PA Consulting Group

State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Semiannual Report (Second Half of 2007)

Final: March 17, 2008
Revised: June 15, 2008
Revised: July 12, 2008

Evaluation Contractor: PA Government Services Inc.

Prepared by the Focus evaluation team

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David Sumi contributed critical review and analysis.

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[1] This revision added electric bill and gas bill savings maps by utility territory.

[2] This revision clarified that the maps are about dollar savings, not energy savings, per se. No data changed.

This report is the property of the state of Wisconsin, Public Service Commission of Wisconsin, and was funded through the Wisconsin Focus on Energy Program.

Table of Contents

1. INTRODUCTION

The purpose of this document is to present an overview of all Focus on Energy (Focus) impacts achieved for the previous two quarters and the program to date. Focus on Energy has had a number of impacts on the state of Wisconsin. The most important are energy impacts—the energy savings realized through the implementation of energy conservation measures. Other impacts that result from the program are: (1) environmental benefits (with emphasis on quantification of displaced generation emissions); (2) other non-energy benefits following from increased health, safety, and comfort; and (3) the economic benefits realized as a result of savings on energy bills, stimulation of economic development, and the creation of jobs. Another significant benefit provided by Focus on Energy, beyond the implementation of energy efficiency measures, is encouragement to various members of the marketplace—manufacturers, distributors, retailers, building contractors, trade allies, and consumers—to "raise the bar" for practices and standards related to energy efficiency technologies.

The program administrators for Focus must maintain a *program tracking database* that includes all of the energy efficiency measures and actions taken within the program. The term "tracked" is used to signify that these savings result from program efforts directly counted (or tracked) by program administrators. This is the fundamental foundation for a program-based evaluation of energy impacts. The table below provides definitions for each of the various tracked savings impacts incorporated in the Focus impact evaluation system. Currently, *the verified gross energy savings* is being used for publicly reported impacts, while the *verified net energy savings* are used for the economic and benefit-cost analyses. In the current program contract period, verified net is also the basis for program administrators' performance contracts.

1.1 TRACKED ENERGY IMPACTS

The numbers in the tracked energy impacts tables presented in this report are annual energy savings—the energy saved by an installed conservation measure over 12 months. The annual energy impacts reported for a given time period, such as a six-months (e.g., this report covers the second half of 2007 (July 1, 2007–December 31, 2007), are the sum of the annual energy savings for all of the energy conservation measures installed in that period. See the introduction to *Section 2, Focus Impacts,* for additional explanation of the date references that will be used in this report as Focus transitions from a fiscal year basis to a calendar year basis.

The energy conservation measures installed typically last for a number of years, so their lifetime energy impact would be calculated by multiplying the annual energy savings by the number of years that energy conservation measure is expected to be in operation. (See additional discussion in *Section 2.8*.)

The term "tracked" is used to signify that these savings result from Focus efforts directly counted (or tracked) by program administrators. The table below provides definitions for each of the various tracked savings impacts referred to throughout this report. Currently, the verified gross energy savings are being used for publicly reported impacts, while the net energy savings are used for the economic and benefit-cost analyses (and, as noted above, the program administrator performance contracts).

Table 1-1. Tracked Energy Impacts

Gross Reported Savings	Energy savings as reported by the program administrator, unverified by an independent evaluation.
Verified Gross Savings	Energy savings verified by an independent evaluation based on reviews of the number and types of implemented improvements and the engineering calculations used to estimate the energy saved.
Verified Net Savings	Energy savings that can confidently be attributed to Focus efforts. Evaluators make adjustments for participants who were not influenced by Focus.

1.2 NONTRACKED ENERGY IMPACTS

For purposes of clarity, *nontracked energy savings* can be distinguished from *tracked energy savings* in that they are not directly counted (tracked) by program administrators. Nontracked energy savings are likely to consist of a combination of savings resulting from participant spillover (e.g., participants who, after an initial program experience, go on to adopt more energy saving products or practices without program assistance), market effects (e.g., changes in "marketplace" practices, services, and promotional efforts which induce businesses and consumers to buy energy saving products and services without direct program assistance), and unclaimed rewards (e.g., people who intend to submit the paperwork in order to claim Focus rewards but fail to do so). Nontracked energy savings should be attributed to the program if it can be demonstrated that these impacts were the result of program initiatives or that program initiatives were at least a key driver.

Quantifying nontracked savings is important when program initiatives are designed to create impacts beyond what the program can capture in a tracking database. The savings can be, for example, a direct extension of steps toward verification of *net* energy savings via the gathering of data that document the effects of a program on a specific market. An example from Focus is the use of CFL sales tracking data to estimate changes in product market share that can be confidently attributed to the presence of a program explicitly seeking to influence the CFL market in a specific geography.

1.3 SUPPORTING INFORMATION

Because this document is an overview, significant amounts of supporting information are not provided here. This makes it incumbent on the reader to seek out supporting information if they would like to better understand specific aspects of this report. Supporting information can be found in the various reports listed in Table 1-2. An effort has been made to reference the appropriate evaluation reports in the relevant places throughout this report. The table below provides a list of all of the evaluation reports (and other deliverables) submitted during the second half of 2007.

Table 1-2. Focus Statewide Evaluation Deliverables
Second Half of 2007 (July 1–December 31, 2007)

Program Area	Program	Document Title	Draft Report Date	Final Report Date
Administration	Administration	Evaluation Monthly Progress Report July 2007	20-Aug-07	20-Aug-07
Administration	Administration	Evaluation Monthly Progress Report August 2007	17-Sep-07	17-Sep-07
Administration	Administration	Evaluation Monthly Progress Report September 2007	16-Oct-07	16-Oct-07
Administration	Administration	Schedule of Evaluation Deliverables	Monthly updates	Ongoing task
Administration	Administration	Schedule Of Survey Tasks December 2007	Monthly updates	Ongoing task
Administration	Administration	Evaluation Monthly Progress Report October 2007	19-Nov-07	19-Nov-07
Cross-cutting	Crosscutting – General	Evaluation Semiannual Summary Report FY07 Year-end	09-Aug-07	11-Sep-07
Cross-cutting	Crosscutting – General	Evaluation Semiannual Report FY07 Year-end	09-Aug-07	11-Sep-07
Cross-cutting	Crosscutting – General	Evaluation Monthly Progress Report June 2007	16-Jul-07	16-Jul-07
Cross-cutting	Crosscutting – General	Focus on Energy Evaluation Contract Period One Detailed Evaluation Plans	06-Aug-07	06-Aug-07
Cross-cutting	Crosscutting – General	Evaluation's Annual Report for Fiscal Year 07	11-Sep-07	11-Sep-07
Cross-cutting	Crosscutting – General	Response to Review Comments Semiannual Reports FY07 Year-end	11-Sep-07	11-Sep-07
Residential	ENERGY STAR Products	Comprehensive CFL Market Effects Study	12-Jun-07	30-Jul-07
Residential	ENERGY STAR Products	FY06 Net-to-Gross Savings Adjustments for ENERGY STAR Qualified Clothes Washers	18-Jun-07	25-Jul-07
Residential	Home Performance with ENERGY STAR	Home Performance with ENERGY STAR Program Net Analysis	21-Jun-07	08-Oct-07
Residential	Residential Lighting	Compact Fluorescent Lighting Installation Rate Study	28-Nov-07	08-Jan-08[3]
Residential	Residential Lighting	Analysis of Delta Watts Values for CFLs Rewarded through the Residential Lighting Program in FY07	12-Dec-07	06-Mar-08[3]

In addition to the reports finalized in the second half of 2007, the *Abbreviated FY07 Business Programs Impact Evaluation* report was drafted and finalized in January and February. The results of this study are discussed in section 3.3.1.

[3] Although this report was not finalized in the period being reported on, we have added the finalized date for clarity. We strive to finalize drafts of reports that are used in the semiannual reports between the draft and final versions of the semiannual reports.

2. FOCUS IMPACTS

This chapter describes various Focus estimated impacts and associated evaluation analyses.

- Verified tracked energy impacts
- Verified nontracked energy impacts
- Market effects
- Economic impacts
- Environmental impacts
- Non-energy benefits
- Benefit-cost analysis.

Data for the energy impacts tables throughout this report are derived from data downloaded from WECC's tracking databases on January 14, 2008.

With the transition of the Focus programs from WDOA to the PSCW, and recognizing the PSCW's desire for a calendar year basis for program and evaluation reporting, this report adopts the following conventions for referencing time periods. References to time periods covered during the analysis will be "the last half of 2007," "the first half of 2008," or "the 18-month contract period" depending on what is being discussed. Tables will be labeled as shown below.

Table 2-1. Example of Date References Used in this Report

FY02 Mar 02–June 02	FY03 Jul 02–Jun 03	FY04 Jul 03–Jun 04	FY05 Jul 04–Jun 05	FY06 Jul 05–Jun 06	FY07 Jul 06–Jun 07	2007 Jul–Dec	2008 Jan–Jun	2008 Jul–Dec	Program To Date

Previous versions of this report have shown cumulative savings, simply summing up the savings from each fiscal year. While it is important to know the cumulative energy impacts from Focus on Energy, simply summing the savings is a bit of an oversimplification and can be misleading. Also, this year's goals are now based on verified net energy impacts, where previously they were based on verified gross impacts. This report is also changing the basis of other reported impacts to verified net versus gross, i.e., the displaced emissions and equivalencies. Focus is now in its eighth year of operation and some measures installed in the first years of the program have reached the end of their useful life. Compact fluorescent lights (CFLs), a significant measure for the Residential and Business programs, have an estimated useful life of six years. Therefore, many of the CFLs installed in 2001 are no longer operating and saving energy.

There are also other factors that result in measures no longer remaining in operation. For example, people move out of Wisconsin and take the CFLs with them or they do not last as long as expected. Because of this, we have taken the program-to-date (PTD) savings numbers out of the report. There are figures in this section that show the stream of net energy impacts over 20 years of all of the measures installed through December 2007. As of December 2007, the net annual energy savings from all measures installed since Focus began in July 2001 which are still in operation is over 753 GWH and almost 38 million therms.

Please see Figure 2.1 Cumulative Net Electricity Savings and Figure 2.2 Cumulative Net Therm Savings, which graph Focus net savings from fiscal year 2002 through fiscal year 2021.

Another factor that can have a significant impact on the stream of energy savings from installed measures occurs when Focus on Energy is successful in getting participants to purchase energy efficient equipment before their existing inefficient equipment fails. This results in a higher energy savings in the early years of the equipment life which then drops to a lower level of savings at the time that the equipment was expected to have failed or been replaced (had there been no program intervention). Both first-year savings tables (for each fiscal year) and the stream of energy savings that is shown in this section do not account for this. The evaluation team is currently developing a "white-paper" that discusses this issue and presents possible methods for addressing it. This will be presented to the PSCW for their review and comment, and a policy decision will be made on the most appropriate method to be adopted for estimating the flow of accelerated savings in the future.

2.1 VERIFIED TRACKED ENERGY IMPACTS

Table 2-1a presents a summary of the annual kWh and therms saved with dollar values along with number of participants. Table 2-1b shows the gross, verified gross, and verified net energy impacts of the Business, Residential, and Renewable Energy Program areas for energy efficiency measures implemented from July 1, 2001, through December 31, 2007, as documented in their respective tracking systems (Tracked Energy Impacts).

Table 2-1a. All Programs: Tracked Energy Impacts Summary (July 1, 2001–December 31, 2007)

	Annual kWh Saved	Annual kW Saved	Annual Therms Saved	Annual Dollar Value of Energy Saved	Number of Participants
Second Half of 2007 (July 1, 2007–December 31, 2007)					
Total Saved	**134,456,104**	**24,477**	**5,732,558**	**$16,697,668**	
Business	96,823,479	19,865	4,407,387	$11,333,596	6,579
Residential	35,447,002	3,892	973,602	$4,825,527	83,167
Renewables	2,185,622	721	351,569	$538,544	106
FY07 (July 1, 2006–June 30, 2007)					
Total Saved	**238,215,129**	**41,000**	**13,610,670**	**$33,809,745**	
Business	151,040,005	32,275	11,513,743	$22,560,136	12,819
Residential	78,656,578	6,855	1,423,453	$9,853,663	214,800
Renewables	8,518,546	1,871	673,475	$1,395,946	117
FY06 (July 1, 2005–June 30, 2006)					
Total Saved	**218,773,020**	**41,438**	**13,058,131**	**$32,153,016**	
Business	131,761,262	28,280	9,418,597	$19,432,882	13,023
Residential	73,967,366	11,283	1,573,432	$9,538,404	226,982
Renewables	13,044,392	1,874	2,066,101	$3,181,730	92
FY05 (July 1, 2004–June 30, 2005)					
Total Saved	**214,916,929**	**35,903**	**9,175,257**	**$27,775,738**	
Business	110,718,465	20,901	7,105,272	$15,002,791	13,261
Residential	82,290,063	11,740	1,726,542	$10,583,916	207,861
Renewables	21,908,401	3,262	343,443	$2,189,031	65
FY04 (July 1, 2003–June 30, 2004)					
Total Saved	**228,345,200**	**37,688**	**14,469,634**	**$33,860,837**	
Business	137,366,305	23,540	12,615,132	$22,264,222	11,754
Residential	90,494,941	13,928	1,640,668	$11,340,156	212,920
Renewables	483,954	220	213,833	$256,459	52
FY03 (July 1, 2002–June 30, 2003)					
Total Saved	**221,782,713**	**35,851**	**8,142,803**	**$27,103,787**	
Business	128,323,420	21,383	6,196,249	$15,175,067	6,385
Residential	89,739,440	13,863	1,946,555	$11,615,880	156,464
Renewables	3,719,852	604	0	$312,840	31
FY02 (July 1, 2001–June 30, 2002)					
Total Saved	**56,501,440**	**11,717**	**2,659,333**	**$7,661,131**	
Business	30,532,158	7,036	1,740,729	$3,887,897	1,164
Residential	25,968,737	4,680	918,604	$3,773,202	52,482
Renewables	545	0	0	$32	1

Note: The numbers in this table are the verified gross savings. This table does not include any of the savings reported in Table 2-6 Nontracked energy impacts. However, for some measures i.e., CFLs, a market-based approach has been used to evaluate the impacts, in which case, the verified gross savings does reflect some non-tracked impacts.

There are some discrepancies between the Renewables numbers here and in the Renewables section below. These differences are driven by a couple of factors, e.g., these numbers are based on what is currently reported in WECC's tracking database, while the numbers in the Renewables section are based on a "frozen frame", e.g., what was in the tracking database at the time the sample was drawn. Also, assignment to a time period is based on the date the project was entered into the tracking database here vs. when the project was completed.

Table 2-1b. All Programs: Tracked Energy Impacts
Program to Date (July 1, 2001–December 31, 2007)

	Annual kWh Saved			kW Reduction			Annual Therms Saved		
	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net
Second Half of 2007 (July 1, 2007–December 31, 2007)									
Total	**139,069,875**	**134,456,104**	**96,981,824**	**25,005**	**24,477**	**17,327**	**6,567,373**	**5,732,558**	**3,686,245**
Business Programs	100,170,917	96,823,479	62,314,822	20,494	19,865	13,432	5,232,854	4,407,387	2,576,021
Residential Programs	36,622,268	35,447,002	34,559,997	3,918	3,892	3,760	975,041	973,602	944,864
Renewable Energy Program	2,276,690	2,185,622	107,004	593	721	135	359,477	351,569	165,360
FY07 (July 1, 2006–June 30, 2007)									
Total	**260,281,171**	**238,215,129**	**165,224,854**	**43,278**	**41,000**	**28,164**	**15,914,496**	**13,610,670**	**8,455,000**
Business Programs	157,156,174	151,040,005	98,477,284	33,452	32,275	21,770	13,658,924	11,513,743	6,809,760
Residential Programs	94,251,511	78,656,578	66,330,516	8,288	6,855	6,043	1,566,948	1,423,453	1,328,472
Renewable Energy Program	8,873,486	8,518,546	417,054	1,538	1,871	351	688,625	673,475	316,767
FY06 (July 1, 2005–June 30, 2006)									
Total	**234,759,134**	**218,773,020**	**166,034,451**	**43,672**	**41,438**	**30,498**	**13,622,799**	**13,058,131**	**6,315,500**
Business Programs	131,817,040	131,761,262	91,617,024	28,338	28,280	19,021	9,674,444	9,418,597	4,365,774
Residential Programs	90,190,978	73,967,366	72,071,221	13,417	11,283	11,092	1,859,273	1,573,432	1,490,128
Renewable Energy Program	12,751,116	13,044,392	2,346,205	1,917	1,874	385	2,089,081	2,066,101	459,598
FY05 (July 1, 2004–June 30, 2005)									
Total	**276,039,121**	**214,916,929**	**152,968,942**	**40,830**	**35,903**	**22,891**	**9,616,902**	**9,175,257**	**5,233,131**
Business Programs	143,707,711	110,718,465	55,861,214	27,077	20,901	9,970	7,044,228	7,105,272	3,463,641
Residential Programs	112,960,587	82,290,063	92,846,146	10,761	11,740	11,937	2,125,483	1,726,542	1,681,393
Renewable Energy Program	19,370,823	21,908,401	4,261,581	2,993	3,262	985	447,192	343,443	88,097
FY04 (July 1, 2003–June 30, 2004)									
Total	**282,860,389**	**228,345,200**	**168,998,126**	**44,432**	**37,688**	**26,980**	**13,558,958**	**14,469,634**	**12,438,703**
Business Programs	156,470,715	137,366,305	79,938,939	28,604	23,540	13,185	11,642,146	12,615,132	10,615,984
Residential Programs	125,891,779	90,494,941	88,610,086	15,628	13,928	13,600	1,825,352	1,640,668	1,622,971
Renewable Energy Program	497,895	483,954	449,101	199	220	195	91,460	213,833	199,749
FY03 (July 1, 2002–June 30, 2003)									
Total	**230,941,953**	**221,782,713**	**145,719,026**	**38,158**	**35,851**	**23,288**	**7,982,370**	**8,142,803**	**5,580,467**
Business Programs	129,814,716	128,323,420	62,483,109	23,351	21,383	10,550	6,248,606	6,196,249	3,642,577
Residential Programs	97,455,122	89,739,440	80,232,127	14,082	13,863	12,260	1,733,764	1,946,555	1,937,890
Renewable Energy Program	3,672,115	3,719,852	3,003,790	725	604	478	0	0	0
FY02 (July 1, 2001–June 30, 2002)									
Total	**54,525,224**	**56,501,440**	**39,065,535**	**10,926**	**11,717**	**8,175**	**3,679,853**	**2,659,333**	**1,622,710**
Business Programs	30,559,935	30,532,158	18,764,493	6,965	7,036	4,397	2,760,541	1,740,729	785,725
Residential Programs	23,964,753	25,968,737	20,300,601	3,961	4,680	3,778	919,312	918,604	836,985
Renewable Energy Program	536	545	440	0	0	0	0	0	0

Note: The numbers in this table are the verified gross savings. This table does not include any of the savings reported in Table 2-6 Nontracked energy impacts. However, for some measures i.e., CFLs, a market-based approach has been used to evaluate the impacts, in which case, the verified gross and verified net savings do reflect some non-tracked impacts.

Figures 2-1 and 2-2 reflect the stream of energy savings over time from program inception in fiscal year 2002 for twenty years, through fiscal year 2021. These graphs are based on the net savings shown in the tables above. The savings implemented each fiscal year continues over the effective useful life of the measures installed to realize the savings. The charts show that the cumulative savings peaks at about 756 GWh and 38 million therms in the second half of 2007 (the current period) and then begins to decline since it only reflects those measures that have been installed through December 2007. The electricity savings for the residential programs declines much more rapidly that the electricity savings for the business programs because CFLs make up a significant proportion of the residential programs electricity savings

and CFLs have an expected measure life of six years. While, the T8/T5 fluorescent lighting measures that account for approximately 26 percent of the business programs savings (see Figure 2-3) have an expected measure life of fifteen years. There are measures for both programs that have expected measure lives of more than fifteen years.

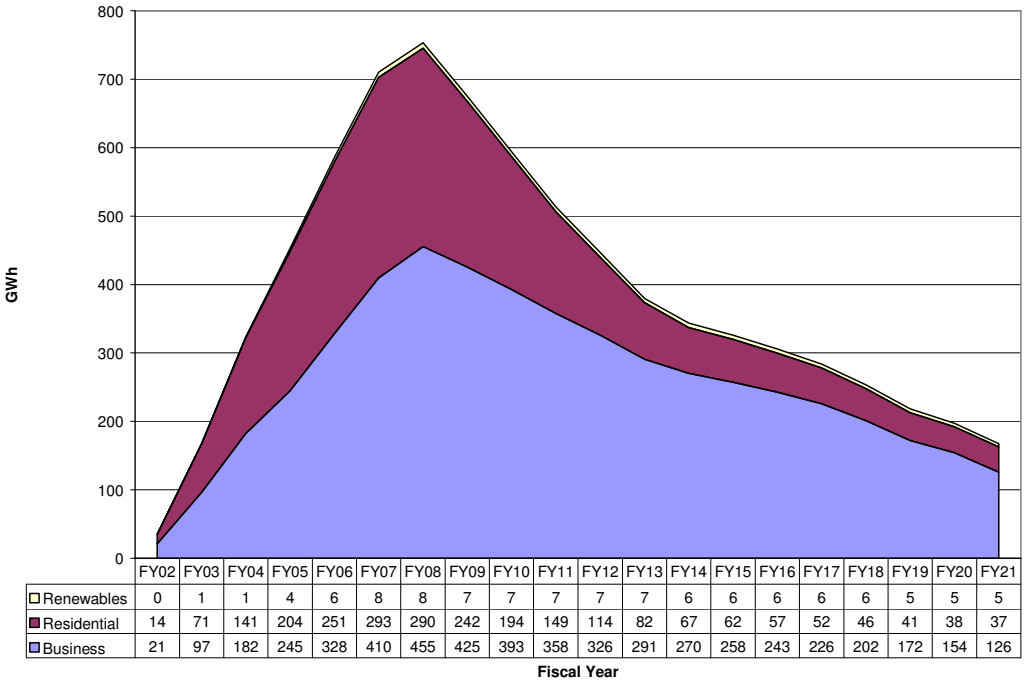
The measure life is interpreted as the median measure life. Measure lives for all program measures included in this analysis are provided in Appendix C. The savings implemented in each program year is extended into the future with an exponential decay rate, such that half the savings remains after the measure life.

That is, we interpret the measure life identified from the literature as the time until half the units would be expected to have failed or been removed. This interpretation is consistent with the persistence study framework used in California and elsewhere. Under those rules, the "expected useful life" is the median survival time, where "surviving" means remaining in place and operable.

The exponential decay formula implies a constant failure rate over time. This assumption is not necessarily realistic for many measures. Experience from numerous persistence studies conducted in California indicates that the failure process is often a mixture of two phenomena—in the short term, removal due to defect or dissatisfaction, and in the longer term, more or less steady wear-out patterns. This mixture suggests a "hazard rate" that is high in the early years, then declines, becoming stable (exponential) or eventually rising again in much later years.[4]

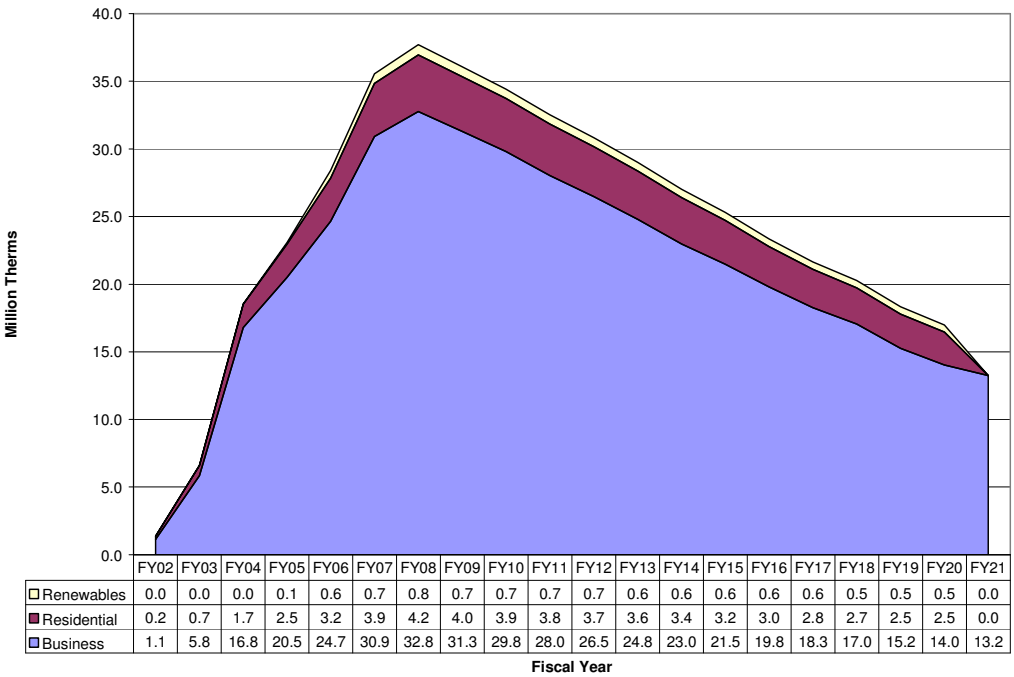
[4] *Focus on Energy Statewide Evaluation Interim Benefit-Cost Analysis: FY07 Evaluation Report Final: February 26, 2007,* Miriam L. Goldberg, Chris Clark, Sander Cohan, KEMA Inc, pp. 5-15–5-16.

Figure 2-1. Cumulative Net Electricity Savings (GWh)



	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Renewables	0	1	1	4	6	8	8	7	7	7	7	7	6	6	6	6	6	5	5	5
Residential	14	71	141	204	251	293	290	242	194	149	114	82	67	62	57	52	46	41	38	37
Business	21	97	182	245	328	410	455	425	393	358	326	291	270	258	243	226	202	172	154	126

Figure 2-2. Cumulative Net Gas Savings (Million Therms)



	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Renewables	0.0	0.0	0.0	0.1	0.6	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.0
Residential	0.2	0.7	1.7	2.5	3.2	3.9	4.2	4.0	3.9	3.8	3.7	3.6	3.4	3.2	3.0	2.8	2.7	2.5	2.5	0.0
Business	1.1	5.8	16.8	20.5	24.7	30.9	32.8	31.3	29.8	28.0	26.5	24.8	23.0	21.5	19.8	18.3	17.0	15.2	14.0	13.2

Figure 2-3. Electric Energy Impacts by Measure Category
Business Programs
Program to Date (July 1, 2001–December 31, 2007)

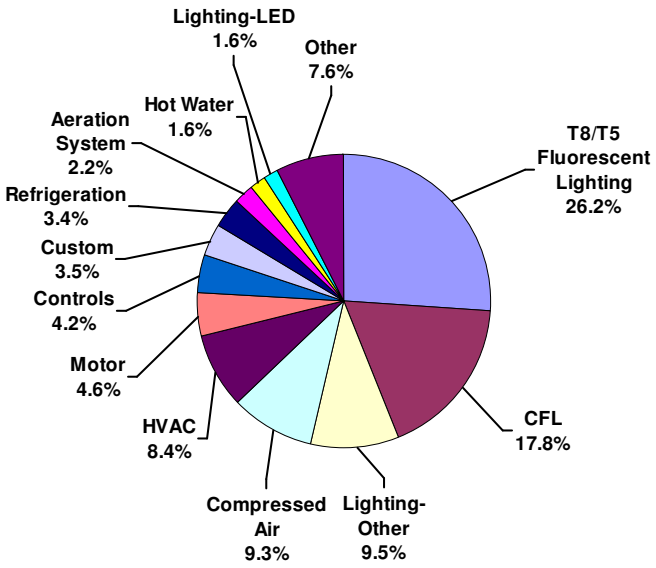


Figure 2-4. Gas Energy Impacts by Measure Category
Business Programs
Program to Date (July 1, 2001–December 31, 2007)

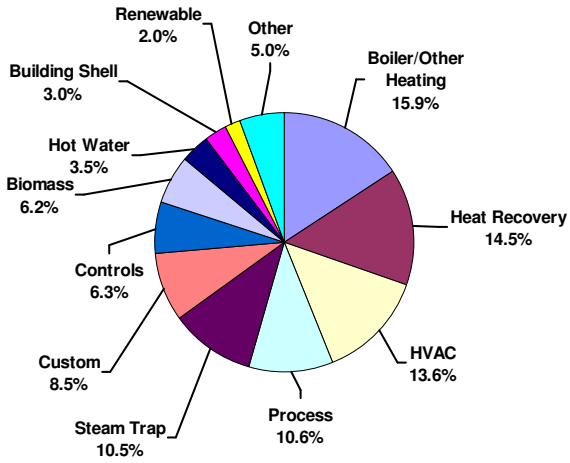


Table 2-2. Electric Energy Impacts by Measure Category
Business Programs
Program to Date (July 1, 2001–December 31, 2007)

Measure Category	Verified Gross kWh	Percent of Total
T8/T5 Fluorescent Lighting	206,086,156	26.2%
CFL	140,006,008	17.8%
Lighting-Other	74,621,877	9.5%
Compressed Air	73,226,633	9.3%
HVAC	65,850,165	8.4%
Motor	36,557,260	4.6%
Controls	33,344,439	4.2%
Custom	27,532,777	3.5%
Refrigeration	26,834,250	3.4%
Aeration System	17,659,865	2.2%
Hot Water	12,709,432	1.6%
Lighting-LED	12,290,995	1.6%

Table 2-3. Gas Energy Impacts by Measure Category
Business Programs
Program to Date (July 1, 2001–December 31, 2007)

Measure Category	Verified Gross Therms	Percent of Total
Boiler/Other Heating	8,428,487	15.9%
Heat Recovery	7,661,654	14.5%
HVAC	7,194,295	13.6%
Process	5,611,026	10.6%
Steam Trap	5,559,752	10.5%
Custom	4,523,266	8.5%
Controls	3,353,076	6.3%
Biomass	3,277,426	6.2%
Hot Water	1,878,667	3.5%
Building Shell	1,564,764	3.0%
Renewable	1,060,113	2.0%

Figure 2-5. Electric Energy Impacts by Measure Category
Residential Programs
Program to Date (July 1, 2001–December 31, 2007)

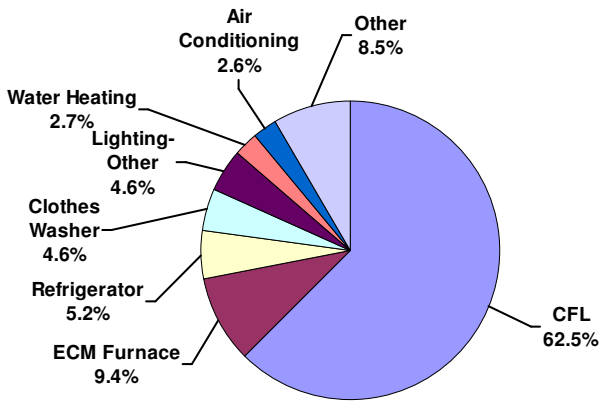


Figure 2-6. Gas Energy Impacts by Measure Category
Residential Programs
Program to Date (July 1, 2001–December 31, 2007)

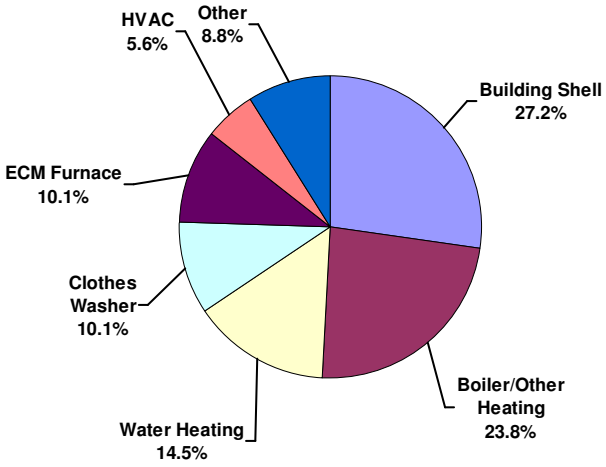


Table 2-4. Electric Energy Impacts by Measure Category - Residential Programs
Program to Date (July 1, 2001–December 31, 2007)

Measure Category	Verified Gross kWh	Percent of Total
CFL	297,864,835	62.5%
ECM Furnace	44,566,723	9.4%
Refrigerator	25,001,001	5.2%
Clothes Washer	21,958,680	4.6%
Lighting-Other	21,701,606	4.6%
Water Heating	12,724,613	2.7%
Air Conditioning	12,472,219	2.6%

Table 2-5. Gas Energy Impacts by Measure Category - Residential Programs
Program to Date (July 1, 2001–December 31, 2007)

Measure Category	Verified Gross Therms	Percent of Total
Building Shell	2,771,577	27.2%
Boiler/Other Heating	2,426,010	23.8%
Water Heating	1,479,289	14.5%
Clothes Washer	1,030,349	10.1%
ECM Furnace	1,029,307	10.1%
HVAC	567,038	5.6%

The figures above summarize the distribution of energy impacts by measure category and fuel type for Business Programs and Residential program areas. The accompanying tables present corresponding verified gross impact values.

2.2 VERIFIED NONTRACKED ENERGY IMPACTS

As the Focus program progresses, the evaluation team also seeks to quantify energy savings attributable to the Focus effort that are not directly "tracked" by program administrators. For example; participants who, after an initial program experience, go on to adopt more energy saving products or practices without program assistance often referred to as spillover, changes in marketplace practices, services, and promotional efforts which induce businesses and consumers to buy energy saving products and services without direct program assistance often referred to as market effects, and unclaimed rewards, people who intend to submit the paperwork in order to claim rewards but fail to do so.

Presently, the majority of the "nontracked" energy savings quantified as attributable to Focus on Energy are related to the ENERGY STAR® Products program compact fluorescent light bulb (CFL) initiative in the residential and business sector (in the business sector the program is referred to as CFL Participants). Also, spillover savings have been quantified for the rest of the business sector participants, referred to in the table as "Non-CFL Participants."

In the business sector, the results for the "CFL participants—through June 30, 2006" are presented as a range. The report providing these estimates characterized the lower estimate as a "robust" estimate at about 1.1 million kWh and 298 kW and the higher estimate as a "basic" estimate of about 16.2 million kWh over 4,600 kW.

Table 2-6. Nontracked Energy Impacts

Program Area (Sector)	Program		Annual kWh Saved	kW Reduction	Annual Therms Saved
Residential	ENERGY STAR Products - CFLs FY02		14,964,840	453	0
Residential	ENERGY STAR Products - CFLs FY02		2,302,014	70	0
Business	CFL Participants—through June 30, 2006	Robust	1,108,813	298	0
		Basic	16,196,526	4,609	0
Business	Non-CFL Participants—through June 30, 2006		629,248	452	845
	Total	Robust	**19,005,005**	**1,273**	**845**
		Basic	**34,092628**	**5,584**	**845**

Notes: FY03 is only through December 31, 2002, because nontracked sales information is not available for all of fiscal year 2003. Savings are not adjusted for installation rates of CFLs.

For the business programs, nontracked impacts are not broken out by program. Instead, they are categorized and "CFL Participants" and "Non-CFL Participants." The "CFL Participants" are businesses in the Agricultural and Commercial programs that have received rewards through the ENERGY STAR Products program, which accounts for approximately 20 percent of the overall business programs savings. "Non-CFL Participants" are the business sector participants that have received benefits and services from Focus on energy through initiatives other than ENERGY STAR Products program.

2.3 MARKET EFFECTS

One of the objectives of Focus is to be able to translate market effects into energy impacts attributable to program activities or specific market interventions by the programs. As these impacts are quantified, they will be reported in Table 2-6 above. Translation into energy impacts is important to allow inclusion of impacts of program-induced market effects into long-term energy resource planning and for appropriate evaluation of the benefit-cost ratio of

market transformation-oriented programs or programs with significant market transformation components. While a relatively high level of uncertainty is inherent in estimating the energy impacts of market transformation-oriented programs, the uncertainty can be managed. Consistent measurement of key market effects and/or their indicators over time will allow for significant reduction of the uncertainty.

Ultimately, for the concept of market transformation to be proven and the potential significant benefits realized, it is critical for policy makers to provide consistent and sound policy objectives, administrators to use discipline in designing their programs with clear program logic models, and evaluators to consistently provide appropriate feedback through implementation of sound research and policy makers and administrators using that feedback (along with other sources of information) to inform policy changes and refine their program logic models.

Both market indicators and market effects can be translated into energy impacts attributable to the program. Market indicators (for example, Point-of-Sale (POS) data) provide value because (1) changes in indicators can typically be measured earlier after an intervention than can changes in market effects; (2) indicators can provide insights into drivers of changes in market effects; and (3) because indicators that are typical pre-cursors to actual purchase behavior represent important stages in program logic—and therefore facilitate assigning attribution to the program.

The length of time it takes before measurable changes can be observed in either market indicators or market effects metrics can vary dramatically, depending on the market actors targeted by the intervention (e.g., changes at the manufacturer level can have a dramatic impact sooner); the size of the intervention; the size of the market; the readiness of the market for a product; etc. Typically, market indicators are more likely to be measurable in the short term, but can evaporate after a year of program activity. Market effects (for example, manufacturer sales data), involve a much longer time span and are unlikely to be measurable until after at least a year of program activity. Market effects that are sizable enough to be translated into energy impacts should not typically be expected until at least three to five years of program activity.

Much of the Focus evaluation efforts to date have been focused on review of market indicators, including (but not limited to) those market indicators that have been included as contract metrics each year for the program administrators. However, in FY07, the residential evaluation team—in coordination with the business program evaluation team—established a comprehensive system for collecting retail-based CFL sales information that addresses the limitations of the former POS approach. A *uniform approach* to program attribution for all sectors touched by the retail-based CFL initiative (i.e., residential, commercial, agricultural, and multifamily). The system provides a representative picture of Wisconsin retail-based CFL sales by including both participating and nonparticipating retailers. The system attempts to include a census of retailers who are responsible for the bulk of rewarded CFL sales, a statewide representative sample of the remaining participating retailers, and, a statewide representative sample of nonparticipating retailers. The *Comprehensive CFL Market Effects Study* report presents the initial findings of this effort.

2.4 ECONOMIC IMPACTS[i]

One of the goals of Wisconsin Focus on Energy programs is to support economic development. In general, economic development is a process of enhancing the state's

economy by supporting the growth, retention, and attraction of business activity in the state. By strengthening and diversifying the state's economic base, Wisconsin residents can enjoy better job opportunities, higher incomes, and higher living standards. Economic prosperity can also increase revenue for state and local government. In an era of global economic change and uncertainty, it is particularly important to see that programs such as Focus are indeed addressing these economic development goals.

Focus directly affects participating business and residential customers' energy costs. Decreasing energy costs through increased efficiency and conservation can make business operations more profitable and can also leave more money in families' pockets (to spend on other desired purchases). By lowering costs of doing business, it also makes Wisconsin a more competitive location for additional business attraction, investment, and expansion.

Focus also creates other direct and indirect impacts throughout Wisconsin's economy. Wisconsin businesses are major manufacturers of heating and air conditioning equipment, motors, and controls. Focus stimulates sales for these industries in Wisconsin, as well as the development of solar, wind, and biomass energy production within the state. At the same time as it is increasing the flow of dollars staying within Wisconsin, it is also reducing the outflow of money from the state associated with importation of coal and natural gas.

There are also cost effects. When customers make energy-efficiency purchases that they might not have made, they are also spending some of their own money, because Focus pays only part of the extra cost of buying energy-efficient equipment. The Public Benefits charge that funds Focus is a cost to customers, although not a new one, since customers have paid the cost of demand-side management programs through utility rates for a number of years.

To analyze the economic development impacts of the Focus on Energy programs, the following three steps were performed for two funding scenarios (low and high) in the FY07 research and will be conducted again in 2008:

(1) Document Direct Effects. The first step is to track the net direct effects of the program. These are changes in program-related spending by Focus and program participants, household, and business savings in energy costs, and spending on new equipment. Here, careful attention is given to establishing net changes *compared to what would otherwise be expected to occur without the program*.

(2) Apply the Economic Model. The second step is to apply the REMI economic model of Wisconsin. This is a tool used to trace how the direct effects (from step 1) lead to changes in household and business costs, spending and sales patterns in the state. In our analysis, we apply the Wisconsin statewide REMI model to track impacts including:

1. Lower business operating costs
2. Lower household living costs
3. Reduced outflow of dollars to purchase out-of-state coal and natural gas
4. Increase in dollars going to equipment manufacturers and installers in Wisconsin
5. Emissions benefits from NO_x and SO_2 reductions (monetized)
6. Non-energy benefits (monetized)

7. Indirect effects on orders for business suppliers and induced effects of workers re-spending their income within Wisconsin.

Results of the REMI model represent changes in the state economy over time. The key indicators of change in the state's economy are changes in business sales, jobs, personal income, and value added (gross regional product) in Wisconsin.

(3) Analyze Policy Implications. The third and final step in the analysis process is to apply results of the economic model (from step 2) to assess how the forecast program impacts translate into economic development changes. These include:

1. Diversified business growth
2. Expanded mix of those jobs available to Wisconsin residents
3. Shifts in the nature and size of impacts occurring over time
4. Shifts in the competitiveness of Wisconsin as a place to live and to locate a business
5. Changes in the incidence of economic impacts, in terms of urban and rural locations.

This general approach for conducting economic impact analysis, using a regional economic model, has been proven in use around the country including studies of the economic impacts of energy programs and policies in over twenty states.

Summary of Economic Analysis Results

The REMI economic model generated estimates of economic impacts of Focus on Energy from its inception in 2002 through 2026. Program funding was assumed, for purposes of this analysis, to continue through 2012 after which measure-related savings persist with some decay and market transformation effects begin to take hold. Since a key feature of Focus programs is energy cost savings for households and businesses, and since those savings continue over the lifetime of installed equipment, it is necessary to measure economic impacts over a period of time. This analysis examined Focus programs assuming a ten-year implementation span. However, some economic impacts will continue for an additional 15 years beyond any active program period.

Tables 2-7a and 2-7b summarize the economic analysis results for all Focus programs combined—including Residential, Renewables, and Business programs for low and high funding scenarios. The tables show the projected economic impacts for selected years and periods. They also show how program impacts accumulate over a 25-year interval. These economic impacts are presented in terms of (1) the number of job years created for Wisconsin residents, (2) the sales generated for Wisconsin businesses, (3) the value added portion of those sales, and (4) disposable income generated for Wisconsin residents.

The tables also summarize impacts when both the Residential and Business programs include expected "market effects" beyond what the program instigates in terms of increases in household and business purchases of energy efficient products, adoption of energy efficient practices, and the ensuing energy savings. These are effects in the economy without formal program participation. Market effects reflect the behavior of customers, retailers, wholesalers, and manufacturers who are influenced by Focus programs to take additional actions on their own to increase the supply and use of energy-efficient equipment *that they would not have done without the existence of the program.*

Altogether, the analysis found that Focus leads to significant economic development benefits for Wisconsin's economy. Even without counting market effects, the first year of program operation (fiscal year 2002) resulted in a variety of household and business cost savings and spending changes that altogether support over 351 jobs in the state, and that impact grows to 1,417 jobs by the fifth year of program operation (fiscal year 2006). The disposable income generated in Wisconsin from program-generated savings and this additional business activity represents $12 million in the first year, and grows to $85 million by the fifth year of program operation. The impacts inclusive of market effects also grow over time, adding a small impact in the first five years, but then adding roughly 2.9–4.0 percent to jobs and income over the 25-year analysis interval.

Tables 2-7a and 2-7b. Economic Development Impacts for all Focus on Energy Programs, Low and High Funding Scenarios

Low Funding Scenario (mil. $ 2006)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job year for sums)	351	1,417	3,216	16,711	60,496
Sales generated	$39	$181	$444	$2,208	$8,984
GRP (Value-added)	$26	$104	$265	$1,310	$5,415
Disposable income generated	$12	$85	$213	$1,014	$4,195
Impact with Market Effects*					
Jobs (job year for sums)	351	1,418	3,218	16,716	62,296
Sales generated	$39	$181	$444	$2,209	$9,261
GRP (Value-added)	$26	$104	$266	$1,310	$5,575
Disposable income generated	$12	$85	$213	$1,014	$4,366
*note: Renewable program has no built in market effect projections					

High Funding Scenario (mil. $ 2006)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job year for sums)	351	1,417	3,934	18,229	73,233
Sales generated	$39	$181	$549	$2,438	$10,863
GRP (Value-added)	$26	$104	$316	$1,411	$6,637
Disposable income generated	$12	$85	$257	$1,097	$5,095
Impact with Market Effects*					
Jobs (job year for sums)	351	1,418	3,949	18,275	77,741
Sales generated	$39	$181	$551	$2,445	$11,598
GRP (Value-added)	$26	$104	$318	$1,415	$7,060
Disposable income generated	$12	$85	$258	$1,100	$5,468
*note: Renewable program has no built in market effect projections					

Who benefits? To assess the diversity of economic development benefits, the REMI economic model was applied to show the breakdown of economic growth impacts by industry sector and occupation category. The comparison of job impacts by industry shows that Focus programs provide widespread benefits among all sectors of the economy. While many of the program participants are manufacturing and commercial businesses, many of the spillover economic benefits accrue to wholesalers, retailers, and service providers that provide goods and services to participating businesses, or that benefit from the re-spending of additional

household income within the state. A further analysis shows that the program economic benefits are concentrated on those industries that offer growth for the state economy.

A further breakdown of job impacts by occupation shows that the types of additional jobs created or supported by Focus programs span a wide range of skill-levels among both blue-collar and white-collar categories. In addition, the impacts are widely distributed among urban and rural areas, with urban areas having proportionally greater participation in the residential programs while the semi-urban and rural areas have had proportionally greater participation in the industrial programs.

2.5 ENVIRONMENTAL IMPACTS

Evaluators also estimated emission factors or rates for the electric generating plants serving Wisconsin (Table 2-8)[ii] and used these data to estimate displaced emissions associated with the Focus programs (Table 2-9). The evaluation team estimated the generation emissions rates shown in Table 2-8 using hourly measured emissions data from EPA data in a model developed by the evaluation team to estimate emissions rates for NO_x, SO_2, CO_2, and mercury for the power plants supplying Wisconsin. Emissions factors from reduced use of natural gas at the customer site (the "On-site Therms" column in Table 2-10) were also taken from EPA data. There are also very small amounts of NO_x and SO_2 in natural gas but they are not large enough to significantly affect the emissions numbers.

The figures in Table 2-8 are updated from the previous semiannual report submitted on September 11, 2007. The results are now based on EPA data from 2005 rather than 2000. Under the same assumption of a single marginal unit, emission factors for NO_x, SO_2, and mercury have declined significantly. The emission factor for CO_2 increased somewhat.

One predominant factor in the per-MWh decrease in emissions of NO_x, SO_2, and mercury appears to be the significant reduction in the use of coal as a fuel. In 2000, coal accounted for 96.5 percent of the energy production in Wisconsin monitored by the EPA (i.e., excluding hydroelectric and nuclear power). By 2005, coal accounted for only 87.3 percent, the difference primarily made up by pipeline natural gas, both a cleaner fuel and a fuel burning in newer, cleaner plants. Thus, fewer coal burning plants and more natural gas burning plants were marginal units in 2005.

Table 2-8. Electrical Generation from Wisconsin Plants Monitored by the EPA (Excludes Hydro and Nuclear)

Fuel	2000 GWH	2000 Percent	2005 GWH	2005 Percent
Coal	42,276	96.5%	36,650	87.3%
Natural Gas	106	0.2%	168	0.3%
Pipeline Natural Gas	384	0.9%	4,947	11.8%
Diesel	834	1.9%	0	0.0%
Oil	208	0.5%	0	0.0%
Wood	0	0.0%	205	0.5%
Total	**43,809**	**100.0%**	**41,970**	**100.0%**

Source: Environmental Protection Agency, Office of Air and Radiation, "Acid Rain Hourly Emissions Data" for 2005.

Also, in the period between 2000 and 2005, the per-MWh emission of NO_x from coal-burning plants decreased significantly and to a lesser degree decreased for SO_2 as well. We note, parenthetically, that the emission factors for pipeline natural gas also declined sharply for NO_x and SO_2. We believe this reflects the introduction of newer, more efficient gas-burning plants.

The following table shows emissions factors by fuel type for 2000 and 2005 *on all units*. (Note that the basis is therefore different than for Table 2-10, which represents only marginal plants.)

Table 2-9. Emissions Factors by Fuel Type, 2000 and 2005, for Wisconsin Plants Monitored by the EPA (Excludes Hydro and Nuclear)

	NO_x (lbs/MWH)		SO_2 (lbs/MWH)		CO_2 (lbs/MWH)		Hg (lbs/GWH)	
Fuel	**2000**	**2005**	**2000**	**2005**	**2000**	**2005**	**2000**	**2005**
Coal	6.00	4.81	11.57	11.24	1,250	1,320	0.06	0.06
Natural Gas	4.07	3.58	0.61	0.11	1,040	800	0.00	0.00
Pipeline Natural Gas	2.01	0.81	0.07	0.02	1,340	800	0.00	0.00
Diesel	1.68		0.10		920		0.01	
Oil	3.53		0.18		2,000		0.02	
Wood		6.73		4.85		1,570		0.00
Total	**5.64**	**4.15**	**10.48**	**8.67**	**1,250**	**1,220**	**0.06**	**0.04**

In general, the emissions produced per MWh of electricity generated, went down from 2000 to 2005, with the exception of the CO_2 in coal-fired generators, which increased from 1,250 pounds per MWh in 2000 to 1,320 pounds per MWh in 2005.

Table 2-10. Emissions Rates

Emissions	Generation lbs/MWh	On-site Therms lbs/Therm
NO_x	1.9	.01
SO_2	3.7	.00006
Mercury (Lbs/GWh)	0.0154	
CO_2	1,692	11.708

Sources: Generation factors from *Estimating Seasonal and Peak Environmental Emissions Factors*. Jeff Erickson with Carmen Best, David Sumi, Bryan Ward, Bryan Zent, and Karl Hausker; PA Government Services Inc. Report for the Wisconsin Department of Administration, Division of Energy. Focus on Energy statewide evaluation. May 2004.
Therm factors from EPA data (EPA's *E-Grid 2000 database* with data for the MAIN and MAPP NERC regions from 1998). Update based on memo from Eric Rambo and Bryan Ward dated January 5, 2007.

Using the marginal cost emission rates and evaluation-verified gross electricity savings estimates,[iii] the Focus programs together potentially displaced 1,433,622 pounds of NO_x; 3,157,076 pounds of SO_2; over 1,718 million pounds of CO_2; and over 12.5 pounds of mercury from inception to December 31, 2007 (Table 2-12).

Table 2-11. Net Emissions Displaced Annually
Second Half of 2007 (July 1, 2007–December 31, 2007)

Program Area	Net MWh	Net Therms	NO_x	SO_2	CO_2	Mercury
Business	62,315	2,576,021	118,550	255,820	135,730,691	1.03
Renewables	410	79,085	783	2,292	1,623,428	0.01
Residential	34,560	944,864	65,720	137,135	69,587,120	0.56
Total	**97,285**	**3,599,971**	**185,052**	**395,247**	**206,941,239**	**1.59**

Table 2-12. Net Emissions Displaced Annually
Cumulative in Current Year (July 1, 2001–December 31, 2007)

Program Area	Net MWh	Net Therms	NO_x	SO_2	CO_2	Mercury
Business	410,695	29,102,562	782,031	1,804,892	1,037,141,384	7.07
Renewables	7,897	759,550	15,048	36,664	22,293,334	0.14
Residential	334,780	7,837,032	636,543	1,315,520	658,611,289	5.36
Total	**753,371**	**37,699,143**	**1,433,622**	**3,157,076**	**1,718,046,008**	**12.56**

Emission reductions are calculated using the marginal cost emission rates.

Wisconsin's investor-owned utilities are included in the federal SO_2 regulatory structure of the Clean Air Act (acid rain provisions). In this cap-and-trade system SO_2 emissions cannot be considered reduced or avoided unless EPA lowers the SO_2 cap.

The Department of Natural Resources (DNR) has developed an emissions registry to track emissions reductions in Wisconsin. The ongoing reporting of emissions reductions associated with Focus programs' energy impacts has been the basis for the Division of Energy's entries to the DNR's *Voluntary Emissions Reduction Registry (http://www.dnr.state.wi.us/org/aw/air/registry/index.html*). For purposes of this Registry, the Focus evaluator serves as the independent third-party verification organization for a residential program offered through Wisconsin's Focus on Energy. The program, ENERGY STAR® Products, promotes the installation of energy-efficient appliances, lighting, and windows. Drawing upon the evaluation activities conducted over the past four years, the emissions savings from the Energy Saver compact fluorescent light bulb portion of the program were verified for the Registry. The calculations, assumptions, and research activity backup that supports the registered reductions in emissions associated with the verified energy impacts of the program are cited and available on the state's DNR website.

2.6 NON-ENERGY BENEFITS

Table 2-13 shows the total value of non-energy benefits (NEBs) for each program area. The NEBs reported are based on the reports that were completed for each program area.[5] NEBs values are calculated using the same approach utilized by the recently completed benefit cost analysis. However, they are a combination of one-time savings and ongoing savings, so it is not straightforward to turn these values into lifetime benefits. A review of the NEBs attributed to Focus is in process. A draft report will be issued in early August.

Table 2-13. Value of Non-Energy Benefits by Program Area
Program to Date (July 1, 2001–December 31, 2007)

Program Area	Value of Non-energy Benefits	
	2007 Jul–Dec	Program to Date as of December 31, 2007
Business Programs	$2.3 million	$20.3 million
Example Benefits from Business Programs: • Maintenance employee morale • Equipment life • Productivity • Waste generation • Defects and errors • Sales • Non-energy costs • Personnel needs • Injuries and illnesses		
Residential Programs	$2.4 million	$25.1 million
Example Benefits from Residential Programs: • Increased safety resulting from a reduction of gasses such as carbon monoxide due to the installation of a new high-efficiency furnace • Fewer illnesses resulting from elimination of mold problems due to proper air sealing, insulating and ventilation of a home • Reduced repair and maintenance expense due to having newer, higher quality equipment • Increased property values resulting from installation of new equipment • Reduced water and sewer bill from installation of an ENERGY STAR qualified washing machine, which uses much less water than conventional washing machine.		
Renewable Energy Programs	$34,343	$761,245
Example Benefits from Renewable Energy Programs: • Greater diversity of primary in-state energy supplies • Use of wastes as a fuel instead of disposal • Increased ability to handle energy emergencies or generation short-falls • Increased sales of renewable energy by-products.		

[5] *Non-energy Benefits Cross-cutting Report. Year 1 Efforts.* Jeff Riggert, Nick Hall, and Tom Talerico, TecMRKT Works, December 4, 2002.

Non-energy Benefits to Implementing Partners from the Wisconsin Focus on Energy Program. Nick Hall and Johna Roth, TecMarket Works, October 20, 2003.

A Qualitative Program Effects Status Study. Nick Hall, TecMarket Works. January 17, 2005.

2.7 HISTORICAL SIMPLE B/C AND COST OF CONSERVED ENERGY (CCE)

This section of the *Semiannual Report* presents the simple benefit-cost test and cost of conserved energy results for the last six months of 2007 and for the program to date, along with information on the key input assumptions for the analysis. This is different from the next section, which presents results from the benefit cost analysis completed in FY07 covering a ten-year program horizon. The numbers presented in this section are based on the program activities through December 31, 2007. However, the inputs and methodology applied are consistent.

The simple benefit-cost test is based on the Total Resource Cost (TRC) test, a commonly used test of program cost effectiveness. The test compares program and participant costs against the avoided costs of supplying the conserved energy. The methodology and inputs used for this test are consistent with the recently completed benefit cost reports, which is covered in greater detail in section 2.8 below.

The methodology for calculating the cost of conserved energy was outlined in a memo report issued by the evaluation team (*Cost of Conserved Energy (CCE): Potential Calculations for Focus on Energy*, October 31, 2005). The specification and calculation of CCE originated with the desire to compare energy conservation measures, specific technologies, energy efficiency (EE) programs, or entire program portfolios to the relative cost of achieving a specific unit of energy savings (i.e., $/kWh). A key potential benefit of the CCE approach is to give equal weight to both energy *supply* and energy *demand* options. Thus, cost of conserved energy curves were developed about two decades ago to place energy efficiency cost estimates at a level comparable to that for supply-side options (Meier, 1982). Much of the early development of CCE curves was conducted at the Lawrence Berkeley National Lab. Recent development work has been sponsored by the California Energy Commission (CEC)[6] . Based on reporting by ACEEE, CCE results have also been calculated and reported by six other public benefits states. They are California, Connecticut, Massachusetts, New Jersey, New York, and Vermont.

The cost of conserved energy has several inputs in common with the simple benefit-cost test. For example, the discount rate and the expected life of the savings resulting from the program(s) and the results of the two tests are presented together in the tables below.

It should be noted that one of the key assumptions for calculating the cost of conserved energy for programs that result in both electric and gas savings is the allocation of program costs (a known value) to the attributed savings. In other words, what proportion of the program costs were required to generate the electric savings and what proportion of the program costs were required to generate the gas savings? In Tables 2-15 and 2-16 below, the allocation of program costs is indicated in the column “Elec %” The methodology for attributing program costs is based on a three-step process that is based on the value of incentive dollars paid to realize the energy savings, where this is known. A number of incentives, however, are related to measures that realize electric and gas savings. And, other incentives are paid for measures/activities for which no energy savings is directly related. For

[6] See Sathaye, Jayant, and Scott Murtishaw. 2004. *Market Failures, Consumer Preferences, and Transaction Costs in Energy Efficiency Purchase Decisions.* Lawrence Berkeley National Laboratory for the California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-202.

these the program cost allocation is based on the value of the energy savings realized by the program.

2.7.1 Key Inputs:

Discount rate: 5%

Table 2-14. Utility Avoided Costs

Sector	kW	kWh	Therms
Schools/Government	$104.00	$0.056	$0.917
Commercial/Agriculture			$0.987
Industrial			$0.878
Residential			$1.061

Details on measure life and the basis for incremental costs are presented by program and b/c measure category in Appendix C of this report.

2.7.2 Definitions for Each of the Columns in Tables 2-15 and 2-16

Value of Energy Savings. The present value of the utility avoided costs over the life of the measures installed through the program. This is comparable to the "documentable savings" referred to in the next section.

Value of Avoided Emissions. The present value of the utility avoided costs over the life of the measures installed through the program. This is comparable to the "externalities" referred to in the next section.

Program Costs. Program spending less incentives, but including program administrative costs

Incremental Costs. The costs of a measure over and above a standard efficiency measure. For the renewables program area, it is the full project costs. The NTG ratio is applied to these costs to obtain the value to be included in the simple b/c formula.

Simple B/C. The simple benefit-cost ratio

CCE kWh. The cost of conserved energy for each kilowatt-hour saved

CCE Therms. The cost of conserved energy for each therm saved

Elec %. The proportion of the program cost that are allocated to electricity savings

NTG kWh. The net-to-gross ratio for the electric energy savings

NTG Therms. The net-to-gross ratio for the gas energy savings

The business program area has the best simple b/c ratio for the second half of 2007 and program to date at 2.8 and 3.2 respectively. For the residential program area, the simple b/c ratio is 1.0 and 1.4 respectively. For the renewables program areas, the simple b/c is 1.0 for both time periods. The results of the simple b/c test indicate that the benefits outweigh the costs of the Focus on Energy across all for the program areas.

Table 2-15. Simple Benefit-Cost and Cost of Conserved Energy Second Half of 2007 (July 1, 2007–December 31, 2007)

Program Area	Value of Energy Savings	Value of Avoided Emissions	Program Costs	Incremental Costs	Simple B/C	CCE kWh	CCE Therms	Elec %	NTG kWh	NTG Therms
Business	$48,903	$836	$5,787	$19,165	2.8	$0.023	$0.158	73%	62%	49%
Renewables	$919	$11	$670	$1,540	1.0	$0.319	$0.190	90%	18%	22%
Residential	$16,291	$989	$3,630	$13,966	1.0	$0.043	$0.716	55%	94%	97%
Total	$66,113	$1,836	$10,086	$34,671	2.0	$0.030	$0.243	68%	70%	55%

Dollar values, with the exception of the CCE values, are denominated in thousands (000).

Table 2-16. Simple Benefit-Cost and Cost of Conserved Energy Program to Date (July 1, 2001–December 31, 2007)

Program Area	Value of Energy Savings	Value of Avoided Emissions	Program Costs	Incremental Costs	Simple B/C	CCE kWh	CCE Therms	Elec %	NTG kWh	NTG Therms
Business	$506,066	$6,271	$67,073	$172,863	3.2	$0.027	$0.160	67%	55%	57%
Renewables	$13,023	$55	$8,455	$24,422	1.0	$0.156	$0.110	94%	18%	22%
Residential	$233,749	$6,525	$54,179	$151,271	1.4	$0.047	$0.703	68%	79%	87%
Total	$752,838	$12,851	$129,707	$348,556	2.2	$0.036	$0.247	69%	63%	60%

Dollar values, with the exception of the CCE values, are denominated in thousands (000).

2.8 BENEFIT-COST ANALYSIS[iv]

The analysis takes a societal perspective to counting Focus benefits and costs. The "simple" b/c test (results presented below in Table 2-17) is somewhat conservative. It counts as benefits only the avoided costs of well-documented *net* energy savings. These avoided costs include the value of avoided emissions for which active offset markets currently exist. The simple test is comparable to Total Resource Cost or Societal tests typically done in other states.

The "expanded" test used is intended to be more realistic by including a broader range of effects (Table 2-18). However, including this broader set of effects requires using estimates that have somewhat less empirical certainty and that are not necessarily counted in other jurisdictions.

Costs in both tests are program spending, excluding incentive payments, and customer incremental costs for measures attributable to the programs.

The expanded b/c test expands upon the simple test in several ways.

- Market effects are counted that are considered reasonably likely, but have not been rigorously or precisely quantified in impact analysis to date.
- Non-energy benefits (and costs) are included for all programs.
- Avoided emissions externality costs for expected future emissions offset markets are counted as a benefit.
- Benefits are valued in terms of their net impact on the economy, as determined from the economic impact analysis. The net economic impacts take into account the

economic ripple effects on the Wisconsin economy of energy savings and associated non-energy and emissions effects.

Spending Scenarios. For this long-term analysis, conducted in the middle of the life of the program, it is necessary to establish meaningful assumptions of the levels and duration of future program spending. Two spending scenarios are considered.

- The low-funding version of the analysis assumes that spending levels will be similar to those observed in the first five program years. This version indicates the cost-effectiveness of the program as it has existed to date, but assumes a longer total program life. The low-funding scenario provides a minimum realistic benefit-cost assessment.
- The high-funding version assumes that spending rises based on the currently legislated funding levels for the remaining years. Under this scenario, we also count additional market effects that are reasonably likely under increased funding but have not been documented for the programs so far. Thus, the high-funding scenario provides a measure of likely cost-effectiveness of the programs as they could proceed under current funding plans.

Benefit-Cost Analysis Results. In terms of benefit-cost ratios, the low- and high-funding scenarios gave very similar results for Focus as a whole, as well as for the Business and Residential program areas and individual programs. We present the high-funding results as representing a more likely future path for the programs. The consistency with the low-funding results reduces possible concern that the cost-effectiveness would be overstated if future funding turns out to be less than currently planned.

Focus as a whole is projected to have positive net benefits for the state for all forms of the benefit-cost comparison conducted. For the expanded test, high-funding assumption, the projected net present value of 10 years of program operations over a 25-year horizon is a net benefit of $4.4 billion. The benefit-cost ratio for Focus as a whole is 5.3. Under the more conservative simple test, net benefits are $1.4 billion, with a benefit-cost ratio of 2.4.

Table 2-17. Benefits and Costs by Program Area
25-Year Net Present Value ($000,000), Simple B/C Test, High Funding

Program Area	Benefits	Costs	Net Benefits	B/C Ratio
Residential	$785	$469	$316	1.7
Business	$1,499	$483	$1,016	3.1
Renewables	$94	$56	$38	1.7
Total	$2,377	$1,008	$1,369	2.4

Table 2-18. Benefits and Costs by Program Area
25-Year Net Present Value ($000,000), Expanded B/C Test, High Funding

Program Area	Benefits	Costs	Net Benefits	B/C Ratio
Residential	$1,418	$469	$950	3.0
Business	$3,577	$483	$3,094	7.4
Renewables	$366	$56	$310	6.5
Total	$5,361	$1,008	$4,353	5.3

The Residential Portfolio has projected benefits substantially above the program costs. The net benefit is estimated at $0.3 billion using the simple test and $1 billion with the expanded test. The benefit-cost ratio is 1.7 using the simple test and 3.0 using the expanded test. A large fraction of the program area achievement comes from compact fluorescent bulbs, both through direct savings tracked by the program and through market effects savings. The ENERGY STAR® Products (ESP) program, which is dominated by the CFL effort, has the highest simple b/c ratio of any of the Residential Programs.

The Business Program area has net benefits of $1 billion and a benefit-cost ratio of 3.1 under the simple test and $3.1 billion and 7.4 under the expanded test. These b/c ratios represent improvements compared to the findings from the initial b/c report. Contributors to this improvement include increased attribution levels based on the most recent impact report, some projected added market effects savings, and, for the expanded b/c analysis, the inclusion of non-energy benefits. (The increased attribution stems largely from the change in attribution method for CFLs, applying the same analysis as has been used in the past for the Residential CFLs.)

For the Renewables program, the Low scenario appears to represent a more realistic estimate of the overall b/c ratio than does the High scenario. Under this scenario, the b/c ratio is 1.7 using the simple test, and 6.5 using the expanded test. Thus, even under the most conservative analysis, the program is cost-effective.

2.9 COMPARISONS OF FOCUS ENERGY IMPACTS AND ACHIEVABLE POTENTIAL

As part of an effort to present additional information at the measure and market levels, this section supplements the energy impacts results reported at the technology-specific level with comparisons to *achievable potential* in Wisconsin. The intent of these comparisons is to provide some insights regarding the present selection of markets promoted in Focus. The results for achievable potential are taken from the study on *Energy Efficiency and Customer-Sited Renewable Energy: Achievable Potential in Wisconsin 2006–2015* prepared by the

Energy Center of Wisconsin (ECW) on behalf of The Governor's Taskforce on Energy Efficiency and Renewables (November 2005). In the following discussion, the ECW's report is referred to as the *Potential Study*. Prior to presenting the comparison results in tables, the methods used are summarized.

2.9.1 "Mapping" Focus Measure Categories to Potential Study Markets

The ECW's *Potential Study* produced results for 36 markets (15 C&I, 15 residential, and 6 renewable). To compare to Focus impacts, some of these markets have been combined and others have been added to provide information about the types of markets that had significant activity in Focus but were not included in the *Potential Study*, e.g., energy-efficient refrigerators and freezers in the residential sector (see Tables 2-19 through 2-24).

To make comparisons between potential savings and achieved savings, the first step was to "map" or assign the measures installed through Focus to the *Potential Study* markets. The evaluation team made the initial assignments early in FY07 with some review by the ECW's author of the *Potential Study* report. Subsequently, there has been collaboration between the program administrators and representatives from the ECW and the evaluation team to review the assignments. This has resulted, over time, in a number of changes being made to the assignments of Focus measures for both the residential and the commercial and industrial markets. Changes in the evaluation reporting database have now made it easier to specify market assignments at the measure level, where for the commercial and industrial sectors assignments were made at the program/measure category level. Therefore, additional review of the assignments of measures to markets has occurred, including PSCW and program implementers, as the measure lists for inclusion in the PSCW's tracking system for business programs have been established.

2.9.2 Markets with No Identified Potential

The *Potential Study* estimates the potential in the 30 C&I and residential markets "to save electric energy, electric demand, and natural gas at or below current utility avoided costs" (Volume I, page 9). The markets included were not exhaustive, therefore, it should be noted that there could be markets that were not included in the study that could provide additional potential for energy savings.

Where there are no Focus energy impacts noted for markets it is because current Focus programs do not capture energy savings from the market. Note that this can be affected by the *Potential Study's* definitions of markets and the mapping task of assigning Focus measure categories to markets.

2.9.3 Values Used to Represent Energy Savings Potential

The estimated values for market-specific energy efficiency potential have "considerable variation in the magnitude of these contributions, depending on the resource and sector in question" (Volume I, page 14). The *Potential Study* used 90 percent probability boundaries for each market's estimates. The point estimate used in the comparison tables in this report represents the upper boundary of the average annual incremental impact (referred to in the tables as "high" potential). Also, the *Potential Study* used both a 5-year and 10-year horizon for estimating the incremental impacts. The point estimate is based on the 5-year horizon values.

All tables use Focus net energy impacts for 2007 (January 1, 2007, through December 31, 2007). A full year of Focus program results makes comparisons to the *Potential Study's* annual incremental potentials feasible.

In the results provided in Tables 2-19 through 2-24, the percent of potential achieved is color-coded as follows: red signifies that the Focus net savings are at least 66 percent of the estimated annual achievable potential (or have exceeded it); yellow indicates that the Focus savings are realizing 33 percent to 66 percent of the achievable potential; and, green identifies *Potential Study* markets for which Focus is realizing less than 33 percent of the achievable potential. The intent of this scheme is to assist the reader in interpreting the many comparisons.

A. COMMERCIAL & INDUSTRIAL MARKETS

Table 2-19 provides the comparison results for electric C&I markets. As shown in the table, and summarized in the *Potential Study* report (Volume I, page 14), "Lighting, industrial process improvements, commercial new construction and industrial pump system improvements dominate the C&I sector contribution to overall potential." A close convergence can be seen between achievable potential and actual net Focus kWh impacts for the most important end-use—lighting. The *Potential Study* indicates that lighting markets account for about 46 percent of achievable potential. At this end-use level, Focus measures assigned to the two lighting markets (specified in the *Potential Study*) contributed about 58 percent of Focus kWh savings in calendar year 2007. Focus is therefore achieving almost 68 percent of the kWh potential.

There are four markets in which Focus had little or no savings in calendar year 2007. These also tend to be the markets that are also expected to have little potential. One of these, the market for high performance new buildings, is a new initiative for Focus beginning in the second half of 2007. Since this market is reflecting no savings for the calendar year and we know that some impacts have been realized in this market, some re-allocation of savings to markets is necessary to take this market into account. It should be noted that some measures in markets such as wastewater are captured in other markets such as motors and pumps. A lack of tracked savings in a sector does not indicate that there is no activity. Focus is approaching or has exceeded the estimated annual market potential in five of the C&I markets.

Table 2-19. Comparisons of Focus Electric Energy Impacts (Net, Calendar Year 2007) and Achievable Potential—Commercial & Industrial Markets

Market ID	Market	Annual kWh Potential - High	% of kWh Potential - High	Net kWh Savings	% of kWh Savings	% of kWh Potential Achieved
1.01	High Performance New Buildings	15,636,000	7.7%	0	0.0%	0.0%
2.01	Commercial Unitary HVAC Replacement and System Improvements	2,103,000	1.0%	1,305,569	1.2%	62.1%
3.00	C&I Lighting Remodeling and Replacement and Retrofit	93,898,000	46.4%	63,684,998	58.2%	67.8%
4.01	Commercial Boiler Replacement and Systems Improvements	0	0.0%	26,268	0.0%	
6.01	Commercial Chiller Replacement and System Improvements	3,028,000	1.5%	4,086,222	3.7%	134.9%
7.01	Commercial Ventilation System Improvements	5,893,000	2.9%	1,521,368	1.4%	25.8%
8.01	Commercial Refrigeration System Improvements	6,486,000	3.2%	1,836,650	1.7%	28.3%
9.01	Industrial Motors: New, Replacement and Repair Market	3,096,000	1.5%	2,277,227	2.1%	73.6%
10.01	Industrial Compressed Air Systems Improvements	10,988,000	5.4%	8,821,596	8.1%	80.3%
11.01	Industrial Fan and Blower Systems Improvement	4,809,000	2.4%	0	0.0%	0.0%
12.01	Industrial Pump Systems Improvement	30,055,000	14.8%	1,016,867	0.9%	3.4%
13.01	Manufacturing Process Upgrades	10,154,000	5.0%	5,606,399	5.1%	55.2%
14.01	Municipal Water and Wastewater	4,449,000	2.2%	0	0.0%	0.0%
15.01	Agriculture Energy Efficiency	11,843,000	5.9%	7,748,707	7.1%	65.4%
70.00	Commercial Pumps			185,384	0.2%	
71.00	HVAC-Other			572,692	0.5%	
72.00	Turn Off/Disconnect			57,920	0.1%	
73.00	Waste Water Treatment			2,017,642	1.8%	
99.02	Savings not Mapped to Market			8,645,981	7.9%	
	TOTALS	**202,438,000**	**100.0%**	**109,411,491**	**100.0%**	**54.0%***

The 54.0 percent of potential achieved is the sum of savings in markets for which annual potential was estimated over the total potential, recognizing that some of the markets have significantly exceeded their estimated annual potential.

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

Table 2-20 shows natural gas savings and potential for C&I markets. The *Potential Study* estimates that over 79 percent of the achievable potential is represented by Manufacturing Process Upgrades. For calendar year 2007, about 45 percent of Focus savings were obtained from these process upgrades in calendar year 2007, which represented realizing 62 percent of the annual potential. Another important contribution to Focus therm savings was in the market category of Commercial Boiler Replacement and Systems Improvements (about 26 percent of therm savings), while the *Potential Study* suggests that about 7 percent of annual therm savings potential is achievable in this market. Focus is achieving savings that significantly exceed the estimated annual potential in the Commercial Unitary HVAC Replacement and System Improvements and Agricultural upgrades markets.

As with the electricity savings in the C&I markets, there is a new initiative beginning in July 2007 to pursue the high performance new buildings market. We know that some savings has been achieved in that market that is not reflected in the table below.

Table 2-20. Comparisons of Focus Gas Energy Impacts (Net, Calendar Year of 2007) and Achievable Potential—Commercial & Industrial Markets

Market ID	Market	Annual Therm Potential - High	% of Therm Potential - High	Net Therm Savings	% of Therm Savings	% of Therm Potential Achieved
1.01	High Performance New Buildings	562,000	10.5%	0	0.0%	0.0%
2.01	Commercial Unitary HVAC Replacement and System Improvements	0	0.0%	210,462	3.6%	
3	C&I Lighting Remodeling and Replacement and Retrofit	-1	0.0%	1,686	0.0%	
4.01	Commercial Boiler Replacement and Systems Improvements	390,000	7.3%	1,538,591	26.1%	394.5%
6.01	Commercial Chiller Replacement and System Improvements	0	0.0%	632	0.0%	
7.01	Commercial Ventilation System Improvements	97,000	1.8%	33,663	0.6%	34.7%
8.01	Commercial Refrigeration System Improvements	0	0.0%	2,277	0.0%	
10.01	Industrial Compressed Air Systems Improvements	0	0.0%	18,472	0.3%	
13.01	Manufacturing Process Upgrades	4,229,000	79.2%	2,622,765	44.5%	62.0%
15.01	Agriculture Energy Efficiency	65,000	1.2%	437,534	7.4%	673.1%
70	Commercial Pumps			241	0.0%	
71	HVAC-Other			102,396	1.7%	
99.02	Savings not Mapped to Market			923,188	15.7%	
	TOTALS	**5,342,999**	**100.0%**	**5,891,906**	**100.0%**	**110.3%**

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

B. RESIDENTIAL MARKETS

Table 2-21 presents comparisons of Focus energy impacts and achievable potential for residential electric markets. For electric energy savings, incentives for CFLs continue to be the dominant market for energy savings, accounting for 55 percent of annual achievable potential. Focus savings have exceeded this potential with over 74 percent of energy savings for the second half of 2007 attributable to incentivized CFLs. The market with the second largest potential, Retailer Promotion of ENERGY STAR Consumer Electronics (14.7 percent of total kWh achievable potential), is not currently a market that Focus programs are targeting for savings. Overall, the residential programs are approaching estimated annual potential or have exceeded that potential in one market, incentives for homeowner clothes washer purchases. They are capturing a significant proportion of the estimated annual market potential of the three markets and are capturing little or none of the potential in ten of the markets. Lighting fixtures and refrigerators & freezers are markets that were not included in the *Potential Study* but that combined account for just over three percent of residential programs electricity savings in calendar year 2007.

Table 2-21. Comparisons of Focus Electric Energy Impacts (Net, Calendar Year 2007) and Achievable Potential—Residential Markets

Market ID	Market	Annual kWh Potential - High	% of kWh Potential - High	Net kWh Savings	% of kWh Savings	% of kWh Potential Achieved
16.01	ENERGY STAR Marketing	417,000	0.2%	0	0.0%	0.0%
16.02	Retailer Promotion of ENERGY STAR Consumer Electronics	31,371,000	14.7%	0	0.0%	0.0%
17.01	Incentives for CFLs	117,230,000	55.0%	51,394,859	74.5%	43.8%
18.01	Multi-family Common Area Lighting—Direct Install Market	4,744,000	2.2%	0	0.0%	0.0%
19.01	Incentives For Variable Speed Furnaces	15,242,000	7.2%	6,755,976	9.8%	44.3%
20	Central AC/HVAC	4,946,000	2.3%	453,106	0.7%	9.2%
22	Room AC	1,582,000	0.7%	33	0.0%	0.0%
23	Homeowner Water Heater Purchases	9,313,000	4.4%	0	0.0%	0.0%
24.01	Incentives for Energy Efficient (EE) New Home Construction	732,000	0.3%	1,144	0.0%	0.2%
26.01	Dehumidifier Early Retirement	2,019,000	0.9%	1,500	0.0%	0.1%
27	Direct Install Market	13,713,000	6.4%	0	0.0%	0.0%
28	Shell Improvements including Remodeling (25.01)	4,582,000	2.2%	197,236	0.3%	4.3%
29.01	Incentives for Homeowner Clothes Washer Purchases	4,172,000	2.0%	5,021,299	7.3%	120.4%
30.01	Multi-Family Fuel Switching	2,909,000	1.4%	0	0.0%	0.0%
81	Refrigerators & Freezers			846,450	1.2%	
82	Lighting Fixtures			1,314,605	1.9%	
99	Savings not Mapped to Market			2,981,317	4.3%	
	Totals	**212,972,000**	**100.0%**	**68,967,525**	100.0%	32.4%*

*The 32.4 percent of potential achieved is the sum of savings in markets for which annual potential was estimated over the total potential, recognizing that some of the markets have significantly exceeded their estimated annual potential.

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

As shown in Table 2-22, the market cited by the *Potential Study* as having the greatest achievable potential for residential natural gas therm savings is Incentives for Energy Efficient New Home Construction, estimated to contribute over 58 percent of total annual therm potential. Based on assignments of Focus measures to *Potential Study* markets, about 11 percent of therm savings for the 2007 calendar year are attributable to new home construction measures. In addition, Focus is accomplishing significant therm savings with Shell Improvements including Remodeling, where nearly 15 percent of savings for the 2007 calendar year were realized (about 10 percent of the estimated annual potential).

Also with respect to residential natural gas, Focus is capturing significant therm savings from multi-family buildings. About 14 percent of therm savings for the second half of 2007 are attributable to Multi-family Heating System Replacements (versus estimated achievable potential of two percent of total potential). However, the *Potential Study* suggests that there is important achievable potential in the Homeowner Water Heater Purchases (11.5 percent of total therm savings potential) where for the second half of 2007 less than one percent of Focus residential therm savings were realized.

Table 2-22. Comparisons of Focus Gas Energy Impacts (Net, Second Half of 2007) and Achievable Potential—Residential Markets

Market ID	Market	Annual Therm Potential - High	% of Therm Potential - High	Net Therm Savings	% of Therm Savings	% of Therm Potential Achieved
19.01	Incentives For Variable Speed Furnaces	0	0.0%	174,912	13.3%	
21.01	Multi-family Heating System Replacement—Medium and Larger Buildings	262,000	2.2%	180,140	13.7%	68.8%
21.02	Multi-family Fuel Switching	571,000	4.9%	0	0.0%	0.0%
23	Homeowner Water Heater Purchases	1,344,000	11.5%	12,084	0.9%	0.9%
24.01	Incentives for Energy Efficient (EE) New Home Construction	6,884,000	58.7%	148,900	11.3%	2.2%
27	Direct Install Market	630,000	5.4%	0	0.0%	0.0%
28	Shell Improvements including Remodeling (25.01)	1,897,000	16.2%	196,578	14.9%	10.4%
29.01	Incentives for Homeowner Clothes Washer Purchases	140,000	1.2%	167,145	12.7%	119.4%
99	Savings not Mapped to Market			438,126	33.2%	
	Totals	11,728,000	100.0%	1,317,884	100.0%	11.2%

*The 11.2 percent of potential achieved is the sum of savings in markets for which annual potential was estimated over the total potential, recognizing that some of the markets have significantly exceeded their estimated annual potential.

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

C. RENEWABLE ENERGY MARKETS

Table 2-23 provides results for comparisons of estimated achievable potential and calendar year 2007 Focus savings for renewable energy markets and electric energy potential. This potential is dominated by Agriculture Anaerobic Digestion, contributing almost 60 percent of total achievable potential. The technologies in this market accounted for almost 90 percent of savings for the 2007 calendar year, but this was less than 14% of the estimated annual potential.

Table 2-23. Comparisons of Focus Electric Energy Impacts (Net, Calendar Year 2007) and Achievable Potential—Renewables Markets

Market ID	Market	Annual kWh Potential – High	% of kWh Potential - High	Net kWh Savings	% of kWh Savings	% of kWh Potential Achieved
31.01	Customer-sited, Grid-connected, Commercial Solar Photovoltaics (PV)	263,000	1.2%	93,826	4.9%	35.7%
33.01	Residential Solar Thermal (Hot Water)	333,000	1.6%	70,178	3.6%	21.1%
35.01	Customer-sited, Gird-connected, Commercial Wind Energy	7,914,000	37.5%	33,792	1.7%	0.4%
36.01	Agriculture Anaerobic Digestion	12,583,000	59.7%	1,730,144	89.5%	13.7%
99.03	Savings not Mapped to Market			5,670	0.3%	
	Totals	**21,093,000**	**100.0%**	**1,933,610**	**100.0%**	**9.2%**

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

Focus is also obtaining nearly all of its 2007 calendar year therm savings from Wood Residue for Commercial/Institutional Heat (Table 2-24), which is also the source of greatest annual therm potential (75.3 percent according to the *Potential Study*). Another important source of therm potential is Commercial Solar Thermal (Hot Water), which is projected to have 22 percent of the annual therm potential, but accounts for less than one percent of the program savings in calendar year 2007.

Table 2-24. Comparisons of Focus Gas Energy Impacts (Net, Calendar Year 2007) and Achievable Potential—Renewables Markets

Market ID	Market	Annual Therm Potential - High	% of Therm Potential - High	Net Therm Savings	% of Therm Savings	% of Therm Potential Achieved
32.01	Commercial Solar Thermal (Hot Water)	212,000	22.0%	917	0.2%	0.4%
33.01	Residential Solar Thermal (Hot Water)	26,000	2.7%	30,991	6.9%	119.2%
34.01	Wood Residue for Commercial/Institutional Heat	724,000	75.3%	414,263	92.7%	57.2%
99.03	Savings not Mapped to Market			503	0.1%	
	Totals	**962,000**	**100.0%**	**446,674**	**100.0%**	**46.4%**

Red = Focus net savings are at least 66 percent of the estimated annual achievable potential
Yellow = Focus net savings are realizing 33 percent to 66 percent of the achievable potential
Green = Focus net savings are less than 33 percent of the achievable potential.

3. BUSINESS PROGRAMS EVALUATION

3.1 OVERVIEW OF KEY ACTIVITIES

This chapter describes our evaluation of the Business Programs during the second half of 2007 (July 1, 2007, through December 31, 2007). This chapter summarizes the following:

- Reports delivered in the second half of 2007
- Energy impacts
- Deemed savings review—fall 2008
- Upcoming evaluation activities for the remainder of the eighteen-month contract period.

3.2 REPORTS DELIVERED IN THE SECOND HALF OF 2007

- *Semiannual Report (Fiscal Year 07, Year End)*
- *Abbreviated FY07 Business Programs Impact Evaluation – DRAFT memo*, January 15, 2008[7]

3.3 ENERGY IMPACTS

In this section, we provide a summary of the FY07 abbreviated impact evaluation and estimates of tracked and untracked savings for the program to date.

3.3.1 FY07 Abbreviated Impact Evaluation

A. APPROACH

The evaluation team has implemented nine rounds of data collection and a document review to estimate net energy savings for Business Programs. The most recent round included measures installed between July 1, 2006, and June 30, 2007.

The impact analysis determines three adjustment factors to the savings reported by the program:

- Gross savings adjustment factor: This factor adjusts tracking gross savings for installation and changes based on engineering review. Applying the gross savings adjustment factor to tracking gross savings produces the estimate of verified gross savings.
- Attribution factor: This factor adjusts verified gross savings for program attribution.

[7] This work was completed but, due to external circumstances, the memo was not submitted until January 15, 2008. We include it in this report because of its immediate relevance.

- Realization rate: This factor combines the gross savings adjustment factor and the attribution factor. (It is the ratio of net savings to tracking gross savings.)

The definitions of these factors and the general methods for producing them for this round were essentially the same as in the previous rounds of impact evaluation for this program area. However, a modified sampling and analysis strategy was employed to provide updated adjustment factors at modest cost. We refer to this process as the Abbreviated Impact Analysis.

The Abbreviated Impact Analysis combines data collected from a sample of small and moderate size projects from the previous period (FY06 in this case) with data collected from a small number of large update-period (FY07) projects to provide an estimate for the update-period (FY07) program. The rationale for this approach is that the fundamental program operations were not substantially different between FY06 and FY07. As a result, empirical results from FY06 projects are generally likely to be indicative of FY07 performance also. However, idiosyncratic results for very large projects can swing the overall results for any particular period. We therefore relied on the results for "modest" size projects from FY06 to project effects for corresponding projects from FY07, but directly examined the very large projects for FY07 itself.

The adjustment factors shown in Tables 3-1 through 3-3 below are based on data collection and analysis of a sample of implemented projects. The data collection includes engineering interviews and decision-maker surveys with participating customers, and some onsite observations and monitoring for large projects. Site-specific analysis includes engineering review and if necessary modification of gross savings estimates, and determination of program attribution. Statistical analysis combines the individual results from the sample to generate program-level adjustment factors.

Between September and November 2007, KEMA collected data for a small sample of the largest projects completed in FY07. The five participants in each of the four sectors with the greatest FY07 savings[8] in that sector were solicited to participate in the sample. Thirteen of the twenty candidates agreed to do so.

The adjustment factors shown in the tables are based on this new data collection together with data from the previous sample of FY06 implementation. The largest projects from the FY06 sample were excluded from this analysis. This approach assumes that the net-to-gross components for all projects except for the largest are essentially the same in FY06 and FY07.

[8] Participant savings magnitude for sampling purposes is measured as total avoided costs, based on program tracked energy savings. Total avoided cost is calculated as the sum of avoided cost for all projects completed by the participant in FY07.

B. RESULTS

Overall, the Business Programs' achieved kWh, kW, and therm realization rates of 61 percent, 66 percent, and 39 percent, respectively. The realization rate is the ratio of achieved attributable savings to gross reported savings.

- The FY07 attribution rates are consistent with the rates achieved for FY06. The FY07 attribution factors for the program overall are 65 percent, 69 percent, and 58 percent for kWh, kW, and therms, respectively.
- FY07 gross savings adjustment factors for kWh, kW, and therms are 93 percent, 96 percent, and 67 percent, respectively. The gross savings adjustment factor adjusts gross reported savings for installation rates, tracking system data entry errors, and errors in gross savings calculations including corrections to input assumptions.

The tables below provide the new adjustment factors together with indicators of statistical precision, the 90% confidence interval, and sample sizes. The relative error (%) indicated for each confidence interval is the relative difference between the estimated percentage and the upper or lower confidence bound, not the absolute difference. The ± amount indicated for each confidence interval is the absolute difference in the estimated percentage. For example, the Commercial kWh attribution estimate in Table 3-2 is 72.2 percent, the 90% confidence interval is ± 9.7 percentage points (i.e., 72.2% ± 9.7% or 62.5% to 81.9%), and the relative precision (at 90 percent confidence) is 13.4 percent (9.7%/72.2%).[9]

Table 3-1 shows the FY07 gross savings adjustment factors by sector. The gross savings adjustment factors combine the installation rates and the engineering verification factors to adjust the tracking estimate of gross savings.

Table 3-1. FY07 Gross Savings Adjustment Factors by Sector

	kWh						kW						Therms					
		Gross Savings	90% Confidence Interval					Gross Savings	90% Confidence Interval					Gross Savings	90% Confidence Interval			
Segment	min n	Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound	min n	Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound	min n	Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound
Agriculture	61	83%	20.1%	16.8%	66.5%	100.1%	59	82%	14.9%	12.2%	69.8%	94.2%	7	79%	24.3%	19.1%	59.5%	97.7%
Commercial	81	99%	3.0%	3.0%	96.1%	102.2%	77	100%	3.7%	3.7%	96.0%	103.4%	10	85%	17.7%	15.1%	70.3%	100.5%
Industrial	27	99%	1.7%	1.6%	97.2%	100.5%	24	99%	1.8%	1.8%	96.7%	100.3%	23	99%	2.0%	2.0%	97.4%	101.4%
Institutional	17	93%	6.1%	5.7%	87.4%	98.8%	14	98%	5.3%	5.2%	92.6%	103.0%	20	53%	55.2%	29.3%	23.8%	82.3%
Business Programs Overall	186	93%	4.4%	4.1%	89.1%	97.3%	174	96%	4.0%	3.9%	92.0%	99.8%	60	67%	30.5%	20.5%	46.7%	87.7%

The FY07 attribution factors by sector are provided in Table 3-2. The FY07 attribution factors for the program overall are 65 percent, 69 percent, and 58 percent for kWh, kW, and therms, respectively. These results are consistent with the FY06 results.

[9] The critical value for calculating the confidence interval ± for each adjustment factor is determined using Student's t distribution and n-1 for the degrees of freedom, where n is the sample size. The critical value for the Gross Savings Adjustment Factor and the Realization Rate is determined using the degrees of freedom based on the minimum sample size for the components of the adjustment factor. These two adjustment factors are products of other adjustment factors.

Table 3-2. FY07 Attribution Factors by Sector

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	n	Attribution Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	+/-	Lower Bound	Upper Bound
Agriculture	113	61%	14.5%	8.8%	51.9%	69.5%	104	55%	16.3%	9.0%	46.1%	64.1%	26	46%	23.9%	10.9%	34.7%	56.6%
Commercial	129	72%	13.4%	9.7%	62.5%	81.9%	109	77%	12.4%	9.5%	67.1%	86.0%	57	44%	29.2%	12.9%	31.4%	57.3%
Industrial	59	58%	25.4%	14.6%	42.9%	72.1%	53	54%	27.1%	14.7%	39.4%	68.7%	33	63%	24.7%	15.6%	47.5%	78.6%
Institutional	39	72%	32.7%	23.4%	48.2%	95.0%	29	85%	20.4%	17.2%	67.3%	101.8%	55	55%	42.4%	23.5%	32.0%	79.0%
Business Programs Overall	340	65%	13.5%	8.8%	56.6%	74.3%	295	69%	14.3%	9.8%	58.8%	78.4%	171	58%	20.7%	11.9%	45.6%	69.4%

Table 3-3 shows the FY07 realization rates by sector. The realization rates combine the effect of the gross savings adjustment factors and the attribution factors.

Table 3-3. FY07 Realization Rates by Sector

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	min n	Realization Rate	Relative Error (%)	+/-	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	+/-	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	+/-	Lower Bound	Upper Bound
Agriculture	61	51%	24.9%	12.6%	38.0%	63.1%	59	45%	22.1%	10.0%	35.2%	55.2%	7	36%	36.0%	12.9%	23.0%	48.9%
Commercial	81	72%	13.8%	9.9%	61.7%	81.5%	77	76%	12.9%	9.9%	66.5%	86.3%	10	38%	36.2%	13.7%	24.2%	51.7%
Industrial	27	57%	26.0%	14.8%	42.1%	71.6%	24	53%	27.8%	14.8%	38.4%	68.0%	23	63%	25.1%	15.7%	46.9%	78.4%
Institutional	17	67%	34.3%	22.9%	43.8%	89.5%	14	83%	21.8%	18.0%	64.6%	100.7%	20	29%	70.4%	20.7%	8.7%	50.1%
Business Programs Overall	186	61%	14.2%	8.7%	52.3%	69.7%	174	66%	14.9%	9.8%	56.0%	75.6%	60	39%	37.0%	14.3%	24.4%	52.9%

3.3.2 Verified Tracked Energy Impacts

The estimates of the adjustment factors by sector are used to calculate verified gross savings and net savings. Multiplying tracking gross savings by the gross savings adjustment factor (which is the product of the installation rate and the engineering verification factor) alone yields verified gross savings.

For the last six months of 2007 (July 1, 2007, through December 31, 2007), Table 3-4a gives tracking and verified gross savings and net savings by sector and for Business Programs overall. These estimates are based on the savings tracked for this period with the most recent available adjustment factors. That is, the estimates of the adjustment factors by sector reported above are used to calculate verified gross savings and net savings for this time period. Verified gross savings and net savings for the second half of 2007 will be updated when adjustment factors based on a sample of current contract period projects becomes available.

Table 3-4a. All Business Programs: Tracked Energy Impacts
Second Half of 2007 (July 1, 2007–December 31, 2007)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	9,814,799	2,599	565,334	8,146,283	2,131	446,614	5,005,548	1,169	203,520
Commercial	30,093,459	6,230	547,068	29,792,524	6,230	465,008	21,667,290	4,735	207,886
Industrial	47,339,977	7,183	2,852,012	46,866,577	7,111	2,823,492	26,983,787	3,807	1,796,768
Schools & Government	12,922,682	4,483	1,268,440	12,018,094	4,393	672,273	8,658,197	3,721	367,848
TOTAL	100,170,917	20,494	5,232,854	96,823,479	19,865	4,407,387	62,314,822	13,432	2,576,021

Table 3-4b gives the same results for FY07 (July 1, 2006, through June 30, 2007). These estimates are based on the savings tracked for FY07, the adjustment factors from the most recent round of impact evaluation data collection are used to calculate the savings shown in Tables 3-4a and 3-4b.

Table 3-4b. All Business Programs: Tracked Energy Impacts
FY07 (July 1, 2006–June 30, 2007)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	19,695,023	5,302	756,579	16,346,869	4,347	597,698	10,044,462	2,386	272,369
Commercial	51,717,511	11,736	1,489,990	51,200,336	11,736	1,266,491	37,236,608	8,919	566,196
Industrial	62,520,244	10,531	7,828,273	61,895,042	10,425	7,749,990	35,636,539	5,581	4,931,812
Schools & Government	23,223,397	5,884	3,584,081	21,597,759	5,766	1,899,563	15,559,676	4,884	1,039,384
TOTAL	157,156,174	33,452	13,658,924	151,040,005	32,275	11,513,743	98,477,284	21,770	6,809,760

Tables 3-4c through 3-4g provide tracking and verified gross savings and net savings by program and for Business Programs overall for FY06 through FY02 (program start through June 30, 2002), respectively. Adjustment factors determined from the earlier rounds of similar data collection and analysis are used to calculate the savings for each of these program years. Estimates of the adjustment factors used to calculate verified gross savings and net savings for the earlier years are provided in the following reports:

- FY02: *Volume III, Impact Evaluation of the Business Programs Comprehensive Report*, December 23, 2002
- FY03: *Business Programs Impact Evaluation Report—Contract Year 2 Complete*, January 14, 2004
- FY04: *Business Programs Impact Evaluation Report—Year 3, Round 1*, June 17, 2004
- FY05: *Business Programs Impact Evaluation Report—FY05, Round 1,* September 9, 2005.
- FY06: *Business Programs Impact Evaluation Report*—FY06, March 2, 2007.

Table 3-4c. All Business Programs: Tracked Energy Impacts
FY06 (July 1, 2005–June 30, 2006)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	10,369,560	2,554	169,600	10,784,342	2,375	162,816	5,495,867	1,047	98,368
Channel EHCI	720,371	649	363,389	719,198	671	336,265	266,434	291	284,833
Channel Lighting	44,199,666	10,821	2,572	40,406,474	10,358	2,526	29,273,759	7,775	1,589
Commercial	25,077,211	3,441	1,400,525	24,973,534	3,522	1,367,959	14,995,143	2,037	694,238
Industrial	36,584,840	6,477	5,203,226	40,318,839	6,979	5,261,531	32,142,582	5,342	1,951,784
Schools & Government	14,865,393	4,396	2,535,132	14,558,875	4,375	2,287,500	9,443,240	2,530	1,334,962
TOTAL	131,817,040	28,338	9,674,444	131,761,262	28,280	9,418,597	91,617,024	19,021	4,365,774

Table 3-4d. All Business Programs: Tracked Energy Impacts
FY05 (July 1, 2004–June 30, 2005)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	15,305,374	3,661	262,691	9,701,733	2,194	261,335	5,629,513	1,059	96,312
Commercial	44,218,407	9,807	1,018,331	30,703,691	6,529	920,120	18,924,532	3,871	275,075
Industrial	67,588,254	9,542	3,982,640	54,234,559	8,270	4,228,658	23,555,437	3,162	2,140,696
Schools & Government	16,595,676	4,067	1,780,566	16,078,481	3,908	1,695,159	7,751,733	1,878	951,559
TOTAL	143,707,711	27,077	7,044,228	110,718,465	20,901	7,105,272	55,861,214	9,970	3,463,641

Table 3-4e. All Business Programs: Tracked Energy Impacts
FY04 (July 1, 2003–June 30, 2004)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	16,000,309	3,541	81,250	11,105,756	2,876	63,415	5,889,700	1,550	53,368
Commercial	42,261,364	9,346	589,867	37,826,842	9,625	589,498	19,901,095	5,512	509,922
Industrial	80,264,260	11,792	8,611,077	69,713,833	7,524	10,127,720	40,260,298	4,113	8,828,403
Schools & Government	17,944,782	3,925	2,359,952	18,719,873	3,516	1,834,499	13,887,845	2,009	1,224,291
TOTAL	156,470,715	28,604	11,642,146	137,366,305	23,540	12,615,132	79,938,939	13,185	10,615,984

Table 3-4f. All Business Programs: Tracked Energy Impacts
FY03 (July 1, 2002–June 30, 2003)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	7,129,148	1,805	60,906	6,716,282	1,722	58,897	3,905,035	1,134	51,166
Commercial	39,355,560	9,477	1,167,849	36,381,429	7,866	1,197,427	17,650,457	4,633	872,738
Industrial	54,297,607	7,855	1,686,471	56,649,270	7,697	1,759,518	21,358,513	2,956	915,699
Industries of the Future	15,295,186	1,638	1,190,100	14,262,206	1,628	1,235,975	9,899,931		833,046
Renewables	0	0	701,849	0	0	678,278	0	0	677,718
Schools & Government	13,737,215	2,576	1,441,431	14,314,234	2,470	1,266,154	9,669,172	1,826	292,211
TOTAL	129,814,716	23,351	6,248,606	128,323,420	21,383	6,196,249	62,483,109	10,550	3,642,577

Table 3-4g. All Business Programs: Tracked Energy Impacts
FY02 (July 1, 2001–June 30, 2002)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	931,679	278	1,319	957,662	249	1,316	438,982	91	466
Commercial	7,989,934	1,947	1,359,460	7,929,764	1,287	491,392	3,949,903	613	173,848
Industrial	16,115,405	2,525	866,495	16,618,938	4,083	631,758	11,800,434	3,027	399,772
New Buildings	143,000	113	18,049	143,000	113	18,049	143,000	46	0
Schools & Government	5,379,917	2,102	515,218	4,882,794	1,304	598,213	2,432,174	621	211,640
TOTAL	30,559,935	6,965	2,760,541	30,532,158	7,036	1,740,729	18,764,493	4,397	785,725

3.3.3 Verified Tracked Energy Impacts by Technology/End-use Categories and Business Programs Sector (Verified Gross)

The following tables present the verified gross energy impacts for Business Programs by sector (agricultural, commercial, industrial, and schools/government). For each sector, energy impacts are presented for July 1, 2007, through December 31, 2007. The tables also include a column that displays the percentage of total kWh, kW, or therm savings that comes from each technology or end-use category. The tables for each sector presented below break out the savings for that sector by measure category and indicate the percent of savings that measure category accounts for in that sector.

A. AGRICULTURAL

Table 3-5. Agricultural
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Ag Specialty	988,200	12.1%	360	16.9%	343,344	76.9%
Air Conditioning	181	0.0%	0	0.0%	0	0.0%
Appliance-Other	245,583	3.0%	17	0.8%	-1,258	-0.3%
Boiler/Other Heating	0	0.0%	0	0.0%	1,530	0.3%
Building Shell	3,967	0.0%	0	0.0%	10,170	2.3%
CFL	1,248,190	15.3%	315	14.8%	0	0.0%
Clothes Washer	1,223	0.0%	0	0.0%	0	0.0%
Compressed Air	127,351	1.6%	30	1.4%	0	0.0%
Controls	7,769	0.1%	0	0.0%	0	0.0%
Custom	33,530	0.4%	11	0.5%	0	0.0%
Greenhouse	87,375	1.1%	3	0.2%	76,026	17.0%
Heat Recovery	1,010,499	12.4%	244	11.4%	14,645	3.3%
Hot Water	873,122	10.7%	121	5.7%	3,406	0.8%
HVAC	1,734,163	21.3%	571	26.8%	-1,503	-0.3%
Light Fixture	13,517	0.2%	4	0.2%	0	0.0%
Lighting-Other	467,371	5.7%	97	4.6%	0	0.0%
Motor	1,065,266	13.1%	294	13.8%	0	0.0%
Other	291	0.0%	0	0.0%	0	0.0%

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Refrigeration	99,202	1.2%	30	1.4%	0	0.0%
Renewable	0	0.0%	0	0.0%	254	0.1%
T8/T5 Fluorescent Lighting	139,484	1.7%	33	1.6%	0	0.0%
TOTAL	8,146,283	100.0%	2,131	100.0%	446,614	100.0%

B. COMMERCIAL

Table 3-6. Commercial
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Air Conditioning	197,674	0.7%	43	0.7%	0	0.0%
Appliance-Other	0	0.0%	0	0.0%	16,641	3.6%
Boiler/Other Heating	69,083	0.2%	0	0.0%	99,399	21.4%
Building Shell	177,496	0.6%	63	1.0%	141,172	30.4%
CFL	8,282,751	27.8%	2,361	37.9%	0	0.0%
Clothes Washer	6,023	0.0%	0	0.0%	254	0.1%
Compressed Air	10,594	0.0%	4	0.1%	0	0.0%
Controls	2,150,816	7.2%	131	2.1%	1,736	0.4%
Dehumidifier	49,647	0.2%	23	0.4%	-2,093	-0.5%
Food Service	59,322	0.2%	15	0.2%	6,049	1.3%
Freezer	15,030	0.1%	2	0.0%	0	0.0%
Furnace	2,265	0.0%	0	0.0%	503	0.1%
Heat Recovery	216,931	0.7%	11	0.2%	47,275	10.2%
Hot Water	206,966	0.7%	20	0.3%	13,949	3.0%
HVAC	3,117,566	10.5%	1,343	21.6%	121,823	26.2%
Light Fixture	62,295	0.2%	19	0.3%	0	0.0%
Lighting-LED	502,033	1.7%	56	0.9%	0	0.0%
Lighting-Other	4,415,164	14.8%	859	13.8%	0	0.0%
Motor	149,587	0.5%	43	0.7%	0	0.0%
Pump	219,092	0.7%	97	1.6%	0	0.0%
Refrigeration	5,011,815	16.8%	59	0.9%	0	0.0%
Refrigerator	12,508	0.0%	2	0.0%	0	0.0%
Steam Trap	0	0.0%	0	0.0%	18,299	3.9%
T8/T5 Fluorescent Lighting	4,856,018	16.3%	1,080	17.3%	0	0.0%
Vending Miser	1,849	0.0%	0	0.0%	0	0.0%
TOTAL	29,792,524	100.0%	6,230	100.0%	465,008	100.0%

C. INDUSTRIAL

Table 3-7. Industrial
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Aeration System	664,554	1.4%	16	0.2%	0	0.0%
Air Conditioning	1,262	0.0%	2	0.0%	0	0.0%
Appliance-Other	110,573	0.2%	0	0.0%	0	0.0%
Boiler/Other Heating	-3,216,648	-6.9%	0	0.0%	1,056,894	37.4%
Building Shell	14,551	0.0%	0	0.0%	27,906	1.0%
CFL	108,330	0.2%	20	0.3%	0	0.0%
Compressed Air	10,591,314	22.6%	1,544	21.7%	54,462	1.9%
Controls	0	0.0%	0	0.0%	47,536	1.7%
Heat Recovery	0	0.0%	0	0.0%	396,062	14.0%
HVAC	2,461,900	5.3%	449	6.3%	334,731	11.9%
Light Fixture	841	0.0%	0	0.0%	0	0.0%
Lighting-LED	49,888	0.1%	6	0.1%	0	0.0%
Lighting-Other	1,950,722	4.2%	285	4.0%	0	0.0%
Motor	8,058,565	17.2%	559	7.9%	0	0.0%
Process	1,902,553	4.1%	81	1.1%	630,088	22.3%
Pulping	1,783,166	3.8%	210	3.0%	0	0.0%
Pump	5,140,423	11.0%	776	10.9%	0	0.0%
Refrigeration	298,480	0.6%	94	1.3%	0	0.0%
Steam Trap	0	0.0%	0	0.0%	275,812	9.8%
T8/T5 Fluorescent Lighting	16,937,927	36.1%	3,069	43.2%	0	0.0%
Vending Miser	8,176	0.0%	0	0.0%	0	0.0%
TOTAL	46,866,577	100.0%	7,111	100.0%	2,823,492	100.0%

D. SCHOOLS/GOVERNMENT

Table 3-8. Schools/Government
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Ag Specialty	0	0.0%	0	0.0%	1,112	0.2%
Air Conditioning	1,357	0.0%	3	0.1%	0	0.0%
Appliance-Other	43,943	0.4%	21	0.5%	-150	0.0%
Boiler/Other Heating	11,964	0.1%	2	0.1%	201,399	30.0%
Building Shell	33,819	0.3%	0	0.0%	127,789	19.0%
CFL	943,611	7.9%	237	5.4%	0	0.0%
Compressed Air	82,807	0.7%	21	0.5%	0	0.0%
Controls	384,016	3.2%	98	2.2%	55,250	8.2%
Custom	0	0.0%	0	0.0%	18,859	2.8%
Food Service	80,069	0.7%	33	0.8%	3,238	0.5%
Freezer	1,616	0.0%	0	0.0%	0	0.0%

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Heat Recovery	914	0.0%	0	0.0%	2,737	0.4%
Hot Water	24,604	0.2%	16	0.4%	8,936	1.3%
HVAC	3,445,977	28.7%	2,522	57.4%	130,289	19.4%
Light Fixture	8,834	0.1%	2	0.0%	0	0.0%
Lighting-LED	1,594,028	13.3%	258	5.9%	0	0.0%
Lighting-Other	2,170,765	18.1%	370	8.4%	0	0.0%
Motor	92,415	0.8%	24	0.5%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%
Pump	101,309	0.8%	14	0.3%	0	0.0%
Refrigerator	235	0.0%	0	0.0%	0	0.0%
Steam Trap	0	0.0%	0	0.0%	122,814	18.3%
T8/T5 Fluorescent Lighting	2,952,595	24.6%	773	17.6%	0	0.0%
Vending Miser	43,214	0.4%	0	0.0%	0	0.0%
TOTAL	12,018,094	100.0%	4,393	100.0%	672,273	100.0%

3.3.4 Program Targets and Accomplishments

Gross program savings as verified by evaluation are shown in the following table along with the program goals and percentage of goal achieved. Savings shown are as of December 31, 2007, or six months of an 18-month target period.

Table 3-9. Verified Gross Program Savings versus Program Targets
Second Half of 2007 (July 1, 2007–December 31, 2007)

	kWh			kW			Therms		
Program	Target	Net	% of 18-month Target	Target	Net	% of 18-month Target	Target	Net	% of 18-month Target
Agricultural	30,000,000	5,005,548	17%	6,375	1,169	18%	750,000	203,520	27%
Commercial	87,750,000	21,667,290	25%	18,375	4,735	26%	1,050,000	207,886	20%
Industrial	127,500,000	26,983,787	21%	18,750	3,807	20%	6,000,000	1,796,768	30%
Schools & Government	27,000,000	8,658,197	32%	7,500	3,721	50%	2,700,000	367,848	14%
Program Area Totals	**272,250,000**	**62,314,822**	**23%**	**51,000**	**13,432**	**26%**	**10,500,000**	**2,576,021**	**25%**

3.4 DEEMED SAVINGS

The deemed savings work is an ongoing collaborative effort between KEMA and the We Energies evaluation team. In 2006, the evaluation teams developed a database of deemed kW and kWh values for prescriptive measures that are included in the statewide programs and We Energies' Nonresidential Prescriptive Rebate and Comprehensive Agriculture programs. Subsequent to this initial effort, KEMA has taken the lead in reviewing measures with therm savings.

Each round prior to PSCW approval of the final database of deemed values, the evaluation teams and the implementers reach consensus on discrepancies that arise during the implementers review of the draft database. Two rounds of deemed savings work was

conducted in FY07. The first round was completed in October 2006 and the second in April 2007.

The *Contract Period One Detailed Evaluation Plan* included one round of deemed savings review. This round was planned for fall 2008, with the updated values taking effect on January 1, 2009. Following discussions with the program, the PSCW directed KEMA to implement three rounds of deemed savings review during this contract period. The first round was completed in October 2007, with the values being applied retroactively to the start of the current contract period (i.e., July 1, 2007). Going forward, deemed values will not be retroactively applied; rather they will take effect immediately after being approved by the PSCW. The second and third rounds are scheduled to be completed in April and October 2008.

3.5 UPCOMING EVALUATION ACTIVITIES

In this section, we briefly describe upcoming evaluation activities. For more information on these activities, refer to the *Contract Period One Detailed Evaluation Plan.*

- Impact Evaluation: KEMA will conduct two more rounds of impact evaluation data collection during this contract period.
  - Round 2: This round will cover measures implemented during the first nine months of this contract period (July 1, 2007, through March 31, 2008). It will be a full impact evaluation similar to those conducted in previous years.
  - Round 3: The final round of impact evaluation will use an abbreviated approach similar to that used for the FY07 Abbreviated Impact Evaluation. It will cover measures implemented between April 1, 2008, and September 30, 2008. This timing will allow additional large current projects to be included in the determination of the final set of adjustment factors for the 18-month contract period.
- Additional Looks at Attribution: In addition to generating sector-level adjustment factors for purposes of determining overall program performance, we will also produce a separate report analyzing the attribution factors by customer and/or measure characteristics. We have provided similar reports in previous years.
- Deemed Savings Review: KEMA will conduct two more rounds of deemed savings review.
  - Round 2: Proposals due to KEMA by March 31, 2008, with agreed values due to the PSCW for final approval by April 30, 2008.
  - Round 3: Proposals due to KEMA by September 3, 2008, with agreed values due to the PSCW for final approval by October 31, 2008.
- Channel Studies: We will conduct channel studies for the lighting, rotary, and HVAC channels. The primary purpose of these studies is to establish baselines for the contract metrics. These studies will not be incorporated into the NTG calculation. However, they will seek qualitative evidence to support the need for further supply-side research.
- Pre-rinse Sprayer Protocol: KEMA will assist the Commercial Sector in assessing the energy savings attributable to pre-rinse sprayers. We will work with the sector to develop a protocol to collect field measurements. The sector will be responsible for

collecting the data. KEMA will be responsible for analyzing the data and recommending revisions to the deemed savings values if appropriate.

- E&T Participant Spillover Study: This study will develop an estimate of the rate of energy savings attributable to Focus due to measures implemented as a result of E&T or other support program, but not already tracked by Focus or accounted for in the implementing partner spillover estimate. This study will be limited to the effects of Focus on participants in these program components.

- Benefit Cost Inputs: A benefit cost analysis is scheduled for all Focus programs this contract period. As part of this effort KEMA will:
  - Provide input streams for the Business Programs.
  - Develop market effects projections.
  - Conduct an incremental cost study with the intent of obtaining incremental costs for the prescriptive measures that account for the majority of prescriptive savings, and secondarily for large custom measures in the engineering sample.

- Review of Load Shapes: KEMA will review load shapes proposed by WECC for particular categories of measures. These load shapes can be used for program planning and may be used in future evaluations.

For further information, including recommended program improvements, the reader is referred to the following recent evaluation reports.

Table 3-10. Further Business Programs Reading

Time Period	Date	Title
FY07	4/20/2007	*Business Programs: End-use Specific Attribution Factors - FY06*
	4/13/2007	*Final Deemed Savings for FY08 (Spring 2007)*
	3/2/2007	*Business Programs: Impact Evaluation Report - FY06*
	11/10/2006	*Business Programs: Lighting and Motor/Drive Channel Market Effects Contract Metrics Assessment*
	10/27/2006	*Deemed Savings Resolution (Fall 2006)*
FY06	6/21/2006	*Business Programs: A Behind-the-Scenes Look at Attribution*
	6/12/2006	*Business Programs: Targeted Market Study: HVLS Fans on Wisconsin Dairy Farms*
	4/5/2006	*Business Programs: Recent Customer Experience*
	4/4/2006	*Business Programs: Delivery Review*
	3/16/2006	*Net-to-Gross Method Selection Framework for Evaluating Focus on Energy Programs*
	2/3/2006	*Business Programs: Measure Review*
	12/30/2005	*Focus on Energy Public Benefits Evaluation BP Motors Metric Preliminary Assessment*
	12/22/2005	*Business Programs: Participant Spillover Savings Study*
	10/28/2005	*Business Programs: End-use Specific Adjustment Factors*
	9/9/2005	*Business Programs: Impact Evaluation Report – FY05, Round 1*

4. RESIDENTIAL PROGRAMS EVALUATION

This chapter describes the residential program evaluation activities conducted during the second half of 2007, overall and by individual program area.

- ENERGY STAR® Products (Composed of Residential Lighting and Appliance and Plug Load
- New Construction (This includes the Wisconsin ENERGY STAR Homes program and measures installed through Efficient Heating and Cooling in new homes.)
- Existing Homes (This includes the Home Performance with ENERGY STAR program and measures installed through Efficient Heating and Cooling in existing homes.)
- Apartment and Condominium Efficiency Services
- Targeted Home Performance with ENERGY STAR
- Efficient Heating and Cooling (This was made into its own program in July 2006.)

4.1 OVERALL

4.1.1 Verified Energy Impacts

The following tables present the gross, verified gross, and net energy savings summary by Residential program area for:

a. Second half of 2007: July 1, 2007, through December 31, 2007
b. FY07: July 1, 2006, through December 31, 2006
c. FY06: July 1, 2005, through June 30, 2006
d. FY05: July 1, 2004, through June 30, 2005
e. FY04: July 1, 2003, through June 30, 2004
f. FY03: July 1, 2002, through June 30, 2003
g. FY02: June 1, 2001, through June 30, 2002, (although FY02 of the program covered a 15-month period, significant energy savings were not recognized in the first two months of that period).

The discussion of each individual program includes tables on the energy savings totals and any new research to modify verified gross energy savings or net energy savings numbers.

Table 4-1a. All Residential Programs: Tracked Energy Impacts
Second Half of 2007 (July 1, 2007–December 31, 2007)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	6,409,167	539	530,042	6,435,193	532	567,199	6,435,193	532	567,199
EHCI	5,866,644	1,918	146,654	5,851,827	1,912	146,726	4,782,172	1,774	123,590
ENERGY STAR	24,021,210	1,373	63,658	23,012,184	1,353	62,731	23,204,660	1,365	62,731
HPES	148,509	88	111,832	148,668	95	111,871	138,842	89	106,269
THPES	177,608	0	37,780	0	0	0	0	0	0
WESH	-869	0	85,076	-869	0	85,076	-869	0	85,076
TOTAL	36,622,268	3,918	975,041	35,447,002	3,892	973,602	34,559,997	3,760	944,864

Table 4-1b. All Residential Programs: Tracked Energy Impacts
FY07 (July 1, 2005–June 30, 2006)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	1,467,617	413	400,607	1,465,272	413	400,607	1,465,272	413	400,607
EHCI	9,270,252	2,984	274,846	8,902,027	2,189	275,146	7,207,877	1,970	231,426
ENERGY STAR	82,661,322	4,676	284,144	67,459,814	3,946	188,083	56,853,050	3,370	152,715
HPES	392,348	214	345,909	371,121	230	298,510	346,397	214	282,629
THPES	435,080	0	107,675	433,888	76	107,380	433,888	76	107,380
WESH	24,892	1	153,767	24,456	0	153,727	24,032	0	153,715
TOTAL	94,251,511	8,288	1,566,948	78,656,578	6,855	1,423,453	66,330,516	6,043	1,328,472

Table 4-1c. All Residential Programs: Tracked Energy Impacts
FY06 (July 1, 2005–June 30, 2006)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	5,848,481	469	537,436	5,848,481	469	537,436	5,848,481	469	537,436
EHCI	11,430,586	8,388	258,196	10,980,716	7,122	274,194	9,467,141	6,927	235,134
ENERGY STAR	71,467,407	4,175	338,623	55,957,719	3,249	147,817	55,608,648	3,280	120,559
HPES	995,068	373	484,986	734,891	366	374,559	708,195	347	357,685
THPES	371,904	0	92,366	371,904	66	92,040	371,904	66	92,040
WESH	77,532	14	147,666	73,655	12	147,386	66,852	5	147,274
TOTAL	90,190,978	13,417	1,859,273	73,967,366	11,283	1,573,432	72,071,221	11,092	1,490,128

Table 4-1d. All Residential Programs: Tracked Energy Impacts
FY05 (July 1, 2004–June 30, 2005)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	16,662,736	846	790,191	16,662,736	846	790,191	16,662,736	846	790,191
ENERGY STAR	85,113,175	2,229	363,729	55,298,666	3,231	157,359	66,109,600	3,978	127,623
HPES	9,084,502	6,901	582,559	8,804,317	6,948	491,823	8,586,575	6,457	476,796
THPES	593,163	115	167,477	288,277	44	69,503	288,277	44	69,503
WESH	1,507,010	669	221,526	1,236,066	671	217,666	1,198,958	612	217,280
TOTAL	112,960,587	10,761	2,125,483	82,290,063	11,740	1,726,542	92,846,146	11,937	1,681,393

Table 4-1e. All Residential Programs: Tracked Energy Impacts
FY04 (July 1, 2003–June 30, 2004)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	10,811,378	558	510,518	10,650,266	553	512,838	10,650,266	553	512,838
ENERGY STAR	99,149,908	6,257	354,823	64,245,536	4,619	354,919	62,407,846	4,311	354,919
HPES	13,606,210	8,038	554,150	13,557,990	8,063	481,219	13,510,885	8,044	463,522
THPES	708,507	148	220,606	418,019	62	107,214	418,019	62	107,214
WESH	1,615,776	628	185,255	1,623,130	631	184,477	1,623,070	631	184,477
TOTAL	125,891,779	15,628	1,825,352	90,494,941	13,928	1,640,668	88,610,086	13,600	1,622,971

Table 4-1f. All Residential Programs: Tracked Energy Impacts
FY03 (July 1, 2002–June 30, 2003)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	10,567,053	2,352	1,030,053	14,839,005	2,390	1,325,191	14,839,005	2,390	1,325,191
ENERGY STAR	76,044,599	5,681	180,793	64,985,866	5,428	180,793	55,509,638	3,834	180,793
HPES	9,385,086	5,919	334,938	9,469,824	5,914	288,290	9,446,776	5,905	279,625
THPES	183,949	58	85,943	130,604	41	61,020	130,604	41	61,020
WESH	1,274,434	71	102,037	314,141	89	91,261	306,104	89	91,261
TOTAL	97,455,122	14,082	1,733,764	89,739,440	13,863	1,946,555	80,232,127	12,260	1,937,890

Table 4-1g. All Residential Programs: Tracked Energy Impacts
FY02 (June 1, 2001–June 30, 2002)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	2,594,407	526	389,116	2,454,383	491	389,116	2,454,383	491	389,116
ENERGY STAR	18,295,376	1,786	55,519	20,239,649	2,542	55,519	14,916,810	1,649	55,519
HPES	3,059,372	1,644	404,564	3,059,354	1,644	396,942	2,714,057	1,635	315,322
THPES	15,598	5	6,971	11,075	3	4,949	11,075	3	4,949
WESH	0	0	63,142	204,276	0	72,078	204,276	0	72,078
TOTAL	23,964,753	3,961	919,312	25,968,737	4,680	918,604	20,300,601	3,778	836,985

4.1.2 Market Effects

Market effects metrics have been established for each residential program. These metrics, which were reflected in WECC's FY07 contract, were measured during the second half of 2007 in order to provide early insight into the extent to which residential programs are changing the marketplace for the delivery of energy efficient products, practices, and services. The metric measurement process is discussed next in the *Program Metrics and Goals* section.

4.1.3 Program Metrics and Goals

During the second half of 2007, evaluation efforts focused on addressing Residential Program metrics that the residential evaluation team agreed to review as part of our *Contract Period One Detailed Evaluation Plan*.[v] The Metrics goals were a key aspect of WECC's FY07 contract for delivery of the Residential Programs.

Gross program savings unadjusted by evaluation results are shown in the following table along with the program goals and percentage of goal achieved. Savings shown are as of December 31, 2007, or six months of an 18-month target period.

Table 4-2. Net Program Savings versus Program Portfolio Targets
Second Half of 2007 (July 1, 2007–December 31, 2007)

	kWh			kW			Therms		
Program	Net Target	Net YTD	% of 18-month Target	Net Target	Net YTD	% of 18-month Target	Net Target	Net YTD	% of 18-month Target
ACES	19,154,025	6,435,193	34%	2,235	532	24%	1,825,973	577,139	32%
EHCI	13,958,476	4,793,736	34%	4,964	1,778	36%	511,125	141,718	28%
ENERGY STAR	88,278,767	23,964,562	27%	5,686	1,336	23%	110,250	63,355	57%
Head Start	2,160,450	0	0%	62	0	0%	0		
HPES	1,192,994	144,691	12%	476	94	20%	755,303	121,759	16%
THPES	1,215,840	177,608	15%	195	31	16%	300,900	43,955	15%
WESH	414,449	-869	0%	33	0	0%	396,450	88,476	22%
Total	**126,375,001**	**35,514,921**	**28%**	**13,651**	**3,771**	**28%**	**3,900,001**	**1,036,401**	**27%**

4.2 ENERGY STAR PRODUCTS

Evaluation efforts during the second half of 2007 focused on the following:

- Conducting a CFL installation rate study[vi]
- Measuring program metrics.[vii]

Key findings from these efforts are presented below for each of the following four areas:

- Process findings and issues
- Verified energy impacts
- Market effects
- Program metrics and goals.

4.2.1 Process Findings and Issues

We did not formally include process related evaluation tasks as part of our *Contract Period One Detailed Evaluation Plan*. The evaluation team, however, stayed abreast of process related issues through monitoring of program changes and issues based on regular communications with the ESP program manager.

4.2.2 Verified Energy Impacts

During the second half of 2007, the evaluation team conducted a CFL installation rate study for CFLs rewarded during FY07. The primary purpose of this installation rate study was to quantify the rate at which CFLs rewarded through the FY07 initiative are being installed in Wisconsin residences. We found that installation rates, currently at 81 percent for instant rewards and 88 percent for mail-in rewards, have significantly improved over the past four

years. This improvement would appear to demonstrate that limiting the number of rewarded CFLs an individual can purchase results in higher first year installation rates and, therefore, higher first year energy savings within the state of Wisconsin. The improvement in first year installation rates is also likely to be influenced by the expansion in the types of CFLs available. Thus, consumers today are able to find CFLs for applications where they were not previously available (e.g., globes, a-lines, indoor/outdoor floods). The survey information also indicates that participating Wisconsin residents, the ultimate sponsors of the Focus initiative, continue to be satisfied with the CFLs they have received through the program.

In addition to improving installation rates, the program continues to demonstrate success in reaching a substantial number of Wisconsin residents who never purchased CFLs before. In FY03 and FY05, we found that approximately two-thirds of participants had never purchased a CFL prior to their program involvement. Jumping ahead to this FY07 study, it seems reasonable—relative to the previous studies—to expect decreasing percentages of current year CFL program participants to have never purchased CFLs before. In FY07, we found that this percentage had, indeed, decreased to about 55 percent (i.e., approximately 55 percent of participants had never purchased a CFL prior to their involvement in the FY07 program). However, with 150,000+ program participants, this still means that the program reached over 80,000 households that had not purchased CFLs before.

Like previous studies, this FY07 study also found that the program is reaching a diverse group of purchasers (those with somewhat lower incomes and education) who have been historically under-represented both in CFL programs in particular and in energy efficiency programs in general—again, a significant accomplishment. Finally, like previous studies, we continue to see a substantial amount of CFL purchasing reportedly taking place after participants' recent program experience. This would appear to signal that the program was having some participant market effects—at least in the short-term.

The implication of all this positive outreach is that the program is continuing to broaden the Wisconsin market for CFLs, which would appear to bolster the likelihood of the program having beneficial long-term market effects. However, it is important to keep in mind that the influence the program is having on retailer marketing, CFL stocking, and pricing may be a temporary phenomena. Thus, until rewards are substantially reduced (or ended), or substantial lapses in time occur between reward periods, it will remain difficult to reliably assess lasting long-term market effects. The tables for each sector presented below break out the savings for that sector by measure category and indicate the percent of savings that measure category accounts for in that sector.

Table 4-3. ENERGY STAR Products Program: Tracked Energy Impacts
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Appliance-Other	142,780	0.6%	10	0.7%	17,430	27.8%
Ceiling Fan	23,975	0.1%	0	0.0%	0	0.0%
CFL	20,482,444	89.0%	1,317	97.3%	0	0.0%
Clothes Washer	1,418,605	6.2%	0	0.0%	45,301	72.2%
Dehumidifier	500	0.0%	1	0.0%	0	0.0%
Lighting Fixture	548,704	2.4%	21	1.6%	0	0.0%
Lighting-LED	254,920	1.1%	0	0.0%	0	0.0%
Lighting-Other	62,712	0.3%	2	0.2%	0	0.0%

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Refrigerator	66	0.0%	0	0.0%	0	0.0%
Torchiere	77,478	0.3%	2	0.2%	0	0.0%
TOTAL	23,012,184	100.0%	1,353	100.0%	62,731	100.0%

4.2.3 Market Effects

The metric measurement process provided some findings related to ESP market effects. These findings are summarized next in the *Program Metrics and Goals* section.

4.2.4 Program Metrics and Goals

We address the ESP metric we measured below. We include a brief description of the metric, an overview of our measurement approach, and results.

Description

Increase the number of CFLs and other lighting products (fixtures, lamps) sold through special promotions with new retailer types (drug, grocery, lighting showroom, and mass merchant) by 5 percent from the total sales during FY06.

Measurement Approach

The evaluation team measured this metric by analyzing the program database to compare the distribution of CFLs by retailer type in FY07 to the distribution in FY06.

Results

Our analysis indicates that the Residential Lighting Program has met the goal for this metric. In FY07, 84,567 CFLs were sold through drug, grocery, lighting showroom, and mass merchant retailer types, compared to 50,465 CFLs in FY06 (Table 4-4). This represents a 68 percent increase, which exceeds the metric goal of a 5 percent increase.[viii] A combination of expanded efforts in the grocery channel (a springtime CFL promotion with a major grocery chain) and increased sales among existing retailers led to the program exceeding its metric goal.

Table 4-4. CFLs Sales by Drug, Grocery, Lighting Showroom, and Mass Merchant Retailer Types

Retailer Type	FY06	FY07
Drug	13	79
Grocery	22,255	45,638
Lighting Showroom	13,041	19,254
Mass Merchant	15,156	19,596
Total	**50,465**	**84,567**

4.3 NEW CONSTRUCTION

New Construction includes the Wisconsin ENERGY STAR Homes (WESH) program and measures installed through Efficient Heating and Cooling (EHC) in new homes.

Evaluation efforts conducted during the second half of 2007 focused on measuring WESH program metrics.[ix] Key findings from this effort are presented below for the each of the following four areas:

- Process findings and issues
- Verified energy impacts
- Market effects
- Program metrics and goals.

4.3.1 Process Findings and Issues

We did not formally include process related evaluation tasks as part of our *Contract Period One Detailed Evaluation Plan*. The evaluation team, however, stayed abreast of process related issues through monitoring of program changes and issues based on regular communications with the WESH program manager.

4.3.2 Verified Energy Impacts

We did not plan any energy impact evaluation tasks for the second half of 2007.

The table below shows energy impacts for new construction program activity. This includes WESH activity and measures installed through EHC in new homes.

Table 4-5. New Construction: Energy Impacts
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Building Shell	-869	100.0%	0	0.0%	85,076	100.0%
TOTAL	-869	100.0%	0	0.0%	85,076	100.0%

4.3.3 Market Effects

The metric measurement process provided some findings related to WESH market effects. These findings are summarized next in the *Program Metrics and Goals* section.

4.3.4 Program Metrics and Goals

We address the WESH metric we measured below. We include a brief description of the metric, an overview of our measurement approach, and results.

Description

Increase new builder participation (as defined by a 10 percent increase in the number of certified homes associated with new builders annually).

Measurement Approach

The evaluation team measured this metric by analyzing the program database to compare the number of WESH homes certified by new builders in FY06 and FY07. A builder is classified as a new builder in FY07 if the builder had certified less than three homes through the end of FY06. Similarly, a builder is classified as a new builder in FY06 if the builder had certified less than three homes through the end of FY05.[x]

Results

Our analysis indicates that WESH has met this metric. In FY07, 147 new builders certified 328 homes, compared to 223 homes certified by 123 new builders in FY06. This represents a 47 percent increase, which exceeds the metric goal of a 10 percent increase. To shed light on why the program met its goal, we looked at the distribution of the number of homes certified among new builders during FY07 and compared this to the distribution of the number of homes certified among new builders during FY06 (Table 4-6).

Table 4-6. Number of Homes Certified by New Builders in FY06 and FY07

# of Homes Certified	New Builders			
	FY06		FY07	
	#	%	#	%
1	81	66%	96	65%
2	23	19%	28	19%
3	9	7%	6	4%
4-5	4	3%	7	5%
6-9	4	3%	5	3%
10-14	2	2%	3	2%
25-29	0	0%	2	1%
Total	**123**	**100%**	**147**	**100%**

During FY07, the program added two new builders who each certified 28 homes. During FY06, the highest volume new builder certified only 14 homes. This, along with the fact that the program also added builders in the 4–5, 6–9, and 10–14 volume ranges, contributed to the program meetings its goal.

4.4 EXISTING HOMES

Existing Homes includes the Home Performance with ENERGY STAR (HPWES) program and measures installed through Efficient Heating and Cooling (EHC) in existing homes.

Evaluation efforts conducted during the second half of 2007 focused on measuring HPWES and EHC program metrics.[xi] Key findings from this effort are presented below for the each of the following four areas:

- Process findings and issues
- Verified energy impacts
- Market effects
- Program metrics and goals.

4.4.1 Process Findings and Issues

We did not formally include process related evaluation tasks as part of our *Contract Period One Detailed Evaluation Plan*. The evaluation team, however, stayed abreast of process related issues through monitoring of program changes and issues based on regular communications with the program manager.

4.4.2 Verified Energy Impacts

We did not plan any energy impact evaluation tasks for the second half of 2007.

The table below shows energy impacts for Existing Homes program activity for six months of an 18-month period.

Table 4-7. Existing Homes: Tracked Energy Impacts
Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Building Shell	138,808	93.4%	94	99.4%	108,562	97.0%
Other	0	0.0%	0	0.0%	648	0.6%
Water Heating	9,860	6.6%	1	0.6%	2,661	2.4%
TOTAL	148,668	100.0%	95	100.0%	111,871	100.0%

4.4.3 Market Effects

The metric measurement process provided some findings related to market effects. These findings are summarized next in the *Program Metrics and Goals* section.

4.4.4 Program Metrics and Goals

We measured one contract metric for EHC and two for HPWES. For each metric, we include a brief description of the metric, an overview of our measurement approach, and results.

EHC - FY07 METRIC #1

Description

Increase in market share for 90+ furnaces with ECM by 2 percentage points as compared to the baseline set in FY06.

Measurement Approach

The evaluation team measured this metric by analyzing trends in annual ECM furnace market share as reported by information in the Energy Center of Wisconsin's (ECW) Furnace and AC Tracking (FACTS) reports. These reports provide market-based information on current and historic sales trends of residential furnaces sold in Wisconsin by distributors who agree to provide data to ECW.[xii]

Results

Our analysis indicates that EHC has not met its goal for this metric. In FY07, ECM market share was 25.9 percent, compared to 26.2 percent in FY06 (Table 4-8). This represents a 0.3 percentage point decrease, which does not meet the metric goal of a 2 percentage point increase.[xiii] We do not have information available to reach a conclusion as to why ECM market share fell between FY06 and FY07.

Table 4-8. ECM Furnace Market Share

Period	ECM Furnaces	All Furnaces	Market Share
FY06	14,651	56,000	26.2%
FY07	13,119	50,588	25.9%

HPWES - FY07 METRIC #1

Description

Retain 90 percent of consultants and qualified contractors that enter the program after training.

Measurement Approach

The evaluation team measured this metric by analyzing the program database to assess trends in program activity for each consultant and qualified contractor.

Results

Our analysis indicates that HPWES has not met this metric. During FY06, 52 consultants and qualified contractors provided services through the program. Ten of these 52 did not provide services through the program in FY07. This represents a retention rate of 81 percent, which is less than the metric goal of 90 percent. An investigation into the reasons why this group of ten consultants and qualified contractors did not continue to provide services in FY07 was not planned as part of this analysis. We did, however, look at the number of assessments and ratings performed by this group and found lower activity levels. This group comprised about

20 percent of consultants and qualified contractors who provided services during FY06 but only accounted for three percent of assessments and ratings performed during FY06.

HPWES - FY07 METRIC #2

Description

Increase the number of referrals received by consultants and qualified contractors from remodeling/home improvement companies to 300 in FY07.

Measurement Approach

The evaluation team measured this metric by analyzing the program database to assess trends in number of referrals received by consultants and qualified contractors from remodeling/home improvement companies.

Results

Our analysis indicates that HPWES has met this metric. During FY07, a total of 386 referrals were received from remodeling/home improvement companies (Table 4-9). This exceeds the metric goal of 300. The program exceeded its goal primarily due to increased activity among remodelers and insulation allies.

Table 4-9. Number of Referrals Received from Remodeling/Home Improvement Companies

	Period of Program Activity				
Company Type	**FY03**	**FY04**	**FY05**	**FY06**	**FY07**
Remodeler	15	69	75	76	223
Ally—HVAC	17	9	11	13	40
Ally—Insulation	1	6	27	43	104
Ally-Other	0	3	3	2	19
Total	**33**	**87**	**116**	**134**	**386**

4.5 APARTMENT AND CONDOMINIUM EFFICIENCY SERVICES

The Apartment and Condominium Efficiency Services (ACES) program consists of a whole building existing and a new construction component. Each component contains both prescriptive and custom incentives. The custom incentive structure has two tiers for both existing building and new construction projects, with the Tier 2 incentives based on implementation of multiple incentive categories to encourage more comprehensive installations.

Through December 31, 2007, ACES accounted for over 54 percent of the total unverified gross therm savings for all of the residential programs combined, 14 percent of the unverified gross kW, and 18 percent of the unverified gross kWh savings.

ACES is on track to meet its kWh and therm target net savings, and slightly below target for meeting its kW target net savings. Through December 2007 (six months through the 18-month period), ACES had achieved the following net savings as a percent of target: kWh 34 percent, kW 24 percent, therms 32 percent (Table 4-2).

Evaluation efforts during the second half of 2007 focused on reviewing deemed savings values and their underlying assumptions for the following measures:

- Whole Building Existing, In Unit Direct Install—CFL replacement
- Whole Building Existing, In Unit Direct Install—Low-flow showerheads
- Whole Building Existing, In Unit Direct Install—Faucet Aerators
- Whole Building Existing, Whole Building—Prescriptive CFL, cold cathode, or LED lamp replacement
- Whole Building Existing, Whole Building—90+ efficiency modulating boiler replacements
- New Construction—Common Area Lighting
- New Construction—90+ efficiency modulating boiler replacements.

Key findings efforts are presented below for each of the following four areas:

- Process findings and issues
- Verified energy impacts
- Market effects
- Program metrics.

4.5.1 Process Findings and Issues

We did not formally include process related evaluation tasks as part of our *Contract Period One Detailed Evaluation Plan*. The evaluation team, however, stayed abreast of process related issues through monitoring of program changes and issues based on communications with the ACES program manager and implementation contractors.

4.5.2 Verified Energy Impacts

WECC is applying deemed savings from their other business and residential programs to similar measures installed under the prescriptive track. Savings for measures installed under the custom/whole building track are being calculated by the implementation contractors. During the fourth quarter of 2007 and continuing into 2008, the evaluation team obtained the deemed savings estimates and their underlying assumptions from WECC and is reviewing the savings being used to estimate gross energy impacts for major prescriptive measures listed earlier. This review will be finalized in the first quarter of 2008.

The verified tracked energy impacts by program initiative and measure category for the second half of 2007 (July 1–December 31) are shown in Table 4-10.

Table 4-10. Apartment and Condominium Efficiency Services: Tracked Energy Impacts Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Air Conditioning	11,770	0.2%	19	3.6%	0	0.0%
Boiler/Other Heating	758,023	11.8%	38	7.2%	255,197	45.0%
Building Shell	172,906	2.7%	88	16.5%	21,250	3.7%
CFL	301,847	4.7%	39	7.3%	0	0.0%
Clothes Washer	37,104	0.6%	0	0.0%	5,385	0.9%
Dishwasher	18,396	0.3%	0	0.0%	1,331	0.2%
ECM Furnace	1,546	0.0%	0	0.0%	40	0.0%
HVAC	0	0.0%	0	0.0%	0	0.0%
Lighting-LED	571,956	8.9%	121	22.8%	0	0.0%
Lighting-Other	2,117,750	32.9%	170	31.9%	0	0.0%
Other	45,217	0.7%	12	2.3%	26,027	4.6%
Refrigerator	35,298	0.5%	3	0.5%	0	0.0%
Water Heating	2,363,380	36.7%	42	7.9%	257,969	45.5%
TOTAL	6,435,193	100.0%	532	100.0%	567,199	100.0%

4.5.3 Market Effects

The evaluation will undertake data collection to quantify participant spillover in the impact analyses for the New Construction and Existing Building Programs in the impact reports due in the second and fourth calendar quarters of 2008.

4.5.4 Program Metrics

ACES has no program contract metrics.

4.6 TARGETED HOME PERFORMANCE WITH ENERGY STAR

Beginning July 1, 2007, Focus on Energy eligibility rules and their impact on accounting for gas and electric savings relative to the participating gas and electric utilities, have been modified so that WECC no longer claims savings for gas or electric savings that are realized in a nonparticipating utility territory. In other words, a participant may be in a participating electric utility territory, but not in a participating gas utility territory. WECC's tracking database indicates that there are no eligible electric or gas savings from the THPWES program. We do not believe this is the case, but did not have the opportunity to investigate this with WECC before this report was finalized.

Table 4-11. Targeted Home Performance with ENERGY STAR: Tracked Energy Impacts Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Boiler/Other Heating	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%
TOTAL	0	0.0%	0	0.0%	0	0.0%

4.7 EFFICIENT HEATING AND COOLING

Table 4-12. Efficient Heating and Cooling: Tracked Energy Impacts Second Half of 2007 (July 1, 2007–December 31, 2007)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Adjustment	-773	0.0%	0	0.0%	78	0.1%
Air Conditioning	518,127	8.9%	1,222	63.9%	0	0.0%
Boiler/Other Heating	0	0.0%	0	0.0%	30,968	21.1%
ECM Furnace	5,334,473	91.2%	690	36.1%	115,680	78.8%
TOTAL	5,851,827	100.0%	1,912	100.0%	146,726	100.0%

5. RENEWABLE ENERGY PROGRAM EVALUATION

5.1 OVERVIEW/KEY ACTIVITIES

This chapter describes our evaluation activities for the Renewable Energy Program conducted between July 1, 2007, and January 21, 2008. This chapter summarizes the following:

- Reports
- Gross energy impacts
- Net energy impacts
- Upcoming evaluation activities for this contract period (ending March 2009).

5.1.1 Reports Delivered in the Second Half of 2007

During the last half of 2007, the Renewable Energy evaluation team submitted the following reports:

- *Semiannual Report (Fiscal Year 07, Year End)*

5.2 GROSS ENERGY IMPACTS

5.2.1 Program Activities

In this section, we discuss the projects implemented for FY07 and the last half of calendar year 2007 (referred to as last half of 2007 in this report). In FY07, the program increased the total number of renewable energy system installations for the fifth consecutive fiscal year (see Table 5-1). A total of 43 nonresidential and 79 residential installations were funded by the program between July 1, 2006, and June 30, 2007 (FY07). This increase in projects for FY07 is due to a large increase in the number of PV installations, particularly in the residential sector. PV installations dominate the residential sector and comprise over 40 percent of the nonresidential projects. The total of 92 PV installations in the fiscal year is an increase of 61 percent over FY06 PV installations. Installations of wind machines were the same as installations for FY06, while, biogas system installations declined.

For the last half of 2007, which is the first six months of the current contract period, the program installed 103 projects. This is 84 percent of the number of projects installed in the 12-month period of FY07. The mix of projects is somewhat different in this six-month period. PV systems still comprise the vast majority of projects installed in the last half of 2007, and are on pace to exceed the number of installations in FY07; Residential solar water heating, which became part of the Renewables program in FY07,[10] comprises 22 percent overall and 32 percent of residential projects for this time period.

[10] Prior to FY07 Solar water heating was offered as part of the Focus on Energy Residential program.

Table 5-1. Projects Implemented by Type and Year

Technology	Completed Projects						
	FY02/FY03 Mar 02–Jun 03	FY04 Jul 03–Jun 04	FY05 Jul 04–Jun 05	FY06 Jul 05–Jun 06	FY07 Jul 06–Jun 07	2007 Jul–Dec	Program To Date
Nonresidential Projects							
Biogas	0	1	4	7	2	2	16
Thermal Bioenergy	0	3	7	16	14	5	45
Solar Electric	3	3	9	9	18	16	58
Solar Water Heating	0	0	4	5	6	7	22
Wind Machine	2	2	5	1	1	2	13
Hydroelectric	1	0	1	0	0	0	2
Other	0	0	1	1	2	0	4
All Nonresidential	**6**	**9**	**31**	**39**	**43**	**32**[11]	**160**
Residential Projects							
Solar Electric (PV)	20	40	35	48	74	46	263
Solar Water Heating[a]	-	-	-	-	-	23	23
Wind Machine	1	8	2	5	5	2	23
Other	0	0	1	1	0	0	2
All Residential	**21**	**48**	**38**	**54**	**79**	**71**	**311**
All Projects	**27**	**57**	**69**	**93**	**122**	**103**	**471**

[a] Residential Solar Water Heating was included and tracked in the Focus on Energy Residential program until FY07. This table includes only those projects completed through the Focus Renewable Energy program.

5.2.2 Program-reported Gross Energy Impacts

The program tracks gross energy savings (generation) for all projects completed that receive a Cash-Back Reward or a grant that has associated energy impacts. The program-reported gross impacts are provided in Table 5-2 by technology and segment for FY06, FY07, and the last half of 2007.

As of December 2008, the program-reported impacts for the last half of 2007 are lagging behind FY07. Program-reported kW savings for this 6-month period are 39 percent and kWh savings are 26 percent of the 12-month FY07 totals. Therm savings are on track, at 52 percent of FY07 totals. The lower kWh savings early in the program year is consistent with past years, where large electric projects were installed later in the program year, substantially increasing program savings. Residential program installations have already met or exceeded tracked savings totals achieved in FY07.

[11] KEMA classifies projects as nonresidential or residential based upon the CustomerType field in the WATTS database. For the FY07 participants KEMA reclassified some residential participants as nonresidential based upon the BusinessName field and other indications that the site was not residential. As of July 2007, the BillMeasureTo field in WATTS began indicating residential or commercial for solar measures, but the two fields (CustomerType and BillMeasureTo) are not always consistent. In these cases for the last half of 2007, KEMA categorized the measure based upon the BillMeasureTo field.

Table 5-2. Renewable Energy Program-reported Gross Impacts[12] by Segment and Technology

Segment	Technology	Energy Impacts	Completed			
			FY06 Jul 05– Jun 06	FY07 Jul 06– Jun 07	2007 Jul 07– Dec 07	Program To Date
Nonresidential	Biogas	Kilowatts	1,586	1,045	230	5,161
		Annual kilowatt-hours	12,366,960	8,238,780	1,734,480	41,267,426
		Annual therms	75,488	0	138,637	247,290
	Thermal Bioenergy	Kilowatts	0	0	0	0
		Annual kilowatt-hours	0	0	0	0
		Annual therms	1,982,546	684,448	213,992	3,376,674
	Solar Electric	Kilowatts	24	124	88	300
		Annual kilowatt-hours	29,643	153,422	112,846	378,948
		Annual therms	0	0	0	1,283
	Solar Water Heating	Kilowatts	0	0	0	0
		Annual kilowatt-hours	0	0	0	0
		Annual therms	13,708	2,697	5,428	42,313
	Wind Machine	Kilowatts	65	90	14	495
		Annual kilowatt-hours	83,600	109,560	22,065	694,239
		Annual therms	0	0	0	0
	Hydroelectric	Kilowatts	0	0	0	1,300
		Annual kilowatt-hours	0	0	0	6,473,600
		Annual therms	0	0	0	0
	Other	Kilowatts	0	14	0	14
		Annual kilowatt-hours	0	29,973	0	29,973
		Annual therms	102	1,480	0	2,638
	All Nonresidential	**Kilowatts**	**1,675**	**1,273**	**332**	**7,271**
		Annual kilowatt-hours	**12,480,203**	**8,531,735**	**1,869,391**	**48,844,186**
		Annual therms	**2,071,844**	**688,625**	**358,057**	**3,670,198**

[12] Gross energy impacts are those reported in the program tracking system maintained by WECC.

Table 5-2. Renewable Energy Program-reported Gross Impacts[13] by Segment and Technology

Segment	Technology	Energy Impacts	Completed			
			FY06 Jul 05– Jun 06	FY07 Jul 06– Jun 07	2007 Jul 07– Dec 07	Program To Date
Residential	Solar-PV and Thermal[14]	Kilowatts	135	224	191	705
		Annual kilowatt-hours	177,638	290,398	246,088	923,286
		Annual therms	0	0	0	3,776
	Solar Water Heating[15]	Kilowatts	-	-	0	0
		Annual kilowatt-hours	-	-	25,574	25,574
		Annual therms	-	-	1,421	1,421
	Wind Machine	Kilowatts	106	40	70	340
		Annual kilowatt-hours	123,346	51,353	135,637	506,011
		Annual therms	0	0	0	0
	Other	Kilowatts	0	0	0	0
		Annual kilowatt-hours	-15,545	0	0	-15,545
		Annual therms	1,881	0	0	2,253
	All Residential	**Kilowatts**	**241**	**264**	**261**	**1,045**
		Annual kilowatt-hours	**285,439**	**341,751**	**407,299**	**1,439,326**
		Annual therms	**1,881**	**0**	**1,421**	**7,450**
TOTAL	**All Projects**	**Kilowatts**	**1,916**	**1,537**	**593**	**8,316**
		Annual kilowatt-hours	**12,765,642**	**8,873,486**	**2,276,690**	**50,283,512**
		Annual therms	**2,073,725**	**688,625**	**359,477**	**3,677,648**

5.3 NET ENERGY IMPACTS

5.3.1 Approach

The evaluation team estimates net energy savings for the Renewable Energy Program on an annual basis. The most recent round of data collection to determine net energy savings included renewable energy projects installed between July 1, 2006, and June 30, 2007 (FY07).

The impact analysis determines three adjustment factors to the gross savings reported by the program:

- *Gross savings adjustment factor*: This factor adjusts tracked gross savings for installation and changes based on engineering review. Applying the gross savings

[13] Gross energy impacts are those reported in the program tracking system maintained by WECC.

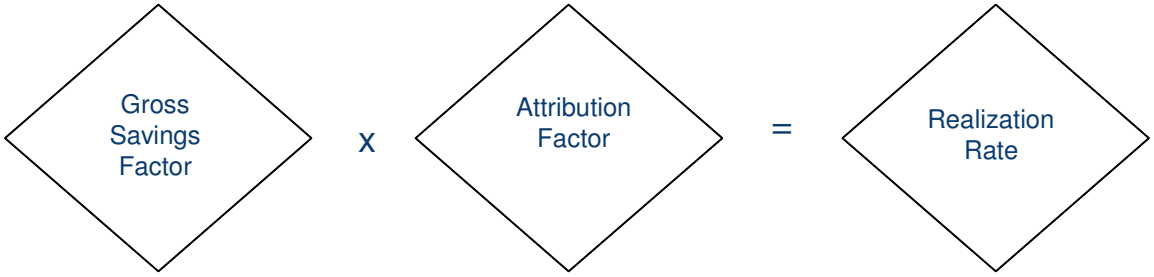
[14] Prior to July 2007, "Solar PV and Thermal" included residential PV installations and projects that combine PV with solar thermal technologies. The therm savings are from both the combined projects and PV installations that were off-grid and displacing fossil fuel generators on-site.

[15] Solar water heating projects were switched from the Residential to the Renewable Program beginning in FY07.

adjustment factor to tracking gross savings produces the estimate of verified gross savings.

- *Attribution factor*: This factor adjusts verified gross savings for program attribution.
- *Realization rate*: This factor combines the gross savings adjustment factor and the attribution factor. (It is the ratio of net savings to tracked gross savings.)

Figure 5-1. Realization Rate Calculation



The definitions of these factors and the methods for producing them are the same as in all previous Renewable Impact Evaluations. The reporting of the results in this Semiannual Report are the same as in the previous two rounds of impact evaluation for the Renewable Program. This section includes results that have not been reported previously. They were revised from the draft of this report based on comments from the program and follow-up analysis. The results of the impact evaluation are reported in the semiannual reports instead of a stand-alone document[16], as has been done for the past two years, to save evaluation resources for analytical tasks.

5.3.2 Overall Findings

Final fiscal year energy impacts are determined following the end of the fiscal year. Thus, final FY07 adjustment factors were calculated during the last half of 2007 based on all projects completed in FY07. They are based on engineering reviews and surveys with a sample of program participants to calculate net energy impacts for all projects completed in that fiscal year.

This report also includes estimated net energy impacts for projects completed in the last half of 2007, based upon the final FY07 adjustment factors. The final net energy impacts for the current program period will be calculated after the end of the current contract period. (They will be calculated in the first quarter of 2009. We may provide some interim results depending upon project completions and evaluation budget, as discussed later in the report.) In this report, we present the final FY07 adjustment factors, final FY07 energy impacts, and estimated energy impacts for the last half of 2007, using the final FY07 adjustment factors.

[16] *Focus on Energy Evaluation: Contract Period One Detailed Evaluation Plans.* August 6, 2007 (Revised).

The overall results of this analysis are reported below in Table 5-3. In section 5.3.3, we discuss the development of the realization rate for FY07. In section 5.3.4, we discuss the application of the FY07 adjustment factors to projects completed in the last half of 2007. These estimated net impacts are reported in Table 5-3.

Table 5-3. Renewable Energy Program-Reported Gross, Evaluation-Verified Gross, and Verified Net Impacts

Time Period	Kilowatt-hours			Kilowatts			Therms		
	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net
FY02: Mar 02–Jun 02	536	545	440	0.48	0.41	0.32	0	0	0
FY03: Jul 02–Jun 03	3,659,120	3,718,437	3,005,052	707	604	478	1,686	1,713	1,385
FY04: Jul 03–Jun 04	516,495	484,151	448,980	217	220	195	106,943	213,834	199,754
FY05: Jul 04–Jun 05	22,191,543	21,909,710	4,256,338	3,343	3,261	984	447,192	343,622	88,276
FY06: Jul 05–Jun 06	12,765,642	13,042,016	2,350,819	1,916	1,874	386	2,073,725	2,066,494	459,285
FY07: Jul 06–Jun 07	8,873,486	8,515,648	420,003	1,539	1,871	350	688,625	673,425	315,121
2007[a]: Jul – Dec*	2,276,690	2,155,814	300,363	593	626	207	359,477	351,676	166,575
Total	**50,283,512**	**49,826,321**	**10,781,994**	**8,316**	**8,457**	**2,602**	**3,677,648**	**3,650,765**	**1,230,395**

[a] FY07 technology specific net adjustment factors were applied. When technology specific factors for a specific type of savings were not available, FY07 program level net adjustment savings factors were applied.

5.3.3 Final FY07 Net Energy Impacts

This section presents the results of the FY07 impact evaluation.

The objective of this analysis was two-fold. The first objective was to verify the data that had been entered into the program tracking database to produce *gross savings adjustment factors*. Gross savings factors are based on verification of installation (Installation Rate) and an engineering review (resulting in an Engineering Verification Factor) of the reported savings for projects installed between July 1, 2006, and June 30, 2007.

The second objective was to determine the *realization rate* for the program. The realization rate is the percentage of program reported impacts that can be attributed to the program. The realization rate is a function of the gross savings adjustment factor combined with the attribution factor, which subtracts out estimated free-ridership. Free-ridership calculations are based on participant reports of program effect on their decision to install a renewable energy system. For instance, the program could have:

- Been the main factor in the decision to install

- Accelerated the timing of the installation
- Changed the size of the system installed
- Had no impact on a pre-existing intention to install the measure[17].

Data used in the net impact analysis came from several sources.

- Program-reported savings for each measure were obtained directly from the Renewable Energy Program tracking database.
- The evaluation team requested additional information from program staff for each completed measure. This included detailed paperwork associated with the project application and some conversations clarifying the status of some projects. This information was used as a basis for the engineering verification.
- We conducted telephone interviews with participants completing 29 percent of the measures and representing 96 percent of kWh, 83 percent of kW, and 98 percent of therms savings reported by the program. These are very high proportions of savings. The interviews verified installation details, assessed the extent to which the project implementation was attributable to the Focus Renewable Energy Program, and covered some general issues associated with participating in the program and installing a renewable energy measure. KEMA completed interviews with 35 of 36 participants contacted for a response rate of 97 percent. A copy of the interview protocol is included as Appendix D.
- We verified the information provided in the program documentation (measure, size, and other key variables) and then reviewed the engineering calculations for reasonableness and consistency. We discuss the engineering calculations in more detail below.

A. INSTALLATION RATE

We confirmed the installation of 100 percent of the equipment for the sampled.

B. ENGINEERING VERIFICATION FACTOR

The overall engineering verification factors are high for the Renewables program. Program level engineering verification resulted in 96 percent for kWh, 122 percent for kW, and 98 percent for therms. In Table 5-4 below, we provide the engineering verification factors for each of the technology categories. This is followed by a more detailed discussion of the development of the engineering verification factors.

[17] There are ongoing discussions about changes to net-to-gross survey questions and approaches to calculating acceleration effects. These discussions did not affect the methods or reporting approach used in this study due to timing.

Table 5-4. Engineering Verification Factors by Technology

Technology	kWh	kW	Therms
Biogas	97%	144%	
Biomass			98%
PV Residential	101%	76%	
PV Commercial	100%	77%	
Solar Water Heating			100%
Wind	53%	100%	
Other	46%	97%	100%
Overall	**96%**	**122%**	**98%**

i. Biogas

Methane producing bio-digesters were installed at two sites. The methane is used to power an engine/generator, which produces electricity that is fed directly to the grid. The producer is paid by the utility on the basis of the kWh produced per month. Prior to installation, the Focus program estimated the amount of electricity that would be produced at each site.

Focus estimates electrical production as a function of the kW rated capacity of the generator times a capacity factor of 0.90[18]. This approach assumes that the generator runs at near capacity at all times and that biogas production and quality is not a limiting factor. While this is a reasonable estimate of potential, these assumptions do not necessarily hold true in all circumstances. The Focus estimate is different than the production estimate proposed in the grant application, which appears to factor in biogas production. The methodology and the reason for the differences in these two figures are not documented.

KEMA verified project details with the participants. In both cases, participants reported increasing the kW size of the generator (and thus capacity). At one site, the participant had also increased the number of cows and therefore the potential methane production.

KEMA obtained kWh production figures from the consultant who designed and monitors the bio-digesters and used them to develop annualized estimates of production.[19] KEMA compared these annual estimates to the estimated usage. We found one project to be within 1 percent of the KEMA results, and the other project to be producing 87 percent of the KEMA estimate. Overall, the KEMA estimated technology level savings was close to that estimated by Focus (despite increases in capacity and the number of cows).

Both KEMA and Focus used the rated capacity of the generator to estimate kW production. Since both sites had increased the size of the generators, KEMA's estimate of kW was substantially higher than that of Focus (and likely an overestimate of capacity savings).

[18] Focus program biodigetser production estimate is based on the formula: kWh/year = 0.9 x Genset rated capacity (kW) x 8760 hr/yr.

[19] kWh/year = actual production/actual days in use x 365 days/year.

ii. Biomass

Focus estimates the energy saved from the installation of a biomass heating system by using the energy content (in therms) of the fossil fuel used in the replaced system. Where there are no previous fuel records, as in a new installation, the estimated energy requirement of the facility is used.

KEMA surveyed the owners of nine facilities who had installed biomass heating systems with financial assistance from the Focus program. KEMA collected information on the uses and performance of the new biomass system, as well as that of the replaced system. Based on this information KEMA recalculated the estimated savings from the biomass projects.

Analysis of these data and information in the program folders highlighted problems with both the data collected from the applicants and the calculation methodology employed by Focus.

We identified the following issues with the Focus estimates:

The usage data were not annualized. The information provided by the participants sometimes included 13-14 months of gas or propane usage. The savings calculations were based on the information provided with no adjustment to and annual (12-month period). In other words, when 14 months of data were provided the calculations assumed that this was annual usage and potentially overestimated savings.

The usage data were not weather normalized. The prior usage data was not corrected for annual variations in temperature. Since 2003, average temperature (the number of heating degree-days) has been below normal. Standard engineering practice is to estimate space heating savings based on average heating degree-days to adjust for annual fluctuations. The result of not weather normalizing these projects is an under-estimate of savings.

The calculations assume that all of the fossil fuel use is being replaced by the biomass system. In several cases, the biomass system did not completely replace the existing fossil fuel system. This occurred in two types of situations. The first situation is where the biomass system is used to supplement, rather than replace the existing fossil fuel system. The second situation is where the biomass system replaces the space heating fossil fuel system, but not other fossil fuel uses at the facility. This results in an over-estimate of savings.

KEMA addressed these problems, where possible, to provide a more accurate estimate of energy savings. We based prior-usage estimates on twelve months of usage, rather than all of the data provided. We weather normalized space heating loads to provide savings estimates for an average winter. In one case, where biomass was installed to meet part of the space heating load, we multiplied the weather adjusted space heating load times the percentage of floor space heated with biomass to estimate savings.

In two cases, we had insufficient data on prior usage with which to estimate savings and relied upon current biomass usage. In these cases, the thermal content of the biomass fuel used in a heating season was estimated and then normalized for weather to arrive at a more accurate estimate.

Overall, KEMA's estimated savings for biomass projects differed from those of Focus by only 2 percent, but individual projects varied by as much as 20 percent.

iii. Solar Electric (PV)

Both Focus and KEMA estimate the solar energy transmitted by the photovoltaic system to the grid using PVWATTS, an online software package provided by the National Renewable Energy Laboratory (NREL). The program requires the user to put in the following information:

1. A reference city
2. The PV panel rated DC capacity
3. The panel orientation
4. The panel tilt
5. A derate factor (0.0 to 1.0) which takes into account equipment and environmental inefficiencies affecting the quantity of kWh supplied by the PV system.

KEMA surveyed eighteen customers who had PV systems installed through the Focus program. We confirmed the data used in the PVWATTS model and obtained readings of kWh production from 15 customers. These data were useful for evaluating the overall estimates and especially the derate factor of .80 used by the program.

KEMA PVWATTS estimates varied from Focus estimates by more than 10 percent for only two sites. (KEMA estimates were higher than Focus estimates.) The reason for the discrepancy in estimates was that Focus deducted an additional 20 percent off the PVWATTS calculation. Focus has since abandoned this practice.

KEMA compared the PVWATTS estimates to the kWh production figures provided by the participants. (The production figures were annualized to be comparable to the PVWATTS output.) Although individual cases varied, overall the PVWATTS calculations were consistent with actual production. This confirms the use of .80 as a base derate factor for Focus systems.

Focus uses the DC rated capacity of the system to estimate kW demand savings. KEMA used the AC rated capacity of the system after the derate factor had been applied[20] to estimate kW savings. This reduced the kW savings by 20 percent. Using AC rated capacity (rather than DC) is the appropriate approach, as all the systems are connected to the grid are used to generate AC power.

iv. Solar Hot Water

Focus relied on the calculations of SHW installers who used RETScreen model version 3[21] to estimate the systems' thermal potential. The model requires inputs about the particular solar panel being used, a reference city for climate data, system design parameters, and the quantity of water being heated. The model includes a database and calculation algorithms to assist with data input.

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[20] PVWatts calculates the AC rating of a PV system as: AC rating (kW) = DC rating (kW) x derate factor.

[21] RETscreen software is a product of Natural Resources, Canada, and is available for free download from www.retscreen.net. Version 3 has since been replaced by Version 4.

Four facilities were verified for solar hot water (SHW) installations. The KEMA survey confirmed the original system data, and collected information about the current operating parameters. RETScreen analysis was run based on the collected information and compared to the Focus estimates. KEMA results were consistent with Focus results.

v. Wind Evaluation Discussion

Focus relied on the generation estimates provided by participants in their application for program production estimates. These numbers were not always consistent with the estimates contained in the site's feasibility study and it was not always clear how the applicant arrived at these production estimates.

KEMA reviewed four sites with wind turbines for kWh estimated production The KEMA survey confirmed the specifications of the installed wind equipment. First KEMA developed an engineering estimate of wind production by estimating location specific average wind speed and using the Swept Area Method.[22] We determined the average wind speed at a site's location using wind data from a local wind measurement reference site.[23] We adjusted the wind speed for the site and turbine height using the power law equation and the local wind shear exponent from the feasibility study.[24] Having derived a local average annual wind speed, we estimate a wind turbine's annual kWh production using the Swept Area Method and additional inputs of air density, turbine efficiency and the radius of the turbine rotor. The turbine efficiency was obtained from manufacturer data and discounted by 10 percent to take into account system inefficiencies. There were no substantial differences between the kWh estimated derived by Focus and KEMA.

KEMA obtained actual kWh production data from participant meters for the three largest sites and estimated annual usage based on these data. When a full 12 months of data were not available, we annualized the production data based on monthly average wind speeds. These estimates, based on actual production, resulted in estimates that were 50 percent of the Focus estimated usage. In other word, the actual production of the wind machines was substantially lower than both the Focus or KEMA estimates.

This is the first year in which we compared the estimates to actual production and we are uncertain of the reasons for the differences. None of the low readings were due to the system being down for repairs, for maintenance, or for other reasons. The largest system had the lowest performance relative to estimates, and includes some refurbished equipment. These findings could indicate that estimates of wind production are overstated due to inefficiencies

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[22] Swept Area Method: Production (kWh) = ½ x air density x 1.91 (EPF) x π x (rotor radius)^2 x (avg annual wind speed)^3 x turbine efficiency x 8760hr/yr x (1 kW/1000 W) where 1.91 (EPF) implies that the wind distribution approximates a Rayleigh function.

[23] Wisconsin has measured wind speed at a number of locations throughout the state, and the data and annual average wind speeds can be found online: search for wind maps and data at www.focusonenergy.com.

[24] Power Law Method: Wind Speed $_{(site)}$ = Wind Speed $_{(ref)}$ x (Height $_{(site)}$ / Height $_{(ref)}$)$^{\alpha}$ where α is the wind shear exponent based on the terrain at the turbine site.

with the equipment; inefficiencies that should be accounted for in future estimates by applying an additional efficiency factor. KEMA used the annualized estimates of kWh production based on participant meter readings as the basis for the engineering verification.[25]

Both Focus and KEMA used the rated capacity of the wind turbine as the peak kW estimate.

vi. Overall Engineering Verification

The engineering verification factors overall for electric energy, electric demand, and therms are high. The variation in engineering factor results, however, was also high across (and within some) technologies. Solar electric (PV) and solar water heating calculations were internally consistent, well documented and consistent with both KEMA's approach and final estimates[26].

We identified the following overall issues with the reported gross savings estimates:

Poor documentation. For some technologies, and specific projects within other technologies, we did not find sufficient documentation of the approach Focus used to estimate savings.

Incorrect database information. In some cases, the Focus paper records included calculations and estimates that were closer to the estimates calculated by KEMA, but the Focus database was not updated to include these estimates. We also found projects that were incorrectly categorized by sector. For example, the WECC PV project is listed in the database as a residential project.[27]

Inconsistent calculations. The calculations for some technologies, especially biomass, were inconsistent and not grounded in standard engineering approaches.

KEMA is working with Focus Renewable Energy staff to develop consistent approaches for calculating generation and therm savings associated with Focus projects. As of this report, we have discussed and verbally agreed upon approaches for estimating savings for all the renewable technologies. These discussions include an approach for calculating kW savings based upon the new requirement for the Renewable Energy Program to track peak kW. The result of these meetings will be a document outlining the calculation approaches and data required in the tracking system or project folder to support the calculation approach.

C. REALIZATION RATE

Table 5-5 below reports the overall final adjustment factors for FY07. These factors are based on a sample of projects completed in FY07 (July 1, 2006–June 30, 2007). The resulting gross

[25] Meter readings were annualized when fewer than 12 months of data were available. This annualization accounts for additional production for the other months in the year, based on monthly wind data for that location and year. Metered wind data were not "weather normalized" because long-term wind speed data are not readily available.

[26] With the exception of the PV program using DC, instead of AC rated capacity.

[27] We have since worked with WECC to identify the source of the discrepancy and believe that this issues has been resolved.

savings adjustment factors combined with the attribution factor are used to determine the net program impacts. These numbers were calculated by technology and then aggregated to program level factors for electric energy (kWh), electric demand (kW), and fossil fuels (therms).[28] The calculation of the technology and overall program factors is weighted by the size of the project, so projects (and technologies) that account for a large amount of savings count more than projects that have small savings. The resulting net adjustment factors were then applied to all projects completed in FY07, resulting in the final net energy impacts of the Focus Renewable Program for FY07.

Table 5-5. Final Net Adjustment Factors for FY07

	kWh				kW				Therms			
			Standard Error				Standard Error				Standard Error	
			Margin of Error				Margin of Error				Margin of Error	
Adjustment Factor	n[a]	Estimate	Jul06-Jun07[a]	Extrapolated	n[a]	Estimate	Jul06-Jun07[a]	Extrapolated	n[a]	Estimate	Jul06-Jun07[a]	Extrapolated
Installation Rate	25	100%			25	100%			12	100%		
Engineering Verification Factor	25	96%	+/- 1.2%	+/- 7.9%	25	122%	+/- 4.3%	+/- 18.3%	12	98%	+/- 3.2%	+/- 5.0%
Gross Savings Adjustment Factor		96%				122%				98%		
Attribution Factor	25	5%	+/- 2.1%	+/- 5.4%	25	19%	+/- 9.3%	+/- 18.7%	12	47%	+/- 4.5%	+/- 6.9%
Realization Rate		5%				23%				46%		

[a] The gross savings adjustment factor and the realization rate are not calculated directly but are products of other adjustment factors. Therefore, sample sizes are not provided for these two adjustment factors.

Similar to previous years, the final FY07 gross savings adjustment factors are high, 96 percent, 122 percent, and 98 percent for energy (kWh), demand (kW), and therms, respectively. Final FY07 net Verified energy impacts are, however, low. The realization rates are 5 percent for energy (kWh), 23 percent for demand (kW), and 46 percent for therms program estimated impacts. These low realization rates are a result of low attribution factors.

For all energy types, the installation rate was 100 percent and the engineering verification factor was close to or exceeded 100 percent. The free-ridership rates, however, for all energy types (kW, kWh, and therms) for the Renewable Energy Program are high. Free-ridership is estimated at 95 percent for kWhs (energy), 81 percent for kW (demand), and 53 percent for therms. That is, the analysis indicates that 95 percent of the electric energy savings, 81 percent of the demand savings, and 53 percent of the therm savings would have occurred without the program.

These results represent a high free-ridership rate and a continuation of low realization rates for FY06. The realization rates are overall (for all projects) and are weighted by the kWh, kW, and therms associated with the project. The Renewables program is characterized by a wide variety of projects, in regards to technology type and size, relative to the overall number of projects. The savings associated with the program, however, is dominated by the largest projects, for which one project can represent 30 to 80 percent of a savings (kW, kWh, or therms. In the past, the Renewables program capped incentives at $35,000, which meant that

[28] For a more complete description of the data collection methodology and analysis algorithms refer to *Renewable Energy Program: Spring 2004 Impact and Linkage Evaluation* Bobbi Tannenbaum and Ryan Barry, KEMA Consulting and Adam Serchuk, Serchuk and Associates, PA Government Services Inc. July 19, 2004.

incentives for large projects were a very small percentage of project cost. Although the program provides other services to these participants, (such as assistance filling out Department of Agriculture loan applications and information on codes or technologies), this is a situation likely to result in high free-ridership. For the current program year, Focus modified the program rules to limit applicants and increase incentive amounts for large projects. We anticipate realization rates improving for the current program period as projects participating with the current incentive structure are implemented.

While the overall program realization rate was low, realization rates for the individual technologies varied substantially. For the technologies that did not include large projects we found realization rates ranging from 46 to 67 percent for kWhs and 49 to 90 percent for kW savings. The realization rate for therm savings ranged from 60 to 80 percent. This is a clear indication that a substantial number of the projects provided incentives by the Renewable Program would not be installed without the program. These projects, however, do not represent a substantial portion of the program savings and get lost in the savings weighted averages.

5.3.4 Estimated Energy Impacts (July 1, 2007–December 31, 2007)

Estimated last half of 2007 evaluation-verified gross and net energy impacts are determined by applying the final FY07 adjustment factors to the last half of 2007 program-reported gross energy savings. The estimated last half of 2007 impacts, the final FY07 impacts, and the impacts for the previous program years are provided in Table 5-3. The evaluation team calculated FY07 adjustment factors based on projects completed during FY07. These adjustment factors were then applied to the program-reported gross energy savings for projects completed in the last half of 2007 to determine estimated evaluation-verified gross and net energy impacts for that six-month period.

For all completed years in the table, evaluation-verified gross is calculated by multiplying the overall program-reported gross savings by the overall program gross savings adjustment factor. Similarly, evaluation-verified net savings is the product of the overall program-reported gross savings and the overall realization rate. This is done for each of the three energy units (kWh, kW, and therms). In the case of estimated last half of 2007 energy savings, the adjustment factors are applied at the technology level because the percentage of savings attributable to each technology changed from FY07 to the last half of 2007. Technology level adjustment factors are not provided in this report to protect respondent confidentiality. Overall factors are reported in Table 5-5.

5.4 UPCOMING RENEWABLE EVALUATION ACTIVITIES IN THE CURRENT CONTRACT PERIOD

In this section, we describe the upcoming FY07 evaluation activities. For a more detailed discussion of these activities refer to *Focus on Energy Public Benefits Evaluation Contract Year 6 Detailed Evaluation Plan (FY07 DEP).*

- **Benefit-Cost Analysis.** A benefit-cost analysis of the Focus on Energy program will be conducted in this contract period.
- **Standardized Calculation Approaches.** The evaluation team is working with the technology leads to develop standardized approaches for estimating project generation (kW and kWh) and therms.

- **Modified Detailed Evaluation Plan.** The DEP will be modified based on an increased focus on the net-to-gross estimates in this contract period and the additional effort to refine these estimates. KEMA will assess the need to conduct additional (unplanned) research to address program effects (supply-side) on participants that may not be captured in the current attribution sequence. This may result in one or more planned activities discussed below being eliminated or scaled back.
- **Process Evaluation.** KEMA currently has a process evaluation planned for early 2008 to assess the integration of the renewable program activities with the Business Program.
- **Impact Evaluation.** KEMA plans to conduct two additional impact evaluations in this contract period. The next impact evaluation would cover projects completed between July 1, 2007, and March 31, 2008. The purpose of this mid-year evaluation is to determine if the change in program rules and incentive levels had an impact on the program realization rate. This evaluation is contingent on the installation of a substantial number of projects funded through the new program rules. The second impact evaluation would complete the determination of a realization rate for all projects implemented in the current program 18 month contract period and would be completed in early 2009. These impact evaluations will include revisions to the participant questionnaire and reporting based upon work being completed by an ad hoc evaluation working group addressing net-to-gross self reports.

6. FOCUS ON ENERGY BIBLIOGRAPHY

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APPENDIX A: GEOGRAPHIC DISTRIBUTION OF DIRECT ENERGY IMPACTS

This appendix presents the geographic distribution of direct energy impacts.

A.1 INTRODUCTION

The following appendix sections provide tables and maps that show annual energy savings achieved through resource acquisition activities of Focus on Energy programs. This version of the report does not provide observations, comments, or analysis of the data—which is largely the domain of the respective program evaluation leads. It is expected that evaluation team leads may integrate some of this information in the relevant evaluation reports and make the relevant analysis integrating it with other evaluation results and analysis. The data reported here are the verified gross numbers, so it does represent evaluation work done to establish verified gross for specific programs and/or program areas.

The maps that represent impacts by "*County*" and *"Utility Territory*" have been normalized, while the maps that represent impacts by "*Senate District*" and "*Assembly District*" show total energy impacts. The primary reason the Senate District and Assembly District data has not been normalized is because of difficulty in estimating the number of eligible participants in those regions due to issues with the nonparticipating utility territories. Some options are being considered for establishing those estimates for use in future reports.

For the county maps, an effort was made to estimate the number of eligible participants (excluding the relevant customers of nonparticipating utilities). For the utility maps, this was not an issue—since by definition their customers are eligible to participate in the program, therefore the number of customers reported by the utilities was used. Although, it should be noted there are likely some differences in the definition of rate classes from utility to utility that may cause anomalies in the *"per capita"* values. This will be most notable in the Industrial Sector. There are some differences in the numbers of eligible customers using these two methods. These differences are primarily due to the definition of a *"customer,"* since the utilities define customers by *service addresses or meters*; the method used for the county maps defined eligible customers as *households* (using U.S. Census data) for the residential segment *and business addresses* for the business segment (using Dun & Bradstreet data).

The maps are based on the "Dollars Saved per Customer" column in the tables for the county and utility territory maps. This represents the annuals dollars in energy bill savings realized by program participants divided by the total number of customers in the county or utility territory. The senate and assembly district maps present the information shown in the "Annual Dollars Saved" column of the tables. This represents the annual dollars in energy bill savings realized by program participants. The energy bill savings are calculated using the average retail price of energy for the state of Wisconsin for each rate class (commercial, industrial, and residential). Comparisons cannot be made between maps, because both the definition of per capita and energy savings scales vary by program.

A.2 BUSINESS PROGRAMS

This section presents tables and maps that show annual energy savings achieved through participation in Focus on Energy Business Programs. These impacts are broken out for the Commercial and Industrial sectors.

The *"Number of Customers"* presented for each of the counties in Table A-1 and Table A-5 are based on the number of customers in industries targeted by the program administrator in the respective programs who are in participating utility territories in that county. The number businesses in participating utility territories in each county were estimated by determining the proportion of businesses in the State of Wisconsin Department of Workforce Development Standard Name and Address Program (SNAP) covered by Wisconsin's Unemployment Insurance Law. It was determined, based on geographic location, whether each business was in a utility territory of a utility participating in the Focus on Energy program. Then for each industry (at the two-digit SIC level) in each county, the proportion of the businesses that were in a participating utility territory was determined. Because the SNAP database is not fully representative of all of the businesses in the state, this ratio was applied to the number of businesses in that industry in that county reported by Dun and Bradstreet.

An analysis of the industries of the businesses that have had energy savings potential identified by the program administrator was conducted to determine which of the industries were being targeted by the program administrator. This analysis resulted in the identification of 23 of the 82 two-digit SIC codes as being targeted by the industrial programs and 28 of the 82 two-digit SIC codes as being targeted by the commercial programs, with eight industries (as identified by the two-digit SIC code) being targeted by both the industrial and commercial programs. The 23 codes identified as being targeted by the industrial programs account for about 33 percent of Wisconsin businesses, while the 28 codes identified as being targeted by the commercial programs account for about 79 percent of Wisconsin businesses.

The *"Number of Customers"* presented for each of the participating utilities in Table A-4 and Table A-9 are based on the number of customers reported by the utilities in 2005 and 2006, respectively.

A.2.1 Commercial Programs

Figure A-1.
Wisconsin Focus on Energy Commercial Programs
Per Capita Energy, Electric or Gas Bill Savings by County
Net Cumulative Savings (July 1, 2001–December 31, 2007)

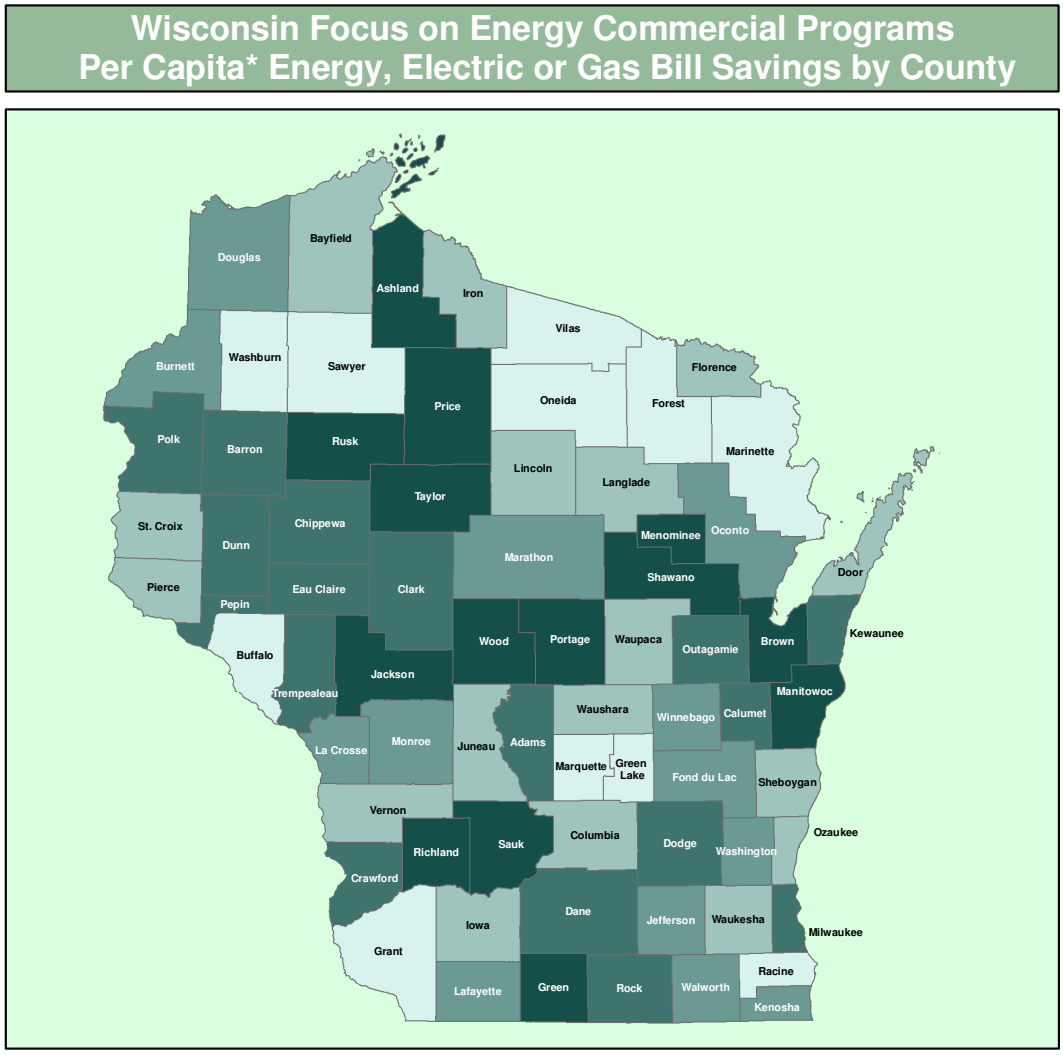


Table A-1. Commercial Program Energy Impacts
(By County)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Adams	$218	661,960	9,257	298
Ashland	$311	1,750,868	87,138	757
Barron	$217	1,906,187	107,505	1,239
Bayfield	$103	600,315	17,305	658
Brown	$290	17,174,395	1,078,182	8,735
Buffalo	$54	263,847	12,626	648
Burnett	$162	586,248	32,558	507
Calumet	$224	2,236,944	46,751	1,051
Chippewa	$200	2,823,965	154,302	1,965
Clark	$206	2,204,670	84,177	1,312
Columbia	$135	1,757,320	131,079	2,073
Crawford	$245	2,359,729	5,019	831
Dane	$224	27,348,423	1,082,467	15,152
Dodge	$216	4,438,181	258,381	2,929
Door	$144	1,361,464	41,375	1,087
Douglas	$194	1,817,565	162,448	1,634
Dunn	$220	2,307,966	102,507	1,350
Eau Claire	$201	5,951,411	233,005	3,667
Florence	$111	37,534	739	35
Fond du Lac	$157	4,902,149	157,377	3,640
Forest	$46	209,993	2,199	436
Grant	$75	1,179,929	33,943	1,789
Green	$373	3,145,344	70,980	900
Green Lake	$39	681,808	15,084	1,842
Iowa	$103	1,268,772	32,461	1,351
Iron	$145	444,358	14,432	359
Jackson	$740	493,268	25,653	91
Jefferson	$173	2,940,684	139,345	2,241
Juneau	$133	487,772	8,847	376
Kenosha	$171	5,151,499	190,275	3,647
Kewaunee	$214	1,595,944	82,486	1,015
La Crosse	$165	6,033,784	175,760	4,159
Lafayette	$199	685,939	60,211	596
Langlade	$133	1,198,327	37,580	1,042
Lincoln	$118	1,357,085	40,625	1,312
Manitowoc	$462	3,810,809	219,711	1,174
Marathon	$164	7,759,231	170,928	5,019
Marinette	$94	1,578,503	43,475	1,872
Marquette	$79	397,791	11,778	574
Menominee	$346	226,527	4,101	67
Milwaukee	$223	40,389,304	2,016,858	24,399
Monroe	$162	1,711,894	124,237	1,663

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Oconto	$154	1,240,725	30,565	876
Oneida	$98	1,885,873	64,206	2,273
Outagamie	$200	10,428,143	264,470	5,713
Ozaukee	$118	2,588,637	101,777	2,713
Pepin	$201	761,240	24,282	440
Pierce	$143	1,276,505	26,391	938
Polk	$201	2,667,232	81,668	1,523
Portage	$268	5,663,494	183,249	2,470
Price	$346	645,045	129,227	534
Racine	$92	4,423,217	148,715	5,693
Richland	$496	680,414	11,582	139
Rock	$217	8,660,970	406,482	5,237
Rusk	$558	2,562,729	55,759	487
Sauk	$375	7,472,152	164,709	2,118
Sawyer	$71	637,840	12,663	933
Shawano	$265	2,173,277	38,218	835
Sheboygan	$120	2,896,876	139,779	3,215
St. Croix	$123	1,587,930	73,636	1,684
Taylor	$2,094	1,072,007	55,889	70
Trempealeau	$201	646,864	29,851	421
Vernon	$136	1,172,633	24,514	908
Vilas	$67	761,793	7,408	1,068
Walworth	$192	6,390,675	159,549	3,633
Washburn	$88	525,919	15,468	678
Washington	$158	4,965,151	123,197	3,433
Waukesha	$104	13,259,004	337,308	13,996
Waupaca	$137	2,936,724	18,001	1,935
Waushara	$138	992,286	31,670	838
Winnebago	$184	7,551,973	308,948	5,157
Wood	$484	3,899,757	61,030	805
Not mapped*		152,576	6,127	

* *Unknown County*: The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-2.
Wisconsin Focus on Energy Commercial Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
Net Cumulative Savings (July 1, 2001–December 31, 2007)

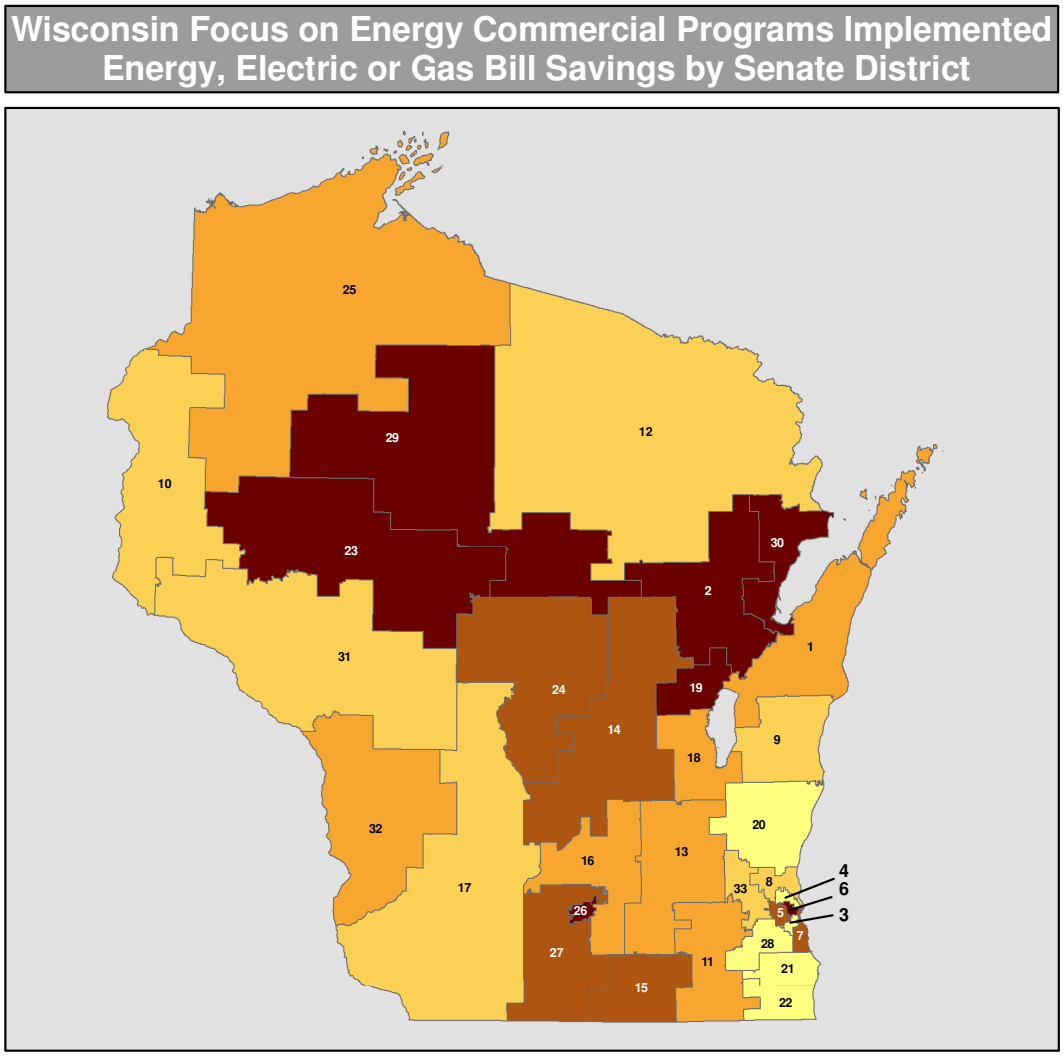
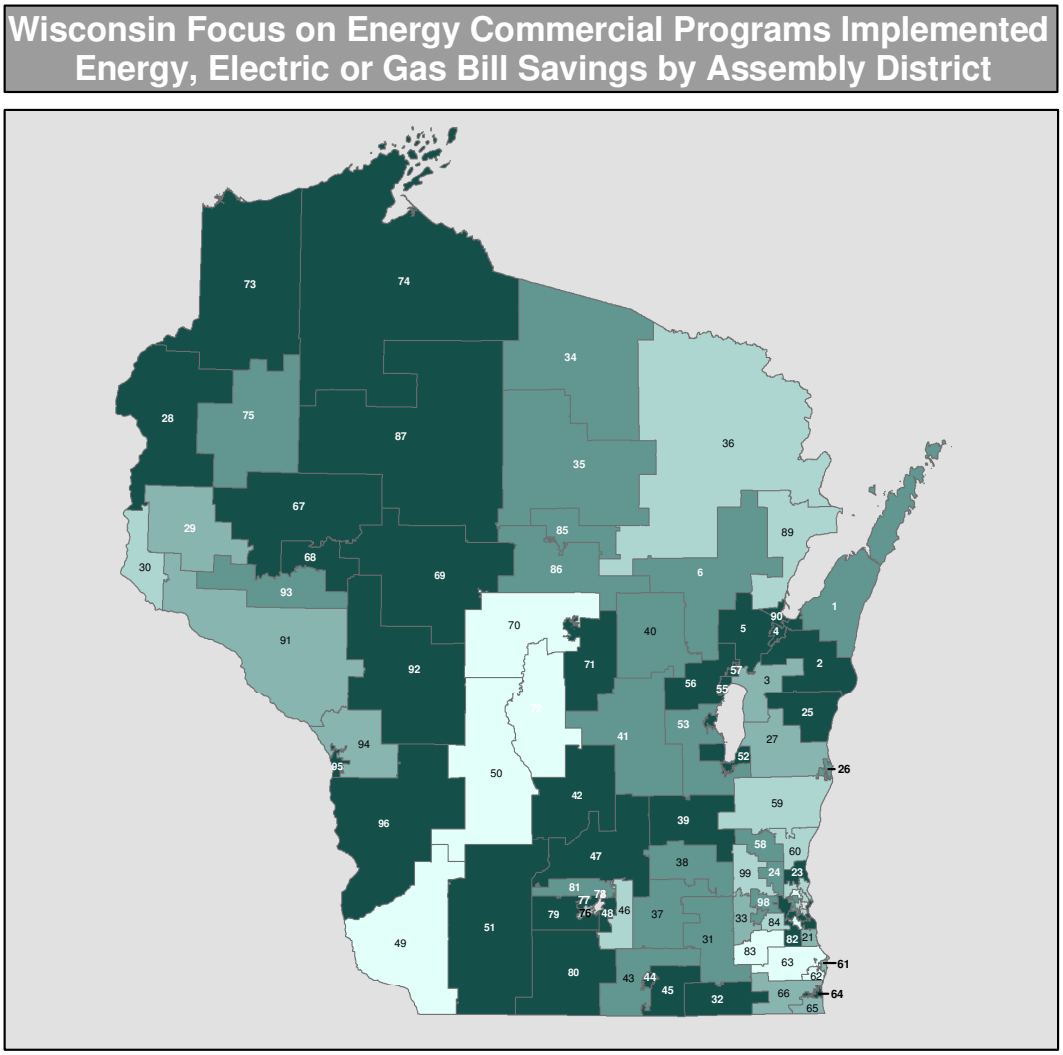


Table A-2. Commercial Program Energy Impacts
(By Senate District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Senate District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$935,467	8,177,006	245,571
2	$1,295,105	11,123,400	356,419
3	$571,509	2,624,913	347,626
4	$352,805	3,133,410	88,489
5	$1,206,553	8,457,712	490,842
6	$1,485,091	10,840,482	568,292
7	$1,209,258	10,264,849	342,898
8	$774,971	6,409,891	233,795
9	$873,935	6,722,820	305,794
10	$837,795	6,553,192	284,114
11	$941,732	8,126,004	256,031
12	$776,205	7,055,485	181,208
13	$961,797	7,322,376	342,899
14	$1,262,303	11,618,543	282,640
15	$1,221,862	9,417,199	426,041
16	$1,002,185	8,595,953	276,774
17	$705,432	5,807,015	215,126
18	$911,286	7,954,046	240,189
19	$1,359,946	11,554,755	384,729
20	$667,615	5,433,239	208,800
21	$426,069	3,766,602	108,323
22	$697,436	5,539,016	229,539
23	$1,348,444	10,784,074	437,565
24	$1,133,889	10,399,133	257,008
25	$1,056,343	7,559,703	416,820
26	$1,633,350	11,479,641	661,955
27	$1,238,775	11,197,394	294,425
28	$546,353	5,577,581	76,590
29	$1,294,937	10,923,595	372,907
30	$1,583,919	9,102,515	811,098
31	$893,016	6,724,645	324,552
32	$1,043,155	9,950,591	204,470
33	$811,482	7,470,005	181,620
Not mapped*	$19,245	152,581	6,356

* *Unknown District*: The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-3.
Wisconsin Focus on Energy Commercial Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
Net Cumulative Savings (July 1, 2001–December 31, 2007)



Implemented Annual Energy, Electric or Gas Savings by Assembly District

	$0
	$65,000 - $179,999
	$180,000 - $259,999
	$260,000 - $319,999
	$320,000 - $419,999
	=> $420,000

The map above portrays the annual energy, electric or gas bill savings realized by projects implemented through programs targeted at commercial sector businesses as of December 31, 2007. Electric and gas savings have been valued at the average cost of gas and electricity for commercial businesses in Wisconsin and summed for all projects within each Wisconsin Assembly District. This does not take into account the opportunity for savings within each district and therefore makes it difficult to compare savings across districts.

Map Produced by: PA Government Services and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. March, 2008.

Table A-3. Commercial Program Energy Impacts
(by Assembly District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$355,261	3,155,865	89,052
2	$336,695	2,702,625	108,428
3	$243,511	2,318,516	48,091
4	$603,067	4,672,416	208,243
5	$403,152	3,760,448	86,123
6	$288,886	2,690,536	62,053
7	$118,824	608,154	67,075
8	$179,076	998,488	94,255
9	$273,609	1,018,271	186,296
10	$166,069	1,273,525	58,440
11	$68,629	705,379	9,224
12	$118,107	1,154,506	20,825
13	$236,685	1,416,430	116,515
14	$666,841	5,952,031	164,792
15	$303,027	1,089,250	209,536
16	$1,135,911	8,684,888	401,895
17	$216,693	1,651,987	77,067
18	$132,487	503,606	89,330
19	$672,406	5,767,587	185,681
20	$327,537	2,738,059	96,398
21	$209,315	1,759,203	60,819
22	$180,215	1,272,919	72,510
23	$316,385	2,578,463	98,649
24	$278,371	2,558,510	62,637
25	$460,156	3,390,367	173,464
26	$218,558	1,720,698	73,189
27	$195,221	1,611,755	59,140
28	$405,187	3,326,750	124,289
29	$263,694	1,718,361	118,116
30	$168,914	1,508,082	41,709
31	$233,754	1,770,458	84,102
32	$516,112	4,834,450	108,558
33	$191,866	1,521,096	63,371
34	$289,505	2,593,096	70,789
35	$301,628	2,699,166	73,963
36	$185,072	1,763,222	36,456
37	$233,971	2,095,725	57,205
38	$253,464	1,664,505	112,466
39	$474,363	3,562,146	173,227
40	$259,559	2,874,841	17,626
41	$283,793	1,995,588	114,930
42	$718,951	6,748,115	150,084
43	$243,339	2,309,202	48,697

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
44	$319,359	3,098,637	58,239
45	$659,165	4,009,360	319,106
46	$203,385	1,325,972	91,052
47	$348,696	2,936,826	100,802
48	$450,104	4,333,154	84,921
49	$154,220	1,426,541	33,943
50	$179,692	1,459,016	56,481
51	$371,519	2,921,458	124,702
52	$297,968	2,790,456	62,726
53	$295,938	2,696,545	68,541
54	$317,380	2,467,046	108,921
55	$393,117	2,641,994	169,401
56	$339,804	3,933,085	8,951
57	$627,025	4,979,677	206,377
58	$300,084	2,514,334	87,838
59	$181,261	1,541,354	51,173
60	$186,270	1,377,551	69,790
61	$163,057	1,748,974	15,826
62	$163,283	991,494	79,186
63	$99,729	1,026,134	13,311
64	$329,888	2,332,322	132,547
65	$198,659	1,810,534	45,980
66	$168,889	1,396,160	51,013
67	$414,630	3,355,192	131,277
68	$463,938	3,871,697	137,094
69	$469,876	3,557,185	169,194
70	$162,531	1,648,402	23,687
71	$643,929	5,386,260	189,241
72	$327,429	3,364,471	44,080
73	$329,120	1,964,239	162,465
74	$418,090	3,393,199	131,538
75	$309,133	2,202,264	122,817
76	$160,461	933,769	81,201
77	$282,219	2,118,941	103,088
78	$1,190,669	8,426,930	477,666
79	$521,361	5,162,829	86,390
80	$419,012	3,965,604	84,742
81	$298,402	2,068,961	123,293
82	$293,345	3,036,335	37,651
83	$117,988	1,128,465	22,878
84	$135,020	1,412,781	16,061
85	$304,769	3,224,651	33,276
86	$366,628	3,174,592	98,756
87	$623,541	4,524,351	240,875
88	$1,023,363	3,898,409	689,303
89	$190,572	1,773,581	41,045
90	$369,984	3,430,525	80,750

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
91	$226,500	1,877,461	67,993
92	$327,395	2,082,572	150,892
93	$339,122	2,764,612	105,667
94	$227,668	2,499,455	17,308
95	$465,394	3,650,678	156,959
96	$350,093	3,800,458	30,203
97	$384,194	3,243,007	110,462
98	$262,282	2,663,375	37,950
99	$165,006	1,563,622	33,207
Not mapped*	$19,245	152,581	6,356

* *Unknown District:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-4.
Wisconsin Focus on Energy Commercial Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
Net Cumulative Savings (July 1, 2001–December 31, 2007)

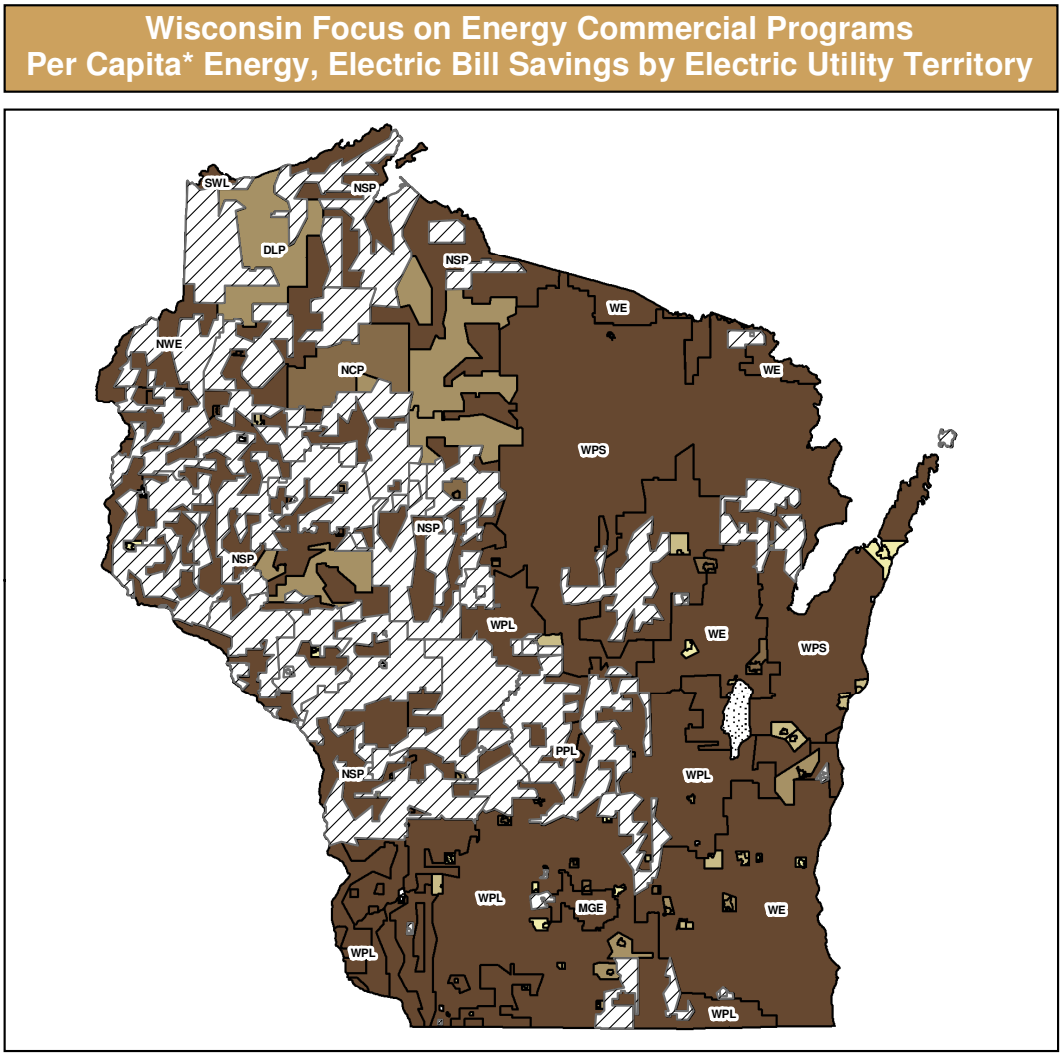


Table A-4. Commercial Program Electric Impacts
(By Participating Electric Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
Algoma Utility Comm		$0	$0	0	0	361
Alliant Energy	WPL	$75	$4,042,590	48,068,842	11,079	54,010
Bloomer Electric & Water Co		$130	$44,232	525,950	2	341
Brodhead Water & Lighting Comm		$12	$3,583	42,606	5	302
Cedarburg Light & Water Comm		$2	$1,396	16,599	4	830
City of Argyle		$0	$34	400	0	96
City of Black River Falls		$0	$0	0	0	498
City of Boscobel		$0	$0	0	0	310
City of Columbus		$3	$1,304	15,511	4	407
City of Cornell		$39	$5,573	66,269	24	143
City of Cuba City		$0	$0	0	0	135
City of Eagle River		$0	$0	0	0	548
City of Elroy		$12	$1,656	19,687	8	140
City of Evansville		$16	$9,204	109,438	19	583
City of Kaukauna		$27	$40,977	487,237	270	1,503
City of Kiel		$2	$825	9,811	2	353
City of Lodi		$26	$6,849	81,443	24	262
City of Medford		$21	$11,581	137,701	35	551
City of Menasha		$3	$2,539	30,193	7	794
City of Muscoda		$4	$884	10,514	2	200
City of New Holstein		$4	$1,398	16,623	3	331
City of New Richmond		$0	$0	0	0	618
City of Plymouth		$9	$7,496	89,137	40	879
City of Princeton		$26	$4,296	51,080	16	163
City of Richland Center		$2	$944	11,225	3	495
City of River Falls		$1	$516	6,134	0	647
City of Shullsburg		$0	$79	934	0	168
City of Westby		$0	$82	970	0	184
Consolidated Water Power Co	CWP	$3	$552	6,568	2	182
Cumberland City of		$156	$35,002	416,196	107	224
Dahlberg Light & Power Co	DLP	$14	$14,933	177,564	25	1,080
Eau Claire Electric Coop	C-8	$7	$3,582	42,591	11	506
Florence Utility Comm		$10	$1,583	18,821	0	164
Hartford Electric		$2	$1,669	19,849	10	755
Hustisford Utilities		$3	$509	6,048	1	187
Jefferson Utilities		$6	$2,887	34,333	7	515
Juneau Utility Comm		$5	$987	11,741	0	186
La Farge Municipal Electric Co		$70	$7,773	92,431	22	111
Lake Mills Light & Water		$11	$4,683	55,678	9	418
Madison Gas & Electric Co	MGE	$117	$2,109,223	25,079,938	5,079	18,070
Manitowoc Public Utilities		$3	$4,827	57,398	17	1,721
Mt Horeb Village of		$1	$417	4,957	0	476

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
New London Electric&Water Util		$0	$11	133	0	502
North Central Power Co Inc	NCP	$45	$19,094	227,034	35	423
Northwestern Wisconsin Elec Co	NWE	$4,518	$126,500	1,504,161	360	28
Oconomowoc Utilities		$10	$10,183	121,080	22	1,070
Oconto Falls Water & Light Comm		$10	$2,759	32,809	8	268
Pioneer Power & Light Co	PPL	$59	$7,104	84,466	2	121
Price Electric Coop Inc	C-16	$20	$4,375	52,025	14	223
Reedsburg Utility Comm		$32	$20,941	248,997	67	662
Rice Lake Utilities		$4	$3,652	43,424	14	836
Richland Electric Coop	C-17	$76	$13,785	163,916	48	182
Scenic Rivers Energy Coop	C-20	$73	$41,296	491,030	138	562
Shawano Municipal Utilities		$23	$28,244	335,841	83	1,238
Slinger Utilities		$0	$151	1,792	0	302
Spooner City of		$67	$23,377	277,965	42	347
Stoughton City of		$8	$6,133	72,921	17	799
Sturgeon Bay City of		$2	$2,735	32,515	14	1,464
Sun Prairie Water & Light Comm		$1	$930	11,056	0	1,606
Superior Water, Light & Power Co	SWL	$80	$150,033	1,783,986	601	1,871
Two Rivers Water & Light		$5	$3,353	39,872	9	707
Village of Belmont		$6	$582	6,920	2	98
Village of Benton		$26	$2,137	25,405	6	82
Village of Cadott		$1,072	$8,578	101,992	19	8
Village of Cashton		$21	$2,161	25,701	7	101
Village of Centuria		$5	$342	4,063	0	69
Village of Gresham		$2	$352	4,191	2	161
Village of Mazomanie		$0	$22	267	0	106
Village of New Glarus		$7	$1,250	14,863	5	184
Village of Pardeeville		$0	$52	613	0	135
Village of Prairie Du Sac		$6	$1,646	19,567	4	265
Village of Stratford		$29	$4,336	51,554	15	151
Village of Viola		$0	$0	0	0	85
Village of Waunakee		$41	$21,087	250,731	167	517
Waterloo Light & Water Comm		$30	$9,003	107,046	20	300
Waupun Utilities		$20	$10,259	121,989	26	520
We Energies	WEP	$71	$7,282,887	86,597,937	18,193	103,051
Westfield Electric Co		$0	$0	0	0	129
Whitehall Electric Utility		$0	$11	133	0	198
Wisconsin Dells Electric Util		$19	$12,837	152,638	50	689
Wisconsin Public Service Corp	WPS	$97	$4,368,125	51,939,658	14,361	45,128
Wonewoc Electric & Water Util		$0	$9	113	0	79
Xcel Energy	NSP	$66	$2,530,903	30,093,977	9,303	38,263
Not mapped*			$1,425,711	16,952,564	3,844	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-5.
Wisconsin Focus on Energy Commercial Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
Net Cumulative Savings (July 1, 2001–December 31, 2007)

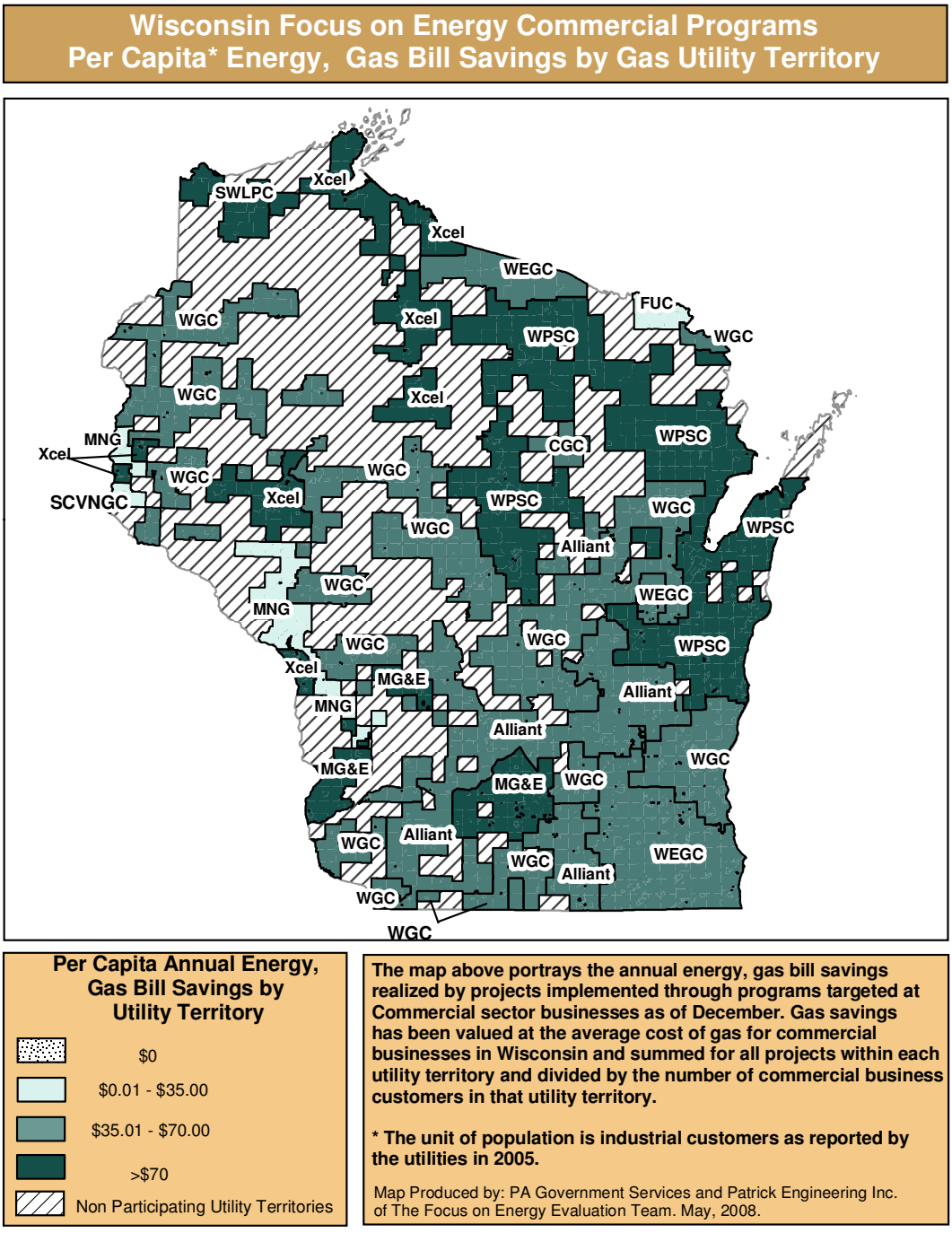


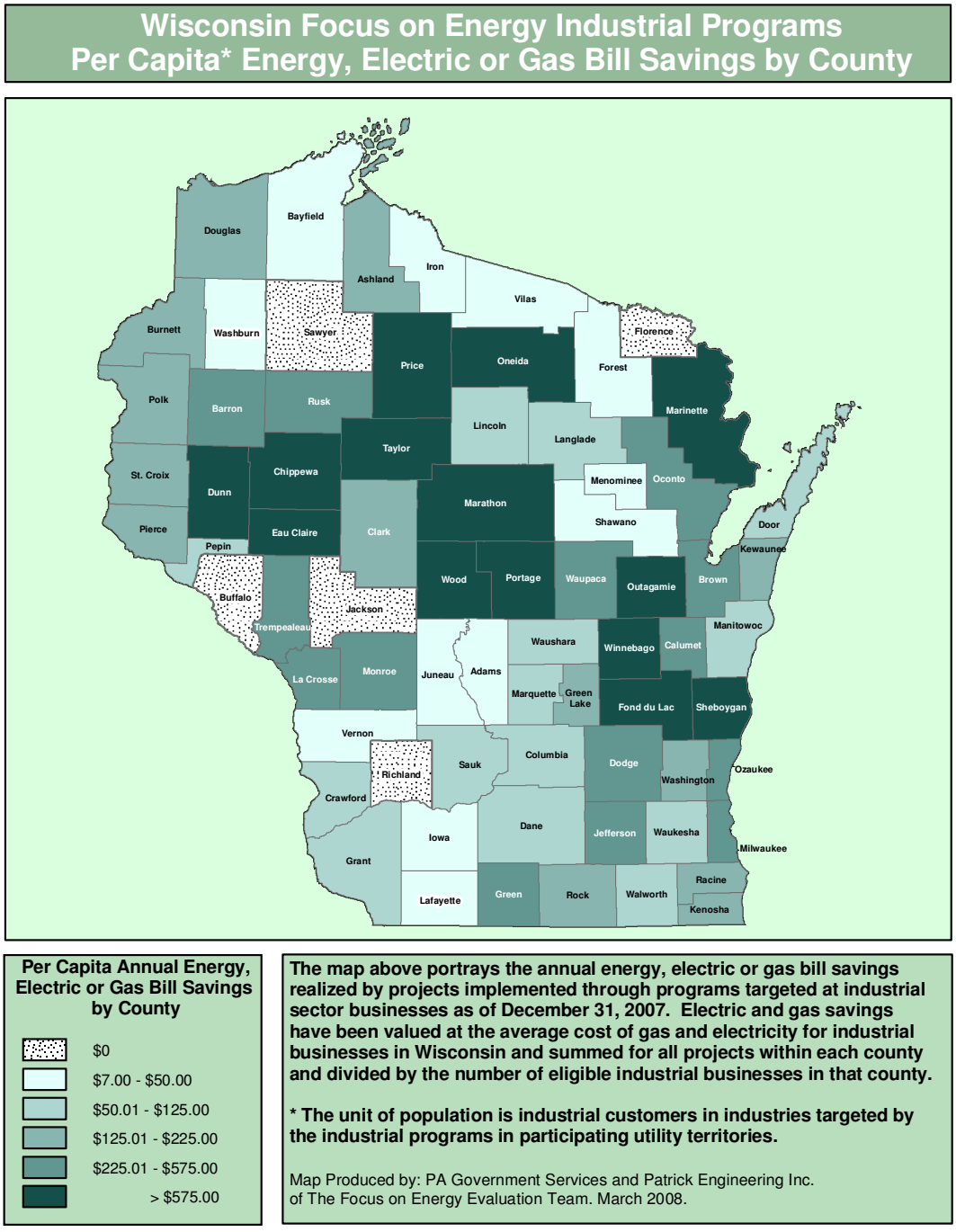
Table A-5. Commercial Program Gas Impacts
(By Participating Gas Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Therms Saved	Annual Dollars Saved	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$67	1,222,322	$1,233,323	18,332
City Gas Company	CGC	$44	24,848	$25,071	575
Florence Utility Commission	FUC	$6	740	$746	117
Madison Gas and Electric	MG&E	$77	1,029,164	$1,038,427	13,522
Midwest Natural Gas Inc.	MNG	$22	31,961	$32,249	1,461
St Croix Valley Natural Gas Company	SCVNGC	$30	16,499	$16,647	551
Superior Water Light & Power Company	SWLPC	$145	162,569	$164,032	1,132
Wisconsin Electric Gas Operations	WEGC	$43	1,504,524	$1,518,064	35,313
Wisconsin Gas Company	WGC	$66	3,259,370	$3,288,704	49,892
Wisconsin Public Service Corp	WPSC	$86	2,198,567	$2,218,354	25,798
Xcel (Northern States Power Company)	Xcel	$73	810,561	$817,857	11,129
Not mapped*			200,379	$202,182	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

A.2.2 Industrial Programs

Figure A-6.
Wisconsin Focus on Energy Industrial Programs
Per Capita Energy, Electric or Gas Bill Savings by County
Net Cumulative Savings (July 1, 2001–December 31, 2007)



The map above portrays the annual energy, electric or gas bill savings realized by projects implemented through programs targeted at industrial sector businesses as of December 31, 2007. Electric and gas savings have been valued at the average cost of gas and electricity for industrial businesses in Wisconsin and summed for all projects within each county and divided by the number of eligible industrial businesses in that county.

*** The unit of population is industrial customers in industries targeted by the industrial programs in participating utility territories.**

Map Produced by: PA Government Services and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. March 2008.

Table A-6. Industrial Program Energy Impacts
(By County)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Adams	$28	61,410	0	128
Ashland	$225	990,114	9,335	300
Barron	$252	869,531	79,195	513
Bayfield	$19	22,437	4,574	300
Brown	$235	11,829,113	381,947	4,550
Burnett	$176	756,047	0	252
Calumet	$316	1,562,090	30,670	386
Chippewa	$885	6,069,985	417,865	868
Clark	$210	725,688	66,515	514
Columbia	$110	1,565,146	2,170	853
Crawford	$123	540,692	1,258	268
Dane	$94	7,652,440	248,286	7,409
Dodge	$348	3,234,694	232,829	1,204
Door	$70	322,429	16,683	505
Douglas	$165	578,598	91,989	753
Dunn	$1,116	4,314,102	320,526	510
Eau Claire	$694	5,239,708	863,518	1,669
Fond du Lac	$645	13,548,759	193,771	1,531
Forest	$39	164,491	0	249
Grant	$72	327,887	26,775	638
Green	$565	3,459,941	7,270	373
Green lake	$165	293,302	102,881	718
Iowa	$7	62,404	0	490
Iron	$44	129,923	0	174
Jefferson	$369	2,591,322	254,054	1,091
Juneau	$19	51,944	0	160
Kenosha	$152	2,012,502	156,525	1,786
Kewaunee	$192	345,286	54,434	384
La Crosse	$343	5,807,350	326,813	1,931
Lafayette	$30	110,846	0	220
Langlade	$88	312,622	22,426	461
Lincoln	$84	437,888	26,516	618
Manitowoc	$121	423,751	32,175	469
Marathon	$634	10,426,431	865,036	2,310
Marinette	$766	38,764	686,884	885
Marquette	$51	167,144	0	192
Menominee	$30	17,107	0	34
Milwaukee	$240	16,296,038	1,937,843	11,962
Monroe	$482	3,129,394	148,916	686
Oconto	$352	271,706	115,770	369
Oneida	$1,954	947,312	2,107,861	1,090
Outagamie	$595	18,332,071	608,452	2,816

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Ozaukee	$358	4,116,523	308,357	1,522
Pepin	$76	45,953	8,319	143
Pierce	$190	596,697	30,703	343
Polk	$223	2,384,856	14,556	694
Portage	$1,767	4,672,021	1,665,509	1,083
Price	$11,467	6,054,421	2,446,758	241
Racine	$138	2,810,435	257,973	3,047
Rock	$147	3,251,709	152,882	2,328
Rusk	$322	904,935	19,627	225
Sauk	$58	799,477	250	821
Shawano	$15	85,837	0	333
Sheboygan	$2,485	12,960,771	2,953,199	1,476
St. Croix	$193	2,008,635	60,276	921
Taylor	$1,492	52,841	63,560	44
Trempealeau	$417	447,868	61,344	208
Vernon	$34	156,497	1,769	324
Vilas	$48	390,999	0	476
Walworth	$104	2,681,834	23,204	1,735
Washburn	$23	132,109	227	343
Washington	$144	2,456,941	125,753	1,864
Waukesha	$112	9,153,431	418,715	8,512
Waupaca	$527	1,163,339	385,497	850
Waushara	$103	232,583	22,267	346
Winnebago	$636	11,179,196	885,225	2,404
Wood	$3,970	5,656,940	1,324,256	412
Not mapped*		1,200,263	125,989	

* *Unknown County:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-7.
Wisconsin Focus on Energy Industrial Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
Net Cumulative Savings (July 1, 2001–December 31, 2007)

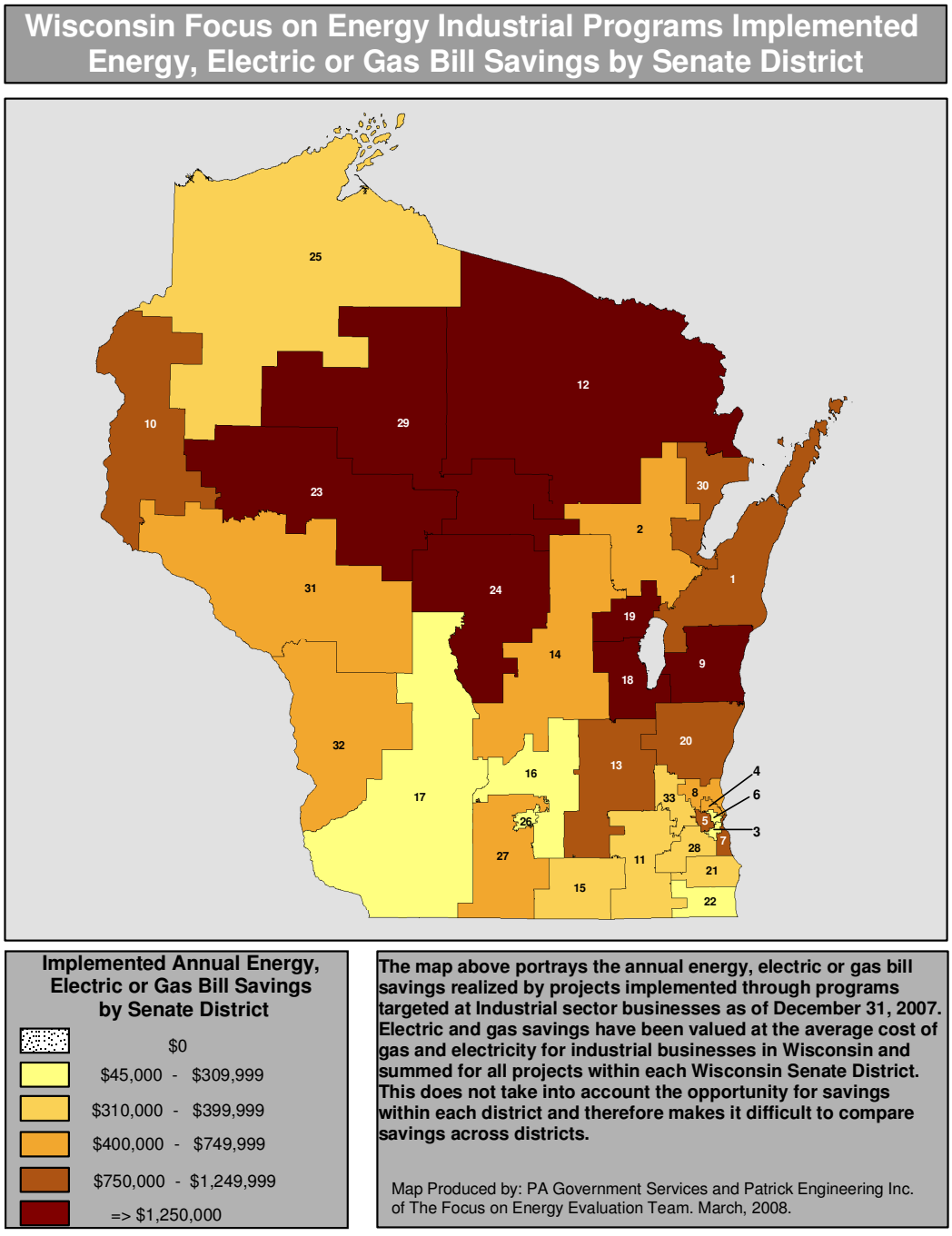


Table A-7. Industrial Program Energy Impacts
(By Senate District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Senate District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$1,023,936	9,193,334	491,228
2	$566,643	5,736,298	233,078
3	$48,971	636,296	11,745
4	$606,381	3,423,362	411,674
5	$940,706	4,840,103	666,777
6	$83,231	632,642	46,780
7	$1,004,455	3,707,863	799,220
8	$403,596	6,379,714	28,931
9	$3,637,970	12,590,834	2,944,745
10	$1,004,469	9,952,833	426,060
11	$398,683	3,343,177	205,390
12	$2,328,907	2,758,237	2,201,954
13	$820,290	5,606,728	498,592
14	$731,042	3,519,478	532,619
15	$345,814	3,322,750	152,882
16	$183,162	2,202,400	54,534
17	$105,841	1,351,948	26,775
18	$1,358,380	19,875,218	192,803
19	$2,051,379	16,824,466	1,079,370
20	$765,120	6,321,746	399,799
21	$382,315	2,775,100	222,702
22	$309,141	2,047,838	191,797
23	$1,848,178	11,402,945	1,196,834
24	$3,558,552	10,486,789	2,989,765
25	$344,293	2,754,053	185,320
26	$305,862	2,987,784	132,297
27	$427,360	6,110,887	69,146
28	$317,980	2,347,360	182,881
29	$4,340,837	17,158,503	3,386,094
30	$1,178,760	4,806,460	910,711
31	$647,467	4,676,737	378,531
32	$707,031	6,504,540	329,841
33	$333,193	4,141,730	91,117
Not mapped*	$195,554	1,217,370	125,989

* *Unknown District:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-8.
Wisconsin Focus on Energy Industrial Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
Net Cumulative Savings (July 1, 2001–December 31, 2007)

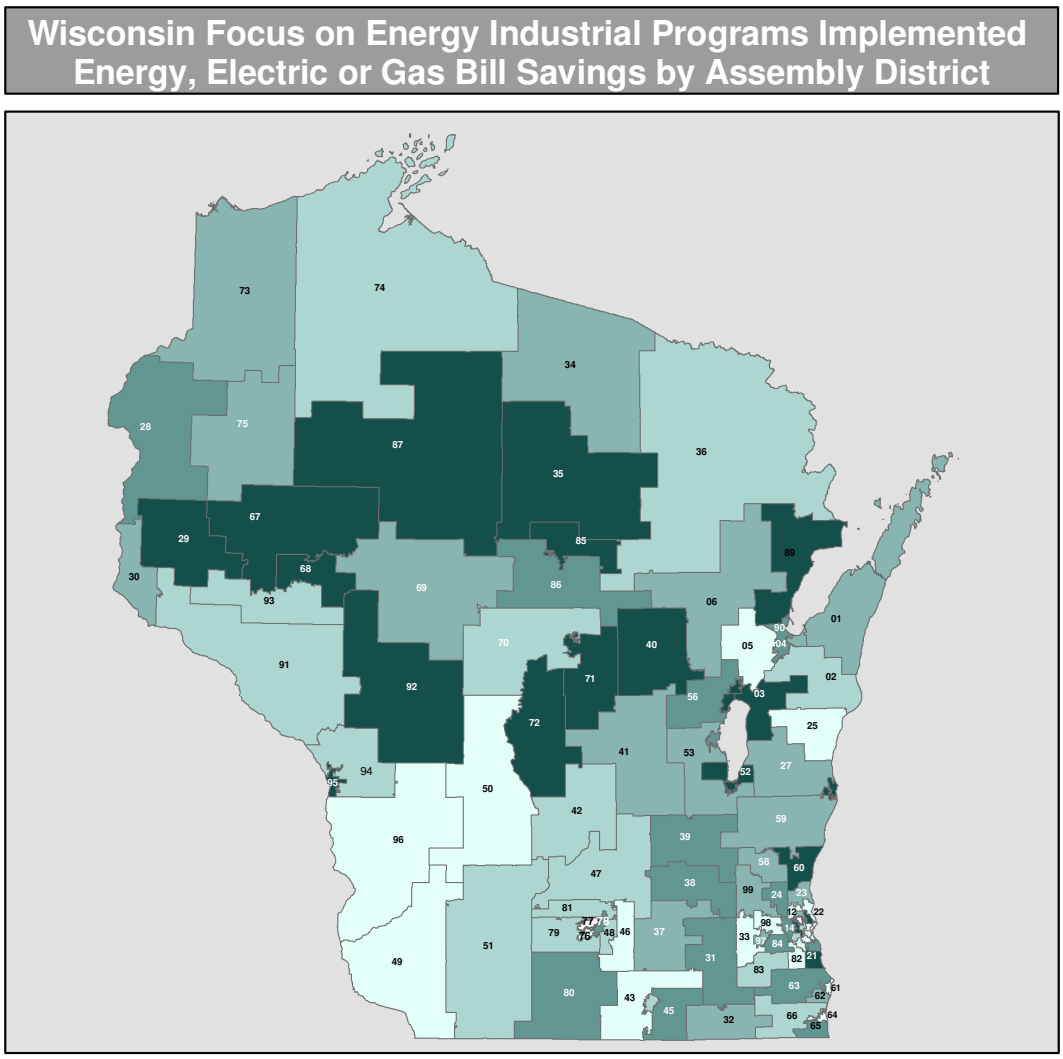


Table A-8. Industrial Program Energy Impacts
(By Assembly District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$110,090	682,148	71,117
2	$81,103	1,226,997	9,101
3	$832,744	7,284,188	411,010
4	$403,711	5,124,593	104,049
5	$41,799	477,793	13,928
6	$121,133	133,912	115,101
7	$1,052	17,886	0
8	$31,435	487,327	2,826
9	$16,484	131,083	8,919
10	$477,999	2,215,836	353,361
11	$111,225	915,739	58,313
12	$17,157	291,787	0
13	$589,521	1,584,522	504,422
14	$292,618	2,379,341	155,196
15	$58,567	876,240	7,159
16	$5,698	85,019	710
18	$77,534	547,623	46,070
19	$37,066	320,166	18,537
20	$424,313	1,207,639	359,048
21	$543,076	2,180,058	421,635
22	$54,534	918,593	529
23	$144,180	2,285,210	9,969
24	$204,882	3,175,911	18,433
25	$54,482	391,929	31,947
26	$3,466,119	12,040,576	2,802,981
27	$117,370	158,330	109,817
28	$211,764	3,357,849	14,556
29	$652,483	4,873,269	371,885
30	$140,222	1,721,715	39,619
31	$235,107	608,321	202,579
32	$126,724	2,138,971	968
33	$36,853	595,885	1,844
34	$154,135	1,184,050	85,887
35	$2,089,242	875,172	2,070,916
36	$85,530	699,015	45,151
37	$176,247	1,763,853	73,712
38	$271,578	610,625	239,505
39	$372,465	3,232,250	185,375
40	$451,443	1,226,435	385,497
41	$199,551	935,868	146,872
42	$80,048	1,357,176	250
43	$25,733	310,539	7,594
44	$79,233	793,770	33,089

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
45	$240,848	2,218,441	112,199
46	$36,780	238,559	23,123
47	$88,476	1,458,396	2,766
48	$57,907	505,446	28,645
49	$47,692	363,030	26,775
50	$3,054	51,944	0
51	$55,094	936,973	0
52	$928,175	12,949,041	169,483
53	$112,598	1,822,301	5,535
54	$317,608	5,103,876	17,784
55	$1,052,811	3,509,628	860,209
56	$207,408	2,973,071	33,121
57	$791,159	10,341,767	186,040
58	$160,912	1,715,622	61,010
59	$150,571	999,548	93,290
60	$453,637	3,606,575	245,499
61	$36,348	296,422	19,226
62	$140,574	1,365,218	61,279
63	$205,393	1,113,459	142,197
64	$46,324	605,664	10,885
65	$204,708	1,063,251	144,501
66	$58,110	378,923	36,412
67	$646,921	4,874,080	366,184
68	$1,010,250	4,542,294	755,247
69	$191,006	1,986,571	75,403
70	$104,358	341,307	85,660
71	$1,824,576	4,591,911	1,579,849
72	$1,629,618	5,553,572	1,324,256
73	$124,539	578,598	91,989
74	$80,864	1,142,473	13,909
75	$138,890	1,032,982	79,422
76	$27,606	469,495	0
78	$278,255	2,518,289	132,297
79	$58,216	814,174	10,511
80	$259,304	3,932,822	28,510
81	$109,840	1,363,891	30,125
82	$29,961	487,565	1,313
83	$70,676	1,113,245	5,302
84	$217,343	746,550	176,266
85	$1,085,771	6,523,672	713,597
86	$347,526	3,524,735	142,552
87	$2,907,540	7,110,096	2,529,945
88	$136,828	2,160,231	9,965
89	$632,525	-288,334	660,040
90	$409,407	2,934,563	240,706
91	$97,585	493,821	69,663
92	$494,285	3,237,397	308,868

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
93	$55,596	945,518	0
94	$73,638	514,331	44,101
95	$589,419	5,293,019	282,713
96	$43,974	697,189	3,028
97	$173,756	2,509,459	26,626
98	$36,068	581,634	1,898
99	$123,369	1,050,637	62,593
Not mapped*	$195,554	1,217,370	125,989

* *Unknown District:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-9.
Wisconsin Focus on Energy Industrial Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
Net Cumulative Savings (July 1, 2001–December 31, 2007)

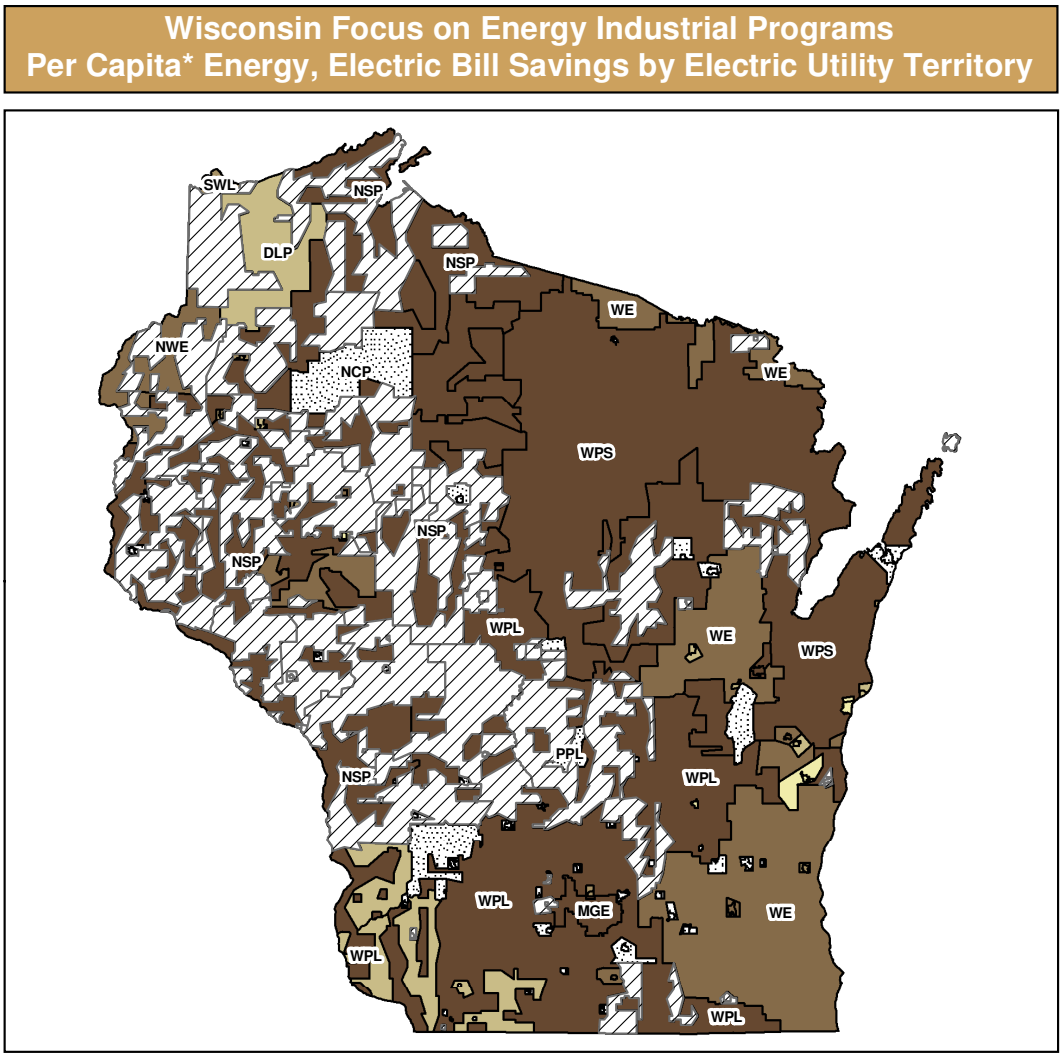


Table A-9. Industrial Program Electric Impacts
(By Participating Electric Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
Algoma Utility Comm		$566	$1,132	19,245	4	2
Alliant Energy	WPL	$2,740	$2,717,655	46,218,621	6,385	992
Bloomer Electric & Water Co		$330	$16,850	286,563	39	51
Brodhead Water & Lighting Comm		$0	$0	0	0	2
Cedarburg Light & Water Comm		$271	$1,084	18,434	3	4
City of Argyle		$0	$0	0	0	6
City of Columbus		$0	$0	0	0	1
City of Cornell		$1,920	$19,196	326,460	43	10
City of Elroy		$0	$0	0	0	13
City of Evansville		$1,927	$3,855	65,559	5	2
City of Kaukauna		$39,836	$318,687	5,419,842	580	8
City of Kiel		$36	$571	9,711	32	16
City of Medford		$0	$0	0	0	67
City of Menasha		$46	$547	9,310	3	12
City of Muscoda		$0	$0	0	-34	1
City of New Holstein		$2,433	$2,433	41,386	2	1
City of New Richmond		$0	$0	0	0	1
City of Plymouth		$1	$8	138	0	7
City of Princeton		$0	$0	0	0	17
City of Richland Center		$0	$0	0	0	4
City of River Falls		$0	$0	0	0	2
City of Shullsburg		$0	$0	0	0	12
Consolidated Water Power Co	CWP	$0	$0	0	0	1
Cumberland City of		$124	$3,474	59,090	7	28
Dahlberg Light & Power Co	DLP	$41	$1,589	27,016	29	39
Eau Claire Electric Coop	C-8	$1,283	$10,264	174,565	60	8
Hartford Electric		$0	$0	0	0	8
Jefferson Utilities		$0	$0	0	0	4
Juneau Utility Comm		$0	$0	0	0	2
La Farge Municipal Electric Co		$0	$0	0	0	6
Lake Mills Light & Water		$0	$0	0	0	2
Madison Gas & Electric Co	MGE	$5,705	$302,378	5,142,478	848	53
Manitowoc Public Utilities		$0	$34	574	0	426

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
Mt Horeb Village of		$0	$0	0	0	0
New London Electric&Water Util		$15	$91	1,544	0	6
North Central Power Co Inc	NCP	$0	$0	0	0	3
Northwestern Wisconsin Elec Co	NWE	$1,777	$49,769	846,404	87	28
Oconomowoc Utilities		$1,662	$13,294	226,081	56	8
Oconto Falls Water & Light Comm		$0	$0	0	0	0
Pioneer Power & Light Co	PPL	$0	$0	0	0	29
Price Electric Coop Inc	C-16	$7,021	$7,021	119,412	19	0
Reedsburg Utility Comm		$0	$0	0	0	6
Rice Lake Utilities		$34	$5,381	91,515	62	157
Scenic Rivers Energy Coop	C-20	$15	$289	4,916	1	19
Shawano Municipal Utilities		$0	$0	0	0	140
Slinger Utilities		$0	$0	0	0	1
Spooner City of		$156	$2,493	42,398	8	16
Stoughton City of		$0	$0	0	0	3
Sturgeon Bay City of		$0	$0	0	0	2
Sun Prairie Water & Light Comm		$0	$0	0	0	3
Superior Water, Light & Power Co	SWL	$259	$32,433	551,581	222	125
Two Rivers Water & Light		$35	$106	1,797	0	3
Village of Belmont		$0	$0	0	0	13
Village of Benton		$2,066	$2,066	35,143	4	0
Village of Cadott		$3	$361	6,145	1	141
Village of Cashton		$0	$0	0	0	7
Village of Centuria		$0	$0	0	0	0
Village of Gresham		$0	$0	0	0	10
Village of Mazomanie		$0	$0	0	0	17
Village of New Glarus		$0	$0	0	0	0
Village of Pardeeville		$0	$0	0	0	20
Village of Prairie Du Sac		$0	$0	0	0	1
Village of Stratford		$6,741	$13,481	229,270	42	2
Village of Viola		$0	$0	0	0	0
Village of Waunakee		$537	$2,149	36,551	7	4
Waterloo Light & Water Comm		$0	$0	0	0	1
Waupun Utilities		$3	$6	103	0	2
We Energies	WEP	$1,187	$3,525,651	59,960,046	7,405	2,969
Westfield Electric Co		$0	$0	0	0	39

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
Whitehall Electric Utility		$0	$0	0	0	1
Wisconsin Public Service Corp	WPS	$9,915	$2,250,762	38,278,264	6,199	227
Wonewoc Electric & Water Utility		$0	$0	0	0	3
Xcel Energy	NSP	$25,201	$2,066,522	35,144,927	4,961	82
Not mapped*			$484,655	8,242,433	908	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-10.
Wisconsin Focus on Energy Industrial Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
Net Cumulative Savings (July 1, 2001–December 31, 2007)

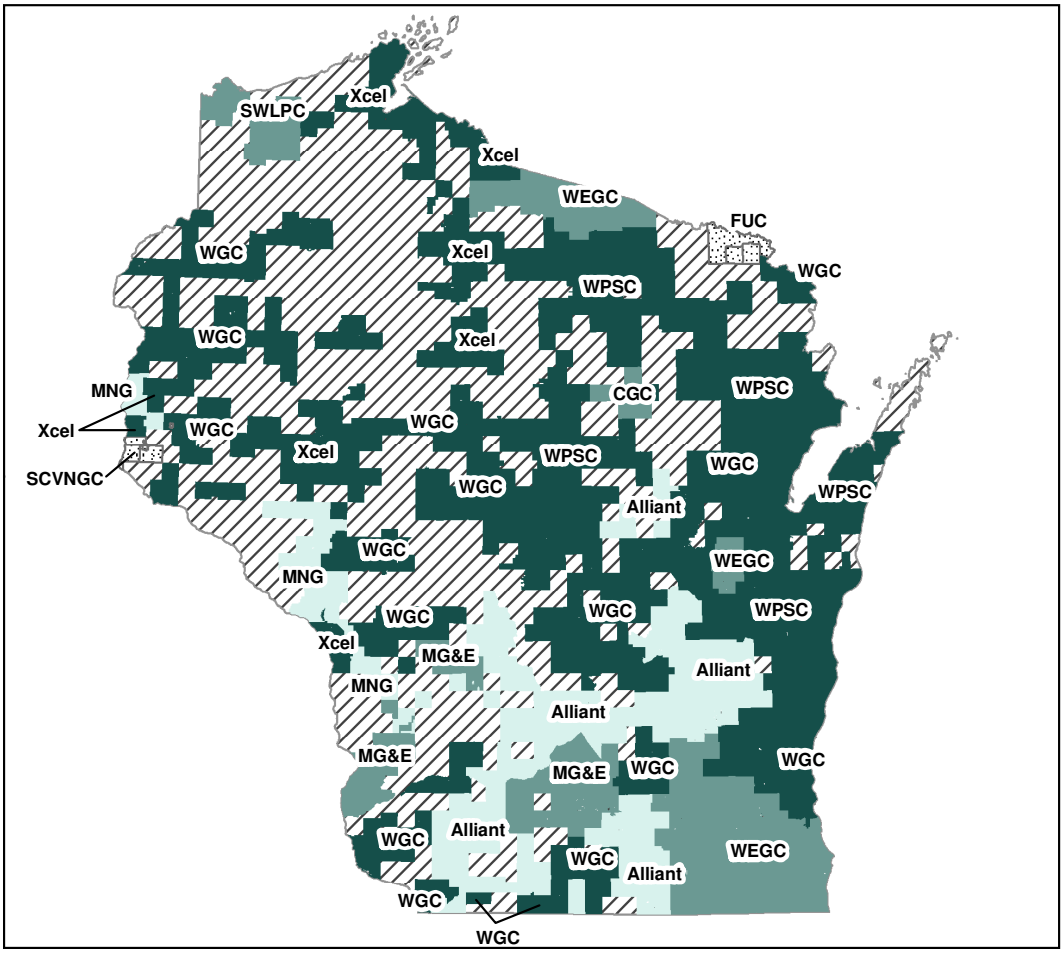


Table A-10. Industrial Program Gas Impacts
(By Participating Gas Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Therms Saved	Annual Dollars Saved	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$387	929,011	$914,147	2,360
City Gas Company	CGC	$1,298	22,426	$22,067	17
Florence Utility Commission	FUC	$0	0	$0	0
Madison Gas and Electric	MG&E	$2,961	204,605	$201,332	68
Midwest Natural Gas Inc.	MNG	$161	13,058	$12,849	80
St Croix Valley Natural Gas Company	SCVNGC	$0	0	$0	25
Superior Water Light & Power Company	SWLPC	$1,275	91,989	$90,517	71
Wisconsin Electric Gas Operations	WEGC	$2,083	3,003,147	$2,955,096	1,419
Wisconsin Gas Company	WGC	$3,618	4,544,966	$4,472,247	1,236
Wisconsin Public Service Corp	WPSC	$6,424	8,774,000	$8,633,616	1,344
Xcel (Northern States Power Company)	Xcel	$174,650	4,082,263	$4,016,947	23
Not mapped*			132,513	$130,393	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

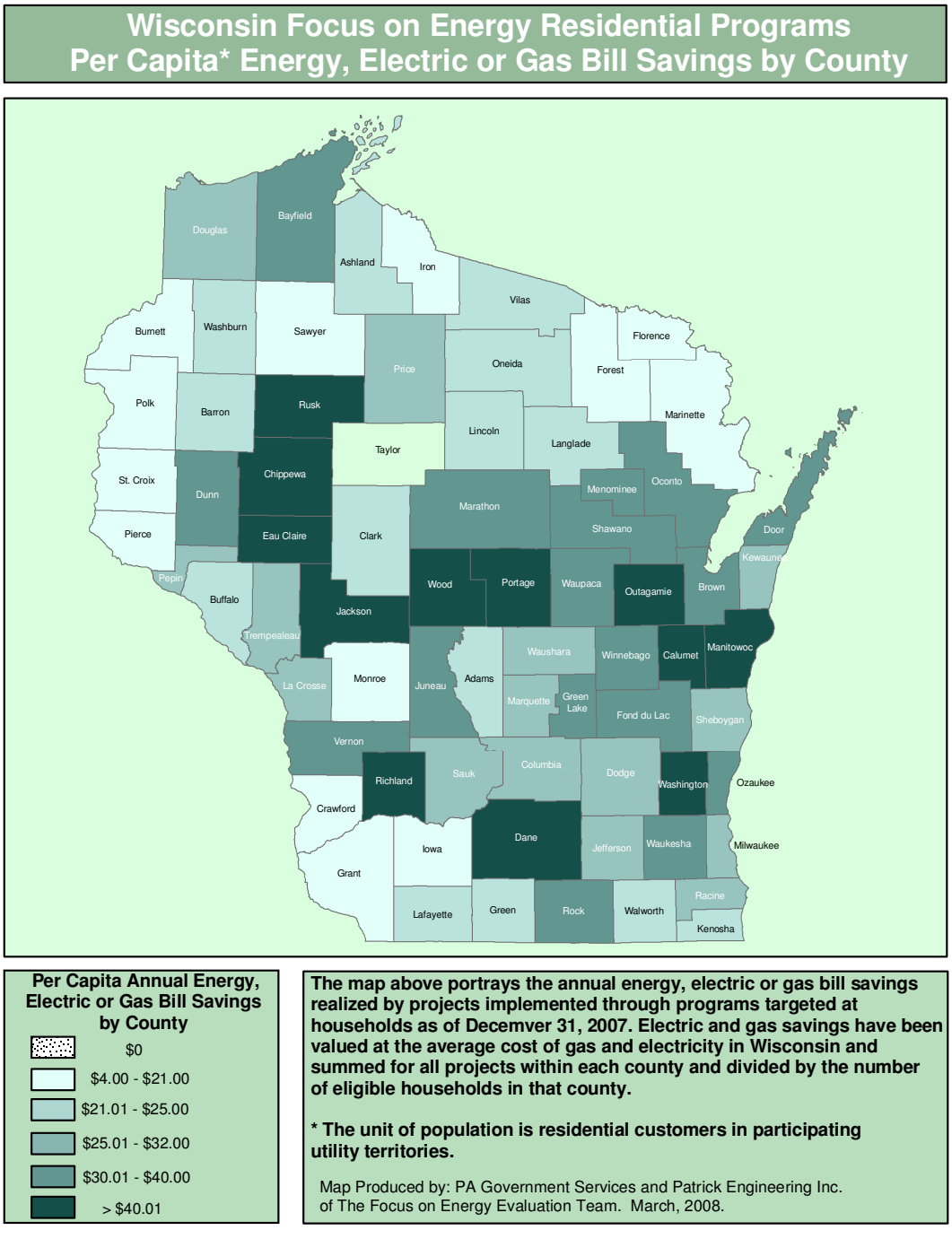
A.3 RESIDENTIAL PROGRAMS

In this section, we summarize the verified energy impacts across the Residential Programs through December 31, 2007. The tables and maps below provide *verified gross energy savings* that are based on the evaluators' review of participants, measures installed, and per-unit savings used by WECC program administrators.

The *"Number of Customers (Households)"* for each county was estimated by determining the proportion of the area of each census block group that was within the boundaries of a utility participating in the Focus on Energy. This proportion was then applied to the population of that census block group to estimate the number of participating households within the block group. These block group estimates were then aggregated to the county level.

The *"Number of Customers"* presented for each of the participating utilities in Table A-14 are based on the number of customers reported by the utilities in 2005. The *"Number of Customers"* presented for each of the participating utilities in Table A-15 are based on the number of customers reported by the utilities in 2006.

Figure A-11.
Wisconsin Focus on Energy Residential Programs
Per Capita Energy, Electric or Gas Bill Savings by County
Net Cumulative Savings (July 1, 2001–December 31, 2007)



The map above portrays the annual energy, electric or gas bill savings realized by projects implemented through programs targeted at households as of Decemver 31, 2007. Electric and gas savings have been valued at the average cost of gas and electricity in Wisconsin and summed for all projects within each county and divided by the number of eligible households in that county.

*** The unit of population is residential customers in participating utility territories.**

Map Produced by: PA Government Services and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. March, 2008.

Table A-11. Residential Programs Energy Impacts
(by Participating County)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Adams	$24	531,332	4,021	2,519
Ashland	$25	961,581	19,024	4,950
Barron	$23	1,812,882	15,833	9,114
Bayfield	$37	1,109,392	23,317	3,836
Brown	$37	24,184,780	635,823	87,295
Buffalo	$21	312,570	15,215	2,373
Burnett	$11	332,931	2,371	3,486
Calumet	$45	4,612,158	85,274	13,028
Chippewa	$47	5,216,229	76,209	13,563
Clark	$24	1,631,577	14,589	7,798
Columbia	$26	3,375,207	52,295	15,889
Crawford	$18	687,672	5,144	4,209
Dane	$50	51,903,411	2,050,344	154,704
Dodge	$29	6,722,398	93,527	27,767
Door	$39	2,111,195	16,937	6,178
Douglas	$31	3,651,860	71,287	14,885
Dunn	$33	2,532,456	22,891	8,903
Eau Claire	$48	12,648,464	151,980	30,944
Florence	$4	70,508	256	1,756
Fond du Lac	$38	10,682,186	243,616	36,540
Forest	$20	747,055	3,583	4,043
Grant	$19	1,705,476	22,213	10,565
Green	$24	2,388,473	30,128	11,716
Green Lake	$36	2,069,474	26,451	6,843
Iowa	$21	1,517,111	19,663	8,753
Iron	$12	249,393	3,257	2,384
Jackson	$73	653,816	2,967	981
Jefferson	$26	4,983,483	65,063	22,669
Juneau	$33	747,188	13,926	2,814
Kenosha	$22	10,082,263	169,418	56,057
Kewaunee	$25	1,567,721	13,617	7,163
La Crosse	$29	8,618,898	165,604	37,142
Lafayette	$24	718,011	7,720	3,563
Langlade	$21	1,632,256	9,636	8,452
Lincoln	$22	1,951,479	47,200	11,553
Manitowoc	$41	4,535,058	56,902	13,227
Marathon	$33	11,783,715	215,402	44,418
Marinette	$20	2,975,053	28,982	16,834
Marquette	$32	694,891	6,608	2,534
Menominee	$33	267,560	12,466	1,289
Milwaukee	$28	76,655,730	2,114,362	377,729
Monroe	$14	1,329,217	14,545	11,207
Oconto	$33	2,302,167	24,132	8,063

County	Annual Dollars per Capita	Annual kWh Saved	Annual Therms Saved	Eligible Participants
Oneida	$22	2,788,663	36,421	15,211
Outagamie	$47	18,232,580	238,917	46,720
Ozaukee	$39	7,963,458	122,423	25,245
Pepin	$29	458,540	6,055	1,916
Pierce	$21	717,145	6,848	3,977
Polk	$19	1,160,457	27,654	8,142
Portage	$49	8,917,435	183,783	23,159
Price	$30	762,278	4,569	2,801
Racine	$25	15,635,339	141,648	70,819
Richland	$48	885,884	7,218	2,099
Rock	$34	14,794,898	271,464	54,206
Rusk	$49	1,447,649	11,595	3,369
Sauk	$25	3,411,727	41,160	16,064
Sawyer	$16	644,510	7,726	4,683
Shawano	$32	2,533,088	33,087	9,375
Sheboygan	$27	7,118,276	157,282	34,842
St. Croix	$20	2,285,204	30,730	13,910
Taylor	$143	960,324	4,237	733
Trempealeau	$29	704,649	5,652	2,785
Vernon	$35	1,323,071	13,385	4,360
Vilas	$25	1,831,330	21,440	8,793
Walworth	$24	6,368,317	77,322	31,728
Washburn	$22	734,115	3,942	3,684
Washington	$43	12,948,550	268,556	38,827
Waukesha	$33	36,382,373	423,705	128,672
Waupaca	$35	4,310,451	51,781	14,439
Waushara	$29	1,535,624	16,599	6,153
Winnebago	$37	15,857,672	350,683	55,533
Wood	$45	3,487,562	49,299	9,378
Not mapped*		3,483,248	553,725	

* *Unknown County:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-12.
Wisconsin Focus on Energy Residential Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
Net Cumulative Savings (July 1, 2001–December 31, 2007)

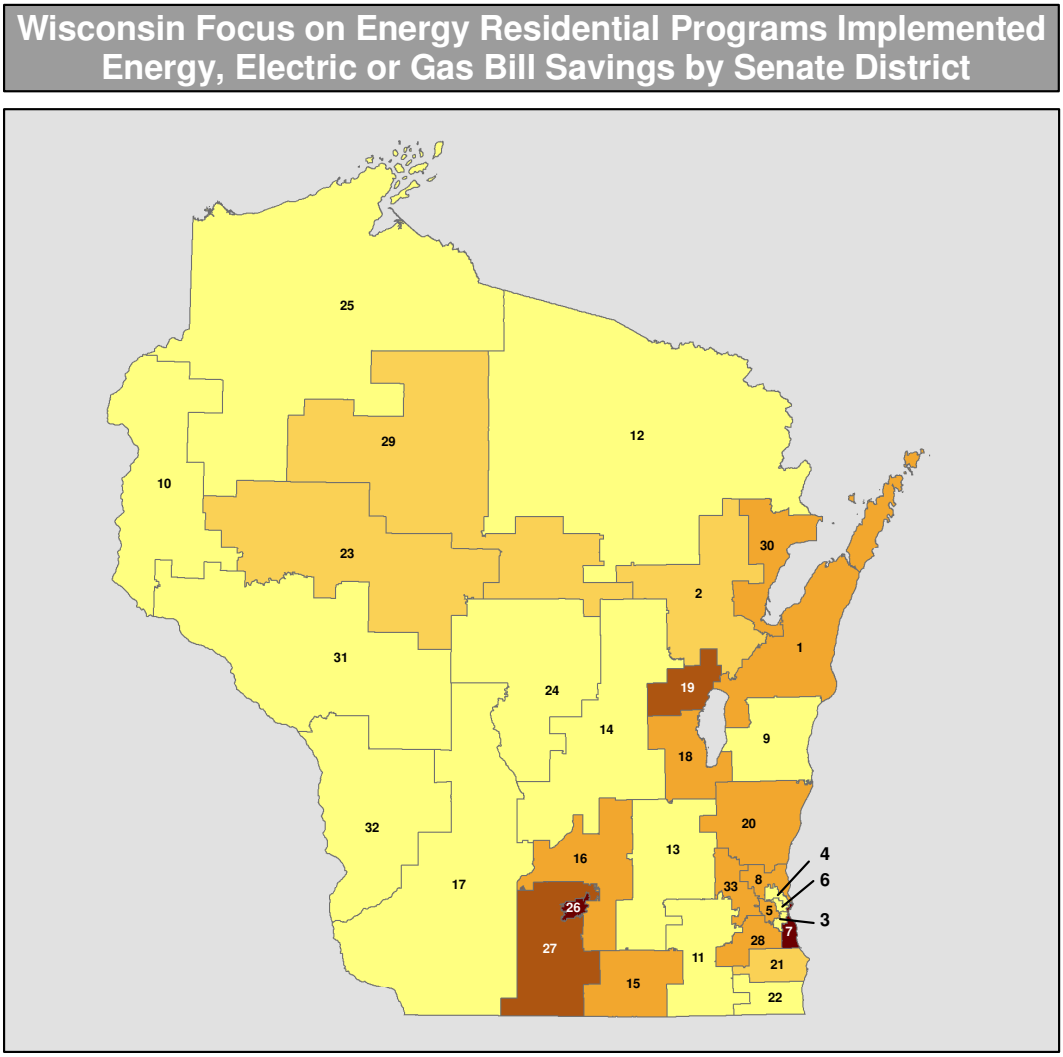
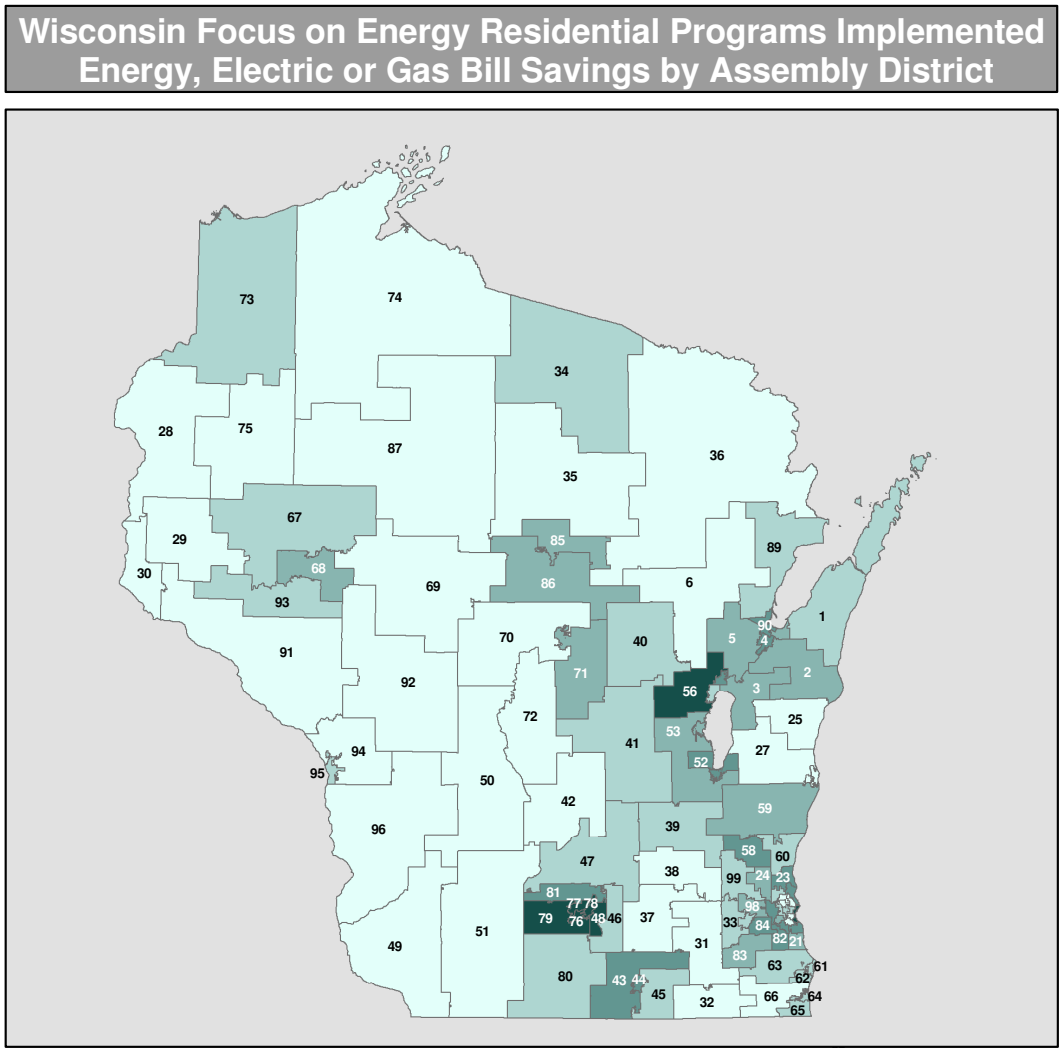


Table A-12. Residential Programs Energy Impacts
(By Senate District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Senate District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$1,942,943	15,808,914	253,730
2	$1,765,369	13,811,883	280,232
3	$1,342,569	10,558,689	208,194
4	$1,085,534	7,683,110	245,199
5	$2,101,351	17,214,648	263,903
6	$1,409,112	8,152,943	482,105
7	$2,817,172	19,264,902	697,017
8	$2,304,248	18,114,997	357,941
9	$1,141,760	8,844,393	189,206
10	$666,466	5,465,436	83,193
11	$1,499,423	12,454,648	172,910
12	$1,414,767	11,961,737	144,226
13	$1,461,023	11,957,296	184,536
14	$1,484,652	12,398,415	165,227
15	$2,002,108	16,196,624	269,888
16	$2,186,429	14,709,645	562,738
17	$885,649	7,428,757	95,626
18	$2,193,910	16,189,559	436,013
19	$2,569,913	21,198,996	309,627
20	$1,985,027	15,602,417	308,624
21	$1,540,272	13,413,188	121,896
22	$1,399,446	11,186,832	200,742
23	$2,043,853	17,440,568	193,962
24	$1,654,789	13,165,667	242,977
25	$1,129,904	9,194,929	147,432
26	$3,552,976	22,992,817	996,398
27	$2,587,847	18,282,114	587,595
28	$2,179,171	18,755,582	192,376
29	$1,710,222	13,892,243	225,419
30	$1,945,430	14,382,434	384,247
31	$946,246	7,774,008	116,839
32	$1,362,152	10,918,177	192,740
33	$1,864,659	15,423,375	220,881
Not mapped*	$682,659	3,110,752	309,066

* *Unknown district:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of state boundaries according to the GIS mapping application.

Figure A-13.
Wisconsin Focus on Energy Residential Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
Net Cumulative Savings (July 1, 2001–December 31, 2007)



Implemented Annual Energy, Electric or Gas Bill Savings by Assembly District

- $0
- $175,000 - $389,999
- $390,000 - $499,999
- $500,000 - $619,999
- $620,000 - $749,999
- => $750,000

The map above portrays the annual energy, electric or gas bill savings realized by projects implemented through programs targeted at households as of December 31, 2007. Electric and gas savings have been valued at the average cost of gas and electricity in Wisconsin and summed for all projects within each Wisconsin Assembly District. This does not take into account the opportunity for savings within each district and therefore makes it difficult to compare savings across districts.

Map Produced by: PA Government Services and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. March, 2008.

Table A-13. Residential Programs Energy Impacts
(By Assembly District)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
1	$495,744	4,298,569	40,900
2	$738,171	5,810,671	113,993
3	$709,074	5,700,109	98,837
4	$764,609	6,141,890	106,997
5	$606,746	4,354,136	131,674
6	$393,899	3,314,758	41,562
7	$721,767	5,558,954	122,492
8	$240,417	1,877,367	38,488
9	$380,377	3,122,289	47,215
10	$321,870	2,428,689	59,153
11	$286,840	1,871,243	79,093
12	$476,790	3,383,029	106,937
13	$581,876	4,741,339	75,371
14	$882,554	7,330,339	101,812
15	$636,880	5,142,578	86,720
16	$579,587	2,434,864	280,958
17	$358,054	2,862,478	51,336
18	$471,487	2,855,757	149,812
19	$1,348,806	7,591,269	480,618
20	$800,965	6,063,336	145,435
21	$667,401	5,610,297	70,964
22	$735,825	5,522,468	137,905
23	$828,034	6,526,156	127,140
24	$740,448	6,066,759	92,912
25	$277,861	2,287,197	33,914
26	$480,819	3,460,560	103,436
27	$383,123	3,097,051	51,855
28	$176,700	1,364,642	29,653
29	$306,757	2,542,001	35,916
30	$183,009	1,558,793	17,625
31	$468,583	3,913,961	52,077
32	$402,331	3,251,471	54,532
33	$628,496	5,289,097	66,301
34	$512,067	4,287,839	55,950
35	$481,210	3,920,247	62,405
36	$421,555	3,754,275	25,871
37	$431,967	3,588,649	49,759
38	$434,579	3,348,307	73,642
39	$594,560	5,021,138	61,135
40	$539,586	4,562,492	54,977
41	$553,349	4,673,596	56,853
42	$391,721	3,162,367	53,396
43	$707,368	6,184,834	53,744

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
44	$728,578	5,454,726	137,748
45	$566,163	4,557,065	78,396
46	$512,049	3,368,479	138,668
47	$598,666	4,793,943	85,123
48	$1,075,534	6,545,494	338,946
49	$224,151	1,870,339	25,086
50	$239,215	2,000,249	26,393
51	$422,284	3,558,169	44,147
52	$823,748	6,067,616	164,707
53	$690,226	5,344,212	114,603
54	$679,936	4,777,731	156,703
55	$594,404	4,904,139	71,530
56	$1,129,196	9,218,537	144,696
57	$846,312	7,076,320	93,401
58	$780,775	5,916,903	141,193
59	$634,079	4,895,373	106,551
60	$570,114	4,789,582	60,881
61	$489,284	4,661,091	2,703
62	$496,259	3,988,128	69,281
63	$554,729	4,763,969	49,911
64	$488,682	3,570,767	100,303
65	$456,982	3,841,670	48,573
66	$453,782	3,774,394	51,866
67	$512,704	4,482,245	39,004
68	$1,151,662	9,981,616	95,409
69	$379,487	2,976,707	59,548
70	$419,793	3,454,654	51,313
71	$970,145	7,538,168	158,684
72	$264,851	2,172,844	32,980
73	$513,941	4,107,656	73,781
74	$362,927	2,888,719	53,179
75	$253,036	2,198,554	20,472
76	$1,121,578	7,133,694	325,741
77	$1,107,033	7,909,102	243,411
78	$1,324,403	7,950,379	427,246
79	$1,173,449	8,085,043	284,883
80	$549,026	4,494,818	69,212
81	$865,432	5,702,826	233,500
82	$789,748	6,717,610	76,877
83	$643,906	5,485,546	61,919
84	$745,525	6,552,505	53,579
85	$699,650	5,161,136	139,209
86	$634,034	5,367,175	64,053
87	$376,539	3,363,932	22,157
88	$656,777	4,830,024	132,015
89	$527,472	4,263,646	71,418
90	$761,181	5,288,764	180,813

Assembly District	Annual Dollars Saved	Annual kWh Saved	Annual Therms Saved
91	$208,557	1,673,056	29,385
92	$231,621	2,123,029	8,791
93	$506,068	3,977,923	78,664
94	$413,835	3,571,262	35,680
95	$688,259	5,097,887	135,073
96	$260,057	2,249,029	21,987
97	$528,442	4,030,032	93,279
98	$719,612	6,196,848	63,228
99	$616,633	5,196,758	64,375
Not mapped*	$682,659	3,110,752	309,066

* *Unknown District*: The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of state boundaries according to the GIS mapping application.

Figure A-14.
Wisconsin Focus on Energy Residential Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
Net Cumulative Savings (July 1, 2001–December 31, 2007)

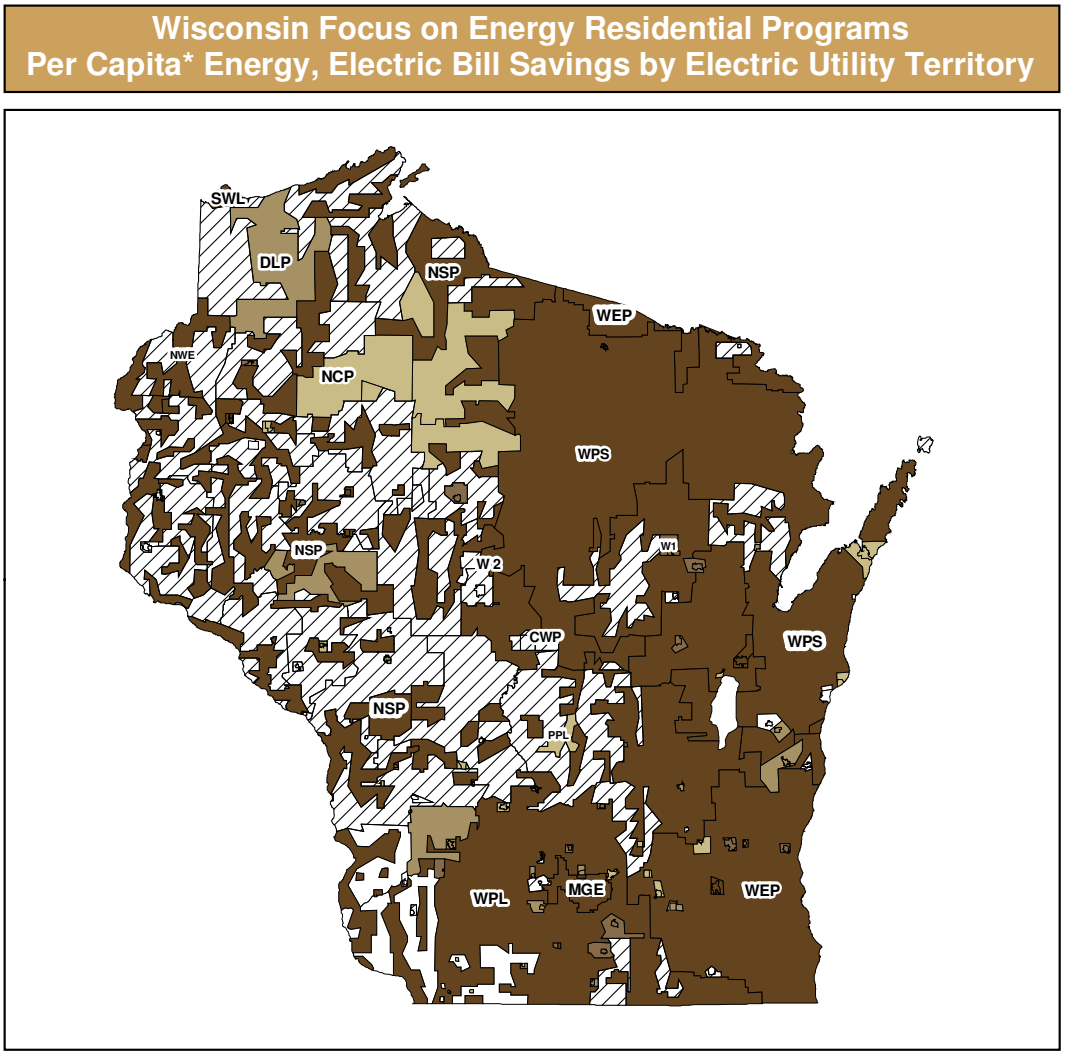


Table A-14. Residential Programs Electric Impacts
(By Participating Electric Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
Algoma Utility Comm		$1	$1,667	15,983	1	1,637
Alliant Energy	WPL	$18	$6,892,049	66,079,086	8,799	384,563
Bloomer Electric & Water Co		$13	$20,053	192,259	15	1,570
Brodhead Water & Lighting Comm		$7	$10,617	101,789	8	1,462
Cedarburg Light & Water Comm		$14	$69,874	669,938	91	5,082
City of Argyle		$18	$7,164	68,691	13	396
City of Black River Falls		$6	$13,463	129,077	9	2,156
City of Boscobel		$2	$2,885	27,665	2	1,429
City of Columbus		$5	$10,463	100,320	10	2,178
City of Cornell		$39	$27,086	259,692	9	701
City of Cuba City		$2	$2,098	20,118	1	918
City of Eagle River		$23	$18,430	176,700	13	817
City of Elroy		$5	$3,480	33,366	3	759
City of Evansville		$13	$44,721	428,772	40	3,528
City of Kaukauna		$15	$184,365	1,767,638	256	12,170
City of Kiel		$7	$14,842	142,299	17	2,043
City of Lodi		$14	$18,820	180,439	16	1,367
City of Medford		$13	$34,323	329,082	22	2,560
City of Menasha		$5	$37,180	356,470	58	7,867
City of Muscoda		$13	$12,012	115,170	9	937
City of New Holstein		$4	$8,135	77,993	12	2,034
City of New Richmond		$2	$7,752	74,328	7	3,368
City of Plymouth		$7	$44,672	428,304	34	6,706
City of Princeton		$11	$7,382	70,777	7	667
City of Richland Center		$10	$24,255	232,546	17	2,434
City of River Falls		$2	$11,627	111,477	8	4,851
City of Shullsburg		$6	$4,090	39,214	9	679
City of Westby		$5	$4,446	42,627	3	945
Consolidated Water Power Co	CWP	$18	$17,880	171,432	25	987
Cumberland City of		$16	$17,348	166,332	18	1,113
Dahlberg Light & Power Co	DLP	$9	$88,403	847,586	53	9,644
Eau Claire Electric Coop	C-8	$6	$58,176	557,777	37	9,586
Florence Utility Comm		$4	$3,391	32,516	3	914
Hartford Electric		$11	$56,274	539,537	50	5,279
Hustisford Utilities		$6	$7,548	72,364	9	1,306
Jefferson Utilities		$7	$23,264	223,053	25	3,383
Juneau Utility Comm		$4	$3,894	37,338	4	924
La Farge Municipal Electric Co		$3	$1,235	11,839	1	449
Lake Mills Light & Water		$5	$16,750	160,592	24	3,253
Madison Gas & Electric Co	MGE	$32	$3,772,187	36,166,701	4,543	116,977
Manitowoc Public Utilities		$4	$63,997	613,583	83	15,594
Mt Horeb Village of		$7	$21,827	209,271	20	2,936

Utility	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Annual kWh Saved	Annual kW Saved	Number of Customers
New London Electric&Water Util		$11	$36,751	352,355	52	3,265
North Central Power Co Inc	NCP	$6	$24,434	234,268	20	4,185
Northwestern Wisconsin Elec Co	NWE	$543	$39,127	375,138	30	72
Oconomowoc Utilities		$15	$108,222	1,037,605	134	7,195
Oconto Falls Water & Light Comm		$7	$9,752	93,497	8	1,311
Pioneer Power & Light Co	PPL	$5	$9,376	89,896	7	1,937
Price Electric Coop Inc	C-16	$5	$46,021	441,238	36	8,522
Reedsburg Utility Comm		$6	$23,075	221,237	23	4,032
Rice Lake Utilities		$5	$21,334	204,548	15	4,374
Richland Electric Coop	C-17	$7	$25,890	248,222	23	3,462
Scenic Rivers Energy Coop	C-20	$4	$43,587	417,900	40	12,139
Shawano Municipal Utilities		$10	$41,033	393,417	50	4,082
Slinger Utilities		$13	$20,521	196,747	22	1,532
Spooner City of		$10	$12,840	123,111	8	1,254
Stoughton City of		$15	$108,296	1,038,317	88	7,404
Sturgeon Bay City of		$6	$39,977	383,284	56	6,932
Sun Prairie Water & Light Comm		$5	$54,491	522,443	41	10,535
Superior Water, Light & Power Co	SWL	$23	$280,752	2,691,775	183	12,462
Two Rivers Water & Light		$6	$31,422	301,267	40	5,644
Village of Belmont		$5	$2,852	27,343	2	535
Village of Benton		$3	$1,146	10,990	3	432
Village of Cadott		$28	$18,683	179,125	14	660
Village of Cashton		$13	$5,958	57,120	13	472
Village of Centuria		$2	$909	8,719	1	387
Village of Gresham		$11	$9,797	93,930	7	924
Village of Mazomanie		$10	$7,361	70,574	7	736
Village of New Glarus		$13	$12,619	120,986	15	978
Village of Pardeeville		$14	$16,475	157,959	15	1,199
Village of Prairie Du Sac		$13	$20,787	199,301	18	1,626
Village of Stratford		$29	$19,681	188,695	12	673
Village of Viola		$3	$880	8,437	0	336
Village of Waunakee		$8	$34,715	332,837	28	4,211
Waterloo Light & Water Comm		$5	$7,782	74,610	7	1,490
Waupun Utilities		$8	$30,238	289,909	21	3,666
We Energies	WEP	$21	$20,199,812	193,670,295	29,777	953,667
Westfield Electric Co		$0	$0	0	0	572
Whitehall Electric Utility		$6	$4,329	41,507	3	738
Wisconsin Dells Electric Util		$7	$8,882	85,161	5	1,271
Wisconsin Public Service Corp	WPS	$19	$6,991,519	67,032,782	9,260	367,836
Wonewoc Electric & Water Util		$7	$2,945	28,232	2	438
Xcel Energy	NSP	$19	$3,823,683	36,660,428	4,428	201,970
Not mapped*			$3,563,279	34,163,750	3,570	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

Figure A-15.
Wisconsin Focus on Energy Residential Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
Net Cumulative Savings (July 1, 2001–December 31, 2007)

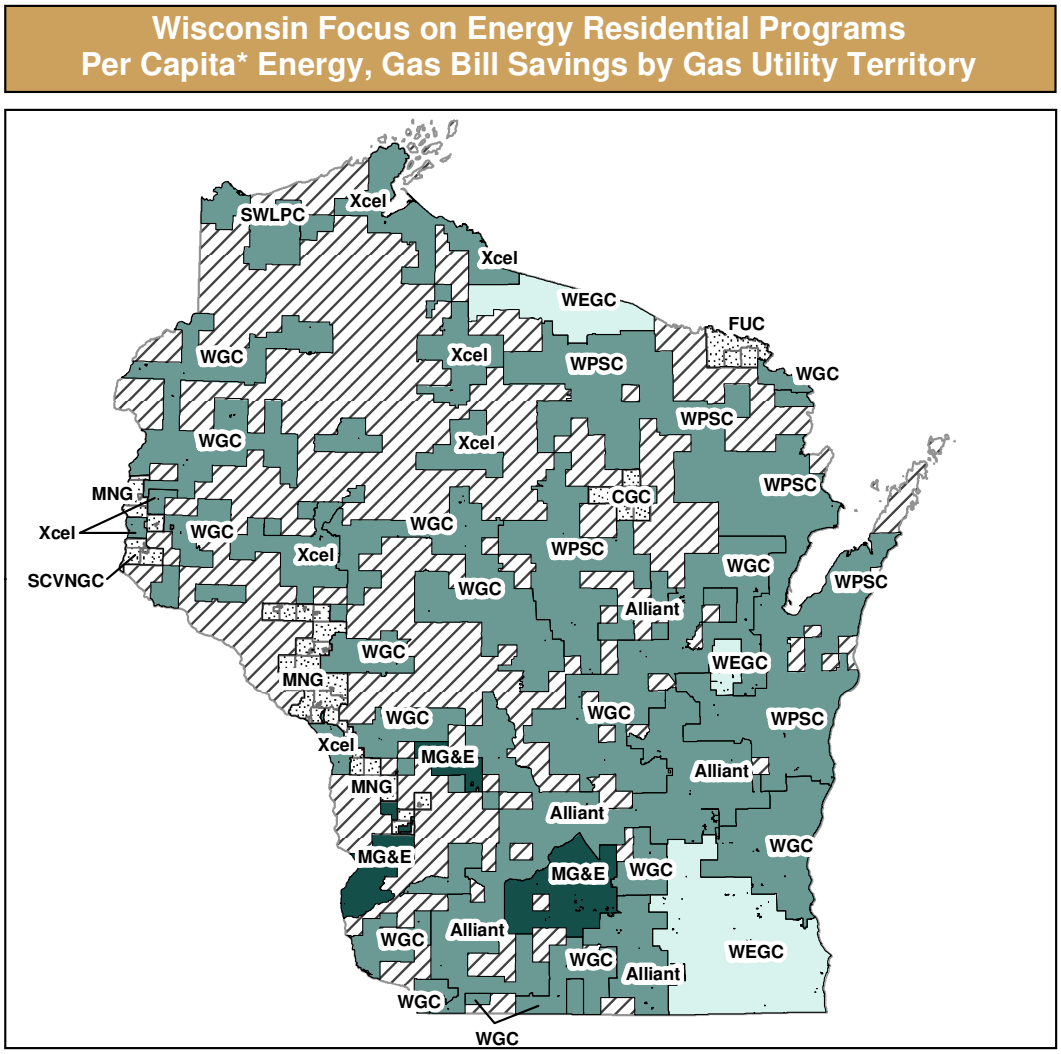


Table A-15. Residential Programs Gas Impacts
(By Participating Gas Utility)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

Utility	Map Code	Annual Dollars per Capita	Annual Therms Saved	Annual Dollars Saved	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$6	835,883	$968,788	153,893
City Gas Company	CGC	$2	7,796	$9,035	4,033
Florence Utility Commission	FUC	$0	184	$214	1,106
Madison Gas and Electric	MG&E	$17	1,802,239	$2,088,794	123,706
Midwest Natural Gas Inc.	MNG	$2	20,133	$23,334	12,096
St Croix Valley Natural Gas Company	SCVNGC	$3	14,035	$16,267	6,420
Superior Water Light & Power Company	SWLPC	$8	70,687	$81,926	10,835
Wisconsin Electric Gas Operations	WEGC	$4	1,387,790	$1,608,448	405,283
Wisconsin Gas Company	WGC	$6	2,863,192	$3,318,439	531,963
Wisconsin Public Service Corp	WPSC	$7	1,583,460	$1,835,230	278,556
Xcel (Northern States Power Company)	Xcel	$6	404,645	$468,983	83,881
Not mapped*			852,661	$988,234	

* *Unknown Utility:* The impacts for these participants are not mapped either because their address information is not complete or because their address falls out of the boundaries of participating utility territory according to the GIS mapping application.

A.4 RENEWABLE ENERGY PROGRAM

Figure A-16.
Wisconsin Focus on Energy Renewable Energy Program
Completed Projects and Their Energy Impacts by County
Net Cumulative Savings (July 1, 2001–December 31, 2007)

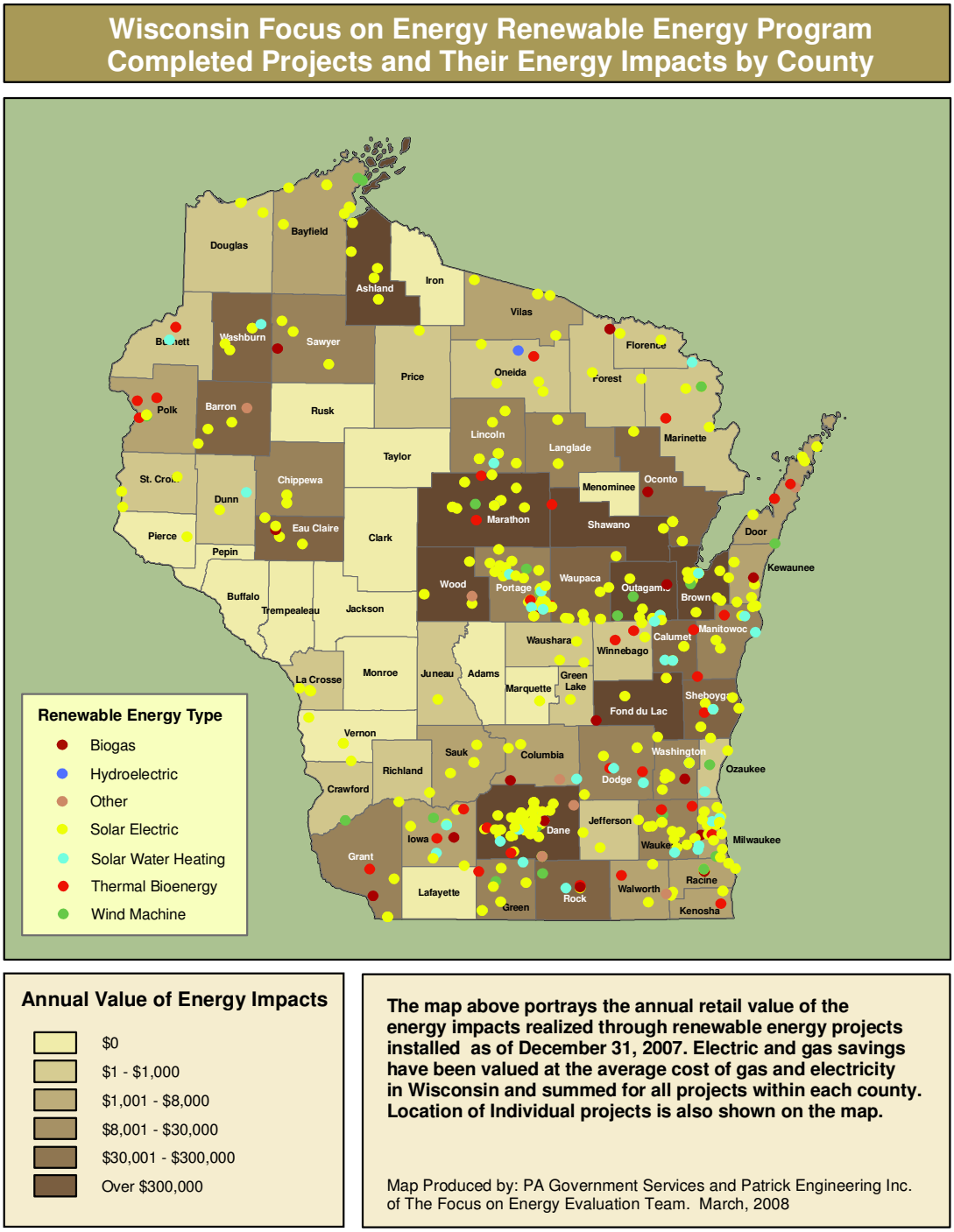


Table A-16. Renewable Programs Energy Impacts
(By County)
Net Cumulative Savings (July 1, 2001–December 31, 2007)

County	Annual Dollars
Ashland	362,486
Barron	183,309
Bayfield	2,509
Brown	498,247
Burnett	548
Calumet	877,524
Chippewa	22,383
Columbia	2,608
Crawford	134
Dane	1,441,141
Dodge	218,643
Door	3,680
Douglas	464
Dunn	59,210
Eau Claire	39,100
Florence	143
Fond du Lac	1,221,460
Forest	404
Grant	723,099
Green	9,269
Green Lake	666
Iowa	5,544
Jefferson	2,005
Juneau	50
Kenosha	10,436
Kewaunee	8,661
La Crosse	548
Langlade	18,369
Lincoln	22,800
Manitowoc	145,919
Marathon	323,895

County	Annual Dollars
Marinette	1,871
Marquette	64,974
Milwaukee	17,919
Oconto	211,296
Oneida	1,536
Outagamie	683,635
Ozaukee	2,561
Pierce	527
Polk	7,930
Portage	22,383
Price	260
Racine	9,870
Richland	143
Rock	30,833
Sauk	3,778
Sawyer	21,319
Shawano	554,683
Sheboygan	85,061
St. Croix	167,556
Vernon	953
Vilas	8,425
Walworth	1,635
Washburn	40,121
Washington	13,393
Waukesha	13,344
Waupaca	182,606
Waushara	1,265
Winnebago	1,390
Wood	1,298,179
Unknown county	297,759

APPENDIX B: RESIDENTIAL DEFAULT SAVINGS VALUES USED FOR THE SECOND HALF OF 2007

The following table lists default/deemed energy savings by measure (used for the second half of 2007) for the Residential Programs, as of December 31, 2007.

Table B-1. Residential Programs: Default/Deemed Energy Savings By Measure (as of December 31, 2007)

Program	Program Initiative	Measure	Qualifier	Deemed Gross kWh	Deemed Gross kW	Deemed Gross Therms	Deemed Verified kWh	Deemed Verified kW	Deemed Verified Therms	Deemed Net kWh	Deemed Net kW	Deemed Net Therms
ACES	Whole Building	Faucet Aerator - Bath - Electric	N/A	175	0	10	142	0	10	142	0	10
ACES	Whole Building	Faucet Aerator - Bath - Gas	N/A	0	0	10	0	0	10	0	0	10
ACES	Whole Building	Faucet Aerator - Kitchen - Electric	N/A	176	0	10	142	0	10	142	0	10
ACES	Whole Building	Faucet Aerator - Kitchen - Gas	N/A	0	0	10	0	0	10	0	0	10
ACES	Whole Building	Showerhead - Electric	N/A	521	0	0	594	0	0	594	0	0
ACES	Whole Building	Showerhead - Gas	N/A	0	0	25	0	0	25	0	0	25
EHCI	EHCI	>=90% modulating hot water	N/A	0	0	98	0	0	98	0	0	98
EHCI	EHCI	>=90% non-modulating hot water	N/A	0	0	98	0	0	98	0	0	98
EHCI	EHCI	90+ AFUE Boiler	N/A	0	0	98	0	0	98	0	0	98
EHCI	EHCI	90+ AFUE with ECM	N/A	773	0.1	20	773	0.1	20	618	0.08	16
EHCI	EHCI	SEER 14	w/ RCA	185	0.42	0	185	0.42	0	185	0.42	0
EHCI	EHCI	SEER 14	w/o RCA	82	0.2	0	82	0.2	0	82	0.2	0
EHCI	EHCI	SEER 15	w/ RCA	257	0.59	0	257	0.59	0	257	0.59	0
EHCI	EHCI	SEER 15	w/o RCA	154	0.37	0	154	0.37	0	154	0.37	0
EHCI	EHCI	SEER 16	w/ RCA	319	0.74	0	319	0.74	0	319	0.74	0
EHCI	EHCI	SEER 16	w/o RCA	216	0.52	0	216	0.52	0	216	0.52	0
EHCI	EHCI	SEER 17	w/ RCA	374	0.87	0	374	0.87	0	374	0.87	0
EHCI	EHCI	SEER 17	w/o RCA	271	0.65	0	271	0.65	0	271	0.65	0
EHCI	EHCI	SEER 18	w/ RCA	424	0.99	0	424	0.99	0	424	0.99	0
EHCI	EHCI	SEER 18	w/o RCA	321	0.77	0	321	0.77	0	321	0.77	0
EHCI	EHCI	SEER 19	w/ RCA	467	1.09	0	467	1.09	0	467	1.09	0
EHCI	EHCI	SEER 19	w/o RCA	364	0.87	0	364	0.87	0	364	0.87	0
EHCI	EHCI	SEER 20 w/ RCA	w/ RCA	507	1.19	0	507	1.19	0	507	1.19	0

Program	Program Initiative	Measure	Qualifier	Deemed Gross kWh	Deemed Gross kW	Deemed Gross Therms	Deemed Verified kWh	Deemed Verified kW	Deemed Verified Therms	Deemed Net kWh	Deemed Net kW	Deemed Net Therms
EHCI	EHCI	SEER 20 w/o RCA	w/o RCA	404	0.97	0	404	0.97	0	404	0.97	0
EHCI	EHCI	SEER 20+	w/ RCA	507	1.19	0	507	1.19	0	507	1.19	0
Energy Star	Customer Rewards	Ceiling Fan	N/A	175	0	0	175	0	0	175	0	0
Energy Star	Customer Rewards	CFL	Instant	51.1	0.004	0	38.4	0.0027	0	38.784	0.002727	0
Energy Star	Customer Rewards	CFL	Mail In	51.1	0.004	0	43.5	0.0031	0	43.935	0.003131	0
Energy Star	Customer Rewards	CFL	MF	173	0.005	0	131	0.004	0	132.31	0.00404	0
Energy Star	Customer Rewards	CFL	KEEP	38.4	0.0027	0	38.4	0.0027	0	38.4	0.0027	0
Energy Star	Customer Rewards	CFL	WR	51.1	0.004	0	51.1	0.004	0	51.1	0.004	0
Energy Star	Customer Rewards	Dehumidifier	N/A	50	0.05	0	50	0.05	0	50	0.05	0
Energy Star	Customer Rewards	Indoor Fixture/Lamp	N/A	104	0.004	0	104	0.004	0	104	0.004	0
Energy Star	Customer Rewards	Lighting Fixture	N/A	104	0.004	0	104	0.004	0	104	0.004	0
Energy Star	Customer Rewards	Lighting Fixture-LED	N/A	15.6	0	0	15.6	0	0	15.6	0	0
Energy Star	Customer Rewards	Refrigerator	N/A	66	0.01	0	66	0.01	0	66	0.01	0
Energy Star	Customer Rewards	Torchiere	N/A	349	0.01	0	349	0.01	0	349	0.01	0
Energy Star	Customer Rewards	Water Heater	N/A	242	0.017	30	242	0.017	30	242	0.017	30
HPES	EHCI	Water Heater - Fuel Switch	N/A	3280	0.25	-39	3280	0.25	-39	3280	0.25	-39
HPES	Whole House	Attic Insulation	N/A	160	0.116	100	160	0.118	100	136	0.1	85
HPES	Whole House	Chimney Liner	N/A	0	0	81	0	0	81	0	0	81
HPES	Whole House	Floor Insulation	N/A	126	0.093	79	126	0.093	79	107	0.079	67
HPES	Whole House	Foundation Insulation	Exterior	59	0	49	59	0	49	51	0	41
HPES	Whole House	Foundation Insulation	Interior	172	0	140	172	0	140	172	0	140
HPES	Whole House	Sidewall Insulation	1 inch Foam Continuous	60	0.4	41	60	0.4	41	60	0.4	41
HPES	Whole House	Sidewall Insulation	1/2 inch Foam Continuous	36	0.02	25	36	0.02	25	36	0.02	25
HPES	Whole House	Sidewall Insulation	Cavity	326	0.26	225	326	0.26	225	326	0.26	225
HPES	Whole House	Sill Box Insulation	N/A	53	0	39	53	0	39	45	0	33
HPES	Whole House	Water Heater - Fuel Switch	N/A	3280	0.25	-39	3280	0.25	-39	3280	0.25	-39
HPES	Whole House	Water Heater - Poor Draft	N/A	0.5	-0.005	75	0.5	-0.005	75	0.5	-0.005	75

Program	Program Initiative	Measure	Qualifier	Deemed Gross kWh	Deemed Gross kW	Deemed Gross Therms	Deemed Verified kWh	Deemed Verified kW	Deemed Verified Therms	Deemed Net kWh	Deemed Net kW	Deemed Net Therms
THPES	Whole House	Home Weatherization	N/A	1192	0.21	295	1192	0.21	295	1192	0.21	295
WESH	Whole House	Certified Home	N/A	0	0	100	0	0	100	0	0	100

NOTE: HPES Air Conditioners and ENERGY STAR Clothes Washers are deemed measures, but are not reflected in this table for the draft report. They will appear in this table in the final report.

APPENDIX C: MEASURE LIFETIME AND NET INCREMENTAL COSTS BY PROGRAM BY B/C MEASURE CATEGORY

Table C-1. Measure Lifetime and Net Incremental Costs by Program by B/C Measure Category

BCI_ID	Program	Measure Category BC	Measure Life	NIC Value	NIC Unit
1101	Agriculture	CFL	6	2.2	avoided cost
1102	Agriculture	HVAC	15	2.5	avoided cost
1103	Agriculture	Manufacturing Process	12	1.29	avoided cost
1104	Agriculture	Motor	16	1.29	avoided cost
1105	Agriculture	Other Lighting	15	2.2	avoided cost
1107	Agriculture	Other	17	2.9	avoided cost
1201	Commercial	CFL	6	2.2	avoided cost
1202	Commercial	HVAC	15	2.5	avoided cost
1203	Commercial	Manufacturing Process	12	1.29	avoided cost
1204	Commercial	Motor	16	1.29	avoided cost
1205	Commercial	Other Lighting	15	2.2	avoided cost
1206	Commercial	Building Shell	10	6.18	avoided cost
1207	Commercial	Other	19	2.9	avoided cost
1301	Industrial	CFL	6	2.2	avoided cost
1302	Industrial	HVAC	15	2.5	avoided cost
1303	Industrial	Manufacturing Process	12	1.29	avoided cost
1304	Industrial	Motor	16	1.29	avoided cost
1305	Industrial	Other Lighting	15	2.2	avoided cost
1306	Industrial	Building Shell	10	6.18	avoided cost
1307	Industrial	Other	28	2.9	avoided cost
1401	Schools & Government	CFL	6	2.2	avoided cost
1402	Schools & Government	HVAC	15	2.5	avoided cost
1403	Schools & Government	Manufacturing Process	12	1.29	avoided cost
1404	Schools & Government	Motor	16	1.29	avoided cost
1405	Schools & Government	Other Lighting	15	2.2	avoided cost
1406	Schools & Government	Building Shell	10	6.18	avoided cost
1407	Schools & Government	Other	10	2.9	avoided cost
1501	Channel EHCI	CFL	6	2.2	avoided cost
1502	Channel EHCI	HVAC	15	2.5	avoided cost
1503	Channel EHCI	Manufacturing Process	12	1.29	avoided cost
1504	Channel EHCI	Motor	16	1.29	avoided cost
1505	Channel EHCI	Other Lighting	15	2.2	avoided cost
1506	Channel EHCI	Building Shell	10	6.18	avoided cost
1507	Channel EHCI	Other	19	2.9	avoided cost
1601	Channel Lighting	CFL	6	2.2	avoided cost
1602	Channel Lighting	HVAC	15	2.5	avoided cost
1603	Channel Lighting	Manufacturing Process	12	1.29	avoided cost
1604	Channel Lighting	Motor	16	1.29	avoided cost
1605	Channel Lighting	Other Lighting	15	2.2	avoided cost
1606	Channel Lighting	Building Shell	10	6.18	avoided cost
1607	Channel Lighting	Other	19	2.9	avoided cost
2107	ACES	Other	8	0.05207	kWh

BCI_ID	Program	Measure Category BC	Measure Life	NIC Value	NIC Unit
2207	EHCI	Other	20	1.16155	kWh
2208	EHCI	ECM Furnace	23	850	unit
2212	EHCI	SEER 12	20	350	unit
2213	EHCI	SEER 13	20	700	unit
2214	EHCI	SEER 14+	20	350	unit
2301	ENERGY STAR	CFL	6	4	unit
2305	ENERGY STAR	Other Lighting	25	0.06734	kWh
2307	ENERGY STAR	Other	12	0.75188	kWh
2309	ENERGY STAR	Clothes Washers	12	200	unit
2407	HPES	Other	25	6.41556	therm
2408	HPES	ECM Furnace	23	850	unit
2412	HPES	SEER 12	20	350	unit
2413	HPES	SEER 13	20	700	unit
2414	HPES	SEER 14+	20	1050	unit
2420	HPES	Air Sealing	25	375	home
2421	HPES	Attic Insulation	25	900	home
2422	HPES	Sidewall Insulation	25	1800	home
2507	THPES	Other	25	6100	home
2607	WESH	Other	12	0	unit
2608	WESH	ECM Furnace	23	0	unit
2612	WESH	SEER 12	20	0	unit
2613	WESH	SEER 13	20	0	unit
2614	WESH	SEER 14+	20	0	unit
2630	WESH	Home Certification	50	2445	home
4101	Renewables	Solar Electric	25	6.8	kWh
4102	Renewables	Wind	20	1.37	kWh
4103	Renewables	Solar Water Heating	20	16.1	therm
4104	Renewables	Biomass	20	3.06	kWh
4105	Renewables	Biomass-Combustion	20	1.92	therm
4107	Renewables	Other	25	0.2	kWh

APPENDIX D: RENEWABLE ENERGY PROGRAM SURVEY, FISCAL YEAR 2007 IMPACT INSTRUMENT

INTERVIEWER GUIDELINES

1. Record beginning and end-time
2. Do not read responses that are in brackets.
3. Read responses that are NOT in brackets
4. Read close-ended questions exactly as written.
5. Skip questions that are not applicable, but indicate they have been skipped by drawing a line through the question
6. Record open-ended answers verbatim, or read back to the respondent what you have recorded to make sure it captures what they meant.
7. Probe on open-ended questions to make sure you understand the issue completely.
8. Many questions have been converted from open-ends to close-ends. If the respondents answer does not fit a category be sure to select “other” and record the response.
9. After completing the interview, review your notes to make sure they are legible and comprehendible to others.
10. Try to complete data entry the same day that you conduct a survey.

CALL LOG FOR

MPAC.0030 [Focus on Energy Renewables Evaluation]

KEMA ID:_____

Type of project: _____

Type of customer (Res/Comm/Ind): _____

Contact Name: _____

Business Name: _____

Call Order: _____

hphone: _____

wphone: _____

email: _____

KEMA Employee initials	Date	Time	Notes (include message left, best time to call, best way to contact, and whether survey was completed)

Date of interview: _____

Interview start time: _____

Interview end time: _____

Reward Amount: _____

A INFORMED RESPONDENT

Hello, my name is _____ and I'm calling from KEMA Consulting on behalf of the Focus on Energy Program, the program that provided you with a cash back reward and other assistance to install the [TYPE OF PROJECT] on your [home/business]. I need to ask you some questions about your participation in the Renewable Energy Program. This is not a sales or marketing call. Focus on Energy is required by the state of Wisconsin to conduct these types of interviews to better understand and improve the program. Your responses will be kept entirely confidential.

Are you the best person to talk to about your [household's/business's] decision to install [TYPE OF PROJECT] and your experiences with the program? (IF NOT, GET CONTACT INFORMATION FOR CORRECT PERSON AND CALL THEM.)

I'd like to start by confirming some information. Our records show that you installed…

A1. [EQUIPMENT TYPE]_____

A2. [INSTALLATION MONTH AND YEAR] _____

A3. [AT ADDRESS] _____

Now I'd like to confirm some of the specifics for the [TYPE OF PROJECT].

A4. It was manufactured by [MANUFACTURER NAME] _____ and was rated to generate _____ (depending on type of project: kW, kWh, therms).

[NOTE: WE DON'T HAVE MANUFACTURER NAME FOR MANY SYSTEMS, SO BE SURE TO ASK CUSTOMER]

A5. Is this what was installed?

YES 1

NO 2

(If no, discuss and record any changes to the plans.)

_____

A6. Is this [TYPE OF PROJECT] operating now?

YES ..... [SKIP TO A7].1

NO 2

A6a. Why not? _____

_____

A7. Overall, how satisfied or dissatisfied would you say you are with the performance of the [TYPE OF PROJECT]? Would you say you are.

Very DISsatisfied 1

Somewhat DISsatisfied 2

Somewhat Satisfied 3

Very Satisfied 4

[Don't know] 97

[Refused] 98

A8. Why do you say that?

[Good performance] 1

[Poor performance] 2

[Less energy] 3

[Technical difficulties] 4

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

B DECISION TO INSTALL

Okay, now I'd like to start at the beginning and learn about when and why you decided to install a [TYPE OF PROJECT] in your home/facility.

B1. For what reasons did you decide to install a [TYPE OF PROJECT]? [CIRCLE ALL THAT APPLY, ASK IF ANY OTHERS]

[Were undertaking remodeling or expansion] 1

[Wanted to reduce energy costs] 2

[Commitment to environment] 3

[Wanted to get off the electric grid] 4

[New construction and too expensive to get on the grid] 5

[Wanted to educate others on renewable energy options] 6

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

B2. About when did you first start thinking of installing a [TYPE OF PROJECT]? (Month, year)

[RECORD AS MM:YY]: _____

B3. From where or whom did you hear about [TYPE OF PROJECT]?

[Independent reading/research] 1

[MREA – Midwest Renewable Energy Association] 2

[A friend or relative] 3

[Installer/contractor] 4

[Focus on Energy] 5

[Don't remember] 6

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

B4. Who did you contact, (where did you get information, etc.)

[Installer/contractor] 1

[MREA – Midwest Renewable Energy Association] 2

[Focus on Energy] 3

[Self-installer] 4

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

B5. At what point in the process did you learn about the Focus on Energy Renewables Program? Was it…

Before you started considering [TYPE OF PROJECT] 1

When you were considering [TYPE OF PROJECT] 2

After you decided to install [TYPE OF PROJECT] 3

[Don't know] 97

[Refused] 98

B6. From what sources did you hear about Focus on Energy? [CIRCLE ALL THAT APPLY]

[Utility] 1

[MREA – Midwest Renewable Energy Association] 2

[Installer/contractor] 3

[Friend or relative] 4

[The Internet] 5

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

B7. What did you hear about it? [RECORD VERBATIM THEN CIRCLE ALL THAT APPLY]

[_____

_____

_____

_____]

[Focus provided financial incentives/rebates available] 1

[Other services] 2

[They could provide me with technical information] 3

[They could provide me with information about rebates or tax credits] 4

[They could provide me information about rules or utility buy-back rates]..... 5

[Other, please describe _____ 96

[Don't know]..... 97

[Refused] 98

B8. Why did you participate in the Focus on Energy Renewable program? [RECORD VERBATIM THEN CIRCLE ALL THAT APPLY]

[_____

_____

_____

_____]

[Wanted to take advantage of financial incentives]..... 1

[Wanted technical assistance]..... 2

[Wanted help reviewing proposals] 3

[Equipment vendor included incentive in sales proposal] 4

[Commitment to environment]..... 5

[Other, please describe _____] 96

[Don't know]..... 97

[Refused] 98

B9. At what point in the planning for the installation of a [TYPE OF PROJECT] did your household/business learn cash incentives were available? Would you say it was… [READ LIST]

Before the start of planning..... 1

About the same time as the start of planning 2

Just after planning started 3

Long after planning started 4

[Don't know] 97

[Refused] 98

B10. Have you ever received assistance from Focus on Energy for energy efficiency improvements to your [home/business]?

Yes 1

No ..... [SKIP TO C1] 2

[Don't know] 97

[Refused] 98

B11. What kind of assistance did you receive for energy efficiency improvements?

Rebate 1

Advice 2

Other (describe) _____

_____ 96

[Don't know] 97

[Refused] 98

C DETERMINE PROGRAM IMPACT ON DECISION TO INSTALL (NET-TO-GROSS)

Facilitation

C1. Approximately how many times did you have contact with Focus on Energy staff, either by phone, email, or in person? [If respondent is unsure, probe using name of Focus staff member assigned to project]

0 →skip to C3

_____ Number of times contacted Focus staff

C1a. What did you discuss with Focus on Energy staff? (probe: application process, technical issues, insurance, contractors, other?)

[Additional improvements] 1

[Technical information] 2

[Electrical code information] 3

[Insurance information] 4

[Incentives available from Focus] 5

[Federal tax credits] 6

[Federal grants available] 7

[Other, please describe _____] 96

[Don't know/don't remember] 97

[Refused] 98

C2. How did these contacts with Focus on Energy staff affect your decision to pursue the [TYPE OF PROJECT]? Would you say the contacts... [READ LIST]

Were a *very important* factor in my decision to pursue the project 1

Were a *somewhat important* factor in my decision to pursue the project 2

Made no difference 3

Made me less inclined to pursue the project 4

Other, please describe _____96

[Don't know] 97

[Refused] 98

C3. What types of challenges or obstacles, if any, did you encounter in the process of installing the [TYPE OF PROJECT]? (Probe for issues such as insurance, installers, permits, dealing with utility connection, money, technical problems.) [RECORD VERBATIM THEN CIRCLE ALL THAT APPLY]

_____

_____

_____

[None] ..... [SKIP TO C6] 1

[Information] 2

[Application process] 3

[Technical difficulties] 4

[Difficulties with contractor/installer] 5

[Difficulties with Focus] 6

[Difficulties with utility] 7

[Insurance] 8

[Permits/ordinance] 9

[Cost] 10

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

C4. How were these resolved? [RECORD VERBATIM THEN CIRCLE ALL THAT APPLY]

_____

_____

_____

[Not resolved] 1

[Focus incentive] 2

[Info from Focus] 3

[Assistance from Focus] 4

[Resolved by respondent] 5

[Contractor/installer] 6

[Manufacturer] 7

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

C5. Did Focus on Energy staff play a role in resolving this (these) issues?

[Yes] 1

[No] 2

[Some but not all] 3

[Don't know] 97

[Refused] 98

C5a. If yes, what role?

_____

_____

C6. Did you or anyone else in your [household/company] attend a workshop about [TYPE OF PROJECT]?

Yes 1

No ..... [SKIP TO C10] 2

[Don't know] ..... [SKIP TO C10] 97

[Refused] ..... [SKIP TO C10] 98

C7. What, if any, benefits did you get out of attending the workshop? [RECORD VERBATIM and then CIRCLE ALL THAT APPLY]

_____

_____

[Provided technical information we needed to make a decision] 1

[Provided even more reasons to install a [TYPE OF PROJECT] 2

[Confirmed our commitment to installing a [TYPE OF PROJECT] 3

[Provided access to "experts" that we needed in order to install the system] 4

[Increased our knowledge related to the financial costs and benefits of [TYPE OF PROJECT] 5

[Increased our knowledge of the environmental impacts of renewable energy projects] ... 6

[Helped us better understand the process for installing a [TYPE OF PROJECT] 7

[Helped us better understand the challenges with installing a [TYPE OF PROJECT] 8

[Other, please describe _____] 96

[Don't know 97

[Refused] 98

C8. How did the workshop affect your decision to pursue the [TYPE OF PROJECT]? Would you say the workshop… [READ LIST]

Was a *very important* factor in my decision to pursue the project 1

Was a *somewhat important* factor in my decision to pursue the project 2

Made no difference 3

Made me less inclined to pursue the project 4

Other, please describe _____ 96

[Don't know] 97

[Refused] 98

C9. Why do you say this?

_____

_____

_____

Site Assessment

C10. Did you have a site assessment done before installation by Focus on Energy at your [home/business]?

Yes 1

No ..... [SKIP TO C14] 2

[Don't know] ..... [SKIP TO C14] 97

[Refused] ..... [SKIP TO C14] 98

C11. What benefits, if any, did you get from the site assessment? [RECORD VERBATIM and then CIRCLE ALL THAT APPLY]

_____

_____

[Provided technical information we needed to make a decision] 1

[Provided even more reasons to install a [TYPE OF PROJECT]] 2

[Confirmed our commitment to installing a [TYPE OF PROJECT]] 3

[Provided access to "experts" that we needed in order to install the system] 4

[Increased our knowledge related to the financial costs and benefits of [TYPE OF PROJECT] 5

[Increased our knowledge of the environmental impacts of renewable energy projects] .. 6

[Helped us better understand the process for installing a [TYPE OF PROJECT]] 7

[Helped us better understand the challenges with installing a [TYPE OF PROJECT]] 8

[Other, please describe _____]96

[Don't know] 97

[Refused] 98

C12. How did the site assessment affect your decision to pursue the installation of a [TYPE OF PROJECT]? Would you say it... [READ LIST]

Was a *very important* factor in my decision to pursue the project 1

Was a *somewhat important* factor in my decision to pursue the project 2

Made no difference 3

Made me less inclined to pursue the project 4

No site assessment 5

Other, please describe _____ 96

[Don't know] 97

[Refused] 98

C13. Why do you say this?

_____

_____

_____

[Don't know] 97

[Refused]..... 98

Cash Incentive

C14. Our records show that you received $_____ in financial assistance from Focus on Energy for your [TYPE OF PROJECT] project, and that the total cost of your project was $_____. Is this correct?

Yes..... 1

No 2

[RECORD CORRECT AMOUNTS:_____]

[Don't know] 97

[Refused]..... 98

C15. Did you receive financial assistance such as rebates, grants, reduced financing, or tax credits from any other source for this project?

Yes..... 1

No .....[SKIP TO D1] 2

[Don't know] .....[SKIP TO D1] 97

[Refused].....[SKIP TO D1] 98

C16. From what sources?

Federal tax credits..... 1

Department of Agriculture grant 2

City of Madison 3

Other (please describe _____ 96

[Don't know] 97

[Refused]..... 98

C17. About how much?

_____Record Amount

[Don't know] 97

[Refused]..... 98

D ATTRIBUTION

Now that we have discussed the services and incentives you received from the Focus on Energy Renewable Program, I'd like you to think about the impact these services had on your installation of the [TYPE OF PROJECT].

D1. Without the Focus on Energy Program, would you say the likelihood of installing the [TYPE OF PROJECT] was… [READ LIST]

Very likely 1

Somewhat likely..... 2

Not very likely 3

Or very unlikely .....[SKIP TO D7] 4

[Don't know].....[SKIP TO D7] 97

[Refused] .....[SKIP TO D7] 98

D2. Without these services and incentives, how different would the timing have been for the project? Would you say the timing would have been…[READ LIST]

About the same.....[SKIP TO D4] 1

Earlier .....[SKIP TO D4] 2

Or later..... 3

[Don't know].....[SKIP TO D4] 97

[Refused] .....[SKIP TO D4] 98

D3. About how much later? [TRY TO GET A NUMBER]

[RECORD NUMBER OF MONTHS OR YEARS] ..... _____

[Don't know]..... 97

[Refused] 98

D4. Without these services or incentives, how different would the renewable energy project have been? Would you say the project capacity would have been the… [READ LIST]

Same size.....[SKIP TO D7] 1

Smaller 2

Or larger .....[SKIP TO D6] 3

[Don't know].....[SKIP TO D7] 97

[Refused] .....[SKIP TO D7] 98

D5. How much smaller—what percent of the installed project?

[RECORD PERCENTAGE 0–99]..... _____

[Don't know]..... 97

[Refused] 98

D6. How much larger—what percent greater than the installed project?

[RECORD PERCENTAGE ≥101] ..... _____

[Don't know] 97

[Refused] 98

D7. What would your household/company have done if it had not received cash incentives or other services from Focus on Energy? (In your own words describe influence of Focus)

_____

_____

_____

_____

[Don't know] 97

[Refused] 98

E ENGINEERING QUESTIONS

This section of the survey asked factual questions specific to the installation of the equipment. A series of questions was developed for each technology that covered the following areas:

A. Equipment installation details

B. Date system began operating

C. Determining whether the equipment is currently functioning and whether there have been any problems. Length of time system has been or was down (if applicable).

D. Obtain readings from inverters or meters specific to the renewable energy system, if available.

E. Any pertinent operating characteristics (such as seasonally changing tilt angle on PV systems).

F. Determine uses of the system.

G. Filling data gaps necessary for engineering calculation.

F BARRIERS TO IMPLEMENTING RENEWABLE ENERGY PROJECTS

Enrollment Process

F1. What suggestions, if any, do you have on how to encourage other [households/businesses] to participate in the program? [IF "yes," PROBE] What are they? [ACCEPT MULTIPLE RESPONSES]

[None] 1

[Increase awareness/advertise] 2

[Be more clear] 3

[Have better engineers] 4

[Other, please describe _____] 96

[Don't know] 97

[Refused] 98

Overall

F2. How satisfied or dissatisfied are you with the technical performance of the [TYPE OF PROJECT]? How would you rate your satisfaction on a 5-point scale with 1 meaning "not at all satisfied" and 5 meaning "very satisfied?"

1 (not at all satisfied) 1

2 2

3 3

4 4

5 (very satisfied) 5

[Don't know] 97

[Refused] 98

F3. Is your [household/company] considering any additional renewable energy projects or considering expanding your [TYPE OF PROJECT]?

Yes 1

No 2

[Don't know] 97

[Refused] 98

F4. Next I'd like to know how satisfied or dissatisfied you are with the Focus on Energy program. Using a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "very satisfied," overall, how satisfied are you with the Focus on Energy Program?

1 (not at all satisfied) 1

2 2

3 3

4 4

5 (very satisfied) 5

[Don't know] 97

[Refused] 98

F5. Why do you say that? [OPEN END] record verbatim.

F6. Are there any other comments you'd like me to pass on about the program?

G DEMOGRAPHICS–FOR HOUSEHOLDS ONLY

Finally, I need to ask you a few questions about your household. These questions are for classification purposes only. All of your answers are confidential.

G1. Do you own or rent this residence?

Own/buying 1

Rent/lease 2

Other, please describe _____ 96

[Don't know/not sure] 97

[Refused] 98

G2. What type of residence is this? Is it a... [Read list, record one number]

Single family home (house on separate lot, includes modular homes) .....[SKIP TO G5] 1

Row or townhouse (adjacent walls to another house) .....[SKIP TO G5] 2

A unit in a multi-family structure, 2–4 attached units (example: duplex, triplex, fourplex, or single family house converted to flats) 3

A unit in a multi-family structure, 5 or more attached units (example: apartment building, high-rise condominium, garden apartments) 4

Mobile home, house trailer .....[SKIP TO G5] 5

Other, please describe: _____96

[Don't know/not sure] 97

[Refused] 98

G3. (IF G2 = 4) How many units are in your building?

5–9 units 1

10–19 units 2

20–49 units 3

50+ units 4

[Don't know/not sure] 97

[Refused] 98

G4. (If G1 =1 and (G2 = 3 or 4)) Do you own a single unit or do you own the entire building?

Single unit 1

Entire building 2

Other, please describe _____ 96

[Don't know/not sure] 97

[Refused] 98

G5. In approximately what year was this residence/facility built? (Fill in blank)

[PUT IN FULL YEAR – Ex: 1957] Year Built..... ____

[Don't know/not sure] 97

[Refused] 98

G6. How many **years** have you lived at this residence?

[RECORD NUMBER. If less than one year, record ZERO] ..... _____

[Don't know/not sure] 97

[Refused] 98

G7. How many people live in this residence full-time, including yourself and any infants?

[RECORD NUMBER] ..... _____

[Refused] 98

G8. What is the total enclosed square footage of your home? Your best estimate is fine.

[RECORD # SQ FT] ..... _____

[Don't know] 97

[Refused] 98

Those are all the questions I have for today. Thank you for taking the time to talk with me.

X FIRMOGRAPHICS–FOR NONRESIDENTIAL ONLY

Finally, I need to ask you a few questions about your business/farm. These questions are for classification purposes only. All of your answers are confidential.

X1. How would you best describe this business/farm? Is it a . . . [Interviewer – verbatim is not as important as getting the right answer]

Dairy Farm 1

Other farm 2

School 3

Hotel or motel 4

Other (describe) _____ 96

[Don't know/not sure] 97

[Refused] 98

X2. Which best describes your facilities at this location? Is it:

A single, stand alone building..... [Skip to X4] 1

Multiple buildings 2

School..... [Skip to X4] 3

Hotel or motel ..... [Skip to X4] 4

Other (describe) _____ [Skip to X4] 96

[Don't know/not sure] ..... [Skip to X4] 97

[Refused] ..... [Skip to X4] 98

X3. How many buildings do you occupy at this location?

_____ Record number of buildings

X4. Approximately how many full-time employees do you have at this location?

_____Record number of FTEs

Those are all the questions I have for today. Thank you for taking the time to talk with me.

APPENDIX E: ENDNOTES

Endnotes include sources and references supporting this report.

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[i] *Economic Development Benefits: FY07 Economic Impacts Report.* Lisa Petraglia, Glen Weisbrod, Brian Baird. Final: February 23, 2007.

[ii] *Estimating Seasonal and Peak Environmental Emissions Factors.* With Carmen Best, David Sumi, Bryan Ward, Bryan Zent, and Karl Hausker. Report for the Wisconsin Department of Administration, Division of Energy Focus on Energy statewide evaluation. May 2004.

[iii] The Renewable Energy Program savings are evaluation-verified gross, not net.

[iv] *Interim Benefit-Cost Analysis: FY07 Evaluation Report*. Miriam L. Goldberg, Chris Clark, Sander Cohan. Final: February 26, 2007.

[v] State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation: Contract Period One Detailed Evaluation Plans, August 6, 2007 (Revised Final).

[vi] State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation: Residential Lighting Program Compact Fluorescent Lighting Installation Rate Study, December 27, 2007.

[vii] State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation: FY07 Metrics Performance—Residential Programs, January 21, 2008.

[viii] We were not able to include fixtures in the analysis because, unfortunately, retailers were not coded in the RLP database in FY06. We were still, however, able to use the data available to confirm attainment of the metric goal with the inclusion of fixtures. In FY07, 8,785 of the 15,811 fixtures rewarded through RLP were sold in the targeted channels (drug, grocery, lighting showroom, and mass merchant). This yields 93,352 CFLs and fixtures rewarded during FY07 in the targeted channels (84,567 + 8,785). In FY06, a total of 25,041 fixtures were rewarded through RLP. The worst case scenario in terms of metrics attainment is that all of the fixtures rewarded in FY06 were sold in the targeted channels. This would yield 75,506 CFLs and fixtures rewarded during FY06 in the targeted channels (50,465 + 25,041). This worst case scenario would yield a 24% increase from FY06 to FY07, which still exceeds the metric goal.

[ix] State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation: FY07 Metrics Performance—Residential Programs, January 21, 2008.

[x] This is the classification rule that was agreed to and used when this metric was previously measured.

[xi] State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation: FY07 Metrics Performance—Residential Programs, January 21, 2008.

[xii] An inherent disadvantage to FACTS is that not all distributors in Wisconsin provide data, resulting in coverage of only 50–60 percent of the Wisconsin market. For the purposes of measuring this metric, we assume that the market share of ECM furnaces sold by distributors outside of FACTS is the same as that sold by distributors involved with FACTS. We recommend a continuation of the efforts to improve the market coverage of FACTS.

[xiii] It is important to note that the metrics measurement process is not assessing attribution. It simply involves measuring the total change in ECM furnace market share. Separating the change in ECM furnace market share into its component pieces (i.e., program-induced versus naturally occurring) is addressed through the net-to-gross analysis (State of Wisconsin Department of Administration, Division of Energy. Focus on Energy Public Benefits Evaluation: FY05 Net-to-Gross Savings Adjustments for 12/13+ SEER Central Air Conditioners and ECM Furnaces. Memorandum issued by Tom Talerico and Rick Winch, Glacier Consulting Group. June 27, 2006).