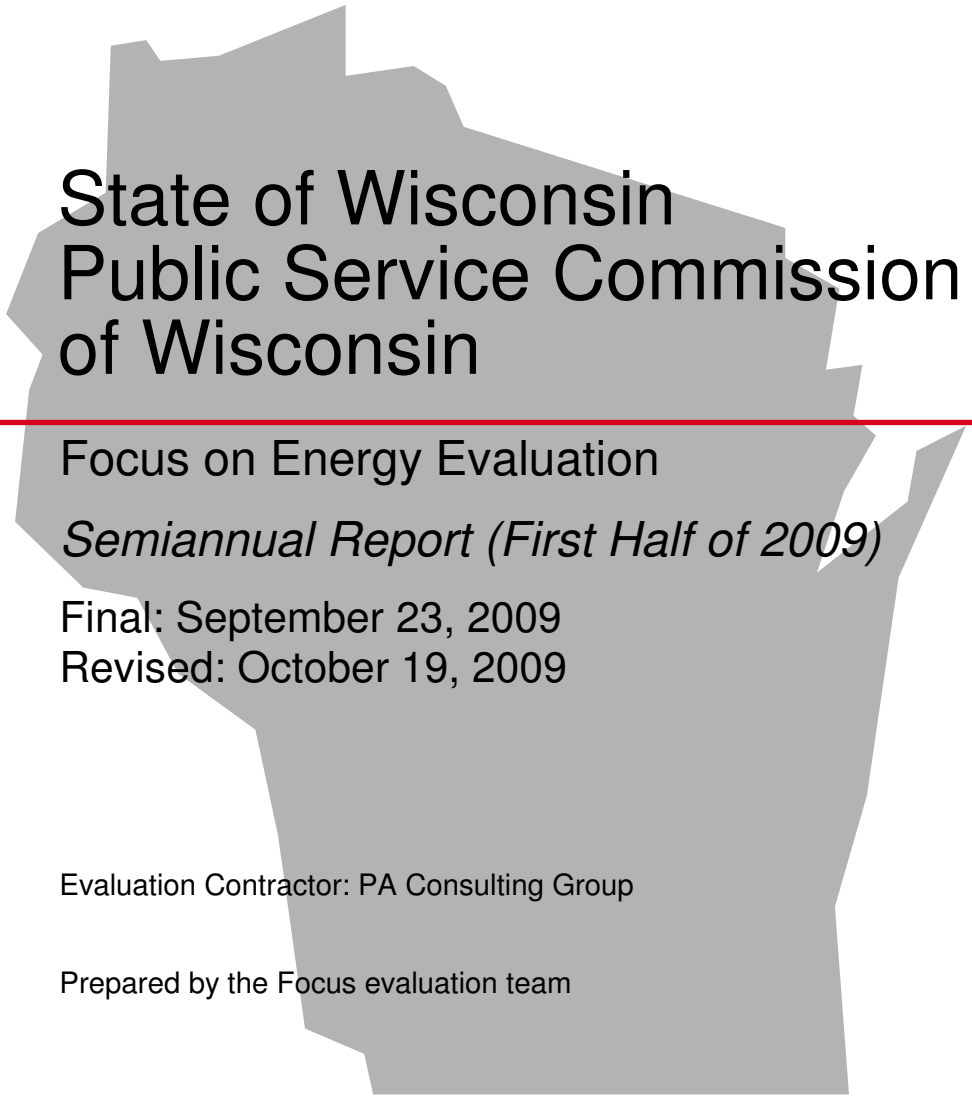
PA Consulting Group



State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Semiannual Report (First Half of 2009)

Final: September 23, 2009
Revised: October 19, 2009

Evaluation Contractor: PA Consulting Group

Prepared by the Focus evaluation team

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The power is within you.

State of Wisconsin Public Service Commission of Wisconsin

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[1] Revised to reflect changes in the modeling that generates the simple b/c values. An explanatory note has been added (immediately following the column definitions on page 2-29) and Tables 2-21 and 2-22 have been updated

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1. INTRODUCTION

The purpose of this document is to present an overview of all Focus on Energy (Focus) impacts achieved for the previous six months 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.

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 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 has transitioned from a fiscal year basis to a calendar year basis.

The program administrators for Focus must maintain a *program tracking database*—or access a state-sponsored 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.

1.1.1 Reporting of tracked energy impacts: annual first year vs. lifecycle

Focus includes many long-term initiatives directed toward lasting changes in the state's energy efficiency markets. As a result, any meaningful assessment of the benefits (and costs) of Focus must consider a multi-year timeframe. Thus, as in the formal benefit-cost analysis conducted for Focus, in order to appropriately value Focus energy impacts, the energy savings must be estimated as a *projected stream* based on the program-area evaluations.[2] These energy savings are counted as benefits over the measure lifetime, or the 25-year horizon of the benefit-cost analysis, whichever is shorter.

Table 1-1 below provides definitions for each of the various tracked savings impacts incorporated in the Focus impact evaluation system. As introduced in a previous semiannual

[2] Documentable energy savings, projected net verified savings based on documented impacts, are the foundation of Focus benefits included in the benefit-cost analysis (see *Interim Benefit-cost Analysis: FY07 Evaluation Report*, February 26, 2007). In this analysis, the projected new implementation of energy efficient measures includes both direct effects (in-program) and projected market effects.

report (*First Half of 2008.* Final: October 22, 2008), the types of reported impacts have been expanded for this semiannual report corresponding to three added impact types which are now included in Table 1-1 (definitions), and also shown in Table 1-2 (with Appendix D providing a complete listing of tables and figures in the report linked to the type of impacts reported).

These additional reported impact types are necessitated by the need to report more accurately what were previously referred to as "cumulative" savings (simple summing of annual first year savings), as well as to conform to the impacts as used in the benefit-cost. As the energy impacts of Focus are increasingly seen as resources in the state's long-term planning, these impacts must be as realistically reported as we can. While it is important to know the cumulative energy impacts from Focus on Energy, simply summing the savings is an oversimplification and can be misleading. For this reason we have taken the program-to-date (PTD) savings numbers out of the semiannual reports, since they were previously compiled by a simple summing of annual first year savings.

Why is a "lifecycle" approach needed? The energy efficiency measures installed typically last for a number of years, so their lifetime energy impacts would be calculated by multiplying the annual energy savings by the number of years that the energy efficiency measure is expected to be in operation. These lifetime energy impacts—explicitly considering measure life interpreted as the median number of years of expected operation—are now termed in this report *lifecycle* energy impacts. An additional new concept embodied in the energy impacts presented in this semiannual report is *persistent* savings. These are lifecycle impacts that also include an exponential decay rate, such that half the savings remains after the measure life. (See additional discussion in *Section 2.1 and Section 2.8*.).

The term "tracked" is used to signify that these savings result from Focus efforts directly counted (or tracked) by program administrators. Table 1-1 below provides definitions for each of the various tracked savings impacts referred to throughout this report.

Table 1-1. Tracked Energy Impacts

Gross Reported Savings	Energy savings as reported by the program administrator, unverified by an independent evaluation (inputs to the evaluation impact analyses).
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 (Program Administrator contract performance targets currently use these savings).
Lifecycle Savings	Energy savings, expressed either as *verified gross* or *verified net*, that explicitly incorporate measure life (lifecycle verified gross savings are shown in the tables that accompany maps depicting the geographic distribution of Focus energy impacts—see Appendix A).
Persistent Savings	Energy savings, expressed as *verified net*, that are lifecycle impacts that also include an exponential decay rate, such that half the savings remains after the measure life (used in the Economic and Benefit-cost analyses, and also reflected in the Appendix A maps).

Table 1-2, below, presents a matrix of the energy impact reporting types that shows the different types as a product of level of evaluation (gross reported, verified gross, and verified

net) and how the duration of impacts is approached (first year, lifecycle, and persistent). The table also identifies the impact types that are included in this report, denoted as "Reported," and those that are "Not Reported."

Table 1-2. Tracked Energy Impacts and Approach to Impact Duration

	First Year	Lifecycle	Persistent
Gross	Reported	Not Reported	Not Reported
Verified Gross	Reported	Reported	Not Reported
Verified Net	Reported	Reported	Reported

Note: See Appendix D for a complete listing of tables and figures in the report linked to the type of impacts noted in this table as "Reported."

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 are 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 energy 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.

As the Focus on Energy programs have evolved, the evaluation has attempted to reflect an additional variation on nontracked energy impacts: *untracked attributable savings*. In the previous18-month contract period (18MCP) additional research on nontracked energy impacts was completed for the Education & Training Program in the business programs. The primary purpose of the Focus on Energy Business Programs Education and Training (E&T) Program Untracked Savings Study was to estimate untracked attributable savings (UAS) resulting from the E&T Program. These UAS are the E&T-attributable portion of energy savings from projects that do not appear in the Focus WATTS or WISeerts databases and were implemented at the building or facilities of the trainees' companies. We estimated the E&T UAS that occurred in the recent past and used these past energy savings to project 2008 E&T Program UAS. For the CY09 period the E&T UAS annual estimates will be included in the final (year-end) CY09 evaluation report.

It is important to note that these untracked attributable savings are different from participant spillover savings that we estimated in previous studies. When we estimated participant spillover effects from the Focus on Energy Business Programs in 2005, we were estimating

the level of untracked energy savings that had "spilled over" due to the influence of tracked projects. To credit a project with participant spillover energy savings, we had to find a causal link between the older tracked project and the newer untracked project. For example, a program participant might have had a positive experience with a tracked energy-savings project and decided to implement similar projects in their other facilities. Although in most cases such program participants would have also sought Focus financial incentives for these new projects (therefore making them "tracked projects"), sometimes they did not and these were generally the types of projects that produced participant spillover energy savings. Section 2.2 of this semiannual report provides additional delineation between untracked attributable savings and participant spillover savings.

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. An effort has been made to reference the appropriate evaluation reports in the relevant places throughout this report. Supporting information can be found in the various reports named in Appendix F, which provides a list of all of the evaluation reports (and other deliverables) submitted during the first half of 2009.

2. FOCUS IMPACTS

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

- Tracked energy impacts
- 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 July 16, 2009. Data was only extracted for the dates of July 1, 2007, through June 30, 2009. This is a departure from previous practice, which was to pull all data since program inception. Data for the time period prior to July 1, 2007, will now be static. A snapshot of the WISeerts database made on July 11, 2009, was downloaded on July 16, 2009.

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 first half of 2009," "the second half of 2009," or "the 15-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	The 18MCP[3] July 07– Dec 08	The First Half of 2009 (Jan 1–Jun 30, 2009)	Program To Date

2.1 VERIFIED TRACKED ENERGY IMPACTS

2.1.1 New energy impact reporting types

To continue a discussion introduced in Section 1 (and initially introduced in the semiannual report—*First Half of 2008*), earlier versions of the semiannual reports 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 an oversimplification and can be misleading. Also, this year's Program Administrator goals are now based on verified *net* energy impacts, where previously they were based on verified *gross* impacts.

[3] "18MCP" refers to the period of July 1, 2007–December 31, 2008. This is also referred to as "FY08."

In addition, Focus is now in its ninth 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—adding to potential confusion concerning cumulative savings.

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 semiannual reports.

There are, however, figures in this section that show the stream of net energy impacts over 20 years of all of the measures installed through June 2009. These are termed *lifecycle verified gross* impacts (Figures 2-1 through 2-3 for energy, demand, and gas savings respectively), and *persistent verified net* (Figures 2-4 through 2-6, again corresponding to energy, demand, and gas savings). As of June 2009, the persistent verified net energy savings from all measures installed since Focus began in July 2001 that are still in operation is 1,112 GWh,194 MW of demand reductions, and 50.7 million therms (see Figure 2-4. Persistent Verified Net Electricity Savings, Figure 2-5. Persistent Verified Net Electricity Demand Reductions, and Figure 2-6. Persistent Verified Net Gas Savings, which graph Focus net savings from fiscal year 2002 through fiscal year 2021).

Applying an exponential decay rate to report persistent verified net. The energy savings impacts for each year are the total impacts of all measures implemented as a result of the program up through that year. Thus, the documentable energy savings for Year 1 would be the annual energy savings due to measures implemented through the programs and attributable to them (first-year net savings). The documentable savings shown for Year 10 are the net (i.e. program-attributable) annual energy savings due to all measures implemented through the program in Years 1 through 10 *and persisting until Year 10*.

The development of the stream of energy savings impacts involves discounting according to an assumed discount rate, or decay curve, to account for measure persistence over a theoretical measure life. This decay curve is an exponential decay, with median measure lifetime equal to the savings-weighted average measure life for each program area (calculated at the level of major end-uses for each program area—see Section 2.8 for further discussion). Thus, the savings implemented in each program year are extended into the future, using the exponential decay rate, such that half the savings remains after the measure life.[4]

[4] That is, we interpret the measure life 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.

With this interpretation and an assumed exponential decay, the fraction f of savings that survives from one year to the next is given by

$$f = 2^{-(1/L)}$$

where L is the measure life. For example, if the measure life is 15 years, the surviving fraction each year is

$$f = 2^{-1/15} = 95.5\%.$$

The decay rate is

$$d = 1-f = 4.5\%.$$

Thus, in this example, the surviving savings from the prior year is calculated as 95.5 percent of the prior year's amount; 4.5 percent of the prior year's savings is lost.

Future considerations. 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 presently account for this. However, the evaluation team has developed a "white-paper" that discusses this issue and presents possible methods for addressing it. After receiving review comments from interested stakeholders (including WECC), this paper was submitted to the PSCW for their review, and the PSCW has subsequently directed the evaluation team to incorporate in our impact measurement approaches the capability of estimating separately the energy savings from "accelerated" and "efficiency" savings.[5] As future Focus research and reporting incorporates these separate estimates they will be integrated in the stream of energy savings.

2.1.2 Energy impacts summaries

One of the routine tasks in preparing the evaluation semiannual reports is to reconcile the program gross energy impacts reported in WECC's monthly performance reports with the summary of the detailed data downloaded from the tracking system(s). This is now the third time that this process has been done with data from the new tracking system (the Wisconsin Energy Efficiency and Renewables Tracking System or WISeerts) for the Focus Business program developed by the Public Service Commission of Wisconsin (PSCW). This system replaces the Wisconsin Activity and Technology Tracking System (WATTS) developed by WECC.

One component of the Business Programs (BP) gross savings that WISeerts does not track is the ENERGY STAR rebate measures. This data is still maintained at WECC. In the last SAR

[5] Mimi Goldberg, Rick Winch, Tom Talerico, Ralph Prahl, and Bryan Ward. *Focus on Energy Evaluation: Treatment of Accelerated Savings*, July 2, 2008.

we indicated that there were some minor differences in the gross BP numbers between WECC's December 2008 monthly report and the gross impacts included in this report (e.g., evaluation estimates of overall gross savings are a little over one-percent higher than WECC's final December 2008 numbers). In an effort to identify and minimize this type of discrepancy, we worked with staff at WECC, the PSCW, and others on the evaluation team to ensure we were all using the same criteria for extracting and reporting on data from the various databases. For the first half of 2009 the gross numbers for BP reported are 201,330,517 kWh, 41,293 kW, and 8,923,550 therms.

2009 Residential program participant counts include 2,759 records representing "buydowns" for CFLs. These are claims made by retailers for CFLs sold at a reduced price to consumers. Program administrators take steps to allocate these sales appropriately to business and residential programs areas; however, no record is made of the number of consumers tied to each retailer claim. Forty-two percent of retailer claims are for three or fewer CFLs—suggesting the likelihood of a single consumer—but 267 claims are for more than 100 CFLs. Our approach for this report has been to count each claim as a "participant," recognizing that this undercounts the number of consumers who received CFLs under the buydown program.

Table 2-1a presents a summary by program area of the annual kWh, kW, and therm impacts with dollar values along with number of participants. It is important to note that these are ***lifecycle*** *verified gross* impacts. Thus, they reflect a stream of savings that incorporates measure life assumptions.[6]

Table 2-1a. All Programs: Tracked Energy Impacts—Lifecycle Verified Gross (July 1, 2001—June 30, 2009)

Program Area	Annual Verified kWh Saved	Annual Verified kW Saved	Annual Verified Therms Saved	Annual Dollar Value of Energy Saved	Number of Participants
Total Saved	**1,958,770,550**	**346,920**	**97,260,374**	**$268,576,809**	
Business	1,268,756,769	254,766	76,772,052	$172,670,755	84,861
Residential	628,205,427	82,270	14,946,810	$84,648,115	1,298,530
Renewables	61,808,354	9,884	5,541,512	$11,257,939	854

Note: The numbers in this table are ***lifecycle*** *verified gross* impacts. Thus, they reflect a stream of savings that incorporates measure life assumptions.

Table 2-1b also shows the same summary as Table 2-1a, but the values are *first year* annual impacts for verified gross—not *lifecycle.* They are also broken out by the Business, Residential, and Renewable Energy Program areas for energy efficiency measures implemented from July 1, 2001, through June 30, 2009, as documented in their respective tracking systems (Tracked Energy Impacts).

[6] The draft of this report showed lower lifetime savings values for residential programs because they omitted FY02 through FY04 savings from energy savings kits and appliance turn-in.

Table 2-1b. All Programs: Tracked Energy Impacts—Annual First Year Verified Gross (July 1, 2001–June 30, 2009)

	Annual Verified kWh Saved	Annual Verified kW Saved	Annual Verified Therms Saved	Annual Dollar Value of Energy Saved	Number of Participants
The First Half of 2009 (January 1, 2009–June 30, 2009)					
Total Saved	**255,206,356**	**44,514**	**9,519,301**	**$31,064,750**	
Business	187,493,082	38,649	7,935,606	$22,131,879	13,296
Residential	60,583,073	5,001	1,553,353	$8,302,759	91,696
Renewables	7,130,200	862	30,340	$630,111	171
The 18MCP (July 1, 2007–December 31, 2008)					
Total Saved	**599,423,280**	**105,624**	**26,622,738**	**$78,123,824**	
Business	412,262,916	87,835	20,247,680	$50,989,461	34,506
Residential	180,172,215	16,597	4,145,552	$24,101,457	407,717
Renewables	6,988,148	1,190	2,229,505	$3,032,905	401
FY07 (July 1, 2006–June 30, 2007)					
Total Saved	**238,189,767**	**41,008**	**13,694,194**	**$34,847,157**	
Business	151,014,313	32,282	11,513,742	$23,250,145	12,813
Residential	78,656,906	6,855	1,506,976	$10,144,534	214,788
Renewables	8,518,546	1,870	673,474	$1,452,477	117
FY06 (July 1, 2005–June 30, 2006)					
Total Saved	**218,883,777**	**41,469**	**13,042,576**	**$33,117,671**	
Business	131,863,070	28,308	9,418,597	$20,039,321	13,019
Residential	73,961,454	11,286	1,573,063	$9,733,386	226,918
Renewables	13,059,251	1,874	2,050,914	$3,344,963	87
FY05 (July 1, 2004–June 30, 2005)					
Total Saved	**214,892,987**	**35,913**	**9,175,217**	**$28,452,157**	
Business	110,718,465	20,905	7,106,161	$15,445,041	13,258
Residential	82,266,120	11,745	1,725,612	$10,796,282	207,772
Renewables	21,908,400	3,262	343,443	$2,210,833	65
FY04 (July 1, 2003–June 30, 2004)					
Total Saved	**228,323,107**	**37,696**	**14,467,224**	**$34,799,967**	
Business	137,364,603	23,543	12,613,286	$22,972,226	1,561
Residential	90,474,549	13,931	1,640,104	$11,552,445	212,891
Renewables	483,953	220	213,833	$275,296	52
FY03 (July 1, 2002–June 30, 2003)					
Total Saved	**221,681,741**	**35,777**	**8,086,332**	**$27,661,851**	
Business	128,323,628	21,384	6,196,248	$15,574,474	1,528
Residential	89,638,259	13,787	1,890,083	$11,776,025	156,599
Renewables	3,719,852	604	0	$311,351	31
FY02 (July 1, 2001–June 30, 2002)					
Total Saved	**56,484,523**	**11,705**	**2,652,791**	**$7,873,550**	
Business	30,532,158	7,036	1,740,728	$4,009,527	1,164
Residential	25,952,364	4,668	912,062	$3,864,023	57,321

Note: The numbers in this table *are annual first year savings*—not *lifecycle.* Also, the numbers in this table are the verified gross savings.

Table 2-1c again provides the *lifecycle* approach to estimating energy impacts and also shows by program area the *lifecycle verified gross, lifecycle verified net,* and the net-to-gross percentages used to derive verified net from verified gross. Table 2-1d corresponds to Table 2-1b by presenting *first year* (not *lifecycle*) summary results. For Table 2-1d the gross, verified gross, and verified net energy impacts are shown by fiscal year and program area.

Table 2-1c. All Programs: Tracked Energy Impacts - Lifecycle Verified Gross and Lifecycle Verified Net (July 1, 2001–June 30, 2009)

	Annual kWh Saved			kW Reduction			Annual Therms Saved		
	Verified Gross	Verified Net	NTG	Verified Gross	Verified Net	NTG	Verified Gross	Verified Net	NTG
Total Saved	**1,958,770,550**	**1,334,064,309**	**68%**	**346,920**	**227,992**	**66%**	**97,260,374**	**59,244,763**	**61%**
Business	1,268,756,769	755,364,555	60%	254,766	150,626	59%	76,772,052	44,221,252	58%
Residential	628,205,427	560,729,712	89%	82,270	73,812	90%	14,946,810	13,270,167	89%
Renewables	61,808,354	17,970,042	29%	9,884	3,554	36%	5,541,512	1,753,344	32%

Note: The numbers in this table are lifecycle verified gross and lifecycle verified net.

Table 2-1d. All Programs: Tracked Energy Impacts - Annual First Year
Program to Date (July 1, 2001–June 30, 2009)

	Annual kWh Saved			kW Reduction			Annual Therms Saved		
	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net
The First Half of 2009 (January 1, 2009–June 30, 2009)									
Total Saved	**275,195,112**	**255,206,356**	**163,435,286**	**47,707**	**44,514**	**26,522**	**10,508,766**	**9,519,301**	**4,844,437**
Business	201,330,517	187,493,083	112,210,061	41,293	38,650	22,830	8,923,550	7,935,607	3,742,104
Residential	62,186,824	60,583,073	47,685,558	5,087	5,002	3,235	1,553,411	1,553,353	1,092,862
Renewables	11,677,772	7,130,200	3,539,667	1,327	862	457	31,806	30,341	9,471
The 18MCP (July 1, 2007–December 31, 2008)									
Total Saved	**634,527,786**	**599,423,280**	**399,106,995**	**112,183**	**105,624**	**66,500**	**28,697,916**	**26,622,738**	**14,757,962**
Business	442,832,926	412,262,917	246,385,380	93,853	87,836	51,982	22,145,197	20,247,680	10,796,591
Residential	179,877,412	180,172,215	148,771,644	16,584	16,598	13,815	4,143,595	4,145,552	3,278,330
Renewables	11,817,448	6,988,149	3,949,971	1,746	1,190	703	2,409,124	2,229,506	683,041
FY07 (July 1, 2006–June 30, 2007)									
Total Saved	**260,254,357**	**238,189,767**	**162,763,097**	**43,911**	**41,008**	**27,979**	**15,914,328**	**13,694,194**	**8,520,818**
Business	157,130,223	151,014,314	98,462,584	33,460	32,282	21,776	13,658,924	11,513,743	6,809,760
Residential	94,250,649	78,656,907	63,883,459	8,913	6,855	5,852	1,566,780	1,506,977	1,394,290
Renewables	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 Saved	**234,862,916**	**218,883,777**	**166,124,214**	**44,348**	**41,469**	**30,494**	**13,606,641**	**13,042,576**	**6,311,815**
Business	131,911,853	131,863,071	91,697,275	28,366	28,309	19,042	9,674,445	9,418,597	4,365,774
Residential	90,185,421	73,961,454	72,078,061	14,066	11,286	11,066	1,858,471	1,573,064	1,489,822
Renewables	12,765,642	13,059,252	2,348,878	1,916	1,874	385	2,073,725	2,050,914	456,220
FY05 (July 1, 2004–June 30, 2005)									
Total Saved	**276,013,670**	**214,892,987**	**152,928,433**	**41,103**	**35,913**	**22,850**	**9,615,956**	**9,175,217**	**5,232,659**
Business	143,707,711	110,718,465	55,861,214	27,083	20,906	9,972	7,045,122	7,106,161	3,463,969
Residential	112,935,136	82,266,121	92,805,638	11,027	11,745	11,893	2,123,643	1,725,612	1,680,593
Renewables	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 Saved	**282,836,318**	**228,323,107**	**168,974,239**	**44,697**	**37,696**	**26,986**	**13,556,180**	**14,467,224**	**12,436,908**
Business	156,470,715	137,364,604	79,935,444	28,607	23,544	13,187	11,639,771	12,613,286	10,614,752
Residential	125,867,708	90,474,549	88,589,694	15,890	13,932	13,604	1,824,949	1,640,105	1,622,408
Renewables	497,895	483,954	449,101	199	220	195	91,460	213,833	199,749
FY03 (July 1, 2002–June 30, 2003)									
Total Saved	**230,845,735**	**221,681,741**	**145,617,986**	**38,144**	**35,777**	**23,213**	**7,935,747**	**8,086,332**	**5,523,996**
Business	129,814,716	128,323,629	62,483,249	23,353	21,385	10,551	6,258,454	6,196,249	3,642,577
Residential	97,358,904	89,638,260	80,130,947	14,066	13,788	12,184	1,677,293	1,890,084	1,881,419
Renewables	3,672,115	3,719,852	3,003,790	725	604	478	0	0	0
FY02 (July 1, 2001–June 30, 2002)									
Total Saved	**54,507,968**	**56,484,523**	**39,048,723**	**10,935**	**11,705**	**8,163**	**3,673,296**	**2,652,791**	**1,616,168**
Business	30,559,935	30,532,158	18,764,493	6,966	7,036	4,397	2,760,541	1,740,729	785,725
Residential	23,948,033	25,952,365	20,284,229	3,969	4,668	3,766	912,755	912,062	830,443

Note: The numbers in this table are *annual first year* (not *lifecycle).*

As cited above, Figures 2-1, 2-2, and 2-3 below reflect the *lifecycle verified gross* stream of energy savings over time from program inception in fiscal year 2002 for twenty years, through

calendar year 2021. These graphs are based on the verified gross savings shown in Table 2-1c, above. The savings implemented each fiscal year continue over the effective useful life of the measures installed to realize the savings. The charts show that the lifecycle savings peak at about 1,959 GWh and 97.3 million therms at the end of June 2009 (the current reporting period) and then begin to decline since it only reflects those measures that have been installed through June 2009. The electricity savings for the residential programs decline 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. For example, the High Bay Fluorescent Lighting measure category that accounts for approximately 28.5 percent of the business programs savings (see Figure 2-7) has an expected measure life of fifteen years. There are measures for both programs that have expected measure lives of more than fifteen years.

Figures 2-4 through 2-6, below, again present energy, demand, and gas savings through 2021, but incorporate the decay factor and verified net—and are thus the *persistent verified net savings*.

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 are extended into the future with an exponential decay rate, such that half the savings remains after the measure life.

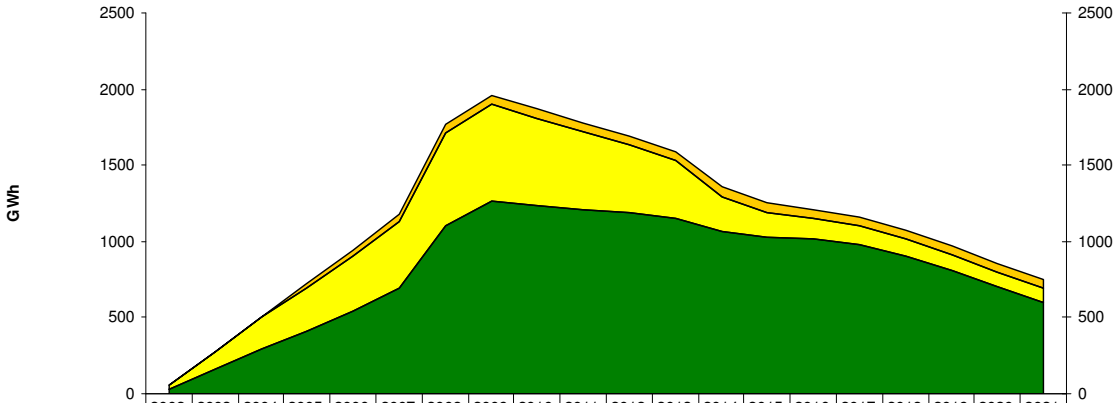
That is, we interpret the measure life identified from the literature as the time until half the units would be expected to have failed or been removed. This interpretation is consistent with the persistence study framework used in California and elsewhere. Under those rules, the "expected useful life" is the median survival time, where "surviving" means remaining in place and operable. (See section 2.8 for additional discussion of these computations.)

Additional explanation of the cumulative stream of demand reduction impacts for Focus on Energy will also aid in interpretation of Figure 2-2 and Figure 2-5. In particular, guidance for calculating demand impacts for Focus can be found in the Focus Business Programs Operations Manual (page 57). It specifies that the demand (kW) impacts for Focus measures should be calculated for non-weather dependent equipment based on the "average kW savings over the period from 1:00 pm to 4:00 pm, Monday through Friday, during the months of June through August. Average kW is the kWh savings realized over the three-hour peak period (1:00 pm to 4:00 pm), divided by these same three hours per day for weather dependent measures, such as air conditioning they will be calculated based on state-wide average design-day conditions as defined by the latest version of ASHRAE Fundamentals."

The manual provides further guidance in the calculation of demand impacts, and this guidance has evolved over the life of the Focus program. The current level of specificity can be especially important because in many cases the incentives paid to participants explicitly consider the demand impacts of equipment.

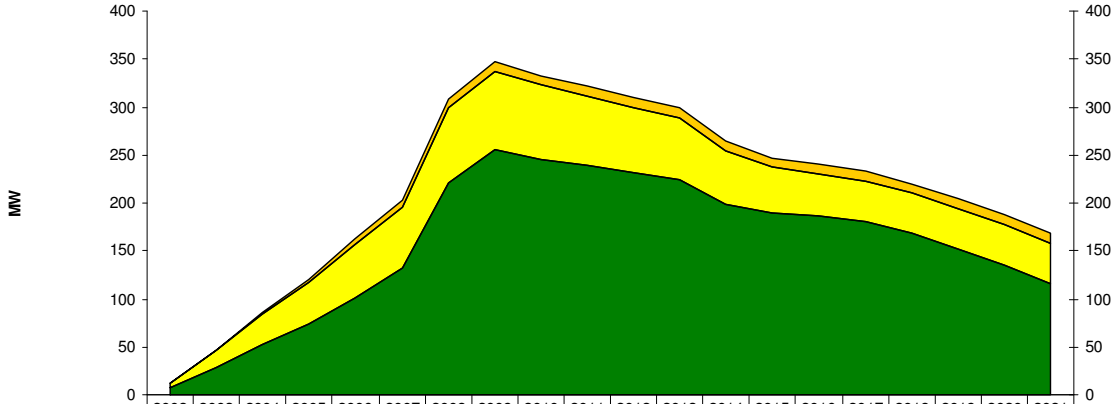
The changes over time in the guidance regarding the calculation of demand impacts for Focus measures means that cumulative demand impacts across program years (reflected in Figure 2-2 and Figure 2-5) are not based on exactly the same definition (since changes in the calculation guidance are not applied retroactively).

Figure 2-1. Lifecycle Verified Gross Electricity Savings (GWh)



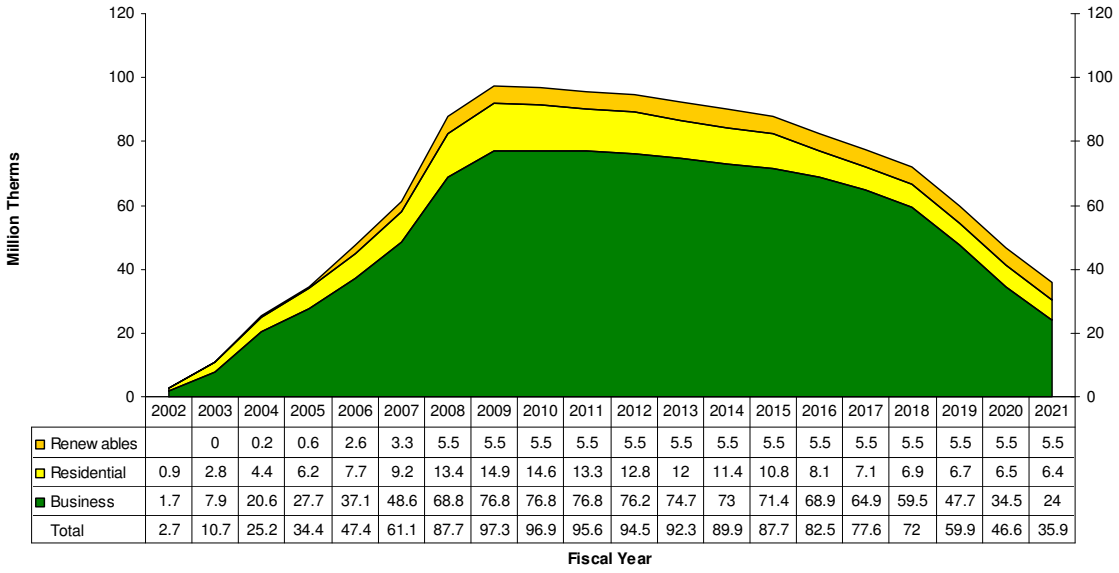
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		4	4	26	39	48	55	62	62	62	62	62	62	62	62	62	62	62	62	62
Residential	26	116	206	288	362	441	612	628	571	507	449	375	234	167	132	119	110	100	96	96
Business	31	159	296	407	539	690	1102	1269	1236	1210	1184	1151	1060	1023	1014	983	904	810	700	595
Total	56	278	506	721	940	1178	1768	1959	1868	1779	1695	1588	1356	1252	1207	1163	1075	972	858	753

Figure 2-2. Lifecycle Verified Gross Electricity Demand Reductions (MW)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		1	1	4	6	8	9	10	10	10	10	10	10	10	10	10	10	10	10	10
Residential	5	18	32	44	55	62	79	82	78	73	69	65	55	47	43	42	42	42	42	42
Business	7	28	52	73	101	133	221	255	245	239	231	224	199	190	187	181	168	152	136	116
Total	12	47	85	121	163	204	309	347	333	321	310	298	263	247	240	234	220	204	188	168

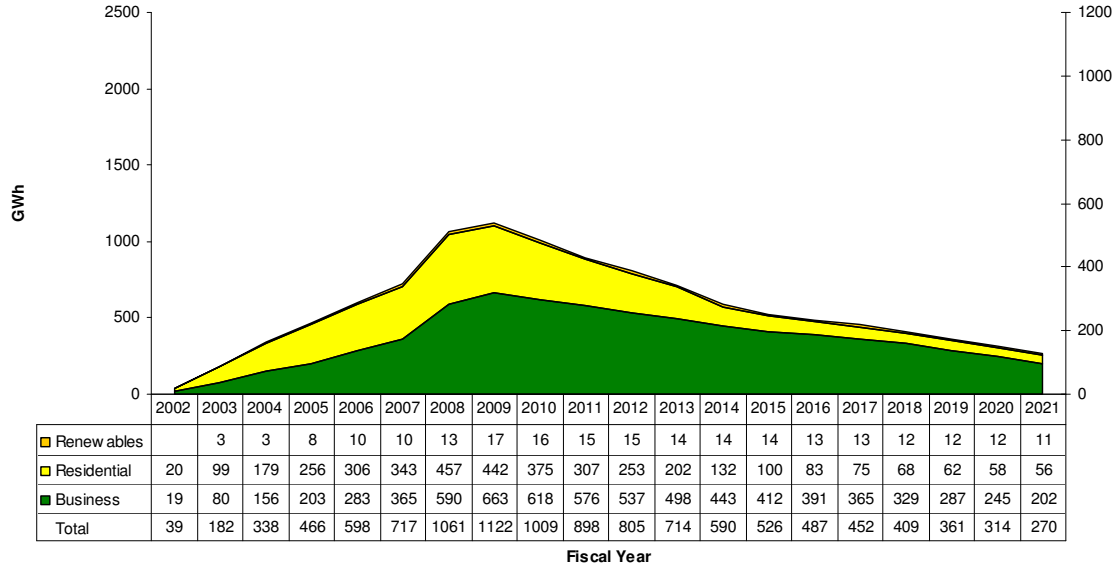
Figure 2-3. Lifecycle Verified Gross Gas Savings (Million Therms)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		0	0.2	0.6	2.6	3.3	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Residential	0.9	2.8	4.4	6.2	7.7	9.2	13.4	14.9	14.6	13.3	12.8	12	11.4	10.8	8.1	7.1	6.9	6.7	6.5	6.4
Business	1.7	7.9	20.6	27.7	37.1	48.6	68.8	76.8	76.8	76.8	76.2	74.7	73	71.4	68.9	64.9	59.5	47.7	34.5	24
Total	2.7	10.7	25.2	34.4	47.4	61.1	87.7	97.3	96.9	95.6	94.5	92.3	89.9	87.7	82.5	77.6	72	59.9	46.6	35.9

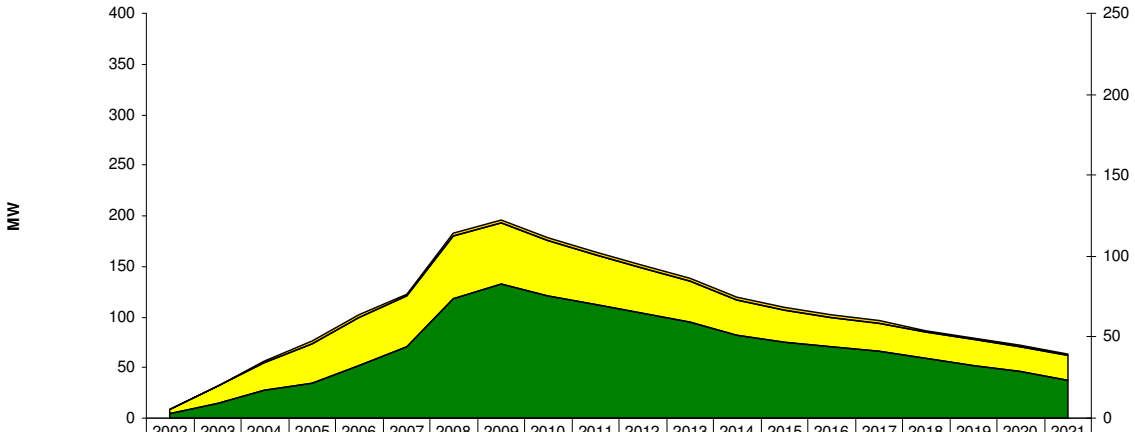
Figures 2-4, 2-5, and 2-6 reflect the stream of *persistent verified net* savings—thus applying a decay factor to the lifecycle savings—and indicate that the savings stream peaks at about 1,122 GWh and 51.2 million therms at the end of June 2009 (the current reporting period). It also declines, again because it only reflects those measures that have been installed through June 2009. We do not account for future purchase behavior for the same measure that may have been affected by participation in the program.

Figure 2-4. Persistent Verified Net Electricity Savings (GWh)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		3	3	8	10	10	13	17	16	15	15	14	14	14	13	13	12	12	12	11
Residential	20	99	179	256	306	343	457	442	375	307	253	202	132	100	83	75	68	62	58	56
Business	19	80	156	203	283	365	590	663	618	576	537	498	443	412	391	365	329	287	245	202
Total	39	182	338	466	598	717	1061	1122	1009	898	805	714	590	526	487	452	409	361	314	270

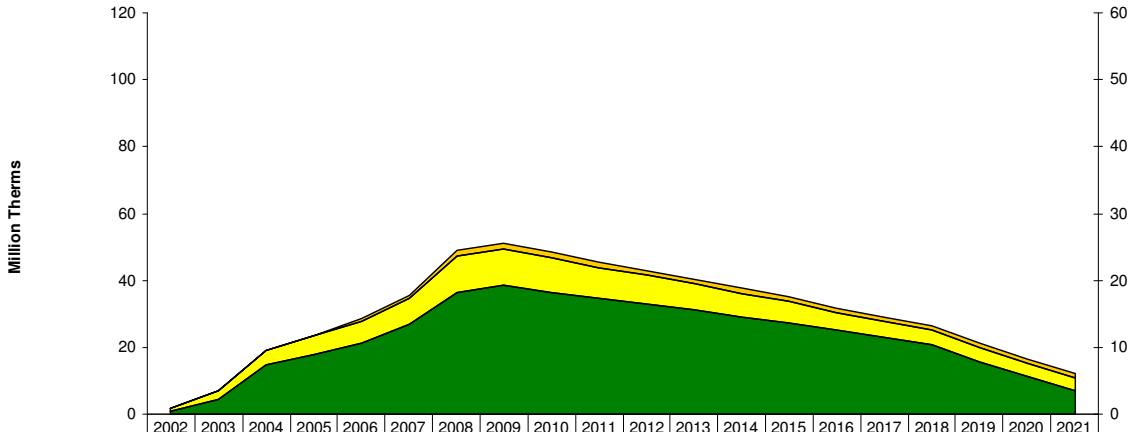
Figure 2-5. Persistent Verified Net Electricity Demand Reductions (MW)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		0	1	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2
Residential	4	16	28	39	48	51	62	61	55	49	45	40	35	31	28	27	26	25	24	24
Business	4	15	27	35	52	70	118	132	121	112	103	95	82	75	71	66	59	52	46	38
Total	8	31	56	76	102	123	182	196	179	164	150	138	119	108	102	96	88	80	73	64

Fiscal Year

Figure 2-6. Persistent Verified Net Gas Savings (Million Therms)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Renew ables		0	0.2	0.3	0.7	1	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.1
Residential	0.8	2.7	4.1	5.6	6.7	7.8	10.7	11.2	10.4	9.2	8.6	7.8	7.1	6.6	5.4	4.9	4.7	4.4	4.2	4.1
Business	0.8	4.4	14.8	17.6	21.1	26.9	36.4	38.4	36.5	34.7	32.9	31.1	29	27.2	25	22.8	20.6	15.6	11.1	6.9
Total	1.6	7.1	19.1	23.4	28.6	35.7	48.8	51.2	48.4	45.4	42.9	40.3	37.5	35	31.7	28.9	26.5	21.2	16.4	12

Fiscal Year

Figure 2-7. Verified Gross Electric Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

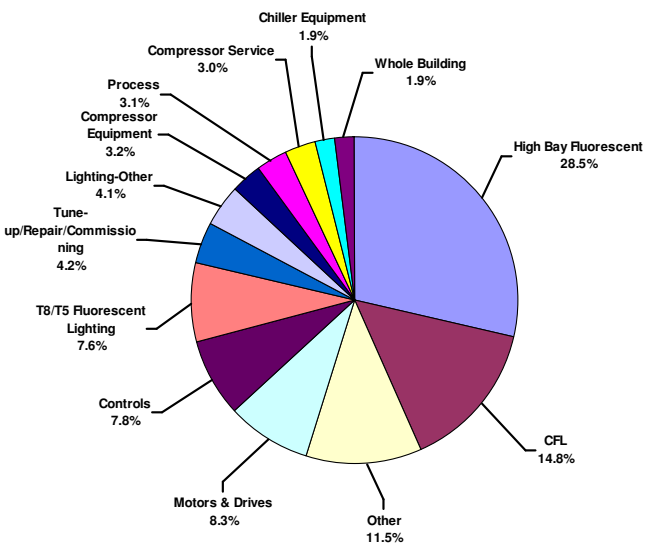


Figure 2-8. Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)

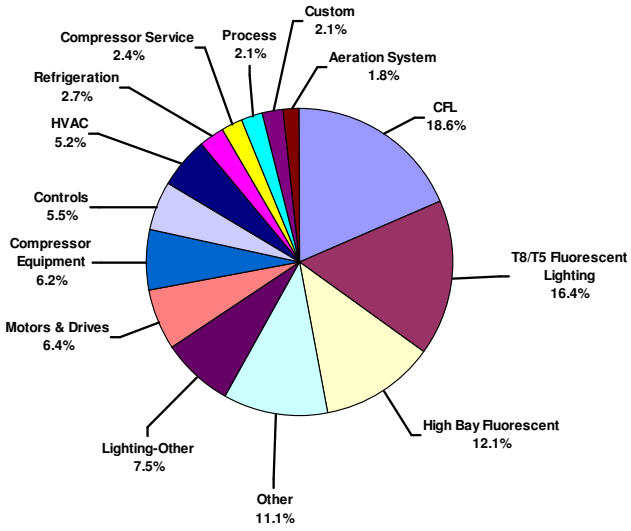


Table 2-2. Verified Gross Electric Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified Gross kWh	Percent of Total
High Bay Fluorescent	53,525,233	28.5%
CFL	27,796,321	14.8%
Other	21,536,256	11.5%
Motors & Drives	15,571,384	8.3%
Controls	14,654,586	7.8%
T8/T5 Fluorescent Lighting	14,288,694	7.6%
Tune-up/Repair/Commissioning	7,833,123	4.2%
Lighting-Other	7,625,673	4.1%
Compressor Equipment	6,060,999	3.2%
Process	5,822,575	3.1%
Compressor Service	5,652,349	3.0%
Chiller Equipment	3,649,185	1.9%
Whole Building	3,476,705	1.9%

Table 2-3. Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)

Measure Category	Verified Gross kWh	Percent of Total
CFL	239,421,191	18.6%
T8/T5 Fluorescent Lighting	211,029,130	16.4%
High Bay Fluorescent	155,501,440	12.1%
Other	143,110,406	11.1%
Lighting-Other	96,258,113	7.5%
Motors & Drives	82,182,915	6.4%
Compressor Equipment	79,575,704	6.2%
Controls	70,774,679	5.5%
HVAC	67,024,119	5.2%
Refrigeration	35,264,189	2.7%
Compressor Service	31,463,279	2.4%
Process	27,625,828	2.1%
Custom	27,532,945	2.1%
Aeration System	22,808,302	1.8%

Figure 2-9. Verified Gross Gas Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

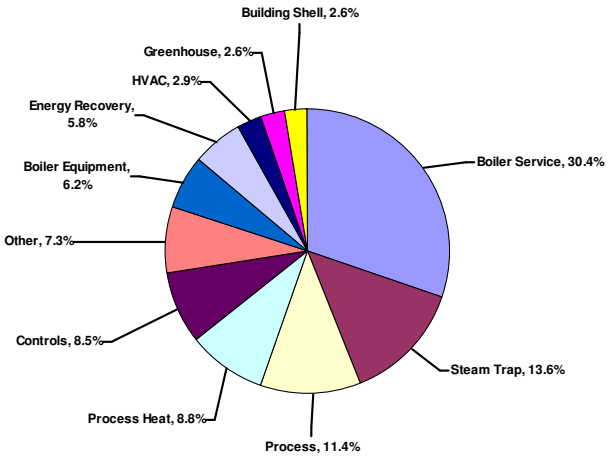


Figure 2-10. Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)

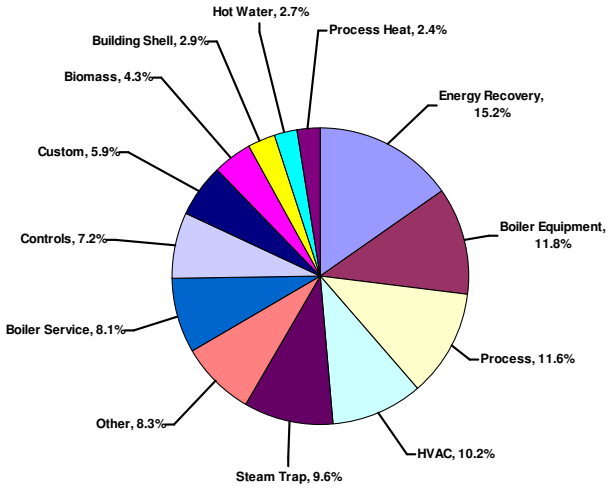


Table 2-4. Verified Gross Gas Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified Gross Therms	Percent of Total
Boiler Service	2,408,705	30.4%
Steam Trap	1,078,826	13.6%
Process	906,585	11.4%
Process Heat	696,594	8.8%
Controls	671,557	8.5%
Other	582,677	7.3%
Boiler Equipment	488,538	6.2%
Energy Recovery	459,259	5.8%
HVAC	231,314	2.9%
Greenhouse	208,042	2.6%
Building Shell	203,511	2.6%

Table 2-5. Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)

Measure Category	Verified Gross Therms	Percent of Total
Energy Recovery	11,677,492	15.2%
Boiler Equipment	9,027,301	11.8%
Process	8,867,809	11.6%
HVAC	7,833,454	10.2%
Steam Trap	7,357,063	9.6%
Other	6,351,635	8.3%
Boiler Service	6,193,931	8.1%
Controls	5,538,928	7.2%
Custom	4,504,209	5.9%
Biomass	3,277,426	4.3%
Building Shell	2,245,864	2.9%
Hot Water	2,034,687	2.7%
Process Heat	1,862,253	2.4%

Figure 2-11. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

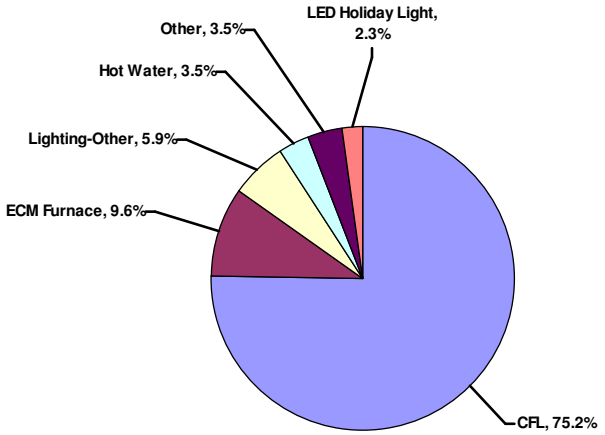


Figure 2-12. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)

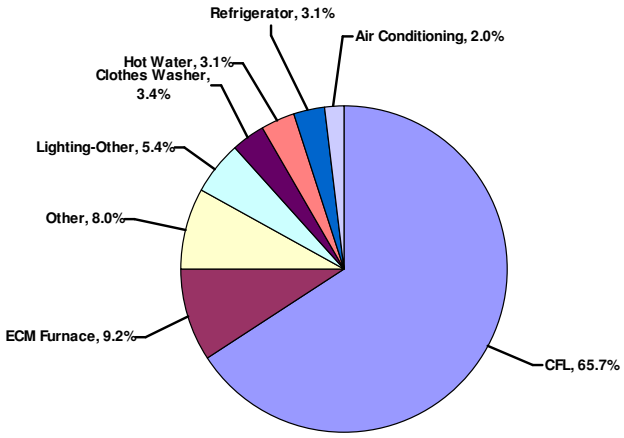


Table 2-6. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified Gross kWh	Percent of Total
CFL	45,532,803	75.2%
ECM Furnace	5,833,444	9.6%
Lighting-Other	3,573,516	5.9%
Hot Water	2,134,125	3.5%
Other	2,098,227	3.5%
LED Holiday Light	1,410,958	2.3%

Table 2-7. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)

Measure Category	Verified Gross kWh	Percent of Total
CFL	448,068,315	65.7%
ECM Furnace	62,937,642	9.2%
Other	54,795,254	8.0%
Lighting-Other	36,975,415	5.4%
Clothes Washer	23,416,387	3.4%
Hot Water	21,229,198	3.1%
Refrigerator	20,942,508	3.1%
Air Conditioning	13,340,225	2.0%

Figure 2-13. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

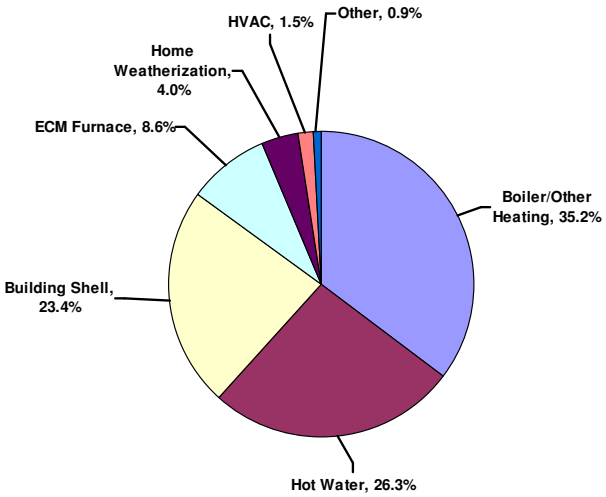


Figure 2-14. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)

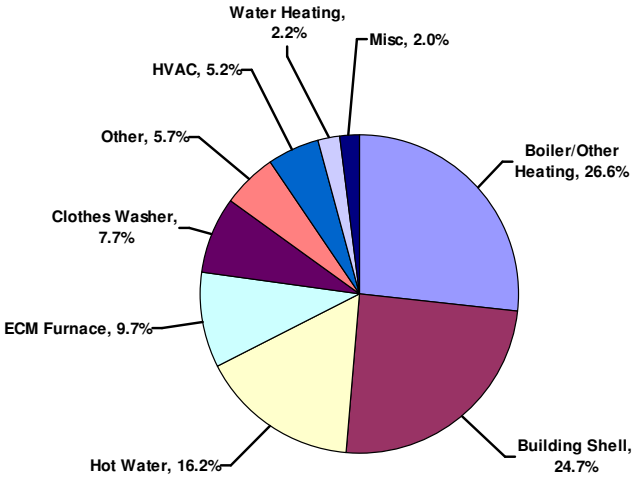


Table 2-8. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified Gross Therms	Percent of Total
Boiler/Other Heating	547,506	35.2%
Hot Water	408,903	26.3%
Building Shell	363,295	23.4%
ECM Furnace	133,935	8.6%
Home Weatherization	62,408	4.0%
HVAC	22,716	1.5%
Other	14,591	0.9%

Table 2-9. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)

Measure Category	Verified Gross Therms	Percent of Total
Boiler/Other Heating	3,981,225	26.6%
Building Shell	3,699,132	24.7%
Hot Water	2,422,971	16.2%
ECM Furnace	1,448,655	9.7%
Clothes Washer	1,143,878	7.7%
Other	859,310	5.7%
HVAC	772,506	5.2%
Water Heating	323,996	2.2%
Miscellaneous	295,138	2.0%

The figures above (Figures 2-7 through 2-14) 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 prior to October 1, 2004, documented in FY06 are presented as a range. [7] The report providing these estimates characterized the lower estimate as a "robust" estimate at about 1.1 million annual kWh saved and 298 annual kW reduction and the higher estimate as a "basic" estimate of about 16.2 million annual kWh saved and over 4,600 annual kW reduction.

Table 2-10. Nontracked Energy Impacts

Program Area (Sector)	Program		Annual kWh Saved	kW Reduction	Annual Therms Saved
Residential	ENERGY STAR Products - CFLs FY03		14,964,840	453	0
Residential	ENERGY STAR Products - CFLs FY02		2,302,014	70	0
Business	CFL Participants—prior to October 1, 2004, documented in FY06	Robust	1,108,813	298	0
		Basic	16,196,526	4,609	0
Business	Non-CFL Participants—prior to October 1, 2004, documented in FY06		629,248	452	845
	Total	Robust	**19,005,005**	**1,273**	**845**
		Basic	**34,092628**	**5,584**	**845**

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.

In the previous18-month contract period (18MCP) additional research on nontracked energy impacts was completed for the Education & Training Program in the business programs. The primary purpose of the Focus on Energy Business Programs Education and Training (E&T)

[7] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc , *Focus on Energy Statewide Evaluation, Business Programs: Participant Spillover Savings Study, Final Report*: December 22, 2005.

Program Untracked Savings Study was to estimate untracked[8] attributable savings (UAS) resulting from the E&T Program. These UAS are the E&T-attributable portion of energy savings from projects that do not appear in the Focus WATTS or WISeerts databases and were implemented at the building or facilities of the trainees' companies. We estimated the E&T UAS that occurred in the recent past and used these past energy savings to project 2008 E&T Program UAS. For the CY09 period, the E&T UAS annual estimates will be included in the final (year-end) CY09 evaluation report.[9]

It is important to note that these untracked attributable savings are different from participant spillover savings that we estimated in previous studies. When we estimated participant spillover effects from the Focus on Energy Business Programs in 2005, we were estimating the level of untracked energy savings that had "spilled over" due to the influence of tracked projects. To credit a project with participant spillover energy savings, we had to find a causal link between the older tracked project and the newer untracked project. For example, a program participant might have had a positive experience with a tracked energy-savings project and decided to implement similar projects in their other facilities. Although in most cases such program participants would have also sought Focus financial incentives for these new projects (therefore making them "tracked projects"), sometimes they did not and these were generally the types of projects that produced participant spillover energy savings.

The untracked attributable savings from the Focus E&T Program are different from the aforementioned participant spillover savings. They do not represent spillover from an earlier tracked project, but are the first effects of a clearly identified program activity (e.g., a company representative took a particular training course).[10] This explicit causal link between an E&T Program training course and a specific energy-saving project also distinguishes the E&T Program untracked energy savings from more loosely defined claims of program market effects where the causal links between program effects and end user behaviors are not clearly defined.[11]

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[8] The terms "tracked" and "untracked" indicate whether or not an energy-efficient project appears in the Focus WATTS or WISeerts program tracking databases and therefore were included in the Business Program's *ex ante* gross energy savings claims. In theory any energy-saving project that the Focus program influenced, even if this influence did not include financial incentives, can be claimed in these program tracking databases. In reality, however, the projects listed in these databases are almost exclusively projects that received financial incentives from Focus on Energy.

[9] Estimation of E&T program untracked attributable savings (UAS) requires gathering training counts and attendance as well as "verifying" counts for inclusion in the E&T impact methodology (where verifying entails comparing the courses to those used in the 2008 E&T study).

[10] This is not to say that the trainees were not influenced by earlier tracked projects. They could have been. But we are assuming that in assigning relative attribution to the training courses, the trainees are accounting for these other influences. So, for example, if an untracked project was mostly influenced by a positive experience with a tracked project and only slightly influenced by a training course, we are assuming that the respondent would capture the lesser influence of the training course in the way that they responded to the program attribution questions. The estimated effects of tracked projects on untracked projects would be captured elsewhere through our estimates of participant spillover.

[11] Untracked attributable savings are not based on attendance counts at E&T events that occur in the current year. Rather, they represent delayed direct impacts based on a net percentage of attendance that occurs in past years (up to four). For instance, for one-time projects the energy savings in a given year represent the sum of the energy savings streams from the four past years of Focus BP trainings. So, the 2008 E&T untracked attributable savings represent the modeled estimate of the

For additional description of the methodology used please see the full report for the Education & Training Spillover study.[12] For informational purposes, Table 2-11 shows untracked attributable savings (UAS) for year 2008 by project type (one-time vs. O&M projects) and savings type (as reported in the 18 MCP evaluation report). As noted above, for the CY09 period the E&T UAS annual estimates will be included in the final (year-end) CY09 evaluation report.

Table 2-11. Untracked Attributable Savings (UAS) for 2008 by Project Type and Savings Type

Project Type	Savings Type	2008
One-time	kWh	6,149,181
One-time	kW	751
One-time	therms	3,268,883
O&M	kWh	2,799,165
O&M	kW	1,695
O&M	therms	549,388
All	**kWh**	**8,948,346**
All	**kW**	**2,447**
All	**therms**	**3,818,271**

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. 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. For example, 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. Then, policy makers and administrators can use the

savings from projects that were implemented in 2008 that were the result of trainings in 2004, 2005, 2006, and 2007. The number of trainees in 2008 would not factor into this calculation, but could be used in the model, along with other past annual trainee counts, to estimate E&T untracked attributable savings for 2009

[12] Christopher Dyson, Ken Agnew, Miriam Goldberg, and Claire Palmgren, KEMA Inc , *Focus on Energy Evaluation, Business Programs: Impact Evaluation of the Education and Training Program, Final Report:* November 20, 2008,

evaluation 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 appropriate 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. Given the rapidly changing retail markets for ENERGY STAR lighting, for CY09 a different approach is being used to: (1) determine the extent to which market effects are occurring in the Wisconsin markets (e.g., for CFLs); and (2) estimate net CFLs currently installed (attributable to the Focus program). For more information on the approach, and current progress, see section 4.2 below.

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 energy bill surcharge 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 2009:

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 Regional Economic Models, Inc. (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:

a. Lower business operating costs
b. Lower household living costs
c. Reduced outflow of dollars to purchase out-of-state coal and natural gas
d. Increase in dollars going to equipment manufacturers and installers in Wisconsin
e. Emissions benefits from NO_x and SO_2 reductions (monetized)
f. Non-energy benefits (monetized)
g. Indirect effects on orders for business suppliers and induced effects of workers re-spending their income within Wisconsin.
h. 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:

a. Diversified business growth
b. Expanded mix of those jobs available to Wisconsin residents
c. Shifts in the nature and size of impacts occurring over time
d. Shifts in the competitiveness of Wisconsin as a place to live and to locate a business

e. 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.

2.4.1 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 2-12a and 2-12b 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 2-12a and 2-12b. 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. **All impacts are based on persistent net savings.					

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. **All impacts are based on persistent net savings.					

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.

The economic analysis for Focus on Energy is scheduled to be conducted again in the 2009 contract period (CY09). Results will be provided in a final CY09 evaluation report issued at the end of the first calendar quarter of 2010.

2.5 ENVIRONMENTAL IMPACTS

Evaluators also estimated emission factors or rates for the electric generating plants serving Wisconsin (Table 2-13)[ii] and used these data to estimate displaced emissions associated with the Focus programs (Table 2-14). The evaluation team estimated the generation emissions rates shown in Table 2-13 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 2-15) 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.

Table 2-13. 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.

The following table shows emissions factors by fuel type for 2000 and 2005 *on all units*. (Note that the basis is therefore different from that for Table 2-15, which represents only marginal plants.)

Table 2-14. 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)		Mercury (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.

The emissions rates provided in Table 2-15 have been updated (since the last semiannual report) based on evaluation team research. In this research, we compare our approach to the recent World Resources Institute "Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects," with special attention to the identification of plants operating on the margin of system supply. We described an approach that uses the average duration of operation of each generating unit to identify the dispatch order and thus plants operating on the margin. We use data from 2002 to 2006 from the Environmental Protection Agency's (EPA) "Acid Rain Hourly Emissions" data series to estimate an emission rate for CO_2, NO_X, and SO_X for all monitored utilities serving on the grid that serves Wisconsin. We find that emission rates for all pollutants have declined over the study period. We trace this decline to the decreasing use of coal generation at the margin.

Table 2-15. Emissions Rates

Emissions	Generation lbs/MWh	On-site Therms lbs/Therms*
NO_x	2.87	0.009804
SO_2	2.71	0.0000588
Mercury	0.0000154	0.00000002549
CO_2	1,700	11.76

Sources: Generation factors from *Quantifying Environmental Benefits of Focus on Energy: Emission-rate Estimates 2002 to 2006.* Eric Rambo, Bryan Ward and David Sumi. PA Consulting Group Report for the Public Service Commission of Wisconsin, October 28, 2008.

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 emission rates and evaluation-verified *gross* electricity savings estimates,[iii] the Focus programs together potentially displaced 6,575,212 pounds of NO_x; 5,313,987 pounds of SO_2; over 4,473 million pounds of CO_2; and over 32.6 pounds of mercury from Focus inception to June 30, 2009 (Table 2-17). *[Note: We are reporting emissions based on verified gross impacts to be consistent with the policy of publicly reporting based on verified gross energy impacts. However, the reader should be aware that the economic and benefit-cost analyses for Focus use calculate avoided emissions based on persistent net energy impacts. Further, markets for greenhouse gases (GHG), and the protocols for quantifying and reporting GHG effects, stringently require net emissions impacts.]*

Table 2-16 Verified Gross Emissions Displaced (lbs) Annually
The First Half of 2009 (January 1, 2009–June 30, 2009)

Program Area	Verified Gross MWh	Verified Gross Therms	NO_x	SO_2	CO_2	Mercury
Business	187,493	7,935,607	615,905	508,572	412,060,973	3.09
Renewables	7,130	30,341	20,761	19,324	12,478,145	0.11
Residential	60,583	1,553,353	189,102	164,271	121,258,661	0.97
Total	**255,206**	**9,519,301**	**825,769**	**692,168**	**545,797,780**	**4.17**

Table 2-17 Lifecycle Verified Gross Emissions Displaced (lbs) Annually Cumulative in Current Year (July 1, 2001–June 30, 2009)

Program Area	Lifecycle Verified Gross MWh	Lifecycle Verified Gross Therms	NO_x	SO_2	CO_2	Mercury
Business	1,268,757	76,772,052	4,394,005	3,442,845	3,059,725,836	21.50
Renewables	61,808	5,541,512	231,718	167,826	170,242,385	1.09
Residential	628,205	14,946,810	1,949,488	1,703,315	1,243,723,708	10.06
Total	**1,958,771**	**97,260,374**	**6,575,212**	**5,313,987**	**4,473,691,929**	**32.64**

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.

An additional estimation of the verified gross emissions displaced in the first half of 2009 is shown in Table 2-18. This presentation of the verified gross emissions displaced adjusts the results for the Renewables program by removing the CO_2 (and SO_x and NO_x) impacts for the program's biomass projects. With reference to *The GHG Protocol for Project Accounting* (World Resources Institute and World Business Council for Sustainable Development, 2005), these biomass projects are seen as a source of "upstream" secondary effects. That is, these projects use biomass fuels to generate electricity, heat, or steam and cause changes in the release of CO_2 (and to some extent SO_x and NO_x) from the project processes. The evaluation team will, in CY09, estimate the direction (positive or negative in terms of emissions released) and relative magnitude of this secondary effect by obtaining appropriate emission rates to apply to the levels of biomass inputs used in the program projects. For now, the reduced verified gross emissions displaced as shown in Table 2-18 reflect application of the "conservativeness principle" that the GHG Protocol suggests guide any effort to assess the significance of secondary effects.

Table 2-18. Verified Gross Emissions Displaced (lbs) Annual with Adjustments for Energy Impacts from Renewables Biomass/Biogas The First Half of 2009 (January 1, 2009–June 30, 2009)

Program Area	Verified Gross MWh	Verified Gross Therms	NO_x	SO_2	CO_2	Mercury
Business	187,493	7,935,607	615,905	508,572	412,060,973	3.09
Renewables	797	13,968	2,423	2,159	1,518,553	0.01
Residential	60,583	1,553,353	189,102	164,271	121,258,661	0.97
Total	**248,873**	**9,502,928**	**807,431**	**675,004**	**534,838,189**	**4.07**

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 2-19 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.[13] 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.

Table 2-19. Value of Non-energy Benefits by Program Area

Program Area	Value of Non-energy Benefits	
	The First Half of 2009 (January 1, 2009–June 30, 2009)	**Lifecycle Persistent Net (as of June 30, 2009)**
Business Programs	$3.6 million	$25.9 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	$2.3 million	$35.3 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.		

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

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

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

Program Area	Value of Non-energy Benefits	
	The First Half of 2009 (January 1, 2009–June 30, 2009)	Lifecycle Persistent Net (as of June 30, 2009)
Renewable Energy Programs	$338,002	$1,269,599

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.

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 18-month contract period and for the program to date, along with information on the key input assumptions for the analysis. Note that this is different from section 2.8, 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 June 30, 2009. 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.

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)[14]. 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.

[14] 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.

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 2-21 and 2-22 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 both electric and gas savings. And, other incentives are paid for measures/activities for which no energy savings is directly related. For 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 2-20. 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 benefit-cost measure category in Appendix C of this report.

2.7.2 Definitions for each of the columns in tables 2-21 and 2-22

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 associated with pollutants displaced by the program over the life of the measures. This is comparable to the "externalities" referred to in the next section.

Program Costs. Program spending including administrative costs directly related to program implementation, but excluding incentives and other Focus administrative costs (e.g., evaluation, compliance).

Incentives. Financial payments by the program to encourage the adoption of energy efficient measures.

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 attribution 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 is the sum of *Value of Energy Savings* and the *Value of Avoided Emissions* divided by the sum of *Program Costs* and net *Incremental Costs.*

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.

NOTE: The simple b/c values in this report reflect some changes in the modeling that generates them. These are (1) a more accurate calculation of the net present value of the value of energy savings and value of avoided emissions, which results in slightly higher values. (2) A correction of incremental cost values. These were under-stated in a previous version of this report because they were being adjusted to net values when they had already been calculated as net. (3) An eight percent line loss factor has been added to the energy savings. (4) For the renewables portfolio, incremental costs were represented by actual project costs instead of estimated values. This was an exceptional deviation from a policy against making ad hoc changes in calculations. It was done because for renewables an unacceptable level of error had intruded into the estimation approach. (5) A revision of program cost values was made based on a review by the PSCW of numbers reported by the fiscal agent for Focus (Wipfli), which is discussed below.

Historically, we have assumed invoice costs reflect a small amount of spending from the prior reporting period, where savings have been credited but some costs not yet invoiced. Over time, this small asynchrony of savings and costs would be expected to level out, with no penalty to programs and no significant effect on the b/c ratio. Some concerns have been raised that a higher degree of mismatch between savings and costs was introduced recently when the processing of invoices changed from the State to a fiscal agent. We have addressed this issue for this report by accepting program spending totals from PSCW. This is not expected to be an issue for the final SAR addressing 2009 program impacts. Moreover, possible accounting changes are being considered to more systematically address this issue for the 2010 program year.

The treatment of offset to program costs from program-generated revenues was also affected by the change to a fiscal agent. For the 18MCP, offsets amounted to approximately $469,000. The program costs below do not reflect these offsets.

It is notable that the renewables portfolio shows a significant decline in its b/c value. In previous reporting periods it has had a value greater than or approximately equal to one but now is less than one for both the program year and for the program to date. The primary driver of the decline in the b/c ratio for the renewables portfolio is a decline in the implementation of biomass projects completed in this period and biomass is the most cost

effective technology in the renewable energy portfolio. The program implementers attribute this decline to low natural gas prices and other economic conditions.

Table 2-21. Simple Benefit-cost and Cost of Conserved Energy
The First Half of 2009 (January 1, 2009–June 30, 2009)

Program Area	Value of Energy Savings	Value of Avoided Emissions	Program Costs	Incentives	Incremental Costs	Simple B/C	CCE kWh	CCE Therms	Elec %	NTG kWh	NTG Therms
Business	$104,448	$6,211	$10,210	$14,059	$49,865	2.9	$0.038	$0.196	85%	60%	47%
Renewables	$3,057	$342	$1,070	$1,903	$11,592	0.5	$0.172	$9.359	87%	50%	31%
Residential	$27,392	$1,489	$5,496	$7,335	$16,274	1.8	$0.047	$0.559	68%	79%	70%
Total	$134,897	$8,042	$16,776	$23,297	$77,731	2.3	$0.043	$0.316	80%	64%	51%

"Program Costs" does not include incentives. Dollar values are denominated in thousands (000).

Table 2-22. Simple Benefit-cost and Cost of Conserved Energy
Program to Date (July 1, 2001–June 30, 2009)

Program Area	Value of Energy Savings	Value of Avoided Emissions	Program Costs	Incentives	Incremental Costs	Simple B/C	CCE kWh	CCE Therms	Elec %	NTG kWh	NTG Therms
Business	$835,128	$42,973	$93,193	$77,962	$379,004	2.8	$0.040	$0.230	74%	59%	58%
Renewables	$35,736	$2,081	$12,137	$11,172	$66,738	1.0	$0.194	$0.229	90%	29%	32%
Residential	$411,338	$23,733	$74,539	$77,871	$240,381	1.5	$0.054	$0.809	66%	90%	89%
Total	$1,282,202	$68,788	$179,870	$167,005	$686,122	2.1	$0.048	$0.370	72%	69%	61%

"Program Costs" does not include incentives. Dollar 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 2-23) 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 2-24). 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.

2.8.1 Documentable savings, measure life, and decay rates

Documentable savings for the earlier program years are taken from the prior evaluation reports, in particular the most recent year-end report. In addition, the energy efficiency measures installed typically last for a number of years, so their lifetime energy impacts would be calculated by multiplying the annual energy savings by the number of years that the energy efficiency measure is expected to be in operation. These lifetime energy impacts—explicitly considering measure life interpreted as the median number of years of expected operation—are now termed in Focus evaluation impact reporting *lifecycle* energy impacts. An additional new concept embodied in the energy impacts used in this Benefit-cost Report is *persistent* savings. These are *lifecycle* impacts that also include an exponential decay rate, such that half the savings remains after the measure life.

Measure life was assessed for each program component by the program area evaluators, primarily based on secondary sources. This measure life is interpreted as the median measure life. (Measure lives for all program measures included in this analysis are provided in Appendix D of the *Interim Benefit-cost Analysis: FY07 Evaluation Report*.) 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.

With this interpretation and an assumed exponential decay, the fraction "f" of savings that survives from one year to the next is given by

$$f = 2^{-(1/L)}$$

where L is the measure life. For example, if the measure life is 15 years, the surviving fraction each year is

$$f = 2^{-1/15} = 95.5\%.$$

The decay rate is

$$d = 1-f = 4.5\%.$$

Thus, in this example, the surviving savings from the prior year is calculated as 95.5 percent of the prior year's amount; 4.5 percent of the prior year's savings is lost. Associated non-energy and environmental benefits decay at the same rate.

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.

The Weibull function is commonly used for survival analysis. This form can give either an increasing or decreasing hazard rate, but not one that starts high, drops, then stabilizes or climbs. For a fixed median measure life, we considered a Weibull with shape parameter 1/2 (decreasing hazard) and one with shape parameter 2 (increasing hazard). The first gives a five to ten percent net present value (NPV) and the second gives a five to ten percent higher NPV compared to the exponential. A mixture of the two distributions, representing a combination of the two contributing phenomena, would give NPV somewhere between, or close to that from the exponential itself. Thus, the exponential assumption, which is computationally convenient, appears to yield appropriate end results for purposes of this analysis.

2.8.2 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.

2.8.3 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 2-23. 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 2-24. 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. (For FY08, this program was divided into ENERGY STAR lighting and ENERGY STAR appliances.)

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.

In tandem and coordinated with the economic analysis scheduled for the next CY09 period, the Benefit-cost analysis will again be conducted for Focus on Energy. These results will be reported separately in their entirety. They will also be included in the semiannual report issued in the first calendar quarter of 2010.

2.9 COMPARISONS OF FOCUS ENERGY IMPACTS AND ACHIEVABLE POTENTIAL

For some time this section has provided a comparison of the program energy impacts achieved against the estimated achievable potential for impacts as reported in *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 April 2009, ECW submitted a draft of an updated potential study for the state of Wisconsin, *Energy Efficiency and Customer-Sited Renewable Resource Potential in Wisconsin for the years 2012 and 2018.* Once this report has been finalized, we will prepare a memo comparing achieved energy impacts for the most recent 12 months against the achievable potential estimated in the report. In the next semiannual report (finalized in March 2010), this section will present an updated version of the contents of that memo.

3. BUSINESS PROGRAMS EVALUATION

3.1 OVERVIEW OF KEY ACTIVITIES

This chapter describes our evaluation of Focus Business Programs program activity during the first half of 2009. The CY09 evaluation covers program year 2009 (January 1, 2009, through December 31, 2009)[15]. This chapter summarizes the following:

- Reports delivered in first half of 2009
- Energy impacts
- Upcoming evaluation activities
- Further Business Programs reading.

3.2 REPORTS DELIVERED IN THE FIRST HALF OF 2009

- Semiannual reports
  - 18-month Contract Period, Year End – Final Report: April 8, 2009
- Detailed Evaluation Plans–Final: April 21, 2009
- Business Programs Measure Life Study, Draft Report: July 20, 2009.

3.3 ENERGY IMPACTS

The evaluation team has implemented eleven rounds of data collection and document review to estimate net energy savings for Business Programs. The CY09 impact evaluation is schedule to commence in September 2009 with final reporting in March 2010. The impact evaluation results presented in this section are from the 18MCP. Three rounds of impact evaluation data collection were conducted during the 18MCP.

- Round 1: FY07 Abbreviated Impact Evaluation. Covers measures implemented during FY07 (July 1, 2006, through June 30, 2007).
- Round 2: First Three Quarters of 18MCP Impact Evaluation. Covers measures implemented during the first nine months for the 18MCP (July 1, 2007, through March 31, 2008). This was a full impact evaluation similar to studies conducted in previous years.
- Round 3: 18MCP Abbreviated Impact Evaluation. Covers measures implemented in the 18MCP between April 1, 2008, and September 30, 2008. This small sample of large measures was combined with the data collected during Round 2 to produce a final set of 18MCP adjustment factors for use in the final 18MCP semiannual report.

The first round of impact evaluation, Round 1, covers measures implemented during FY07. It has been summarized in previous semiannual reports and therefore is not summarized in the final 18MCP semiannual report. In this section, we provide a summary of the combined

[15] Although the six-month program period under review is from January–June 2009, evaluation activities only occurred from April–June.

results of the second and third rounds of data collection, Round 2 and Round 3, conducted during the 18MCP. These results were reported in the Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period–Final Report (April 2, 2009).

Following the impact evaluation summary we also provide estimates of tracked and evaluation verified savings for the program to date.

3.3.1 General approach

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.
- 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 have essentially remained the same for each round of impact evaluation for this program area.

3.3.2 18MCP impact evaluation

The final 18MCP impact evaluation included measures implemented between July 1, 2007, and September 2008. Data collection and document review to estimate net energy savings for Business Programs used similar procedures and protocols that have been used in the past. The adjustment factors are calculated separately for each energy unit (kWh, kW, and therms) in combination with each sector and for Business Programs overall. The calculation of the adjustment factors uses appropriate weights corresponding to the sampling rate within each stratum. The main objective in designing the sample drawn was to provide the best possible estimates for each of the sectors and Business Programs overall.

A. RESULTS

This section provides the final results of the 18MCP impact evaluation. The results are provided by the overall program and each sector for kWh, kW, and therms in the following order.

1. Gross savings adjustment factor
2. Attribution factor
3. Realization rate.

Table 3-4 shows the 18MCP 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. Overall, the gross savings adjustment factors for therm savings are particularly high this round, with Commercial at 103 percent and

Industrial at 95 percent. The Business Programs overall adjustment factors for electrical savings are high, at 93 percent for both kWh and kW.

Table 3-4. 18MCP Gross Savings Adjustment Factors by Sector

Segment	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	127	95%	4.2%	4.0%	90.5%	98.5%	107	97%	2.7%	2.6%	94.3%	99.5%	25	77%	7.3%	7.3%	70.0%	84.7%
Commercial	133	91%	4.5%	4.1%	86.5%	94.7%	129	95%	4.4%	4.2%	90.9%	99.2%	26	103%	5.2%	5.2%	98.3%	108.7%
Industrial	131	93%	7.1%	6.7%	86.5%	99.8%	121	91%	10.0%	9.1%	81.5%	99.6%	38	95%	6.1%	5.8%	88.8%	100.3%
S&G	77	99%	2.6%	2.6%	96.6%	101.8%	68	95%	4.5%	4.5%	90.3%	99.3%	63	79%	13.0%	10.2%	68.4%	88.9%
Business Programs Overall	470	93%	4.2%	3.9%	89.1%	96.9%	430	93%	4.5%	4.2%	89.1%	97.5%	152	91%	4.9%	4.4%	86.4%	95.2%

The 18MCP attribution factors by sector are provided in Table 3-5. The 18MCP attribution factors for the program overall are 60 percent, 58 percent, and 52 percent for kWh, kW, and therms, respectively. Compared with the FY07 results, the kW attribution adjustment factor for the Schools & Government sector decreased from 85 percent to 46 percent. The therm adjustment factor for the Agriculture sector decreased from 46 percent to 17 percent. These decreases are statistically significant at the 95 percent confidence level. No other sector experienced a statistically significant change from the previous year.

Table 3-5. 18MCP Attribution Factors by Sector

Segment	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	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	126	60%	14.2%	8.4%	51.1%	68.0%	107	57%	18.7%	10.6%	46.1%	67.4%	22	17%	8.5%	8.5%	8.1%	25.2%
Commercial	131	70%	12.1%	8.4%	61.1%	77.9%	126	69%	13.9%	9.6%	59.6%	78.9%	26	33%	12.7%	12.7%	20.5%	45.8%
Industrial	130	57%	12.9%	7.4%	49.8%	64.6%	124	54%	14.0%	7.5%	46.2%	61.3%	38	63%	11.6%	7.3%	56.0%	70.7%
S&G	77	43%	26.6%	11.4%	31.5%	54.4%	68	46%	14.1%	14.1%	31.8%	59.9%	62	38%	30.2%	11.5%	26.7%	49.7%
Business Programs Overall	464	60%	8.4%	5.0%	54.6%	64.5%	425	58%	9.0%	5.2%	53.0%	63.4%	148	52%	11.9%	6.2%	46.2%	58.6%

Table 3-6 shows the 18MCP realization rates by sector. The realization rates combine the effect of the gross savings adjustment factors and the attribution factors.

Table 3-6. 18MCP Realization Rates by Sector

Segment	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	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	126	56%	14.8%	8.3%	48.0%	64.6%	107	55%	18.9%	10.4%	44.6%	65.4%	22	13%	6.7%	6.7%	6.2%	19.6%
Commercial	131	63%	12.9%	8.1%	54.9%	71.1%	126	66%	14.6%	9.6%	56.2%	75.4%	26	34%	13.2%	13.2%	21.1%	47.5%
Industrial	130	53%	14.8%	7.9%	45.4%	61.1%	121	49%	17.2%	8.4%	40.3%	57.1%	38	60%	13.1%	7.8%	52.1%	67.8%
S&G	77	43%	26.7%	11.4%	31.2%	54.0%	68	43%	13.5%	13.5%	30.0%	57.0%	62	30%	32.9%	9.9%	20.2%	39.9%
Business Programs Overall	464	55%	9.3%	5.2%	50.2%	60.5%	425	54%	10.0%	5.4%	48.9%	59.8%	148	48%	12.8%	6.1%	41.5%	53.7%

3.3.3 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 18-month contract period (July 1, 2007, through December 31, 2008), Table 3-7a 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 final 18MCP adjustment factors. That is, the estimates of the adjustment factors by sector reported in the *Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period–Final Report* (April 2, 2009).

Figure 3-1. Verified Gross Electric Energy Impacts by Program, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

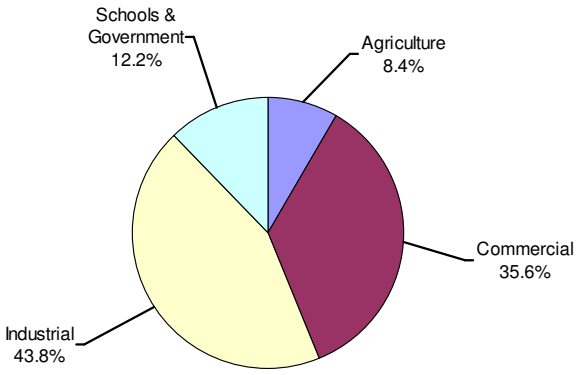


Figure 3-2. Verified Gross Electric Energy Impacts by Program, Business Programs, Program to Date (July 1, 2001–June 30, 2009)

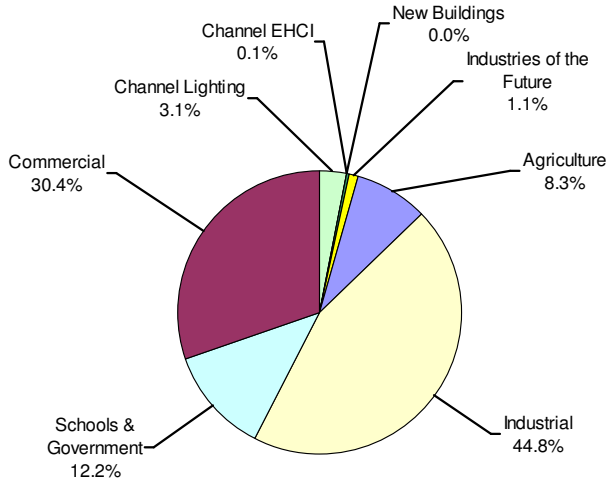


Figure 3-3. Verified Gross Gas Energy Impacts by Program, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

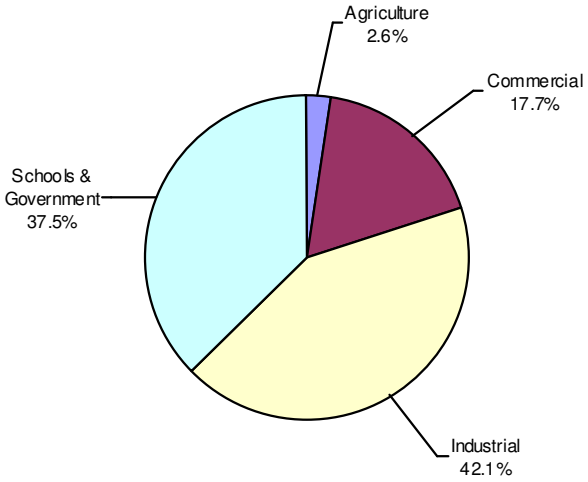


Figure 3-4. Verified Gross Gas Energy Impacts by Program, Business Programs, Program to Date (July 1, 2001–June 30, 2009)

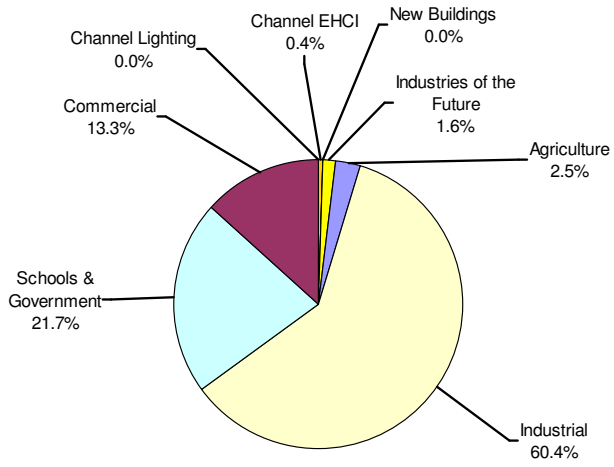


Table 3-7a. All Business Programs: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	16,500,857	3,607	269,895	15,675,814	3,499	207,819	9,240,480	1,984	35,086
Commercial	73,289,360	16,449	1,366,885	66,693,333	15,642	1,407,909	46,172,308	10,867	464,747
Industrial	88,349,427	14,707	3,520,796	82,164,967	13,384	3,344,756	46,825,196	7,207	2,112,477
Schools & Government	23,190,874	6,530	3,765,975	22,958,969	6,125	2,975,123	9,972,077	2,772	1,129,794
Total	**201,330,517**	**41,293**	**8,923,550**	**187,493,083**	**38,650**	**7,935,607**	**112,210,061**	**22,830**	**3,742,104**

Tables 3-7b through 3-7h provide tracking and verified gross savings and net savings by program and for Business Programs overall for 18MCP 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
- FY07: Abbreviated FY07 Business Programs Impact Evaluation—Final memo, February 18, 2008.

Table 3-7b. All Business Programs: Tracked Annual Energy Impacts
The 18-month Contract Period (July 1, 2007–December 31, 2008)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
Agriculture	38,061,160	9,469	743,242	36,158,668	9,185	572,464	21,319,235	5,208	96,806
Commercial	149,679,778	36,946	2,220,233	136,209,054	35,099	2,286,848	94,300,134	24,385	755,002
Industrial	210,764,565	34,274	13,967,554	196,011,045	31,189	13,269,176	111,705,219	16,794	8,380,532
Schools & Government	44,327,423	13,164	5,214,168	43,884,149	12,362	4,119,193	19,060,792	5,596	1,564,250
Total	**442,832,926**	**93,853**	**22,145,197**	**412,262,917**	**87,836**	**20,247,680**	**246,385,380**	**51,982**	**10,796,591**

Table 3-7c. All Business Programs: Tracked Annual 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	5,304	756,579	16,346,869	4,349	597,698	10,044,462	2,387	272,369
Commercial	51,718,124	11,740	1,489,990	51,200,942	11,740	1,266,491	37,237,049	8,923	566,196
Industrial	62,493,680	10,529	7,828,273	61,868,743	10,423	7,749,990	35,621,398	5,580	4,931,812
Schools & Government	23,223,397	5,887	3,584,081	21,597,759	5,769	1,899,563	15,559,676	4,886	1,039,384
Total	**157,130,223**	**33,460**	**13,658,924**	**151,014,314**	**32,282**	**11,513,743**	**98,462,584**	**21,776**	**6,809,760**

Table 3-7d. All Business Programs: Tracked Annual 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	10,369,653	2,556	169,600	10,784,342	2,377	162,816	5,495,867	1,048	98,368
Channel EHCI	720,371	650	363,389	719,198	671	336,265	266,434	291	284,833
Channel Lighting	44,213,387	10,825	2,572	40,419,017	10,361	2,526	29,282,846	7,778	1,589
Commercial	25,077,211	3,442	1,400,525	24,973,534	3,523	1,367,959	14,995,143	2,038	694,238
Industrial	36,665,838	6,497	5,203,226	40,408,104	7,000	5,261,531	32,213,745	5,358	1,951,784
Schools & Government	14,865,393	4,397	2,535,132	14,558,875	4,376	2,287,500	9,443,240	2,530	1,334,962
Total	**131,911,853**	**28,366**	**9,674,445**	**131,863,071**	**28,309**	**9,418,597**	**91,697,275**	**19,042**	**4,365,774**

Table 3-7e. All Business Programs: Tracked Annual 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	263,585	9,701,733	2,195	262,224	5,629,513	1,059	96,640
Commercial	44,218,407	9,810	1,018,331	30,703,691	6,532	920,120	18,924,532	3,872	275,075
Industrial	67,588,254	9,543	3,982,640	54,234,559	8,270	4,228,658	23,555,437	3,162	2,140,696
Schools & Government	16,595,676	4,068	1,780,566	16,078,481	3,908	1,695,159	7,751,733	1,879	951,559
Total	**143,707,711**	**27,083**	**7,045,122**	**110,718,465**	**20,906**	**7,106,161**	**55,861,214**	**9,972**	**3,463,969**

Table 3-7f. All Business Programs: Tracked Annual 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	1,551	53,368
Commercial	42,261,364	9,348	589,867	37,837,194	9,631	589,498	19,906,541	5,516	509,922
Industrial	80,264,260	11,793	8,611,077	69,713,833	7,524	10,127,720	40,260,298	4,114	8,828,403
Schools & Government	17,944,782	3,925	2,357,577	18,707,821	3,513	1,832,653	13,878,904	2,007	1,223,059
Total	**156,470,715**	**28,607**	**11,639,771**	**137,364,604**	**23,544**	**12,613,286**	**79,935,444**	**13,187**	**10,614,752**

Table 3-7g. All Business Programs: Tracked Annual 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	61,754	6,716,282	1,722	58,897	3,905,035	1,134	51,166
Commercial	39,232,419	9,479	1,869,698	36,381,429	7,868	1,875,705	17,650,457	4,634	1,550,456
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
Schools & Government	13,860,356	2,576	1,450,431	14,314,442	2,470	1,266,154	9,669,313	1,826	292,211
Total	**129,814,716**	**23,353**	**6,258,454**	**128,323,629**	**21,385**	**6,196,249**	**62,483,249**	**10,551**	**3,642,577**

Table 3-7h. All Business Programs: Tracked Annual 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**	**6,966**	**2,760,541**	**30,532,158**	**7,036**	**1,740,729**	**18,764,493**	**4,397**	**785,725**

3.3.4 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 January 1, 2009, through June 30, 2009. 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 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 3-8. Agricultural
The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Ag Specialty	996,808	6.4%	315	9.0%	2,164	1.0%
Appliance-Other	17,129	0.1%	0		415	0.2%
Boiler Equipment	0		0		782	0.4%
Boiler Service	0		0		2,196	1.1%
CFL	3,924,177	25.0%	1,048	30.0%	0	
Compressor Equipment	115,061	0.7%	46	1.3%	0	
Controls	7,263	0.0%	0		0	
Dishwasher	6,783	0.0%	1	0.0%	0	
Energy Recovery	1,814,471	11.6%	323	9.2%	6,202	3.0%
Fan	2,213,330	14.1%	616	17.6%	0	
Furnace	768	0.0%	0		192	0.1%
Greenhouse	37,727	0.2%	10	0.3%	207,743	100.0%
High Bay Fluorescent	1,164,771	7.4%	245	7.0%	0	
High Intensity Discharge (HID)	65,223	0.4%	10	0.3%	0	
Hot Water	2,227,440	14.2%	180	5.1%	-16,296	-7.8%
Lighting Fixtures	4,726	0.0%	1	0.0%	0	
Lighting-Other	982,014	6.3%	205	5.9%	0	
Motors & Drives	1,296,430	8.3%	282	8.1%	0	
Other	243,103	1.6%	48	1.4%	4,421	2.1%
Pasteurization	74,251	0.5%	51	1.5%	0	
Refrigeration	32,742	0.2%	5	0.1%	0	
T8/T5 Fluorescent Lighting	49,380	0.3%	11	0.3%	0	
Timer	27,702	0.2%	0		0	
Tune-up / Repair / Commissioning	28,571	0.2%	17	0.5%	0	
Variable Speed Drive	345,942	2.2%	85	2.4%	0	
Total	**15,675,814**	**100.0%**	**3,499**	**100.0%**	**207,819**	**100.0%**

B. COMMERCIAL

Table 3-9. Commercial
The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Aeration	0		0		7,960	0.6%
Air Conditioning	499,018	0.7%	149	1.0%	0	
Air Sealing	19	0.0%	0		837	0.1%
Appliance-Other	0		0		2,614	0%
Boiler Equipment	-412	0%	0		138,769	10%
Boiler Service	0		0		503,832	36%
Boiler/Other Heating	0		0		38,237	3%
Building Shell	20,492	0%	0		29,565	2%
CFL	18,393,627	27.6%	5,468	35.0%	0	
Chiller Equipment	1,976,684	3.0%	964	6.2%	0	
Chiller Service	973,300	1.5%	813	5.2%	0	
Compressor Equipment	74,393	0.1%	13	0.1%	0	
Computer Management	704,338	1.1%	0		0	
Controls	8,614,487	12.9%	663	4.2%	117,206	8.3%
Dehumidifier	162,033	0.2%	43	0.3%	84,745	6.0%
Dishwasher	66,530	0.1%	8	0.1%	474	0.0%
Energy Recovery	61,412	0.1%	89	0.6%	69,555	4.9%
Food Service	344,858	0.5%	59	0.4%	13,042	0.9%
Fryer	14,312	0.0%	3	0.0%	0	
Fuel Switching	441,651	0.7%	0		-18,976	-1.3%
Furnace	31,188	0.0%	0		10,860	0.8%
Geothermal	351,527	0.5%	18	0.1%	-14,647	-1.0%
Griddle	1,490	0.0%	0		0	
High Bay Fluorescent	12,458,451	18.7%	3,180	20.3%	0	
High Intensity Discharge (HID)	92,823	0.1%	6	0.0%	0	
Hot Water	116,987	0.2%	28	0.2%	32,167	2.3%
HVAC	1,169,357	1.8%	371	2.4%	104,677	7.4%
Ice Machine	8,863	0.0%	2	0.0%	0	
Infrared Heater	0		0		3,619	0.3%
LED Holiday Light	356,391	0.5%	0		0	
Lighting Fixtures	75,962	0.1%	23	0.1%	0	
Lighting-LED	959,828	1.4%	127	0.8%	0	
Lighting-Other	4,075,451	6.1%	887	5.7%	0	
Motors & Drives	3,622,769	5.4%	318	2.0%	0	
Other	111,814	0.2%	59	0.4%	43,697	3.1%
Oven	0		0		2,130	0.2%
Packaged Terminal Unit (PTAC, PTHP)	19,894	0.0%	2	0.0%	0	
Process	773,873	1.2%	62	0.4%	19,784	1.4%
Process Cooling	174,094	0.3%	11	0.1%	0	
Refrigerated Case Door	929,496	1.4%	106	0.7%	0	
Refrigeration	951,310	1.4%	117	0.7%	0	
Refrigerator / Freezer	40,436	0.1%	5	0.0%	0	

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Rooftop Unit / Split System AC	10,059	0.0%	15	0.1%	0	
Server Virtualization	135,093	0.2%	16	0.1%	0	
Showerhead	0		0		15,685	1.1%
Steam Trap	23,986	0.0%	5	0.0%	188,562	13.4%
Steamer	36,510	0.1%	7	0.0%	0	
T8/T5 Fluorescent Lighting	5,501,215	8.2%	1,287	8.2%	0	
Tune-up / Repair / Commissioning	1,525,849	2.3%	610	3.9%	5,665	0.4%
Variable Speed Drive	138,242	0.2%	3	0.0%	0	
Vending Machine	140,460	0.2%	0		0	
Whole Building	513,176	0.8%	105	0.7%	7,850	0.6%
Total	**66,693,333**	**100.0%**	**15,642**	**100.0%**	**1,407,909**	**100.0%**

C. INDUSTRIAL

Table 3-10. Industrial
The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Aeration System	929,012	1%	95	1%	0	
Air Conditioning	12,680	0%	18	0%	0	
Air Sealing	0		0		4,411	0%
Boiler Equipment	0		0		104,758	3%
Boiler Service	0		0		289,008	9%
Building Shell	0		0		66,295	2.0%
Burner	0		0		4,988	0.1%
CFL	393,843	0.5%	68	0.5%	0	
Chiller Equipment	779,545	0.9%	98	0.7%	0	
Chiller Service	351,294	0.4%	275	2.1%	0	
Compressor Equipment	5,789,334	7.0%	920	6.9%	33,693	1.0%
Compressor Service	5,652,349	6.9%	764	5.7%	0	
Controls	4,424,103	5.4%	253	1.9%	509,990	15.2%
Direct Fired Heating	500,932	0.6%	-15	-0.1%	64,545	1.9%
Dishwasher	6,659	0.0%	1	0.0%	0	
Energy Recovery	-126,398	-0.2%	1	0.0%	330,917	9.9%
Fan	-50,235	-0.1%	-4	0.0%	14,365	0.4%
Filtration	223,046	0.3%	108	0.8%	26,473	0.8%
Food Service	1,116	0.0%	0		0	
Furnace	3,983	0.0%	0		1,251	0.0%
High Bay Fluorescent	35,915,579	43.7%	6,911	51.6%	0	
HVAC	139,672	0.2%	22	0.2%	113,648	3.4%
Infrared Heater	0		0		6,815	0.2%
Lighting Fixtures	7,715	0.0%	1	0.0%	0	
Lighting-LED	8,756	0.0%	2	0.0%	0	
Lighting-Other	933,966	1.1%	141	1.1%	0	
Motors & Drives	8,898,608	10.8%	922	6.9%	0	
Other	750,815	0.9%	18	0.1%	0	

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Packaged Terminal Unit (PTAC, PTHP)	138	0.0%	0		0	
Process	5,048,702	6.1%	512	3.8%	886,801	26.5%
Process Cooling	58,394	0.1%	6	0.0%	0	
Process Heat	-2,036,841	-2.5%	-238	-1.8%	696,594	20.8%
Pump	817,999	1.0%	105	0.8%	0	
Reconfigure Equipment	101,164	0.1%	16	0.1%	0	
Refrigerated Case Door	127,005	0.2%	31	0.2%	0	
Refrigerator / Freezer	1,970	0.0%	0		0	
Rooftop Unit / Split System AC	12,035	0.0%	16	0.1%	0	
Specialty Pulp & Paper	64,938	0.1%	10	0.1%	0	
Steam Trap	0		0		142,863	4.3%
T8/T5 Fluorescent Lighting	5,150,641	6.3%	880	6.6%	0	
Tune-up / Repair / Commissioning	4,805,192	5.8%	1,000	7.5%	0	
Variable Speed Drive	58,856	0.1%	14	0.1%	0	
Whole Building	2,408,401	3%	431	3%	47,343	1%
Total	**82,164,967**	**100%**	**13,384**	**100%**	**3,344,756**	**100%**

D. SCHOOLS/GOVERNMENT

Table 3-11. Schools/Government
The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Air Conditioning	3,806	0%	7	0%	0	
Air Curtain	11,503	0%	0		19,154	1%
Air Sealing	0		0		5,797	0%
Boiler Equipment	0		0		244,229	8%
Boiler Service	0		0		1,613,669	54%
Boiler/Other Heating	0		0		37,649	1%
Building Shell	75,423	0%	0		107,651	4%
CFL	5,084,674	22%	1,150	19%	0	
Chiller Equipment	892,956	4%	944	15%	0	
Chiller Service	297,843	1%	229	4%	0	
Compressor Equipment	82,211	0%	24	0%	0	
Computer Management	547,434	2%	0		0	
Controls	1,608,733	7%	50	1%	44,361	1%
Dampers / Shutters	0		0		2,515	0%
Direct Fired Heating	0		0		727	0%
Dishwasher	118,780	1%	13	0%	480	0%
Door	0		0		103	0%
Economizer	44,019	0%	-2	0%	0	
Energy Recovery	8,474	0%	164	3%	52,584	2%
Fluorescent, Other	29,005	0%	6	0%	0	
Food Service	61,384	0%	8	0%	4,780	0%
Fryer	0		0		939	0%
Fuel Switching	183,015	1%	19	0%	-679	0%

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Furnace	10,815	0%	0		2,655	0%
Geothermal	-43,583	0%	29	0%	22,416	1%
Greenhouse	0		0		299	0%
High Bay Fluorescent	3,986,431	17%	848	14%	0	
High Intensity Discharge (HID)	222,635	1%	47	1%	0	
Hot Water	52,167	0%	47	1%	19,171	1%
HVAC	20,987	0%	3	0%	12,989	0%
Induction	4,208	0%	2	0%	0	
Infrared Heater	0		0		909	0%
Lighting-LED	381,073	2%	44	1%	0	
Lighting-Other	1,634,242	7%	332	5%	0	
Motors & Drives	1,753,578	8%	98	2%	0	
Other	156,894	1%	32	1%	4,936	0%
Refrigerator / Freezer	25,547	0%	3	0%	0	
Rooftop Unit / Split System AC	2,176	0%	3	0%	0	
Scheduling	18,853	0%	5	0%	0	
Steam Trap	15,018	0%	2	0%	747,401	25%
Steamer	38,462	0%	7	0%	0	
T8/T5 Fluorescent Lighting	3,587,458	16%	743	12%	0	
Tune-up / Repair / Commissioning	1,473,511	6%	1,032	17%	12,287	0%
Variable Speed Drive	3,644	0%	0		0	
Whole Building	555,129	2%	235	4%	18,100	1%
Zoning	10,463	0%	0		0	
Total	**22,958,969**	**100%**	**6,125**	**100%**	**2,975,123**	**100%**

3.3.5 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 for the first half of 2009. The Table 3-12 presentation of verified net savings does not include the untracked attributable savings resulting from the Impact Evaluation of the Education and Training program (see Section 2.2). These savings for CY09 will be added to the net values for total business programs (i.e., are not broken out by program) in the final CY09 evaluation report.

Table 3-12. Net Business Program Savings versus Business Program Portfolio Targets The First Half of 2009 (January 1, 2009–June 30, 2009)

	kWh			kW			Therms		
Program	Target	Net	% of 2009 Target	Target	Net	% of 2009 Target	Target	Net	% of 2009 Target
Agriculture	22,240,000	9,240,480	42%	4,862	1,984	41%	470,833	35,086	7%
Commercial	64,000,000	46,172,308	72%	12,800	10,867	85%	799,750	464,747	58%
Industrial	95,126,529	46,825,196	49%	15,378	7,207	47%	4,487,083	2,112,477	47%
Schools & Government	20,800,000	9,972,077	48%	5,720	2,772	48%	1,982,833	1,129,794	57%
Total Business Programs	**202,166,529**	**112,210,061**	**56%**	**38,761**	**22,830**	**59%**	**7,740,500**	**3,742,104**	**48%**

3.4 UPCOMING EVALUATION ACTIVITIES

In this section, we briefly describe upcoming evaluation activities. For more information on these activities, refer to the *Contract Year 2009-Detailed Evaluation Plan.*

- **Measure Life Study:** KEMA conducted a measure life study and distributed a draft report for comment on July 20, 2009. The principal objective of this study was to update the current measure life estimates used by the Focus Evaluation team and the Focus Program. KEMA will submit a final version to the PSCW following a review of comments provided by the PSCW and the Program.

- **Benefit Cost Inputs:** A Focus-wide benefit cost analysis is currently underway. As part of this effort, KEMA is preparing input streams for the Business Programs including market effects projections based on previous evaluation research.

- **Incremental Cost Study:** KEMA conducted an incremental cost study during the 18MCP 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. KEMA conducted this study in partnership with WECC. The evaluation team will incorporate the results of this study into the benefit cost analysis. KEMA distributed the draft report in September for review.

- **Review of Load Shapes:** KEMA reviewed the load shapes used by WECC for program planning. We used the load shapes to develop factors to allocate energy savings into four costing periods by sector and end-use for the benefit cost analysis. A memo describing this process and the results is forthcoming.

- **Deemed Savings Parameter Development (DSPD):** This study includes a review of existing deemed savings measures and calculation parameters to identify those that most warrant an updated review or refinement. The selected measures received updated engineering reviews. KEMA submitted the results of this analysis in August and will finalize the report following PSCW and Program input. Following PSCW approval of the final report and the Deemed Savings Review (see next bullet) KEMA will produce a "manual" of deemed savings calculations and supporting documentation.

- **Deemed Savings Review:** KEMA will conduct one round of deemed savings review during CY09. The results memo and updated database of deemed values will be submitted to the PSCW following the PSCW's approval of the DSPD report.

- **Additional Looks at Attribution:** In addition to the sector-level adjustment factors produced in the 18MCP for purposes of determining overall program performance, we are preparing a separate report that analyzes the attribution factors by customer and/or measure characteristics. We have provided similar reports in previous years. This year's report includes an investigation into the Program's increase in incentives at the beginning of the 18MCP using incentive data provide by the Program.

- **Life Cycle Net Savings (LCNS) Method Analysis:** This study uses the impact evaluation data collected during the 18MCP to compare attribution results using different treatments of acceleration.

- **Supply-side Research:** In the *Channel Studies—Fiscal Year 2008*[16] analysis, KEMA concluded that empirical evidence of supply-side effects exists in the lighting channel, BP HVAC, and VFD markets at varying levels. The strongest evidence was found in the lighting market followed by the BP HVAC market and to a lesser degree in the VFD market. The *Channel Studies* recommended that the PSCW pursue further supply-side research in each market. The PSCW directed KEMA to include at least one supply-side research study in the CY09 DEP. KEMA is working with the PSCW and the Program to finalize the draft work plan submitted on June 25, 2009.
- **Impact Evaluation:** KEMA will conduct one round of impact evaluation data collection during this contract period. This round will cover measures implemented during the first nine months of this contract period (January 1, 2009, through September 30, 2009) and the last three months of 2008 (October 31, 2008, through December 31, 2008). It will be a full impact evaluation similar to those conducted in previous years.

[16] Ryan Barry, Mimi Goldberg, Mitch Rosenberg, Joshua Horton and Karen Rothkin, KEMA Inc., *Focus on Energy Evaluation: Business Programs Channel Studies—Fiscal Year 2008,* Draft Report, August 29, 2008.

3.5 FURTHER BUSINESS PROGRAMS READING

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

Table 3-32. Further Business Programs Reading

Time Period	Date	Title
18MCP	11/20/2008	*Business Programs: Education & Training Participant Spillover Report – Impact*
	11/20/2008	*Business Programs: Education & Training Participant Spillover Report – Process*
	1/17/2009	*Business Programs: Channel Studies Report*
	4/2/2009	*Business Programs: Impact Evaluation Report – 1st 5 Qtrs 18 MCP*
	1/17/2009	*Business Programs: Impact Evaluation Report – 1st 3 Qtrs 18 MCP*
	10/24/2008	*Final Deemed Savings for 18 MCP (Fall 2008)*
	5/21/2008	*Final Deemed Savings for 18 MCP (Spring 2008)*
	11/4/2007	*Final Deemed Savings for 18 MCP (Fall 2007)*
	2/18/2008	*Abbreviated FY07Business Programs Impact Evaluation*
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 finalized during the first half of 2009 (January 1, 2009–June 30, 2009), overall and by individual program area.

- ENERGY STAR®
  - Lighting
  - Appliances[17]
- Wisconsin ENERGY STAR Homes (WESH)
- Home Performance with ENERGY STAR (HPES)
- Apartment and Condominium Efficiency Services (ACES)
- Targeted Home Performance with ENERGY STAR (THPES)
- Efficient Heating and Cooling (EHCI)
- Head Start CFL (A new program in 2008).

4.1 OVERALL

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

- The First Half of 2009: January 1, 2009, through June 30, 2009
- The 18-month Contract Period: July 1, 2007, through December 31, 2008
- FY07: July 1, 2006, through June 30, 2007
- FY06: July 1, 2005, through June 30, 2006
- FY05: July 1, 2004, through June 30, 2005
- FY04: July 1, 2003, through June 30, 2004
- FY03: July 1, 2002, through June 30, 2003
- 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.

[17] Many of the measures eligible through the Appliances initiative exceed ENERGY STAR standards.

Figure 4-1. Verified Gross Electric Energy Impacts by Program, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

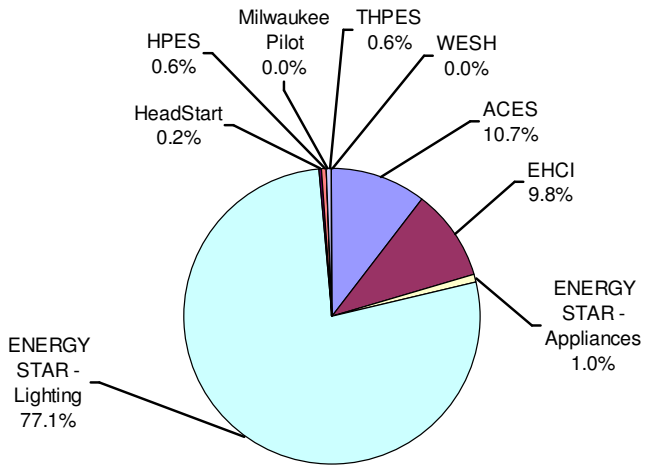


Figure 4-2. Verified Gross Electric Energy Impacts by Program, Residential Programs, Program to Date (July 1, 2001–June 30, 2009)

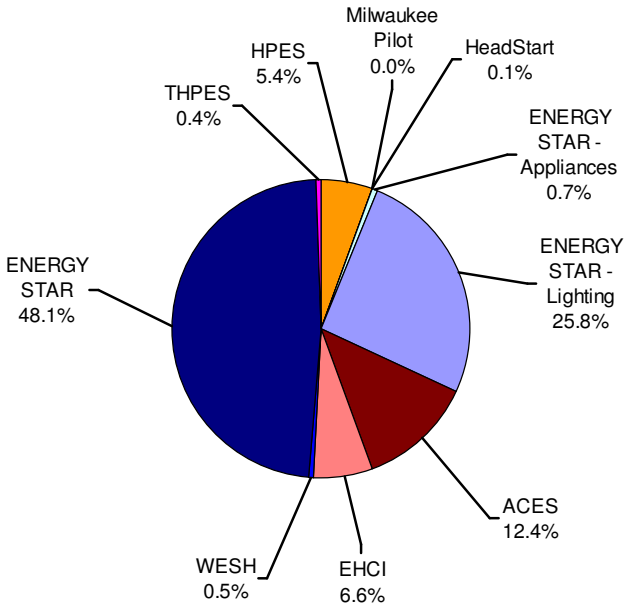


Figure 4-3. Verified Gross Gas Energy Impacts by Program, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)

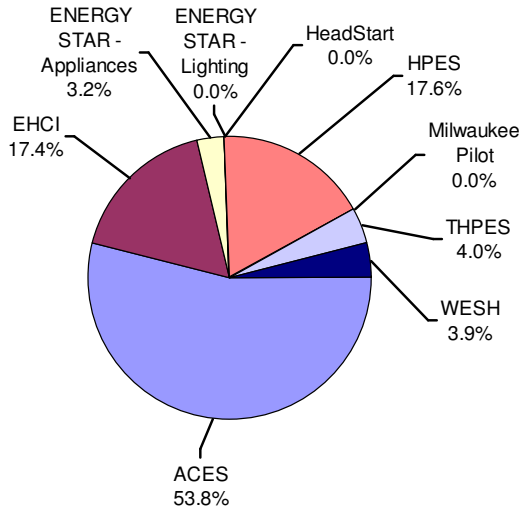


Figure 4-4. Verified Gross Gas Energy Impacts by Program, Residential Programs, Program to Date (July 1, 2001–June 30, 2009)

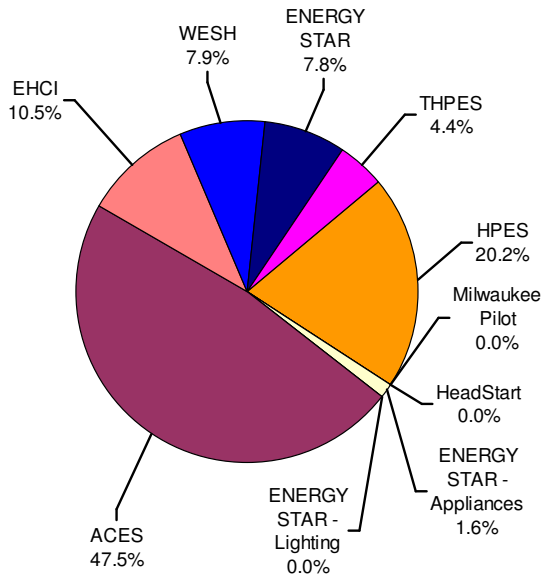


Table 4-1a. All Residential Programs: Tracked Annual Energy Impacts
The First Half of 2009 (January 1, 2009–June 30, 2009)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	7,114,369	693	834,177	6,460,386	624	836,465	4,763,691	426	535,521
EHCI	5,763,458	1,487	270,765	5,929,049	1,487	270,725	2,323,826	499	186,578
ENERGY STAR - Appliances	635,983	46	51,896	635,783	46	49,601	635,783	46	49,601
ENERGY STAR - Lighting	47,806,793	2,590	-85	46,691,635	2,570	-85	39,221,219	2,077	-85
Head Start	127,305	5	0	127,305	5	0	127,305	5	0
HPES	348,169	208	273,212	348,169	208	273,212	231,676	121	197,813
Milwaukee Pilot	0	0	0	0	0	0	0	0	0
THPES	379,552	58	62,408	379,552	62	62,408	379,552	62	62,408
WESH	11,195	0	61,037	11,195	0	61,027	2,506	0	61,027
Total	**62,186,824**	**5,087**	**1,553,411**	**60,583,073**	**5,002**	**1,553,353**	**47,685,558**	**3,235**	**1,092,862**

Table 4-1b. All Residential Programs: Tracked Annual Energy Impacts
The 18-month Contract Period (July 1, 2007–December 31, 2008)

Program	Gross kWh	Gross kW	Gross Therms	Verified kWh	Verified kW	Verified Therms	Net kWh	Net kW	Net Therms
ACES	26,175,716	3,102	2,377,692	26,263,382	3,113	2,377,633	19,059,402	2,034	1,532,127
EHCI	18,943,439	5,404	746,241	18,910,044	5,396	745,721	18,910,044	5,396	745,721
ENERGY STAR - Appliances	3,801,592	91	181,384	3,800,348	91	188,077	3,800,348	91	188,077
ENERGY STAR - Lighting	129,153,602	7,484	0	129,122,207	7,486	0	104,962,211	5,806	0
Head Start	402,388	17	0	402,388	17	0	402,388	17	0
HPES	697,882	333	414,564	707,761	334	416,130	671,165	311	394,413
THPES	706,856	152	165,220	970,148	160	159,517	970,148	160	159,517
WESH	-4,062	0	258,495	-4,062	0	258,474	-4,062	0	258,474
Total	**179,877,412**	**16,584**	**4,143,595**	**180,172,215**	**16,598**	**4,145,552**	**148,771,644**	**13,815**	**3,278,330**

Table 4-1c. All Residential Programs: Tracked Annual 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
ACES	1,467,617	413	400,607	1,465,272	413	400,607	1,465,272	413	400,607
EHCI	9,269,479	2,984	274,826	8,901,254	2,189	275,126	7,207,259	1,970	231,410
ENERGY STAR	82,661,232	5,292	283,996	67,459,724	3,946	271,332	54,405,419	3,178	218,254
HPES	392,348	223	345,909	371,121	230	298,510	346,397	214	282,629
THPES	435,080	0	107,675	435,080	77	107,675	435,080	77	107,675
WESH	24,892	1	153,767	24,456	0	153,727	24,032	0	153,715
Total	**94,250,649**	**8,913**	**1,566,780**	**78,656,907**	**6,855**	**1,506,977**	**63,883,459**	**5,852**	**1,394,290**

Table 4-1d. All Residential Programs: Tracked Annual 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	471	537,436	5,848,481	471	537,436	5,848,481	471	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	71,461,850	4,816	337,821	55,951,807	3,250	147,449	55,615,488	3,252	120,253
HPES	995,068	377	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	**90,185,421**	**14,066**	**1,858,471**	**73,961,454**	**11,286**	**1,573,064**	**72,078,061**	**11,066**	**1,489,822**

Table 4-1e. All Residential Programs: Tracked Annual 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	16,663,485	852	790,191	16,663,485	852	790,191	16,663,485	852	790,191
ENERGY STAR	85,086,975	2,485	361,989	55,273,975	3,230	156,529	66,068,342	3,928	126,923
HPES	9,084,502	6,905	582,559	8,804,317	6,948	491,823	8,586,575	6,457	476,796
THPES	593,164	116	167,477	288,278	44	69,503	288,278	44	69,503
WESH	1,507,010	669	221,426	1,236,066	671	217,566	1,198,958	612	217,180
Total	**112,935,136**	**11,027**	**2,123,643**	**82,266,121**	**11,745**	**1,725,612**	**92,805,638**	**11,893**	**1,680,593**

Table 4-1f. All Residential Programs: Tracked Annual 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	10,794,278	562	510,518	10,636,826	556	512,678	10,636,826	556	512,678
ENERGY STAR	99,142,936	6,510	354,420	64,238,584	4,619	354,516	62,400,894	4,310	354,516
HPES	13,606,210	8,042	554,150	13,557,990	8,063	481,219	13,510,885	8,044	463,522
THPES	708,508	149	220,606	418,020	62	107,214	418,020	62	107,214
WESH	1,615,776	628	185,255	1,623,130	631	184,477	1,623,070	631	184,477
Total	**125,867,708**	**15,890**	**1,824,949**	**90,474,549**	**13,932**	**1,640,105**	**88,589,694**	**13,604**	**1,622,408**

Table 4-1g. All Residential Programs: Tracked Annual 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	10,460,653	2,279	973,592	14,727,645	2,314	1,268,730	14,727,645	2,314	1,268,730
ENERGY STAR	76,054,781	5,738	180,783	64,996,046	5,429	180,783	55,519,818	3,834	180,783
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	59	85,943	130,604	42	61,020	130,604	42	61,020
WESH	1,274,434	71	102,037	314,141	89	91,261	306,104	89	91,261
Total	**97,358,904**	**14,066**	**1,677,293**	**89,638,260**	**13,788**	**1,890,084**	**80,130,947**	**12,184**	**1,881,419**

Table 4-1h. All Residential Programs: Tracked Annual 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	2,577,687	515	382,451	2,437,663	479	382,451	2,437,663	479	382,451
ENERGY STAR	18,295,376	1,806	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	63,249	204,624	0	72,201	204,624	0	72,201
Total	**23,948,033**	**3,969**	**912,755**	**25,952,365**	**4,668**	**912,062**	**20,284,229**	**3,766**	**830,443**

Gross program savings unadjusted by evaluation results are shown in the following table along with the program targets and percentage of target achieved. Savings shown are for the first half of 2009.

Table 4-2. Net Residential Program Savings versus Residential Program Portfolio Targets
The First Half of 2009 (January 1, 2009–June 30, 2009)

	kWh			kW			Therms		
Program	Target	Net	% of 2009 Target	Target	Net	% of 2009 Target	Target	Net	% of 2009 Target
ACES	10,054,952	4,763,691	47%	1,294	426	33%	813,140	535,521	66%
Affordable Housing	0	0	0%	0	0	0%	0	0	0%
EHCI	4,154,621	2,323,826	56%	940	499	53%	497,974	186,578	37%
ENERGY STAR - Appliances	712,240	635,783	89%	52	46	88%	71,200	49,601	70%
ENERGY STAR - Lighting	56,322,000	39,221,219	70%	3,796	2,077	55%	0	-85	0%
Head Start	1,058,666	127,305	12%	50	5	10%	0	0	0%
HPES	439,848	231,676	53%	202	121	60%	201,454	197,813	98%
THPES	601,960	379,552	63%	96	62	65%	148,975	62,408	42%
WESH	287,608	2,506	1%	35	0	0%	158,539	61,027	38%
Total Residential Programs	**74,710,934**	**47,685,558**	**64%**	**6,366**	**3,235**	**51%**	**1,997,142**	**1,092,862**	**55%**

4.2 ENERGY STAR PRODUCTS

The ENERGY STAR Products program is currently being managed as two program initiatives—Appliances and ENERGY STAR Lighting. Evaluation efforts conducted during this reporting period focused on the ENERGY STAR lighting program and included the following:

- CFL telephone surveys in Wisconsin and Indiana
- On-site CFL inspections in Wisconsin and Indiana
- Modeling of baseline CFL sales and saturation using multi-state data.

The status of the evaluation efforts conducted during this reporting period 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 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 relevant program managers.

4.2.2 Verified energy impacts

The following formulas detail our proposed approach for estimating gross energy savings, net-to-gross ratio, net energy savings, and demand savings for the ENERGY STAR lighting program.

Annual gross energy savings is defined as:

- Gross energy savings (kWh) = ((Delta Watts x average daily hours of use x 365) x Installation rate x Program-supported CFL sales)/1000

The net-to-gross ratio is calculated as sales (adjusted for population, such as CFLs per household) in the program area minus baseline sales, all divided by program-supported sales. The formula is as follows:

- Net-to-gross ratio = (Market-level sales – Baseline sales)/ Program-supported CFL sales

To translate net sales into net energy savings, the formula is as follows:

- Net energy savings = Gross energy savings x Net-to-gross ratio

Net demand savings is defined as:

- Summer demand savings = Annual net energy savings x peak summer factor

Table 4-3 below shows the parameters whose values are required for calculating energy and demand savings from the ENERGY STAR Lighting Program and sources for providing those values.

Table 4-3. Parameters and Sources for CFL Energy Impact Calculations

Gross Savings Parameter	Source
Number of program CFLs sold	Program records
Installation rates	Wisconsin Focus on Energy CFL In-service study
Delta Watts	Wisconsin Focus on Energy Delta Watts study
Hours of use	Studies from other areas
Measure life	Studies from other areas
Demand factor	Studies from other areas
Net Savings Parameter	**Source**
Net-to-gross ratio	Multi-state Modeling task

Appliances and Plug Load Program. Evaluation reporting for this program will involve a review of deemed savings for water heaters, possibly from the CY09 ACES research, as well as from information from DOE, California, and elsewhere. We expect to complete this task during the fourth quarter of 2009.

4.2.3 Market effects

This research emphasizes two objectives:

- Determining whether or not (and the extent to which) market effects are occurring in the Wisconsin CFL market
- Helping the evaluators and program staff to understand the mechanisms that are either contributing to or taking away from the program's ability to achieve market effects.

In the past, the evaluation contractor for Wisconsin Focus on Energy has used Michigan as a comparison/ baseline area for purposes of estimating net CFL sales that may be attributed to the Wisconsin program. This approach has been predicated on the absence of a CFL program in Michigan, but Michigan has recently introduced such a program, rendering it no longer a non-program comparison area. Because members of the evaluation team are also involved in the evaluation of the Michigan lighting program, the team has selected Indiana as the non-program comparison area, after consulting with the PSCW.

Evaluation efforts conducted during this reporting period for the ENERGY STAR Lighting program focused include the following:

- CFL telephone surveys in Wisconsin and Indiana
- On-site CFL inspections in Wisconsin and Indiana
- Modeling of baseline CFL sales and saturation using multi-state data.

Telephone Surveys. The team designed the draft random-digit dial (RDD) telephone surveys, which was reviewed by the PSCW and WECC. The team then revised the draft surveys to address comments provided by the PSCW and WECC. The surveys began fielding on June 10 and completed fielding on July 16, with a total of 504 surveys in Wisconsin and 600

surveys in Indiana. The team has begun the data analysis and expects to issue a draft survey report shortly that includes Wisconsin and Indiana results and a revised draft report in October that also includes Michigan data (pending approval of data sharing agreement). We expect to issue the final report in November.

Onsite Inspections. The team will visit 100 homes in Wisconsin and 100 homes in Indiana in order to estimate the number of CFLs out of all eligible sockets that are currently installed, and the number in storage; these households will be recruited through the telephone surveys. In addition, the on-site results will be used to adjust the RDD surveys results, as evidence from previous studies casts doubt on the accuracy of respondents' self-reports on the numbers of CFLs purchased or installed in their homes.[18]

The team designed the draft onsite inspection form, which was reviewed by the PSCW and WECC. The team then revised the draft survey to address comments provided by the PSCW and WECC. The onsite inspections began in Wisconsin on June 29 and in Indiana on July 13. As of July 28, 39 onsite inspections have been completed in Wisconsin and 55 in Indiana. The team expects to complete 100 onsite inspections in each state by the end of August, and issue a draft onsite report in mid-October that includes Wisconsin and Indiana results, and a revised draft report in mid-November that also includes Michigan results (pending approval of data sharing agreement). We expect to issue the final report in late December.

Multi-state Modeling. In addition to Wisconsin and Indiana, thirteen other regions are included in the modeling effort. Sponsors in California, Connecticut, Massachusetts, New York City, New York State (minus New York City and Long Island), and Michigan (Consumers Power area) are involved, and are providing data from the comparison areas of the District of Columbia, Georgia, Houston, Indiana, Kansas, Maryland, Ohio (minus the Cincinnati area), and Pennsylvania. (Note that Michigan, for purposes of examining 2008, is also a non-program area.) In addition to survey data collection, we have been gathering socioeconomic data and program data for all fifteen of these regions.

Telephone survey data has been or is being collected in all regions except Michigan, which will begin surveys soon. Onsite data has been collected in California, Massachusetts, Georgia, Kansas, Maryland, and Pennsylvania, and is in progress in New York City, New York State, Wisconsin, the District of Columbia, Houston, Indiana, and Ohio. Onsite data collection will begin in Michigan and Connecticut later this fall.

Modeling efforts currently underway include variable development, merging of datasets, exploration of best distributions, and testing models. Models will be run based on partial data (i.e., based on RDD and on-site data from Massachusetts, Maryland, California, Georgia, Kansas, and Pennsylvania, and RDD data from Wisconsin, Indiana, New York City, New York State, Ohio, the District of Columbia, and Houston). A draft report based on this partial data will be issued in the fall. A revised draft report based on all data (both RDD and onsite data) collected in all areas will be provided in late October with a final report in late December.

Each sponsor of the multi-state modeling will have its own report, with most parts in common, such as comparisons of key parameters like CFL sales per household, CFLs installed per

[18] NMR and RLW (2004) Impact Evaluation of the Massachusetts, Rhode Island, and Vermont 2003 Residential Lighting Programs. October 1, 2004.
NMR and RLW (2009) Residential Lighting Markdown Impact Evaluation: Final. January 20, 2009.

household, and CFLs in storage per household—across areas. The part that would be unique for each sponsor is the development of a modeled comparison area that is unique to that state, developed to be similar to that state on all known characteristics except for the presence of a CFL program, which will be provide the baseline for estimating net sales. This estimate of net sales will feed into the development of net savings as described earlier in Section 4.2.2.

Table 4-4. ENERGY STAR - Lighting Products Program: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Adjustment	0		0		-85	100%
Ceiling Fan	8,575	0%	0		0	
CFL	44,947,116	96.3%	2,558	99.5%	0	
LED Holiday Light	1,410,958	3.0%	0		0	
Lighting Fixtures	286,624	0.6%	11	0.4%	0	
Lighting Mail In	4,160	0.0%	0		0	
Torchiere	34,202	0.1%	1	0.0%	0	
Total	**46,691,635**	**100.0%**	**2,570**	**100.0%**	**-85**	**100%**

4.2.4 Program metrics and goals

We expect to measure two metrics, the first metric for the ENERGY STAR Lighting program and the second metric for the Efficient Heating and Cooling program.

Increase in the number of specialty CFLs sold. The specific contract metric critical goal states the following: “Increase in the number of specialty CFLs sold in Wisconsin compared to 2008.” The evaluation team will measure this metric by comparing 2009 Wisconsin CFL sales to 2008 Wisconsin CFL sales. Note that this will depend on WECC’s database identifying CFLs, at a minimum, according to their definition of specialty and non-specialty; it also might be instructive to be able to report the numbers sold by three-way, dimmable, floods, etc. We expect to assess this metric during the first quarter of 2010.

ECM Furnace Market Share. The specific contract metric critical goal states the following: “Increase in market share for 90+ furnaces with ECM.” The evaluation team will measure this metric by analyzing trends in annual ECM market share as reported by FACTS data. We expect to assess this metric during the first quarter of 2010.

4.2.5 Verified energy impacts for ENERGY STAR Appliances

For the Appliances program, Table 4-5 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and total for the first half of 2009.

Table 4-5. ENERGY STAR - Appliances Products Program: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Clothes Washer	413	0.1%	0		14	0.0%
Hot Water	635,370	99.9%	46	100.0%	49,587	100.0%
Total	**635,783**	**100.0%**	**46**	**100.0%**	**49,601**	**100.0%**

4.3 WISCONSIN ENERGY STAR HOMES

No evaluation efforts for the WESH program were included in the evaluation plan for 2009.

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

4.3.1 Process findings and issues

No formal process evaluation activities for the WESH program were included in the evaluation plan for 2009. The evaluation team will stay abreast of process related issues through monthly monitoring of program changes and issues based on regular communications with the WESH program manager.

4.3.2 Verified energy impacts

No impact evaluation efforts for the WESH program were included in the evaluation plan for 2009. Verified impact reported is based on prior evaluation findings.

Table 4-6. Wisconsin ENERGY STAR Homes: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Building Shell	-2,819	-25%	0		60,880	100%
ECM Furnace	14,014	125%	0		0	
Hot Water	0		0		147	0%
Total	**11,195**	**100%**	**0**		**61,027**	**100%**

4.3.3 Market effects

No market effects evaluation activities for the WESH program were included in the evaluation plan for 2009.

4.3.4 Program metrics and goals

No program metrics were set for the WESH program in 2009.

4.4 HOME PERFORMANCE WITH ENERGY STAR

Evaluation efforts conducted during this reporting period focused on developing a research plan for estimating supply-side effects of the program on participating insulation contractors and re-evaluating the program attribution based on participant research. The participant research will be conducted first and will inform design of the supply-side research based on what is learned from the participants feedback on their interactions with raters and the insulation contractors and how those interactions affect their decisions related to insulation of their homes. The research plan (including the participant survey and participant survey sampling plan) has been developed with input from the PSCW and was submitted for review in August. It also includes an outline of the contractor survey and its objectives.

Evaluation efforts are discussed below for 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 *Evaluation Calendar Year 2009 Detailed Evaluation Plans*. However, we will report any process related findings that come out of the participant and contractor surveys that will be conducted for the impact/market effects evaluation.

4.4.2 Verified energy impacts

The table below shows energy impacts for HPWES program activity for the first half of 2009.

Table 4-7. Home Performance with ENERGY STAR: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Building Shell	326,524	94%	206	99%	266,852	98%
Hot Water	13,005	3.7%	1	0.5%	4,962	1.8%
HVAC	8,640	2.5%	1	0.5%	588	0.2%
Other	0		0		810	0.3%
Total	**348,169**	**100.0%**	**208**	**100.0%**	**273,212**	**100.0%**

4.4.3 Market effects

Two areas of potential market effects research have been identified. (1) A review of non-tracked actions taken by audit recipients of an audit who do not take any action through Focus (information on process issues could also be obtained through these interviews) and (2) a review of education and training related efforts of Focus through this program and a determination if there is enough tracked activity to allow research to be conducted to determine the level of non-tracked savings resulting from these activities. No budget is currently allocated to these efforts.

4.4.4 Program metrics and goals

A memo report addressing two contract metrics will be submitted in the first quarter of 2010 based on program activity for the 2009 calendar year. The metrics to be evaluated are:

- **CY09 Metric #1 – Increase number of measures implemented per project completion.** This specific contract metric's critical goal states the following: "Increase the number of measures implemented per project completion compared to 18MCP." The evaluation team will measure this metric by analyzing the program database to assess the number of measures installed per project completion in FY08 and CY09. Since this metric is on a per project basis, we can look at trends over time and determine if the trend is moving up and the difference between 12-month vs. 18-month contract period comparison should make little difference.
- **CY09 Metric #2 – Increase the number of completions.** The specific contract metric critical goal states the following: "Increase the number of completions compared to 18MCP." The evaluation team will measure this metric by analyzing the program database to assess the number of project completions in FY08 and CY09, both as a percent of assessments conducted and against 12-month slices in FY08 since it is an 18-month period.

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 installations that are more comprehensive. In June 2008, the Residential Housing Energy Efficiency Program (RHEEP) for two-to three-unit rental properties started site assessments under the ACES umbrella. Impacts from this program are reported under the Whole Building initiative.

ECW has submitted a draft report evaluating the baseline specifications for new construction projects. A meeting was held in July 2009 to discuss the report and its recommendations. Some additional information is being gathered which will inform the final report and its recommendations.

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

- Process findings and issues
- Verified energy impacts

- Market effects
- Program metrics.

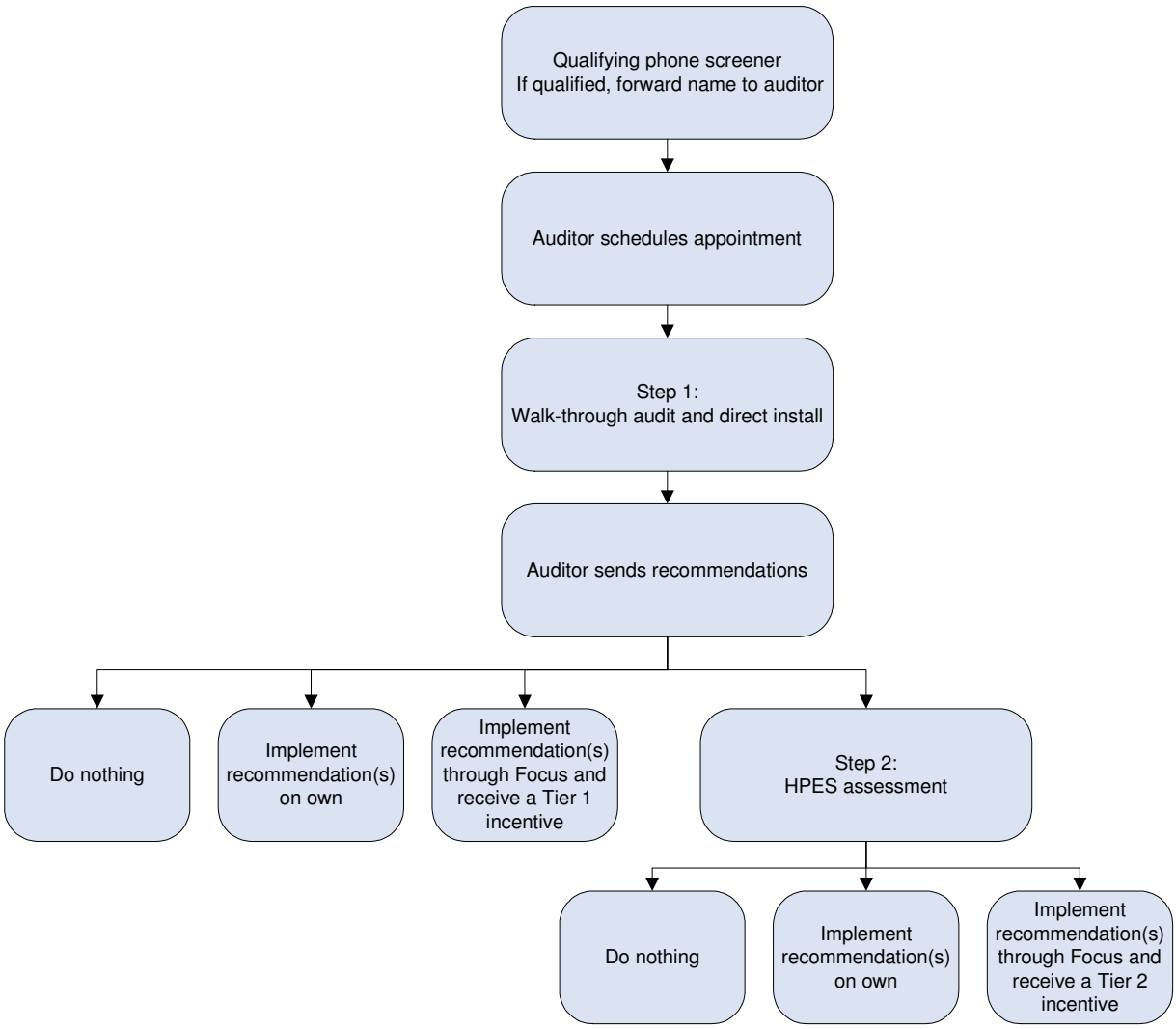
4.5.1 Process findings and issues

We did not formally include process related evaluation tasks in the 2009 evaluation plan, although some process related questions are included in the participant surveys. However, the report *Residential Evaluation: ACES RHEEP Pilot Results* was submitted on April 28, 2009. As the RHEEP initiative was piloted in the eighteen-month contract period, this report primarily focused on process issues. Following are some highlights from that report.

In 2008, the Apartment and Condo Efficiency Services program (ACES) developed a pilot program for two- and three-unit rental buildings not currently served under ACES, integrating program design components from the ACES Whole Building program and the Home Performance with ENERGY STAR® program. The pilot program targeted non-owner occupied two- or three-unit buildings, flats, duplexes, and cooperative housing including co-ops and fraternity and sorority buildings in the Madison metropolitan and Oshkosh areas. The program was designed to increase building and equipment efficiency and affect the timing of these improvements, which include accelerating the retirement of mechanical equipment.

The pilot was promoted at apartment association meetings and shows, tenant resource associations, neighborhood associations, co-op boards, through press releases, and on campuses in the target areas. The pilot also offered a $50 referral bonus to renters who convinced their landlords to participate in the walk-through audit and direct install portion of the pilot. Figure 1-1 graphically presents the participation process, which is discussed in more detail following the figure.

Figure 4-1. Residential Housing Energy Evaluation Program Pilot Participation Process



Landlords completed a brief qualifying phone screening prior to being accepted into the program. The pilot consisted of two steps:

1. The first step was a walk-through audit that included a direct install component. The walk-through audit identified potential opportunities to increase the efficiency of the unit; identified equipment that could be upgraded or serviced and provided incentive forms for that equipment; identified solutions to other building problems such as ice dams, window condensation, drafts, etc.; directly installed CFLs in fixtures and low volume/high pressure showerheads and facet aerators; and informed the owner about other Focus offerings. After the walk-through audit, landlords were provided with an audit report, a list of Home Performance consultants (see Step 2), and a RHEEP incentive application. Savings were claimed from the direct install component of the initial audit.

2. The second step was to motivate the owner to follow through with a complete Home Performance with ENERGY STAR assessment. The owner would pay the standard cost of this assessment (less a $75 incentive), which provided the owner with a list of available increased and/or bonus incentives for installed measures and an additional bonus for completing air sealing and at least one other building shell measure recommended as a result of the Home Performance assessment.

The pilot used two different delivery approaches to determine which achieved the program goals most effectively. Once screened for eligibility, Focus on Energy forwarded landlord contact information to staff in the Madison and Oshkosh areas. In the Madison metropolitan area, the walk-through audit and direct install (Step 1) were completed by a member of the ACES existing buildings team. In Oshkosh, the audit and direct install were completed by a Home Performance with ENERGY STAR independent consultant. In both areas, the goal was to have staff encourage the owner to participate in the full program that required the complete Home Performance assessment to obtain increased incentives (Step 2).

The pilot goal was to complete walk-through audits and direct installs (Step 1) in 200 units during the pilot period (March 1, 2008, through the end of 2008) on a first come, first served basis. Between June 24 and December 12, 2008, 32 rental property owners/managers participated in the pilot program. These 32 owners/managers represented 69 properties (approximately 140 to 150 units) that received the walk-through audit. As discussed in Chapter 2, only one of the 32 owners/managers we talked with went on to receive a Home Performance assessment and installed some of the recommended improvements (Step 2). An additional seven owners/managers made some of the recommended improvements from the walk-through audit (Step 1) without receiving the Home Performance assessment.

A. EVALUATION METHODOLOGY

The primary objective of the evaluation was to assess the overall effectiveness of the pilot design. Given the differences in the student rental markets in these two cities, it was difficult for the evaluation to assess definitively whether one delivery method was more effective in terms of recruiting participants, completing audits, moving owners to take additional action, moving owners to a full Home Performance assessment and securing completed jobs as a result of the assessment. However, the evaluation of the pilot program addressed a number of researchable questions in the two pilot areas.

- Is there a market for a program of this type among 2- to 3-unit rental buildings and co-ops?
- What are the barriers to getting a Home Performance assessment and/or installing efficiency improvements?
- Is the pilot effectively screening participants for attribution?
- Can the program achieve energy savings in this underserved market (both prescriptive and custom)?
- What percent of landlords who participate in Step 1 move forward with Step 2? What percent actually install additional equipment as part of Step 2?
- What aspects of the program worked best or need improvement?
- Can this program be expanded to other areas?

If participation in the pilot is low, we can alter our approach, as discussed below, and call a sample of nonparticipants to determine barriers to participation and the types of services that would be of interest to this market.

To address these researchable questions, PA conducted three primary evaluation tasks.

1. In-depth interviews with ACES and Home Performance with ENERGY STAR program managers and the primary field staff in the Madison and Oshkosh areas. These interviews were used to gain an understanding of the different marketing and delivery processes used in each area and any barriers staff are facing in getting participation across the two steps.
2. A review of the tracking database to assess key information on potential participants.
3. In-depth interviews with participating landlords in the Madison and Oshkosh areas. As the number of participating landlords was relatively small, we attempted to reach each of them for the interview. These interviews covered all phases of the program: the walk-through audit, direct install, and Home Performance with ENERGY STAR assessment.

The following recommendations for the Residential Housing Energy Evaluation program pilot (RHEEP) are based on the findings from the evaluation research.

i. Increase tenant involvement in the program.

This would be used to support the marketing effort as well as increase possible uptake by landlords. One of the disappointments of the program was the lack of effectiveness of the $50 offer to college students if they referred the landlord to the program and the landlord followed through and completed an audit. Only one case of tenant referral has been confirmed for the pilot program.

Offer education and outreach to tenants on how to take control of their bills by reducing usage. This would include additional marketing to tenants in the form of flyers or at student gatherings, similar to the approach used with landlords and association meetings. More exposure to tenants would likely increase the effectiveness of the $50 incentive effort.

A few landlords commented that they still have issues with tenants removing efficient equipment or something as simple as leaving the windows open in the winter, which usually defeats the purpose of the landlord installing energy efficient equipment. Although some believe it is worth the cost to install the energy-saving equipment, they are hesitant to do so if their tenants will negate the savings by their own actions.

ii. Enhance marketing to landlords with additional benefits of participating.

There are marketing opportunities from participating in RHEEP that landlords can use to retain or attract tenants. If tenants pay the utility bills, participation in the RHEEP program increases tenant comfort and assists them with decreasing their utility bills. Landlords like to use participation as a "green" sales tool. They also feel they can leverage the installed equipment as a tool to retain current tenants or attract new tenants, as a few have admitted to doing. The landlords could take the opportunity to highlight those benefits in new marketing materials.

iii. Refine the walk-through audit process and report.

Although program staff and auditors were concerned about the length of the audit process, almost all the landlords we spoke with appreciated the personal contact and opportunity to ask questions and learn more about the equipment and energy savings potential. Program staff and auditors worked together initially to develop the audit procedures and data sheet. We recommend that they meet again to determine what additional efficiencies can be gained in the process now that they have the experience of conducting audits. As suggested by program staff, a review of other program options, such as incentives to auditors for getting landlords to complete a HPES assessment, should be considered. The program could also explore options for reducing or expanding the walk-through audit depending on program goals.

Once the audit format is decided, a review of the audit report should be conducted. To reduce misunderstandings regarding the incentive levels, the purpose of the audit, and the benefit of the HPES assessment, an easy-to-read template should be developed to consistently report audit recommendations. An example of a revised audit report, based on the current format, can be found in Appendix D. To address the miscommunication issues that arose last year, and to better outline the differences between Tier level incentives that are available, the audit report should be restructured to specifically address energy efficiency improvements in three categories. These three categories include behavior modifications that cost little or nothing to implement, Track 1 improvements that are eligible for Track 1 incentives, and Track 2 improvements that are eligible for Track 2 incentives only after an HPES assessment is completed. Track 1 improvements eligible for additional incentives once the HPES assessment is completed should be noted. This revised audit report would facilitate the follow-up communication recommended later in this section.

iv. Increase the amount of information recorded in the tracking database.

PA believes it would be beneficial to record more of the screening information in the tracking database. If there is one person primarily responsible for screening interested landlords, an Access form could be used as the outline for the screening interview and data could be captured directly using that form. If all the information from the screening was captured, the program would have efficient access to information regarding number of ineligible landlords and reasons for ineligibility, effectiveness of marketing, reasons for interest which could influence marketing adjustments, and possible expansion opportunities into areas not currently served by the program.

For instance, if all of the interested landlords who had called in the past had been recorded, the program manager could use this to decide where to expand the program. That list could serve as a starting point for marketing to that area, as any eligible landlords have already expressed interest in participating.

v. Set up a more formal follow-up process with participating landlords.

A difficulty encountered with the pilot was moving participants from the walk-through audit to the Home Performance assessment or from the audit to taking recommended measures through a Focus program. Repeatedly, the issue of landlords misunderstanding the program offerings was evident. Although a revised audit report will improve the information communicated to landlords, more is needed to persuade them to move from the audit to the

HPES assessment. One program staff interviewed suggested follow-up calls with participants. Although that was done in some cases, it was not done consistently with all participants.

If the pilot wants to encourage the assessment, the follow-up contacts should be made by Home Performance staff who can best explain the benefits of the assessment, not the auditor. If the pilot wants to encourage implementation of recommended improvements, a follow-up call by either the auditor or other program staff would provide a good opportunity to answer questions, remind participants about available incentives, and help convince landlords to install some of the recommended equipment.

Regardless of who conducts the follow-up call, we recommend waiting for a few months after the audit to make the first follow-up call. Based on interviews with participating landlords, it is possible that landlords are a bit overwhelmed by the amount of information they receive and need some time to process it and consider the most appropriate improvements to make. They also need time to research the costs, benefits and equipment available. Therefore, additional follow-up calls may be warranted six to eight months after the audit.

Also, a report *Energy Efficiency and Customer-Sited Renewable Energy: Achievable Potential in Wisconsin 2006–2015* prepared by the Energy Center of Wisconsin evaluating market potential in the state of Wisconsin has been submitted for public comment. We will review the findings from this study to identify any opportunities not being exploited by current program design efforts.

4.5.2 Verified energy impacts

Participant surveys have been completed with ACES program participants from April 2008 through March 2009. The sampling approach for this research provided statistically significant estimates of program attribution at the measure level for the Whole Building program initiative. Surveys with New Construction participants are being conducted by senior consulting staff, as opposed to being conducted by interviewers, in an effort to gain more qualitative insight on the programs influence on implementation of energy efficient measures in new construction projects.

The verified tracked annual energy impacts by program initiative and measure category for first half of 2009 are shown in Table 4-9.

Table 4-9. Apartment and Condominium Efficiency Services: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Air Conditioning	48,274	0.7%	97	15.5%	0	
Appliance-Other	3,192	0.0%	0		323	0.0%
Boiler/Other Heating	87,650	1.4%	37	5.9%	429,415	51.3%
Building Shell	45,863	0.7%	32	5.1%	35,563	4.3%
CFL	458,382	7.1%	40	6.4%	0	
Clothes Washer	86,705	1.3%	0		3,430	0.4%
Dishwasher	100,110	1.5%	2	0.3%	4,810	0.6%
ECM Furnace	4,554	0.1%	1	0.2%	2,455	0.3%
Freezer	566	0.0%	0		0	
Hot Water	1,485,750	23.0%	0		354,207	42.3%
HVAC	4,692	0.1%	8	1.3%	1,308	0.2%

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Laundry	72,280	1.1%	8	1.3%	-1,156	-0.1%
Lighting	141,393	2.2%	17	2.7%	0	
Lighting-LED	174,352	2.7%	20	3.2%	0	
Lighting-Other	3,573,516	55.3%	352	56.4%	0	
Motors & Drives	107,257	1.7%	1	0.2%	0	
Other	15,862	0%	0		6,110	1%
Refrigerator / Freezer	49,988	1%	8	1%	0	
Total	**6,460,386**	**100%**	**624**	**100%**	**836,465**	**100%**

4.5.3 Market effects

Information on participant spillover is being captured as part of the participant surveys. In the event that significant spillover is identified, additional information will be gathered to allow an estimate of the energy impacts resulting from it.

Based on participant surveys conducted in 2008, 71 percent of respondents had additional properties in Wisconsin (beyond the participating properties). Of the participants with additional properties, 20 percent reported installing energy efficient equipment on their own, although participants' reports of program influence were mixed.

4.5.4 Program metrics and targets

No program metrics were specified for the ACES project for 2009.

For the first half of 2009, ACES accounted for 49 percent of the total net therm savings for all of the residential programs combined, 13 percent of the net kW, and 10 percent of the net kWh savings. In terms of ACES program targets for the 2009 calendar year, ACES had achieved 47 percent of its program target: for kWh, 33 percent of its kW target, and 66 percent of its therms target (Table 4-2).

4.6 TARGETED HOME PERFORMANCE WITH ENERGY STAR

The Targeted Home Performance with ENERGY STAR (THP) program provides Wisconsin residents who have limited incomes and resources (set as households between 150% and 200% of the federal poverty level) the opportunity to increase the energy efficiency, affordability, safety, durability, and comfort of their homes through whole house energy efficiency services.

THP set aggressive 18-month program goals that increased its participation goals by more than 50 percent over prior levels. By December 31, 2008, THP had weatherized 593 homes reaching 83 percent of their total goal of 715. The program had the highest number of completions in December 2008 in the program history. Eighty homes were served through the program in December 2008.

Evaluation efforts through December 31, 2008, focused on an interim process evaluation to assist THP in reaching its program goals and reviewing THP participants' savings values.

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

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

4.6.1 Process findings and issues

The evaluation team stayed abreast of process related issues through monitoring of program changes and issues based on communications with the THP program manager. In June 2008, evaluators conducted interviews with 15 of the 19 THP service providers. The primary objective of the interviews was to provide concrete recommendations to help THP achieve its production goals.[19]

4.6.2 Verified energy impacts

THP energy impacts are based on whole house savings for a program-served home. The basis of the reported energy impacts is a billing analysis of fiscal year (FY) 2002–2004 THP-served home.[20] Evaluators conducted the billing analysis in FY04.[21]

The FY04 billing analysis is the best estimate available for THP given the fact that it is based on actual billing data; however, the analysis was based on served homes in the first three years of the program. Additionally, the billing analysis does not capture any modifications to measure installation practices that may have taken place after FY04, such as the addition of measures, increase or decrease of incidence of measures being installed, or increase in the number of certain measures being installed (e.g., CFLs).

This issue was raised in 2005 and evaluators reviewed THP's program tracking data to identify any programmatic changes and resulting modifications in per home savings to the FY04 billing analysis. The analysis compared the average home savings per the deemed savings reported by the program during the period of the impact analysis against the results of the billing analysis. From this comparison, evaluators recommended an adjustment factor, which accounted for the difference in the deemed savings and billing analysis while taking into consideration the additional measures installed through the program not included in the billing analysis.

This adjustment factor was then applied to the deemed savings reported by the program in subsequent program years. This approach allowed THP energy impacts to be based on the

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[19] Lark Lee, PA Consulting Group, *Targeted Home Performance with ENERGY STAR Service Provider Interview Results,* February 16, 2009.

[20] A home is counted as a one dwelling unit (i.e. a duplex counts as two homes).

[21] Lark Lee, Pamela Rathbun, and Laura Schauer, PA Government Services, Inc. *Low-income Public Benefits Evaluation Year 3 Low-income Program Evaluation—Volume III. Other Evaluation Deliverables: Technical Appendices D–H, Appendix F,* September 17, 2004.

findings of the billing analysis, yet still recognized changes the program has made to increase savings per home. The reader is referred to the memorandum *Recommendation Adjusting Targeted Home Performance Energy Impacts* dated June 20, 2005, for a detailed discussion about this analysis.

The program has continued to make minor program modifications since 2005. In 2008, the PA evaluator, THP program manager, and the Public Service Commission of Wisconsin (PSCW) evaluation manager discussed and decided that the FY04 billing analysis was still the best estimate of program savings since the program was still essentially the same in its approach and targeted the same customer segment. However, it was also agreed that an updated analysis of program measures was needed to capture changes in the program since 2005.

Based on a detailed analysis of the 2008 THP program[22], evaluators recommend that the deemed savings per home in the THP program be updated to 1,636 kWh savings and 276 therms. This is an increase from the current per home values of 1,192 kWh and a slight decrease from the 295 therms being reported based on the 2005 memorandum.

For the electric impacts, the number of CFLs per home has risen dramatically and accounts for much of the increase in electric impacts. For the gas impacts, the changes have not been as significant.

Table 4-10. Targeted Home Performance with ENERGY STAR: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Home Weatherization	379,552	100%	62	100%	62,408	100%
Total	**379,552**	**100%**	**62**	**100%**	**62,408**	**100%**

4.6.3 Market effects

The evaluation is not quantifying market effects from the program.

4.6.4 Program metrics

THP does not have contract metrics.

[22] Bryan Ward, Lark Lee, and Sandra Duerst, PA Consulting Group. *Recommendations for Targeted Home Performance with ENERGY STAR Impacts,* June 2009.

4.7 EFFICIENT HEATING AND COOLING

Evaluation tasks for consideration for Efficient Heating and Cooling (EHC) concern contract metrics only.

4.7.1 Verified energy impacts

Table 4-11. Efficient Heating and Cooling: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
Adjustment	-730	0.0%	0		334	0.1%
Air Conditioning	114,903	1.9%	206	13.9%	0	
Boiler/Other Heating	0		0		118,091	43.6%
ECM Furnace	5,814,876	98%	1,281	86%	131,480	49%
HVAC	0		0		20,820	8%
Total	**5,929,049**	**100%**	**1,487**	**100%**	**270,725**	**100%**

4.7.2 Program metrics and goals

Evaluating EHC's progress in meeting contract metric goals continues to be an important part of ongoing evaluation planning. In consultation with the PSCW and with input from WECC, we will measure one CY09 metric as discussed below.

- **CY09 Metric #1 – ECM Furnace Market Share.** The specific contract metric critical goal states the following: "Increase in market share for 90+ furnaces with ECM." The evaluation team will measure this metric by analyzing trends in annual ECM market share as reported by FACTS[23] data.

4.8 HEAD START CFL

Table 4-12. Head Start CFL: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)

Measure Category	Verified kWh	kWh %	Verified kW	kW %	Verified Therms	Therm %
CFL	127,305	100%	5	100%	0	
Total	**127,305**	**100%**	**5**	**100%**	**0**	

[23] 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.

5. RENEWABLE ENERGY PROGRAM EVALUATION

5.1 OVERVIEW/KEY ACTIVITIES

This chapter describes the evaluation activities for the Renewable Energy Program conducted between January 1, 2009, and June 30, 2009. This chapter summarizes the following:

- Reports
- Gross energy impacts
- Net energy impacts
- Upcoming evaluation activities for this contract period (ending March 2010).

5.1.1 Reports delivered in the first half of 2009

During the first half of 2009, the Renewable Energy evaluation team submitted the following report:

- Semiannual reports
  - 18-month Contract Period, Year End – Final Report: April 8, 2009
- *Renewables: Impact Evaluation Report 18-month Contract Period* – Final: April 21, 2009
- Detailed Evaluation Plans – Final: April 21, 2009.

5.2 GROSS ENERGY IMPACTS

5.2.1 Program Activities

In this section, we discuss the projects implemented in the first half of 2009, the period from January 1, 2009, to June 30, 2009. During that time period, the Program funded a total of 173 renewable energy projects consisting of 63 nonresidential and 110 residential installations. For CY09, the program is on track to increase the annual number of renewable energy system installations for the seventh consecutive fiscal year (see Table 5-1). The non-residential sector is substantially ahead of the 18MCP pace. The Program has funded six biogas projects in the first half of 2009. This is roughly triple the rate seen in the 18MCP. Based on number of projects, PV systems predominate and comprise over half of the projects in the non-residential sector. The residential sector is also ahead of the 18MCP pace. Solar thermal systems are the most common system type for residential, with PV systems a close second.

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	18MCP Jul 07–Dec 08	First Half of 2009 Jan 09–Jun 09	Program To Date
Nonresidential Projects								
Biogas	0	1	4	7	2	6	6	26
Thermal Bioenergy	0	3	7	16	14	18	4	62
Solar Electric	3	3	9	9	18	78	34	154
Solar Water Heating	0	0	4	5	6	38	18	71
Wind Machine	2	2	5	1	1	4	1	16
Other	1	0	2	1	2	0	0	6
All Nonresidential	**6**	**9**	**31**	**39**	**43**	**144**	**63**	**335**
Residential Projects								
Solar Electric (PV)	20	40	35	48	74	133	49	399
Solar Water Heating[a]	-	-	-	-	-	160	54	214
Wind Machine	1	8	2	5	5	13	7	41
Other	0	0	1	1	0	0	0	2
All Residential	**21**	**48**	**38**	**54**	**79**	**306**	**110**	**656**
All Projects	**27**	**57**	**69**	**93**	**122**	**450**	**173**	**991**

[a] Residential Solar Water Heating was included and tracked in the Focus on Energy Residential program through 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. We provide the program-reported gross impacts in Table 5-2, by technology and segment for the Program to-date, and individually for FY07, the 18MCP, and the first half of 2009.

Through June 2009, the program-reported impacts for the current contract period have already approached the total electric savings for the full 18MCP, while therm savings have been far lower. Program-reported kW and kWh savings for this six-month period are 109 and 148 percent (respectively) of the annual totals from the 18MCP. Therm savings are far lower, at only 2 percent of annualized 18MCP total. This represents a substantial change in historic trends, in which the program has experienced low kWh savings early in each program year. The installation of six biogas systems during the first half of 2009 is responsible for the substantial kW and kWh tracked savings. The findings during the first part of the program period, however, show high electric savings but low therm savings. The therm savings for the period are limited primarily to residential solar hot water systems and one small biomass system.

Table 5-2. Renewable Energy Program-reported Gross Impacts[24] by Segment and Technology

Segment	Technology	Energy Impacts	Completed			
			FY07 Jul 06–Jun 07	18MCP Jul 07–Dec 08	CY09 Jan 09–Jun 09	Program To Date
Nonresidential	Biogas	Kilowatts	1,045	1,180	971	7,082
		Annual kilowatt-hours	8,238,780	10,159,791	10,595,683	60,288,419
		Annual therms	0	138,637	1,929	249,219
	Thermal Bioenergy[25]	Kilowatts	0	-66	0	-66
		Annual kilowatt-hours	0	-329,413	173,975	-155,438
		Annual therms	684,448	2,213,364	16,707	5,392,753
	Solar Electric	Kilowatts	124	307	137	657
		Annual kilowatt-hours	153,422	778,759	356,211	1,401,072
		Annual therms	0	0	0	1,283
	Solar Water Heating	Kilowatts	0	-13	1	-13
		Annual kilowatt-hours	0	-19,107	6,869	-12,238
		Annual therms	2,697	48,752	9,785	95,422
	Wind Machine	Kilowatts	90	17	8	506
		Annual kilowatt-hours	109,560	127,249	67,688	867,111
		Annual therms	0	0	0	0
	Other	Kilowatts	14	0	0	1,314
		Annual kilowatt-hours	29,973	0	0	6,503,573
		Annual therms	1,480	0	0	2,638
	All Nonresidential	**Kilowatts**	**1,273**	**1,425**	**1,117**	**9,481**
		Annual kilowatt-hours	**8,531,735**	**10,717,278**	**11,200,426**	**68,892,499**
		Annual therms	**688,625**	**2,400,753**	**28,421**	**5,741,315**
Residential	Solar-PV and Thermal[26]	Kilowatts	224	263	118	896
		Annual kilowatt-hours	290,398	681,074	302,004	1,660,276
		Annual therms	0	0	0	3,776
	Solar Water Heating[27]	Kilowatts	0	28	14	43
		Annual kilowatt-hours	0	140,187	77,527	217,714
		Annual therms	0	8,371	3,385	11,756
	Wind Machine	Kilowatts	40	27	11	308
		Annual kilowatt-hours	51,353	278,909	97,815	747,098
		Annual therms	0	0	0	0
	Other[28]	Kilowatts	0	0	0	0
		Annual kilowatt-hours	0	0	0	-15,545
		Annual therms	0	0	0	2,253
	All Residential	**Kilowatts**	**264**	**319**	**144**	**1,246**
		Annual kilowatt-hours	**341,751**	**1,100,170**	**477,346**	**2,609,542**
		Annual therms	**0**	**8,371**	**3,385**	**17,785**
TOTAL	**All Projects**	**Kilowatts**	**1,537**	**1,743**	**1,261**	**10,727**
		Annual kilowatt-hours	**8,873,486**	**11,817,448**	**11,677,772**	**71,502,041**
		Annual therms	**688,625**	**2,409,124**	**31,806**	**5,759,100**

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

[25] Negative thermal bioenergy kW and kWh in 18MCP are related primarily to parasitic loads. Positive thermal bioenergy kWh in CY09 is related to electric heat savings due to a biomass system.

[26] 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.

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

[28] Residential "Other" savings are from a geo-thermal heat pump system that replaced a combustion type heating system in FY06. The negative electric savings result from an increase in electric usage associated with the system.

5.3 NET ENERGY IMPACTS

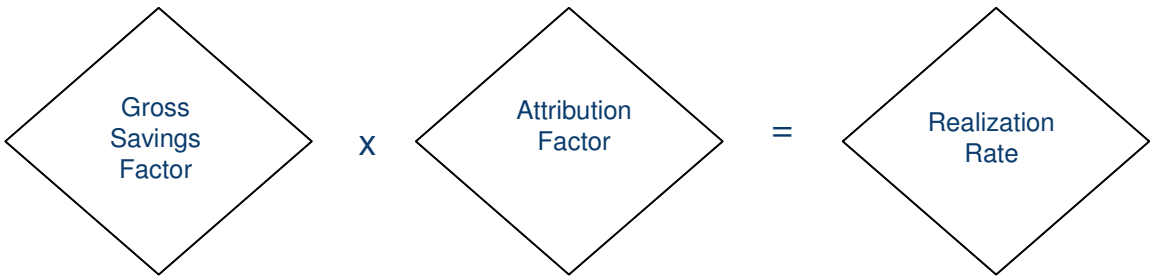
5.3.1 Approach

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, 2007, and December 31, 2008 (18MCP).

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 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 previously reported in the 18MCP impact evaluation as well as impacts for projects completed in the period from January 1, 2009, to June 30, 2009 based on 18MCP adjustment factors.

5.3.2 Overall findings

Final 18MCP net energy impacts were determined following the end of the 2008. Final 18MCP adjustment factors were calculated during the beginning of CY09 based on all projects completed in 18MCP. KEMA calculated these based on engineering reviews and surveys with a sample of program participants. The engineering review assessed the algorithms and input assumptions used to estimate impacts and calculated a revised estimate of impacts. The survey confirms installation and equipment details, as well as obtaining

participant self-reports of program attribution. Program attribution is the percent of tracked impacts that occurred as a direct result of the program.

This report also includes estimated net energy impacts for projects completed in the period from January 1, 2009, to June 30, 2009. KEMA calculated the net energy impacts based on the final 18MCP adjustment factors. We will calculate the final net energy impacts for CY09 based on a sample of 2009 participants who complete projects through September 30, 2009. The evaluation team will report these results in the first quarter of 2010. In this report, we present the final 18MCP adjustment factors, final 18MCP energy impacts, and estimated energy impacts for the period from January 1, 2009, to June 30, 2009, using the final 18MCP adjustment factors.

Table 5-3 reports the overall results of this analysis. In section 5.3.3, we discuss the development of the realization rate for 18MCP. In section 5.3.4, we discuss the application of the 18MCP adjustment factors to projects completed between January 1, 2009, and June 30, 2009.

Table 5-3. Renewable Energy Program-Reported Gross, Evaluation-Verified Gross, and Verified Net Annual 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
18MCP: Jul 07–Dec 08	11,817,448	6,998,114	3,914,269	1,743	1,190	702	2,409,124	2,219,576	684,193
CY09: Jan 09–Jun 09[a]	11,677,772	7,018,604	3,564,329	1,261	822	442	31,806	30,239	9,468
Total	**71,502,042**	**61,687,226**	**17,960,230**	**10,728**	**9,843**	**3,539**	**5,759,100**	**5,548,904**	**1,757,481**

[a] 18MCP technology specific net adjustment factors were applied. When technology specific factors for a specific type of savings were not available, the technology specific adjustment factors for the other type of energy savings were applied.

5.3.3 Final 18MCP net energy impacts

This section presents the results of the 18MCP 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, 2008, and December 31, 2009.

The second objective was to determine the *realization rate* for the program. The realization rate is the percentage of program reported impacts attributable 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.

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 14 percent of the measures and representing 87 percent of kWh, 70 percent of kW, and 92 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. A copy of the interview protocol is included as Appendix E.
- 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 participants.

B. ENGINEERING VERIFICATION FACTOR

The overall engineering verification factors are low for the Renewables program electric savings. Program level engineering verification resulted in 56 percent for kWh, 64 percent for kW, and 93 percent for therms. In Table 5-4 below, we provide the engineering verification factors for each of the technology categories.

Table 5-4. Engineering Verification Factors by Technology for the 18MCP

Technology	Verified Gross Installed		
	kWh	Peak kW	Therm
Biogas	**57%**	**56%**	**0%**
Biomass	**169%**[a]	**134%**[a]	**98%**
Solar Electric	**99%**	**99%**	
Solar Electric - Residential	100%	99%	
Solar Electric - Non-residential	99%	99%	
Solar Hot Water	**48%**	**23%**	**105%**
Solar Hot Water - Residential	51%	26%	109%
Solar Hot Water - Non-residential	69%	30%	105%
Wind	**60%**	**108%**	
Wind - Residential	59%	128%	
Wind - Non-residential	62%	76%	
Overall	**56%**	**64%**	**93%**

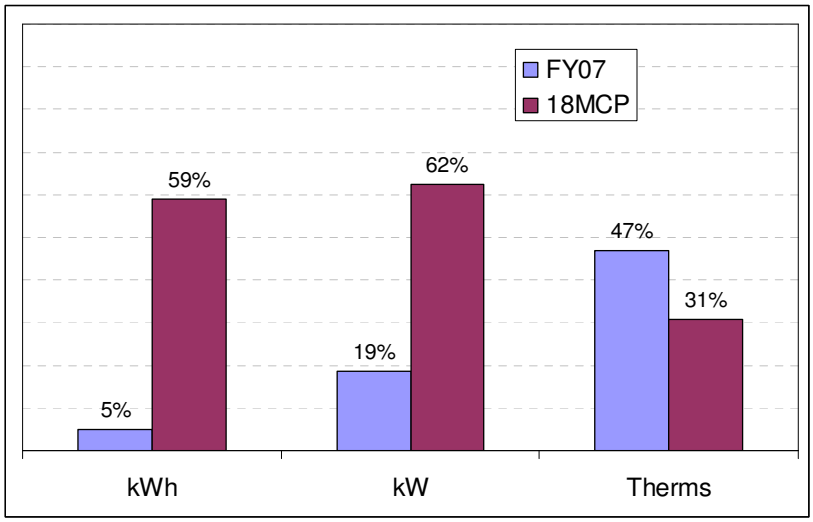
[a] Verified gross installed kWh and kW for biomass in the 18MCP represents parasitic load (negative savings). Values greater than 100 percent indicate greater parasitic load than tracked by the program.

The overall engineering verification factor incorporates KEMA's verification of the calculations used for program-tracked savings and the verification of installation. For the 18MCP we found low verified gross estimates for kWh and peak kW. The low overall verified gross installed electrical adjustment factors were primarily due to low biogas verified savings. Additional detail is available in the 18MCP Impact Evaluation Report.

C. PROGRAM ATTRIBUTION

Attribution is the percent of tracked savings that is directly attributable to the program. The 18MCP attribution factors for the program overall were 59, 62, and 31 percent for kWh, kW, and therms, respectively. This is shown in Figure 5-2, with a comparison to FY07 attribution values. Attribution for electric projects increased substantially, while attribution for projects displacing therms declined. While the majority of the projects displacing therms are solar hot water, the most of the tracked therm savings result from biogas and biomass projects. We discuss the attribution results by technology below.

Figure 5-2. Overall Program Attribution
FY07 and 18MCP

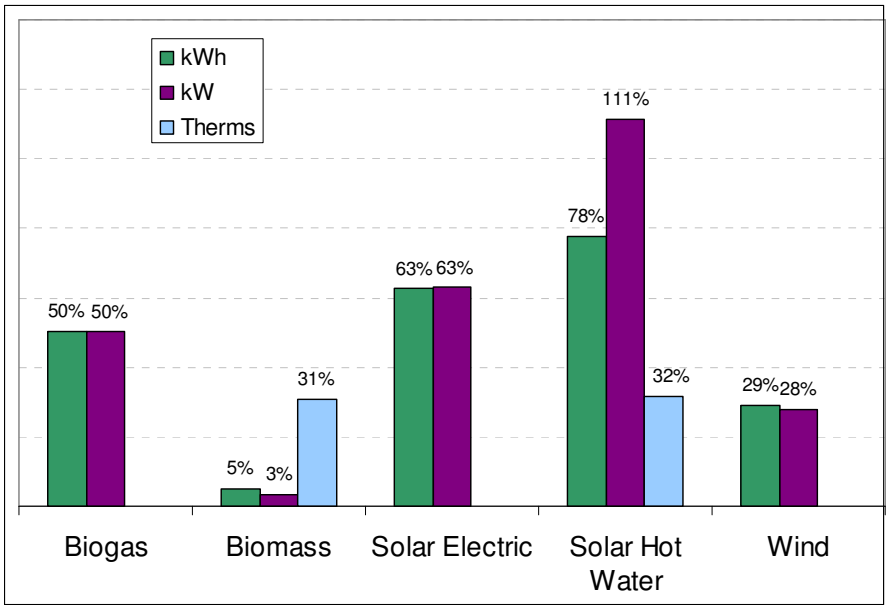


Attribution varied substantially by technology and by the type of energy offset. Solar Hot Water, Solar Electric, and Biogas have high electric attribution rates relative to wind (see Figure 5-3)[29]. Thermal attribution for biomass and solar hot water are low, at approximately 30 percent.

Attribution for biogas projects for the 18MCP was 50 percent, which is substantially higher than in previous years. For the 18MCP, the program substantially increased the grant amounts available for biogas projects, and several high grant projects were completed in the 18MCP.

[29] This is the first SAR that includes attribution and realization rates for individual Renewable technologies. This is because the program completed, and we interviewed, a sufficiently large number of participants in each of the technology groups to report the results without violating respondent confidentiality.

Figure 5-3. Program Attribution by Technology[30]



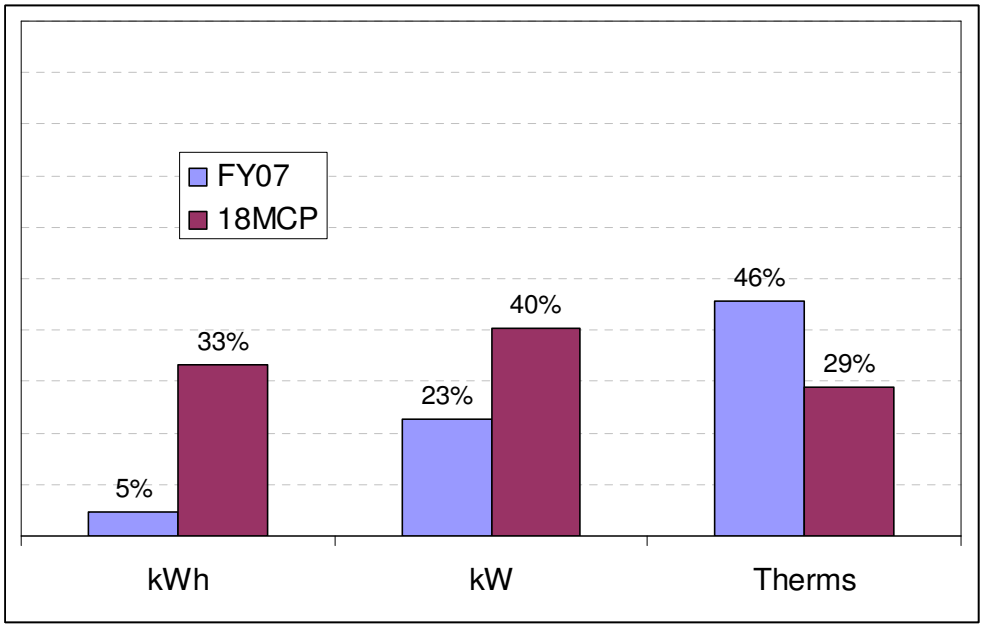
D. REALIZATION RATE

The realization rates combine the effect of the gross savings adjustment factors and the attribution factors. The 18MCP realization rates for the program overall are 33 percent, 40 percent, and 29 percent for kWh, kW, and therms, respectively, as shown in Table 5-5.

The overall realization rates for electric measures increased in the 18MCP over FY07, as shown in Figure 5-4. The therm realization rate declined from 46 to 29 percent.

[30] The electric energy and demand attribution for Solar Hot Water requires some explanation. Peak demand attribution exceeds 100 percent due to the nature of the calculation. Attribution is calculated as the savings attributable to the program divided by the verified gross savings. In the case of Solar Hot Water, the verified gross savings included a substantial amount of parasitic load. The projects with higher parasitic loads (a negative savings) had low attribution rates, which increased the amount of electricity savings attributable to the program. For peak demand, this resulted in net savings greater than the verified gross savings.

Figure 5-4. Final Realization Rates
FY07 and 18MCP



Realization rates by technology varied substantially, and varied from the attribution rates. Solar Electric has the highest realization rate, roughly equal to the attribution rate, because the verified gross installation was almost equal to the tracked energy and demand savings. Solar hot water and biogas had realization rates substantially lower than attribution due to low verified gross adjustment factors. Wind energy (kWh) is quite low, due to low verified gross adjustment factors and very low attribution.

Table 5-5. Realization Rates by Technology
18MCP

	kWh						kW						Therms					
			Margin of Error (90% confidence)						Margin of Error (90% confidence)						Margin of Error (90% confidence)			
Technology	n[a]	Estimate	18MCP[a]		Extra-polated		n[a]	Estimate	18MCP[a]		Extra-polated		n[a]	Estimate	18MCP[a]		Extra-polated	
Overall Renew	**58**	**33%**	**±**	**3.3%**	**±**	**26.6%**	**50**	**40%**	**±**	**5.5%**	**±**	**23.6%**	**23**	**29%**	**±**	**25.4%**	**±**	**40.3%**
Biogas	4	29%	±	0.0%	±	27.9%	4	28%	±	0.0%	±	27.6%	1	0%	±	0.0%	±	0.0%
Biomass	3	8%	±	8.0%	±	12.6%	3	4%	±	4.9%	±	7.8%	8	30%	±	27.0%	±	42.7%
Solar Electric	23	62%	±	13.5%	±	14.8%	23	62%	±	13.9%	±	15.1%						
Solar Thermal	18	36%	±	27.9%	±	29.6%	11	24%	±	53.2%	±	57.8%	15	33%	±	21.1%	±	23.7%
Wind	7	17%	±	13.2%	±	16.8%	7	30%	±	26.2%	±	33.9%						

Table 5-5 below reports the overall final adjustment factors for 18MCP. The evaluation team calculated the final adjustment factors for each technology based on a sample of projects completed in the 18MCP (July 1, 2006–June 30, 2007). We weighted the calculation of the technology and overall program factors 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.[31] Finally, we applied the resulting net adjustment factors to all projects completed in 18MCP. These adjustments resulted in the final net energy impacts of the Focus Renewable Program for 18MCP.

Table 5-6. Final Net Adjustment Factors for 18MCP

	kWh						kW						Therms					
			Margin of Error (90% confidence)						Margin of Error (90% confidence)						Margin of Error (90% confidence)			
Adjustment Factor	n[a]	Estimate	18MCP[a]		Extra-polated		n[a]	Estimate	18MCP[a]		Extra-polated		n[a]	Estimate	18MCP[a]		Extra-polated	
Installation Rate	58	100%	±	0.0%	±	0.0%	50	100%	±	0.0%	±	0.0%	25	100%				
Engineering Verification Factor	62	56%	±	2.6%	±	24.1%	59	64%	±	3.6%	±	22.1%	25	93%	±	3.7%	±	8.9%
Gross Savings Adjustment Factor	58	56%	±	2.6%	±	24.1%	50	64%	±	3.6%	±	22.1%	25	93%	±	3.7%	±	8.9%
Attribution Factor	59	59%	±	5.3%	±	40.2%	56	62%	±	7.8%	±	29.6%	23	31%	±	27.2%	±	43.0%
Realization Rate	58	33%	±	3.3%	±	26.6%	50	40%	±	5.5%	±	23.6%	23	29%	±	25.4%	±	40.3%

a The gross savings adjustment factor and the realization rate are not calculated directly but are products of other adjustment factors. Therefore, sample sizes reflect the minimum sample size used in calculating these two adjustment factors.

Program realization rates overall are 33 percent for energy (kWh), 40 percent for demand (kW), and 29 percent for therms program estimated impacts. These low realization rates are a result of both low program attribution and low gross savings adjustments.

Free-ridership rates for the Renewable Energy Program remain high: free-ridership on electric savings fell, while therm free-ridership increased. Free-ridership s estimated at 41 percent for kWhs (energy), 38 percent for kW (demand), and 69 percent for therms. That is, the analysis indicates that 41 percent of the electric energy savings, 38 percent of the demand savings, and 69 percent of the therm savings would have occurred without the program.

5.3.4 Estimated energy impacts (January 1, 2009–June 30, 2009)±

In the absence of CY09 adjustment factors, we estimated January 1, 2009, to June 30, 2009, evaluation-verified gross and net energy impacts by applying the final technology specific 18MCP adjustment factors to the January 1, 2009, to June 30, 2009, program-reported gross energy savings. Table 5-3 shows the estimated January 1, 2009, to June 30, 2009, impacts, the final 18MCP impacts, and the impacts for the previous program years.

For all years in the table prior to the 18MCP, evaluation-verified gross is the product of the overall program-reported gross savings and the overall program gross savings adjustment factor. Similarly, evaluation-verified net savings is the product of the overall program-reported

[31] 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.

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 the 18MCP and estimated January 1, 2009, to June 30, 2009, energy savings, the adjustment factors are applied at the technology level and the resulting savings are summed to calculate the overall program savings. Applying the ratios at the technology level provides more accurate results. We report overall factors in Table 5-5.

5.4 UPCOMING RENEWABLE EVALUATION ACTIVITIES CURRENT CONTRACT PERIOD

In this section, we describe the upcoming evaluation activities for the current contract period. For a more detailed discussion of these activities, refer to the Detailed Evaluation Plan.[32]

- **Benefit-cost inputs.** Provide renewable program inputs to support the Renewable Program and overall Focus on Energy benefit-cost report.
- **Impact evaluation.** KEMA plans to conduct an impact evaluation in this contract period. The impact evaluation will cover projects completed between January 1, 2009, and September 30, 2009 (the first nine months of the current program year). The purpose of this evaluation is to determine the program realization rate for CY09 and identify changes to realization rates due to program modifications or external factors.
- **Standardized calculation adjustments.** The evaluation team is currently adjusting the Standard Calculations Recommendations for submission to the PSCW. The evaluation team released a draft document with the revisions for comment on September 1. The Standard Calculation report outlines standardized approaches for estimating project generation (kW and kWh) and therms for all renewable energy types included in the program. The adjustments include revisions to the biogas energy estimation method, clarifications to the solar hot water estimation methods, and clarifications to the wind energy estimation method. The adjustments address unresolved issues raised in the original document. Additionally, some sections were modified for clarification or to address questions raised in the past year.
- **Biogas supply-side study.** Conduct research to assess market effects of biogas program. This study is proceeding in two phases. The report on the first phase of the study will be available this fall.

[32] Focus on Energy Evaluation, *Calendar Year 2009, Detailed Evaluation Plan: Renewable Energy Program,* April 16, 2009.

APPENDIX A: GEOGRAPHIC DISTRIBUTION OF DIRECT ENERGY IMPACTS

This appendix presents the geographic distribution of direct energy impacts. Also note that information on participant avoided costs, used to value the energy savings in these maps, may be found in Table A-17.

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.

Note: A change in the type of energy impacts data used for the maps. The data reported in all of the maps in this report are *lifecycle verified gross* energy impacts—a recently introduced (for Focus) type of reported energy impacts. As in the past, these are impact estimates based on evaluation work done to establish verified gross for specific programs and/or program areas. However, as discussed in Section 1.1, *lifecycle verified gross* is defined as:

> Energy savings, expressed as *verified gross*, that explicitly incorporate measure life.

The reader should be aware of this shift since it has the effect of diminishing the levels of reported savings (compared to verified gross savings). This is because verified gross savings do ***not*** consider the lifecycle effects (i.e., the median operating life of energy efficiency measures, such as CFLs) that may cause energy savings to end.

In order to provide some continuity in this transition in the basis for the mapped energy impacts, the tables that accompany the maps include a column for verified gross impacts—as in past reports—though these are *lifecycle* verified gross impacts, and will therefore show some differences from past reports. Additional discussion of lifecycle and persistent savings is provided above in Section 2.1 and Section 2.8.

Normalizing data for the maps. As in the past, 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 energy savings achieved through participation in Focus on Energy Business Programs. These impacts are broken out for the Commercial and Industrial sectors.

Note: A change in the type of energy impacts data used for the Business Programs maps. As explained in the Introduction to this Appendix (above), the data reported in all of the maps in this report are *lifecycle verified gross* energy impacts— a recently introduced (for Focus) type of reported energy impacts. As in the past, these are impact estimates based on evaluation work done to establish verified gross for specific programs and/or program areas. However, as discussed in Section 1.1, *lifecycle verified gross* is defined as:

> Energy savings, expressed as *verified gross*, that explicitly incorporate measure life.

The reader should be aware of this shift since it has the effect of diminishing the levels of reported savings (compared to verified gross savings). This is because verified gross savings do ***not*** consider the lifecycle effects (i.e., the median operating life of energy efficiency measures, such as CFLs) that may cause energy savings to end.

In order to provide some continuity in this transition in the basis for the mapped energy impacts, the tables that accompany the maps include a column for verified gross impacts—as in past reports—though these are *lifecycle* verified gross impacts, and will therefore show some differences from past reports. Additional discussion of lifecycle and persistent savings is provided above in Section 2.1 and Section 2.8.

The *"Number of Customers"* presented for each of the counties in Table A-1 ("eligible participants") 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

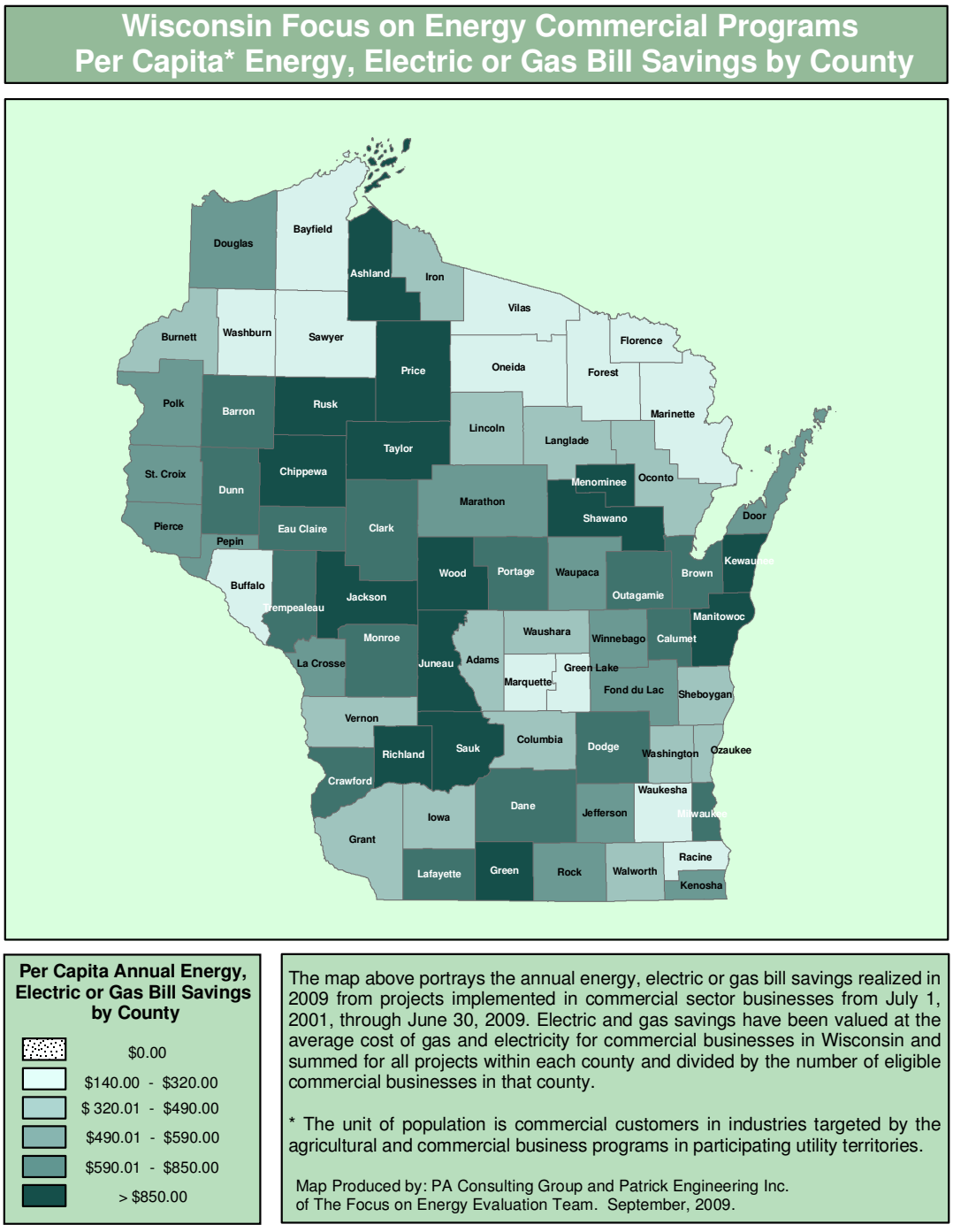
database is not fully representative of all of the businesses in the state, this ratio was applied to the number of businesses in that industry in that county reported by Dun and Bradstreet.

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.
Commercial Programs
Per Capita Energy, Electric or Gas Bill Savings by County
(July 1, 2001–June 30, 2009)



The map above portrays the annual energy, electric or gas bill savings realized in 2009 from projects implemented in commercial sector businesses from July 1, 2001, through June 30, 2009. 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 county and divided by the number of eligible commercial businesses in that county.

* The unit of population is commercial customers in industries targeted by the agricultural and commercial business programs in participating utility territories.

Map Produced by: PA Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

Table A-1. Commercial Program Energy Impacts
(By County)
(July 1, 2001– June 30, 2009)

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Adams	$490	1,010,012	238	38,116	489,759	113	16,531	258
Ashland	$852	3,945,717	1,101	234,563	2,107,238	573	99,965	690
Barron	$710	4,489,450	936	261,211	2,403,369	490	112,499	933
Bayfield	$296	1,309,129	358	54,027	648,625	178	20,842	571
Brown	$821	46,070,157	12,574	2,120,537	26,111,737	7,097	1,078,765	7,532
Buffalo	$275	580,954	156	59,964	304,839	82	23,830	417
Burnett	$433	1,261,678	182	85,077	702,177	105	34,080	460
Calumet	$805	5,896,547	1,170	136,949	3,196,581	615	52,732	800
Chippewa	$861	8,924,638	1,905	619,559	5,035,235	1,067	243,211	1,657
Clark	$797	5,295,924	1,286	304,428	2,811,687	690	125,685	975
Columbia	$439	5,330,758	1,288	339,816	2,925,074	679	139,641	1,868
Crawford	$735	5,099,114	823	37,740	2,091,854	410	15,154	637
Dane	$761	78,224,724	18,292	3,254,951	42,762,577	10,239	1,166,564	13,302
Dodge	$619	9,910,213	2,230	556,151	5,215,492	1,162	206,054	2,326
Door	$571	5,387,549	1,496	95,855	3,135,632	876	39,087	974
Douglas	$560	4,263,101	1,083	410,328	2,135,258	604	178,929	1,441
Dunn	$759	5,828,441	1,291	321,858	3,217,641	710	134,331	1,109
Eau Claire	$700	17,261,656	5,093	803,671	9,352,122	2,746	301,812	3,325
Florence	$217	60,748	9	1,108	26,471	4	525	29
Fond du Lac	$515	12,960,754	2,920	415,047	7,113,174	1,535	156,649	2,991
Forest	$149	531,964	114	10,190	277,611	59	4,113	373
Grant	$347	4,113,550	1,057	88,356	2,228,979	568	38,917	1,273
Green	$1,181	7,795,124	1,903	174,042	4,214,929	1,004	67,126	714
Green lake	$146	1,890,285	451	49,726	987,550	236	18,007	1,461
Iowa	$380	3,402,295	715	77,058	1,903,414	373	29,358	972
Iron	$445	1,210,276	267	37,489	630,383	133	15,462	320
Jackson	$4,048	965,614	295	136,556	495,791	161	54,016	57
Jefferson	$577	6,953,662	1,821	470,168	3,691,960	913	164,534	1,902
Juneau	$936	1,389,075	237	116,598	718,514	120	43,126	261
Kenosha	$578	15,906,901	3,405	513,260	8,454,529	1,816	207,344	3,276
Kewaunee	$1,213	6,550,669	1,476	305,006	3,573,216	773	83,870	728
La Crosse	$581	15,336,367	4,440	771,860	8,347,194	2,509	285,658	3,669
Lafayette	$734	2,313,840	592	87,102	1,233,965	304	47,781	394
Langlade	$484	3,530,108	1,113	121,521	1,840,816	562	40,411	886
Lincoln	$435	2,945,008	719	213,886	1,669,967	412	76,025	1,107
Manitowoc	$2,136	11,616,589	2,499	561,501	6,433,190	1,333	231,202	744
Marathon	$575	19,781,783	4,897	667,579	11,348,320	2,721	256,541	4,154
Marinette	$302	4,476,523	1,156	109,455	2,375,612	607	46,388	1,636
Marquette	$167	661,044	161	22,668	330,168	82	9,905	479
Menominee	$956	393,038	96	18,813	186,522	56	6,368	56
Milwaukee	$600	94,683,477	21,820	4,907,134	50,363,128	11,677	2,070,276	22,188
Monroe	$678	5,569,190	1,202	461,769	2,799,708	604	184,233	1,435
Oconto	$455	2,931,274	964	76,726	1,440,503	475	33,177	725

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Oneida	$315	4,354,209	1,010	251,006	2,350,850	563	92,954	2,034
Outagamie	$628	25,678,261	5,851	881,170	13,353,667	3,121	341,148	4,966
Ozaukee	$360	5,817,481	1,447	341,495	3,039,627	816	135,627	2,391
Pepin	$536	1,454,384	535	61,923	758,058	268	26,759	354
Pierce	$564	3,285,129	735	81,320	1,753,334	383	35,099	646
Polk	$509	5,091,942	1,314	203,683	2,510,001	629	80,377	1,277
Portage	$848	15,022,241	3,362	512,442	8,347,606	1,830	200,826	2,146
Price	$1,094	1,458,408	347	378,128	736,353	173	108,978	491
Racine	$277	11,303,238	2,638	406,544	6,194,047	1,448	153,257	5,028
Richland	$1,818	2,160,101	539	30,711	1,165,848	280	15,359	118
Rock	$540	17,751,331	4,163	931,463	9,466,974	2,210	426,192	4,646
Rusk	$1,309	5,012,326	1,266	150,952	2,593,009	646	49,589	447
Sauk	$908	12,704,875	3,073	419,811	6,847,658	1,627	164,965	1,678
Sawyer	$290	2,305,691	475	43,831	1,239,554	251	17,857	832
Shawano	$915	4,486,288	1,059	91,969	2,284,983	527	38,043	521
Sheboygan	$374	7,406,941	1,889	389,684	4,011,032	1,037	157,251	2,801
St. Croix	$503	5,040,700	1,297	265,144	2,894,090	733	105,763	1,417
Taylor	$4,964	2,014,141	455	113,208	1,023,113	223	47,981	59
Trempealeau	$816	1,422,113	421	119,075	763,940	236	45,958	306
Vernon	$331	2,223,378	566	75,030	1,076,305	276	29,952	812
Vilas	$221	2,162,698	586	25,042	1,130,191	303	10,725	943
Walworth	$466	12,299,435	3,331	397,324	6,468,006	1,766	176,815	3,147
Washburn	$311	1,511,774	248	53,994	766,276	137	20,815	598
Washington	$447	10,732,790	2,386	339,254	5,790,856	1,292	136,141	2,842
Waukesha	$310	34,180,949	8,275	960,841	19,235,434	4,610	402,722	12,615
Waupaca	$498	7,400,047	1,897	135,551	3,766,182	982	45,575	1,543
Waushara	$382	2,270,402	595	81,561	1,175,700	307	36,870	732
Winnebago	$572	20,301,456	5,036	764,063	10,984,248	2,775	296,416	4,436
Wood	$2,134	8,532,881	1,826	453,444	4,995,025	1,032	163,271	568
Not mapped*		3,417,617	1,123	53,885	1,864,824	578	14,213	

* *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.
Commercial Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
(July 1, 2001– June 30, 2009)

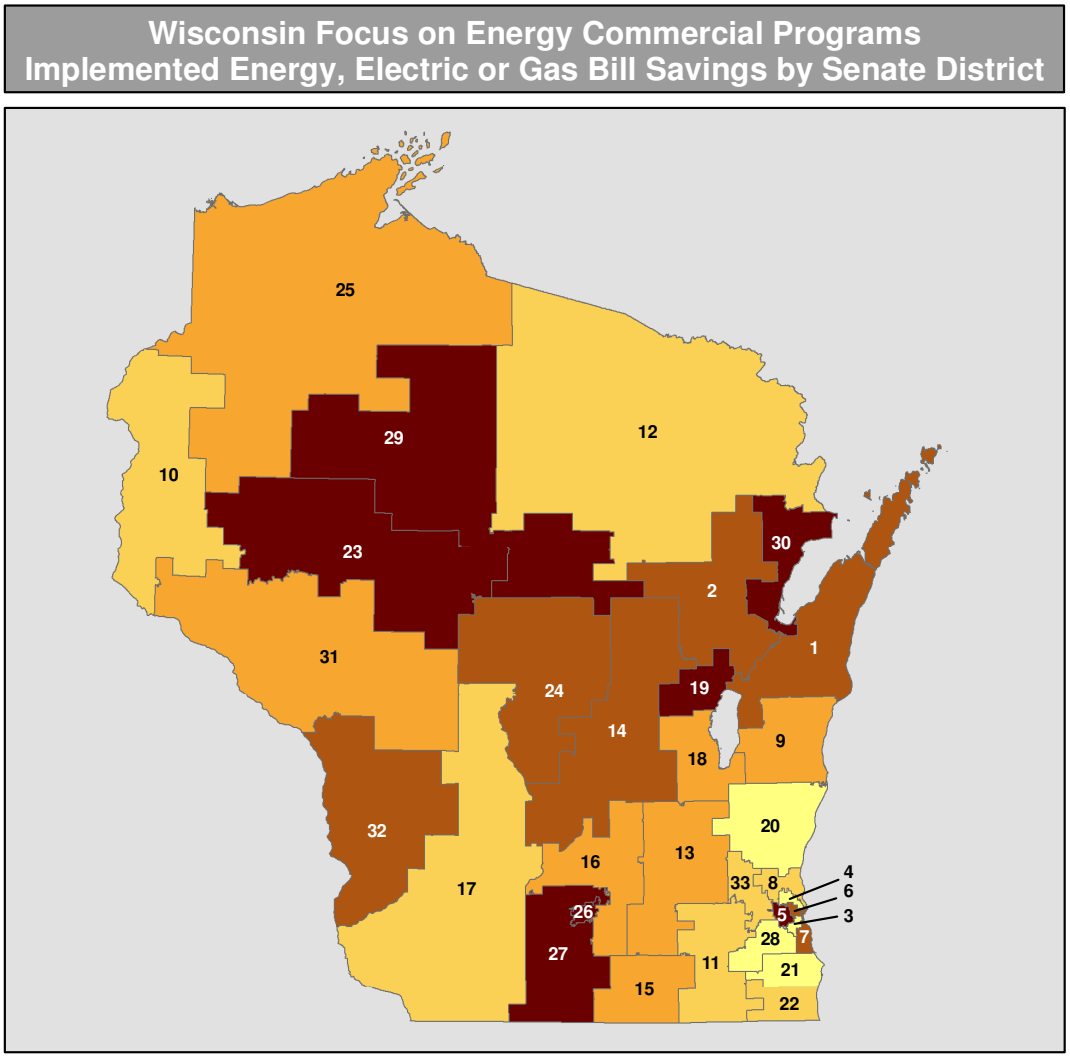


Table A-2. Commercial Program Energy Impacts
(By Senate District)
(July 1, 2001–June 30, 2009)

Senate District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$3,108,746	27,662,368	6,674	722,592	15,326,108	3,648	262,774
2	$3,181,086	25,946,775	6,500	919,254	14,269,498	3,532	384,676
3	$1,429,882	6,830,699	1,535	781,559	3,610,354	823	337,092
4	$872,461	7,124,203	1,607	251,517	4,022,497	912	101,767
5	$3,188,618	20,085,308	4,407	1,372,931	11,221,022	2,515	553,563
6	$2,950,481	22,329,117	5,105	985,004	10,875,977	2,419	474,112
7	$3,019,923	25,384,347	6,049	815,349	13,907,302	3,405	346,809
8	$2,174,282	15,595,548	3,941	791,379	8,438,356	2,196	298,361
9	$2,442,965	18,367,703	3,916	824,762	10,150,960	2,130	331,115
10	$2,362,213	17,025,115	4,065	853,562	9,181,877	2,164	345,795
11	$2,257,207	17,711,740	4,990	705,586	9,417,134	2,605	301,378
12	$2,205,613	17,090,270	4,601	705,972	9,040,988	2,438	257,148
13	$2,487,147	17,621,797	3,970	921,861	9,484,435	2,114	333,345
14	$2,941,984	24,475,402	5,992	813,654	13,022,967	3,179	320,003
15	$2,702,415	19,507,839	4,642	974,143	10,379,839	2,440	445,046
16	$2,537,672	18,938,735	3,992	867,486	10,559,579	2,169	323,280
17	$2,016,054	16,848,118	4,014	551,791	9,075,579	2,097	227,316
18	$2,615,980	21,987,892	5,651	706,370	11,791,455	3,033	255,564
19	$3,569,736	28,440,389	6,227	1,083,128	15,157,455	3,401	436,879
20	$1,631,167	11,931,295	2,848	576,063	6,254,384	1,502	234,142
21	$1,174,336	9,918,383	2,275	313,449	5,475,923	1,256	111,625
22	$2,076,922	16,885,083	3,659	604,409	8,960,107	1,946	247,998
23	$4,174,182	28,316,096	7,010	1,643,101	15,689,672	3,834	641,541
24	$3,179,552	24,792,446	5,531	1,005,851	13,949,828	3,024	383,102
25	$2,754,236	18,495,614	4,348	1,098,500	9,648,047	2,306	467,530
26	$5,474,732	39,780,696	9,439	1,953,631	20,845,381	5,210	678,884
27	$3,334,402	29,124,332	7,174	816,663	16,521,413	4,060	312,558
28	$1,582,785	15,047,947	3,258	294,419	8,335,718	1,754	116,116
29	$3,477,252	25,842,451	6,403	1,196,938	14,479,833	3,496	414,576
30	$3,735,906	25,558,946	7,532	1,454,118	14,256,118	4,202	793,443
31	$2,805,227	18,668,759	5,073	1,131,741	9,614,996	2,633	453,848
32	$2,941,027	23,536,898	6,030	884,324	11,946,525	3,292	329,994
33	$1,921,404	16,561,160	3,988	487,463	9,132,798	2,214	202,417
Not mapped*	$346,709	3,428,671	1,127	54,398	1,875,177	581	14,427

* *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.
Commercial Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
(July 1, 2001–June 30, 2009)

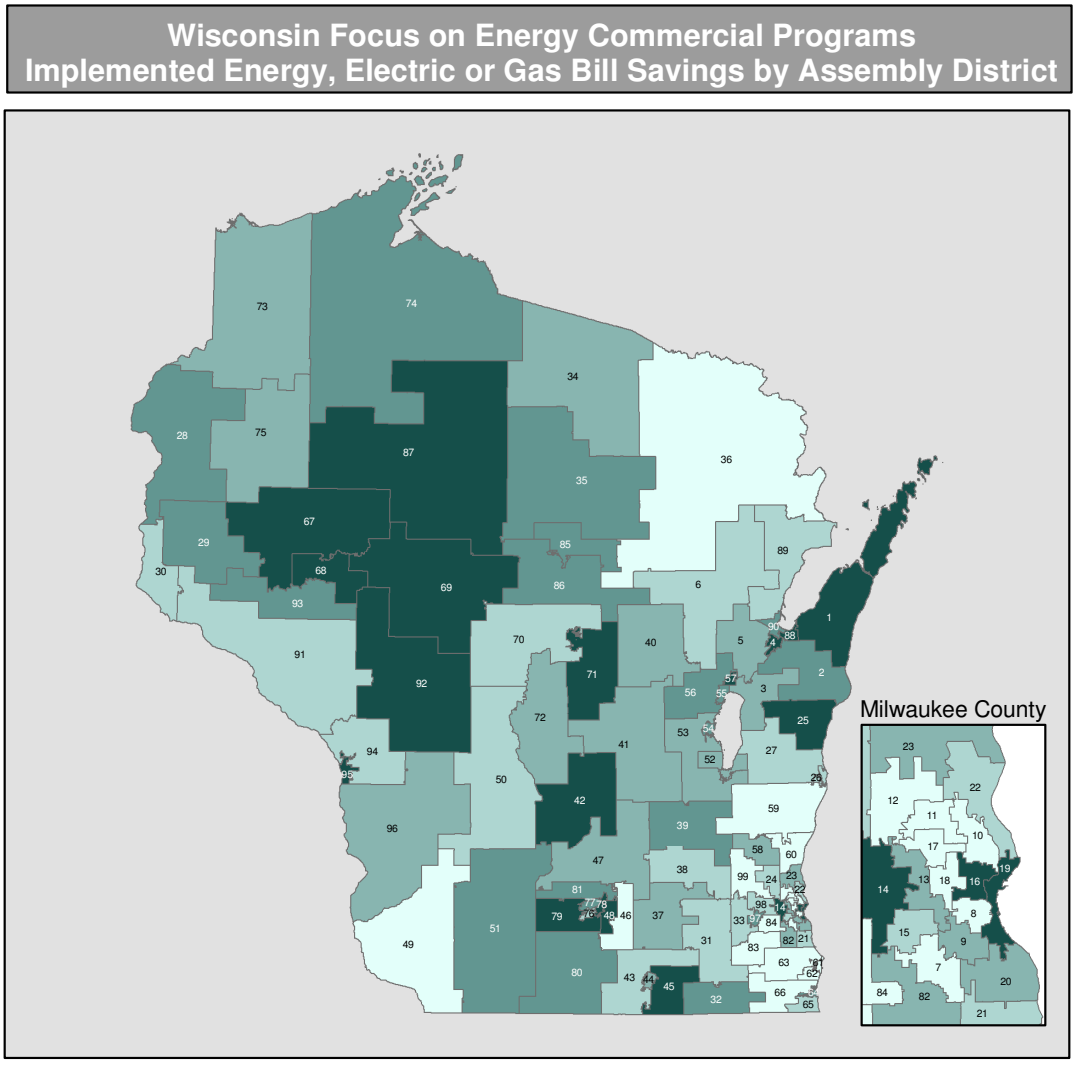


Table A-3. Commercial Program Energy Impacts
(by Assembly District)
(July 1, 2001–June 30, 2009)

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$1,277,637	12,173,519	3,037	235,623	6,815,576	1,679	90,948
2	$1,117,017	8,732,560	2,221	351,641	4,848,096	1,217	114,714
3	$714,091	6,756,289	1,416	135,328	3,662,435	752	57,112
4	$1,633,420	12,232,027	3,104	555,191	7,225,041	1,813	236,267
5	$865,656	7,648,224	1,898	205,373	3,997,324	990	82,443
6	$682,010	6,066,524	1,498	158,690	3,047,134	729	65,966
7	$248,372	1,312,717	338	126,136	689,514	186	58,867
8	$401,779	2,492,390	538	175,925	1,247,659	272	85,238
9	$779,731	3,025,591	659	479,498	1,673,181	366	192,987
10	$436,506	2,805,790	745	183,663	1,562,261	419	72,818
11	$121,856	1,214,344	232	18,411	640,413	124	7,847
12	$314,099	3,104,069	631	49,443	1,819,824	369	21,102
13	$822,201	3,779,084	961	460,739	1,964,840	522	177,222
14	$1,751,701	13,952,375	2,911	531,774	8,038,485	1,706	204,661
15	$614,717	2,353,849	536	380,418	1,217,697	287	171,679
16	$2,225,095	18,079,173	4,085	648,332	8,817,730	1,898	321,647
17	$438,121	3,268,730	754	149,844	1,542,821	377	68,561
18	$287,265	981,214	266	186,828	515,426	144	83,904
19	$1,628,565	14,272,280	3,591	395,241	7,764,160	2,091	179,774
20	$764,705	5,820,677	1,429	252,745	3,052,834	743	98,065
21	$626,653	5,291,390	1,030	167,362	3,090,308	571	68,969
22	$701,735	3,311,671	869	386,656	1,762,526	479	129,513
23	$817,409	6,285,563	1,641	265,307	3,265,330	889	109,060
24	$655,138	5,998,314	1,432	139,416	3,410,499	828	59,788
25	$1,307,173	9,855,997	1,897	439,185	5,535,015	1,018	176,025
26	$588,151	4,342,219	1,010	204,651	2,416,982	576	85,477
27	$547,642	4,169,488	1,008	180,925	2,198,962	537	69,614
28	$883,690	6,615,633	1,634	300,511	3,326,760	798	121,253
29	$903,037	5,579,043	1,258	397,150	3,094,170	687	162,390
30	$575,486	4,830,439	1,174	155,900	2,760,947	678	62,152
31	$620,165	4,264,332	1,279	239,745	2,108,349	599	94,385
32	$1,005,864	9,130,247	2,441	220,094	4,911,978	1,352	103,712
33	$631,178	4,317,160	1,270	245,748	2,396,806	654	103,280
34	$840,213	6,440,996	1,573	274,228	3,445,975	855	102,934
35	$936,995	6,732,336	1,911	340,162	3,605,288	1,005	117,295
36	$428,245	3,915,027	1,117	91,582	1,988,548	577	36,919
37	$720,371	4,669,228	1,190	300,143	2,458,825	622	102,806
38	$687,413	4,934,713	975	249,889	2,767,361	538	104,395
39	$1,079,363	8,017,857	1,805	371,829	4,258,249	953	126,144
40	$766,018	7,402,732	1,884	133,342	3,797,500	983	45,450
41	$773,136	5,361,882	1,285	295,397	2,813,870	677	107,272
42	$1,402,830	11,710,787	2,823	384,915	6,411,598	1,518	167,281

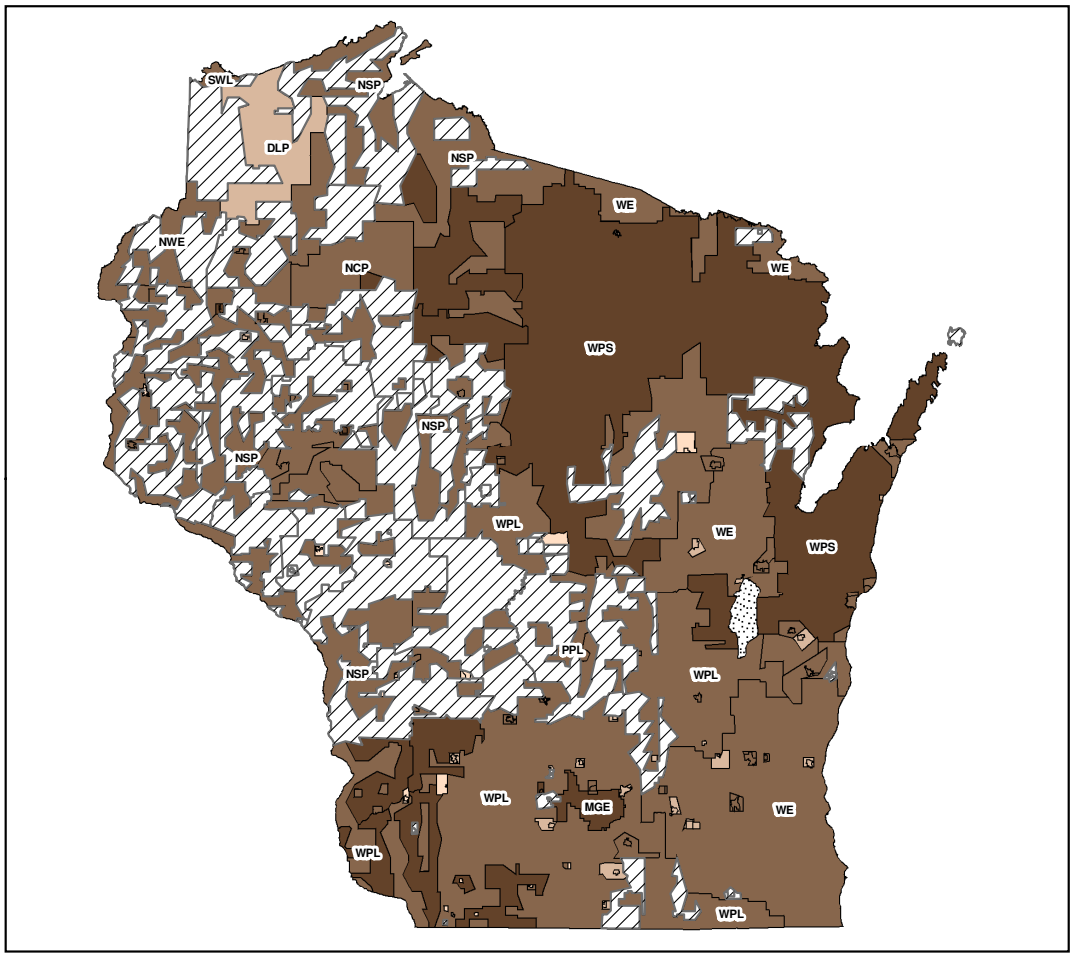
Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
43	$547,106	4,671,962	1,328	142,133	2,406,233	661	59,154
44	$710,229	5,630,288	1,139	217,645	3,066,789	643	88,714
45	$1,445,080	9,205,589	2,174	614,365	4,906,816	1,136	297,178
46	$537,400	3,140,675	934	250,023	1,677,958	512	101,711
47	$862,827	6,848,371	1,507	263,769	3,723,245	779	106,075
48	$1,137,445	8,949,689	1,551	353,694	5,158,376	878	115,494
49	$525,572	5,107,644	1,278	89,310	2,742,366	678	39,563
50	$556,254	3,652,184	873	228,202	1,937,397	457	79,825
51	$934,228	8,088,290	1,863	234,279	4,395,816	962	107,928
52	$711,755	5,965,537	1,576	193,479	3,368,853	853	74,496
53	$835,550	7,800,258	1,591	166,364	4,049,176	791	65,043
54	$1,068,676	8,222,097	2,484	346,527	4,373,426	1,389	116,025
55	$948,150	6,592,184	1,308	361,006	3,778,565	752	155,351
56	$976,976	10,577,011	2,139	83,497	5,587,414	1,154	25,913
57	$1,644,609	11,271,194	2,780	638,625	5,791,475	1,495	255,615
58	$725,439	5,538,058	1,175	238,528	2,968,766	629	95,902
59	$393,241	3,231,348	835	111,819	1,643,213	408	48,073
60	$512,487	3,161,890	837	225,716	1,642,405	465	90,167
61	$378,003	3,975,314	832	41,228	2,000,035	416	13,736
62	$528,890	3,495,551	868	215,221	2,124,900	529	78,927
63	$267,443	2,447,518	575	57,000	1,350,988	310	18,962
64	$1,005,278	8,041,333	1,615	302,567	4,155,598	843	131,181
65	$583,010	5,305,456	1,114	126,542	3,073,713	652	46,047
66	$488,634	3,538,294	930	175,300	1,730,796	451	70,771
67	$1,256,731	7,960,029	1,824	537,775	4,450,747	1,007	214,021
68	$1,594,310	11,650,234	3,220	563,921	6,671,412	1,805	205,095
69	$1,323,141	8,705,834	1,966	541,405	4,567,513	1,022	222,425
70	$686,091	5,256,695	1,319	224,140	2,948,218	717	78,938
71	$1,720,861	13,868,741	3,138	510,061	7,686,488	1,702	203,722
72	$772,601	5,667,010	1,075	271,650	3,315,122	605	100,442
73	$838,074	4,581,288	1,138	414,044	2,305,241	634	180,160
74	$1,106,501	8,367,261	2,136	369,910	4,411,990	1,100	154,126
75	$809,661	5,547,066	1,074	314,546	2,930,816	572	133,244
76	$601,559	4,543,137	988	201,547	2,390,828	525	62,099
77	$1,098,396	7,346,647	1,624	440,330	3,500,877	834	158,393
78	$3,774,776	27,890,913	6,827	1,311,755	14,953,676	3,851	458,392
79	$1,361,281	12,144,223	2,827	314,034	7,291,382	1,745	104,283
80	$1,054,750	9,755,856	2,442	216,926	5,216,393	1,278	85,919
81	$918,371	7,224,253	1,905	285,702	4,013,638	1,037	122,356
82	$774,557	7,247,935	1,588	152,918	3,812,468	815	59,956
83	$400,791	3,739,605	746	79,951	2,180,837	420	32,322
84	$407,438	4,060,407	924	61,550	2,342,412	519	23,837
85	$1,086,832	9,389,637	2,302	274,061	5,602,640	1,295	101,874
86	$913,737	7,235,955	1,886	280,590	4,148,419	1,086	106,154
87	$1,476,843	9,218,770	2,215	642,288	4,729,952	1,116	206,548
88	$2,067,521	10,720,916	3,648	1,065,738	5,874,929	2,000	636,443

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
89	$604,867	4,777,067	1,478	186,727	2,511,642	761	72,616
90	$1,063,518	10,060,964	2,407	201,654	5,869,547	1,441	84,384
91	$586,447	3,753,291	1,077	247,993	1,964,006	563	99,235
92	$1,181,879	6,182,566	1,403	605,099	3,122,788	718	240,796
93	$1,036,901	8,732,902	2,593	278,649	4,528,202	1,353	113,818
94	$600,701	5,836,773	1,594	102,152	3,297,759	876	27,832
95	$1,547,593	9,727,624	2,867	667,934	5,149,180	1,642	256,584
96	$792,733	7,972,501	1,569	114,239	3,499,587	774	45,579
97	$958,575	7,911,342	1,837	269,941	4,448,730	1,029	113,732
98	$630,453	5,831,724	1,315	129,634	3,235,164	753	52,035
99	$332,376	2,818,094	836	87,888	1,448,904	432	36,650
Not mapped*	$346,709	3,428,671	1,127	54,398	1,875,177	581	14,427

* *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.
Commercial Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
(July 1, 2001–June 30, 2009)

Wisconsin Focus on Energy Commercial Programs
Per Capita* Energy, Electric Bill Savings by Utility Territory



Per Capita Annual Energy Electric Bill Savings by Utility Territory

- $0
- $1.90 - $30.20
- $30.21 - $61.90
- $61.91 - $200.00
- > $200.00
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2009 from projects implemented in commercial sector businesses from July 1, 2001, through June 30, 2009. Electric savings has been valued at the average cost of electricity for commercial businesses in Wisconsin and summed for all projects within each utility territory and divided by the number of commercial business customers in that utility territory.

* The unit of population is commercial customers as reported by the utilities in 2007.

Map Produced by: PA Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

Table A-4. Commercial Program Electric Impacts
(By Participating Electric Utility)
(July 1, 2001–June 30, 2009)

Utility Name	Map Code	Annual Dollars Saved	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers
Algoma Utility Commission		$12,356	$34	147,625	38	96,054	25	362
Alliant Energy	WPL	$9,779,001	$176	116,833,941	27,522	62,997,408	14,795	55,701
Arcadia Electric & Water Utility		$454	$2	5,426	1	2,757	1	239
Barron Light And Water Utility		$10,023	$32	119,752	23	70,962	15	316
Black River Falls Municipal Electric & Water		$13,166	$26	157,300	70	83,730	42	511
Bloomer City Of Electric Utility		$60,884	$163	727,403	41	411,295	25	373
Boscobel Municipal Utilities		$5,325	$17	63,617	16	29,537	8	314
Brodhead Water And Light Commission		$9,639	$32	115,161	23	57,961	11	305
Cashton Municipal Electric And Water Utility		$6,086	$52	72,715	20	35,138	9	116
Cedarburg Light And Water Commission		$40,743	$48	486,779	121	245,367	63	847
Centuria Municipal Electric Utility		$906	$13	10,830	1	6,313	1	71
City of Argyle		$1,723	$20	20,589	5	9,181	2	88
City of Kiel		$18,389	$51	219,706	61	124,373	35	362
City of Lodi		$15,626	$54	186,693	55	90,308	26	290
City of Muscoda		$4,180	$21	49,935	14	24,663	7	201
City of New Richmond		$13,189	$22	157,569	46	89,036	26	588
City of Westby		$4,288	$23	51,228	15	22,055	6	189
Columbus Water And Light Dept		$16,685	$41	199,346	43	118,015	25	411
Consolidated Water Power Company	CWP	$4,890	$26	58,425	16	26,438	8	189
Cornell Municipal Water And Electric Utility		$12,662	$92	151,280	46	67,551	20	138
Cuba City Electric & Water Utility		$3,382	$24	40,410	11	23,694	6	141
Cumberland Municipal Utility		$61,521	$278	735,019	201	419,654	110	221
Dahlberg Light And Power Company	DLP	$62,068	$56	741,556	150	353,849	72	1,107
Eagle River Light And Water Commission		$24,989	$47	298,552	108	164,533	57	531
Eau Claire Electric Cooperative	C-8	$102,825	$183	1,228,500	370	734,427	199	561
Elroy Municipal Electric And Water Utility		$2,472	$17	29,532	8	12,381	4	143
Evansville City of Water & Light		$34,370	$62	410,629	96	224,255	50	556
Florence Utility Commission		$4,005	$22	47,844	4	20,328	2	178
Hartford City Of Utilities		$78,829	$99	941,809	265	510,300	145	796

Utility Name	Map Code	Annual Dollars Saved	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persisten t Net kW	Number of Customers
Hustisford Utilities		$6,038	$31	72,142	18	35,555	9	194
Jefferson Utilities		$24,997	$48	298,650	80	143,682	39	521
Juneau Utility Commission		$6,313	$34	75,428	17	39,050	9	184
Kaukauna Utilities		$143,743	$90	1,717,363	469	931,817	249	1,593
La Farge Municipal Electric Utility		$8,103	$72	96,811	28	56,918	13	113
Lake Mills Light And Water Dept		$26,044	$59	311,154	59	162,683	28	441
Madison Gas And Electric Company	MGE	$5,108,690	$275	61,035,718	13,503	32,927,235	7,522	18,553
Manitowoc Public Utilities		$240,137	$113	2,869,016	534	1,809,144	328	2,121
Mazomanie Electric Utility		$26,306	$231	314,294	82	214,643	56	114
Medford Electric Utility		$92,773	$168	1,108,393	242	594,673	124	552
Menasha Electric & Water Utilities		$35,657	$42	426,013	109	203,816	52	854
Mount Horeb Electric Utility		$27,053	$55	323,213	90	193,354	54	491
New Glarus Light And Water Works		$13,599	$69	162,469	45	80,319	22	197
New Holstein Public Utility		$33,676	$104	402,338	93	211,866	49	324
New London Electric & Water Utility		$17,100	$34	204,300	43	107,387	22	499
North Central Power Company Inc	NCP	$82,583	$193	986,654	172	499,401	84	427
Northwestern Wisconsin Electric Co	NWE	$203,778	$139	2,434,629	553	1,228,236	274	1,470
Oconomowoc City Of Utilities		$192,067	$174	2,294,712	477	1,293,194	278	1,103
Oconto Falls Water And Light Commission		$26,724	$100	319,278	79	183,217	46	267
Pierce-Pepin Electric Cooperative	C-14	$44,396	$139	530,413	198	239,602	86	320
Pioneer Power & Light Company	PPL	$15,951	$124	190,574	20	93,769	11	129
Plymouth Utilities		$68,310	$72	816,126	241	429,845	128	947
Polk-Burnett Electric Cooperative	C-15	$121,556	$120	1,452,282	319	727,579	164	1,015
Price Electric Cooperative Inc	C-16	$57,970	$247	692,591	167	366,886	89	235
Princeton Municipal Water & Electric Utility		$11,766	$77	140,575	33	82,076	20	153
Reedsburg Utility Commission		$55,990	$84	668,937	186	344,574	96	667
Rice Lake Municipal Water & Electric Utility		$96,832	$111	1,156,892	217	654,163	123	876
Richland Center Electric Utility		$24,331	$39	290,697	86	169,168	50	623
Richland Electric Cooperative	C-17	$94,898	$516	1,133,793	292	592,813	148	184
River Falls Municipal Utility		$76,833	$114	917,955	201	497,593	117	675
Riverland Energy Cooperative	C-18	$23,203	$21	277,221	73	125,102	33	1,107
Rock County Electric Cooperative	C-19	$36,189	$71	432,361	189	194,452	85	511

Utility Name	Map Code	Annual Dollars Saved	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers
Scenic River Electric Cooperative	C-20	$259,526	$350	3,100,669	852	1,722,356	458	741
Shawano Municipal Utilities		$107,394	$84	1,283,083	306	721,431	169	1,280
Sheboygan Falls Utilities		$6,242	$14	74,571	21	36,164	10	462
Shullsburg Electric Utility		$3,179	$16	37,983	11	17,760	5	203
Slinger Utilities		$31,200	$95	372,757	144	213,476	76	327
Spooner Municipal Utilities		$59,132	$170	706,477	120	364,869	68	347
Stoughton Electric Utility		$59,714	$72	713,429	222	344,440	104	827
Stratford Municipal Water & Electric Utility		$21,284	$137	254,292	65	122,918	30	155
Sturgeon Bay Utilities		$126,930	$84	1,516,482	398	837,943	218	1,509
Sun Prairie Water & Light Commission		$65,992	$38	788,434	195	465,217	114	1,740
Superior Water Light And Power Company	SWL	$293,899	$152	3,511,343	924	1,776,584	528	1,930
Two Rivers Water & Light Utility		$57,053	$96	681,640	192	403,117	110	592
Village of Belmont		$778	$6	9,293	2	5,632	1	131
Village of Benton		$2,746	$33	32,811	6	13,376	3	82
Village of Cadott		$17,350	$964	207,290	53	114,766	26	18
Village of Gresham		$3,358	$20	40,123	11	17,867	5	168
Village of Pardeeville		$4,674	$33	55,848	16	31,433	9	140
Village of Prairie Du Sac		$7,298	$29	87,192	24	41,571	12	254
Village of Viola		$2,643	$30	31,582	8	13,032	3	88
Village of Waunakee		$37,348	$67	446,219	246	225,256	121	556
Waterloo Water And Light Commission		$27,689	$94	330,814	78	166,912	40	295
Waupun Public Utilities		$57,638	$110	688,631	164	340,521	82	524
We Energies	WEP	$18,357,967	$172	219,330,547	50,670	117,425,788	27,159	106,693
Whitehall Municipal Electric Utility		$6,002	$30	71,708	12	40,323	6	199
Wisconsin Dells Municipal Electric Utility		$42,620	$63	509,196	135	258,653	71	681
Wisconsin Public Service Corporation	WPS	$10,869,691	$204	129,864,883	33,437	72,104,790	18,496	53,383
Wonewoc Electric & Water Utility		$380	$4	4,538	1	1,858	0	91
Xcel Energy	NSP	$6,601,582	$165	78,871,942	20,712	42,242,389	11,142	39,918
Not mapped*		$2,073,768		24,776,206	6,249	13,343,490	3,262	

* *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.
Commercial Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
(July 1, 2001–June 30, 2009)

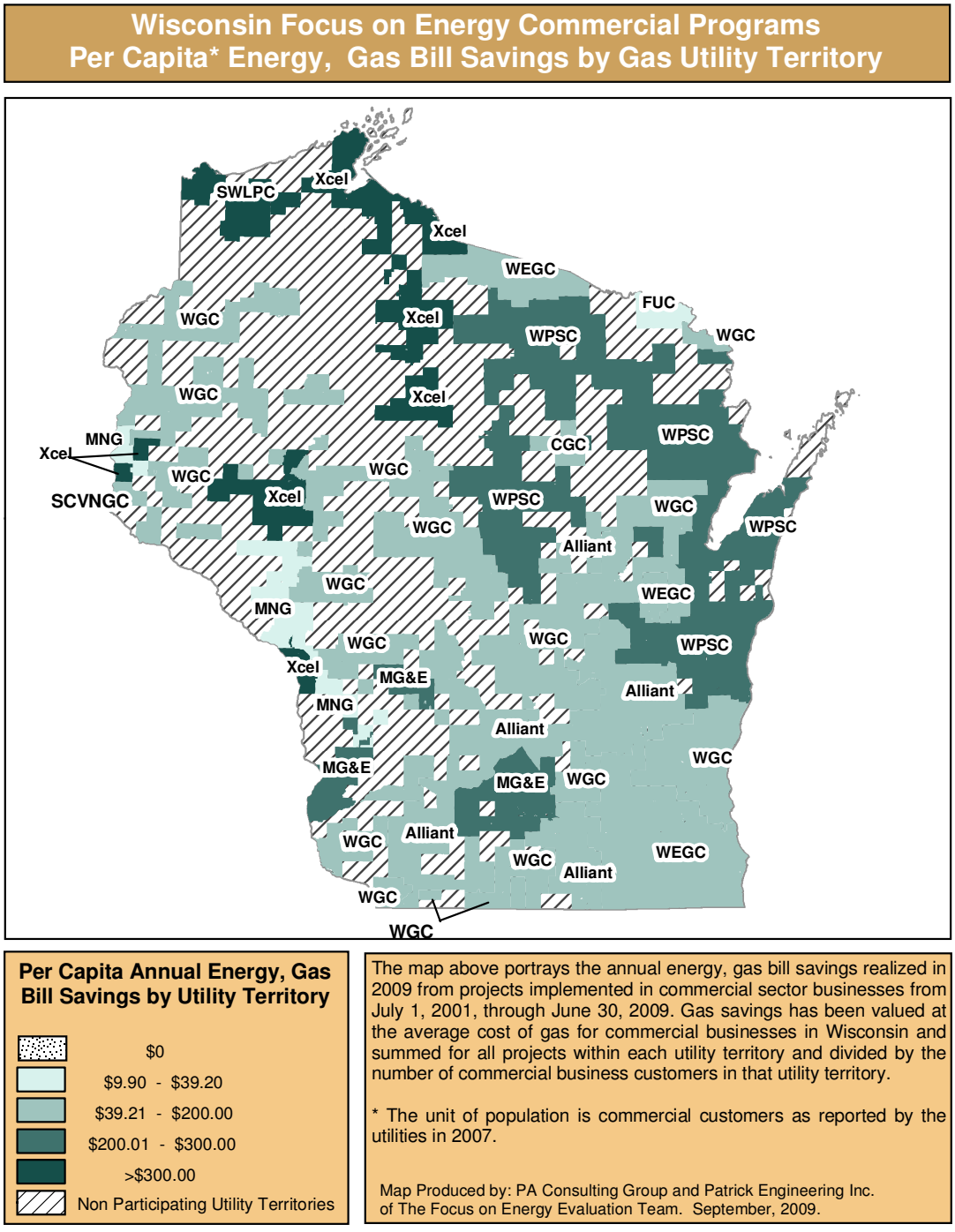


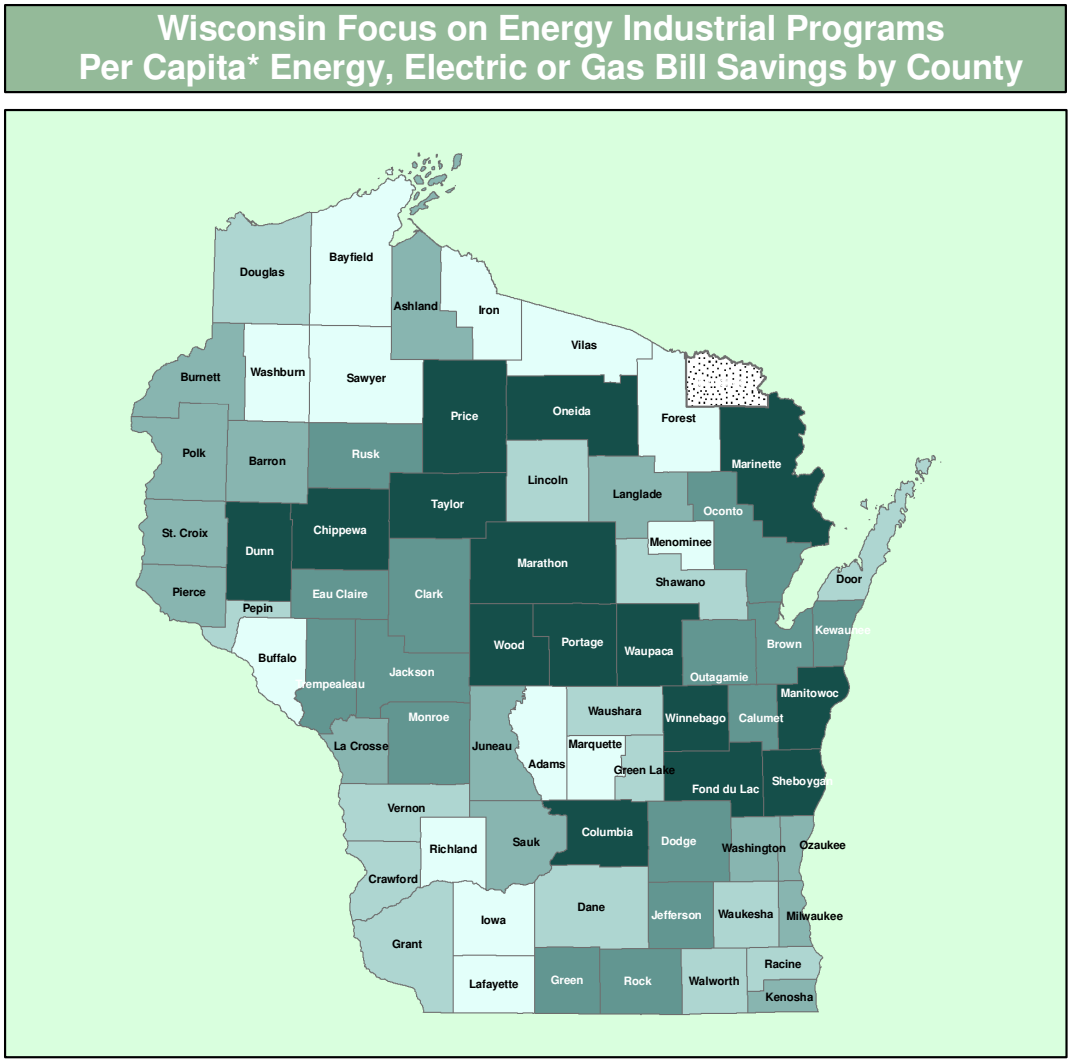
Table A-5. Commercial Program Gas Impacts
(By Participating Gas Utility)
(July 1, 2001–June 30, 2009)

Utility Name	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Lifecycle Verified Gross Therms	Persistent Net Therms	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$183	$3,393,255	3,090,397	1,249,929	18,567
City Gas Company	CGC	$155	$89,570	81,576	31,151	578
Florence Utility Commission	FUC	$10	$1,216	1,108	525	122
Madison Gas and Electric	MG&E	$251	$3,430,791	3,124,582	1,111,693	13,686
Midwest Natural Gas Inc.	MNG	$39	$58,312	53,107	26,419	1,488
St Croix Valley Natural Gas Company	SCVNGC	$54	$32,978	30,035	14,394	616
Superior Water Light And Power Company	SWLPC	$397	$450,543	410,331	178,930	1,136
Wisconsin Electric Gas Operations	WEGC	$121	$4,354,556	3,965,898	1,609,908	35,927
Wisconsin Gas Company	WGC	$130	$6,557,003	5,971,770	2,635,222	50,301
Wisconsin Public Service Corporation	WPSC	$238	$6,150,520	5,601,567	2,377,818	25,876
Xcel (Northern States Power Company)	Xcel	$301	$3,360,788	3,060,827	1,153,772	11,170
Not mapped*			$4,141,407	3,771,773	1,348,462	

* *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.
Industrial Programs
Per Capita Energy, Electric or Gas Bill Savings by County
(July 1, 2001–June 30, 2009)



The map above portrays the annual energy, electric or gas bill savings realized in 2009 from projects implemented in industrial sector businesses from July 1, 2001, through June 30, 2009. 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 Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

Table A-6. Industrial Program Energy Impacts
(By County)
(July 1, 2001–June 30, 2009)

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Adams	$79	156,628	32	0	86,007	17	0	116
Ashland	$595	2,482,997	407	22,357	1,106,266	172	9,749	283
Barron	$821	3,967,303	638	156,823	2,154,125	333	63,596	481
Bayfield	$74	172,986	28	10,992	92,239	14	3,694	289
Brown	$985	46,241,487	7,300	1,477,979	23,565,561	3,464	760,093	4,303
Buffalo	$12	29,262	4	0	16,676	2	0	141
Burnett	$483	1,692,489	142	9,722	721,008	62	6,140	226
Calumet	$1,103	4,532,952	733	131,378	2,282,497	350	63,335	364
Chippewa	$2,652	16,936,187	2,199	1,075,500	8,852,059	1,088	570,988	794
Clark	$984	3,850,727	608	222,915	2,043,431	301	91,998	464
Columbia	$1,871	8,231,723	1,161	991,299	4,737,294	638	616,077	807
Crawford	$226	884,754	124	2,799	570,247	77	1,061	242
Dane	$245	19,906,715	3,486	552,066	10,074,511	1,771	282,841	7,083
Dodge	$1,004	8,613,227	1,408	602,863	4,459,935	692	377,571	1,125
Door	$222	1,116,333	152	41,464	481,110	64	22,192	487
Douglas	$336	1,872,629	552	124,068	946,202	270	72,833	708
Dunn	$2,108	10,216,090	1,524	411,574	5,466,270	748	262,031	486
Eau Claire	$1,584	16,849,506	2,437	1,469,425	8,424,095	1,180	787,584	1,584
Fond du Lac	$1,665	32,231,311	5,000	514,333	13,583,044	2,047	232,251	1,453
Forest	$47	192,324	53	0	89,697	24	0	240
Grant	$409	1,391,825	120	156,595	725,187	49	74,477	596
Green	$980	5,301,519	878	34,633	3,111,611	489	21,532	353
Green Lake	$353	1,322,928	267	155,138	709,782	136	92,103	675
Iowa	$31	210,767	47	2,116	95,255	19	1,256	471
Iron	$154	427,143	27	0	178,566	14	0	162
Jackson	$1,246	617,509	95	0	342,828	49	0	29
Jefferson	$1,160	8,771,553	1,539	673,374	4,290,849	771	385,385	1,044
Juneau	$722	356,653	66	83,611	158,426	28	52,807	149
Kenosha	$503	9,655,621	1,722	266,725	5,229,333	879	142,382	1,673
Kewaunee	$1,281	2,446,704	425	301,792	1,330,733	215	180,416	356
La Crosse	$718	13,856,465	2,370	488,740	6,172,100	1,070	288,558	1,835
Lafayette	$78	279,760	53	0	165,438	28	0	211
Langlade	$414	1,837,097	246	63,930	1,023,375	131	29,145	420
Lincoln	$253	1,672,388	302	44,221	900,446	155	25,496	569
Manitowoc	$1,683	6,194,981	1,157	374,457	3,336,297	593	222,425	446
Marathon	$2,034	31,854,892	5,307	2,483,153	16,678,451	2,641	1,452,228	2,182
Marinette	$2,210	2,901,478	594	1,581,905	1,556,568	306	941,253	819
Marquette	$103	312,469	54	0	172,656	29	0	177
Menominee	$54	29,712	6	0	15,567	3	0	32
Milwaukee	$722	50,516,924	7,451	5,034,219	24,927,051	3,549	2,223,594	11,329
Monroe	$1,299	6,874,594	643	402,333	3,729,153	332	187,341	631
Oconto	$999	1,820,169	367	233,647	1,019,910	212	133,429	349
Oneida	$3,918	6,961,746	985	3,457,219	3,850,817	523	2,330,471	1,019

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Outagamie	$1,319	39,455,996	5,498	1,192,041	19,493,315	1,845	658,910	2,687
Ozaukee	$839	9,391,539	1,153	659,539	4,230,685	489	315,983	1,470
Pepin	$295	449,504	85	10,715	231,670	41	6,239	127
Pierce	$477	1,565,319	257	60,650	732,902	111	26,097	324
Polk	$584	4,731,679	1,436	95,758	2,344,364	687	57,214	644
Portage	$4,992	20,099,470	2,344	3,843,696	10,104,680	1,110	1,845,628	1,034
Price	$26,181	14,618,573	1,813	4,982,213	6,979,426	829	2,961,756	230
Racine	$333	8,789,680	1,544	432,270	4,331,480	730	223,597	2,886
Richland	$18	14,103	3	0	8,035	2	0	46
Rock	$928	14,966,756	2,434	1,104,778	7,519,725	1,148	649,293	2,178
Rusk	$1,076	3,244,723	420	35,800	1,536,771	186	17,600	211
Sauk	$424	5,627,501	1,118	2,578	2,534,229	536	1,351	782
Sawyer	$0	1,805	0	0	977	0	0	423
Shawano	$255	1,116,059	184	11,187	607,783	95	7,066	301
Sheboygan	$4,312	25,512,724	3,522	4,295,416	12,857,832	1,716	2,638,984	1,379
St. Croix	$529	5,964,156	994	114,123	3,031,926	477	58,923	883
Taylor	$4,315	1,139,503	204	102,170	608,026	100	52,183	40
Trempealeau	$1,001	1,383,313	194	108,266	721,031	96	49,734	193
Vernon	$226	696,252	94	28,822	360,472	47	17,482	313
Vilas	$83	635,046	68	0	331,940	37	0	445
Walworth	$360	7,274,613	1,329	156,703	3,802,433	658	77,357	1,634
Washburn	$93	496,733	101	611	270,985	52	199	318
Washington	$429	7,660,143	1,371	301,517	4,012,509	679	145,468	1,775
Waukesha	$373	29,210,809	4,518	1,332,308	14,666,110	2,226	757,852	8,283
Waupaca	$1,973	5,040,869	838	1,222,380	2,746,580	429	770,737	792
Waushara	$253	573,136	153	44,160	292,706	69	18,586	313
Winnebago	$1,661	31,008,158	4,822	1,877,435	15,897,771	2,389	1,040,977	2,264
Wood	$6,508	12,275,750	1,579	1,698,431	5,889,165	671	1,075,512	381
Not mapped*		3,158,186	402	240,151	1,706,594	206	142,677	

* *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.
Industrial Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
(July 1, 2001–June 30, 2009)

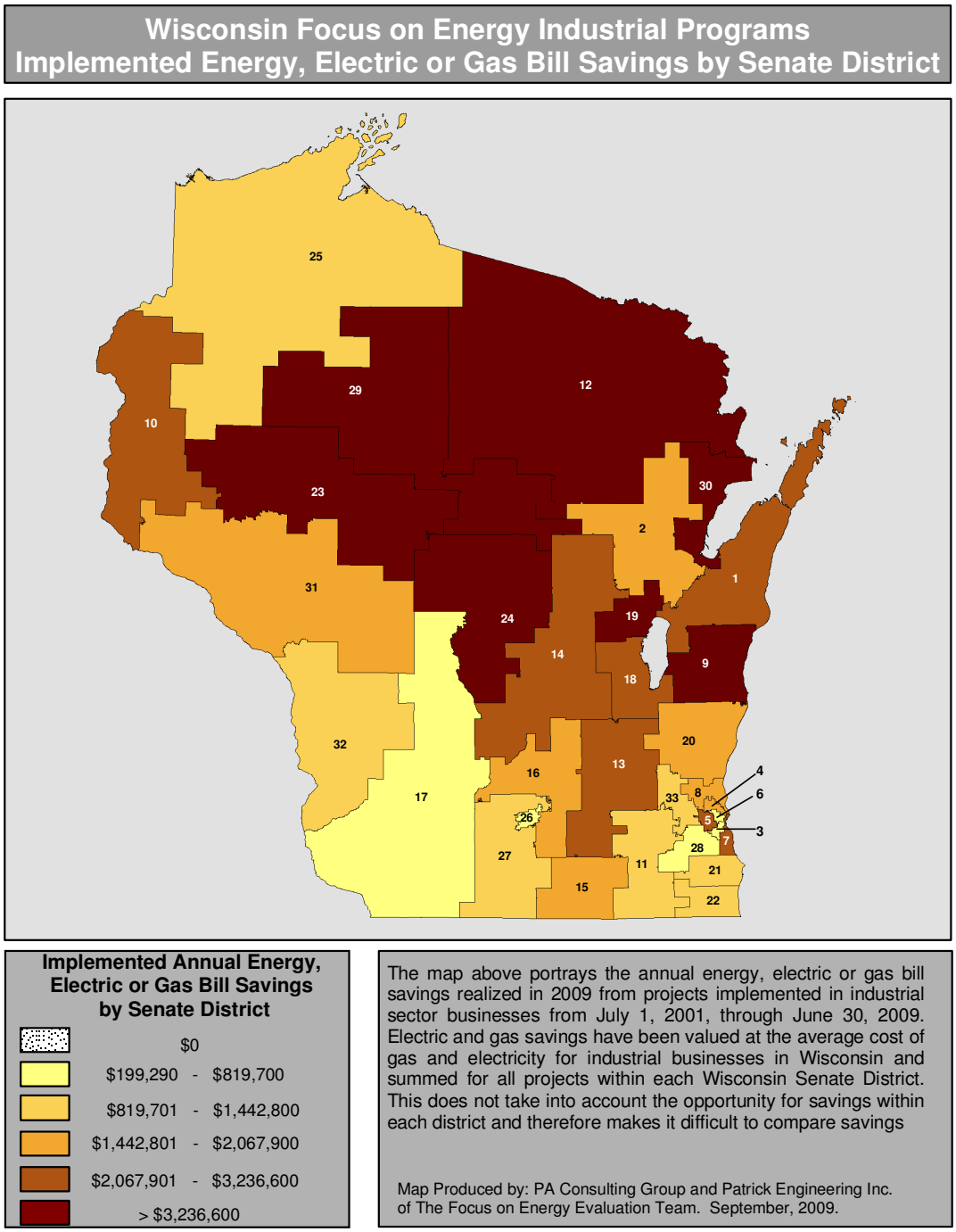


Table A-7. Industrial Program Energy Impacts
(By Senate District)
(July 1, 2001–June 30, 2009)

Senate District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$2,828,847	24,881,081	3,409	1,324,305	11,673,808	1,567	731,640
2	$1,877,191	21,993,385	3,635	569,506	11,269,647	1,718	305,201
3	$199,292	2,338,686	413	60,250	1,271,051	213	31,802
4	$1,562,416	10,523,815	1,671	912,992	5,583,853	844	407,550
5	$2,177,677	15,373,340	1,757	1,232,726	6,355,553	740	557,575
6	$211,334	1,980,869	222	92,047	973,993	107	38,795
7	$2,913,605	9,504,252	1,570	2,273,488	5,275,461	807	911,805
8	$1,759,745	20,567,099	3,632	536,712	10,479,171	1,745	312,606
9	$6,380,003	30,236,651	4,483	4,446,633	15,642,313	2,235	2,755,355
10	$2,118,979	23,958,203	4,301	691,827	12,190,806	2,060	410,407
11	$1,381,524	9,077,372	1,599	820,152	4,786,704	808	464,063
12	$4,492,003	12,445,730	1,742	3,629,631	6,821,265	916	2,427,884
13	$2,257,098	17,039,350	2,875	1,215,329	8,499,708	1,416	754,703
14	$2,631,125	17,822,502	3,578	1,531,831	9,854,515	1,814	939,805
15	$2,067,886	15,764,643	2,649	1,104,778	7,896,957	1,233	649,293
16	$1,708,029	9,648,901	1,448	1,102,766	5,108,643	730	664,444
17	$531,242	4,751,786	553	244,226	1,969,682	219	129,671
18	$3,236,528	44,195,962	6,677	627,835	19,624,514	2,916	301,217
19	$4,358,343	39,066,719	5,933	1,998,977	20,305,886	2,155	1,109,601
20	$1,985,195	14,955,679	1,925	1,070,673	6,918,046	852	494,080
21	$847,356	8,104,534	1,415	359,923	3,960,255	665	195,985
22	$945,015	10,143,557	1,813	339,071	5,493,773	925	169,993
23	$4,553,086	33,396,644	4,829	2,506,636	17,057,788	2,357	1,295,291
24	$7,660,748	32,710,462	3,991	5,542,127	16,189,113	1,819	2,921,141
25	$882,326	9,501,303	1,763	314,850	4,779,556	858	150,072
26	$551,685	5,855,369	829	201,683	2,693,426	419	99,938
27	$1,092,589	13,911,314	2,616	268,830	7,748,548	1,395	154,547
28	$819,671	8,499,741	1,425	310,932	4,531,114	724	136,274
29	$10,767,725	49,600,707	7,510	7,585,423	25,128,353	3,639	4,476,163
30	$4,371,129	27,428,152	4,471	2,667,871	14,141,946	2,196	1,490,656
31	$1,707,444	14,998,235	1,715	800,431	8,056,947	870	406,196
32	$1,442,708	15,437,471	2,589	520,362	7,102,820	1,193	307,102
33	$1,244,608	13,048,352	1,755	464,107	6,247,274	830	282,212
Not mapped*	$432,303	3,132,758	397	240,151	1,692,309	203	142,677

* *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.
Industrial Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
(July 1, 2001–June 30, 2009)

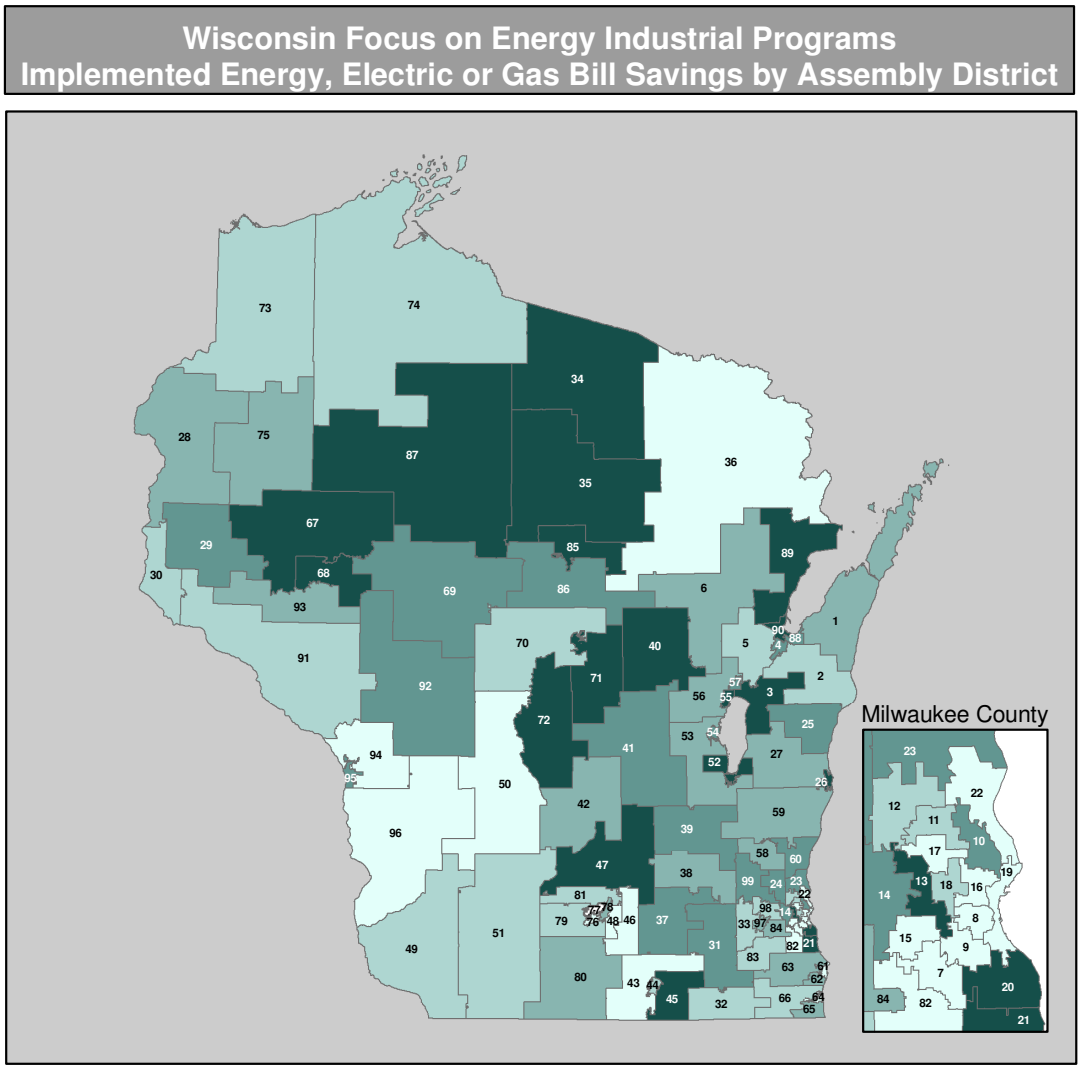


Table A-8. Industrial Program Energy Impacts
(By Assembly District)
(July 1, 2001–June 30, 2009)

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$566,312	3,595,829	584	343,255	1,829,203	282	202,608
2	$246,450	3,411,336	555	45,214	1,808,662	280	23,825
3	$2,016,086	17,873,917	2,270	935,836	8,035,944	1,005	505,206
4	$1,285,449	16,899,506	2,790	286,238	8,502,186	1,288	146,290
5	$219,009	3,043,815	543	39,485	1,653,047	275	19,025
6	$372,732	2,050,065	302	243,783	1,114,414	155	139,886
7	$1,881	32,159	6	0	15,471	3	0
8	$132,551	1,583,187	269	38,510	856,273	137	24,160
9	$64,859	723,340	139	21,740	399,307	73	7,641
10	$1,038,784	5,156,331	808	710,838	2,719,128	406	308,136
11	$315,505	2,356,839	316	171,292	1,229,798	159	80,744
12	$208,127	3,010,644	546	30,863	1,634,927	279	18,671
13	$1,333,506	4,511,844	350	1,031,401	1,970,063	169	426,554
14	$710,455	8,776,394	1,117	190,006	3,666,947	473	125,739
15	$133,716	2,085,102	289	11,319	718,543	98	5,281
16	$14,403	226,344	32	1,120	94,533	14	541
17	$11	188	0	0	102	0	0
18	$196,920	1,754,337	190	90,927	879,359	93	38,254
19	$123,408	1,343,129	163	43,235	675,041	78	19,474
20	$1,353,810	3,290,489	672	1,119,881	1,726,084	333	413,884
21	$1,436,387	4,870,634	735	1,110,371	2,874,335	397	478,448
22	$108,787	1,757,785	411	5,744	800,603	153	3,190
23	$984,196	8,422,229	1,314	473,959	4,283,802	632	280,629
24	$666,763	10,387,084	1,907	57,009	5,394,767	960	28,787
25	$697,468	5,351,701	943	370,679	2,872,128	480	220,308
26	$5,319,144	22,644,291	3,120	3,851,932	11,585,867	1,539	2,439,673
27	$363,390	2,240,659	420	224,023	1,184,318	216	95,375
28	$526,572	7,131,442	1,707	105,480	3,458,581	815	63,355
29	$1,278,887	13,224,000	1,998	487,255	6,915,546	968	303,375
30	$313,520	3,602,761	596	99,092	1,816,678	277	43,677
31	$820,008	1,466,384	286	708,027	753,064	142	397,177
32	$327,562	5,565,468	988	1,911	2,957,388	504	803
33	$233,955	2,045,520	325	110,214	1,076,252	162	66,083
34	$1,608,541	7,329,678	1,030	1,137,661	4,056,263	550	672,452
35	$2,735,144	3,719,832	565	2,427,709	2,021,545	294	1,712,660
36	$148,317	1,396,220	148	64,261	743,456	72	42,772
37	$754,666	5,998,251	916	389,362	2,738,330	437	225,223
38	$463,705	2,542,226	574	303,746	1,364,328	299	196,354
39	$1,038,727	8,498,873	1,385	522,221	4,397,049	680	333,127
40	$1,636,348	5,672,795	945	1,257,945	3,106,460	488	793,199
41	$581,377	5,094,980	1,172	273,212	2,644,606	533	146,386
42	$413,400	7,054,727	1,461	673	4,103,449	793	220

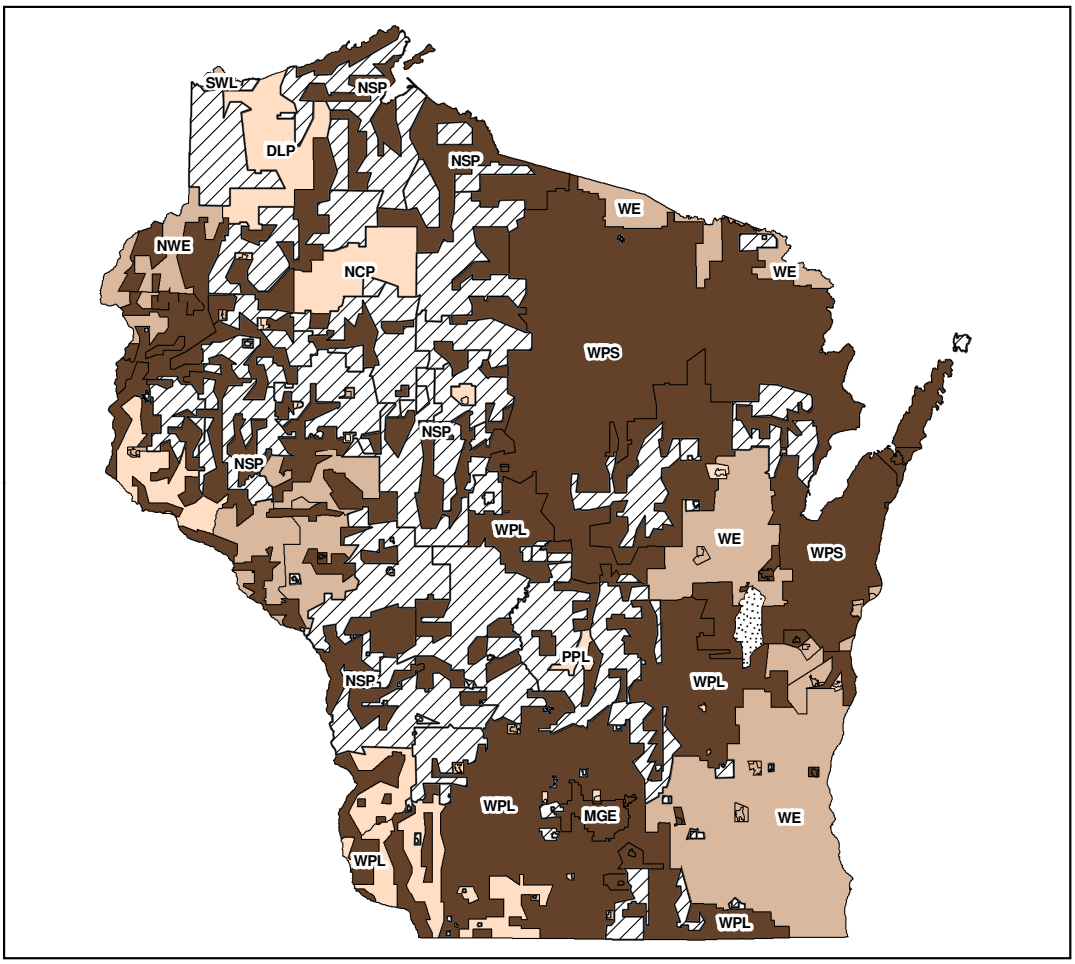
Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
43	$105,152	1,538,794	506	14,593	699,317	204	5,795
44	$219,923	2,249,957	416	85,150	1,158,346	205	28,398
45	$1,742,811	11,975,892	1,727	1,005,035	6,039,294	825	615,100
46	$134,443	1,546,352	292	42,412	899,315	163	23,594
47	$1,430,266	6,895,027	921	990,267	3,615,882	460	616,690
48	$143,319	1,207,523	235	70,086	593,446	108	24,160
49	$237,885	1,290,539	97	156,595	671,863	37	74,477
50	$128,022	672,525	128	85,515	334,375	60	53,938
51	$165,334	2,788,723	328	2,116	963,444	121	1,256
52	$2,114,936	28,421,647	4,156	436,133	11,581,092	1,667	194,067
53	$502,449	6,301,044	1,259	129,063	3,481,909	658	78,701
54	$619,143	9,473,271	1,262	62,639	4,561,514	591	28,449
55	$2,545,241	13,636,915	1,936	1,685,132	7,128,769	976	932,949
56	$493,082	7,453,950	1,286	54,991	3,688,366	619	24,936
57	$1,320,019	17,975,854	2,711	258,854	9,488,750	559	151,717
58	$470,372	4,427,076	677	203,846	2,239,435	328	78,981
59	$547,163	2,830,713	375	367,952	1,297,608	165	153,497
60	$967,660	7,697,891	873	498,875	3,381,003	359	261,603
61	$104,464	868,007	196	51,770	388,167	86	22,384
62	$411,199	4,453,166	638	145,312	2,336,131	323	93,188
63	$331,693	2,783,362	581	162,841	1,235,958	256	80,413
64	$148,515	2,231,237	468	17,346	1,114,913	219	9,925
65	$568,969	5,324,404	950	248,305	2,995,068	509	131,835
66	$227,531	2,587,915	395	73,421	1,383,793	197	28,233
67	$1,502,670	13,707,799	1,816	675,760	7,183,292	905	339,957
68	$2,211,287	12,334,115	1,943	1,436,587	5,921,060	909	763,024
69	$839,129	7,354,730	1,070	394,289	3,953,436	544	192,310
70	$330,193	2,784,640	395	161,323	1,318,161	183	60,914
71	$4,943,359	19,226,293	2,244	3,682,373	9,669,301	1,062	1,784,714
72	$2,387,196	10,699,529	1,351	1,698,431	5,201,650	574	1,075,512
73	$239,263	1,890,675	555	124,068	955,972	272	72,833
74	$215,492	3,092,475	464	33,348	1,381,917	200	13,443
75	$427,571	4,518,154	744	157,434	2,441,667	386	63,795
76	$61,467	1,050,715	134	0	472,884	59	0
78	$490,218	4,804,654	695	201,683	2,220,541	359	99,938
79	$316,520	2,530,170	692	162,493	1,315,888	361	91,123
80	$458,483	6,791,479	1,105	58,999	3,851,221	593	36,613
81	$317,586	4,589,664	819	47,339	2,581,439	442	26,811
82	$119,102	1,999,360	335	2,063	1,056,635	163	1,208
83	$166,249	2,700,143	416	7,995	1,512,456	225	4,797
84	$534,320	3,800,238	674	300,874	1,962,023	337	130,269
85	$3,514,854	21,598,570	3,380	2,171,011	11,318,868	1,677	1,306,461
86	$805,596	8,870,421	1,689	276,448	4,617,580	845	127,382
87	$6,447,275	19,131,716	2,441	5,137,965	9,191,905	1,117	3,042,320
88	$777,927	8,182,947	1,114	288,548	3,868,945	477	169,778
89	$1,862,628	3,065,538	855	1,623,234	1,681,730	464	949,407

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
90	$1,730,574	16,179,667	2,502	756,088	8,591,271	1,255	371,471
91	$248,732	1,875,237	286	134,070	976,705	140	65,503
92	$1,108,705	7,667,623	764	636,595	4,163,416	395	322,645
93	$350,007	5,455,374	665	29,766	2,916,826	335	18,048
94	$135,547	1,073,061	239	70,176	612,670	136	41,044
95	$1,181,880	12,783,404	2,131	418,564	5,559,430	933	247,514
96	$125,281	1,581,006	219	31,622	930,719	124	18,544
97	$463,180	7,089,983	936	46,689	3,100,631	413	25,382
98	$187,632	2,979,814	528	12,838	1,657,546	276	7,941
99	$593,795	2,978,555	291	404,580	1,489,097	141	248,890
Not mapped*	$432,303	3,132,758	397	240,151	1,692,309	203	142,677

* *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.
Industrial Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
(July 1, 2001–June 30, 2009)

Wisconsin Focus on Energy Industrial Programs
Per Capita* Energy, Electric Bill Savings by Electric Utility Territory



Per Capita Annual Energy, Electric Bill Savings by Utility Territory

- $0
- $2.60 - $820.00
- $820.01 - $4,790.00
- > $4,790.00
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2009 from projects implemented in industrial sector businesses from July 1, 2001, through June 30, 2009. Electric savings has been valued at the average cost of electricity for industrial businesses in Wisconsin and summed for all projects within each utility territory and divided by the number of industrial business customers in that utility territory.

* The unit of population is industrial customers as reported by the utilities in 2007.

Map Produced by: PA Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

Table A-9. Industrial Program Electric Impacts
(By Participating Electric Utility)
(July 1, 2001–June 30, 2009)

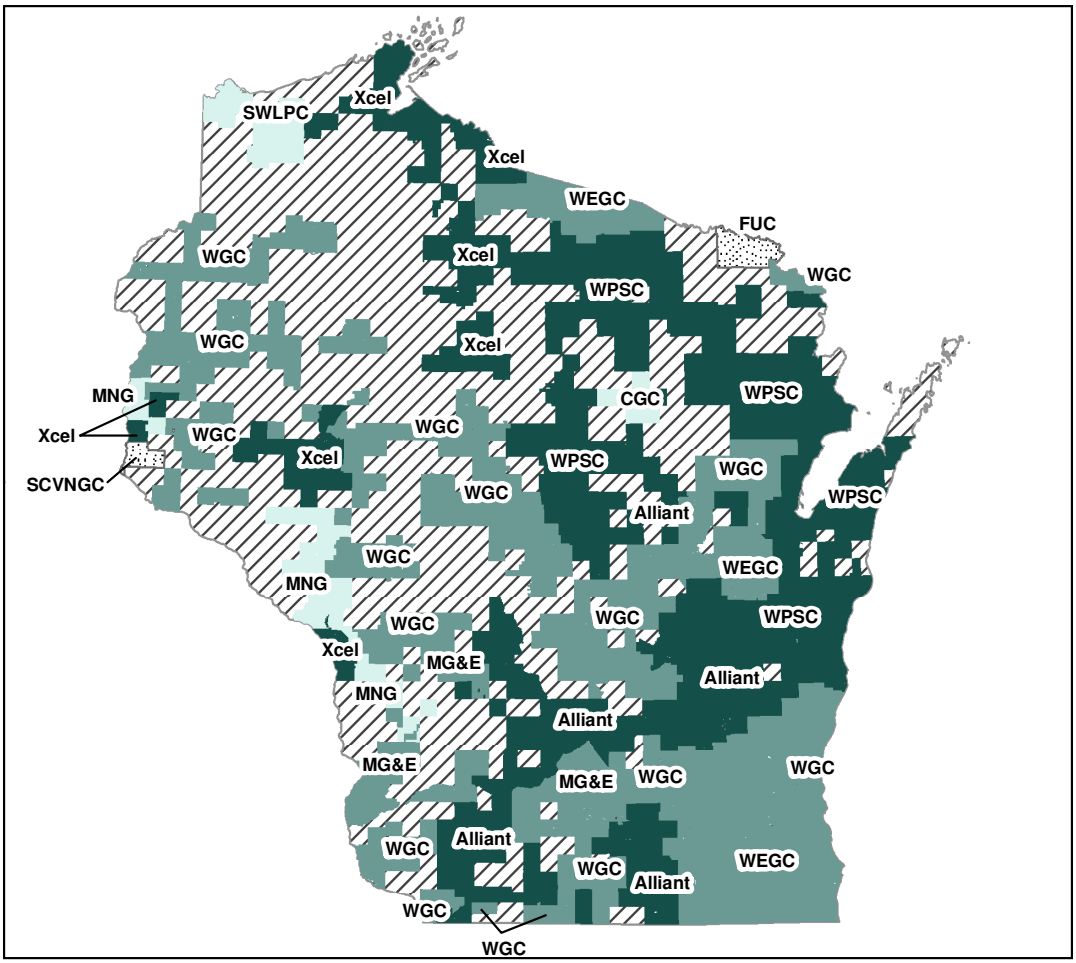
Utility Name	Map Code	Annual Dollars Saved	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers
Algoma Utility Commission		$25,691	$25,691	439,154	75	245,797	40	1
Alliant Energy	WPL	$6,931,221	$6,924	118,482,413	18,370	58,448,326	8,716	1,001
Black River Falls Municipal Electric & Water		$36,124		617,509	95	342,828	49	
Bloomer City Of Electric Utility		$44,755	$814	765,050	124	398,191	62	55
Brodhead Water And Light Commission		$3,095	$1,548	52,912	8	28,948	4	2
Cedarburg Light And Water Commission		$19,051	$6,350	325,657	63	180,465	33	3
City of Kiel		$55,263	$3,251	944,666	176	521,554	93	17
City of Muscoda		$0		0	-44	0	-29	1
City of New Richmond		$0		0	0	0	0	1
Columbus Water And Light Dept		$0		0	0	0	0	1
Consolidated Water Power Company	CWP	$379,606	$379,606	6,488,995	468	3,496,264	240	1
Cornell Municipal Water And Electric Utility		$32,023	$3,202	547,401	77	323,735	44	10
Cuba City Electric & Water Utility		$0		0	0	0	0	
Cumberland Municipal Utility		$81,188	$4,059	1,387,828	166	748,759	85	20
Dahlberg Light And Power Company	DLP	$3,281	$82	56,094	42	29,222	22	40
Eagle River Light And Water Commission		$1,935		33,084	6	18,854	3	
Eau Claire Electric Cooperative	C-8	$27,306	$2,100	466,769	148	232,027	68	13
Evansville City of Water & Light		$6,641	$6,641	113,520	10	49,169	4	1
Florence Utility Commission		$3,226		55,140	11	29,853	5	
Hartford City Of Utilities		$11,379	$1,626	194,508	37	105,392	19	7
Hustisford Utilities		$2,507		42,859	7	23,448	3	
Jefferson Utilities		$0		0	0	0	0	4
Juneau Utility Commission		$3,662	$1,831	62,597	12	35,674	6	2
Kaukauna Utilities		$836,170	$104,521	14,293,507	1,680	6,351,460	741	8
Lake Mills Light And Water Dept		$8,071	$8,071	137,969	22	75,248	11	1
Madison Gas And Electric Company	MGE	$696,083	$14,206	11,898,862	2,040	5,995,266	1,050	49
Manitowoc Public Utilities		$246,136	$2,862	4,207,451	724	2,286,584	373	86
Mazomanie Electric Utility		$2,492	$156	42,605	20	23,309	10	16
Medford Electric Utility		$50,312	$719	860,040	137	467,023	70	70
Menasha Electric & Water Utilities		$116,151	$9,679	1,985,486	265	1,091,606	138	12
New Glarus Light And Water Works		$1,020		17,434	3	9,439	2	
New Holstein Public Utility		$11,178	$11,178	191,084	32	102,832	16	1
New London Electric & Water Utility		$24,416	$4,069	417,367	62	230,793	32	6

Utility Name	Map Code	Annual Dollars Saved	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers
North Central Power Company Inc	NCP	$256	$85	4,379	1	2,371	0	3
Northwestern Wisconsin Electric Co	NWE	$108,031	$3,858	1,846,679	164	797,094	72	28
Oconomowoc City Of Utilities		$38,311	$4,789	654,887	139	336,366	70	8
Oconto Falls Water And Light Commission		$9,323		159,368	29	87,647	15	
Pierce-Pepin Electric Cooperative	C-14	$3,589	$598	61,349	13	25,255	4	6
Pioneer Power & Light Company	PPL	$430	$22	7,352	3	4,022	2	20
Plymouth Utilities		$30,867	$4,410	527,641	96	289,366	49	7
Polk-Burnett Electric Cooperative	C-15	$41,584	$20,792	710,841	40	378,099	23	2
Price Electric Cooperative Inc	C-16	$16,086		274,966	49	96,040	15	
Reedsburg Utility Commission		$17,653	$2,942	301,769	58	167,914	31	6
Rice Lake Municipal Water & Electric Utility		$53,275	$321	910,680	235	509,459	123	166
Richland Center Electric Utility		$821	$205	14,036	3	7,999	1	4
Richland Electric Cooperative	C-17	$4,109		70,245	14	38,031	7	
River Falls Municipal Utility		$5,601	$2,800	95,742	19	51,956	10	2
Riverland Energy Cooperative	C-18	$6,867		117,388	14	40,278	4	
Scenic River Electric Cooperative	C-20	$1,262	$70	21,571	4	11,901	2	18
Shawano Municipal Utilities		$50,389	$309	861,354	134	469,937	69	163
Sheboygan Falls Utilities		$155	$3	2,650	1	1,838	0	59
Slinger Utilities		$0		0	0	0	0	1
Spooner Municipal Utilities		$6,882	$430	117,637	23	63,117	12	16
Stoughton Electric Utility		$49,809	$16,603	851,434	150	468,257	78	3
Stratford Municipal Water & Electric Utility		$22,886	$5,722	391,218	78	205,602	38	4
Sturgeon Bay Utilities		$23,540	$11,770	402,387	81	220,980	42	2
Sun Prairie Water & Light Commission		$22,073	$11,037	377,320	72	213,574	38	2
Superior Water Light And Power Company	SWL	$107,323	$873	1,834,581	513	926,750	249	123
Two Rivers Water & Light Utility		$11,575	$3,858	197,860	37	107,027	19	3
Village of Benton		$2,579		44,083	5	29,520	3	
Village of Cadott		$586	$4	10,025	2	5,428	1	138
Village of Waunakee		$0		0	0	0	0	3
Waterloo Water And Light Commission		$1,278		21,845	10	11,951	5	
Waupun Public Utilities		$1,189	$595	20,325	8	11,547	4	2
We Energies	WEP	$9,913,863	$3,325	169,467,751	25,573	84,972,349	11,586	2,982
Whitehall Municipal Electric Utility		$22,104	$22,104	377,845	46	206,718	24	1
Wisconsin Public Service Corporation	WPS	$7,597,749	$34,852	129,876,057	21,016	66,713,766	10,261	218
Xcel Energy	NSP	$5,613,150	$61,013	95,951,285	14,771	47,656,016	7,021	92
Not mapped*		$1,180,654		20,182,113	2,956	10,304,559	1,395	

* *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.
Industrial Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
(July 1, 2001–June 30, 2009)

Wisconsin Focus on Energy Industrial Programs
Per Capita* Energy, Gas Bill Savings by Gas Utility Territory



Per Capita Annual Energy, Gas Bill Savings by Utility Territory

- $0
- $320 - $3,360
- $3,361 - $8,930
- > $8,930
- Non Participating Utility Territories

The map above portrays the annual energy, gas bill savings realized in 2009 from projects implemented in industrial sector businesses from July 1, 2001, through June 30, 2009. Gas savings has been valued at the average cost of gas for industrial businesses in Wisconsin and summed for all projects within each utility territory and divided by the number of industrial business customers in that utility territory.

* The unit of population is industrial customers as reported by the utilities in 2007.

Map Produced by: PA Consulting Group and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. September, 2009.

Table A-10. Industrial Program Gas Impacts
(By Participating Gas Utility)
(July 1, 2001–June 30, 2009)

Utility Name	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Lifecycle Verified Gross Therms	Persistent Net Therms	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$11,763	$2,658,414	2,563,562	1,533,148	226
City Gas Company	CGC	$3,356	$60,404	58,249	25,701	18
Madison Gas and Electric	MG&E	$8,921	$579,893	559,203	289,616	65
Midwest Natural Gas Inc.	MNG	$329	$26,020	25,092	8,619	79
St Croix Valley Natural Gas Company	SCVNGC		$0	0	0	24
Superior Water Light And Power Company	SWLPC	$1,838	$128,658	124,068	72,833	70
Wisconsin Electric Gas Operations	WEGC	$5,135	$7,548,382	7,279,057	3,712,186	1,470
Wisconsin Gas Company	WGC	$4,946	$7,790,385	7,512,425	3,735,745	1,575
Wisconsin Public Service Corporation	WPSC	$14,304	$18,652,675	17,987,151	10,495,271	1,304
Xcel (Northern States Power Company)	Xcel	$324,363	$8,109,084	7,819,753	4,544,131	25
Not mapped*			$3,816,703	3,680,524	2,208,491	

* *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 June 30, 2009. The tables and maps below provide energy savings that are based on the evaluators' review of participants, measures installed, and per-unit (measure) savings used by WECC program administrators.

Note: A change in the type of energy impacts data used for the Residential Programs maps. As explained in the Introduction to this Appendix (above), the data reported in all of the maps in this report are *lifecycle verified gross* energy impacts— a recently introduced (for Focus) type of reported energy impacts. As in the past, these are impact estimates based on evaluation work done to establish verified gross for specific programs and/or program areas. However, as discussed in Section 1.1, *lifecycle verified gross* is defined as:

> Energy savings, expressed as *verified gross*, that explicitly incorporate measure life.

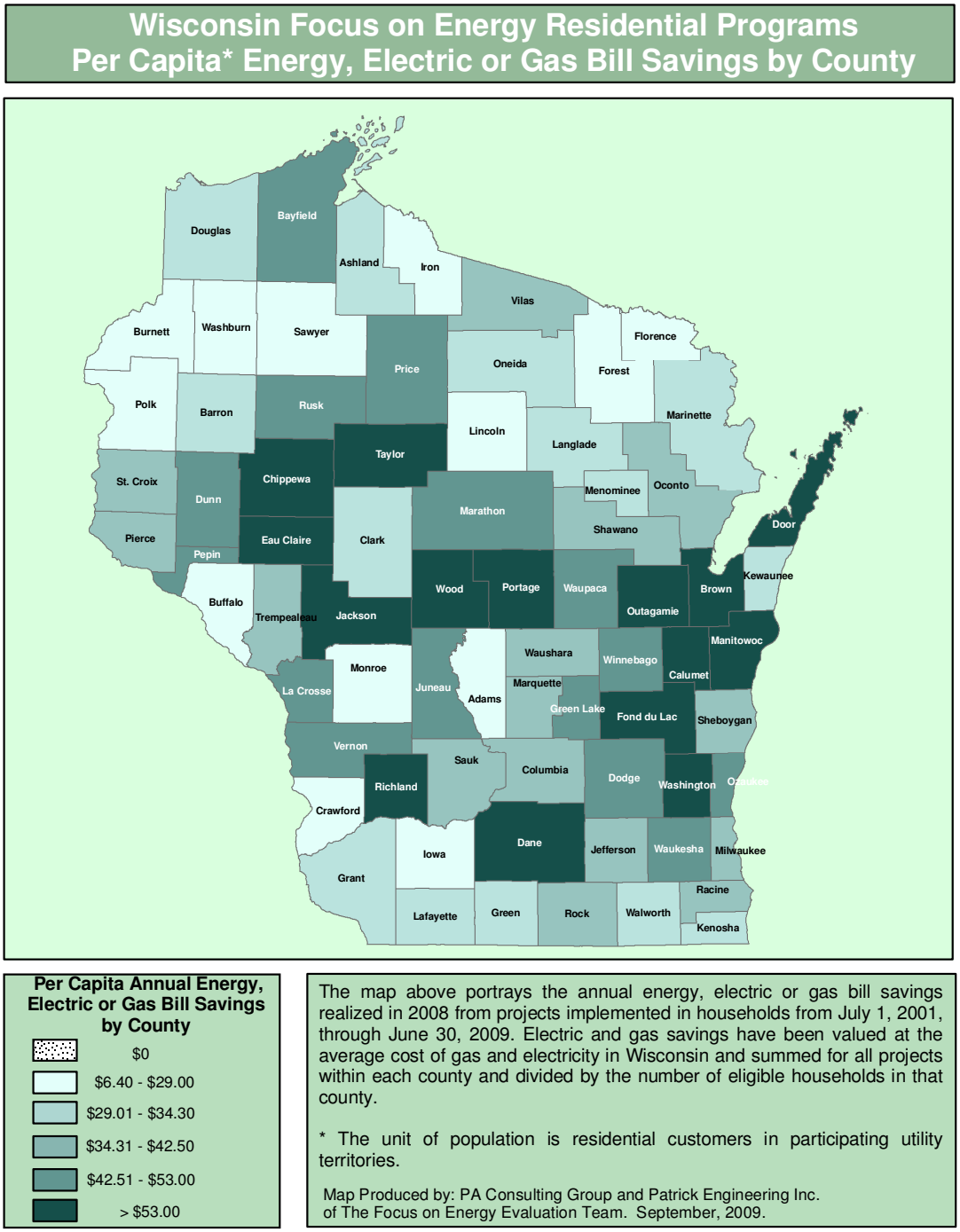
The reader should be aware of this shift since it has the effect of diminishing the levels of reported savings (compared to verified gross savings). This is because verified gross savings do ***not*** consider the lifecycle effects (i.e., the median operating life of energy efficiency measures, such as CFLs) that may cause energy savings to end.

In order to provide some continuity in this transition in the basis for the mapped energy impacts, the tables that accompany the maps include a column for verified gross impacts—as in past reports impacts—though these are *lifecycle* verified gross impacts, and will therefore show some differences from past reports. Additional discussion of lifecycle and persistent savings is provided above in Section 2.1 and Section 2.8.

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.
Residential Programs
Per Capita Energy, Electric or Gas Bill Savings by County
(July 1, 2001–June 30, 2009)



The map above portrays the annual energy, electric or gas bill savings realized in 2008 from projects implemented in households from July 1, 2001, through June 30, 2009. 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 Consulting Group and Patrick Engineering Inc.
of The Focus on Energy Evaluation Team. September, 2009.

Table A-11. Residential Programs Energy Impacts
(by Participating County)
(July 1, 2001– June 30, 2009)

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Adams	$27	563,220	52	6,826	385,335	37	5,552	2,519
Ashland	$30	1,046,346	119	29,519	714,897	82	24,648	4,950
Barron	$30	2,278,357	216	29,448	1,581,606	156	23,013	9,114
Bayfield	$46	1,267,034	102	33,205	833,721	69	28,835	3,836
Brown	$60	38,443,313	4,593	935,694	27,431,578	3,301	704,537	87,295
Buffalo	$25	365,139	64	16,145	244,275	49	13,792	2,373
Burnett	$15	438,934	39	4,058	298,635	27	3,472	3,486
Calumet	$57	5,717,960	869	116,146	4,051,653	638	94,647	13,028
Chippewa	$60	6,254,310	604	125,911	4,334,635	431	107,131	13,563
Clark	$32	2,103,327	191	25,127	1,403,309	129	19,628	7,798
Columbia	$34	4,298,053	487	75,155	2,939,561	342	58,414	15,889
Crawford	$28	996,971	95	12,119	695,265	68	9,739	4,209
Dane	$71	68,613,384	8,678	3,046,407	49,443,739	6,437	2,293,688	154,704
Dodge	$43	9,639,306	1,435	143,108	6,475,513	1,013	116,687	27,767
Door	$54	2,843,028	327	27,066	1,944,162	236	23,910	6,178
Douglas	$31	3,193,163	286	98,702	2,143,136	196	80,543	14,885
Dunn	$45	3,416,915	324	35,094	2,348,056	222	27,163	8,903
Eau Claire	$65	16,392,042	1,583	231,806	11,986,115	1,165	178,374	30,944
Florence	$6	101,474	12	485	66,555	8	387	1,756
Fond du Lac	$57	15,614,299	2,105	345,907	10,922,956	1,547	276,000	36,540
Forest	$25	873,426	85	6,344	600,828	57	5,250	4,043
Grant	$30	2,616,668	315	37,700	1,738,281	212	31,437	10,565
Green	$31	2,894,407	454	44,507	2,000,765	333	36,847	11,716
Green Lake	$44	2,510,127	306	32,593	1,650,286	214	26,567	6,843
Iowa	$26	1,847,966	202	26,749	1,187,358	125	22,241	8,753
Iron	$22	437,565	37	5,438	299,998	25	4,785	2,384
Jackson	$106	921,959	70	5,511	631,746	48	4,736	981
Jefferson	$36	6,716,460	893	94,755	4,653,376	645	79,543	22,669
Juneau	$52	992,945	114	33,105	701,107	82	27,287	2,814
Kenosha	$29	12,888,199	1,997	229,756	8,985,083	1,491	168,211	56,057
Kewaunee	$33	1,967,902	243	23,365	1,325,011	168	18,368	7,163
La crosse	$46	13,272,809	1,946	255,017	9,471,516	1,497	186,334	37,142
Lafayette	$31	904,454	145	13,154	597,027	103	11,094	3,563
Langlade	$34	2,496,975	254	22,048	1,703,908	175	17,257	8,452
Lincoln	$29	2,516,064	347	55,963	1,756,036	258	39,939	11,553
Manitowoc	$69	7,218,165	1,030	124,661	5,078,375	750	105,813	13,227
Marathon	$53	18,531,867	2,301	322,860	13,219,711	1,722	243,280	44,418
Marinette	$29	4,168,531	522	44,216	2,905,714	378	35,941	16,834
Marquette	$37	812,359	77	7,614	564,906	55	6,087	2,534
Menominee	$34	268,074	39	12,837	187,489	31	10,963	1,289
Milwaukee	$40	104,498,028	14,340	3,248,602	73,377,196	10,449	2,292,971	377,729
Monroe	$20	1,888,358	245	24,914	1,297,687	175	21,183	11,207

County	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms	Eligible Participants
Oconto	$42	2,816,236	305	37,368	1,978,731	220	32,109	8,063
Oneida	$33	4,067,259	500	57,125	2,796,418	349	47,956	15,211
Outagamie	$73	27,528,391	3,533	397,192	19,620,543	2,654	310,273	46,720
Ozaukee	$52	10,368,647	1,906	174,457	7,320,503	1,480	137,644	25,245
Pepin	$43	683,202	59	7,900	460,500	41	6,388	1,916
Pierce	$40	1,201,844	194	27,759	861,437	147	18,158	3,977
Polk	$28	1,757,998	165	37,658	1,203,026	109	28,861	8,142
Portage	$70	11,517,468	1,525	331,324	8,046,368	1,112	232,764	23,159
Price	$47	1,162,074	94	8,679	804,916	64	7,944	2,801
Racine	$35	20,701,232	3,073	220,361	14,570,689	2,343	165,903	70,819
Richland	$62	1,090,734	133	13,131	728,058	94	11,271	2,099
Rock	$40	16,665,027	1,858	353,447	11,394,309	1,262	244,285	54,206
Rusk	$52	1,484,659	115	14,571	991,193	76	12,323	3,369
Sauk	$39	4,923,877	652	88,000	3,370,190	447	66,394	16,064
Sawyer	$23	900,063	101	8,841	593,935	69	7,765	4,683
Shawano	$42	3,219,223	355	42,703	2,231,129	253	33,922	9,375
Sheboygan	$40	10,802,422	1,698	209,408	7,507,983	1,229	169,923	34,842
St. Croix	$35	3,814,587	498	66,265	2,736,411	387	51,405	13,910
Taylor	$225	1,297,683	91	23,086	892,202	62	14,804	733
Trempealeau	$38	832,450	84	15,529	550,912	57	11,098	2,785
Vernon	$43	1,539,526	149	21,832	1,064,071	108	18,586	4,360
Vilas	$35	2,605,886	300	28,874	1,800,173	215	23,696	8,793
Walworth	$30	7,903,997	1,072	108,753	5,523,514	818	80,063	31,728
Washburn	$22	725,677	60	5,181	479,919	40	4,405	3,684
Washington	$60	17,722,075	2,254	374,102	12,381,771	1,659	296,298	38,827
Waukesha	$49	51,459,085	7,899	695,828	36,292,958	6,003	549,673	128,672
Waupaca	$48	5,837,907	839	66,162	4,087,192	634	56,139	14,439
Waushara	$36	1,884,331	271	21,165	1,326,931	203	17,560	6,153
Winnebago	$52	21,735,030	2,964	495,564	15,519,431	2,198	381,549	55,533
Wood	$79	6,011,462	698	89,504	4,279,566	511	73,918	9,378
Not mapped*		9,115,492	686	895,409	6,897,179	551	590,132	

* *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.
Residential Programs
Implemented Energy, Electric or Gas Bill Savings by Senate District
(July 1, 2001– June 30, 2009)

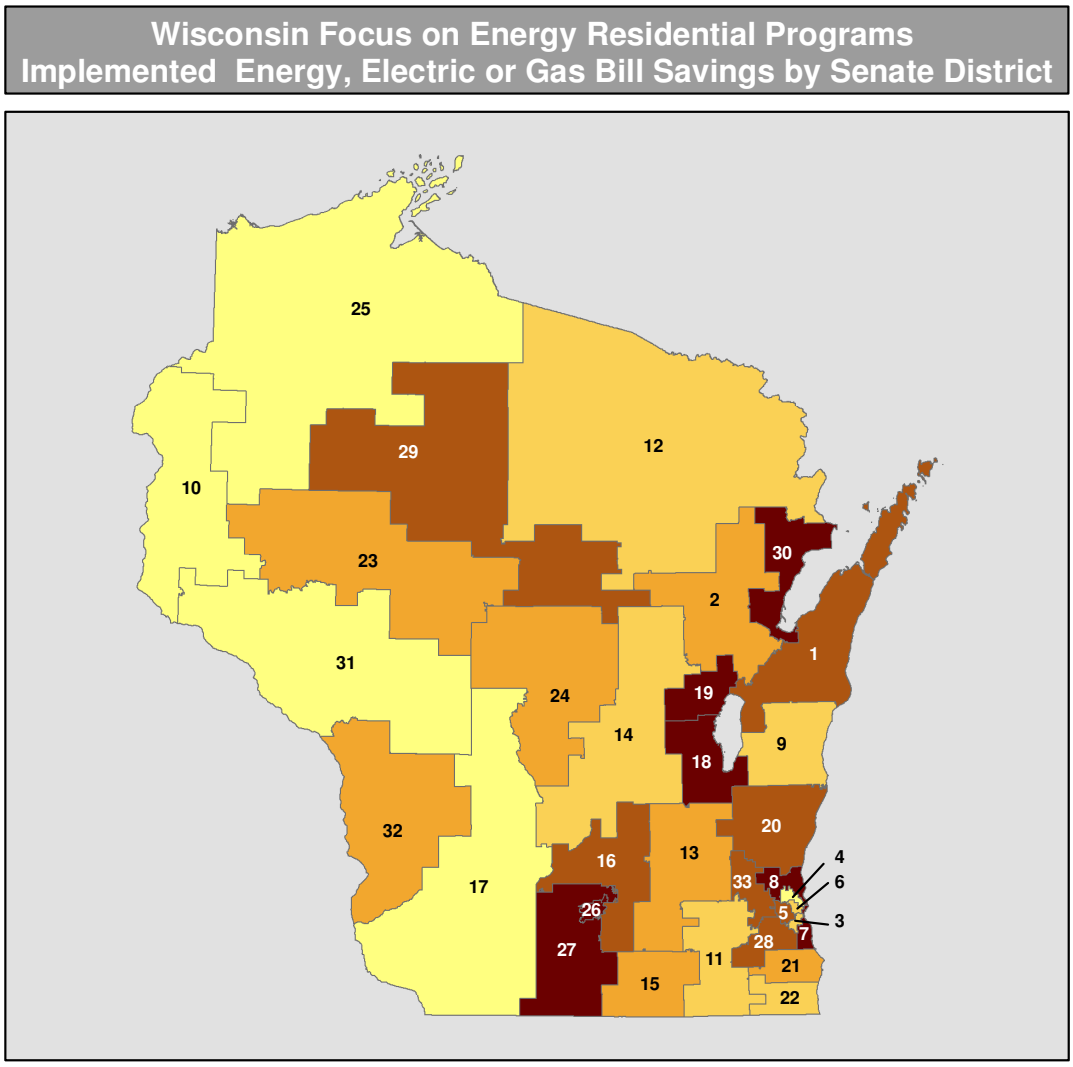


Table A-12. Residential Programs Energy Impacts
(By Senate District)
(July 1, 2001–June 30, 2009)

Senate District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$2,793,645	22,020,573	2,835	384,657	15,496,798	2,063	307,799
2	$2,532,144	19,116,173	2,465	419,771	13,506,848	1,792	325,690
3	$1,855,988	13,324,089	1,690	365,671	9,405,712	1,226	248,191
4	$1,675,770	11,081,062	1,438	410,233	7,808,283	1,004	300,678
5	$3,056,562	24,478,714	3,741	388,322	17,324,530	2,791	297,834
6	$1,968,514	10,229,005	1,250	717,051	7,230,082	904	522,923
7	$3,761,415	24,496,023	3,411	952,555	16,743,762	2,400	629,362
8	$3,559,492	26,571,857	4,069	615,401	18,635,605	3,084	446,920
9	$1,884,055	14,525,117	2,235	286,891	10,216,091	1,632	233,759
10	$1,119,583	8,747,682	1,038	160,675	6,171,844	767	119,862
11	$2,069,779	16,830,955	2,503	241,449	11,797,119	1,907	187,733
12	$1,977,041	16,401,553	1,905	203,240	11,306,435	1,355	159,961
13	$2,084,327	16,479,465	2,325	282,773	11,250,807	1,659	230,030
14	$2,017,142	16,256,598	2,174	247,652	11,188,831	1,571	193,258
15	$2,359,565	18,199,615	1,994	358,576	12,449,055	1,365	245,130
16	$2,863,021	18,604,745	2,385	728,461	13,206,223	1,747	589,954
17	$1,264,908	10,141,796	1,233	159,715	6,811,178	849	132,165
18	$3,288,510	24,094,954	3,120	606,846	17,057,636	2,305	467,862
19	$3,864,270	30,911,845	4,118	493,929	22,029,666	3,098	385,377
20	$2,692,952	20,717,651	2,816	413,745	14,396,195	2,081	338,373
21	$2,115,678	17,852,651	2,599	192,106	12,554,082	1,968	143,064
22	$1,846,477	14,367,860	2,234	269,996	10,050,393	1,683	195,705
23	$2,500,513	20,121,388	1,891	309,595	14,361,859	1,368	249,130
24	$2,492,173	18,554,410	2,314	435,076	13,041,942	1,688	317,115
25	$1,307,352	9,905,283	925	213,729	6,686,634	641	176,156
26	$4,993,947	29,013,981	3,945	1,560,656	20,969,777	2,928	1,109,706
27	$3,855,224	26,113,354	3,029	891,421	18,752,463	2,250	691,967
28	$2,967,439	24,368,145	3,617	326,121	17,157,638	2,734	245,434
29	$2,660,048	21,088,078	2,460	356,093	14,951,380	1,826	267,195
30	$3,160,825	23,392,048	2,760	563,661	16,719,628	1,969	418,835
31	$1,475,301	11,970,071	1,252	174,355	8,340,791	894	137,135
32	$2,077,625	16,203,952	2,242	300,634	11,483,612	1,708	223,092
33	$2,902,427	23,558,960	3,563	342,200	16,771,977	2,721	262,489
Not mapped*	$1,604,402	8,465,774	695	573,555	6,615,390	561	389,624

* *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.
Residential Programs
Implemented Energy, Electric or Gas Bill Savings by Assembly District
(July 1, 2001– June 30, 2009)

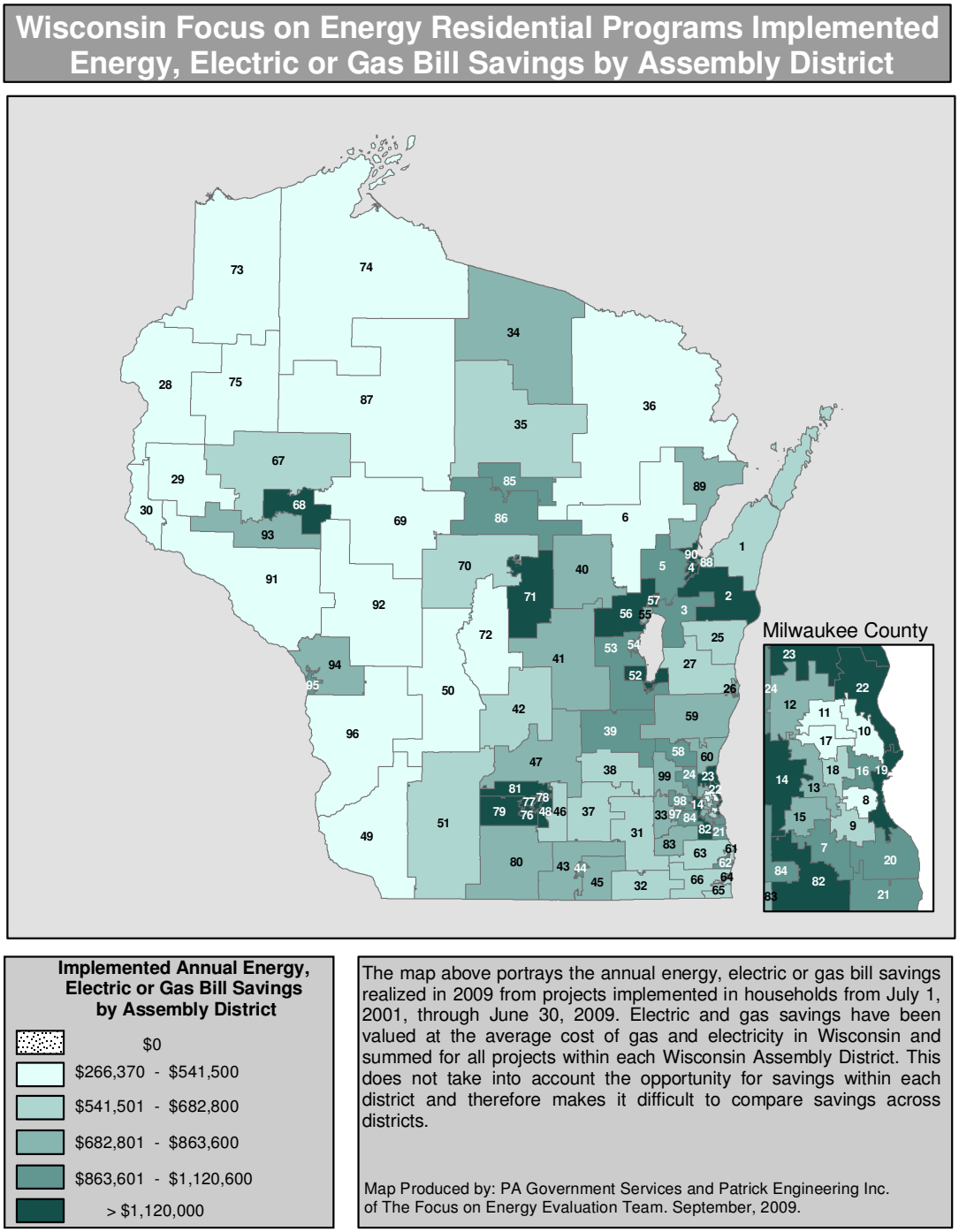


Table A-13. Residential Programs Energy Impacts
(By Assembly District)
(July 1, 2001–June 30, 2009)

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
1	$665,791	5,566,598	666	64,801	3,812,210	478	54,236
2	$1,167,666	8,966,615	1,041	180,799	6,311,927	748	141,071
3	$960,233	7,487,795	1,128	139,058	5,372,905	837	112,492
4	$1,146,132	8,966,588	1,161	163,518	6,348,080	847	129,914
5	$878,439	5,949,406	795	203,175	4,243,543	577	153,340
6	$507,449	4,198,994	509	53,078	2,914,283	368	42,436
7	$963,589	6,768,160	979	202,452	4,777,905	719	126,823
8	$321,582	2,296,072	193	64,418	1,622,754	133	45,705
9	$570,854	4,260,208	518	98,801	3,005,331	374	75,664
10	$531,629	3,871,087	428	100,143	2,755,496	300	81,221
11	$404,011	2,160,716	323	141,990	1,518,564	229	110,899
12	$740,019	5,048,434	687	168,081	3,533,602	476	108,542
13	$762,653	5,843,610	974	119,173	4,098,451	724	94,265
14	$1,438,614	11,940,305	1,632	147,422	8,556,946	1,235	112,627
15	$855,288	6,694,730	1,135	121,727	4,669,094	832	90,942
16	$918,984	3,548,910	431	438,197	2,474,195	299	307,931
17	$465,288	3,316,651	405	93,666	2,336,838	297	76,789
18	$584,213	3,363,169	414	185,188	2,418,830	308	138,203
19	$1,852,872	9,822,058	1,313	658,566	6,503,720	881	426,650
20	$993,701	7,308,898	1,103	181,008	5,030,144	766	120,438
21	$914,842	7,365,067	995	112,981	5,209,898	753	82,274
22	$1,148,851	8,007,647	1,351	246,587	5,663,374	1,042	185,094
23	$1,290,235	9,826,227	1,622	206,660	6,995,697	1,260	141,865
24	$1,120,509	8,738,723	1,095	162,174	5,977,092	782	119,976
25	$548,311	4,240,413	622	82,378	3,013,574	451	69,784
26	$714,641	5,230,957	957	132,317	3,649,985	701	105,408
27	$621,127	5,053,962	656	72,195	3,552,724	480	58,567
28	$266,375	2,041,177	195	41,611	1,395,508	131	32,105
29	$472,062	3,644,331	426	71,463	2,530,810	302	51,561
30	$381,146	3,062,175	417	47,602	2,245,527	334	36,196
31	$663,176	5,482,785	794	69,771	3,813,534	595	57,942
32	$543,657	4,364,116	634	68,209	3,028,320	477	48,758
33	$862,948	6,984,070	1,075	103,469	4,955,280	835	81,033
34	$766,114	6,295,565	744	83,829	4,330,893	520	69,577
35	$669,515	5,377,658	650	83,727	3,734,212	474	61,538
36	$541,495	4,729,133	512	35,685	3,242,085	360	28,845
37	$565,888	4,551,111	580	70,278	3,144,963	419	59,775
38	$631,357	4,659,035	678	113,718	3,216,909	483	88,210
39	$887,164	7,270,102	1,067	98,777	4,889,367	757	82,045
40	$732,207	6,122,115	888	71,246	4,295,566	672	59,673
41	$705,056	5,839,856	750	73,264	3,949,779	536	59,699
42	$579,911	4,294,927	537	103,141	2,943,766	364	73,886

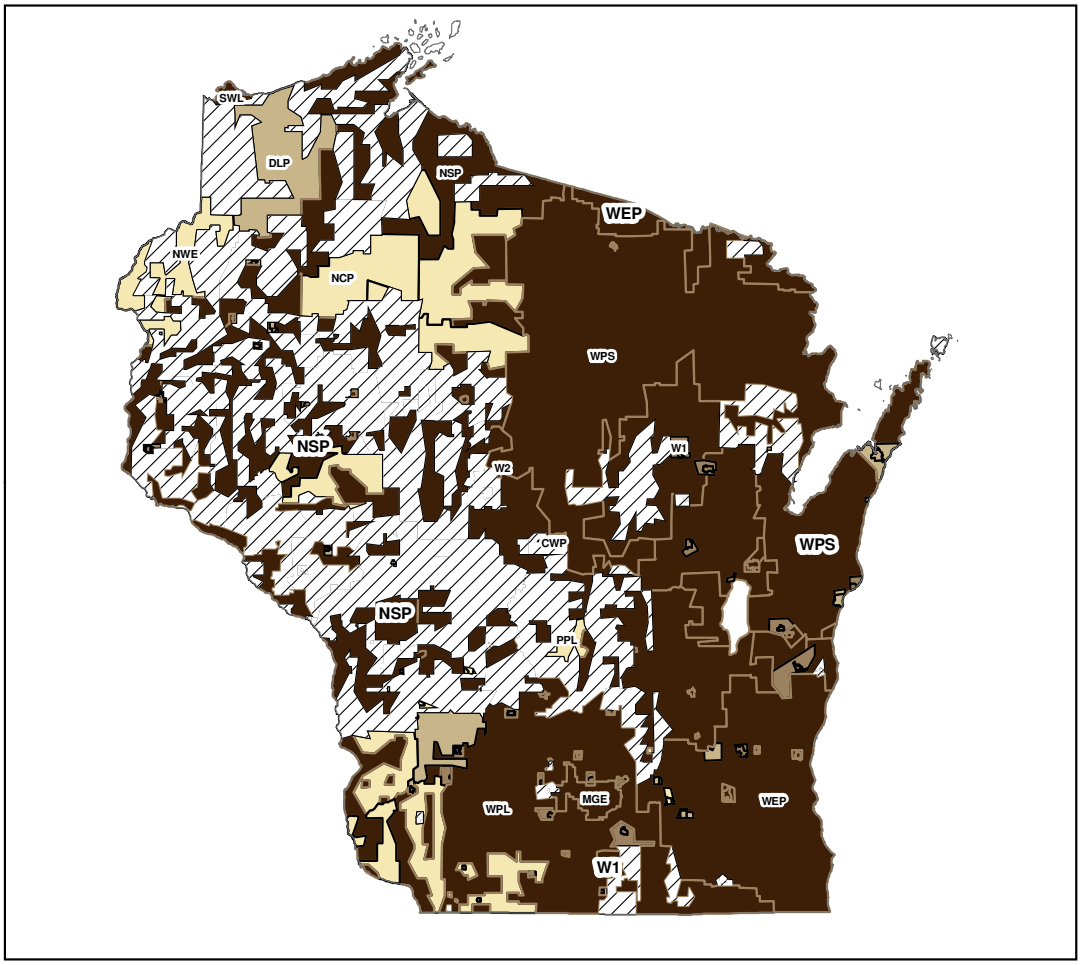
Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
43	$708,507	5,781,005	619	80,998	3,936,971	432	58,681
44	$902,186	6,632,381	800	164,625	4,558,015	542	111,604
45	$748,872	5,786,229	575	112,953	3,954,070	390	74,844
46	$682,272	4,366,425	487	179,262	3,102,750	359	148,454
47	$762,114	5,926,806	721	111,723	4,059,809	512	93,658
48	$1,418,593	8,311,115	1,177	437,476	6,043,526	877	347,843
49	$346,732	2,802,086	336	41,920	1,855,864	227	34,509
50	$376,176	2,913,165	360	56,182	2,054,429	266	46,565
51	$541,973	4,426,285	537	61,613	2,900,641	357	51,090
52	$1,336,142	9,775,248	1,342	247,804	6,966,445	1,008	193,218
53	$899,116	6,830,132	933	145,481	4,725,640	675	115,128
54	$1,053,251	7,489,574	844	213,561	5,365,552	621	159,516
55	$863,537	6,755,991	972	123,180	4,900,269	725	94,937
56	$1,739,361	14,019,630	1,699	213,401	9,883,718	1,273	170,011
57	$1,261,372	10,136,225	1,447	157,348	7,245,679	1,100	120,428
58	$1,089,360	8,133,640	1,038	188,214	5,735,109	773	150,986
59	$803,921	6,056,585	851	134,329	4,091,560	606	112,419
60	$799,633	6,527,067	928	91,202	4,569,211	702	74,967
61	$602,463	5,418,000	687	26,510	3,779,893	513	23,872
62	$866,094	7,063,758	1,011	99,272	5,055,863	765	68,419
63	$647,121	5,370,894	901	66,324	3,718,327	690	50,773
64	$661,722	4,692,907	730	135,231	3,270,793	522	90,778
65	$608,458	4,973,631	836	68,803	3,545,472	656	54,899
66	$576,297	4,701,322	668	65,962	3,234,129	505	50,028
67	$657,527	5,371,598	479	74,617	3,708,655	336	65,474
68	$1,366,697	11,113,941	1,060	159,408	8,211,400	792	124,172
69	$476,268	3,635,658	351	75,570	2,441,676	240	59,484
70	$682,742	5,611,049	632	74,656	3,946,946	452	62,014
71	$1,406,569	9,835,240	1,268	299,266	6,880,385	923	204,590
72	$402,862	3,108,122	415	61,154	2,214,611	313	50,511
73	$510,643	3,656,771	325	101,378	2,448,907	222	82,703
74	$470,025	3,560,005	351	76,941	2,380,891	240	65,845
75	$326,684	2,688,507	250	35,411	1,856,836	180	27,608
76	$1,537,336	8,953,881	1,351	478,558	6,360,831	1,015	363,913
77	$1,689,594	9,963,694	1,405	515,578	7,197,420	1,037	338,467
78	$1,766,954	10,095,806	1,189	566,521	7,411,046	877	407,325
79	$1,861,761	12,741,865	1,395	419,415	9,293,229	1,040	335,667
80	$685,493	5,377,077	738	96,599	3,713,827	539	78,939
81	$1,307,991	7,994,612	896	375,407	5,745,576	671	277,361
82	$1,162,399	9,433,842	1,279	137,160	6,649,077	961	95,700
83	$820,357	6,721,328	995	91,449	4,678,663	750	72,508
84	$984,692	8,213,053	1,344	97,512	5,829,942	1,023	77,225
85	$1,088,788	7,844,764	980	212,121	5,656,661	739	155,172
86	$1,071,231	9,059,232	1,160	95,590	6,447,248	870	75,484
87	$500,020	4,183,988	320	48,381	2,847,377	216	36,538
88	$908,499	6,087,748	814	215,632	4,347,953	585	152,089

Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
89	$727,877	5,566,684	686	114,621	3,930,281	501	97,511
90	$1,524,449	11,737,616	1,259	233,407	8,441,394	884	169,235
91	$281,093	2,161,336	237	43,288	1,447,346	168	34,294
92	$331,100	2,889,033	296	22,041	1,992,541	210	20,020
93	$863,128	6,919,893	720	109,027	4,901,032	516	82,821
94	$765,808	6,479,913	838	68,033	4,678,431	650	54,529
95	$961,805	6,857,403	1,114	193,493	4,835,169	851	135,920
96	$350,012	2,866,636	290	39,108	1,970,012	207	32,643
97	$987,404	7,761,010	1,203	137,819	5,532,187	911	99,016
98	$1,108,404	9,242,402	1,456	109,974	6,691,085	1,137	87,970
99	$806,634	6,555,693	904	94,407	4,548,828	674	75,503
Not mapped*	$1,604,402	8,465,774	695	573,555	6,615,390	561	389,624

* *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.
Residential Programs
Per Capita Energy, Electric Bill Savings by Electric Utility Territory
(July 1, 2001–June 30, 2009)

Wisconsin Focus on Energy Residential Programs
Per Capita* Energy, Electric Bill Savings by Electric Utility Territory



Per Capita Annual Energy, Electric Bill Savings by Utility Territory

- $0
- $2.10 - $7.10
- $7.11 - $11.50
- $11.51 - $16.70
- > $16.70
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2009 from projects implemented in households from July 1, 2001, through June 30, 2009. Electric savings has been valued at the average cost of electricity in Wisconsin and summed for all projects within each utility territory and divided by the number of residential customers in that utility territory.

* The unit of population is residential customers as reported by the utilities in 2007.

Map Produced by: PA Consulting Group and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. September, 2009

Table A-14. Residential Programs Electric Impacts
(By Participating Electric Utility)
(July 1, 2001–June 30, 2009)

Utility Name	Map Code	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers	Annual Dollars Saved
Algoma Utility Commission		$4	64,979	4	45,818	3	1,644	6,829
Alliant Energy	WPL	$23	84,651,265	10,867	61,279,583	8,330	393,691	8,896,848
Arcadia Electric & Water Utility		$2	26,707	2	17,720	1	1,143	2,807
Barron Light And Water Utility		$9	119,705	12	83,646	8	1,456	12,581
Black River Falls Municipal Electric & Water		$9	185,369	14	127,086	10	2,170	19,482
Bloomer City Of Electric Utility		$12	181,824	16	120,460	11	1,575	19,110
Boscobel Municipal Utilities		$9	116,289	8	88,880	6	1,423	12,222
Brodhead Water And Light Commission		$8	119,591	12	86,363	9	1,498	12,569
Cashton Municipal Electric And Water Utility		$15	66,875	13	46,777	11	484	7,029
Cedarburg Light And Water Commission		$19	952,813	135	685,430	106	5,153	100,141
Centuria Municipal Electric Utility		$11	30,042	4	18,426	2	289	3,157
City of Argyle		$20	76,656	13	57,492	11	394	8,057
City of Kiel		$24	494,960	40	393,210	32	2,129	52,020
City of Lodi		$17	227,437	20	164,509	14	1,382	23,904
City of Muscoda		$13	117,264	10	81,113	8	933	12,324
City of New Richmond		$6	190,286	21	139,282	15	3,525	19,999
City of Westby		$6	56,649	4	38,315	2	971	5,954
Columbus Water And Light Dept		$7	146,741	14	105,136	10	2,252	15,422
Consolidated Water Power Company	CWP	$21	196,864	29	143,489	23	984	20,690
Cornell Municipal Water And Electric Utility		$41	277,089	11	210,523	8	716	29,122
Cuba City Electric & Water Utility		$3	26,065	1	18,062	1	934	2,739
Cumberland Municipal Utility		$21	228,432	26	164,118	19	1,117	24,008
Dahlberg Light And Power Company	DLP	$8	774,198	57	516,038	40	9,945	81,368
Eagle River Light And Water Commission		$20	163,548	12	113,374	8	847	17,189
Eau Claire Electric Cooperative	C-8	$7	655,679	58	460,117	42	9,773	68,912
Elroy Municipal Electric And Water Utility		$7	48,319	5	35,659	4	755	5,078
Evansville City of Water & Light		$20	572,989	53	431,576	42	3,058	60,221
Florence Utility Commission		$3	42,624	4	31,008	3	1,341	4,480
Hartford City Of Utilities		$17	898,920	75	645,048	56	5,670	94,477
Hustisford Utilities		$10	130,055	15	94,174	11	1,318	13,669
Jefferson Utilities		$11	358,696	39	260,443	29	3,448	37,699
Juneau Utility Commission		$9	79,838	8	57,302	6	940	8,391
Kaukauna Utilities		$25	3,037,640	390	2,254,854	298	12,531	319,256
La Farge Municipal Electric Utility		$4	17,612	1	12,430	1	448	1,851
Lake Mills Light And Water Dept		$7	217,698	32	161,013	25	3,368	22,880

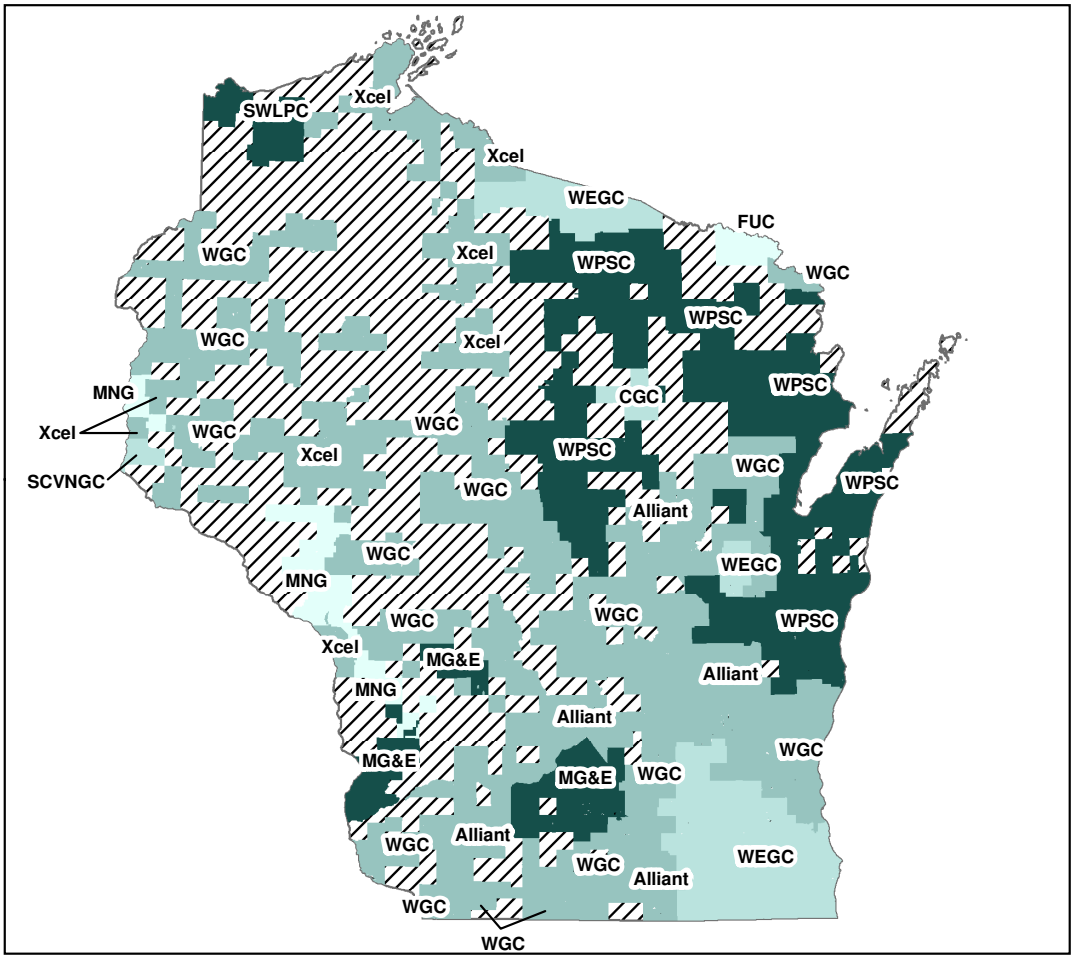
Utility Name	Map Code	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers	Annual Dollars Saved
Madison Gas And Electric Company	MGE	$41	46,360,156	6,007	33,921,575	4,530	118,959	4,872,452
Manitowoc Public Utilities		$11	1,698,958	182	1,265,718	133	15,621	178,561
Mazomanie Electric Utility		$12	94,974	10	70,015	8	802	9,982
Medford Electric Utility		$23	556,555	37	391,156	26	2,574	58,494
Menasha Electric & Water Utilities		$12	900,645	105	684,444	81	8,008	94,658
Mount Horeb Electric Utility		$13	385,247	36	294,664	28	3,068	40,490
New Glarus Light And Water Works		$12	109,836	15	75,205	11	1,002	11,544
New Holstein Public Utility		$12	252,321	26	188,653	20	2,234	26,519
New London Electric & Water Utility		$14	448,510	71	323,986	53	3,271	47,138
North Central Power Company Inc	NCP	$7	292,902	25	199,787	17	4,369	30,784
Northwestern Wisconsin Electric Co	NWE	$5	553,036	46	395,021	34	11,557	58,124
Oconomowoc City Of Utilities		$24	1,695,044	191	1,250,545	149	7,482	178,149
Oconto Falls Water And Light Commission		$13	171,079	14	122,998	10	1,334	17,980
Pierce-Pepin Electric Cooperative	C-14	$10	639,981	73	439,596	54	6,964	67,262
Pioneer Power & Light Company	PPL	$7	128,877	10	90,085	7	1,983	13,545
Plymouth Utilities		$14	921,883	80	650,927	57	6,842	96,890
Polk-Burnett Electric Cooperative	C-15	$4	746,873	55	504,246	38	18,637	78,496
Price Electric Cooperative Inc	C-16	$7	573,365	45	396,910	32	8,663	60,261
Princeton Municipal Water & Electric Utility		$15	103,323	10	74,780	7	706	10,859
Reedsburg Utility Commission		$14	568,644	48	431,738	38	4,149	59,764
Rice Lake Municipal Water & Electric Utility		$7	300,571	22	218,106	17	4,422	31,590
Richland Center Electric Utility		$14	315,365	27	220,292	20	2,438	33,145
Richland Electric Cooperative	C-17	$10	318,669	35	220,492	26	3,489	33,492
River Falls Municipal Utility		$12	601,662	42	451,189	32	5,162	63,235
Riverland Energy Cooperative	C-18	$2	316,098	32	214,307	24	15,151	33,222
Rock County Electric Cooperative	C-19	$5	315,985	40	226,918	31	6,304	33,210
Scenic River Electric Cooperative	C-20	$5	547,852	55	386,095	41	12,429	57,579
Shawano Municipal Utilities		$16	642,433	70	460,349	53	4,151	67,520
Sheboygan Falls Utilities		$10	357,312	58	257,092	43	3,825	37,554
Shullsburg Electric Utility		$8	48,713	10	35,098	8	639	5,120
Slinger Utilities		$21	346,920	33	262,929	26	1,718	36,461
Spooner Municipal Utilities		$10	115,727	10	78,792	7	1,254	12,163
Stoughton Electric Utility		$16	1,171,356	124	851,402	95	7,563	123,110
Stratford Municipal Water & Electric Utility		$32	208,119	14	146,045	10	679	21,873
Sturgeon Bay Utilities		$11	749,616	89	530,612	64	7,361	78,785

Utility Name	Map Code	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW	Number of Customers	Annual Dollars Saved
Sun Prairie Water & Light Commission		$13	1,341,670	105	1,002,019	77	11,253	141,010
Superior Water Light And Power Company	SWL	$19	2,321,693	211	1,582,610	149	12,526	244,010
Two Rivers Water & Light Utility		$15	803,376	89	560,095	62	5,561	84,435
Village of Belmont		$7	35,953	3	24,584	2	535	3,779
Village of Benton		$3	15,887	3	11,686	2	486	1,670
Village of Cadott		$30	180,097	17	127,222	12	641	18,928
Village of Gresham		$13	120,278	8	81,983	6	948	12,641
Village of Pardeeville		$18	208,152	19	148,911	14	1,210	21,877
Village of Prairie Du Sac		$15	234,277	23	168,186	17	1,669	24,622
Village of Viola		$3	9,850	0	7,131	0	337	1,035
Village of Waunakee		$15	633,492	62	468,530	47	4,369	66,580
Waterloo Water And Light Commission		$8	121,165	12	89,116	10	1,505	12,734
Waupun Public Utilities		$19	675,102	42	502,931	31	3,707	70,953
We Energies	WEP	$28	258,375,263	36,562	186,205,842	28,060	968,454	27,155,240
Whitehall Municipal Electric Utility		$9	62,688	4	42,420	3	746	6,588
Wisconsin Dells Municipal Electric Utility		$5	63,656	4	44,844	3	1,279	6,690
Wisconsin Public Service Corporation	WPS	$29	100,946,305	12,557	73,000,625	9,445	370,222	10,609,457
Wonewoc Electric & Water Utility		$7	30,885	3	21,994	2	438	3,246
Xcel Energy	NSP	$25	48,652,119	5,603	35,063,371	4,259	206,386	5,113,338
Not mapped*			54,263,200	7,168	27,815,924	3,307		5,703,062

* *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.
Residential Programs
Per Capita Energy, Gas Bill Savings by Gas Utility
(July 1, 2001–June 30, 2009)

Wisconsin Focus on Energy Residential Programs
Per Capita* Energy, Gas Bill Savings by Gas Utility Territory



Per Capita Annual Energy, Gas Bill Savings by Utility Territory

- $0
- $0.30 - $3.40
- $3.41 - $6.50
- $6.51 - $9.90
- > $9.90
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2009 from projects implemented in households from July 1, 2001, through June 30, 2009. Electric savings has been valued at the average cost of electricity in Wisconsin and summed for all projects within each utility territory and divided by the number of residential customers in that utility territory.

* The unit of population is residential customers as reported by the utilities in 2007.

Map Produced by: PA Consulting Group and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. September 2009.

Table A-15. Residential Programs Gas Impacts
(By Participating Gas Utility)
(July 1, 2001–June 30, 2009)

Utility Name	Map Code	Annual Dollars per Capita	Annual Dollars Saved	Lifecycle Verified Gross Therms	Persistent Net Therms	Number of Customers
Alliant/Wisconsin Power & Light	Alliant	$10	$1,533,825	1,230,999	941,350	155,827
City Gas Company	CGC	$4	$18,356	14,732	12,325	4,096
Florence Utility Commission	FUC	$0	$348	279	208	1,118
Madison Gas and Electric	MG&E	$25	$3,165,479	2,540,513	1,956,436	125,241
Midwest Natural Gas Inc.	MNG	$3	$41,885	33,616	27,099	12,402
St Croix Valley Natural Gas Company	SCVNGC	$4	$27,599	22,150	18,051	6,648
Superior Water Light And Power Company	SWLPC	$11	$125,107	100,407	79,062	10,899
Wisconsin Electric Gas Operations	WEGC	$6	$2,679,945	2,150,839	1,611,096	416,733
Wisconsin Gas Company	WGC	$10	$5,188,158	4,163,850	3,140,447	535,433
Wisconsin Public Service Corporation	WPSC	$11	$2,936,654	2,356,865	1,802,233	278,936
Xcel (Northern States Power Company)	Xcel	$10	$827,680	664,270	511,954	84,867
Not mapped*			$2,078,689	1,668,290	1,089,248	

* *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

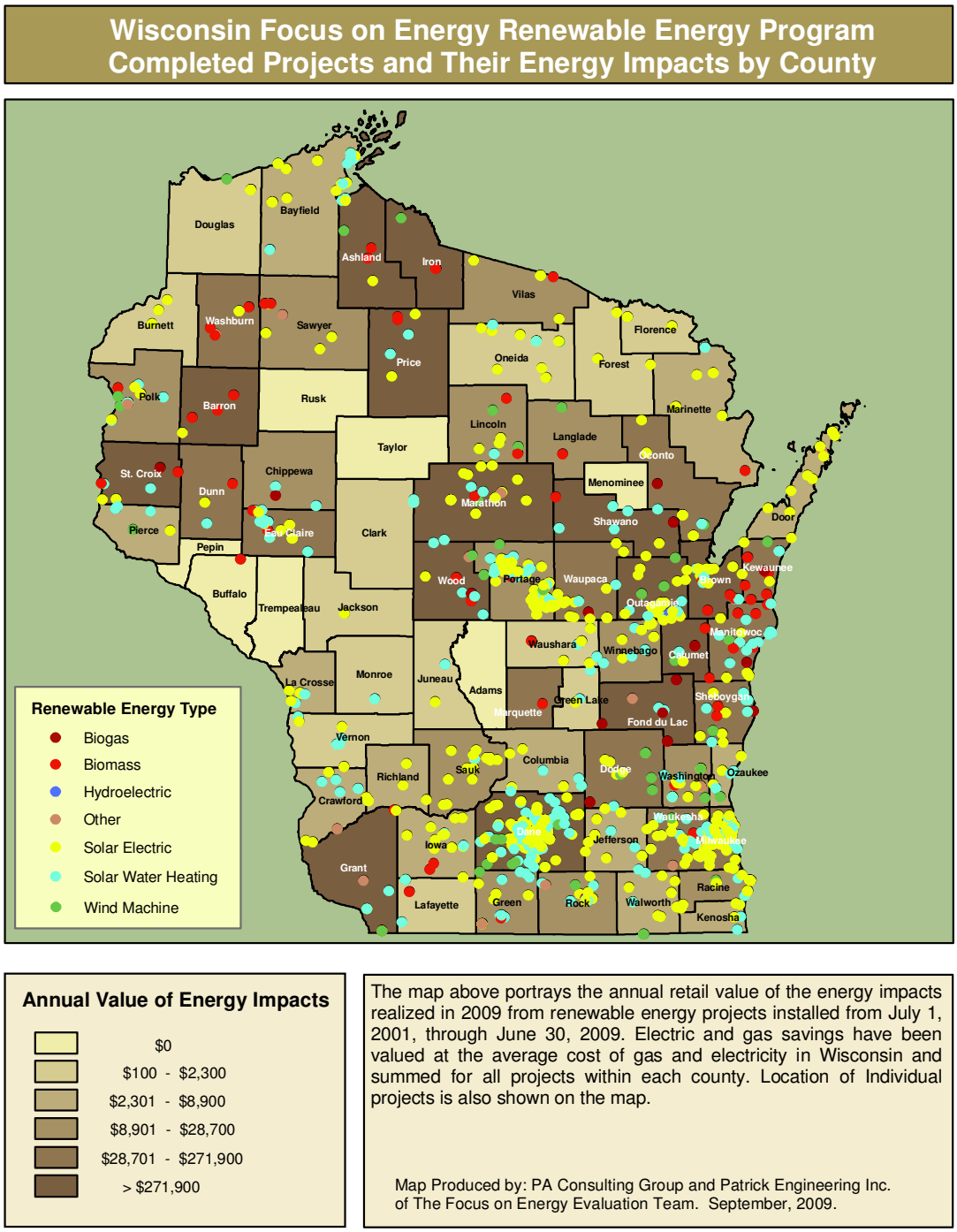
In this section, we summarize the verified energy impacts across the Renewable Energy Programs through June 30, 2009.

Note: A change in the type of energy impacts data used for the Renewable Energy Programs maps. As explained in the Introduction to this Appendix (above), the data reported in all of the maps in this report are *lifecycle verified gross* energy impacts—a recently introduced (for Focus) type of reported energy impacts. As in the past, these are impact estimates based on evaluation work done to establish verified gross for specific programs and/or program areas. However, as discussed in Section 1.1, *lifecycle verified gross* is defined as:

> Energy savings, expressed as *verified gross*, that explicitly incorporate measure life.

In order to provide some continuity in this transition in the basis for the mapped energy impacts, the tables that accompany the maps include a column for verified gross impacts—as in past reports impacts—though these are *lifecycle* verified gross impacts, and will therefore show some differences from past reports. Additional discussion of lifecycle and persistent savings is provided above in Section 2.1 and Section 2.8.

Figure A-16.
Renewable Energy Program
Completed Projects and Their Energy Impacts by County
(July 1, 2001– June 30, 2009)



Annual Value of Energy Impacts

	$0
	$100 - $2,300
	$2,301 - $8,900
	$8,901 - $28,700
	$28,701 - $271,900
	> $271,900

The map above portrays the annual retail value of the energy impacts realized in 2009 from renewable energy projects installed from July 1, 2001, through June 30, 2009. 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. Location of Individual projects is also shown on the map.

Map Produced by: PA Consulting Group and Patrick Engineering Inc. of The Focus on Energy Evaluation Team. September, 2009.

Table A-16. Renewable Programs Energy Impacts
(By County)
(July 1, 2001– June 30, 2009)

County	Annual Dollars	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms
Ashland	$274,935	20,787	15	248,812
Barron	$276,662	450	0	251,935
Bayfield	$5,742	40,031	18	2,178
Brown	$468,823	108,833	70	418,683
Burnett	$865	10,333	4	0
Calumet	$703,883	8,159,382	1,272	19,073
Chippewa	$17,659	208,375	33	199
Clark	$1,094	11,768	5	100
Columbia	$3,320	25,515	19	1,079
Crawford	$3,834	45,808	13	0
Dane	$1,350,087	15,778,850	2,136	26,773
Dodge	$227,837	2,722,072	547	0
Door	$4,568	42,185	35	945
Douglas	$389	4,643	6	0
Dunn	$54,852	2,277	2	49,783
Eau Claire	$34,535	32,098	12	29,006
Florence	$122	1,455	1	0
Fond du Lac	$621,884	7,331,146	991	7,529
Forest	$336	4,013	3	0
Grant	$716,899	247,402	202	634,054
Green	$12,328	31,662	19	8,814
Green Lake	$908	6,434	6	337
Iowa	$7,136	55,943	28	2,235
Iron	$671,763	-437,210	-41	645,134
Jackson	$784	9,362	3	0
Jefferson	$5,166	59,227	33	190
Juneau	$721	445	0	623
Kenosha	$8,831	102,561	37	224
Kewaunee	$271,871	3,160,215	363	6,704
La Crosse	$6,027	34,706	19	2,843
Lafayette	$653	2,752	0	385
Langlade	$16,351	72,747	64	9,346
Lincoln	$18,675	56,552	44	12,697
Manitowoc	$269,596	1,597,396	164	123,765
Marathon	$306,159	58,220	37	274,395
Marinette	$7,720	8,793	7	6,360
Marquette	$60,323	0	0	54,939
Milwaukee	$29,572	306,886	183	3,539
Monroe	$103	1,235	0	0
Oconto	$174,515	2,083,962	257	80
Oneida	$2,286	22,385	15	376
Outagamie	$591,878	7,025,760	1,324	3,480
Ozaukee	$7,306	84,413	25	219
Pierce	$2,914	21,587	6	1,008

County	Annual Dollars	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms
Polk	$16,428	103,336	39	7,084
Portage	$27,648	244,973	132	6,506
Price	$972,515	302,905	3	862,624
Racine	$15,649	186,207	108	58
Richland	$4,513	53,924	19	0
Rock	$28,624	337,978	52	305
Sauk	$10,513	125,608	50	0
Sawyer	$27,257	11,337	6	23,960
Shawano	$635,138	6,083,834	730	114,682
Sheboygan	$83,207	42,982	30	72,504
St. Croix	$324,861	-174,155	-43	309,142
Vernon	$1,769	20,519	10	47
Vilas	$16,987	11,264	4	14,613
Walworth	$7,230	86,386	35	0
Washburn	$71,295	6,986	5	64,400
Washington	$12,960	60,861	30	7,164
Waukesha	$55,756	145,922	87	39,656
Waupaca	$233,970	2,641,329	330	11,740
Waushara	$1,557	18,598	12	0
Winnebago	$8,989	55,080	26	3,988
Wood	$1,259,408	62,698	23	1,142,223
Not mapped*	$199,754	2,216,323	220	12,976

Table A-17. Participant Avoided Costs Used to Value Mapped Energy Savings

Rate Class	kWh Cost	Therm Cost	kWh Year used	Therm Year Used	kWh Source Used	Therm Source Used	Date Updated
Commercial	0.0837	1.098	2006	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	03/20/09
Industrial	0.0585	1.037	2006	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	03/20/09
Residential	0.1051	1.246	2006	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	03/20/09

APPENDIX B: RESIDENTIAL DEFAULT SAVINGS VALUES USED FOR THE FIRST HALF OF 2009

The following table lists default/deemed energy savings by measure (used for the first half of 2009) for the Residential Programs.

Table B-1. Residential Programs: Default/Deemed Energy Savings By Measure (as of June 30, 2009)

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
ACES	Direct Install	CFL	DI-Post 5-1-08	43.5z	37.2795	0.0042	0.003599	0	0
ACES	Direct Install	Faucet Aerator - Bath - Electric	DI-Post 5-1-08	127.1	108.9247	0	0	0	0
ACES	Direct Install	Faucet Aerator - Bath - Gas	DI-Post 5-1-08	0	0	0	0	6.3	5.544
ACES	Direct Install	Faucet Aerator - Kitchen - Electric	DI-Post 5-1-08	223.1	191.1967	0	0	0	0
ACES	Direct Install	Faucet Aerator - Kitchen - Gas	DI-Post 5-1-08	0	0	0	0	11.1	9.768
ACES	Direct Install	Pre-Rinse Sprayer - Gas	DI	0	0	0	0	42	36.96
ACES	Direct Install	Showerhead 1.5 gpm - Electric	DI-Post 5-1-08	726.2	622.3534	0	0	0	0
ACES	Direct Install	Showerhead 1.5 gpm - Gas	DI-Post 5-1-08	0	0	0	0	36.2	31.856
ACES	Direct Install	Showerhead 1.75 gpm - Electric	DI-Post 5-1-08	544.8	466.8936	0	0	0	0
ACES	Direct Install	Showerhead 1.75 gpm - Gas	DI-Post 5-1-08	0	0	0	0	27.2	23.936
ACES	New Construction	Furnace 90%+ AFUE w/ECM	N/A	0	0	0	0	1773	762.39
ACES	Whole Building	CFL	Pre 5-1-08	43.5	23.1855	0.0031	0.001652	0	0
ACES	Whole Building	CFL Fixtures	N/A	394	210.002	0.045	0.023985	0	0
ACES	Whole Building	CFL Reflector Lamps	Post 5-1-08	407	216.931	0.0415	0.02212	0	0

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
ACES	Whole Building	ES Clothes Washer - Common Area	N/A	384	204.672	0	0	22	10.956
ACES	Whole Building	ES Dishwasher	N/A	90	47.97	0	0	5	2.49
ACES	Whole Building	ES Refrigerator	N/A	66	35.178	0.011	0.005863	0	0
ACES	Whole Building	ES Room Thru Wall AC	N/A	33	17.589	0.11	0.05863	0	0
ACES	Whole Building	Furnace 90%+ AFUE w/ECM	Retrofit Post 5-1-08	759	404.547	0.17	0.09061	20	9.96
ACES	Whole Building	HPT8 1 lamp 4ft	N/A	56	29.848	0.0064	0.003411	0	0
ACES	Whole Building	HPT8 2 lamp 4ft	N/A	80	42.64	0.0091	0.00485	0	0
ACES	Whole Building	HPT8 3 lamp 4ft	N/A	145	77.285	0.0166	0.008848	0	0
ACES	Whole Building	HPT8 4 lamp 4ft	N/A	171	91.143	0.0195	0.010394	0	0
ACES	Whole Building	LED Exit Fixture	Post 5-1-08	272	144.976	0.031	0.016523	0	0
ACES	Whole Building	Occupancy Sensor Ceiling	N/A	525	279.825	0	0	0	0
ACES	Whole Building	Occupancy Sensor Socket	N/A	189	100.737	0	0	0	0
ACES	Whole Building	Occupancy Sensor Wall	N/A	189	100.737	0	0	0	0
ACES	Whole Building	Steam Trap-All Other Traps-Replace or Repair	N/A	0	0	0	0	299	148.902
EHCI	EHCI	90+ AFUE with ECM	New Construction Post 5-1-08	1116	424.08	0.17	0.0646	20	7.2
EHCI	EHCI	90+ AFUE with ECM	Retrofit Post 5-1-08	759	288.42	0.17	0.038	20	7.2
EHCI	EHCI	90+AFUE with ECM	N/A	773	773	0.1	0.1	0	0
EHCI	EHCI	HVAC - Flue Closure	N/A	0	0	0	0	60	60

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
EHCI	EHCI	SEER 14	Post 5-1-08	54	54	0.1	0.1	0	0
EHCI	EHCI	SEER 14 w/ RCA	N/A	54	54	0.1	0.1	0	0
EHCI	EHCI	SEER 15	N/A	101	101	0.17	0.17	0	0
EHCI	EHCI	SEER 15	Post 5-1-08	101	101	0.17	0.17	0	0
EHCI	EHCI	SEER 15 w/ECM	N/A	54	54	0.1	0.1	0	0
EHCI	EHCI	SEER 16	Post 5-1-08	142	142	0.28	0.28	0	0
EHCI	EHCI	SEER 16 w/ECM	N/A	101	101	0.17	0.17	0	0
EHCI	EHCI	SEER 16 w/o RCA	N/A	142	142	0.28	0.28	0	0
EHCI	EHCI	SEER 17	Post 5-1-08	178	178	0.29	0.29	0	0
EHCI	EHCI	SEER 17 w/ ECM	N/A	142	142	0.28	0.28	0	0
EHCI	EHCI	SEER 17 w/ECM	N/A	142	142	0.28	0.28	0	0
EHCI	EHCI	SEER 18 w/ECM	N/A	178	178	0.29	0.29	0	0
EHCI	EHCI	SEER 19 w/ECM	N/A	211	211	0.37	0.37	0	0
EHCI	EHCI	SEER 20 w/ ECM	N/A	239	239	0.39	0.39	0	0
EHCI	EHCI	SEER 21 w/ ECM	N/A	265	265	0.41	0.41	0	0
ENERGY STAR - Appliances	Customer Rewards	Clothes Washers Tier 3	EE	393	393	0	0	0	0
ENERGY STAR - Appliances	Customer Rewards	Clothes Washers Tier 3	GG	20	20	0	0	14.3	14.3
ENERGY STAR - Appliances	Customer Rewards	Electric .93 EF +	N/A	260	260	0	0	0	0
ENERGY STAR - Appliances	Customer Rewards	Flue Closure	N/A	0	0	0	0	60	60
ENERGY STAR - Appliances	Customer Rewards	Fuel Conversion Electric to LP	N/A	3280	3280	0.25	0.25	0	0
ENERGY STAR - Appliances	Customer Rewards	Fuel Conversion Electric to Natural Gas	N/A	3280	3280	0.25	0.25	-78	-78

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
ENERGY STAR - Appliances	Customer Rewards	Power Vent with EF of .64 to .79	N/A	-50	-50	-0.005	-0.005	15	15
ENERGY STAR - Appliances	Customer Rewards	Power Vent with EF of .80 or Greater	N/A	-50	-50	-0.005	-0.005	45	45
ENERGY STAR - Appliances	Customer Rewards	Thermal (At least 80% AFUE)	N/A	0	0	0	0	85	85
ENERGY STAR - Lighting	Customer Rewards	Ceiling Fan	N/A	175	175	0	0	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	Instant Post 5-1-08	42.5	31.9	0.0027	0.002	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	KEEP	38.4	38.4	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	Mail In Post 5-1-08	47.7	35.8	0.0031	0.0023	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	MF	173	173	0.005	0.005	0	0
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixture	N/A	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Customer Rewards	Torchiere	N/A	349	349	0.01	0.01	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	CFL	Buydown	42.5	42.5	0.0027	0.0027	0	0
ENERGY STAR - Lighting	Lighting	LED Holiday Light	N/A	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Lighting	LED Holiday Light	N/A	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Lighting	LED Holiday Light	N/A	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Lighting	LED Holiday Light	N/A	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Lighting	LED Holiday Light	N/A	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Lighting	Lighting Fixture LED	N/A	104	104	0.004	0.004	0	0

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
ENERGY STAR - Lighting	Lighting	Lighting Fixtures	N/A	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Lighting	Lighting Fixtures	N/A	104	104	0.004	0.004	0	0
HPES	Whole House	Attic Insulation	N/A	160	99.2	0.118	0.07316	100	62
HPES	Whole House	Chimney Liner	N/A	0	0	0	0	81	81
HPES	Whole House	Duct Sealing	N/A	1080	1080	0.1	0.1	84	84
HPES	Whole House	Floor Insulation	N/A	126	107	0.093	0.079	79	67
HPES	Whole House	Foundation Insulation	Exterior	59	51	0	0	49	41
HPES	Whole House	Foundation Insulation	Interior	172	172	0	0	140	140
HPES	Whole House	Sidewall Insulation	1 inch Foam Continuous	60	30	0.049	0.0245	41	20.5
HPES	Whole House	Sidewall Insulation	1/2 inch Foam Continuous	36	18	0.029	0.0145	25	12.5
HPES	Whole House	Sidewall Insulation	Cavity	326	163	0.264	0.132	225	112.5
HPES	Whole House	Sill Box Insulation	N/A	53	45	0	0	39	33
HPES	Whole House	Water Heater - Fuel Switch	N/A	3280	3280	0.25	0.25	-78	-78
HPES	Whole House	Water Heater - Poor Draft	N/A	0.5	0.5	-0.005	-0.005	75	75
THPES	Whole House	Home Weatherization	N/A	1636	1636	0.269	0.269	269	269
WESH	Reward Items	Drain Water	N/A	0	0	0	0	49	49
WESH	Reward Items	Low Solar Heat Gain Windows	N/A	104.87	104.87	0	0	-10.27	-10.27
WESH	Whole House	Certified Home	N/A	0	0	0	0	100	100

APPENDIX C: MEASURE LIFETIME AND NET INCREMENTAL COSTS BY PROGRAM BY BENEFIT-COST MEASURE CATEGORY

Table C-1. Measure Lifetime and Net Incremental Costs by Program by Benefit-cost 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	17	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
2705	Head Start	CFL	6	4	unit
2807	Affordable Housing	Other	8	0.05207	kwh
2907	Milwaukee Pilot	Other	8	0.05207	kwh
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	Biogas	20	3.06	kWh
4105	Renewables	Biomass-Combustion	20	1.92	therm
4107	Renewables	Other	25	0.2	kWh

APPENDIX D: TABLES AND FIGURES LINKED TO THE TYPE OF IMPACTS

Reference Number	Title	Gross	Verified	Net
Table 2-1a	All Programs: Tracked Energy Impacts - Lifecycle Verified Gross (July 1, 2001–June 30, 2009)		Lifecycle	
Table 2-1b	All Programs: Tracked Energy Impacts - Annual First Year Verified Gross (July 1, 2001–June 30, 2009)		First - Year	
Table 2-1c	All Programs: Tracked Energy Impacts - Lifecycle Verified Gross and Lifecycle Verified Net (July 1, 2001–June 30, 2009)		Lifecycle	Lifecycle
Table 2-1d	All Programs: Tracked Energy Impacts - Annual First Year Program to Date (July 1, 2001–June 30, 2009)	First - Year	First - Year	First - Year
Figure 2-1	Lifecycle Verified Gross Electricity Savings (GWh)		Lifecycle	
Figure 2-2	Lifecycle Verified Gross Electricity Demand Reductions (MW)		Lifecycle	
Figure 2-3	Lifecycle Verified Gross Gas Savings (Million Therms)		Lifecycle	
Figure 2-4	Persistent Verified Net Electricity Savings (GWh)			Persistent
Figure 2-5	Persistent Verified Net Electricity Demand Reductions (MW)			Persistent
Figure 2-6	Persistent Verified Net Gas Savings (Million Therms)			Persistent
Figure 2-7	Verified Gross Electric Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
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Figure 2-9	Verified Gross Gas Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Figure 2-10	Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Figure 2-11	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Figure 2-12	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Figure 2-13	Verified Gross Gas Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Figure 2-14	Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 2-2	Verified Gross Electric Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 2-3	Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 2-4	Verified Gross Gas Energy Impacts by Measure Category, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	

Reference Number	Title	Gross	Verified	Net
Table 2-5	Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 2-6	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 2-7	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 2-8	Verified Gross Gas Energy Impacts by Measure Category, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 2-9	Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 2-16	Verified Gross Emissions Displaced (lbs) Annually The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 2-17	Verified Gross Emissions Displaced (lbs) Annually Cumulative in Current Year (July 1, 2001–June 30, 2009)		Lifecycle	
Table 2-18	Verified Gross Emissions Displaced (lbs) Annual With Adjustments for Energy Impacts From Renewables Biomass/Biogas The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 2-19	Value of Non-Energy Benefits by Program Area			Persistent
Table 2-21	Simple Benefit-Cost and Cost of Conserved Energy The First Half of 2009 (January 1, 2009–June 30, 2009)			Persistent
Table 2-22	Simple Benefit-Cost and Cost of Conserved Energy Program to Date (July 1, 2001–June 30, 2009)			Persistent
Figure 3-1	Verified Gross Electric Energy Impacts by Program, Business Programs The First Half of 2009 (January 1, 2008–June 30, 2009)		First - Year	
Figure 3-2	Verified Gross Electric Energy Impacts by Program, Business Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Figure 3-3	Verified Gross Gas Energy Impacts by Program, Business Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Figure 3-4	Verified Gross Gas Energy Impacts by Program, Business Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 3-7a	All Business Programs: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)	First - Year	First - Year	First - Year
Table 3-7b	All Business Programs: Tracked Annual Energy Impacts 18-month Contract Period (July 1, 2007–December 31, 2008)	First - Year	First - Year	First - Year
Table 3-7c	All Business Programs: Tracked Annual Energy Impacts FY07 (July 1, 2006–June 30, 2007)	First - Year	First - Year	First - Year
Table 3-7d	All Business Programs: Tracked Annual Energy Impacts FY06 (July 1, 2005–June 30, 2006)	First - Year	First - Year	First - Year
Table 3-7e	All Business Programs: Tracked Annual Energy Impacts FY05 (July 1, 2004–June 30, 2005)	First - Year	First - Year	First - Year

Reference Number	Title	Gross	Verified	Net
Table 3-7f	All Business Programs: Tracked Annual Energy Impacts FY04 (July 1, 2003–June 30, 2004)	First - Year	First - Year	First - Year
Table 3-7g	All Business Programs: Tracked Annual Energy Impacts FY03 (July 1, 2002–June 30, 2003)	First - Year	First - Year	First - Year
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Table 3-8	Agriculture The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
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Table 3-10	Industrial The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 3-11	Schools / Government The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 3-12	Net Business Program Savings versus Business Program Portfolio Targets The First Half of 2009 (January 1, 2009–June 30, 2009)			First - Year
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Figure 4-2	Verified Gross Electric Energy Impacts by Program, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Figure 4-3	Verified Gross Gas Energy Impacts by Program, Residential Programs The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Figure 4-4	Verified Gross Gas Energy Impacts by Program, Residential Programs Program to Date (July 1, 2001–June 30, 2009)		First - Year	
Table 4-1a	All Residential Programs: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–December 31, 2008)	First - Year	First - Year	First - Year
Table 4-1b	All Residential Programs: Tracked Annual Energy Impacts 18-month Contract Period (July 1, 2007–December 31, 2008)	First - Year	First - Year	First - Year
Table 4-1c	All Residential Programs: Tracked Annual Energy Impacts FY07 (July 1, 2006–June 30, 2007)	First - Year	First - Year	First - Year
Table 4-1d	All Residential Programs: Tracked Annual Energy Impacts FY06 (July 1, 2005–June 30, 2006)	First - Year	First - Year	First - Year
Table 4-1e	All Residential Programs: Tracked Annual Energy Impacts FY05 (July 1, 2004–June 30, 2005)	First - Year	First - Year	First - Year
Table 4-1f	All Residential Programs: Tracked Annual Energy Impacts FY04 (July 1, 2003–June 30, 2004)	First - Year	First - Year	First - Year
Table 4-1g	All Residential Programs: Tracked Annual Energy Impacts FY03 (July 1, 2002–June 30, 2003)	First - Year	First - Year	First - Year
Table 4-1h	All Residential Programs: Tracked Annual Energy Impacts FY02 (July 1, 2001–June 30, 2002)	First - Year	First - Year	First - Year
Table 4-2	Net Residential Program Savings versus Residential Program Portfolio Targets The First Half of 2009 (January 1, 2009–June 30, 2009)			First - Year
Table 4-4	ENERGY STAR - Lighting Products Program: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	

Reference Number	Title	Gross	Verified	Net
Table 4-5	ENERGY STAR - Appliances Products Program: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-6	Wisconsin ENERGY STAR Homes: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-7	Home Performance with ENERGY STAR: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-9	Apartment and Condominium Efficiency Services: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-10	Targeted Home Performance with ENERGY STAR: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-11	Efficient Heating and Cooling: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table 4-12	Head Start CFL: Tracked Annual Energy Impacts The First Half of 2009 (January 1, 2009–June 30, 2009)		First - Year	
Table A-1	Commercial Program Energy Impacts (By County) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-2	Commercial Program Energy Impacts (By Senate District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-3	Commercial Program Energy Impacts (By Assembly District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-4	Commercial Program Electric Impacts (By Participating Electric Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-5	Commercial Program Gas Impacts (By Participating Gas Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-6	Industrial Program Energy Impacts (By County) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-7	Industrial Program Energy Impacts (By Senate District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-8	Industrial Program Energy Impacts (By Assembly District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-9	Industrial Program Electric Impacts (By Participating Electric Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-10	Industrial Program Gas Impacts (By Participating Gas Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-11	Residential Programs Energy Impacts (By Participating County) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-12	Residential Programs Energy Impacts (By Senate District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-13	Residential Programs Energy Impacts (By Assembly District) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-14	Residential Programs Electric Impacts (By Participating Electric Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-15	Residential Program Gas Impacts (By Participating Gas Utility) (July 1, 2001–June 30, 2009)		Lifecycle	Persistent
Table A-16	Renewable Programs Energy Impacts (by County) (July 1, 2001–June 30, 2009)		Lifecycle	

APPENDIX E: RENEWABLES PARTICIPANT SURVEY

[KEMA ID]

CALL LOG FOR

Focus on Energy Renewables Evaluation
CY08 – KEMA ID 20810063 – Task 3

Measure ID:
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)

Interview start time: _____ Interview end time: _____

Reward Amount:

Comments:

Notes:

Renewable Energy Program Survey

Contract Year 08 Impact Instrument

Interviewer Guidelines

1. Preparation: Review Impact Statement (IS) if provided. Copy information from the IS to the gray areas below before conducting the survey.
2. Record beginning and end-time
3. Do not read responses that are in brackets.
4. Read responses that are NOT in brackets
5. Read closed-ended questions exactly as written.
6. Skip questions that are not applicable, but indicate they have been skipped by drawing a line through the question
7. Record open-ended answers verbatim, or read back to the respondent what you have recorded to make sure it captures what they meant.
8. Probe on open-ended questions to make sure you understand the issue completely.
9. Many questions have been converted from open-ended to closed-ended. If the respondents answer doesn't fit a category be sure to select "other" and record the response.
10. After completing the interview, review your notes to make sure they are legible and comprehensible to others.
11. Complete data entry within one working day of when you complete the survey.

A Informed Respondent

[As the surveyor, you should paraphrase this paragraph, using words that you're comfortable with to set the sort of tone with which you want to proceed.]

Hello, my name is _____ and I'm calling from KEMA Consulting on behalf of the Focus on Energy Program. Focus on Energy gave you a cash back reward, grant or 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]

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 still in operation?

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.....[SKIP TO A8b] 3

Very Satisfied .....[SKIP TO A8b] 4

[Don't know] .....[SKIP TO B1] 97

[Refused].....[SKIP TO B1] 98

A8a. Why do you say that? [dissatisfied] _____

[Poor performance].....1

[Less energy than expected] 2

[Technical difficulties] 3

[Other 96

[Don't know] 97

[Refused].....98

A8b. Why do you say that? [satisfied] _____

[Good performance] 1

[More energy than expected].....2

[Financial savings or income] 2

[Other 96

[Don't know] 97

[Refused].....98

A9. **Prior to this** [TYPE OF PROJECT] **project,** had you ever participated in the Focus on Energy Program?

Yes……1

No……[SKIP TO C1] 2

[Don't know] ….97

[Refused]….98

A9a. What kind of Focus assistance or services did you receive at that time?

Rebate……1

Advice……2

Other (describe) ….96

[Don't know] ….97

[Refused]….98

A9b. For what type of equipment? (probe: type of renewable or ee measure)

_____

B Cash Incentive

B1. 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

B2. Did you receive financial assistance such as rebates, grants, reduced financing, or tax credits from any other source for this [project type]?

Yes.....1
No..... [SKIP TO D1] 2
[Don't know]..... [SKIP TO D1] 97
[Refused]..... [SKIP TO D1] 98

B2a. From what sources?

Federal tax credits.....1
U.S. Department of Agriculture grant.....2
Supplier or Manufacturer (name:_____).....3
We Energies Incentives for Not-For-Profits.....4
Other (please describe) _____96
[Don't know].....97
[Refused].....98

B2b. About how much? _____ Record Amount

[Don't know].....97
[Refused].....98

If residential, skip to D1

C Company Processes, Respondent's Role? [Ask Series Only For NON-residential]

C1. What was your role and involvement in the purchase of [TYPE OF PROJECT]? [probes: when got involved, did you do the research, the legwork? Did you oversee the installation?]

C1a. How did the approval or decision-making process go at your location? [Probes: Who all involved, process, board approval required, understand roles regarding selecting equipment and roles regarding approval of expenditures]

C2. What purchasing policies, if any, does your organization have for this type of equipment? [probe: rate of return or payback requirements, warrantee requirements, spending limits, schedules]

[IF NONE, SKIP TO D1]

C2a. What role, if any, did these policies have in the decisions regarding the [Project Type]?

D Decision to install

Okay, now I'd like hear how the decision-making process went, starting from when you first started thinking about [Project Type].

D1. About when did [you/your organization] first start thinking about [TYPE OF PROJECT]? (MONTH, YEAR) [RECORD AS MM:YY]: _____

D2. 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

[Energy Advisor(s) - Put in energy advisor name(s) from IS or other paperwork]

Learning about Focus

D3. From where or whom did you hear about Focus on Energy? Anywhere else? [CIRCLE ALL THAT APPLY]

[the Internet] 1
[Installer/contractor] 2
[Utility] 3
[Friend or relative or colleague] 4
[MREA – Midwest Renewable Energy Association] 5
[Other, please describe _____] 96
[Don't know] 97
[Refused] 98

Paste in from Impact Statement response to following question and use for probing.
1. Briefly explain how you or other Focus staff got involved with the customer and the project (outline how Focus on Energy services helped make this project happen).

D4. What did you hear about Focus at that time? [RECORD VERBATIM THEN CIRCLE ALL THAT APPLY] [probe: Anything else?]

_____

[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 96
[Don't know] 97
[Refused] 98

D5. Did you hear about Focus on Energy cash incentives . . .

- before you started considering or planning for [project 1
- while you were considering or planning for [project].....2
- after you decided to install [project]but before installation.....3
- after [PROJECT] was installed 4
- [Don't know].....97
- [Refused].....98

D6x. What plans, if any, did you have to install [TYPE OF PROJECT] before learning about the Focus on Energy Program? [Describe existing plans: -system type, system size, timing, cost]

_____

- [Don't know].....97
- [Refused].....98

Sources of Advice

D6. As you were making decisions about the [TYPE OF PROJECT], who or what were the main sources for advice and information?

_____

- [Installer/contractor].....1
- [MREA – Midwest Renewable Energy Association].....2
- [Focus on Energy] 3
- [Self-installer] 4
- [Site Assessor: GET NAME:_____] 5
- [Other, please describe _____].....96
- [Don't know] 97
- [Refused].....98

D6a. What role, if any, did your contractor(s) (supplier or installer) play in your decision to install [TYPE OF PROJECT]? _____

[none] 2
[provided bid(s) only] 2
[recommended specific equipment] 3
[informed me about Focus] 4
[timing in process (influenced my planning about when to install)] 5
[Other, please describe _____] 96
[Don't know] 97
[Refused] 98

D7. Next, concerning your installation of the [TYPE OF PROJECT], 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 D8

_____ Number of times in contact with Focus staff

D7a. 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] 96
[Don't know/don't remember] 97
[Refused] 98

D7b. I'd like to know how much these conversations affected your decision to go ahead with the project? Would you say that the contacts with Focus on Energy staff…[READ LIST]

Were a very important factor in your decision to do the project 1
Were a somewhat important factor 2
Made no difference 3
Made you less inclined to do the project 4
[Other, please describe _____] 96
[Don't know] 97
[Refused] 98

Site Assessment or (Feasibility Study for biomass or biogas)

D8. Did you have a site assessment done for the [TYPE OF PROJECT] at your [home/business]?

Yes 1
No ..... [SKIP TO D16] 2
[Don't know] ..... [SKIP TO D16] 97
[Refused] ..... [SKIP TO D16] 98

D9. Was the assessment done by…?

You, or someone else in your household/business 1
The installer or contractor 2
A Focus on Energy approved site assessor 3
Or someone else (describe: _____) 4
[Don't know] .....[SKIP TO D16] 97
[Refused] .....[SKIP TO D16] 98

D10. Where did you learn about your site assessor?

Focus on Energy Website 1
Focus on Energy Staff 2
Contractor/Installer 3
Other (please describe_____) 4
[Don't Know] 97
[Refused] 98

D11. Did Focus on Energy share the cost of the site assessment with you?

Yes	1
No	2
[Don't know]	97
[Refused]	98

D12. Overall, how satisfied or dissatisfied would you say you were with the site assessment]? Would you say you were:

Very Dissatisfied		1
Somewhat Dissatisfied		2
Somewhat Satisfied	[SKIP TO D13]	3
Very Satisfied	[SKIP TO D13]	4
[Don't know]	[SKIP TO D13]	97
[Refused]	[SKIP TO D13]	98

D12a. Why do you say that?

D13. What benefits, if any, did you get from the site assessment? Anything else? [RECORD VERBATIM and then CIRCLE ALL THAT APPLY]

[Provided technical information]	1
[Provided even more reasons to install]	2
[Confirmed our commitment to installing]	3
[Provided access to "experts"]	4
[Increased our financial knowledge – costs and benefits	5
[Increased our knowledge of the environmental benefits]	6
[Helped us better understand the process for installing	7
[Helped us better understand the challenges with installing	8
[Other	96
[Don't know]	97
[Refused]	98

D14. I'm going to read some statements about the extent, if any, that the site assessment affected your decision to install the [TYPE OF PROJECT]. Please tell me which of the following statements best applies.

The site assessment was…[READ LIST]

a *very important* factor in your decision to do the project 1

a *somewhat important* factor your decision.....2

made no difference your decision.....3

made you less inclined to do the project.....4

[Other, please describe _____] . 96

[Don't know] 97

[Refused].....98

D15. Why do you say that?

_____

[Don't know] 97

[Refused].....98

Workshops and Conferences

D16. Did you or anyone else in your [household/company] attend a workshop about [TYPE OF PROJECT]?

Yes.....1

No ..... [SKIP TO D21] 2

[Don't know] ..... [SKIP TO D21] 97

[Refused]..... [SKIP TO D21] 98

D17. What workshop(s) did you attend and when? [RECORD VERBATIM]

_____

D18. What, if any, benefits did you get out of attending the workshop? [RECORD VERBATIM]

_____

[Don't know] 97

[Refused].....98

D19. I'm going to read some statements about the extent, if any, that the workshop affected your decision to install the [TYPE OF PROJECT].

The workshop(s) was/were . . .

a *very important* factor in your decision to do the project 1

somewhat important factor in your decision 2

made no difference in your decision 3

made you less inclined to do the project 4

Other, please describe

_____ 96

[Don't know] 97

[Refused].....98

D20. Why do you say this?

_____

D21. Did you or anyone else in your [household/company] attend a conference in Wisconsin that covered [TYPE OF PROJECT]?

Yes.....1

No ..... [SKIP TO D26] 2

[Don't know] ..... [SKIP TO D26] 97

[Refused]..... [SKIP TO D26] 98

D22. What, conference(s) did you attend and when? [RECORD VERBATIM]

_____

D23. What, if any, benefits related to your [project type] did you get out of attending the conference? [RECORD VERBATIM and then CIRCLE ALL THAT APPLY]

_____

[Don't know] 97

[Refused].....98

D24. I'm going to read some statements about the extent, if any, that the conference affected your decision to install the [TYPE OF PROJECT].

The conference(s) was/were . . .

a *very important* factor in your decision to do the project 1

somewhat important factor in your decision.....2

made no difference in your decision 3

made you less inclined to do the project.....4

Other, please describe _____ 96

[Don't know] 97

[Refused].....98

D25. Why do you say this?

Barriers

Paste in this section from the Impact Statement:

2. **Briefly explain your understanding of the largest customer barriers preventing the project's implementation.**

- ☐ **Payback**
- ☐ **Confidence in realizing estimated savings**
- ☐ **Unknown technology or process**
- ☐ **Lack of time/unwilling to make time to understand what energy options make sense for the facility**
- ☐ **Finding a vendor to implement equipment**
- ☐ **Lack of credibility/legitimacy. Customer needs a third party reference**
- ☐ **Permit barriers**
- ☐ **Internal bureaucracy/inability to gain decision maker's attention**
- ☐ **Lack of access to financing**
- ☐ **Competition for funding with other internal projects**
- ☐ **Lack of internal advocate**
- ☐ **Other (Please describe)**

Other _____

D26. 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 D29] 1

[Technical difficulties] 2

[Difficulties with contractor/installer] 3

[Permits/ordinance] 4

[Cost] 5

[Difficulties with Focus] 6

[Difficulties with utility] 7

[Insurance] 8

[Information] 9

[Application process] 10

[Other 96

[Don't know] 97

[Refused] 98

D27. 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 96

[Don't know] 97

[Refused] 98

Paste in this section of the Impact Statement and use for probing.

Briefly describe if and how Focus Staff involvement helped overcome the customer's barriers.

D28. What role, if any, did Focus on Energy staff play in resolving this (these) issues?

Final Decision

D29. For what reasons 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
[Commitment to environment] 2
[Wanted technical assistance] 3
[Equipment vendor included incentive in sales proposal] 4
[Wanted help reviewing proposals] 5
[Other 96
[Don't know] 97
[Refused] 98

D30. What were the main reasons that [you/your organization] decided to go ahead with the [TYPE OF PROJECT]? [Record verbatim and then CIRCLE ALL THAT APPLY] _____

_____

[Commitment to environment] 1
[Wanted to reduce energy costs] 2
[To educate others on renewable energy options] 3
[Were undertaking remodeling] 4
[Wanted to get off the electric grid] 5
[Were undertaking building expansion] 6
[New construction and too expensive to get on the grid] 7
[We were replacing existing equipment] 8
[Other 96
[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 and financial incentives had on your installation of the [equipment type].

[Interviewer: Address inconsistencies with previous responses as they arise.]

OLD1. 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 .....[4
[Don't know] 97
[Refused].....98

Timing

DAT1. I'd like to know about the effect, if any, that Focus on Energy incentives and other assistance had on your decision to install [TYPE OF PROJECT] when you did.

Without Focus on Energy incentives and assistance, would you say that it was "*very* likely," "*somewhat* likely," "*not* very likely," or "very unlikely" that you would have installed [TYPE OF PROJECT] when you did?

Very likely.....1
Somewhat likely 2
Not very likely.....3
Or very unlikely 4
[Don't know] 97
[Refused].....98

DAT1_O. Why do you say that? _____

DAT1a. Without Focus incentives and other Focus assistance, how different would the timing have been? Would you say you would have installed [TYPE OF PROJECT] at the same time, earlier, later, or never?

About the same	[SKIP TO DAT3]	1
Earlier	[SKIP TO DAT3]	2
Later		3
Or never	[SKIP TO DAT3]	4
[Don't know]	[SKIP TO DAT3]	97
[Refused]	[SKIP TO DAT3]	98

DAT1b. Approximately how many months later? [TRY TO GET A NUMBER]

[RECORD NUMBER OF MONTHS]	_____
[Don't know]	97
[Refused]	98

DAT1b_O. What other factors, if any, affected your decision to install the [project type] when you did?

_____

Size

Finally, I'd like to know about the effect, if any, that Focus on Energy incentives and other assistance had on the capacity of the renewable energy system you installed.

DAT3. Without Focus services or incentives, how different would the size of the [TYPE OF PROJECT] have been? Would you have installed a [Project type] of the same size, smaller, or larger? [READ LIST]

Same size	[SKIP TO DAT4]	1
Smaller		2
Larger	[SKIP TO DAT4]	3
[Don't know]	[SKIP TO DAT4]	97
[Refused]	[SKIP TO DAT4]	98

DAT3_O. Why do you say that?_____

DAT3a. Focus financial incentives or assistance, approximately what size system (in kW, or btu/h or whatever units the system is measured in.) would you have installed?

[_____kW]

[_____therms]

DAT 3a. [**To be filled out by interviewer**: calculate percent difference from installed project and complete percent response where result is: Difference = Intended capacity in kW/installed capacity in kW]

[INTERVIEWER RECORD PERCENTAGE]..... _____

[Don't know] 97

[Refused].....98

DAT4. Could you please summarize how your [SYSTEM TYPE] would have been different without assistance and/or advice from Focus on Energy? (probe on timing and capacity)

[Don't know] 97

[Refused].....98

.DAT5. [**To be filled out by interviewer:** Vendor surveys are required if the respondent indicates that the program did not have an effect on decision to install, timing, or size AND the respondent indicates that the vendor had substantial influence.

Is a vendor survey required?]

[Yes].....97

[No] 98

F Overall Satisfaction

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. 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

F2a. What type of system are you considering?

Photovoltaic 1
Solar DHW 2
Wind 3
Biomass 4
Biogas 5
Other [please specify_____] 6
[Don't Know] 97
[Refused] 98

F3. 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

F4. Why do you say that? [OPEN END] record verbatim.

F5. Do you have any additional comments about these projects or the Focus on Energy program that they should take into account in the future? [record]

E Engineering Questions

These are questions specific to the technology and site developed by the reviewing engineer. These questions are developed to collect any additional information needed to verify generation/savings calculation. For PV, wind and biogas they also include questions to obtain the inverter or meter readings.

If Non-residential Skip to X1

G Demographics –for Residential Participants 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. What type of residence is the [project type] installed on 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

G2. 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

G3. (IF G1 = 3 or 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 =3 or 4 and G2 = 1) 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 unit /house? Your best estimate is fine.

[RECORD # SQ FT] ..... _____
[Don't know] 97
[Refused].....98

G9. What was your total household income in 2007, before taxes? Was it ... [READ OPTIONS]

Less than $35,000 1
$35,000 to less than 50,000 2
$50,000 to less than 75,000 3
$75,000 to less than 100,000 4
$100,000 to less than 150,000 5
$150,000 to less than 200,000 6
or more than $200,000 7
[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 Non-residential 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 ..... 1 Skip to X4
Multiple buildings 2
School ..... 3 Skip to X4
Hotel or motel ..... 4 Skip to X4
Other (describe) ..... Skip to X4
_____ ..... 96 Skip to X4
[Don't know/not sure] ..... 97 Skip to X4
[Refused] ..... 98 Skip to X4

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.

E Engineering Questions

PV Systems ONLY

I am going to discuss some technical information about the system in order to confirm our information regarding your system. If you have the original site survey or design study for your system as installed, that might help you to answer these questions.

[If they do not have this information handy, attempt the questions anyway, and ask them to give their best estimate. If they don't know or refuse to answer a confirmation question, assume that our information is correct, but mark "'97" or "98" in parentheses].

E1 – Are your panels facing [DEGREES from NORTH]?

YES..... [SKIP TO E2]….1
NO 2
[DON'T KNOW] ..... [SKIP TO E2]…97
[REFUSED] ..... [SKIP TO E2]…98
E1a. [ENTER CORRECT DEGREES FROM NORTH] _____

E2 - Are your solar panels on an automatic tracking system?

YES.....1
NO .....[SKIP TO E5]……2
[DON'T KNOW].....97
[REFUSED].....98

E3 – Is your tracking system SINGLE axis?

YES.....[SKIP TO E5]….1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E4 – [ONLY IF E3 = 2] Are both axes working on your tracking system?

YES.....[SKIP TO E11]…1
NO .....[SKIP TO E11]…2
[DON'T KNOW].....97
[REFUSED].....98

E5 – Your tilt angle was [ANGLE] when it was installed, correct? [SKIP TO E11 AFTER RECORDING ANGLE IF SYSTEM IS SINLGE AXIS TRACKING]

YES ..... [SKIP TO E6]…1

NO 2

[DON'T KNOW] ..... [SKIP TO E6] 97

[REFUSED] ..... [SKIP TO E6] 98

E5a. [ENTER CORRECT DEGREES FROM NORTH] _____

E6 –Is your tilt angle CONSTANT?

YES.....[SKIP TO E9]….1

NO 2

[DON'T KNOW].....97

[REFUSED].....98

E7 –Have you seasonally adjusted the tilt of your panels?

YES.....1

NO .....[SKIP TO E9]…..2

[DON'T KNOW].....97

[REFUSED].....98

E8 –At what times since installation have you adjusted the panels, and to what angles? [They may adjust 4 times a year i.e. late spring to 28 deg, late summer to 43 deg, late fall to 58 deg and late winter to 43 deg].

[record answer in the following format: month:angle, ex: 05:28]

1st angle change _____

2nd angle change _____

3rd angle change _____

4th angle change _____

E9 –At install your system experienced no shading. Is this correct?

YES.....[SKIP TO E10]…1

NO 2

[DON'T KNOW].....[SKIP TO E10]…97

[REFUSED].....[SKIP TO E10]…98

E9a. [RECORD CORRECT % SHADING] _____

E10 - Has shading increased (tree growth) or decreased (tree trimming) since the design study?

INCREASED 1
DECREASED 2
NO CHANGE ..... [SKIP TO E12]…3
[DON'T KNOW] 97
[REFUSED] 98

E11 - What percentage has shading increased/decreased? [USE BRACKETING AND RECORD DECREASED SHADING AS **NEGATIVE** PERCENTAGES, ex: -25%]

% SHADING CHANGE: _____
[DON'T KNOW]……97
[REFUSED]……98

E12 – During winter, how long, on average, does snow cover the panels after a snow fall? [USE BRACKETING; if customer can't answer this, ask how many total days snow covered the panels last winter, and record verbatim in data entry box]

less than 1 day 1
1-2 days 2
3-4 days 3
5-7 days 4
more than one week 5
[DON'T KNOW] 97
[REFUSED] 98

E13 – Have you added to the system since it was first installed? (ex: equipment changes such as panels or an inverter?)

YES 1
NO ..... [SKIP TO E15] 2
[DON'T KNOW] 97
[REFUSED] 98

E14 – What have you added?

_____

E15 – We have already established that your PV system was installed on [DATE]. Did your system begin producing electricity on the same date it was installed?

YES.....[SKIP TO E16]…1
NO 2
[DON'T KNOW].....[SKIP TO E16] 97
[REFUSED].....[SKIP TO E16] 98
E15a [RECORD PRODUCTION DATE] _____

E16 - Has there been any major down-time in the system since installation?

YES.....1
NO .....[SKIP TO E18]…2
[DON'T KNOW].....97
[REFUSED].....98

E17 – When, and for how long [record as month:days (i.e. 03:7)]? _____

E18 – Is your system on the grid?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E19 – Does the system use batteries? [NOTE THAT ALL OFF-GRID SYSTEMS IN THIS STUDY USE BATTERIES ACCORDING TO OUR RECORDS]

YES.....1
NO .....[SKIP TO E23]…2
[DON'T KNOW].....97
[REFUSED].....98

E20 – Do you use the batteries for emergency back-up?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E21 – How much energy do the batteries store, and what is the voltage?

[RECORD AMP-HOURS AND VOLTAGE] _____
[DON'T KNOW] 97
[REFUSED] 98

E22 – Do you run [some/all] of your appliances on DC power?

YES, ALL 1
YES, SOME 2
NO 3
[DON'T KNOW] 97
[REFUSED] 98

E23 – How is your PV system metered? [READ CHOICES, CIRCLE ALL THAT APPLY]

READ-OUT DISPLAY ON INVERTER 1
SEPARATE UTILITY METER FOR PV ELECTRICITY 2
OTHER (describe)
_____
..... 96
[DON'T KNOW] 97
[REFUSED] 98

E24 – Please tell me the total kWh production of the system since inception. [THIS IS THE MOST IMPORTANT QUESTION IN SURVEY. IF RESPONDENT CANNOT ANSWER TOTAL kWh SINCE INCEPTION, ASK FOR CURRENT READ-OUT AND DATE OF RESET. NOTE THAT SOME UTILITY METERS ARE ONE-WAY AND OTHERS TWO-WAY. *BE SURE THEY ARE GIVING kWh PRODUCTION, NOT CONSUMPTION OF GRID POWER!]*

kWh _____
RESET DATE _____
[DON'T KNOW] 97
[REFUSED 98

E25 – Would it be okay if our Engineer called you with other questions regarding your system?

YES 1
NO 2
[DON'T KNOW] 97
[REFUSED] 98

Wind Systems ONLY

I am going to discuss some technical information about the system in order to confirm our information regarding your system. If you have the original site survey or design study for your system as installed, that might help you to answer these questions.

[If they do not have this information handy, attempt the questions anyway, and ask them to give their best estimate].

E26 - Are you on the grid?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E27– Does the system use batteries?

YES.....1
NO .....[SKIP TO E29]…2
[DON'T KNOW].....97
[REFUSED].....98

E28 – How much energy do the batteries store, and what is the voltage?

[RECORD AMP-HOURS] _____
[RECORD VOLTAGE]_____
[DON'T KNOW].....97
[REFUSED].....98

E29 – Was your turbine new or used when you purchased it?

NEW.....[SKIP TO E32]...1
USED.....2
[DON'T KNOW].....97
[REFUSED].....98

E30 - How long was your turbine used before you bought it? _____

[DON'T KNOW].....97
[REFUSED].....98

E31 - Was your turbine reconditioned before it was installed?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E32a – How tall is your turbine? [include units]

RECORD CORRECT HEIGHT: _____]
[Don't Know].....96
[Refused].....97

E32b. What is your rotor diameter? [include units and ask for diameter, not blade length]

[ROTOR DIAMETER:_____]
[Don't Know].....96
[Refused].....97

E32c. What is the maximum capacity of your turbine?

[kWh: _____]
[Don't Know].....96
[Refused].....97

E33 - Has there been any major down-time in the system since installation, other than times when the wind wasn't blowing strong enough to generate power?

YES.....1
NO .....[SKIP TO E41]…2
[DON'T KNOW].....97
[REFUSED].....98

E33a – When, and for how long [(record as month:days (i.e. 03:7)]?

_____

E34 – We have already established that the turbine was installed on [DATE]. Did the turbine begin producing power on the date it was installed?

YES.....[SKIP TO E35]…1
NO 2
[DON'T KNOW].....[SKIP TO E35]..97
[REFUSED].....[SKIP TO E35]..98

E34a. [RECORD PRODUCTION DATE] _____

E35 – Are you metering the energy you produce?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E36 – How is your energy metered? [ACCEPT MULTIPLES]

SEPARATE UTILITY METER FOR WIND ELECTRICITY.....1
OTHER (describe)
_____.....96
[DON'T KNOW].....97
[REFUSED].....98

E37 – Please give me the total kWh produced to date. [THIS IS THE MOST IMPORTANT QUESTION ON THE SURVEY. IF THIS IS NOT WHAT THE METER IS READING, ASK THEM TO GIVE THE CURRENT READING AND DATE THAT THE METER WAS RESET]

kWh_____ Date_____

E38 – Is it okay if our engineer contacts you with further questions about your system?

YES.....1
NO 2

Solar Hot Water Questions

E39 – Is the date of beginning operation the same as the date of installation?

YES.....[SKIP TO E40]...1
NO 2
[DON'T KNOW].....[SKIP TO E40]…97
[REFUSED].....[SKIP TO E40]…98
E39a. DATE OF BEGINNING OPERATION_____

E40 – Our records indicate that you have [NUMBER] panels on the roof. Is this correct?

YES.....[SKIP TO E41]..1
NO 2
[DON'T KNOW].....[SKIP TO E41]..97
[REFUSED].....[SKIP TO E41]..98
E40a.[ENTER Number of panels] _____

E41 – Our records indicate that your panels are facing [DEGREES from NORTH], correct?

YES.....[SKIP TO E42]..1
NO 2
[DON'T KNOW].....[SKIP TO E42] 97
[REFUSED].....[SKIP TO E42] 98
E40a.[ENTER DEGREES FROM NORTH]_____

E42 - Are your solar panels on an automatic tracking system?

YES.....1
NO .....[SKIP TO E45]..2
[DON'T KNOW].....97
[REFUSED].....98

E43 – Is your tracking system SINGLE axis?

YES.....[SKIP TO E45]..1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E44 –Are both axes working on your tracking system?

YES.....1
NO 2
[DON'T KNOW].....97
[REFUSED].....98

E45 – Your tilt angle was [ANGLE] when it was installed, correct? [SKIP TO E56 AFTER RECORDING ANGLE IF SINGLE AXIS TRACKING SYSTEM]

YES.....[SKIP TO E46]..1
NO 2
[DON'T KNOW].....[SKIP TO E46] 97
[REFUSED].....[SKIP TO E46] 98
E45a. [RECORD INSTALLATION ANGLE] _____

E46 – Is your tilt angle is adjustable?

YES.....1
NO .....[SKIP TO E49]..2
[DON'T KNOW].....97
[REFUSED].....98

E47 –Have you seasonally adjusted the tilt of your panels?

YES.....1
NO .....[SKIP TO E49]..2
[DON'T KNOW].....97
[REFUSED].....98

E48 - At what times since installation have you adjusted the panels, and to what angles? [They may adjust 4 times a year i.e. late spring to 28 deg, late summer to 43 deg, late fall to 58 deg and late winter to 43 deg].

[record answer in the following format: month:angle, ex: 05:28]

1st angle change _____
2nd angle change _____
3rd angle change _____
4th angle change _____

E49 – At install your system experienced no shading, is this correct?

YES.....[SKIP TO E50]..1

NO 2

[DON'T KNOW].....[SKIP TO E50]..97

[REFUSED].....[SKIP TO E50]..98

E49a. [RECORD CORRECT PERCENTAGE].....

E50 - Has shading increased (tree growth) or decreased (tree trimming) since the site assessment?

INCREASED 1

DECREASED.....2

NO CHANGE .....[SKIP TO E52]..3

[DON'T KNOW].....97

[REFUSED].....98

E51 - What percentage has shading increased/decreased? [USE BRACKETING AND RECORD DECREASED SHADING AS **NEGATIVE** PERCENTAGES, ex: -25%]

% SHADING CHANGE: .....

[DON'T KNOW].....97

[REFUSED].....98

E52 – During winter, how long, on average, does snow cover the panels after a snow fall? [USE BRACKETING; if customer can't answer this, ask how many total days snow covered the panels last winter, and record verbatim in data entry box]

less than 1 day.....1

1-2 days 2

3-4 days 3

5-7 days 4

more than one week.....5

[DON'T KNOW].....97

[REFUSED].....98

E53 – Our records indicate that [NUMBER] storage tanks were installed, with a capacity of [gallons]. Is this correct?

YES.....[SKIP TO E54] 1
NO 2
[DON'T KNOW].....[SKIP TO E54]..97
[REFUSED].....[SKIP TO E54]..98
E53a. [Number of Tanks]_____.
E53b. [Capacity#1].....
E53c. [Capacity #2].....
E53d. [Capacity#3].....

E54 - What temperature does cold water enter the system from the main?

Temperature (Degrees F) _____

E55 - What temperature is your hot water tank set at?

Temperature (Degrees F) _____

E56 – Have you added to the system since it was first installed?

YES.....1
NO .....[SKIP TO E58]..2
[DON'T KNOW].....97
[REFUSED].....98

E57 – What have you added?

_____

E58- Is this system installed in a year-round home/business or a seasonal home/business?

YEAR-ROUND.....[SKIP TO E60]...1
SEASONAL.....2
SEASON DESCRIPTION: _____

E59 - How many days per year do you use the energy [USE BRACKETING]?

NUMBER OF DAYS:_____

E60 - Has there been any major down-time in the system since installation?

YES.....1
NO .....[SKIP TO E62]…2
[DON'T KNOW].....97
[REFUSED].....98

E61 – When, and for how long? _____

[DON'T KNOW].....97
[REFUSED].....98

E62 - [Firehouse only] - How many people stay overnight at the firehouse at any one time, and how many people use the building in the daytime?

Number of overnight workers_____

Number of daytime workers_____

E63 - What activities do you use hot water for as supplied by your SHW (showering, dishwasher, clothes washer, space heating, etc)?

_____

E64 - About how much hot water do you use per month (potable/non potable?). (If they don't know that ask how much water they use per month).

Hot water use per month _____

E65 – Does the solar hot water supply your full needs?

YES .....[SKIP TO E66]…1
NO 2
[Don't know] 97
[Refused].....98

E65a - What percentage of your hot water needs are supplied through your solar hot water system?

PERCENTAGE: _____
[Don't know] 97
[Refused].....98

E65b - What is your supplemental source for hot water heating?

GAS 1
OIL 2
ELECTRIC 3
OTHER (describe).....96

_____

[Don't know] 97
[Refused].....98

E66 - Do you know how much you have saved on your fossil fuel bill since installation of the SHW system? (if they give a $ amount, also get $/therm, ft3 or kWh for the energy).

SAVINGS _____
TIME PERIOD _____
[Don't know] 97
[Refused].....98

E67 – Is it okay if our engineer contacts you with further questions?

YES.....1
NO 2
[Don't know] 97
[Refused].....98

Biomass Questions

E68 - Our records show that you use [FUEL] for your [furnace/boiler]. Is this correct?

YES.....[SKIP TO E69]..1
NO 2
[DON'T KNOW].....[SKIP TO E69]..97
[REFUSED].....[SKIP TO E69]..98

E68a.Fuel Type _____

E68b. Who is the [supplier/manufacturer] of the fuel? _____

E68c - Do you know the heating efficiency of the fuel?

YES.....1
NO .....[SKIP TO E69]..2
[DON'T KNOW].....[SKIP TO E69]..97
[REFUSED].....[SKIP TO E69]..98

E68d.HEATING EFFICIENCY_____

E69 - What is the moisture content of the fuel?

Moisture content_____
[Don't know]…….....97
[Refused]…….....98

E70 - Do you dry the [fuel] at all before using it?

YES.....1
NO[SKIP TO E83] 2
[Don't know] .....[SKIP TO E83]..97
[Refused].....[SKIP TO E83]..98

E71 - How much energy does it take to dry the [fuel]? _____

Don't know 97
Refused.....98

E72 – Our records indicate that your system is used for [HEAT/PROCESS]. Is this still correct? [This question is especially important for Muscoda Protean Products, since they applied for a system that would be processing whey]

YES .....[SKIP TO E73]..1
NO 2
[DON'T KNOW].....[SKIP TO E73]..97
[REFUSED].....[SKIP TO E73]..98

E72a.USE_____

E73 –What space(s) are you heating with the biomass boiler/furnace?

_____

[Don't Know] 97
[Refused] 98

E74 – Since installing the [boiler/furnace], has your heating behavior changed?

YES.....1
NO .....[SKIP TO E76]..2
[Don't Know].....97
[Refused].....98

E74a. How (probe, warmer, more heated space, longer hours)?

_____

E74b. Was this part of the orig. plan, or did it occur after the installation of the biomass system?

Part of Org. Plan 1
Occurred post install.....[SKIP TO E76]..2
[Don't Know].....97
[Refused].....98

E76 - What duration did you use the heating unit last heating season?

Whole heating season.....1
Partial season 2
[Don't Know].....97
[Refused].....98

E76a - Describe the season_____

E77- Did you supplement your heating/ process with other energy sources?

YES……1
NO……[SKIP TO E79]...2
[Don't Know]……97
[Refused]……98

E78 - What other energy source did you use [propane, electric, etc.] , and how much did you use [kWh, therms, ft3 per heating season]

Energy Source#1 (fuel type):_____
Energy used(quantity):_____
Period of time:_____

Energy Source#2:_____
Energy used:_____
Period of time:_____

E79 – Has there been any down time in the unit?

YES……1
NO……[SKIP TO E81]..2
[Don't Know]……97
[Refused]……98

E79a – When and for how long was the system down? _____

E80 - How did you heat during that time?

Propane……1
Natural Gas……..2
Other (describe)._____

_____96
[Don't Know]……..97
[Refused]...……....98

[Answer may be in therms or ft3 for gas/propane, or kWh for electric. If they are very knowledgeable, may be able to give you BTU]

E81 - How much fuel did you use last heating season or partial season? [If they give a volumetric unit such as ft3, cord of wood, bushel of corncob try to get a weight or the fuel's density?]

FUEL USED (units)_____
TIME PERIOD_____
[Don't Know]……..97
[Refused]...……98

E82 – Is it okay if our engineer contacts you with follow-up questions?

YES……..1
NO……...2
[Don't Know]……..…….97
[Refused]...……98

BIOGAS QUESTIONS:

E83 – Did your generator begin working on the same date it was installed?

YES.....[SKIP TO E84]..1
NO 2
[DON'T KNOW].....[SKIP TO E84]..97
[REFUSED].....[SKIP TO E84]..98

E84a.[BEGINNING GENERATION DATE]_____

E84 - Have you made any changes to the system since installation?

YES.....1
NO .....[SKIP TO E86]..2
[Don't know] .....[SKIP TO E86]..97
[Refused].....[SKIP TO E86]..98

E85 - What changes have you made?

_____

E86 - Our records indicate that you have [number] cows providing waste for the system. Is this correct?

YES.....[SKIP TO E86]..1
NO 2
[DON'T KNOW] .....[SKIP TO E86] 97
[REFUSED] .....[SKIP TO E86] 98

E86a. [NUMBER OF COWS] _____

E86b. Has your herd changed since the system was installed?

YES.....1
NO .....[SKIP TO E87]..2
[DON'T KNOW] .....[SKIP TO E87]..97
[REFUSED] .....[SKIP TO E87]..98

E86a. [NUMBER OF COWS (if reduction make value negative)] _____

E87 - Has there been any unscheduled downtime in the system?

YES.....1
NO ..... [SKIP TO E88]…2
[Don't know] .....[SKIP TO E88]..97
[Refused].....[SKIP TO E88]..98

E87a How long was the system down unexpectedly? _____(days/months)

E89 - Do you produce energy steadily over the course of a year, or are there seasonal effects on energy production?

YEAR-ROUND .....[SKIP TO E90]..1
SEASONAL.....2
Other (describe) 96

_____

[Don't know] 97
[Refused].....98

E89a – Describe the seasonal use of the system (possible reasons: seasonal effects of the herd, weather, regular maintenance).

_____

E90 - How much will the digester/generator be "down" for maintenance on an annual basis?

NUMBER OF DAYS_____

E91 - Have you been monitoring your electricity production since the generator came online?

YES.....1
NO 2
[Don't know] 97
[Refused].....98

E92 - How much electricity have you produced? What period of time does that cover?

ELECTRICITY PRODUCED _____
PERIOD OF TIME _____

E93 - What is the maximum and average kW you have generated?

MAXIMUM kW _____
AVERAGE kW _____

E94 - Are you using some/all of the gas produced by the digester system on site, or are you selling it off site?

ONSITE.....1
SELL TO GRID .....[SKIP TO E96] 2
[Don't know] 97
[Refused].....98

E95 - What are you using it for on site?

_____
[Don't know] 97
[Refused].....98

E95a - Do you have a record of how much you use on site (percentage or volumetric)?

ENERGY USED ONSITE _____
[Don't know] 97
[Refused].....98

E95b – What do you use for heat to keep the digester at an appropriate operating temperature)?

Source of heat:
Electricity _____ 1
Gas heat _____ 2
Waste Heat from generator (if there is a generator on site)_____ 3
No digester heating system _____ 4
[Don't know] 97
[Refused].....98

E96 – Would it be okay if our Engineer called you with other questions regarding your system?

YES.....1
NO 2
[Don't know] 97
[Refused].....98

Geothermal Systems

E97 – Our records indicate that you use your system for both heating and cooling. Is that correct?

YES.....[SKIP TO E98]…1
NO 2
HEATING ONLY 3
COOLING ONLY.....4
[Don't know] 97
[Refused].....98

E98 – What is the manufacturer and model number of your heat pumps?

MANUFACTURER_____
MODEL # _____

E99 – Our records indicate that your heating system has [x] units with a [y] ton capacity, and your cooling system has [a] units with a [b] ton capacity, is that correct?

YES.....[SKIP TO E100]..1
NO 2
[DON'T KNOW].....[SKIP TO E100] 97
[REFUSED].....[SKIP TO E100] 98

E99a.[HEATING SYSTEM #UNITS]_____

E99b. [HEATING SYSTEM CAPACITY] _____

E99c. [COOLING SYSTEM # UNITS]_____

E99d. [COOLING SYSTEM CAPACITY]_____

E100 – Have you modified the system at all since it was installed?

YES.....1
NO .....[SKIP TO E102]….2
[Don't know] .....[SKIP TO E102]….97
[Refused].....[SKIP TO E102]….98

E101 – What modifications have you made?

_____

E102 - The original design indicated that the hydronic (forced hot water) radiant heating would be supplemented by a masonry stove. How is the radiant heating supplemented by the stove:

Not at all (0%) 1

Only when the geothermal system is not working (1-25%) 2

Only when demand exceeds geothermal system capacity (25-75%) 3

Almost always (75-95%) 4

The masonry stove does most of the heating (100%) 5

[Don't know] 97

[Refused] 98

E103 - Do you supplement heating or cooling with a conventional electric or fossil fuel source?

YES 1

NO ..... [SKIP TO E119]… 2

[Don't know] ..... [SKIP TO E119]… 97

[Refused] ..... [SKIP TO E119]… 98

E104 – What sources?

Source _____

Energy used _____

Time period _____

E105 - Under what circumstances does that occur?

_____

E106 - What is the square footage the area of your building that you heat and cool with the geothermal system?

Square footage _____

E107 - Do you happen to know [their architect or builder may have told them] what the average R-value or U-value is for your building? [Record value as wall:ceiling, e.g. 19:30]

Wall: Ceiling Value _____: _____

[Don't know] 97

[Refused] 98

E108 – Which months do you use the system for heating and cooling, and how many days do you use the system for each?

Heating months (number of days) _____

Cooling months (number of days) _____

E109 - Do you know how much electricity/year or gal/ft3 it takes to operate the geothermal system (including heatpumps, airhandlers, and ventilation)?

Energy to operate _____

Time period _____

[Don't know] 97

[Refused].....98

E110 – Is it okay if our engineer contacts you with additional questions?

YES.....1

NO 2

[Don't know] 97

[Refused].....98

APPENDIX F: EVALUATION REPORTS AND OTHER DELIVERABLES

Table F-1. Evaluation Reports and Other Deliverables
The First Half of 2009 (January 1, 2009–June 30, 2009)

Program Area	Program	Document Title	Draft Report Date	Final Report Date
Administration	Administration	Focus Schedule of Research Activities, February 2009	12-Jan-09	17-Jan-09
Administration	Administration	Focus Schedule of Research Activities, March 2009	16-Feb-09	22-Feb-09
Administration	Administration	Focus Schedule of Research Activities, April 2009	13-Mar-09	22-Mar-09
Administration	Administration	Focus Schedule of Research Activities, May 2009	13-Apr-09	22-Apr-09
Administration	Administration	Focus Schedule of Research Activities, June 2009	08-May-09	15-May-09
Administration	Administration	Focus Schedule of Research Activities, July 2009	16-Jun-09	20-Jun-09
Administration	Administration	Evaluation Monthly Progress Report December 2008	19-Jan-09	19-Jan-09
Administration	Administration	Evaluation Monthly Progress Report January 2009	16-Feb-09	16-Feb-09
Administration	Administration	Evaluation Monthly Progress Report February 2009	16-Mar-09	16-Mar-09
Administration	Administration	Evaluation Monthly Progress Report March 2009	20-Apr-04	20-Apr-04
Administration	Administration	Evaluation Monthly Progress Report April 2009	18-May-09	18-May-09
Administration	Administration	Evaluation Monthly Progress Report May 2009	15-Jun-09	15-Jun-09
Business Programs	Business Program - General	Business Programs: Channel Studies—Fiscal Year 2008	30-Aug-08	17-Jan-09
Business Programs	Business Program - General	Business Programs Impact Evaluation Report: First Three Quarters of the 18-Month Contract Period	24-Oct-08	17-Jan-09
Business Programs	Business Program - General	Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period	05-Mar-09	02-Apr-09
Business Programs	Business Programs	Research Plan for Supply-side Research - Draft	26-Jun-09	N/A
Business Programs	Business Programs - E&T	Reconciling Trainee Counts for the 2008 E & T Evaluation	19-Jun-09	19-Jun-09
Business Programs	Scopes of Work	Focus on Energy Evaluation, Calendar Year 2009 Detailed Evaluation Plan: Business Programs	02-Jan-09	21-Apr-09
Crosscutting	Crosscutting - General	Balance of FY08 Budget and Associated Work Scope Tasks	14-Jan-09	N/A
Crosscutting	Crosscutting - General	Semiannual Report (18-month Contract Period)	25-Feb-09	14-Aug-09
Crosscutting	Crosscutting - General	Responses to Review Comments 18MCP	08-Apr-09	08-Apr-09

Program Area	Program	Document Title	Draft Report Date	Final Report Date
Crosscutting	Scopes of Work	Focus on Energy Evaluation, Calendar Year 2009 Detailed Evaluation Plan: Crosscutting Evaluation Issues	07-Jan-09	21-Apr-09
Renewables	Scopes of Work	Focus on Energy Evaluation, Calendar Year 2009 Detailed Evaluation Plan: Renewable Energy Program	07-Jan-09	21-Apr-09
Renewables	Renewables	Renewables: Impact Evaluation Report for the 18-month Contract Period	09-Mar-09	26-Apr-09
Residential	ACES	ACES RHEEP Pilot Results	31-Mar-09	28-Apr-09
Residential	ACES	ACES On-site Verification Inspections: Observations Summary - Draft	31-Mar-09	N/A[33]
Residential	ACES	ACES Direct Install and Whole Building Participant Survey - Draft	08-Jun-09	N/A[33]
Residential	ACES	Proposed Sample Plan for CY09 ACES Survey - Draft	08-Jun-09	N/A[33]
Residential	ACES	ACES New Construction Participant IDI Protocol - Draft	08-Jun-09	N/A[33]
Residential	Administration	Current Research Efforts-July 2009	16-Jun-09	20-Jun-09
Residential	Apartment and Condo Efficiency Services	ACES Impact Attribution	19-Jan-09	20-Feb-09
Residential	Efficient Heating and Cooling Initiative	FY08 Net-to-Gross Adjustments for ECM Furnaces	30-Sep-08	19-Jan-09
Residential	Efficient Heating and Cooling Initiative	ECM Furnace Impact Assessment Report	15-Oct-08	12-Jan-09
Residential	ENERGY STAR Lighting	Wisconsin ENERGY STAR Lighting Program On-Site Data Collection Form	13-May-09	N/A[33]
Residential	ENERGY STAR Lighting	Wisconsin ENERGY STAR Lighting - Consumer Survey	13-May-09	N/A[33]
Residential	Residential - General	FY08 Metrics Performance—Residential Programs	26-Aug-08	22-Feb-09
Residential	Residential - General	Residential Deemed Savings Review - Final - 2 Feb 09	24-Dec-08	02-Feb-09
Residential	Residential Lighting	CFL Database Analysis Report	13-Oct-08	20-Jan-09
Residential	Scopes of Work	Focus on Energy Evaluation, Calendar Year 2009 Detailed Evaluation Plan: Residential Programs	15-Jan-09	21-Apr-09
Residential	Targeted Home Performance with ENERGY STAR	Targeted Home Performance with ENERGY STAR Service Provider Interview Results	19-Jul-08	16-Feb-09
Residential	Targeted Home Performance with ENERGY STAR	Dehumidifiers Deemed Savings Review for Targeted Home Performance with ENERGY STAR	18-Feb-09	19-Mar-09
Residential	Targeted Home Performance with ENERGY STAR	Recommendations for Targeted Home Performance with ENERGY STAR Energy Impacts	18-Feb-09	31-Mar-09

[33] This will be included as an appendix in the report on these findings.

APPENDIX G: 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.