install New Furnace

Customers who installed a new furnace were asked to describe the characteristics of the furnace they installed. The two customers who installed a new furnace stated the exhaust exits out a plastic pipe in the side of the home. In addition, neither customer stated that they installed the furnace as a major renovation of their home.

While one customer stated the website was very useful in helping them to decide whether to install the furnace, the other customer stated that the website was not at all useful because they did not reference the website when deciding to install the furnace.

Furnace Characteristics		
the exhausts exit out a plastic pipe coming through the side of the home	2	100.0%
the exhausts go up a chimney similar to a standard efficiency unit	0	0.0%
Total	2	100.0%
Did you do this as part of a major renovation of your home?		
Yes	0	0.0%
No	2	100.0%
Total	2	100.0%

How useful was the website in determining whether or not to install a high efficiency unit in your house?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
1	0	0	0	1	2
50.0%	.0%	.0%	.0%	50.0%	100.0%

Please explain why you did not find the website very useful in determining whether to install a high efficiency unit in your house?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
0	0	0	1	1
.0%	.0%	.0%	100.0%	100.0%

Other – Please Explain:

Comment	Count	Total

I did not look at this information on the website	1	100.0%

Total savings were calculated for the two customers who installed the furnace using the data above. Total savings were 37.6 Therm, while mean savings were 18.8 Therm.

Table 11. New Furnace Savings

Install New Furnace	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	2	None	None	37.60
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		None	None	18.80

Install New Heat Pump

Of the four customers stating they installed a heat pump after visiting the website, two customers stated the heat pump was high efficiency, while two customers stated the heat pump installed was standard efficiency. Three of the four customers did not know the SEER number of their heat pump. In addition, no customers installed the heat pump as a part of a major renovation of their home.

Half of customers stated that the Energy Efficiency website was not useful in deciding to install the heat pump, while one customer stated it was minimally useful, and another stated the site was very useful. The customers who did not find the website useful stated they either did not look at the website, or they did not find information about heat pumps on the website.

Heat Pump Efficiency		
High Efficiency (>13 SEER)	2	50.0%
Standard Efficiency (<13 SEER)	2	50.0%
Total	4	100.0%
SEER Number		
<=11	0	0.0%
12	0	0.0%
13	0	0.0%
>=14	1	25.0%
Don't know	3	75.0%
Total	4	100.0%
Did you do this as part of a major renovation of your home?		
Yes	0	0.0%
No	4	100.0%
Total	4	100.0%

How useful was the website in determining whether to install a high efficiency unit in your house?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
2	1	0	0	1	4
50.0%	25.0%	.0%	.0%	25.0%	100.0%

Please explain why you did not find the website very useful in determining whether to install a high efficiency unit in your house?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	0	0	2	3
33.3%	.0%	.0%	66.7%	100.0%

Other – Please explain:

Comment	Count	Total
I didn't look on the website	1	50.0%
Wasn't looking. Had to replace our central air system. Decided to go with a heat pump to save on fuel oil.	1	50.0%

Savings calculations for customers installing a heat pump are described below. For those customers who did not know their SEER number, 14 was estimated for high efficiency and 12 was estimated for standard efficiency. Savings totals exceeded 15,000 kWh and 8 kW, and average savings were over 3,000 kWh per install.

Table 12. New Heat Pump Savings

Install New Heat Pump	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	4	8.68	15099.20	0
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		2.17	3774.80	0

Install New Central Air Conditioner

Of the 5 customers installing the central air conditioner, 3 customers installed a high efficiency unit, while two customers installed a standard unit. The most frequently installed SEER number for the central air conditioner was a 13, while two customers also

stated they did not know the SEER number of their unit. Most customers did not do this as a part of a renovation.

No customers rated the website as useful or very useful (4 or above) regarding installation of their air conditioner. Two customers stated the information on the website was not what they needed to make a decision, while one customer stated they did not find the information they were looking for. Other responses included they either weren't looking for the information on the website, or they had researched air conditioners somewhere other than on the Duke Energy website in order to make their decision.

Central Air Conditioner Efficiency		
High Efficiency (>13 SEER)	3	60.0%
Standard Efficiency (<13 SEER)	2	40.0%
Total	5	100.0%
SEER Number		
<=11	1	20.0%
12	0	0.0%
13	2	40.0%
>=14	0	0.0%
Don't know	2	40.0%
Total	5	100.0%
Did you do this as part of a major renovation of your home?		
Yes	1	20.0%
No	4	80.0%
Total	5	100.0%

How useful was the website in determining whether to install a high efficiency unit in your house?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
2	1	2	0	0	5
40.0%	20.0%	40.0%	.0%	.0%	100.0%

Please explain why you did not find the website very useful in determining whether to install a high efficiency unit in your house?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	0	2	2	5
20.0%	.0%	40.0%	40.0%	100.0%

Other – Please Explain:

Comment	Count	Total
I had already researched A/C purchase	1	50.0%
Wasn't looking for this info	1	50.0%

Customers who did not recall their SEER number were estimated at 12 for a standard unit, and 14 for a high efficiency unit. Qualifying savings are calculated below. Total savings were 2399 kWh per install, for a total kWh savings of 9,596. Total kW savings were 7.20, or 1.80 per install.

Table 13. New Central Air Conditioner Savings

Install New Central Air Conditioner	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	4	7.20	9596.00	0
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		1.80	2399.00	0

Insulate Sidewalls

Of the 6 customers who insulated their sidewalls, two thirds of them insulated 1 or 2 walls. The highest number of walls insulated by a customer was four. Nearly all customers insulated their walls using fiberglass insulation. Customers added anywhere from 2 to 10 inches of insulation to their sidewalls, with two customers adding two inches, and two customers adding 6 inches. A majority of customers did not have any insulation in the sidewalls before they insulated them. Two thirds of customers stated that they insulated their sidewalls as a part of a major renovation of their home.

Only one customer found the website useful or very useful when insulating their sidewalls. The customers who did not find the website useful stated that in general, they already had the information they needed to make a decision before visiting the website.

Number of Walls		
1	2	33.3%
2	2	33.3%
3	1	16.7%
4	1	16.7%
Total	6	100.0%
Type of Insulation		
Fiberglass	5	83.3%
Cellulose	0	0.00%
Foam	1	16.7%
Other	0	0.00%
Total	6	100.0%

Inches Added		
2	2	33.3%
3	1	16.7%
6	2	33.3%
10	1	16.7%
Total	6	100.0%
How thick was the insulation before you added more?		
0	4	66.7%
2	1	16.7%
6	1	16.7%
Total	6	100.0%
Did you do this as a part of a major renovation of your home?		
Yes	4	66.7%
No	2	33.3%
Total	6	100.0%

How useful was the website in determining whether to insulate your walls?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
0	2	3	0	1	6
.0%	33.3%	50.0%	.0%	16.7%	100.0%

Please explain why you did not find the website very useful in determining whether to insulate your walls?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
0	0	1	4	5
.0%	.0%	20.0%	80.0%	100.0%

Other – Please explain:

Comment	Count	Total
Already knew it needed insulation and husband had installation experience.	1	25%
Already planned to insulate.	1	25%
I already had info about insulation.	1	25%
I already knew the information found on the site.	1	25%

Savings for insulating sidewalls are calculated below. Total savings are over 3,000 kWh and over 2 kW, for an average of 865 kWh and 0.5 kW per install. Therm savings were 5.28 per install for a total of 21.13 Therm.

Table 14. Insulate Sidewalls Savings

Insulate Sidewalls	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	4	2.06	3459.48	21.13
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.52	864.87	5.28

Insulate Attic

Customers who stated they insulated their attic most frequently insulated their entire attic (66.7%). Nearly all the customers who insulated their attic used fiberglass insulation. Insulation base thickness and thickness added varied, with two thirds of customers adding between 5 and 12 inches of insulation to their base layer, and over 40% of customers having a base layer of 1-4 inches. 58.3% of customers stated that they did not add insulation to their attic as part of a renovation.

75% of customers found the website to be only somewhat useful with regard to insulating their attic. Customers stated in general that either the information they were looking for was on the site, or they already had the information they needed to make a decision before visiting the site, either from prior knowledge, or another information source.

Area of Attic Insulated		
Part	4	33.3%
All	8	66.7%
Total	12	100.0%
Type of Insulation		
Fiberglass	10	83.3%
Cellulose	0	0.0%
Foam	0	0.0%
Other	2	16.7%
Total	12	100.0%
Inches Added		
1-4	3	25.0%
5-8	4	33.3%
9-12	4	33.3%
>12	1	8.4%
Total	12	100.0%
How thick was the insulation before you added more?		
0	3	25.0%
1-4	5	41.6%

5-8	3	25.0%
9-12	1	8.4%
>12	0	0.0%
Total	12	100.0%
Did you do this as a part of a major renovation of your home?		
Yes	5	41.7%
No	7	58.3%
Total	12	100.0%

How useful was the website in determining whether to insulate your attic?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
1	0	9	2	0	12
8.3%	.0%	75.0%	16.7%	.0%	100.0%

Please explain why you did not find the website very useful in determining whether to insulate your attic?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	0	4	5	10
10.0%	.0%	40.0%	50.0%	100.0%

Other – Please explain:

Comment	Count	Total
I already knew it needed to be insulated	1	20.0%
I already knew the information from the site.	2	40.0%
I am a remodeler with prior experience in the insulation industry	1	20.0%
I did not look there first.	1	20.0%

Table 15. Insulate Attic Savings

Insulate Attic	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	7	0.02	1081.58	65.73
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.0035	154.51	9.39

Insulate Ducts

Tips on the website regarding ducts involved both insulating ducts and repairing ducts.

Those customers who chose to insulate their ducts insulated ducts located in heated areas of their home 83.3% of the time, and therefore did not qualify for savings. Half of customers stated that they insulated their ducts as part of a major renovation of their home.

Two thirds of customers found the website to be somewhat useful with regard to duct insulation. Half of customers who did not find the website useful or very useful stated they did not find the information on the website that they needed to make a decision regarding insulation of their ducts.

Duct Location		
Heated	5	83.3%
Unheated	1	16.7%
Don't know	0	0.0%
Total	6	100.0%
Did you do this as a part of a major renovation of your home?		
Yes	3	50.0%
No	3	50.0%
Total	6	50.0%

How useful was the website in determining whether to insulate your ducts?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
0	0	4	2	0	6
.0%	.0%	66.7%	33.3%	.0%	100.0%

Please explain why you did not find the website very useful in determining whether to insulate your ducts?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	0	2	1	4
25.0%	.0%	50.0%	25.0%	100.0%

Please explain why you did not find the website very useful in determining whether to insulate your ducts? Other

Comment	Count	Total
I already knew the info provided by the site	1	100.0%

Savings for insulation of ducts were 384 kWh and 17.3 Therm total, along with a savings of 0.08 kW. Four customers made installs, but only one customer installed in an unheated area of their home. Average savings for the four installs were 0.02 kW, 96

kWh, and 4.33 Therms.

Table 16. Insulate Ducts Savings

Insulate Ducts	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	4	0.08	384.00	17.30
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.02	96.00	4.33

Repair or Fix Holes in Ducts

Customers who repaired or fixed their ducts did not take this action as a part of a major renovation of their home (76.0%). 60% of customers found the website to be useful or very useful with regard to this suggestion. Those who did not find the website useful suggested that they either did not find information about this on the website, or they already had the information they needed regarding repairing their ducts.

Did you do this as a part of a major renovation of your home?		
Yes	6	24.0%
No	19	76.0%
Total	25	100.0%

How useful was the website in determining whether to repair your ducts and where to conduct the repairs?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
3	0	7	10	5	25
12.0%	.0%	28.0%	40.0%	20.0%	100.0%

Please explain why you did not find the website very useful in determining whether to repair your ducts and where to conduct the repairs?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
4	1	1	4	10
40.0%	10.0%	10.0%	40.0%	100.0%

Other – Please explain:

Comment	Count	Total

Already knew that information.	2	50.0%
I had already planned repair.	1	25.0%
Solutions seemed expensive for the benefit.	1	25.0%

Total savings for fixing/repairing ducts are 2.93 kW, 6256.25 kWh, and 53.83 Therm.

Table 17. Fix or Repair Ducts Savings

Fix or Repair Ducts	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	20	2.93	6256.25	53.83
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.15	312.81	2.69

Change Furnace Filter

Of the customers who utilized the tip to change the furnace filter, most customers found the website to be somewhat useful (38.7%), while 42.3% found the website to be useful or very useful in making the decision to change the filter. A majority of customers who did not find the website useful in their decision stated the website did not have the information they needed to make a decision (29.7%) or stated "Other" (51.6%). The responses of those customers who stated "Other" are summarized below, and included already being aware of the tips given on the website, didn't look at the website, and following manufacturer's instruction on filter replacement.

Frequency of Filter Change – Post Website		
Weekly	1	0.9%
Monthly	51	47.2%
Quarterly	47	43.4%
Yearly	9	8.5%
Total	108	100.0%
Frequency of Filter Change – Pre Website		
Weekly	1	0.9%
Monthly	36	33.3%
Quarterly	55	50.9%
Yearly	16	14.9%
Total	108	100.0%

How useful was the website in determining whether to replace the filter?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
14	7	42	27	18	108
13.0%	6.4%	38.9%	25.0%	16.7%	100.0%

Please explain why you did not find the website very useful in determining whether to replace your furnace filter?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
9	3	18	33	63
14.1%	4.7%	29.7%	51.6%	100.0%

Other – Please explain:

Comment	Count	Total
Already following tips found on site	21	63.6%
Tips didn't influence decision	1	3.0%
Didn't review website before decision	2	6.2%
I follow filter manufacturer/HVAC dealer's instructions	6	18.2%
I forget to change the filter	1	3.0%
Can't afford to change filter as frequently	1	3.0%
Not applicable	1	3.0%

Although many customers changed their furnace filter after visiting the website, none of the customers had a high enough changing frequency before and after visiting the website to account for savings.

Table 18. Change Furnace Filter Savings

Change Furnace Filter	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	96	0.00	0.00	0.00
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.00	0.00	0.00

Install New Refrigerator

Customers who installed a new refrigerator all stated that the refrigerator they purchased was Energy Star compliant. No customers left their old refrigerator plugged in as a backup. 75% of customers did not install a new refrigerator as a major renovation of their home.

Three of the 8 customers (37.5%) stated that the website was useful or very useful in their decision to install a new refrigerator. Those customers who did not find the website useful stated that they did not use the website to make their decision to purchase a new refrigerator, or they already needed a new refrigerator. One customer stated they did not find any information about refrigerators on the website.

Energy Star Compliant		
Yes	8	100.0%
No	0	0.0%
Don't know	0	0.0%
Total	8	100.0%
Old Refrigerator Still Plugged In		
Yes	0	0.0%
No	8	100.0%
Don't know	0	0.0%
Total	8	100.0%
Did you do this as part of a major renovation of your home?		
Yes	2	25.0%
No	6	75.0%
Total	8	100.0%

How useful was the website in determining whether to install a new refrigerator?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
3	0	2	1	2	8
37.5%	.0%	25.0%	12.5%	25.0%	100.0%

Please explain why you did not find the website very useful in determining whether to install a new refrigerator?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	0	0	4	5
20.0%	.0%	.0%	80.0%	100.0%

Other – Please explain:

Comment	Count	Total
We had to replace refrigerator	2	50.0%
I didn't refer to the website to decide	1	25.0%
I was already in the process of shopping for a new refrigerator.	1	25.0%

Table 19. Install New Refrigerator

Install New Refrigerator	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	8	2.08	12305.43	-18.07
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.26	1538.18	-2.26

Website Tips – Actions Taken

First Group

For this set of actions, customers were most likely to manage their drapes in summer and winter (80.4% and 72.3%, respectively). Customers were least likely to install a dual heating system (87.8%). These numbers make sense, as managing drapes is a fairly simple measure to implement, while installing a dual heating system requires much more investment. Customers were most likely to plan to insulate their hot water heater (23.6%) at a future date. Overall, a majority of customers found the website to be useful in determining whether to do these actions (47.1%).

Table 20. Frequency of Actions Taken - Group 1

	Yes	No	No, but plan to	N/A	Total
Turn off heat in unused rooms	70	51	6	21	148
	47.3%	34.5%	4.1%	14.2%	100.0%
Clean baseboards of dust	88	40	13	7	148
	59.5%	27.0%	8.8%	4.7%	100.0%
Install dual heating system	5	130	3	10	148
	3.4%	87.8%	2.0%	6.8%	100.0%
Keep draperies open on sunny days and closed at night during winter months	107	27	4	10	148
	72.3%	18.2%	2.7%	6.8%	100.0%
Keep draperies closed on sunny days during summer months	119	22	0	7	148
	80.4%	14.9%	.0%	4.7%	100.0%

Insulate your hot water heater	20 13.5%	83 56.1%	35 23.6%	10 6.8%	148 100.0%

Overall, how useful was the website in determining whether to perform any of these actions?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
6	6	36	65	25	138
4.3%	4.3%	26.1%	47.1%	18.1%	100.0%

Turn off Heat in Unused Rooms

Almost two thirds of customers stated that they have turned the heat off in 1-2 rooms (62.9%).

In how many rooms have you turned the heat off?		
0	4	5.7%
1-2	44	62.9%
3-4	19	27.1%
5-6	1	1.4%
7-8	2	2.9%
Total	70	100.0%

Total savings for turning off heat are over 21,000 kWh and over 200 Therm.

Table 21. Turn off Heat in Unused Rooms Savings

Turn Heat Off in Unused Rooms	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	62	14.02	21251.00	271.00
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0.23	342.76	4.37

Clean Baseboards

Of the 88 customers who stated they cleaned baseboards of dust, 40.9% of them stated they cleaned 6 to 10 baseboards. However, when listing their heating system type, only one customer who indicated they cleaned their baseboards chose electric baseboard as

their heating system type. The difference may be that customers did not understand the difference between an electric baseboard and a heating register (such as would exist with a central furnace system) without additional clarification.

How many baseboards have you cleaned?		
0	2	2.3%
1-5	20	22.7%
6-10	36	40.9%
11-20	21	23.9%
21+	9	10.2%
Total	88	100.0%

Because only one customer used electric baseboards for their heating, this customer was the only customer that had energy savings for taking this action. The total savings calculations for cleaning baseboards are 4.25 kWh.

Table 22. Clean Baseboards Savings

Clean Baseboards	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	1	None	4.25	None
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		None	4.25	None

Manage Window Coverings

Twelve more customers stated they manage their window coverings in summer than in winter (119 customers in summer, 107 customers in winter). Customers who manage their window drapes in winter state that they manage 1-6 windows (46.7%), similar to customers who manage their window drapes in summer, who also state they manage 1-6 windows (48.7%).

Coverings Managed in Winter		
0	8	7.6%
1-6	50	46.7%
7-12	39	36.4%
13-18	7	6.5%
19+	3	2.8%
Total	107	100.0%
Coverings Managed in Summer		
0	6	5.0%
1-6	58	48.7%
7-12	46	38.7%

13-18	7	5.9%
19+	2	1.7%
Total	119	100.0%

The total savings for customers who manage their window coverings are 63,562 kWh for winter, and over twice that amount, 127,483 kWh for summer. Similarly, the Therm savings are 1858 Therm for winter management of drapes, and almost twice that, 3535 Therm, for summer.

Table 23. Manage Window Coverings Savings

Manage Coverings in Winter	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	94	0	63,562.00	1858.00
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0	676.19	19.77
Manage Coverings in Summer	Number of Installs	Total kW Savings	Total kWh Savings	Total Therm Savings
	106	0	127,483.00	3535.00
Mean (per total installs)		Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0	1202.67	33.35
Manage Coverings Total Savings		Total kW Savings	Total kWh Savings	Total Therm Savings
		0	191045.00	5393.00
Mean (per customer)	110	Mean kW Savings	Mean kWh Savings	Mean Therm Savings
		0	1736.77	49.03

Insulate Water Heater

Of the customers who installed the water heater insulation, half of them stated their water heater was 31-50 gallons in capacity. Nearly two thirds of these customers stated they use natural gas to fuel their water heater (62.5%). No customer did this as a major renovation of their home, which is understandable since this was a small task to undertake.

Although customers were asked generally about the usefulness of the website regarding the 6 measures described in this section, customers were also asked specifically about usefulness of the website regarding water heater insulation, and these values were used for the savings estimates. Most customers installing the water heater insulation found the website to be useful or very useful in their decision to do so, suggesting that either the website contained the information they were looking for regarding water heater insulation, or insulating the water heater was a new tip for customers that they decided to

implement after learning about it on the website. Of the 43.7% of customers who rated the website less than useful regarding this measure, customers were split regarding why the website wasn't useful, ranging from not finding the information they were looking for, to information being unclear or not what was necessary. Those customers who mentioned "other" stated that they either already had information about water heater insulation, or had difficult implementing the measure even after looking at the website.

Capacity		
0	2	12.4%
<=30	3	18.7%
31-50	8	50.0%
51-60	1	6.3%
61-75	1	6.3%
76+	1	6.3%
Total	16	100.0%
Water heater heating type		
Electricity	6	37.5%
Gas	10	62.5%
Total	16	100.0%
Did you do this as a major renovation of your home?		
Yes	0	0.0%
No	16	100.0%
Total	16	100.0%

How useful was the website in determining whether to insulate your hot water heater tank?

Not at all Useful 1	2	Somewhat Useful 3	4	Very Useful 5	Total
0	2	5	5	4	16
0.0%	12.4%	31.3%	31.3%	25.0%	100.0%

Please explain why you did not find the website very useful in determining whether to insulate your hot water heater tank?

I did not find any information about this on the website.	The information I found on the website about this was unclear	The information I found on the website about this was not the information I needed to make a decision	Other	Total
1	2	2	2	7
14.2%	28.6%	28.6%	28.6	100.0%