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State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Annual Report (2010)

April 11, 2011
Revised: June 17, 2011

Evaluation Contractor: Tetra Tech

Prepared by the Focus evaluation team

focus on energy℠
Partnering with Wisconsin utilities

State of Wisconsin Public Service Commission of Wisconsin

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* At the request of the PSCW, we have reprocessed the energy impact map data to more fully allocate energy savings across legislative and senate districts, reducing the savings represented in the “not mapped” category.

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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 Contract Year 2010 (CY10) and the program to date. Focus 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:

- Environmental benefits (with emphasis on quantification of displaced generation emissions)
- Other non-energy benefits following from increased health, safety, and comfort
- The market potential of a given program's measures in order to assist in the identification of measure categories where the potential for additional energy savings is strong
- The economic benefits realized because of savings on energy bills, stimulation of economic development, and the creation of jobs.

Another significant benefit provided by Focus, 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. As such, this report also features findings regarding market effects and analysis of untracked attributable savings.

1.1 REPORTING TRACKED ENERGY IMPACTS

Focus includes many long-term initiatives that promote lasting changes in the state's energy efficiency markets. As a result, any meaningful assessment of the Focus program's costs and benefits must consider a multi-year timeframe. Thus, the energy savings must be assessed based on the documented impacts occurring over the lifetime of the measures installed by the program.[1] This report presents energy savings that are counted as benefits over a given measure's lifetime, or the 25-year horizon of the benefit-cost analysis, whichever is shorter. This ensures that the most accurate representation of the program's accomplishments are presented.

Table 1-1 below provides definitions for each of the various tracked[2] savings impacts incorporated in the Focus impact evaluation system. In short, the energy impacts are

[1] 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 energy efficient measures include both direct effects (in-program) and projected market effects.

[2] The program administrators for Focus 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, although this report documents untracked savings as well.

expressed as gross and net annual first year savings, lifecycle savings, lifetime savings, and persistent savings. These energy impact perspectives are necessitated by the need to accurately report annual first year savings, reflect the impact of all program activities within the current year, and conform to the impacts as used in the benefit-cost analysis. Appendix D provides a complete listing of tables and figures in the report linked to the type of impacts reported.

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).
Lifetime savings	Energy savings, expressed as either verified gross or verified net, that are produced as a result of measures installed in the current contract year or in the previous contract year(s) provided the reporting period is within the measure's useful life.
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).

The energy efficiency measures installed typically last for a number of years and then cease operation. Their lifetime energy impacts are calculated by multiplying the annual energy savings by the number of years that the energy efficiency measure is expected to be in operation. Measure life, also referred to as effective useful life, is interpreted as the median number of years of expected operation.

While it is important to know the cumulative energy impacts from Focus, simply summing the savings is an oversimplification and can be misleading because some savings have reached the end of their effective lifetime. Summing annual impacts oversimplifies the estimation of cumulative energy savings, since some measures may no longer be installed or operating. Lifecycle savings provide cumulative impacts for all measures that have not reached the end of their effective lifetime. We use this savings approach to report summary program-to-date impacts.

This report also documents 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 2.6.).

Table 1-2 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, lifetime, 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	Lifetime	Persistent
Gross	Reported	Not reported	Not reported	Not reported
Verified gross	Reported	Reported	Reported	Not reported
Verified net	Reported	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)
- 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 these impacts were demonstrably 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*. It is important to note that these untracked attributable savings are different from participant spillover savings that we estimated in previous studies. When we estimate participant spillover effects, we are 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 must see 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 annual 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 E, which provides a list of CY10 evaluation reports and other deliverables that were submitted after the CY10 evaluation plans were finalized.

2. FOCUS IMPACTS

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

- Verified tracked energy impacts
- Market effects
- Economic impacts
- Environmental impacts
- Non-energy benefits
- Benefit-cost analysis
- Focus energy impacts and achievable potential.

Table 2-1 shows the time periods referred to in this report and their abbreviations. Please note that the renewable measure installations are not represented separately for CY10. Renewables applications are now tied to the Residential and Business sectors and are no longer a separate sector.

Table 2-1. 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 Jul 07–Dec 08	CY09 Jan–Dec 09	CY10 Jan–Dec 10	Program To Date

Prior to delving into the energy impacts, it is important to recognize that the Wisconsin Public Service Corporation (WPS) provided additional funds in CY10 through their Territory-wide program activities.[3] The goal of the territory-wide programs was to drive additional energy impacts within the WPS territory through new program approaches (e.g., increased incentives under specified program conditions, increased outreach and training to trade allies) rather than incorporating new technologies.

Per program design, a number of these programs directly piggy-backed on the existing Focus on Energy infrastructure and for the most part provided the benefits to customers that also received benefits through Focus on Energy. Given these WPS Territory-wide programs directly integrated with the existing Focus offerings (and did not provide incrementally higher energy savings through additional technologies), the savings reflected within the tracked energy impacts are inclusive of savings resulting from WPS Territory-wide Initiative programs. Based on evaluation research for the WPS Territory-wide Programs, there is not significant evidence that these savings should be excluded from the Focus umbrella and allocated to the WPS Territory-wide Initiatives only.

The table below provides a cross-reference of the WPS Territory-wide Programs and related Focus programs where savings from participants that participated in both programs are

[3] The territory-wide programs were developed as part of a rate case where WPS agreed to implement the Energy Efficiency Stipulation to the Public Service Commission's December 30, 2008, Final Decision (under conditions modified in the Commission's February 25, 2009, decision).

captured within the program data. Only the savings from the Residential Heating Equipment Bonus and Home Performance with ENERGY STAR Increased Incentives programs are interrelated and included within this report. In other words, households that received an incentive through Focus for measures through Home Performance with ENERGY STAR also received an additional incentive through the WPS program.

The table also provides a reference to two additional residential WPS Territory-wide programs that overlapped with Focus programs. Although the savings for these programs are not captured in the report, the information is provided given they were directly related with a Focus program.

Table 2-2. WPS Territory-wide and Related Focus on Energy Programs

WPS Territory-wide Program	Related Focus on Energy Program	WPS Territory-wide Offering to Focus Participants
Heating Equipment Bonus	Efficient Heating & Cooling (EHC) program	Provide an additional $250 bonus for an ECM furnace and $200 bonus for a modulating boiler
Home Performance with ENERGY STAR® Increased Incentives	Home Performance with ENERGY STAR®	Homeowners have the option of choosing either triple rewards or reduced interest-rate financing plus $250 in cash
Rental Housing Energy Evaluation Program (RHEEP)	Home Performance with ENERGY STAR, Apartment and Condo Efficiency Services (ACES)	Increased incentives if a complete assessment is completed within six months.
Bundled Measures for Existing Multi-family Buildings *(cancelled)*	Apartment and Condominium Efficiency Services (ACES) program	Owners receive increased incentives for installing a series of measures (instead of individual measure incentives).

2.1 VERIFIED TRACKED ENERGY IMPACTS

This section summarizes the energy impacts resulting from Focus initiatives using three metrics: annual first year savings, lifetime energy savings, and lifecycle energy savings. Each perspective is defined below. The reader is referred to Appendix G for further clarifications on the different means for reporting energy impacts.

Annual verified first year savings represents the annual kWh, kW, and therms savings associated with the specific measure(s) within the year installed.

Lifetime verified gross impacts are a sum of the savings that will be realized over the lifetime of the measures installed in CY10. These savings are reflective *only* of measures installed in CY10 and the stream of those measures' savings over the effective useful life of those measures.

Lifecycle verified gross impacts are the sum of savings of the installed measures that are still within their effective useful life within this contract period. In other words, the lifecycle verified gross impacts include savings for measures installed in previous contract years that have not passed their effective useful life as well as measures installed within this contract year.

The following subsections describe the data sources and treatment of the buy-down CFLs, followed by a detailed summary of the energy impacts by annual verified first year savings, lifetime verified gross impacts, and lifecycle verified gross impacts.

2.1.1 Data sources

In preparing this report, we reconcile program gross energy impacts reported in WECC's monthly performance reports with the summary of the detailed data downloaded from the tracking system(s). The Focus Business Program data is obtained through the Wisconsin Energy Efficiency and Renewables Tracking System (WISeerts). The Focus Residential Program data is obtained through a tracking data system maintained by WECC.

The energy impacts tables throughout this report derive from data exported from WECC's tracking database on February 22, 2010. Data were extracted for the dates of January 1, 2009, through December 31, 2010. Data for the period prior to January 1, 2009, is now considered static and is not updated.[4] The WISeerts database was downloaded on January 17, 2010.

In past years, there have been some minor differences in the gross Business Program numbers between WECC's monthly report and the gross impacts included in this report. In an effort to identify and minimize this type of discrepancy, we have worked with staff at WECC, the PSCW, and others on the evaluation team to ensure we are all using the same criteria for extracting and reporting on data from the various databases. For this report, discrepancies for any program larger than one percent of savings were investigated and reconciled.

2.1.2 Treatment of lighting buy-downs

Beginning with the 18-month contract period, participant counts include a large number of records representing upstream incentives for lighting products, or "buydowns." These records represent claims made by retailers for lighting products sold at a reduced price to consumers. Program administrators take steps to allocate these sales appropriately to business and residential programs; however, no record is made of the number of consumers tied to each retailer claim.

Because buydowns have become such a significant mechanism for promoting lighting products, we estimate the average number of lighting products purchased per customer using instant rebate records from each year. This analysis is completed at the sector level. We apply this average to the number of rebated lighting products to arrive at an estimate of the number of customers benefiting from these incentives.

Table 2-3 provides the estimated number of buydown participants and their related savings for the 18-month contract period, contract year 2009, and contract year 2010. The participation counts and savings documented within the following tables include these buydown participants.

[4] Minor discrepancies in distribution of measures among programs for 2008 were corrected, but the data was not refreshed from the tracking system.

Table 2-3. Estimated Number of Buydown Participants and Verified Savings by Program Area and Year

Program Area	Measure	Verified Gross kWh	Verified Gross kW	Buydown Quantity	Average Quantity per Instant Rebate	Estimated Participants
CY10 (January 1–December 31, 2010)						
Business	CFL	22,427,029	6,279	125,130	11.372[5]	11,004
Residential	CFL	65,073,289	6,081	1,289,607	4.068	317,020
Residential	LED Holiday Light	3,024,622	0	193,886	3.337	58,107
Residential	Lighting Fixture	878,904	34	8,451	1.277	6,618
CY09 (January 1–December 31, 2009)						
Business	CFL	20,889,101	5,851	117,915	11.372	10,369
Residential	CFL	58,457,403	6,287	1,337,698	3.525	379,452
Residential	LED Holiday Light	1,729,853	0	110,888	2.789	39,754
Residential	Lighting Fixture	5,883,384	226	56,571	1.384	40,876
The 18MCP (July 1, 2007–December 31, 2008)						
Business	CFL	10,864,730	3,134	65,334	11.012	5,933
Residential	CFL	49,981,287	2,870	1,011,079	4.202	240,590

2.1.3 Annual verified first year savings for CY10

Table 2-4 shows a summary by program area of the annual kWh, kW, and therm impacts including also the dollar value of energy saved and the number of participants. These are *first year* annual impacts for verified gross. This reflects energy efficiency measures implemented from July 1, 2001, through December 31, 2010, as documented in their respective tracking systems (Tracked Energy Impacts).

Note that the tables also document the number of unique participants that account for the savings. The participant counts are *inclusive* of the assumed number of buydown participants documented in the section above.

Additionally, a participant may be counted even if they did not achieve energy savings. For example, an audit only recipient for the Home Performance with ENERGY STAR program counts as a participant, although no energy savings result from that household's contact with the program. To account for this issue, the tables include two participant counts (1) number of participants with and without energy savings and (2) number of participants with energy savings. The latter classification only captures the unique participants that had measures installed through the program or where the program is claiming savings for that participant.

[5] There were no Instant Rebate records for Business Programs in CY10; we carried over the 2009 average as the best available estimate.

Table 2-4. All Programs: Tracked Energy Impacts—Annual First Year Verified Gross (July 1, 2001–December 31, 2010)

	Annual Verified kWh Saved	Annual Verified kW Saved	Annual Verified Therms Saved	Annual Dollar Value of Energy Saved	Unique Participants with and without Energy Savings	Unique Participants with Energy Savings
CY10 (January 1–December 31, 2010)						
Total Saved	**590,640,200**	**106,657**	**23,640,237**	**$75,411,087**		
Business	470,987,177	90,344	20,041,916	$56,396,192	30,866	17,672
Residential	119,653,022	16,312	3,598,320	$19,014,894	456,632	414,964
CY09 (January 1–December 31, 2009)						
Total Saved	**634,619,944**	**127,641**	**29,661,514**	**$83,273,247**		
Business	500,793,181	110,411	20,712,687	$58,696,839	34,464	20,517
Residential	116,893,752	14,506	3,591,004	$18,660,979	554,387	493,780
Renewables	16,933,010	2,722	5,357,821	$5,915,428	555	417
The 18MCP (July 1, 2007–December 31, 2008)						
Total Saved	**599,520,112**	**105,622**	**26,622,559**	**$79,598,765**		
Business	412,296,921	87,834	20,247,700	$49,925,700	43,293	27,658
Residential	180,235,041	16,597	4,145,352	$27,217,319	772,480	564,660
Renewables	6,988,148	1,190	2,229,505	$2,455,744	449	396
FY07 (July 1, 2006–June 30, 2007)						
Total Saved	**238,189,767**	**41,008**	**13,694,194**	**$34,543,656**		
Business	151,014,313	32,282	11,513,742	$21,622,081	20,655	12,808
Residential	78,656,906	6,855	1,506,976	$11,540,279	320,204	214,441
Renewables	8,518,546	1,870	673,474	$1,381,295	124	117
FY06 (July 1, 2005–June 30, 2006)						
Total Saved	**218,883,777**	**41,469**	**13,042,576**	**$32,867,831**		
Business	131,863,070	28,308	9,418,597	$18,921,224	20,576	12,999
Residential	73,961,454	11,286	1,573,063	$11,025,814	331,813	226,791
Renewables	13,059,251	1,874	2,050,914	$2,920,792	95	87
FY05 (July 1, 2004–June 30, 2005)						
Total Saved	**214,892,987**	**35,913**	**9,175,217**	**$29,318,945**		
Business	110,718,465	20,905	7,106,161	$14,624,710	18,201	13,255
Residential	82,266,120	11,745	1,725,612	$12,236,915	296,102	207,482
Renewables	21,908,400	3,262	343,443	$2,457,319	69	64
FY04 (July 1, 2003–June 30, 2004)						
Total Saved	**228,323,107**	**37,696**	**14,467,224**	**$34,090,730**		
Business	137,364,603	23,543	12,613,286	$20,703,942	2,854	1,557
Residential	90,474,549	13,931	1,640,104	$13,169,846	312,299	212,631
Renewables	483,953	220	213,833	$216,941	55	49
FY03 (July 1, 2002–June 30, 2003)						
Total Saved	**221,681,741**	**35,777**	**8,086,332**	**$28,941,610**		
Business	128,323,628	21,384	6,196,248	$15,225,871	2,544	1,505
Residential	89,638,259	13,787	1,890,083	$13,344,497	667,183	156,390
Renewables	3,719,852	604	0	$371,241	32	31
FY02 (July 1, 2001–June 30, 2002)						
Total Saved	**56,484,523**	**11,705**	**2,652,791**	**$8,118,182**		
Business	30,532,158	7,036	1,740,728	$3,846,805	1,651	1,157
Residential	25,952,364	4,668	912,062	$4,271,377	129,890	52,478

Table 2-5 presents first year summary values for gross, verified gross, and verified net energy impacts by year and by program area. These numbers do not include untracked attributable savings (UAS) that stem from activities related to education and training programs or supply-side impacts.

Table 2-5. All Programs: Tracked Energy Impacts—Annual First Year Gross, Verified Gross, and Net (July 1, 2001–December 31, 2010)

	Annual kWh Saved			kW Reduction			Annual Therms Saved		
	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net
CY10 (January 1–December 31, 2010)									
Total Saved	**599,327,206**	**590,640,200**	**355,418,737**	**107,657**	**106,657**	**63,089**	**25,959,170**	**23,640,237**	**11,638,677**
Business	482,676,963	470,987,177	278,499,604	93,839	90,345	53,039	22,454,056	20,041,917	9,262,874
Residential	116,650,243	119,653,022	76,919,133	13,818	16,312	10,050	3,505,114	3,598,320	2,375,803
CY09 (January 1–December 31, 2009)									
Total Saved	**643,498,487**	**634,619,944**	**407,383,803**	**120,950**	**127,641**	**71,124**	**28,558,163**	**29,661,514**	**15,367,576**
Business	493,620,294	500,793,181	325,557,509	106,325	110,412	61,761	20,106,995	20,712,687	11,462,832
Residential	129,867,702	116,893,752	74,641,871	11,925	14,506	8,088	3,527,667	3,591,005	2,507,533
Renewables	20,010,491	16,933,011	7,184,424	2,700	2,723	1,275	4,923,502	5,357,822	1,397,212
The 18MCP (July 1, 2007–December 31, 2008)									
Total Saved	**634,548,233**	**599,520,112**	**399,140,012**	**112,182**	**105,622**	**66,489**	**28,697,686**	**26,622,559**	**14,757,848**
Business	442,853,458	412,296,922	246,353,253	93,853	87,835	51,971	22,145,167	20,247,701	10,796,676
Residential	179,877,327	180,235,042	148,836,788	16,584	16,597	13,814	4,143,395	4,145,352	3,278,130
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

	Annual kWh Saved			kW Reduction			Annual Therms Saved		
	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net	Gross	Verified Gross	Verified Net
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

Figures 2-1 through 2-8 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.

Figure 2-1. Verified Gross Electric Energy Impacts by Measure Category, Business Programs CY10 (January 1–December 31, 2010)

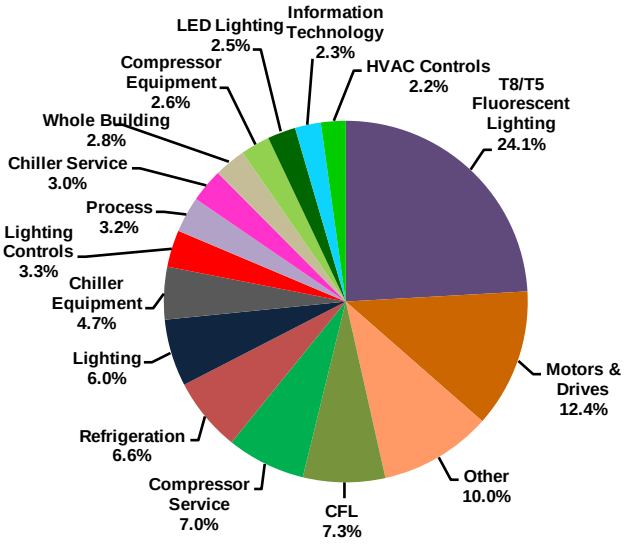


Figure 2-2. Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)

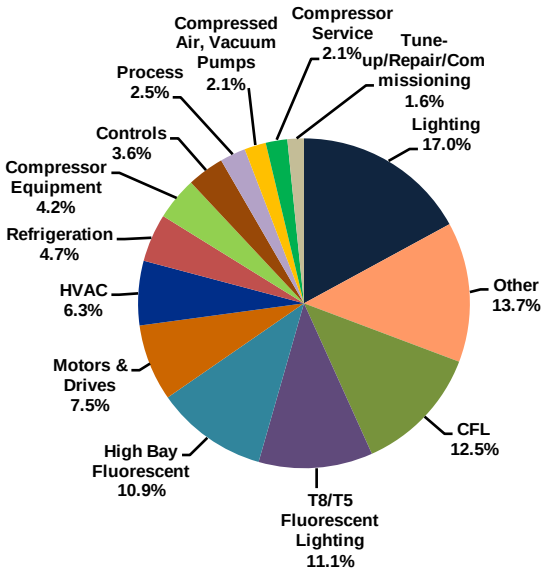


Table 2-6. Verified Gross Electric Energy Impacts by Measure Category, Business Programs CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	Percentage of Total
T8/T5 Fluorescent Lighting	113,319,687	24.1%
Motors & Drives	58,227,307	12.4%
Other	46,933,981	10.0%
CFL	34,437,599	7.3%
Compressor Service	33,114,178	7.0%
Refrigeration	31,171,815	6.6%
Lighting	28,141,274	6.0%
Chiller Equipment	22,327,767	4.7%
Lighting Controls	15,582,544	3.3%
Process	15,047,851	3.2%
Chiller Service	13,999,304	3.0%
Whole Building	13,110,905	2.8%
Compressor Equipment	12,203,328	2.6%
LED Lighting	11,892,084	2.5%
Information Technology	10,902,277	2.3%
HVAC Controls	10,575,276	2.2%

Table 2-7. Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)

Measure Category	Verified Gross kWh	Percentage of Total
Lighting	351,825,643	17.0%
Other	284,649,708	13.7%
CFL	259,051,321	12.5%
T8/T5 Fluorescent Lighting	230,971,511	11.1%
High Bay Fluorescent	226,933,077	10.9%
Motors & Drives	154,518,672	7.5%
HVAC	131,145,354	6.3%
Refrigeration	98,142,013	4.7%
Compressor Equipment	87,265,973	4.2%
Controls	75,054,809	3.6%
Process	52,609,446	2.5%
Compressed Air, Vacuum Pumps	44,585,191	2.1%
Compressor Service	43,197,485	2.1%
Tune-up/Repair/Commissioning	33,943,319	1.6%

Figure 2-3. Verified Gross Gas Energy Impacts by Measure Category, Business Programs CY10 (January 1–December 31, 2010)

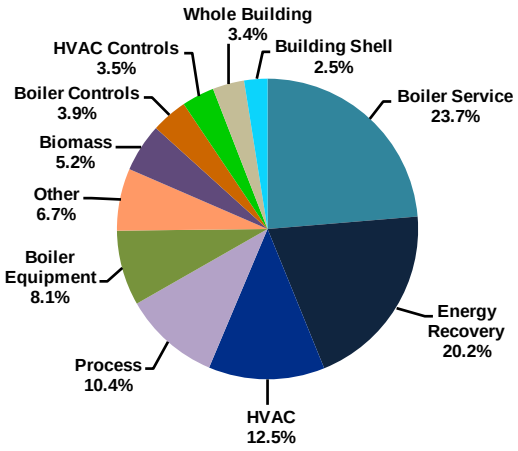


Figure 2-4. Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)

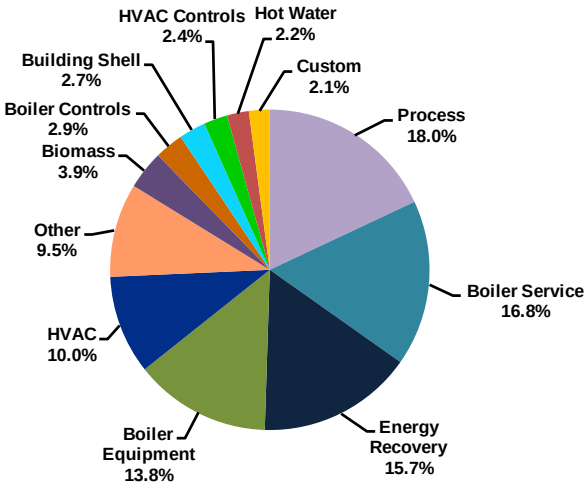


Table 2-8. Verified Gross Gas Energy Impacts by Measure Category, Business Programs CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross Therms	Percentage of Total
Boiler Service	4,750,216	23.7%
Energy Recovery	4,046,428	20.2%
HVAC	2,502,367	12.5%
Process	2,086,610	10.4%
Boiler Equipment	1,614,966	8.1%
Other	1,333,671	6.7%
Biomass	1,040,788	5.2%
Boiler Controls	778,485	3.9%
HVAC Controls	693,904	3.5%
Whole Building	683,911	3.4%
Building Shell	510,572	2.5%

Table 2-9. Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)

Measure Category	Verified Gross Therms	Percentage of Total
Process	19,676,050	18.0%
Boiler Service	18,378,543	16.8%
Energy Recovery	17,260,206	15.7%
Boiler Equipment	15,101,234	13.8%
HVAC	10,961,672	10.0%
Other	10,388,883	9.5%
Biomass	4,318,214	3.9%
Boiler Controls	3,183,158	2.9%
Building Shell	2,957,335	2.7%
HVAC Controls	2,576,872	2.4%
Hot Water	2,439,630	2.2%
Custom	2,349,273	2.1%

Figure 2-5. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)

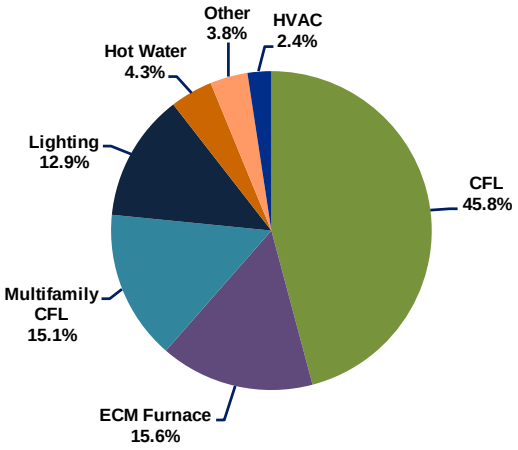


Figure 2-6. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–December 31, 2010)

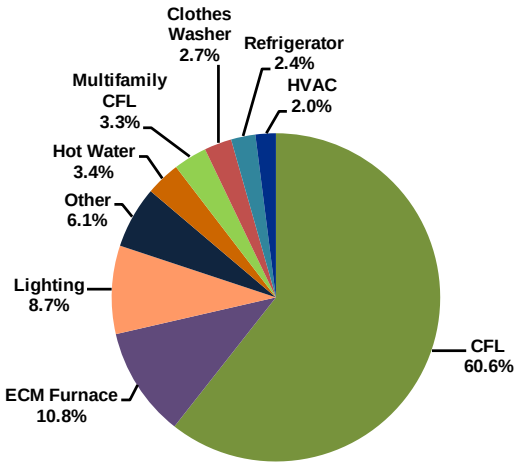


Table 2-10. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	Percentage of Total
CFL	54,795,868	45.8%
ECM Furnace	18,702,681	15.6%
Multifamily CFL	18,126,568	15.1%
Lighting	15,484,846	12.9%
Hot Water	5,128,356	4.3%
Other	4,552,356	3.8%
HVAC	2,862,348	2.4%

Table 2-11. Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–December 31, 2010)

Measure Category	Verified Gross kWh	Percentage of Total
CFL	519,510,529	60.6%
ECM Furnace	92,439,557	10.8%
Lighting	74,586,598	8.7%
Other	52,626,171	6.1%
Hot Water	28,802,385	3.4%
Multifamily CFL	28,453,976	3.3%
Clothes Washer	23,488,702	2.7%
Refrigerator	20,942,508	2.4%
HVAC	16,881,046	2.0%

Figure 2-7. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)

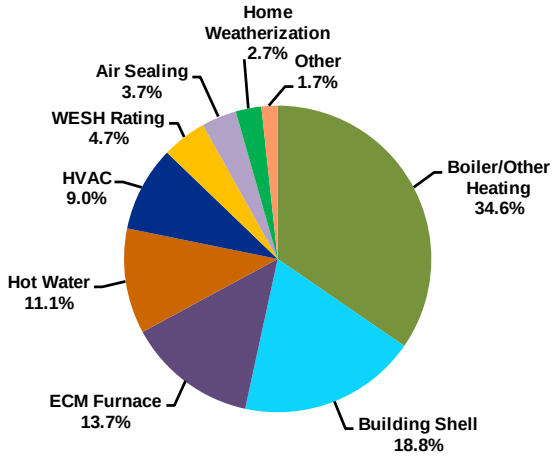


Figure 2-8. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–December 31, 2010)

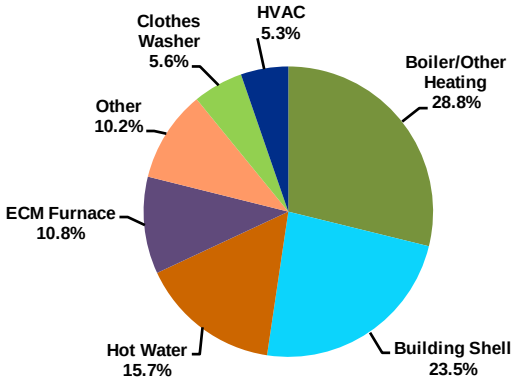


Table 2-12. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross Therms	Percentage of Total
Boiler/Other Heating	1,245,714	34.6%
Building Shell	676,307	18.8%
ECM Furnace	492,300	13.7%
Hot Water	399,982	11.1%
HVAC	322,236	9.0%
WESH Rating	170,400	4.7%
Air Sealing	132,634	3.7%
Home Weatherization	96,324	2.7%
Other	62,423	1.7%

Table 2-13. Verified Gross Gas Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–December 31, 2010)

Measure Category	Verified Gross Therms	Percentage of Total
Boiler/Other Heating	5,934,203	28.8%
Building Shell	4,838,829	23.5%
Hot Water	3,232,080	15.7%
ECM Furnace	2,226,100	10.8%
Other	2,109,447	10.2%
Clothes Washer	1,145,744	5.6%
HVAC	1,096,178	5.3%

2.1.4 Lifetime verified gross impacts

This subsection summarizes the energy impacts across the lifetime of the measure. Again, the lifetime verified gross impacts represent the stream of savings for measures installed in CY10 across those measures' effective useful life.

Table 2-14 presents a summary by program area of lifetime kWh and therm impacts. The table also documents the dollar value of energy saved and the number of participants.

Table 2-14. All Programs: Tracked Energy Impacts—Lifetime[6] Verified Gross CY10 (January 1–December 31, 2010)

Program Area	Lifetime kWh	Lifetime Therms	Dollar Value of Energy Saved	Unique Participants with Energy Savings
Total	**6,578,592,665**	**296,912,500**	**$871,219,511**	
Business	5,350,241,669	236,967,513	$650,297,822	17,672
Residential	1,228,350,997	59,944,987	$220,921,689	414,964

Table 2-15 presents a summary of the lifetime verified gross and verified net savings by program area. The column "NTG" represents the ratio of the verified net to the verified net gross savings.

Table 2-15. All Programs: Tracked Energy Impacts—Lifetime[6] Verified Gross and Lifetime Verified Net CY10 (January 1–December 31, 2010)

	Lifetime kWh Saved			Lifetime Therms Saved		
Program Area	Verified Gross	Verified Net	NTG	Verified Gross	Verified Net	NTG
Total	**6,578,592,665**	**3,945,149,194**	**60%**	**296,912,500**	**156,314,157**	**53%**
Business	5,350,241,669	3,127,718,325	58%	236,967,513	110,151,807	46%
Residential	1,228,350,997	817,430,868	67%	59,944,987	46,162,350	77%

2.1.5 Lifecycle verified gross impacts

This subsection summarizes the energy impacts across the lifecycle of the measure. Again, the lifecycle verified gross impacts represent the savings being realized within CY10, including measures installed prior to CY10 that have not surpassed their effective useful lives.

Table 2-16 presents a summary by program area of the annual kWh, kW, and therm impacts. This table also includes the dollar value of energy saved and the number of participants.

Table 2-16. All Programs: Tracked Energy Impacts—Lifecycle Verified Gross Program to Date (July 1, 2001–December 31, 2010)

Program Area	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Dollar Value of Energy Saved	Unique Participants with and without Energy Savings	Unique Participants with Energy Savings
Total Saved	**2,796,988,978**	**516,100**	**137,117,724**	**$380,452,931**		
Business	1,978,570,395	400,176	106,048,600	$248,578,550	70,231	70,123
Residential	746,807,418	104,179	20,200,130	$116,155,619	2,089,996	2,089,143
Renewables	71,611,165	11,745	10,868,994	$15,718,762	1,092	1,074

Table 2-17 presents a summary by program area of lifecycle kWh, kW, and therm impacts. The column "NTG" represents the ratio of the verified net to the verified net gross savings.

[6] Please see Appendix G for further explanation.

Table 2-17. All Programs: Tracked Energy Impacts—Lifecycle Verified Gross and Lifecycle Verified Net Program to Date (July 1, 2001–December 31, 2010)

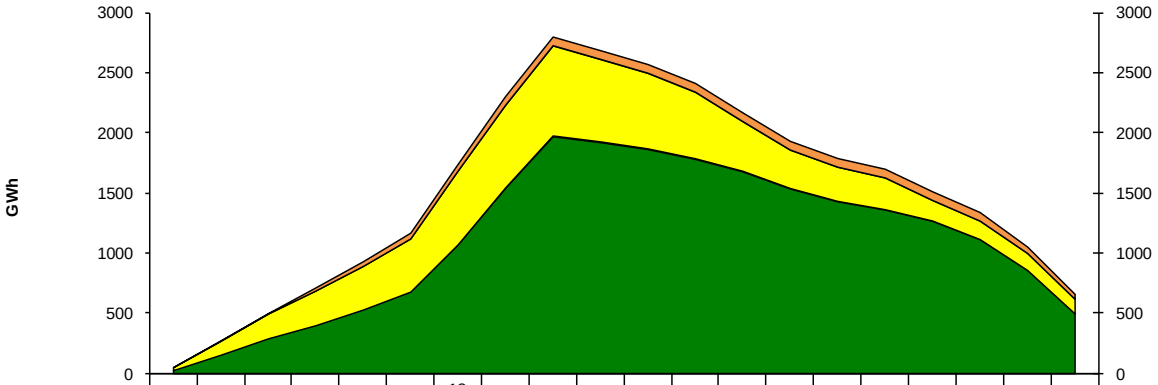
Program Area	kWh Saved			kW Reduction			Therms Saved		
	Verified Gross	Verified Net	NTG	Verified Gross	Verified Net	NTG	Verified Gross	Verified Net	NTG
Total Saved	**2,796,988,978**	**1,834,018,809**	**66%**	**516,100**	**322,269**	**62%**	**137,117,724**	**78,950,676**	**58%**
Business	1,978,570,395	1,205,158,244	61%	400,176	233,091	58%	106,048,600	59,131,602	56%
Residential	746,807,418	607,245,766	81%	104,179	84,807	81%	20,200,130	16,677,989	83%
Renewables*	71,611,165	21,614,799	30%	11,745	4,371	37%	10,868,994	3,141,085	29%

Figures 2-9, 2-10, and 2-11 show graphically the lifecycle verified gross stream of energy savings 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 2-17, above. The savings implemented each fiscal year continue over the measure life, or effective useful life of the measures, installed to realize the 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.)

The charts show that lifecycle savings peak at about 2,797 GWh and 137 million therms at the end of December 2010 (the current reporting period) and then begin to decline. The decline reflects a gradual reduction in energy savings once no new measures are being installed, after December 2010. We do not account for future purchases of a like measure that may have been affected by participation in the program.

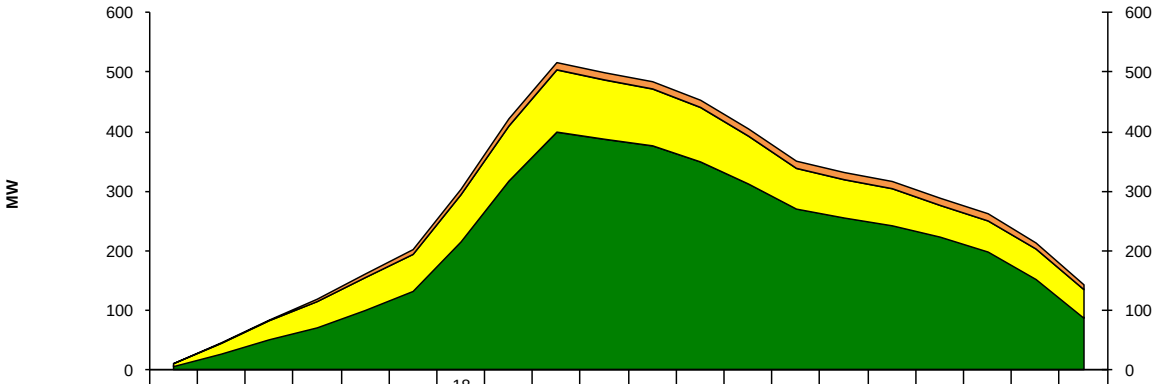
Figure 2-9. Lifecycle Verified Gross Electricity Savings (GWh)



	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		4	4	26	39	48	55	72	72	72	72	72	72	72	72	72	72	71	53	41
Residential	26	116	206	288	362	441	612	685	747	683	626	551	411	318	283	263	170	153	141	122
Business	31	159	295	404	534	683	1076	1548	1979	1930	1872	1790	1686	1543	1436	1367	1273	1119	863	502
Total	56	278	505	718	936	1171	1743	2304	2797	2685	2569	2413	2169	1933	1790	1702	1515	1343	1058	665

Program Year

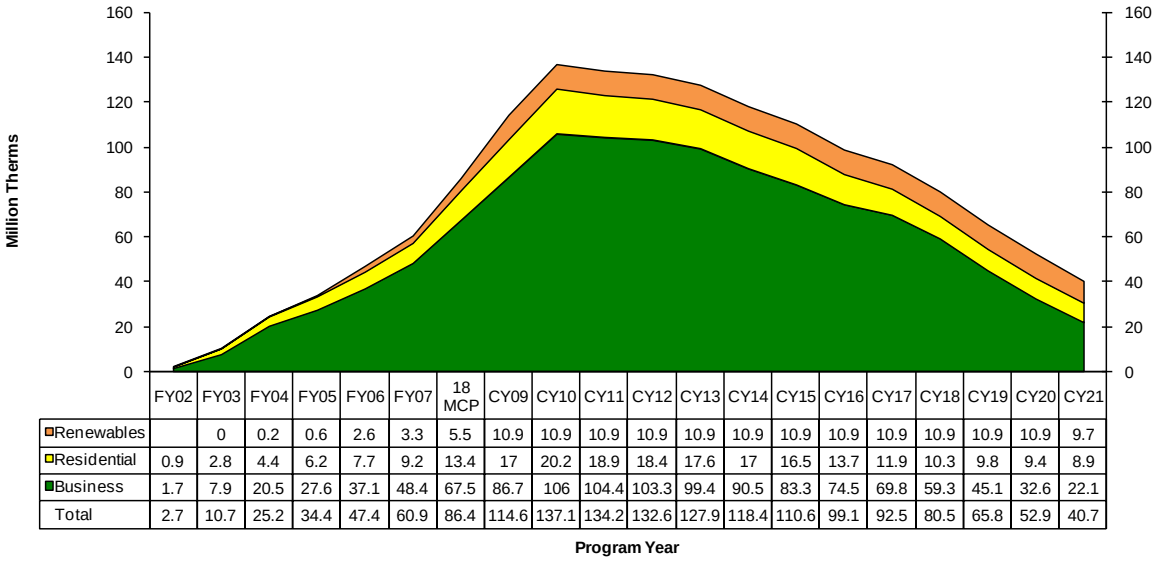
Figure 2-10. Lifecycle Verified Gross Electricity Demand Reductions (MW)



	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		1	1	4	6	8	9	12	12	12	12	12	12	12	12	12	12	12	10	8
Residential	5	18	32	44	55	62	79	92	104	99	95	91	80	68	64	62	53	52	51	48
Business	7	28	52	72	101	133	216	318	400	388	377	350	313	271	256	243	224	199	153	88
Total	12	47	85	121	162	203	304	422	516	498	484	453	405	351	332	317	289	263	214	144

Program Year

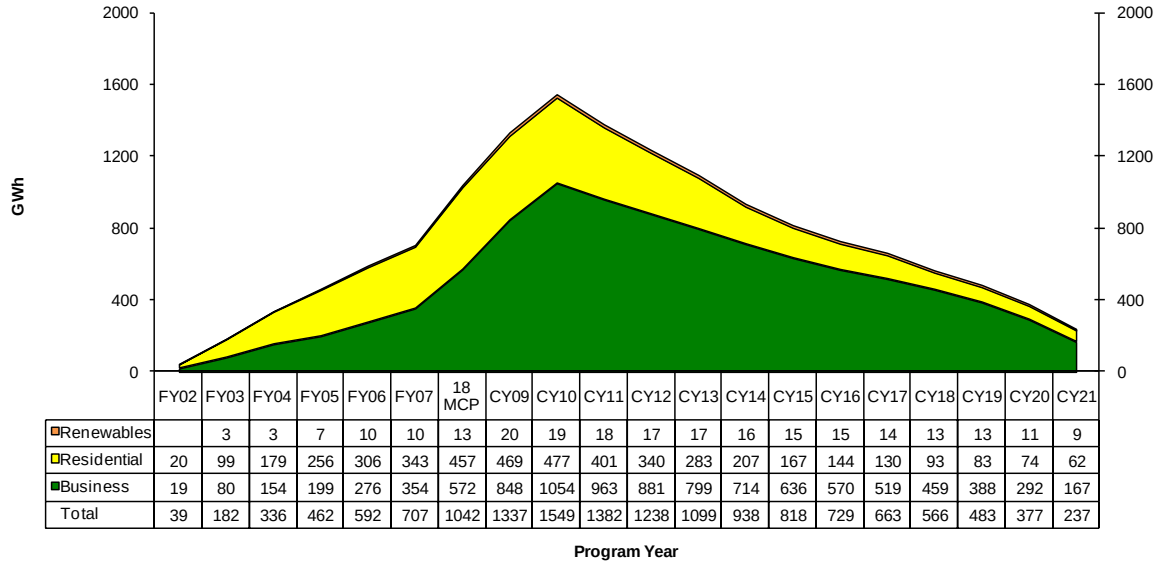
Figure 2-11. Lifecycle Verified Gross Gas Savings (Million Therms)



	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		0	0.2	0.6	2.6	3.3	5.5	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	9.7
Residential	0.9	2.8	4.4	6.2	7.7	9.2	13.4	17	20.2	18.9	18.4	17.6	17	16.5	13.7	11.9	10.3	9.8	9.4	8.9
Business	1.7	7.9	20.5	27.6	37.1	48.4	67.5	86.7	106	104.4	103.3	99.4	90.5	83.3	74.5	69.8	59.3	45.1	32.6	22.1
Total	2.7	10.7	25.2	34.4	47.4	60.9	86.4	114.6	137.1	134.2	132.6	127.9	118.4	110.6	99.1	92.5	80.5	65.8	52.9	40.7

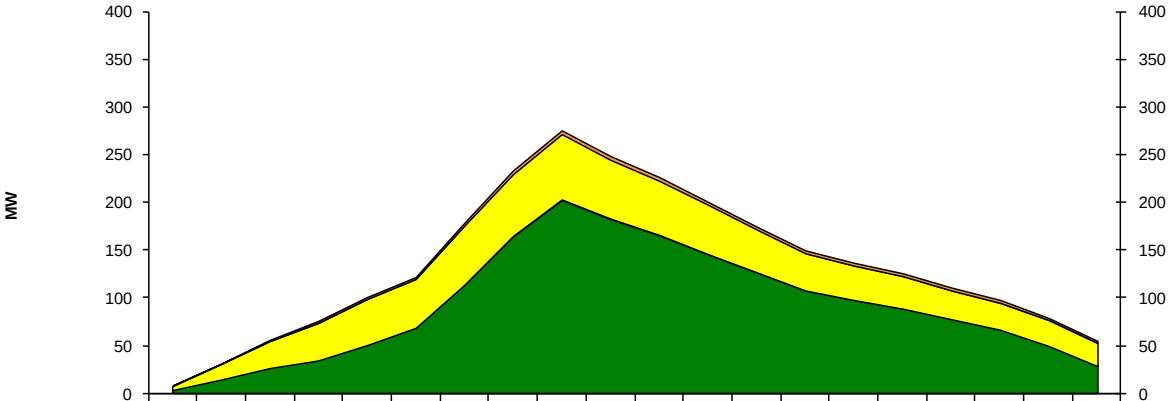
Figures 2-12, 2-13, and 2-14 reflect the stream of *persistent verified net* savings—thus applying a rate of decay factor to the lifecycle savings—and indicate that the savings stream peaks at about 1,549 GWh and 67 million therms at the end of December 2010 (the current reporting period). It also declines, again because it only reflects those measures that have been installed through December 2010. We do not account for future purchase behavior for the same measure that may have been affected by participation in the program.

Figure 2-12. Persistent Verified Net Electricity Savings (GWh)



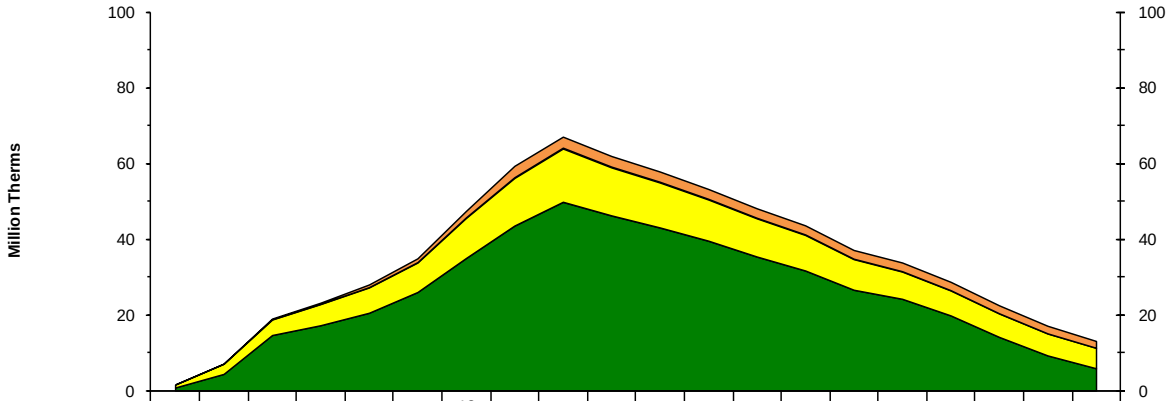
	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		3	3	7	10	10	13	20	19	18	17	17	16	15	15	14	13	13	11	9
Residential	20	99	179	256	306	343	457	469	477	401	340	283	207	167	144	130	93	83	74	62
Business	19	80	154	199	276	354	572	848	1054	963	881	799	714	636	570	519	459	388	292	167
Total	39	182	336	462	592	707	1042	1337	1549	1382	1238	1099	938	818	729	663	566	483	377	237

Figure 2-13. Persistent Verified Net Electricity Demand Reductions (MW)



	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		0	1	2	2	2	3	4	4	4	4	3	3	3	3	3	3	3	2	2
Residential	4	16	28	39	48	51	62	65	69	62	57	52	45	39	36	34	30	28	27	24
Business	4	15	27	35	51	69	114	165	203	183	166	146	127	108	98	89	78	67	50	29
Total	8	31	56	75	101	122	179	234	276	249	226	201	176	151	137	126	111	97	79	55

Figure 2-14. Persistent Verified Net Gas Savings (Million Therms)



	FY02	FY03	FY04	FY05	FY06	FY07	18 MCP	CY09	CY10	CY11	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21
Renewables		0	0.2	0.3	0.7	1	1.7	3	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.3	2.2	2.1	2	1.8
Residential	0.8	2.7	4.1	5.6	6.7	7.8	10.6	12.6	14.1	12.7	11.9	10.9	10.1	9.4	8.1	7.2	6.6	6.2	5.8	5.4
Business	0.8	4.4	14.7	17.3	20.6	26.1	35.1	43.7	50	46.4	43.2	39.7	35.5	31.8	26.7	24.3	19.9	14.2	9.3	5.9
Total	1.6	7.1	19	23.1	28.1	34.9	47.4	59.3	67	61.9	57.8	53.3	48.2	43.6	37.1	33.8	28.7	22.5	17.2	13.2

Additional explanation of the cumulative stream of demand reduction impacts for Focus on Energy may aid in the interpretation of Figure 2-10 and Figure 2-13. Guidance for calculating demand impacts for Focus is found in the Focus Business Programs Operations Manual (see 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 are not based on exactly the same definition (since changes in the calculation guidance are not applied retroactively).

2.2 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 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 a program. Market indicators (for example, Point-of-Sale (POS) data) provide value because changes in indicators can typically be measured earlier after an intervention than can changes in market effects. Also, indicators can provide insights into drivers of changes in market effects. Finally, 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. The time period depends 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, et cetera. 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 the 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. This work includes the ACES market effects study completed in CY10.

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 was 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).

2.3 ECONOMIC IMPACTS

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 understand the extent to which programs such as Focus are addressing these economic development goals.

Focus directly affects Wisconsin's economy—and thus, the income and jobs of Wisconsin residents—in four primary ways:

- **Enhanced business competitiveness.** Decreasing energy costs through increased efficiency, conservation, and lower emission compliance costs can make business operations more profitable. By lowering costs of doing business, it also makes Wisconsin a more competitive location for additional business attraction, investment, and expansion. There is also a benefit (unmeasured to date and not part of this analysis) for Wisconsin firms that sell energy efficient products or include them in their services (as with construction contractors).
- **Improved cost of living.** Decreasing electric and gas energy costs for residential customers, through increased efficiency, conservation, and reduced emission compliance costs, can also leave more money in families' pockets. This is money that can be spent on other discretionary purchases. Lowering the cost of living means that Wisconsin offers higher potential "real" income. This is not only attractive to the state's current residents but also makes Wisconsin a more attractive place to live and work to people who offer skills the state economy needs in order to grow and expand.
- **Import substitution.** Focus also encourages more spending dollars to stay within Wisconsin. 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, the program has the effect of

stopping *economic leakage* that occurs when money flows out of the state to purchase coal and natural gas. These effects combine to stimulate job creation, increase personal income, and to make the Wisconsin economy more efficient and competitive.

- **Spin-off spending changes.** There are also various indirect and induced impacts that cause both positive and negative changes in spending. Suppliers to businesses that are directly affected by the program, either as participants or as manufacturers, retailers, or installers of energy-efficient equipment, can realize increased orders for their products and services. Additional jobs and their associated worker income can mean more re-spending of that income on consumer purchases. On the other hand, reductions in the growth of demand for traditional energy sources can mean less growth or actual reductions in business sales and jobs associated with construction and operation of coal-fired power plants and retail sales from those plants.

The sum of all of the above-cited effects are termed *economic development* impacts because they reflect changes in the growth and development of the state's economy (i.e., the flow of money into, out of, and within the state affecting jobs and income for Wisconsin residents).

2.3.1 Steps in the analysis process

There are three steps in the process of analyzing the economic development impacts of the Focus program portfolio. These steps are briefly summarized below.[7]

Step 1. Document direct effects. The first step is to track the net *direct effects* of the program. These are net changes in:

1. Program operations spending—in this case "ratepayer" dollars are spent in operating the program and paying incentives to business and household participants.
2. Household and business savings—these are dollar savings to businesses and households (resulting from reductions in energy and electric demand), realized because of the existence of the program.
3. Household and business cost—these are the additional household and business expenditures associated with the incremental cost of purchasing energy-efficient equipment. Incremental defines the cost difference when compared to purchasing a traditional energy-consuming component (the baseline assumption). Incentive dollars from (1) program operations spending work to defray these incremental costs.
4. Other spending shifts—shifts in patterns of spending and business sales among sectors of the state economy—affecting the flow of dollars into, out of, and within the state.

We rely on other program evaluation reports to obtain the basic information for these four types of direct economic impacts. A key element of this process is careful attention to establishing the net change in spending and costs incurred by government, households, and

[7] For a more detailed discussion, see Lisa Petraglia, Tyler Comings, and Glen Weisbrod, Economic Development Research Group, Inc., *Focus on Energy Evaluation. Economic Development Benefits: CY09 Economic Impacts*, March 2, 2010.

businesses compared to what would otherwise be expected to occur without the program. In general, the representation of program cost, participation, and energy impacts in this report builds upon program evaluation studies that are described in more detail in other reports.

Step 2. Apply the economic model. The second step is to apply a Regional Economic Models, Inc. (REMI) economic model of the state of Wisconsin. The model is a tool used to trace how the direct Focus program effects create changes in household and business costs, spending, and sales patterns throughout the state's economy. We apply the inputs from Step 1 to the REMI economic model to track a series of shifts in the state economy, including:

1. Lower business operating costs related to energy consumption (increased competitiveness for business attraction)
2. Lower household living costs (increased attraction as a place to live)
3. Import-substitution (Wisconsin-made products substitute for purchases of out-of-state equipment and fuels)
4. Increased orders for firms supplying goods and services to equipment manufacturers and installers in Wisconsin (indirect effect)
5. Re-spending of additional worker income within Wisconsin (induced effect).

The results of the REMI model represent changes in the economy of the state, on a year-by-year basis. The key indicators of change in the state's economy are:

1. Total volume of business sales—by type of business
2. Total number of jobs associated with the change in business sales—by type of business and occupation category
3. Total *real* disposable income associated with (1) the program-generated savings experienced by households and (2) more people working in Wisconsin due to the program's business competitiveness benefits
4. Total gross regional product—the change in "value added" that is generated in Wisconsin, which is essentially the sum of personal income and corporate income (profit).

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

1. Changes in the growth and mix of jobs for Wisconsin residents in terms of industries and occupations. These can lead to increased diversification of the economy, increased opportunities for job skills, and higher income levels for Wisconsin workers.
2. Changes in the incidence of economic impacts, in terms of urban and rural locations.
3. Shifts in the nature and size of impacts occurring over time.
4. Shifts in the economic competitiveness and attractiveness of Wisconsin as a place to live and to locate a business.

2.3.2 Summary of economic analysis results

The model results reflect estimates developed on a new version of the statewide economic model and an updated procedure for measuring job impacts. Two scenarios condition our economic benefit impact assessment:

1. The historic scenario assumes that Focus will fund and manage the programs for ten years beginning in 2001. The total impact of the programs is measured for an additional 15 years after funding ends (2026).

2. A forward-looking scenario assumes that the future Focus programs follow the savings trends projected in the ECW Potential Report.[8] In this scenario, the programs are funded for ten years beginning in 2012. The total impact of the programs is measured for an additional 15 years after funding ends (2036).

The results 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.

Tables 2-18a and 2-18b show the projected annual economic impacts from Focus programs in aggregate for selected years and periods. The tables also summarize impacts when both the Residential and Business programs include expected market effects beyond what the program instigates. These market effects include 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 realized without formal program participation. A similar set of economic impact results are shown for the *forward-looking* funding stance for Focus starting in 2012 and those effects were stated as *net effects* presumably inclusive of free-ridership adjustments and a market effect component—though not explicitly broken out.

Tables 2-18a and 2-18b. Economic Development Impacts for all Focus Programs, Historic and Forward-looking Funding Scenarios

Historic Trend Scenario* (mil $2009)	Year 1	Year 5	Year 10	Sum 10 Years	Sum 25 Years
Impact without Market Effects					
Jobs (job years for sums)	542	1,774	5,194	24,679	91,741
Sales generated	$29	$120	$466	$1,907	$12,209
GRP (value-added)	$25	$91	$343	$1,428	$8,577
Disposable income	$18	$72	$258	$1,090	$5,658
Impact with Market Effects					
Jobs (job years for sums)	545	1,782	5,204	24,897	100,356
Sales generated	$29	$121	$472	$1,915	$13,522
GRP (value-added)	$25	$91	$346	$1,435	$9,450
Disposable income	$18	$72	$262	$1,096	$6,234

[8] As described in the *Benefit-cost Analysis CY09 Evaluation Report* November 24, 2009, on page 5-2 "ECW based the program costs on net savings values. Since the program incurs costs for all participants, this approach underestimates both administrative and incentive costs. For this…analysis, we adjusted the ECW program costs to account for program attribution."

Forward-looking Scenario* (mil $2009)	Year FL1	Year FL5	Year FL10	Sum 10 Years	Sum 25 Years
Impact with Market Effects					
Jobs (job years for sums)	11,813	22,610	33,304	232,826	555,357
Sales generated	$923	$2,306	$4,018	$24,746	$75,384
GRP (value-added)	$637	$1,547	$2,669	$16,559	$50,442
Disposable income	$522	$1,163	$1,932	$12,355	$35,949

*FL1 = 2012, FL5 = 2016, FL10 = 2021

Source: REMI model runs by Economic Development Research Group

Altogether, the analysis confirms that Focus leads to significant economic development benefits for Wisconsin's economy. Even without counting market effects, the first year of program operation causes a variety of household and business cost savings and spending changes that altogether support 542 jobs in the state. The impact grows to an estimated 1,774 jobs by the fifth year of program operation. The personal income generated in Wisconsin from this additional business activity represents $18 million in the first year and grows to $72 million by the fifth year of program operation. The market effects also grow over time, adding a small impact in the first five years but then adding roughly 9.4 percent to jobs and income respectively over the projects' assumed 25-year analysis interval.

2.3.3 Impact by industry

Focus programs provide widespread benefits among all sectors of the economy. There are several reasons for this result. While many of the business portfolio participants are manufacturing and commercial businesses, all of the portfolios create additional economic benefits by supporting manufacturers, wholesalers, retailers, engineering and installation services, and construction services associated with the energy-saving materials, equipment, and buildings. Secondly, the growth of participating firms also leads to "indirect" growth impacts on other firms that supply goods and services to them. The growth of workers at both the directly affected businesses and the indirectly affected businesses leads to further "induced effects" as the additional worker income supports more household consumption.

Table 2-19 shows how the mix of impact among major sectors of the economy can be viewed differently in terms of business output (dollars of total sales) or in terms of jobs.

Table 2-19. Focus' Impacts on the Economy by Major Industry
(Tenth Year, Historic Scenario without Market Effects, Output in Constant 2009 Dollars)

Major Industry	Output Impacts (mil.)	Percentage of Output	Job Impact	Percentage of Jobs	
				Private Sector	All Jobs
Natural Resources/Mining/ Utilities/Construction	$43	9%	1,292	28%	25%
Manufacturing	$137	29%	366	8%	7%
Wholesale	$32	7%	124	3%	2%
Retail	$49	11%	542	12%	10%
Transportation/Info./Finance	$64	14%	291	6%	6%
Other services	$141	30%	1,937	43%	37%
Total private sector	**$466**	**100%**	**4,557**	**100%**	**88%**
Total all sectors			**5,194**		

Note: Job impacts show account for less than 100 percent of the total employment changes since state/local government job changes are not shown as major industry.

Source: REMI model runs by Economic Development Research Group

Table 2-19 shows that the *overall impact* of Focus is to make Wisconsin's total business output $466 million/year higher in the tenth year than would have occurred without the program. This growth involves an additional 4,557 private sector jobs and 5,194 total jobs. Manufacturing accounts for the largest share of the total statewide impact on output—29 percent, though only eight percent of the total private-sector job impact. The high impact on manufacturing output reflects the program impact on increasing the "cost competitiveness" of this sector as well as the redirection of some business and household purchases towards energy-efficient electrical equipment and machinery manufactured in Wisconsin. The smaller job impact is because Wisconsin manufacturing has a high value of output per worker, known as high labor productivity.

Retail accounts for 11 percent of the output impact and 12 percent of the private-sector employment impact. The effect on output is attributable to the large residential program, which causes participating households to experience an increase in their disposable income, which they then spending on retail, entertainment, and personal services, and to the fact that many of the residential programs direct households through retail channel to purchase energy-efficient appliances and lighting. The larger job impact is due to the high labor-intensity of retailing.

The Services sector accounts for 30 percent of the output impact and 43 percent of the employment impact. This classification includes energy-related services, which are supported by the business program's marketing and incentive features. The higher share of employment impact is due to the labor-intensive nature of most services.

The pronounced percentage of job impacts occurring in the *Natural Resource/Mining/Utilities/ Construction* category is primarily attributable to program-related installation demand for contractors to retrofit or install new equipment and systems.

The additional impacts for the remaining sectors such as *Transportation*, *Construction*, *Finance,* and *Wholesale* is attributable to increased spending by both households (due to disposable income growth) and businesses (due to expansion of activity) and to the fact that firms from within these industries are participating in Focus Business programs.

2.4 ENVIRONMENTAL IMPACTS

The Focus evaluation team uses emission factors to estimate environmental impacts, in the form of displaced power plant emissions, from Focus on Energy net energy savings. Emission factors are used to convert energy inputs (i.e., the fuels combusted to generate electricity) and generation of pollutants (i.e., CO_2, NO_x, SO_2, and mercury). Factors are reported in pounds of pollutant per megawatt hour of generation.

The Focus team has aligned its method for estimating emission rates with recommendations of the Greenhouse Gas Protocol Initiative (GHG Protocols). This protocol, developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), has become the most broadly accepted accounting standard for understanding, quantifying, and managing greenhouse gas emissions.[9]

One implication of adherence to the GHG Protocol is that emission factor calculations are based on generation data specific to the geography of the Focus energy efficiency programs. Secondly, emission factors are estimated for plants operating on the margin—plants most likely to remain off-line as a result of a reduction in demand/consumption resulting from Focus programs. Emission factors derive from the Environmental Protection Agency's (EPA) Office of Air and Radiation's "Acid Rain Hourly Emissions Data," which is produced from actual stack monitoring. Appropriate allowance prices for displaced emissions are then used for the benefit-cost and economic impact analyses, including a forecast of future prices to the year 2026.

Marginal plants are identified by their *rate of use*; that is, the average length of time in hours that a generating unit remains on once it is brought online. Peaking units, which are brought on for only a short time, have a short rate of use; base-load plants that remain on for hundreds of hours or more have a long rate of use. We divide the population of generating units into five groups, averaging less than six hours, six to twelve hours, twelve to twenty-four hours, twenty-four to ninety-six hours, and more than ninety-six hours, each time they are dispatched. We define marginal emissions in each hour as those produced by the set of generating units in the group with the shortest rate of use.

In 2009, evaluators calculated emission factors in a new way, based on the apportionment of program energy savings over each hour of the year. Thus, we associate an emission rate for each hour with energy savings estimated for that hour. The energy savings are based on energy savings load shapes developed by Focus. With this approach, the annual emission factor is properly weighted by the timing of the savings. We call these *time-of-savings* (TOS) emission factors. Emission factors for each load shape are reported in Table 2-20.

[9] World Resources Institute and the World Business Council for Sustainable Development. *Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects.* 2007.

Table 2-20. Emission Factors by Load Shape

Load Shape	Pollutant (Lbs/MWh)			
	CO_2	NO_x	SO_2	Mercury
AG_HVAC	1,803	2.7	3.9	0.0000137
AG_LGHT	1,795	2.6	3.9	0.0000136
AG_TOTL	1,797	2.7	3.9	0.0000139
COM_FLAT	1,817	2.7	4.1	0.0000147
COM_HVAC	1,808	2.6	3.9	0.0000136
COM_LGHT	1,796	2.6	3.8	0.0000134
COM_TOTL	1,780	2.6	3.9	0.0000132
IND_HVAC	1,833	2.7	4.1	0.0000146
IND_LGHT	1,802	2.6	3.9	0.0000138
IND_TOTL	1,795	2.6	3.9	0.0000137
RES_COOL	1,641	2.7	4.5	0.0000109
RES_FLAT	1,817	2.7	4.1	0.0000147
RES_HEAT	1,908	2.6	3.6	0.0000158
RES_HVAC	1,783	2.6	3.9	0.0000134
RES_LGHT	1,801	2.6	3.8	0.0000135
RES_SOLAR	1,662	2.5	3.3	0.0000092
RES_TOTL	1,783	2.6	3.9	0.0000134
SCH_HVAC	1,808	2.6	3.9	0.0000134
SCH_LGHT	1,794	2.6	3.8	0.0000133
SCH_TOTL	1,775	2.6	3.8	0.0000130
TOTL_TOTL	**1,801**	**2.6**	**3.8**	**0.0000136**

Emission factors for NO_x vary relatively little from one load shape to another—only about a tenth of a pound per MWh around the mean. This pollutant is less sensitive to the fuel that is predominant on the margin. The values for CO_2, SO_2, and mercury vary somewhat more by load shape, on the order of three percent to four percent around the mean for SO_2 and five percent or more for mercury. Emission rates for CO_2 are quite consistent except for residential heating and cooling and solar. We expect that business sector heating and cooling would also show significant CO_2 variation if heating and cooling were separated into separate load shapes rather than collapsed into a single HVAC load shape. These pollutants vary according to the predominant fuel on the margin. In particular, coal generation produces more pollutants than natural gas, oil, wood, and other fuels. When coal-powered generation is on the margin, emission rates are higher.

The TOTAL load shape (i.e., "TOTL_TOTL", above) represents an aggregate of avoided emissions across all programs, divided by the aggregated energy savings. This is an intrinsically more precise way to represent the emission factor than the other approach, which averages across all units and all hours.

The summary emissions rates for electric generation provided in Table 2-21 reflect the TOTAL load shape in Table 2-17. Emissions factors from reduced use of natural gas at the customer site—the "On-site Therms" column in Table 2-21—were also taken from EPA data.[10]

[10] EPA's *E-Grid 2000 database.*

Table 2-21. Summary Emission Rates for Electric Generation

Emissions	Generation lbs/MWh	On-site Therms lbs/Therms[11]
NO_x	2.63	0.009804
SO_2	3.83	0.0000588
Mercury	0.0000136	0.00000002549
CO_2	1,801	11.76

Using the marginal emission rates and evaluation-verified *gross* electricity savings estimates, the Focus programs together potentially displaced 8,692,461 pounds of NO_x; 10,727,167 pounds of SO_2; over 6,649 million pounds of CO_2; and 41 pounds of mercury from Focus inception to December 31, 2010 (Table 2-23)[12]. *[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 used by Focus calculate avoided emissions based on persistent net energy impacts. Furthermore, markets for greenhouse gases (GHG), and the protocols for quantifying and reporting GHG effects, stringently require net emissions impacts.]*

Table 2-22. Verified Gross Emissions Displaced (lbs) Annually CY10 (January 1–December 31, 2010)

Program Area	Verified Gross MWh	Verified Gross Therms	NO_x	SO_2	CO_2	Mercury
Business	470,987	20,041,917	1,433,858	1,806,184	1,083,904,160	6.92
Residential	119,653	3,598,320	349,627	458,768	257,802,018	1.72
Total	**590,640**	**23,640,237**	**1,783,485**	**2,264,952**	**1,341,706,178**	**8.64**

Table 2-23. Lifecycle Verified Gross Emissions Displaced (lbs) Annually Cumulative in Current Year (July 1, 2001–December 31, 2010)

Program Area	Lifecycle Verified Gross MWh	Lifecycle Verified Gross Therms	NO_x	SO_2	CO_2	Mercury
Business	1,978,570	106,048,600	6,237,757	7,588,884	4,810,382,690	29.62
Renewables	71,611	10,868,994	294,694	275,080	256,785,493	1.25
Residential	746,807	20,200,130	2,160,038	2,863,243	1,582,495,514	10.68
Total	**2,796,989**	**137,117,724**	**8,692,490**	**10,727,209**	**6,649,663,697**	**41.55**

Emission reductions are calculated using marginal emission rates.

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

The *GHG Protocol for Project Accounting* (World Resources Institute and World Business Council for Sustainable Development, 2005) recognizes biomass and biogas projects as a

[11] Therm factors from EPA data (EPA's E-Grid 2000 database with data for the MAIN and MAPP NERC regions from 1998). Updated by Eric Rambo and Bryan Ward, PA Consulting Group. *Emission Factors Update*. December 22, 2009.

[12] The evaluation team recognizes the potential impact of reduced methane production resulting from agriculture projects. Methane is considered by the IPCC to have 21 times the potency of CO_2. We recommend that future reporting calculate and include methane as a displaced greenhouse gas emission.

source of "upstream" secondary emission effects. For these projects, the reduction in energy emissions from one source, electricity or natural gas, are replaced by another: these projects use bio fuels to generate electricity or heat and thereby release of CO_2, NO_x, and SO_2. For Focus renewables projects that are biomass projects, the predominant substitute fuel is wood. For biogas projects, the predominant substitute fuel derives from anaerobic digesters, from which the primary energy source is methane.

Table 2-24 shows emission factors for combustion related to renewables projects. This information comes from a variety of sources, noted below the table. We did not locate a source for SO_2 deriving from biogas. We expect it to be similar to the value for natural gas, however, hence quite low. Nor could we locate a value for mercury emissions. For the current analysis, we treat these values as zero.

Table 2-24. Emission Factors for Renewable Energy Combustion, by Fuel Type

Fuel	Energy Use	CO_2	NO_x	SO_2	Mercury
Wood[1]	Electricity (lbs/MWh)	1,419	4.58	1.45	nd
Wood[2]	Heat (lbs/therm)	26	.049	.002	nd
Biogas	Electricity (lbs/MWh)	1,234[3]	0.09[4]	0.23[4]	nd
Biogas	Heat (lbs/therm)	13[3]	0.0001[3]	nd	nd

Sources:
1. EPA Acid Rain Data
2. EPA AP 42
3. IPCC
4. California Energy Commission

Table 2-25 shows estimated emissions, program to date, that are due to renewables biomass and biogas combustion projects. These offset part of the emission reductions indicated Table 2-23.

Table 2-25. Lifecycle Verified Gross Emissions (lbs) Produced Annually Cumulative in Current Year (July 1, 2001–December 31, 2010)

Project Type	Lifecycle Verified Gross MWh	Lifecycle Verified Gross Therms	Biogenic CO_2	NO_x	SO_2
Biogas	65,956	1,224,151	97,303,248	6,058	15,170
Biomass-Combustion	0	10,585,420	275,220,921	518,686	21,171
Total	**65,956**	**11,809,571**	**372,524,168**	**524,744**	**36,341**

Note that in Table 2-24 and Table 2-25 we characterize CO_2 emissions as biogenic CO_2 as opposed to anthropogenic CO_2 emissions. Biogenic CO_2 was recently sequestered by living organisms from the atmosphere and, thus, part of the natural existing carbon cycle. In contrast, anthropogenic CO2 refers to the release of carbon sources (e.g., coal or other fossil fuels) that would otherwise have remained stored in the earth's surface and not released into the atmosphere.

Biogenic CO_2 is not generally considered an anthropogenic greenhouse gas emission contributing to global warming and, as such, is in essence "carbon neutral" in regards to

contributing to human-induced climate change. This distinction is consistent with the U.S. Environmental Protection Agency (EPA) and international climate agreements[13].

However, there are emerging discussions around whether biogenic emissions should be considered carbon neutral and netted out of the emissions reductions due to displaced conventional electricity and natural gas. For example, one potential issue is that biomass projects can result in land use changes that result increased GHG emissions. Since it is unknown whether Focus funded biomass projects are resulting in land use changes, more careful accounting of the fuel sources may be needed to determine their net emissions impacts.

Prior to 2005, the reporting of emissions reductions associated with Focus program energy impacts was the basis for the Division of Energy's entries to the Department of Natural Resources' (DNR) *Voluntary Emissions Reduction Registry*.[14] For purposes of this Registry, the Focus evaluator served as the independent third-party verification organization for a residential program offered through Wisconsin's Focus on Energy.

2.5 NON-ENERGY BENEFITS

Benefit-cost (b/c) reports for Focus on Energy estimate non-energy benefits (NEBs) for an expanded test of the program portfolio's effectiveness.[15] NEBs represent an array of valued attributes deriving from energy efficient measures that are in addition to energy savings, such as increased property value or reduced water usage. Focus evaluation does not include employment effects or emissions reduction as NEBs, though these are factored into b/c analysis as separate categories of program effects.

Examples of NEBs applying to Business Programs include benefits related to:

- Maintenance
- Employee morale
- Equipment life
- Productivity
- Waste generation
- Defects and errors
- Sales
- Non-energy costs
- Personnel needs
- Injuries and illnesses.

Examples of NEBs applying to Residential Programs include:

- Reduced maintenance costs associated with CFL installation (apartments only)
- Reduced water consumption costs related to installation of low-flow showerheads and aerators

[13] Both the Intercontinental Panel on Climate Change (IPCC) and The Climate Registry require that biogenic emissions from combustion sources be reported separately from anthropogenic emissions (The Climate Registry. *General Reporting Protocol version.1.1*. May 2008. (http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/)

[14] http://dnr.wi.gov/air/vol/registry/ (Last accessed 20 April 2010).

[15] Goldberg, Miriam L., Chris Clark, Sander Cohan, KEMA Inc. (2007). *Focus on Energy Statewide Evaluation: Interim Benefit-Cost Analysis: FY07 Evaluation Report.* February 26, 2007.

- An increase in property value associated with improved insulation
- Increased property values resulting from installation of new equipment or home certification.

Examples of NEBs applying to Renewables Programs include:

- 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.

For Focus evaluations, NEBs are added to the benefit side of program effects in one of two ways. NEBS typically are factored as a dollar amount per measure installed. Alternatively, they are factored as a multiplier of the first-year energy savings.

Table 2-26 shows the total value of NEBs for each program area. The NEBs reported are based on the reports that were completed for each program area.[16] 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 2-26. Value of Non-energy Benefits by Program Area

Program Area	CY10 (January–December 31, 2010)	Program to Date (July 1, 2001–December 31, 2010)
Business	$8,865,718	$38,409,647
Renewables		$1,408,487
Residential	$1,278,630	$6,865,667
Total	**$10,144,347**	**$46,683,801**

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

This section of the *Annual Report* presents a simple benefit-cost (b/c) test and cost of conserved energy results for CY10 and for the period July 1, 2001, to December 31, 2010, along with information on the key input assumptions for the analysis.

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

[16] Ujjwal Bhattacharjee, Steven Drake, Eric Rambo, and Bryan Ward, PA Consulting Group. *A Review and Update of NEBS Values for Residential Programs.* February 19, 2010.

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

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

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

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 report.

2.6.1 B/C inputs

The model to calculate the b/c values for this report is based on the 2007 benefit-cost report and subsequent published evaluation reports.[17] The inputs, their values, and the most relevant information about the model are reported in Section 2 and Appendix C of this report.

The calculation we use for the simple b/c ratio is:

> Simple b/c = (Value of Saved Energy + Value of Avoided Emissions) / ((Program Spending (excluding incentives) + (Incremental Costs × Attribution Rate for Costs))

Every three years, the evaluation team completes a full-scale benefit-cost analysis that includes historical program effects and a fifteen-year forward-looking horizon. This report also includes an expanded b/c test that incorporates:

- Quantified non-energy benefits
- Avoided emissions' externality costs for expected future emissions offset markets.
- Benefits that are valued in terms of their net impact on the economy, as determined from the economic impact analysis. The economic impacts took into account the ripple effects on the Wisconsin economy of energy savings and associated non-energy and emissions effects.

The last full-scale benefit-cost analysis was completed in CY09. [18] We note that our b/c estimate differs from this more expansive benefit-cost reporting that has been part of a separate report published every three years. The simple b/c values are based only on documented performance of past costs and program-attributed measure installations. We do not estimate future market effects, for instance, or future program impacts. At the same time,

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

Miriam L. Goldberg, J. Ryan Barry, Brian Dunn, Mary Ackley, Darcy DeAngelo-Woolsey, KEMA Inc. *Focus on Energy Evaluation Business Programs: Measure Life Study.* August 25, 2009.

Miriam L. Goldberg, J. Ryan Barry, Brian Dunn, Matt Petit, KEMA, Inc. *Focus on Energy Evaluation: Business Programs Incremental Cost Study,* October 28, 2009.

Lisa Wilson-Wright, Chris Russell and Lynn Hoefgen*. Focus on Energy Evaluations: Residential Programs Results of the Multi-State Modeling Effort.* March 7, 2010.

Ron Swager, Patrick Engineering, Inc. *Focus on Energy Statewide Evaluation, Residential Deemed Savings Review*. February 2, 2009.

Steven Drake, Eric Rambo, Bryan Ward, PA Consulting Group. *Focus on Energy Evaluation: Residential Technologies Incremental Cost Review.* November 6, 2009.

[18] Miriam L. Goldberg, Bobbi Tannenbaum, Ben Jones, Betty Seto, Matt Pettit, Nicole Buccitelli, and Brian Bak, KEMA Inc.; Bryan Ward and Eric Rambo, PA Consulting Group, Inc. *Focus on Energy Evaluation: Benefit-cost Analysis CY09 Evaluation Report.* November 24, 2009.

we do not cut off the stream of savings from installed measures in 2026 but rather run benefits out through the life of each installed measure. We believe a look at program performance exclusively *ex post* is an important supplement to the more elaborate, but necessarily more conjectural modeling, found in the full benefit-cost reports.

We discuss each of the inputs to our b/c estimate more fully below.

Value of energy saved. The value of energy saved is the net present value of the persistent net savings for program installed measures, denominated in dollars of utility avoided cost. The value of energy savings is calculated from the agreed-upon avoided costs (see Appendix C), which have a one percent growth rate over time. The value of the stream of avoided costs is netted back to the current year based on a discount rate of five percent. An eight percent line loss factor is added to the energy savings. Net energy savings are degraded over time to account for energy savings reductions from factors such as poor maintenance or removal of the efficient measure.

The value of energy saved for a given reporting period can be affected by updated evaluation results. Since the previous report we have updated the value of utility avoided costs (UAC), calculating a UAC for each measure category based on the timing of energy savings and the cost of energy at different times of day and year. We have also updated all net-to-gross ratios.

Value of avoided emissions. The team estimates an emission factor for energy savings, which represents the amount of pollutants avoided for each unit of energy saved. The stream of persistent net savings is multiplied by the emission factors to estimate a volume of avoided emissions for a given year. The volume of avoided emissions is multiplied by an estimate of the dollar value of those avoided emissions in the marketplace in that year. Currently, only values for NO_x and SO_x are included in the value of avoided emissions because these values can be established on the basis of a real, not hypothetical, market.

Emissions factors have been updated since the 2007 benefit-cost report. Updated values are used as they become available. This results in changes to the value of avoided emissions, which carries through to the b/c ratio. The emission factors have tended to decline over the period that the evaluation team has developed these numbers, thus decreasing the value of avoided emissions.

Program spending. Program spending represents the cost of running programs. In the b/c formula, however, it excludes the value of incentives paid to program participants. These are transfer payments, i.e., a cost to the program but an offsetting benefit to the energy consumer.

The source for program spending data is a summary statement for the reporting period from the fiscal agent for Focus (Wipfli), which is produced for us by the PSCW. Originally, we drew upon invoices submitted to DOA. In the transition of Focus to the PSCW, the format of the invoices did not easily support the level of reporting details that were needed as inputs to the model.

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.

Program spending is updated for every annual report. Typically, spending figures for past reporting periods do not change.

Incremental costs. These are the additional costs incurred by energy consumers for installing efficient rather than baseline equipment. Values used in the 2007 benefit-cost report are the basis for incremental costs. These values, and how they are developed, are documented in Appendix C of this report.

After posting the semiannual report for the first half of CY09, WECC observed that our estimation approach yielded incremental costs for the renewables program that were substantially higher than the actual project costs. A review of our data indicated that underlying changes in the projects had rendered inaccurate the estimation approach we had been using. For the renewables portfolio, incremental costs are now represented by implementer-reported project costs instead of using the normal estimation approach. This has been an exceptional deviation from a policy against making ad hoc changes in calculations, which was done because for renewables an unacceptable level of error had intruded into the estimation approach.

Incremental costs are reviewed and updated for every benefit-cost report. They were last updated in 2009.

Attribution rate for incremental costs. Just as savings are netted to account for free-ridership and other effects, incremental costs are netted to account only for the portion of measure costs that produced program-attributed energy savings. We multiply incremental costs by an attribution factor that is an avoided-cost-weighted average of electricity and gas attribution rates. In other words, because these attribution rates typically vary across electric and gas savings measures, the attribution rate applied to costs is weighted based on the allocation of program costs to achieve electric savings versus gas savings.

Changes in the attribution rate for costs follow from evaluation impact reporting where attribution rates are updated. That is, incremental costs are allocated to the b/c equation based on how much of the energy savings from implemented measures are attributed to the program.

Table 2-27 shows the inputs to the simple b/c ratio reported here, along with the constituent components of the inputs and the sources for them. It also indicates the frequency with which all elements are updated.

Table 2-27. Inputs and Sources for the B/C Calculations

	Components	Source	Updated
Value of Energy Saved	Annual gross energy savings	Program tracking database	Semiannually
	Net-to-gross ratio by energy type	Evaluation research	When updated evaluation research reports are finalized.
	Degradation rate of savings	It is the rate that results in half of the first year savings remains at the end of the measure life (as an estimated useful life)	No change has been made to this rate to date. However, it is significantly affected by changes in measure lifetime.
	Measure lifetime	Evaluation research	As research reports updating the values are finalized.
	Discount rate	Determined by stakeholders based on available data	As needed to support b/c reports.

	Components	Source	Updated
	Avoided cost of energy	Determined by stakeholders based on available data	As needed to support b/c reports.
Value of Avoided Emissions	Persistent net lifetime savings	It is based on the same energy impact data as the "Value of Energy Saved" immediately above.	When updated evaluation research reports are finalized.
	Emission factor by energy type	Evaluation reports based on analysis of EPA Acid Rain database	When updated evaluation research reports are finalized.
	Emission price by pollutant	PA Consulting Group's[19] Multi-pollutant optimization model (M-POM for NO_x, SO_x)	As needed to support b/c reports.
Program Spending	Invoiced expenses	Through FY07, the source was invoices submitted by program administrators. Since then it has been reports obtained from Wipfli via the PSCW.	Program spending for the current period are updated to support evaluation reporting.
	Incentives paid	Invoices/reports	Semiannually
Incremental Costs	First year avoided costs	Verified gross savings × avoided cost of energy	Semiannually
	Number of measures installed	Program tracking database	Semiannually
	Unit of analysis (NIC unit)	Evaluation research	As needed to support b/c reports.
	Incremental cost multiplier	Evaluation research	As needed to support b/c reports.
Attribution Rate for Costs	Attribution rate by energy type	Evaluation research	Semiannually
	Proportion of program spending by energy type	WECC measures	Semiannually

2.6.2 Cost of conserved energy

The cost of conserved energy calculation is based on a methodology 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 portfolio 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. Development work has been sponsored by the California Energy Commission (CEC)[20]. Based on reporting by ACEEE, CCE results have also been calculated and reported

[19] This is a propriety model owned by PA. We show it in this report only as historical information.

[20] Jayant Sathaye 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.

by six other public benefits states. They are California, Connecticut, Massachusetts, New Jersey, New York, and Vermont.

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 to the attributed savings. A portion of the program costs must be allocated to electric savings and a portion to gas savings. In Tables 2-28 and 2-29 below, the allocation of program costs is indicated in the column "Elec %." The methodology for attributing program costs 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; moreover, 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.

2.6.3 A note on documentable savings, measure life, and persistence

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.

An additional concept embodied in the energy impacts used in this benefit-cost report is *persistent* savings. These are lifetime 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.[21]

2.6.4 Benefit-cost findings

Tables 2-28 and 2-29 show results of the simple benefit-cost analysis. Additional details about the inputs to these tables can be found in Appendix C. The columns of Tables 2-28 and 2-29 are defined as follows:

- **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.

[21] The Weibull function is commonly used for survival analysis—applicable here as the survival of efficient measures, once installed. The form of this function 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 function with shape parameter 1/2 (decreasing hazard) and one with shape parameter 2 (increasing hazard). The first gives a five to ten percent lower NPV and the second gives a five to ten percent higher NPV compared to the exponential function. A mixture of the two distributions, representing a combination of the two contributing phenomena, would give NPV somewhere between, or close to the form of the exponential itself. Thus, the exponential assumption, which is computationally convenient, appears to yield appropriate results for purposes of this analysis.

- **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. These are based on first-year annual net and gross savings.
- **NTG Therms.** The net-to-gross ratio for the gas energy savings. These are based on first-year annual net and gross savings.

Table 2-28. Simple Benefit-cost and Cost of Conserved Energy
CY10 (January 1–December 31, 2010)

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	$203,855	$13,573	$19,862	$39,661	$104,694	2.7	$0.040	$0.336	77%	59%	46%
Residential	$60,360	$4,030	$8,524	$18,930	$52,778	1.5	$0.060	$0.800	62%	64%	66%
Total	**$264,215**	**$17,603**	**$28,386**	**$58,591**	**$157,472**	**2.3**	**$0.044**	**$0.448**	**72%**	**60%**	**49%**

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

Table 2-29. Simple Benefit-cost and Cost of Conserved Energy
Program to Date (July 1, 2001–December 31, 2010)

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	$1,027,395	$57,671	$123,555	$138,963	$482,814	2.6	$0.041	$0.245	77%	61%	56%
Renewables	$45,414	$2,101	$13,181	$15,692	$88,379	0.9	$0.255	$0.199	89%	30%	29%
Residential	$463,357	$30,474	$88,572	$105,160	$309,032	1.4	$0.057	$0.776	66%	84%	83%
Total	**$1,536,167**	**$90,246**	**$225,308**	**$259,815**	**$880,225**	**2.0**	**$0.050**	**$0.374**	**73%**	**67%**	**58%**

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

2.7 COMPARISONS OF FOCUS ENERGY IMPACTS AND ACHIEVABLE POTENTIAL

In order to assist in the identification of measure categories where the potential for additional energy savings is strong, evaluators compared program-to-date savings with the savings potential findings of the report, prepared by the Energy Center of Wisconsin (ECW), *Energy Efficiency and Customer-Sited Renewable Resource Potential in Wisconsin: for the years 2012 and 2018* ("the Potential Study"). We compared the market potential in 2012 with what had been achieved between January 1 and December 31, 2010.

We note that the frame of reference of our evaluation is much narrower than the perspective of the ECW Potential Study. The authors of that study consider their findings most accurate at the program portfolio level.[22] At the measure category level there is more uncertainty: potential savings for some measures might be overstated and for others might be understated. Across many technologies, however, those errors are expected to cancel out.

[22] Personal communication with Steven Kihm, ECW, February 11, 2010.

This renders the aggregate savings estimate more accurate than its composite parts. With this caveat in mind, it is prudent for the reader to give credence only to the relatively strong signals and discount weaker ones.

We first assigned measures installed through Focus to markets identified in the Potential Study. Assignments were based on feedback provided by ECW about the specific measures comprised within each market and end-use category. We aligned each program to its market segment. For instance, the ACES program was aligned with the "Rental, Large" (RL) market segment in the potential study, which includes rental properties with five or more units. Each segment is further disaggregated into markets (e.g., New Construction, Retrofit, Replace on Burnout), and end-uses (e.g., space heating, water heating, space cooling, lighting, home appliance, and other). Each end-use comprises one or more specific measure categories. Not all measure categories tracked by Focus can be linked to a market/end-use/measure in the Potential Study, and some market/end-use/measure combinations have no current corollary in Focus Programming.

In a separate communication, supplementing findings of the published report, ECW provided annual 2012 energy saving values for each measure category. We summed program savings for each measure category tracked by Focus and compared that value to its market potential for the year 2012. For measures where current annual savings are low relative to the 2012 potential there may be an opportunity for programs to increase their efforts. It should be understood that not every apparent opportunity will easily be realized. There are sometimes good reasons why annual savings for a given measure are low relative to potential. For example, a measure may not have been in the market long enough to gain acceptance, or there may be substantial measure-specific market barriers.

Table 2-30 shows a comparison of residential program electric savings (kWh) with estimated 2012 potential. In this table, only the five market/end-use/measure combinations with the highest additional savings potential are shown. (Appendix F contains the complete table.) The two right-hand columns show the percentage of 2012 potential that was achieved from January to December 2010 and the additional annual potential that is estimated to exist. The table is sorted from highest to lowest estimated potential relative to current savings, grouped by program. Totals at the bottom of the table are for the program as a whole.

Table 2-30. Comparison of Focus Electric Energy Impacts (Net, 12-month Period from January 1 to December 31, 2010) and Achievable Potential—Residential Markets

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
ACES	Common Area Lighting Improvements in Multifamily	6,266,200	2.9%	505,062	0.7%	8.1%	5,761,138
ACES	CFL Bulbs, purchased replacement (2012)	5,276,272	2.4%	1,986,683	2.6%	37.7%	3,289,590
ACES	Wx - Direct Install	2,770,320	1.3%	0	0.0%	0.0%	2,770,320
ACES	ECM Furnace	355,566	0.2%	26,607	0.0%	7.5%	328,959

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
ACES	Water Heater Blanket	263,101	0.1%	0	0.0%	0.0%	263,101
Residential	Wx - Direct Install	33,254,449	15.2%	570,964	0.8%	1.7%	32,683,485
Residential	CFL Bulbs, purchased replacement (2012)	74,276,305	34.0%	45,987,085	60.9%	61.9%	28,289,220
Residential	Whole-house Electricity-Use Feedback Display Retrofit	23,478,000	10.7%	0	0.0%	0.0%	23,478,000
Residential	ECM Furnace	19,236,625	8.8%	7,081,531	9.4%	36.8%	12,155,094
Residential	Common Area Lighting Improvements in Multifamily	7,594,950	3.5%	0	0.0%	0.0%	7,594,950

Table 2-31 corresponds to Table 2-30—a comparison of residential program savings with estimated 2012 potential—but for gas energy savings. Once again, it only shows five market/end use/measure combinations with the highest savings potential. Note that the total potential is actually lower than the sum of the included measure category potentials. This is because some measures not in the top five categories have negative therm savings, offset by electric savings. The total reflects the negative values that are not included in the table.

Table 2-31. Comparison of Focus Gas Energy Impacts (Net, 12-month Period from January 1 to December 31, 2010) and Achievable Potential—Residential Markets

	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
ACES	Boiler Controls-Gas	172,321	4.9%	3,210	0.1%	1.9%	169,110
ACES	Drainwater heat recovery	152,464	4.3%	0	0.0%	0.0%	152,464
ACES	Wx - Direct Install	112,544	3.2%	0	0.0%	0.0%	112,544
ACES	Mainline Air vent (MF) - gas	24,996	0.7%	0	0.0%	0.0%	24,996
ACES	Hot Water - Electric	0	0.0%	-11,898	-0.5%		11,898
Residential	Wx - Direct Install	3,290,886	93.5%	96,324	4.1%	2.9%	3,194,562
Residential	Low Flow Showerhead (w/ Gas DHW)	1,011,447	28.7%	7,504	0.3%	0.7%	1,003,944
Residential	Drainwater heat recovery	378,750	10.8%	0	0.0%	0.0%	378,750

	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Residential	Setback Thermostats	323,756	9.2%	0	0.0%	0.0%	323,756
Residential	High Efficiency Boiler w/ indirect DHW	145,975	4.1%	0	0.0%	0.0%	145,975

Table 2-32 continues the series with business program electricity savings.

Table 2-32. Comparisons of Focus Electric Energy Impacts (Net, 12-month Period from January 1 to December 31, 2010) and Achievable Potential—Business Markets

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Agriculture	Greenhouses - Space Heating	120,944	0.4%	1,124	0.0%	0.9%	119,820
Agriculture	Grain Drying Operations - Process Improvements	169,301	0.5%	126,367	1.4%	74.6%	42,934
Agriculture	Hot Water - Electric	0	0.0%	-6,262	-0.1%		6,262
Commercial	HVAC RCx / Controls	5,020,177	14.6%	499,382	5.7%	9.9%	4,520,795
Commercial	DHW System improvements	2,825,023	8.2%	16,670	0.2%	0.6%	2,808,352
Commercial	Faucets / Nozzles	745,842	2.2%	0	0.0%	0.0%	745,842
Commercial	Gas Heating Equip	655,827	1.9%	25,442	0.3%	3.9%	630,384
Commercial	Shell improvement	681,377	2.0%	53,357	0.6%	7.8%	628,021
Industrial	Steam Production - Improved Operations and Maintenance	6,006,191	17.5%	0	0.0%	0.0%	6,006,191
Industrial	Process Heating (G) - Improved Operations and Maintenance	4,689,951	13.7%	0	0.0%	0.0%	4,689,951
Industrial	Steam Production - Improved System Design and Controls	4,597,218	13.4%	0	0.0%	0.0%	4,597,218

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Industrial	Process Heating (G) - Insulation and Sealing of System Components	2,463,518	7.2%	0	0.0%	0.0%	2,463,518
Industrial	Steam Production - Waste and/or Process Heat Recovery	1,559,723	4.5%	0	0.0%	0.0%	1,559,723

Table 2-33 completes the series with Business Program gas savings.

Table 2-33. Comparisons of Focus Gas Energy Impacts (Net, 12-month Period from January 1 to December 31, 2010) and Achievable Potential—Business Markets

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Agriculture	Dairy/Livestock Operation - Milking Parlor	19,233,789	2.3%	3,093,572	1.1%	16.1%	16,140,217
Agriculture	Dairy/Livestock Operation - Lighting	4,248,149	0.5%	102,433	0.0%	2.4%	4,145,716
Agriculture	Dairy/Livestock Operation - Ventilation	656,949	0.1%	386,332	0.1%	58.8%	270,617
Commercial	Lighting controls / design	78,281,201	9.3%	3,429,765	1.3%	4.4%	74,851,435
Commercial	Refrig - RCx / controls	56,305,004	6.7%	7,051,410	2.6%	12.5%	49,253,593
Commercial	HVAC RCx / Controls	47,204,099	5.6%	7,205,951	2.6%	15.3%	39,998,148
Commercial	Lighting equipment	87,755,510	10.4%	57,109,659	20.9%	65.1%	30,645,852
Commercial	Cooling Equipment	27,138,539	3.2%	1,042,519	0.4%	3.8%	26,096,020
Industrial	Motors - VSD, Motor Optimization and Efficient Motors	97,521,933	11.5%	19,970,580	7.3%	20.5%	77,551,353
Industrial	Motors - System Component Improvement and Replacement	61,694,668	7.3%	0	0.0%	0.0%	61,694,668

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Industrial	Lighting - Efficient System Design and Controls	55,664,687	6.6%	2,751,122	1.0%	4.9%	52,913,565
Industrial	Process Cooling - VSD, Motor Optimization and Efficient Motors	25,116,332	3.0%	0	0.0%	0.0%	25,116,332
Industrial	HVAC - Efficient System Design and Controls	21,099,215	2.5%	158,444	0.1%	0.8%	20,940,771

3. BUSINESS PROGRAMS EVALUATION

3.1 OVERVIEW OF KEY ACTIVITIES

This chapter describes our evaluation of Focus Business Programs program activity during 2010. The CY10 evaluation covers program year 2010 (January 1 through December 31, 2010). This chapter summarizes the following:

- Reports delivered in contract year 2010
- Energy impacts
- Education and Training untracked attributable savings
- Business Renewable projects.

3.2 REPORTS DELIVERED IN 2010

- *Business Programs: Supply-side Evaluation.* April 22, 2010
- *Business Programs: Education and Training Untracked Attributable Savings.* October 29, 2010
- *Business Programs Impact Evaluation Report: Last Quarter of Calendar Year 2009 and First Two Quarters of Calendar Year 2010.* January 27, 2011.

3.3 ENERGY IMPACTS

The evaluation team has implemented 13 rounds of data collection and document review to estimate net energy savings for Business Programs. The CY10 impact evaluation included one round of data collection and document review. It covered measures implemented during the last quarter of Calendar Year 2009 (CY09) and the first two quarters of Calendar Year 2010 (CY10)[23] (October 1, 2009, through June 30, 2010). KEMA reported the CY10 impact evaluation results in the *Business Programs Impact Evaluation Report: Last Quarter of Calendar Year 2009 and First Two Quarters of Calendar Year 2010* (January 27, 2011).

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.

[23] "Calendar Year 2010" refers to program implementation between January 1, 2010, and December 31, 2010.

- **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 CY10 impact evaluation

The final CY10 impact evaluation included measures implemented between October 1, 2009, and June 30, 2010. Data collection and document review to estimate net energy savings for Business Programs used similar procedures and protocols that were used in the CY09 impact evaluation.

The adjustment factors are calculated separately for each energy unit (kWh, kW, and therms) in combination with each measure group and for the 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 the sampling measure groups and for Business Programs overall. For some sampling measure groups the precision achieved was insufficient to report as a stand-alone estimate. Measure groups with relative errors greater than 40 percent for their primary savings type were allocated into other measure groups. The final reporting measure groups include Non-Small CFL Lighting, HVAC, Expanded Process, Boilers and Burners, Small CFLs, Refrigeration, and Other.

A. RESULTS

This section provides the results of the CY10 impact evaluation. The results are provided by the overall program and each sector for kWh, kW, and therms in the following order:

- Gross savings adjustment factor
- Attribution factor
- Realization rate.

Table 3-1 shows the CY10 gross savings adjustment factors by reporting measure group. The gross savings adjustment factor combines the installation rate and the engineering verification factor to adjust the tracking estimate of gross savings. The gross savings adjustment factor is greater than 90 percent for all three energy units, indicating that the program is doing an effective job of estimating gross energy savings. Most of the measure group level adjustment factors are above 90 percent. Notable exceptions include the Expanded Process kW estimate at 78.1 percent and the Other therms estimate at 62.7 percent.

The CY10 program overall therms gross savings adjustment factor is less than the previous program year at the 95 percent confidence level. The other two energy units are statistically consistent with CY09 results.

Table 3-1. CY10 Gross Savings Adjustment Factors by Reporting Measure Group

Measure Group	kWh				kW				Therms			
	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	3	96.7%	9.2%	0.5%	2	100.0%	<0.1%	0.2%	226	105.0%	10.4%	32.2%
Non-small CFL lighting	364	100.8%	1.2%	39.6%	329	92.1%	5.9%	37.3%	-	-	-	-
Refrigeration	116	116.5%	4.8%	11.7%	113	121.6%	8.3%	9.5%	3	103.1%	3.4%	2.2%
HVAC	73	88.0%	6.8%	7.9%	47	102.4%	3.1%	18.4%	79	91.4%	6.6%	31.1%
Expanded process	26	86.3%	19.6%	16.0%	25	78.1%	19.2%	11.6%	20	98.0%	4.6%	22.7%
Small CFLs	21	100.0%	<0.1%	7.3%	21	100.0%	<0.1%	10.6%	-	-	-	-
Other	50	98.6%	17.2%	17.1%	42	94.2%	27.3%	12.3%	27	62.7%	38.2%	11.9%
Business Programs overall	**653**	**99.1%**	**4.1%**	**100.0%**	**579**	**96.8%**	**4.3%**	**100.0%**	**355**	**93.8%**	**7.5%**	**100.0%**

Table 3-2 shows the attribution adjustment factors by reporting measure group. The CY10 attribution factors for the program overall are 59.8 percent, 58.8 percent, and 46.7 percent for kWh, kW, and therms, respectively. The CY10 adjustment factor for therms is less than that of CY09 and is statistically significant at the 95 percent level of confidence. The kWh and kW estimates are statistically consistent with CY09.

For the kWh energy unit, the attribution adjustment factors at the reporting measure group level are above 50 percent for all but the HVAC measure group (7.9 percent of the overall tracking kWh savings). For the kW energy unit, the attribution adjustment factors are above 50 percent for all but the HVAC (18.4 percent of tracking kW) and refrigeration (9.5 percent of tracking kW) measure groups. For the therms energy unit, the attribution adjustment factors are above 50 percent for all but the boilers and burners measure group (32.2 percent of tracking therms). The low therms attribution for the boilers and burners measure group is primarily a function of boiler service buydowns, which make up a significant portion of the therm savings in this group and generally received poor attribution (18 percent on average).

Table 3-2. CY10 Attribution Factors by Reporting Measure Group

Measure Group	kWh				kW				Therms			
	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	3	100.1%	<0.1%	0.5%	2	100.1%	<0.1%	0.2%	217	27.6%	9.6%	32.2%
Non-small CFL lighting	351	59.8%	5.9%	39.6%	318	61.3%	5.3%	37.3%	-	-	-	-
Refrigeration	115	50.8%	7.0%	11.7%	112	46.2%	7.1%	9.5%	3	95.1%	18.1%	2.2%
HVAC	72	40.0%	15.6%	7.9%	42	44.6%	22.9%	18.4%	74	52.1%	11.6%	31.1%
Expanded process	26	58.7%	12.0%	16.0%	25	53.7%	14.7%	11.6%	20	65.6%	9.3%	22.7%
Small CFLs	21	84.1%	0.1%	7.3%	21	84.2%	0.1%	10.6%	-	-	-	-
Other	48	66.9%	26.1%	17.1%	40	78.1%	11.1%	12.3%	28	51.9%	11.4%	11.9%
Business Programs overall	**636**	**59.8%**	**5.1%**	**100.0%**	**560**	**58.8%**	**6.3%**	**100.0%**	**342**	**46.7%**	**5.4%**	**100.0%**

Tables 3-3a and 3-3b show the CY10 realization rates by reporting measure group. The realization rates combine the effect of the gross savings adjustment factors and the attribution factors. For the Business Programs overall, the CY10 therms adjustment factor is less than

the CY09 factor and statistically significant at the 95 percent level of confidence. The kWh and kW estimates are statistically consistent with CY09.

The kWh realization rate is greater than 50 percent for all measure groups except HVAC (35.2 percent realization rate, 7.9 percent of tracking savings). The realization rates for the non-small CFL lighting and refrigeration measure groups are near 60 percent, accounting for 51.3 percent of tracking kWh savings.

The kW realization rate is greater than 50 percent for all measure groups except HVAC (45.7 percent realization rate, 18.4 percent of tracking savings) and expanded process (42.0 percent realization rate, 11.6 percent of tracking savings).

The therms realization rate is less than 50 percent for most measure groups, particularly boilers and burners (29.0 percent realization rate, 32.2 percent of tracking savings). However, the expanded process group has a relatively high therms realization rate of 64.3 percent, representing 22.7 percent of tracking savings.

The program implemented a number of changes in the second half of 2010. One change was to eliminate service buy-down measures, which typically produce poor attribution adjustment factors (18 percent on average). As part of the impact analysis, the evaluation team also calculated realization rates that included only non-service buy-down measures, shown in Tables 3-3a and 3-3b. The non-service buy-down realization rates were used to determine verified gross savings for measures installed in the second half of the year.

Table 3-3a. CY10 Realization Rates by Reporting Measure Group, January through June

Measure Group	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings
Boilers & burners	3	96.8%	9.2%	0.5%	2	100.1%	<0.1%	0.2%	217	29.0%	10.5%	32.2%
Non-small CFL lighting	351	60.3%	6.0%	39.6%	318	56.5%	6.1%	37.3%	-	-	-	-
Refrigeration	115	59.2%	8.5%	11.7%	112	56.1%	9.5%	9.5%	3	98.1%	18.9%	2.2%
HVAC	72	35.2%	14.0%	7.9%	42	45.7%	23.5%	18.4%	74	47.7%	11.1%	31.1%
Expanded process	26	50.7%	15.5%	16.0%	25	42.0%	15.4%	11.6%	20	64.3%	9.6%	22.7%
Small CFLs	21	84.1%	0.1%	7.3%	21	84.2%	0.1%	10.6%	-	-	-	-
Other	48	65.9%	28.2%	17.1%	40	73.6%	23.8%	12.3%	27	32.5%	21.1%	11.9%
Business Programs overall	**636**	**59.3%**	**5.7%**	**100.0%**	**560**	**56.9%**	**6.6%**	**100.0%**	**342**	**43.8%**	**6.2%**	**100.0%**

Table 3-3b. CY10 Realization Rates by Reporting Measure Group, July through December

Measure Group	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings
Boilers & Burners	3	96.8%	9.2%	0.5%	2	100.1%	<0.1%	0.2%	33	44.6%	26.1%	12.3%
Non-Small CFL Lighting	351	60.3%	6.0%	39.6%	318	56.5%	6.1%	37.3%	-	-	-	-
Refrigeration	55	75.1%	11.0%	7.1%	52	76.0%	17.8%	5.4%	3	98.1%	18.9%	2.2%
HVAC	64	32.3%	16.1%	5.3%	35	57.5%	19.8%	8.5%	42	36.9%	13.1%	19.8%
Expanded Process	16	60.0%	26.8%	9.8%	15	47.3%	22.0%	6.8%	20	64.3%	9.6%	22.7%
Small CFLs	21	84.1%	0.1%	7.3%	21	84.2%	0.1%	10.6%	-	-	-	-
Other	48	65.9%	28.2%	17.1%	40	73.6%	23.8%	12.2%	27	32.5%	21.1%	11.9%
Business Programs Overall	**636**	**59.3%**	**5.7%**	**100.0%**	**560**	**56.9%**	**6.6%**	**100.0%**	**342**	**43.8%**	**6.2%**	**100.0%**

3.3.3 Verified tracked energy impacts[24]

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 contract year 2010, Table 3-4a gives tracking and verified gross savings and net savings by sector and for Business Programs overall. These estimates are based on the savings tracked for this period with the CY10 adjustment factors; that is, the estimates of the adjustment factors by reporting measure group reported in the *Business Programs Impact Evaluation Report: Last Quarter of Calendar Year 2009 and First Two Quarters of Calendar Year 2010* (January 27, 2011).

[24] This report recommended a separate set of adjustment factors and realization rates for the second half of the year; the adjustment factors in Table 3-1 and the realization rates in Table 3-3 apply to the first six months of the year. We apply non-service buy-down ratios that take into account program design changes for measures installed after July 1, 2010.

Figure 3-1. Verified Gross Electric Energy Impacts by Program, Business Programs CY10 (January 1–December 31, 2010)

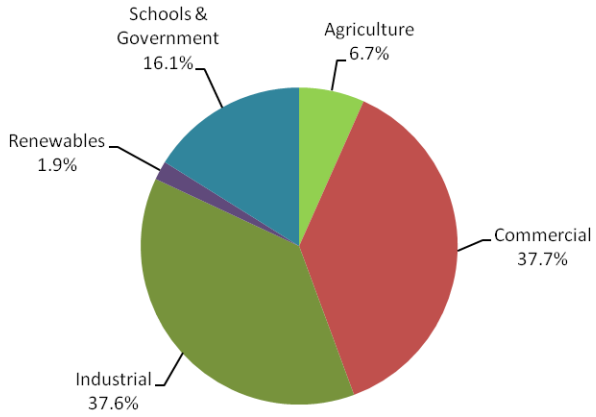


Figure 3-2. Verified Gross Electric Energy Impacts by Program, Business Programs, Program to Date (July 1, 2001–December 31, 2010)

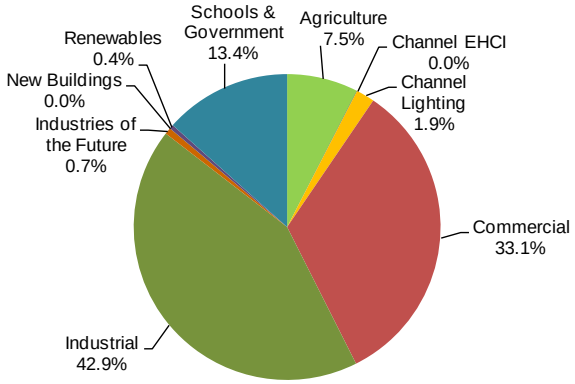


Figure 3-3. Verified Gross Gas Energy Impacts by Program, Business Programs CY10 (January 1–December 31, 2010)

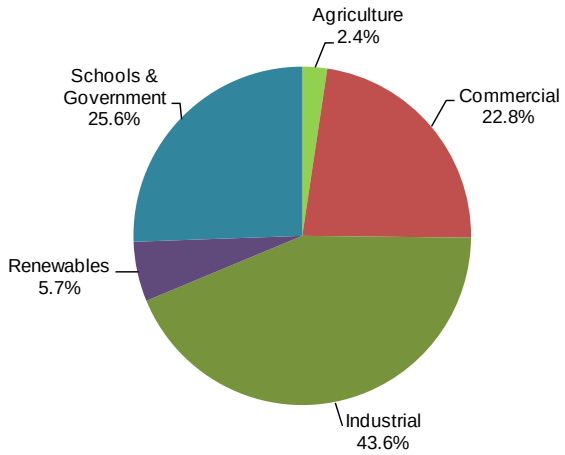


Figure 3-4. Verified Gross Gas Energy Impacts by Program, Business Programs, Program to Date (July 1, 2001–December 31, 2010)

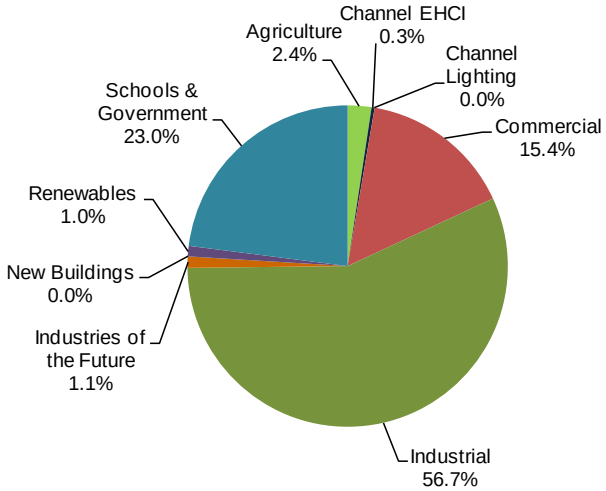


Table 3-4a. All Business Programs: Tracked Annual Energy Impacts
CY10 (January 1–December 31, 2010)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
Agriculture	31,988,223	6,760	680,481	31,431,705	6,522	476,311	20,196,557	4,507	237,561
Commercial	174,586,245	37,988	5,028,526	177,540,005	38,040	4,568,313	106,379,307	22,573	2,051,025
Industrial	186,875,857	29,476	9,069,399	177,045,564	26,451	8,730,693	105,783,618	15,512	4,356,405
Renewables	9,822,649	1,750	1,968,465	9,068,703	1,785	1,143,702	4,641,522	1,062	466,235
Schools & Government	79,403,989	17,866	5,707,184	75,901,201	17,547	5,122,898	41,498,601	9,385	2,151,648
Total	**482,676,963**	**93,839**	**22,454,056**	**470,987,177**	**90,345**	**20,041,917**	**278,499,604**	**53,039**	**9,262,874**

Tables 3-4b through 3-4i provide tracking and verified gross savings and net savings by sector and for Business Programs overall for CY09 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
- 18MCP: Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period–Final Report (April 2, 2009).
- CY09: Business Programs Impact Evaluation Report: Last Quarter of the 18-month Contract Period and First Three Quarters of CY09–Final Report (March 31, 2010).

Table 3-4b. All Business Programs: Tracked Annual Energy Impacts
CY09 (January 1–December 31, 2009)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
Agriculture	31,568,821	7,111	472,039	32,521,930	7,495	431,632	20,315,325	4,357	338,414
Commercial	183,013,839	43,352	3,463,041	183,787,458	43,787	3,489,720	126,673,721	25,762	1,584,789
Industrial	212,711,054	35,970	9,828,622	216,754,701	38,817	10,417,118	135,227,818	22,040	6,940,456
Schools & Government	66,326,581	19,892	6,343,293	67,729,092	20,313	6,374,218	43,340,645	9,602	2,599,172
Total	**493,620,294**	**106,325**	**20,106,995**	**500,793,181**	**110,412**	**20,712,687**	**325,557,509**	**61,761**	**11,462,832**

Table 3-4c. 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 Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
Agriculture	38,029,900	9,465	743,242	36,128,971	9,181	572,464	21,301,729	5,206	96,806
Commercial	149,437,093	36,900	2,220,203	135,988,211	35,055	2,286,817	94,147,243	24,354	754,992
Industrial	210,881,014	34,282	13,967,874	196,119,343	31,196	13,269,480	111,766,937	16,798	8,380,724
Schools & Government	44,505,451	13,207	5,213,848	44,060,397	12,403	4,118,940	19,137,344	5,614	1,564,154
Total	**442,853,458**	**93,853**	**22,145,167**	**412,296,922**	**87,835**	**20,247,701**	**246,353,253**	**51,971**	**10,796,676**

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

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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 3-4e. All Business Programs: Tracked Annual Energy Impacts
FY06 (July 1, 2005–June 30, 2006)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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 3-4f. All Business Programs: Tracked Annual Energy Impacts
FY05 (July 1, 2004–June 30, 2005)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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 3-4g. All Business Programs: Tracked Annual Energy Impacts
FY04 (July 1, 2003–June 30, 2004)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
Agriculture	15,990,832	3,539	81,250	11,099,178	2,874	63,415	5,886,212	1,550	53,368
Commercial	42,270,841	9,350	589,867	37,843,772	9,633	589,498	19,910,030	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 3-4h. All Business Programs: Tracked Annual Energy Impacts
FY03 (July 1, 2002–June 30, 2003)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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	0	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 3-4i. All Business Programs: Tracked Annual Energy Impacts
FY02 (July 1, 2001–June 30, 2002)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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 through December 31, 2010. The tables also include a column that displays the percentage of total kWh, kW, or therm savings that come 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. Please note that the measure analysis group adjustment factors, and not sector level factors, are applied to derive the verified gross and verified net values.

A. AGRICULTURAL

Table 3-5. Agricultural
CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Agriculture	6,389,775	20.3%	1,261	19.3%	325,134	68.3%
Boilers & Burners	16,390	0.1%	4	0.1%	40,093	8.4%
Building Shell	704	0.0%	0		4,489	0.9%
Compressed Air, Vacuum Pumps	56,612	0.2%	6	0.1%	0	
Domestic Hot Water	2,274,849	7.2%	260	4.0%	-5,528	-1.2%
Food Service	2,936	0.0%	0		268	0.1%
HVAC	3,589,247	11.4%	1,246	19.1%	106,678	22.4%
Laundry	77,425	0.2%	18	0.3%	5,228	1.1%
Lighting	15,223,251	48.4%	2,790	42.8%	0	
Motors & Drives	3,546,834	11.3%	888	13.6%	-51	0.0%
Refrigeration	253,683	0.8%	49	0.8%	0	
Total	**31,431,705**	**100.0%**	**6,522**	**100.0%**	**476,311**	**100.0%**

B. COMMERCIAL

Table 3-6. Commercial
CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Boilers & Burners	-67,645	0.0%	-9	0.0%	1,506,942	33.0%
Building Shell	733,609	0.4%	139	0.4%	102,937	2.3%
Compressed Air, Vacuum Pumps	682,325	0.4%	125	0.3%	0	
Domestic Hot Water	278,246	0.2%	32	0.1%	32,161	0.7%
Food Service	1,407,768	0.8%	195	0.5%	58,505	1.3%
HVAC	20,809,234	11.7%	12,414	32.6%	2,459,776	53.8%
Information Technology	7,882,055	4.4%	444	1.2%	0	
Laundry	-15,663	0.0%	-20	-0.1%	46,082	1.0%
Lighting	90,667,315	51.1%	17,208	45.2%	0	
Motors & Drives	7,302,437	4.1%	350	0.9%	0	
New Construction	6,647,111	3.7%	2,112	5.6%	258,371	5.7%
Pools	3,297	0.0%	0		11,610	0.3%
Process	301,818	0.2%	18	0.0%	1,837	0.0%
Refrigeration	40,796,435	23.0%	5,033	13.2%	90,093	2.0%
Vending, Plug Loads	111,662	0.1%	0		0	
Total	**177,540,005**	**100.0%**	**38,040**	**100.0%**	**4,568,313**	**100.0%**

C. INDUSTRIAL

Table 3-7. Industrial
CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Boilers & Burners	729,107	0.4%	97	0.4%	2,989,156	34.2%
Building Shell	52,499	0.0%	0		197,885	2.3%
Compressed Air, Vacuum Pumps	43,534,940	24.6%	5,530	20.9%	56,253	0.6%
Domestic Hot Water	3,185	0.0%	0		2,117	0.0%
Food Service	22,335	0.0%	3	0.0%	1,986	0.0%
HVAC	5,495,409	3.1%	3,887	14.7%	1,325,014	15.2%
Industrial Ovens and Furnaces	848,132	0.5%	135	0.5%	274,772	3.1%
Information Technology	466,878	0.3%	35	0.1%	0	
Lighting	64,166,180	36.2%	8,643	32.7%	0	
Motors & Drives	29,989,753	16.9%	4,111	15.5%	0	
New Construction	994,931	0.6%	130	0.5%	48,460	0.6%
Process	13,885,596	7.8%	1,651	6.2%	3,761,504	43.1%
Refrigeration	9,378,107	5.3%	1,247	4.7%	19,067	0.2%
Vending, Plug Loads	26,519	0.0%	0		0	
Waste Water Treatment	7,451,993	4.2%	981	3.7%	54,477	0.6%
Total	**177,045,564**	**100.0%**	**26,451**	**100.0%**	**8,730,693**	**100.0%**

D. SCHOOLS/GOVERNMENT

Table 3-8. Schools/Government
CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Boilers & Burners	534,013	0.7%	5	0.0%	2,188,315	42.7%
Building Shell	483,246	0.6%	0		192,950	3.8%
Compressed Air, Vacuum Pumps	311,314	0.4%	45	0.3%	0	
Domestic Hot Water	172,657	0.2%	65	0.4%	72,945	1.4%
Food Service	1,245,572	1.6%	225	1.3%	61,983	1.2%
HVAC	26,069,955	34.3%	10,338	58.9%	2,056,834	40.1%
Information Technology	2,553,343	3.4%	187	1.1%	0	
Laundry	35,355	0.0%	38	0.2%	71,423	1.4%
Lighting	34,917,970	46.0%	5,075	28.9%	0	
Motors & Drives	4,976,524	6.6%	209	1.2%	0	
New Construction	3,867,337	5.1%	1,257	7.2%	377,079	7.4%
Pools	-1,085	0.0%	0		57,593	1.1%
Process	191,216	0.3%	45	0.3%	238	0.0%
Refrigeration	494,166	0.7%	59	0.3%	43,537	0.8%
Vending, Plug Loads	49,617	0.1%	0		0	
Total	**75,901,201**	**100.0%**	**17,547**	**100.0%**	**5,122,898**	**100.0%**

3.3.5 Untracked attributable savings

Untracked attributable savings (UAS) are defined as savings motivated by a program but not included in program tracking data. Three studies provide the basis for calculating the untracked attributable savings.

- *Impact Evaluation of the Education and Training Program*[25]
- *Business Programs: Education and Training Untracked Attributable Savings*[26]
- *Business Programs: Supply-Side Evaluation*[27]

The two studies addressing the Education and Training UAS apply similar principles. In 2008, KEMA conducted an Education and Training (E&T) UAS study that included process and impact evaluations of the Focus on Energy E&T program. The impact evaluation component of the 2008 study resulted in a recommendation to the PSCW for additional energy savings to be credited to the Focus Business Programs for its E&T activities.

The 2008 report established a methodology for estimating UAS for one-time projects[28] based on averages of trainee counts and savings estimates from the previous four years. The four-year average lessens the effect of year-to-year fluctuations in course attendance as well as other factors that may affect the likelihood of implementing projects after training courses that would result in UAS. The 2008 report based UAS for operations and maintenance (O&M) projects on a single year of data. KEMA used the per-trainee savings estimates from the 2008 report combined with the 2008 course attendance records to estimate 2009 E&T UAS.

Since the 2008 study, changes in program delivery, updated and expanded course offerings, and emphasis on O&M projects have made it necessary to update UAS estimates to reflect this greater emphasis on O&M courses. Due to a shift in course offerings towards O&M-focused courses and a limited evaluation budget for this round of evaluation, we focused data collection on O&M project savings estimates and continued to use the one-time project per-trainee savings estimates from the 2008 report. The primary purpose of the 2010 report was to provide an updated estimate of per-trainee UAS from O&M projects resulting from classes provided by the Focus on Energy E&T program. Other goals of the study were to estimate total E&T UAS estimates for 2010 and to provide a methodology for making similar estimates for courses offered in future years. The *Business Programs: Education and Training*

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[25] Christopher Dyson, Ken Agnew, Miriam Goldberg, Claire Palmgren, KEMA Inc. *Business Programs: Impact Evaluation of the Education and Training Program,* Final Report November 15, 2008.

[26] Shawn Bodmann, Chris Dyson, Tammy Kuiken, and Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings,* Final Report October 29, 2010.

[27] Christopher Dyson, Shawn Bodmann, Karen Rothkin, Maggie Pinckard, Erika Morgan, Ryan Barry, Miriam Goldberg, KEMA Inc. *Business Programs: Supply-Side Evaluation*. April 22, 2010.

[28] This appendix uses the terms “one-time projects” and “O&M projects” throughout. One-time projects involve changes to the facility’s energy-using equipment. Examples include installing a different type of lighting or installing a new boiler. O&M projects involve changes in routine operations, building management practices, or equipment maintenance practices. Examples include inspecting equipment more often, cleaning equipment more often, and using equipment on a different schedule.

Untracked Attributable Savings report[29] provides the basis for calculating the untracked attributable savings for 2010 and instructions on how to conduct future evaluations.

The evaluation counted energy savings in the year in which the measure was implemented ("first-year savings"). For the one-time measures, we counted the first-year savings in that program year because we knew what year the measure was completed. To be considered attributable, one-time measures must have been completed in the first four years after the training course.

For one-time projects, the analysis methodology reported UAS resulting in year X as the result of cumulative influences of E&T program training in prior years. For example, new measure implementation in 2010 due to E&T program training was the sum of 2006 training influence on adoption four years out, 2007 training influence on adoption three years out, 2008 training influence on adoption two years out, and 2009 training influence on adoption one year out. This savings estimation approach is analogous to counting tracked energy savings implemented in the current year that were the result of multiple years of the program working with the customer on a measure. The 2010 evaluation used the one-time per-project savings estimates from the 2008 evaluation and applied those savings to projects undertaken in 2006 through 2009 to calculate the one-time savings estimates for 2010.

For O&M projects, the evaluation team computed new per-project estimates for the 2010 evaluation. These per project estimates were based on trainees who took courses in 2008 and 2009 and applied to the 2009 course attendance to generate the 2010 savings estimates. Table 3-9 shows UAS estimates for year 2010 by project type (one-time vs. O&M), course type (less- or more-O&M focused) and savings type (kWh, kW, and therms).

Table 3-9. Untracked Attributable Savings (UAS) Estimates for 2010 by Project Type, Course Type, and Savings Type

	O&M Projects		One-time Projects		
Savings	Less O&M Focus	More O&M Focus	Less O&M Focus	More O&M Focus	Total
kWh	2,707,516	7,254,391	3,826,705	1,970,030	15,758,642
kW	845	776	366	341	2,328
Therm	43,179	3,342,470	3,175,331	24,969	6,585,949

We engaged in the following activities to calculate these 2010 UAS estimates:

1. Conducted a computer-aided telephone interview (CATI) survey to discover potential untracked, attributable O&M projects. The subtasks for this task included:
    a. Collected 2008 and 2009 course offering information and training counts from the program.
    b. Filtered trainees to remove program and utility company staff. Also ensured that people who took multiple courses appeared only once in the sample.
    c. Identified courses with more and less O&M focus.

[29] Shawn Bodmann, Christopher Dyson, Tammy Kuiken, Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings*, October 29, 2010.

   d. Drew a sample of trainees from 2008 and 2009 courses for participant surveys.

   e. Made survey calls.

2. Conducted an engineering review of projects discovered in the CATI. The subtasks for this task included:

   a. Filtered the list of projects found in the CATI surveys, based on program attribution, whether the project was tracked in WISeerts, and whether the project was an O&M project.

   b. Drew a sample of potential projects for engineering reviews to confirm project type, attribution, and estimate energy savings for these projects.

   c. Estimated 2010 E&T UAS for O&M projects using the data collected in engineering review.

3. Calculated per-trainee savings for O&M projects for more- and less-O&M-focused courses. The subtasks for this task included:

   a. Aggregated engineering estimates to more- and less-O&M-focused course level using data from step 2.

   b. Calculated 2010 O&M total UAS based on per-trainee UAS and 2009 course attendance (after the filtering applied in step 1).

4. Reanalyzed data on 2004–2007 courses (originally reported in the 2008 E&T UAS report) to provide estimates of per-trainee savings for one-time projects for the more- and less-O&M-focused courses. The subtasks for this task included:

   a. Split 2004–2007 courses into more- and less-O&M-focused categories and recalculate per-trainee UAS estimates for one-time projects for each course category.

   b. Estimated 2010 E&T UAS for one-time projects based on 2006–2007 course attendance (as reported in 2008) and 2008–2009 course attendance (after the filtering applied in step 1), and the per course type estimates (step 4a).

5. Calculated total 2010 E&T UAS by summing the 2010 E&T UAS for O&M projects (Step 3) and 2010 E&T UAS for one-time projects (Step 4).

The supply-side UAS use a different approach. In April 2010 the evaluation team issued a report that estimated Untracked Attributable Savings (UAS) based on supply-side market effects from Focus BP. This report—the Focus on Energy Evaluation Business Programs: Supply-Side Evaluation—estimated UAS for a number of measures including high-bay fluorescents, high-performance T8s, high-efficiency rooftop air conditioners, modulating hot water boilers, and boiler tune-ups. It should be noted that these UAS are separate from those that will be credited to Focus BP as a result of their Education and Training program.

In determining how much UAS to credit Focus BP with from the supply-side market effects, we reviewed our methodologies (different methodologies were used for different measures), the robustness of the sample sizes, the level of program attribution, and other considerations to determine which UAS estimates we had the greatest confidence in. Based on this review, we proposed the PSCW to award UAS to Focus BP for the high-bay fluorescents and high-

performance T8s. These two measures accounted for the bulk of the estimated UAS for kWh and kW. The PSCW agreed with this decision in January 2011.

The April 2010 supply-side report had calculated UAS estimates for Calendar Year 2009 (CY09) Focus BP activities. Since the supply-side study that been scheduled to cover Calendar Year 2010 (CY10) program activities had been cancelled in 2010 for budgetary reasons, we had to determine how the UAS estimates from the April 2010 supply-side report could be applied to CY10 Focus BP activities. We decided that the most straightforward way to do this was to take the ratio of CY09 UAS to CY09 gross tracked savings (kWh and kW) for the high-bay fluorescents and high-performance T8s and apply these ratios to the CY10 gross tracked savings for these same measures. The formula for this would be:

(CY09 UAS x CY10 gross tracked savings)/CY09 gross tracked savings = CY10 UAS

We proposed this approach to the PSCW and in January 2011 they agreed. The following table shows the CY10 UAS estimates for kW and kWh using this approach.

Table 3-10. Supply-side Untracked Attributable Savings

Measure	CY09 Gross Tracked Savings		CY09 UAS		CY10 Gross Tracked Savings		CY10 UAS	
	kWh	kW	kWh	kW	kWh	kW	kWh	kW
High bay fluorescent	141,126,197	29,554	47,788,940	9,751	14,796,137	3,115	5,010,350	1,028
High performance T8	10,625,229	2,274	2,868,783	596	89,177,068	17,677	24,077,566	4,633
Total	**151,751,426**	**31,828**	**50,657,723**	**10,347**	**103,973,205**	**20,793**	**29,087,917**	**5,661**

3.3.6 Shared Savings

At the behest of the PSCW, Focus on Energy and the WPL Shared Savings program began implementing a joint energy efficiency program on May 1, 2009. Under the joint program rules, customers interested in implementing energy efficiency projects in the WPL service territory receive a presentation on both the Shared Savings financing offer and the Focus on Energy incentive that would pertain to their project. The savings credit for joint program projects are added to the Focus program savings regardless of whether the project was identified or initiated by a Focus Energy Advisor or an WPL Account Manager. Projects that received the Focus incentive are already included in the WISeerts database and are evaluated and adjusted for as a part of the Focus impact evaluation. Projects that received WPL Shared Savings financing are included in the WPL iAvenue database, are evaluated and adjusted as part of the WPL impact evaluation, and must be added to the Focus savings external to the established adjustment factor methodology.

Projects that received Shared Savings financing and were implemented under the joint program need to be identified and their savings adjusted for inclusion in the annual Focus on Energy CY10 savings. Since the entire 2010 program year was under the joint program, all Shared Savings projects in 2010 are considered joint.

Adjustment factors from the impact evaluation are applied to the tracking savings to produce the net savings attributable to the joint program. However, the WPL Shared Savings 2010 impact evaluation is ongoing and the adjustment factor results are not final. The evaluator used the finalized adjustment factors from the Shared Savings 2009 program year evaluation to estimate the net savings resulting from the joint program projects in the WPL Shared

Savings database. Once the WPL evaluation has been finalized, the resulting net savings estimates will be updated to reflect the actual WPL results. Table 3-11 shows the 2009 realization rate and joint program net savings that should be added to the Focus on Energy CY10 savings.

Table 3-11. Savings from CY10 Joint Program Measures in iAvenue Database

	kWh	kW	Therms
Tracking savings	24,180,455	2,568	918,588
Realization rate	30.6%	39.7%	25.3%
Net savings	7,399,219	1,019	232,403

3.3.7 Program targets and accomplishments

Net program savings as verified by evaluation are shown in Table 3-12, along with the program goals and percentage of the goals that was achieved. The savings shown are for CY10. The presentation of verified net savings in this table includes the untracked attributable savings resulting from the Impact Evaluation of the Education and Training program (see Section 3.3.5) as well as supply-side effects. The program savings also include savings from Focus on Energy and the WPL Energy Shared Savings program. Please note that the measure analysis group adjustment factors, and not sector-level factors, are applied to derive the verified net values.

Table 3-12. Net Business Program Savings versus Business Program Portfolio Targets CY10 (January 1–December 31, 2010)

Program	kWh			kW			Therms		
	Net Savings Target	Net Savings Achieved	Percentage of 2010 Target	Net Savings Target	Net Savings Achieved	Percentage of 2010 Target	Net Savings Target	Net Savings Achieved	Percentage of 2010 Target
Agriculture	22,240,000	20,196,557	91%	4,862	4,507	93%	200,000	237,561	119%
Commercial	78,080,000	106,379,307	136%	16,000	22,573	141%	976,000	2,051,025	210%
Industrial	95,126,529	105,783,618	111%	15,378	15,512	101%	4,487,083	4,356,405	97%
Renewables	18,265,731	4,641,522	25%	2,143	1,062	50%	683,532	466,235	68%
Schools & Government	22,880,000	41,498,601	181%	6,292	9,385	149%	1,883,691	2,151,648	114%
Shared Savings		4,846,512			1,114			463,886	
UAS One-time		5,796,735			707			3,200,300	
UAS O&M		9,961,907			1,621			3,385,649	
UAS Supply Side		29,087,917			5,661			0	
Total Business Programs	**218,326,529**	**328,192,676**	**150%**	**42,532**	**62,142**	**146%**	**7,546,774**	**16,312,709**	**216%**

3.4 EDUCATION AND TRAINING UAS

The primary purpose of the *Education and Training Untracked Attributable Savings* report was to estimate per-trainee untracked attributable savings (UAS) from operations and maintenance (O&M) projects[30] resulting from classes provided by the Focus on Energy

[30] This section uses the terms “O&M projects” and “one-time projects” throughout. O&M projects involve changes in routine operations, building management practices, or equipment maintenance practices. Examples include inspecting equipment more often, cleaning equipment more often, and using equipment on a different schedule. One-time projects involve changes to the facility’s energy-using equipment. Examples include installing a different type of lighting or installing a new boiler.

Education and Training (E&T) program. These UAS are the E&T-attributable portion of energy savings from projects that were implemented at the building or facilities of the trainees' companies and do not appear in the WISeerts database.

In 2008, KEMA conducted an E&T UAS study that included process and impact evaluations of the Focus on Energy E&T program. The impact evaluation component of the 2008 study resulted in a recommendation to the PSCW for additional energy savings to be credited to the Focus Business Programs for its E&T activities. Since that 2008 study, changes in program delivery, updated and expanded course offerings, and emphasis on O&M projects have made it necessary to update UAS estimates to reflect this greater emphasis on O&M courses.

Secondary purposes of the study were to estimate total E&T UAS estimates for 2010 and to provide a methodology for making similar estimates for courses offered in future years. Due to a shift in course offerings towards O&M-focused courses and a limited evaluation budget, we focused on O&M project savings estimates for this round of evaluation.

According to Nancy Giere Associates, implementers of the E&T program training, all courses contain some O&M component, but some courses are more focused on O&M than others. KEMA worked with Nancy Giere Associates to identify courses that were more- and less-O&M focused. This section provides separate UAS estimates for each type of course. These separate UAS estimates should be more representative estimates for future UAS projections than estimates published in previous evaluations that did not separate by course focus.

3.4.1 Methodology

There were several research tasks for this evaluation, each with several sub-tasks:

1. Conduct a computer aided telephone interview (CATI) survey to discover potential untracked, attributable O&M projects. The subtasks for this task included:
    a. Collect 2008 and 2009 course offering information and training counts from the program.
    b. Filter trainees to remove program and utility company staff. Also ensure people who took multiple courses appeared only once in the sample.
    c. Identify courses with more and less O&M focus.
    d. Draw a sample of trainees from 2008 and 2009 courses for participant surveys.
    e. Make survey calls.
2. Conduct an engineering review of projects discovered in the CATI. The subtasks for this task included:
    a. Filter the list of projects found in the CATI surveys, based on program attribution, whether the project was tracked in WISeerts, and whether the project was an O&M project.
    b. Draw a sample of potential projects for engineering reviews to confirm project type, attribution, and estimate energy savings for these projects.

c. Estimate 2010 E&T UAS for O&M projects using the data collected in engineering review.

3. Calculate per-trainee savings for O&M projects for more- and less-O&M-focused courses. The subtasks for this task included:

   a. Aggregate engineering estimates to more- and less-O&M-focused course level using data from step 2.

   b. Calculate 2010 O&M total UAS based on per-trainee UAS and 2009 course attendance (after the filtering applied in step 1).

4. Reanalyze data on 2004–2007 courses (originally reported in the 2008 E&T UAS report) to provide estimates of per-trainee savings for one-time projects for the more- and less-O&M-focused courses. The subtasks for this task included:

   a. Split 2004–2007 courses into more- and less-O&M-focused categories and recalculate per-trainee UAS estimates for one-time projects for each course category.

   b. Estimate 2010 E&T UAS for one-time projects based on 2006–2007 course attendance (as reported in 2008) and 2008–2009 course attendance (after the filtering applied in step 1), and the per course type estimates (step 4a).

5. Calculate total 2010 E&T UAS by summing the 2010 E&T UAS for O&M projects (Step 3) and 2010 E&T UAS for one-time projects (Step 4).

A. CATI SURVEY OF TRAINEES

The first step in the evaluation was to conduct a computer-aided telephone interview (CATI) survey of a sample of E&T course trainees. The objective of the survey was to collect enough information about O&M projects that resulted from the training to inform follow-up calls that would estimate the energy savings from untracked and attributable projects. We surveyed trainees who took courses in 2008 and 2009 to ensure enough completions to calculate the estimates.

To obtain a CATI sample, KEMA filtered the course rosters provided by Nancy Giere Associates for all 2008 and 2009 courses. The rosters contained 2,046 trainees. The filtering process began by using variables in the course rosters to remove:

- All trainees with a status of “No-Show” or “Cancel” (346 trainees)
- All trainees with participant type of “Focus on Energy” or “Staff” (219 trainees)
- All trainees with state not equal to “WI” (63 trainees)
- All trainees from a company KEMA identified as an energy company (Wisconsin Power and Light Company, Focus on Energy, Madison Gas & Electric, Marshfield Utilities, WECC, Wisconsin Public Service, WPS, WPPI Energy, Xcel Energy: 13 trainees).

KEMA then inspected the database and removed duplicate entries for trainees that took more than one course. Trainees who took more than one course were assigned to the course that had the fewest number of trainees. The exception was trainees who took both building

operator certification (BOC) level I and level II courses. KEMA created a separate category for these trainees. This deduplication process resulted in the following removals:

- Duplicate entries of trainees that took more than one course in 2008 (90 entries)
- Duplicate entries of trainees that took more than one course in 2009 (59 entries)
- Duplicate entries of trainees that took one course in 2008 and one in 2009 (55 entries)
- Duplicate entries of trainees in BOC level I and II courses (nine entries).

Finally, KEMA removed trainees who did not list their phone numbers (six trainees). This resulted in a final population of 1,186 trainees from 2008 and 2009 courses. Table 3-13 summarizes the trainee filtering process.

Table 3-13. Trainee Filtering Process

Description	2008 Courses	2009 Courses	Total
Initial course counts	1,133	913	2,046
STATUS = "No-Show" or "Cancel"	184	162	346
PARTICIPANT TYPE = "Focus on Energy" or "Staff"	107	112	219
STATE ≠ "WI"	22	41	63
Utility name in "Company"	5	8	13
Took multiple 2008 or 2009 courses	90	59	149
Took course in 2008 and 2009[31]			55
Duplicates due to merging BOC I and BOC II trainees			9
Missing phone numbers			6
Total entries removed	408	382	860
Final population	683	503	1,186

KEMA set an overall quota of 201 CATI completes (17 percent response rate) based on the following information.

- CATI response rates from the 2008 E&T UAS study
- The number of CATI responses that generated a completed engineering review of an O&M project from the 2008 E&T UAS study
- The number of completed engineering reviews KEMA wanted for the current study (30 to 35).

KEMA conducted a telephone survey of the 1,186 Focus trainees between July 1 and July 21, 2010. We dialed 997 trainees and completed 189 surveys for an overall response rate of 19 percent. One hundred seventy-six (18 percent) of the dialed trainees refused to take the survey. We failed to contact 479 (48 percent) of the dialed trainees despite calling at least eight times and failed to contact 153 (15 percent) of the dialed trainees for other reasons such as incorrect phone numbers or the trainee no longer worked at the dialed phone number. One

[31] At this point, KEMA merged the 2008 and 2009 courses. Therefore, all removals after this point are listed for the total only.

hundred eighty-nine trainees (16 percent) were not dialed because the quota for that course was already filled. Table 3-14 summarizes the CATI dispositions.

Table 3-14. CATI Dispositions

Disposition	Trainees	Percentage Dialed
Completes	189	19%
Refused	176	18%
Not complete, dialed eight or more times	479	48%
Not complete, eligibility unknown	153	15%
Total dialed	997	100%
Never dialed (quota filled)	189	
Total	**1,186**	

B. ENGINEERING REVIEW

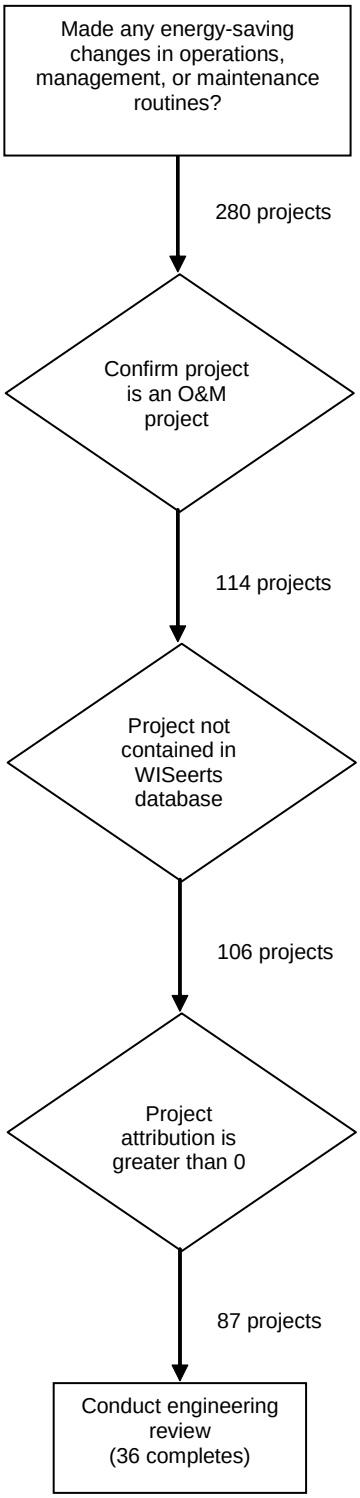
The purpose of the engineering calls was to collect enough technical information to allow the engineer to estimate energy savings from the project. The specific data that the engineers collected varied on a case-by-case basis as dictated by the needs of the particular project. Secondary objectives of the engineering calls were to obtain better descriptions of the projects and to more accurately assess whether they were tracked O&M projects. Finally, engineering calls also collected attribution data when it was missing from the CATI data.

The CATI survey identified 280 projects that were potentially untracked, attributable projects. The engineering review determined whether these projects were O&M projects, untracked, and attributable. This process resulted in 87 attributable, untracked, O&M projects. KEMA divided the projects into eight engineering strata based on the O&M focus of the course taken by the CATI respondent and the size of the respondent's company. KEMA set quotas for each of the engineering strata based on the number of projects within each strata and the variability of the engineering estimates in those strata in the 2008 E&T UAS report. Engineers completed estimates for 36 (41 percent) of these projects. Table 3-15 summarizes the number of projects and engineering completes within each of these eight strata. Figure 3-5 shows a flowchart of the filtering process.

Table 3-15. Disposition and Engineering Completions of CATI Identified Projects by Strata

O&M Focus	Company Size	CATI-Identified Projects	O&M Projects	Untracked O&M Projects	Attributable, Untracked O&M Projects	Quota	Engineering Completes
More	Small	77	33	33	25	5	4
	Medium	76	27	26	25	5	5
	Large	48	18	18	15	10	10
	Unknown	13	6	4	3	2	1
Less	Small	8	4	4	3	2	3
	Medium	17	6	5	1	2	1
	Large	40	20	16	15	6	12
	Unknown	1	0	0	0	0	0
Total		**280**	**114**	**106**	**87**	**32**	**36**

Figure 3-5. Filtering Chain for CATI-identified Energy Saving Projects



C. CALCULATION OF UAS

The primary goal of the study was to compute a *per-trainee* estimate for untracked, attributable O&M project savings. To do so, KEMA gathered savings data for individual projects. To extrapolate from the project level to the per-trainee level, KEMA followed these steps:

1. Calculate net project savings by multiplying gross project savings (as estimated by the engineering review process) by a project attribution factor. Project attribution was primarily based on the trainee's responses to the CATI survey (occasionally these attribution factors were adjusted based on new information uncovered in the engineering review).
2. Extrapolate net savings from the individual project level to the engineering strata level.
3. Divide total engineering strata savings by the number of CATI respondents in each engineering strata.
4. Extrapolate the CATI respondent savings to the entire post-filtering trainee population.
5. Compute total savings for more- and less-O&M-focused courses.
6. Divide total savings by the number of post-filtering trainees in each type of course.

3.4.2 Findings

A. ATTRIBUTABLE UNTRACKED O&M PROJECTS

KEMA calculated the average attribution of the 106 untracked O&M projects discovered in the CATI. This average was weighted based on the number of completed CATI surveys and number of trainees within a particular course, so that they accurately represent the post-filtering population of trainees. The weighted average attribution of the projects that occurred after participants took the course was 65 percent.

B. UAS FOR CY10

Table 3-16 shows the total UAS estimates for CY10. There are three savings metrics: kilowatt hours (kWh), kilowatts during the peak period[32] (kW), and therms.

Table 3-16. Total Untracked Attributable Savings for CY10

Savings	O&M Projects		One-time Projects		Total
	Less O&M Focus	More O&M Focus	Less O&M Focus	More O&M Focus	
kWh	2,707,516	7,254,391	3,826,705	1,970,030	15,758,642
kW	845	776	366	341	2,328
Therm	43,179	3,342,470	3,175,331	24,969	6,585,949

[32] For non-weather dependent measures (e.g., lighting), this is the average usage on weekdays from June 1 to August 31 between 1 pm and 4 pm. For weather dependent measures (e.g., HVAC), this is the maximum usage during the hottest day of the summer.

For CY10, KEMA estimated total O&M project UAS of about 10 million kWh, 1,600 kW, and 3.4 million therms. These savings are equivalent to about 20,000 kWh, 3 kW, and 6,700 therms per trainee. Table 3-17 summarizes the total and per-trainee O&M UAS for CY10.

Table 3-17. O&M Project Untracked Attributable Savings for CY10

	Less O&M Focus	More O&M Focus	Total
Number of 2009 trainees	99	404	503
Total kWh savings	2,707,516	7,254,391	9,961,907
Total kW savings	845	776	1,621
Total therm savings	43,179	3,342,470	3,385,649
kWh/trainee	27,349	17,956	19,805
kW/trainee	8.53	1.92	3.22
Therms/trainee	436	8,273	6,731

Contrary to expectations, for the E&T program as a whole, the per-trainee O&M savings (kWh and kW) estimates for less-O&M-focused courses was higher than the per-trainee O&M savings for more-O&M-focused courses. This occurred for two reasons. First, an attendee of the less-O&M-focused courses completed a large compressed-air project that increased total kWh and kW savings. Second, there were fewer attendees in the less-O&M-focused courses. This reduced the denominator in the per-trainee computation, which increased the resulting per-trainee estimate.

Examining the data by company size and course O&M focus reveals a more nuanced situation. It appears that the combination of company size and course O&M focus affects per-respondent savings. Savings (kWh, kW) per CATI respondent from small- or medium-sized companies was larger for more-O&M-focused courses than for less-O&M-focused courses. However, savings (kWh, kW) per CATI respondent for large companies was larger for less-O&M-focused courses than for more-O&M-focused courses (Table 3-18).

Table 3-18. Per CATI Respondent Savings by Company Size and Course Focus

Company Size	Small		Medium		Large		Unknown	
Course O&M Focus	Less	More	Less	More	Less	More	Less	More
kWh/respondent	201	1,987	463	5,566	105,867	50,192	0	0
kW/respondent	17.6	0.2	0.1	1.9	11.8	4.1	0	0
Therms/respondent	105	2,973	0	1670	1,577	22,022	0	214
Number of CATI respondents	12	57	16	42	19	32	1	10
Total kWh	2,406	113,278	7,400	233,792	2,011,478	1,606,134	0	0
Total kW	211.3	9.6	2.0	80.5	223.3	130.8	0	0
Total therms	1,262	169,477	0	70,139	29,956	704,691	0	2,136

Unfortunately, it is impossible to retain the company size dimension when extrapolating to the total trainee population. We cannot retain the company size dimension because we only have this information for the CATI respondents, and it does not exist in the course rosters. If the course rosters included a measure of company size, such as annual energy usage, floor space, or number of employees, future evaluations could include the company size dimension when extrapolating to the trainee population level or estimate savings based on size units rather than trainees. This would likely produce more accurate savings estimates. KEMA recommends adding a company size variable to the course rosters (see Section 3.4.3).

C. CALCULATING UAS FOR FUTURE COURSES

A secondary goal of the study was to provide a methodology for computing UAS for future courses. The 2008 report established a methodology for estimating UAS for one-time projects based on averages of trainee counts and savings estimates from the previous four years. The four-year average lessens the effect of year-to-year fluctuations in course attendance as well as other factors that may affect the likelihood of implementing projects after training courses that would result in UAS. Because of the four-year average, to compute total savings for a particular year, one must know the number of attendees in less- and more-O&M-focused courses for the latest year, one year before, two years before, and three years before. The following steps can be followed to compute savings in future evaluations:

1. Obtain course rosters for the latest year and the three previous years.
2. Filter the rosters to remove no shows, cancellations, and utility employees. Assign trainees with duplicate courses to the course with the lowest overall attendance, then remove the other entries for those trainees.
3. Divide the courses into more- and less-O&M-focused categories. Table 3-18 categorizes the courses offered since 2004. This table can be used to identify the O&M focus of future courses. If a course does not appear on this list, the evaluator should work with Nancy Giere Associates, or the current implementer of the training program, to identify whether the course is more- or less-O&M-focused.
4. There will be eight categories: more- and less-O&M focused courses for each of the four years. Count the number of (post-filtering) trainees in each of these categories.
5. Multiply the number of trainees in each of the eight categories in step 4 by the per-trainee one-time savings estimates that correspond to those categories. Table 3-19 summarizes the per-trainee savings estimates for each year, course type, and project type.
6. Sum the eight products calculated in step 5 to compute total one-time project savings.
7. Multiply the number of trainees in less- and more-O&M-focused courses in the latest year by the per-trainee O&M savings estimate that corresponds to each category. O&M savings only use the latest year.
8. Sum the two products calculated in step 7 to compute total O&M project savings.
9. Sum the sums from step 6 and step 8 to compute total savings.

Table 3-19. More- and Less-O&M Focused Courses Offered 2004–2009[33]

Less-O&M-focused courses	More-O&M-focused courses
Best Practices in Industrial Lighting	Building Operator Certification
Best Practices in Industrial Lighting Efficiency	Building Operator Certification - Level II
Bottom Line Results	Commercial Practical Energy Management
Compressed Air Best Practices	Energy Efficient Swimming Pool Operation and Maintenance
Compressed Air Leak Detection	Energy Efficient Swimming Pool Operation and Maintenance
Compressed Air Systems Best Practices Training	Hotel Energy Management
Fan System Assessment (Co-Sponsored by the Department of Energy)	Industrial Practical Energy Management
Fan System Assessment (Sponsored by U.S. Department of Energy)	Practical Energy Management - Commercial
Fan System Specialist Qualification (Co-Sponsored by the Department of Energy)	Practical Energy Management - Industrial
Industrial Refrigeration Best Practices	Practical Energy Management Implementation Series
Industrial Ventilation Systems Best Practices Overview	Preventative Operations and Maintenance - Schools and Government
Industrial Ventilation Systems Best Practices Training	School's Practical Energy Management
Pumping System Assessment	Smart Strategies for Healthcare
Pumping System Specialist Qualification	Smart Strategies for Hotels
Pumping System Specialist Qualification (Co-Sponsored by U.S. Department of Energy)	
Retrocommissioning for Large Commercial Buildings	
Steam Specialist Qualification (Co-Sponsored by U.S. Department of Energy)	
Steam System Assessment (Co-Sponsored by U.S. Department of Energy)	
Steam System Specialist Qualification	
Steam Systems Assessment (Sponsored by U.S. Department of Energy)	
Steam Systems Best Practices for Industrial Customers	
Steam Systems Best Practices for Schools & Government	
Steam Systems Best Practices Training	
Strategic Business Solutions: Surviving the Energy Price Shock	

[33] This list represents the titles of all courses offered from 2004 through 2009. Course names may have changed slightly during that period. For the analyses conducted for this report, KEMA collapsed courses of like names together when they occurred in the same year. Table 3-18 lists the course titles used in the analyses for this report.

Table 3-20. Per-Trainee Savings Estimates by Course, Year, and Project Type

Project Type	Course Focus	Metric	Latest Year Minus 3	Latest Year Minus 2	Latest Year Minus 1	Latest Year
One-time	Less O&M	kWh	7,534	2,117	2,401	7,379
		kW	0.73	0.20	0.23	0.69
		Therms	6,959	1,509	2,139	4,299
	More O&M	kWh	1,767	1,864	1,199	1,246
		kW	0.31	0.30	0.21	0.23
		Therms	24	17	15	19
O&M[34]	Less O&M	kWh				27,349
		kW				8.53
		Therms				436
	More O&M	kWh				17,956
		kW				1.92
		Therms				8,273

D. O&M PROJECT PERSISTENCE AND OTHER FINDINGS

The CATI survey asked respondents what year their course-influenced O&M projects started, and if those changes were still in effect. On average, respondents indicated that 86 percent of the course-influenced O&M projects were still in effect at the time of the CATI survey (July 2010). Table 3-21 summarizes the percentage of O&M projects that are still active by the year in which they started. These results suggest that the assumption that O&M projects will last at least into the year after the course was taken is not unreasonable.

Table 3-21. Active O&M Projects by Year of Project Initiation

O&M Project Start Year	Total O&M Projects	Number Still Active (July 2010)	Percentage Still Active (July 2010)
Before 2008	2	2	100%
2008	21	21	100%
2009	69	58	84%
2010	11	10	91%
Don't know	11	7	64%
Total	114	98	86%

KEMA examined the correlations between the number of courses taken, course duration, the number of O&M projects implemented, and each of the net savings metrics (kWh, kW, and therms). None of the correlations were statistically significant at a 90 percent confidence level.

3.4.3 Recommendations

KEMA recommended that Focus on Energy be credited with additional savings of 15,758,642 kWh, 2,328 kW, and 6,585,949 therms in CY10 (Table 3-16).

[34] Per-trainee savings for O&M projects are only estimated for a single year. Therefore, estimates only appear in the last column of the table.

KEMA also recommended that the program add a measure of company size to the E&T course rosters. KEMA recommended using annual energy use (kWh) as the company size metric. If this is unavailable, then floor space (square feet) or number of employees are the next best estimates. A measure of company size would allow future evaluations to normalize project savings results by the company size metric and produce savings estimates based on that metric. There is evidence from this evaluation that trainees from small or medium companies may have higher savings from more-O&M-focused courses whereas trainees from large companies may have higher savings from less-O&M-focused courses. Using this metric to scale up to the total trainee population would yield more accurate population-level savings estimates than the per-trainee results reported in this and the 2008 E&T UAS report. Computing estimates by a company size variable would also help moderate the effect of unusually large projects.

3.5 BUSINESS RENEWABLE PROJECTS

3.5.1 Overview of key activities

This subsection describes the evaluation activities for the Business Programs renewable energy projects conducted between January 1, 2010, and December 31, 2010. It summarizes the following:

- Reports and other deliverables
- Gross energy impacts
- Net energy impacts.

A. REPORTS AND MEMOS DELEVERD IN CY10

During CY10, the Renewable Energy evaluation team submitted the following reports and memos:

- *Renewables: Impact Evaluation CY10.* January 7, 2011
- *Standard Calculation Recommendations for Renewable Energy Systems*. January 18, 2011
- *Post Year 1 Wind Turbine Production Memo*. January 24, 2011
- *2010 Renewables Annual Savings Memo.* February 8, 2011.

3.5.2 Energy impacts

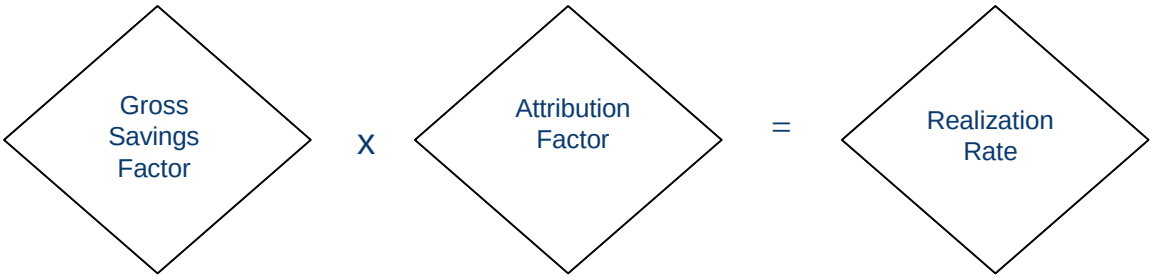
The evaluation team estimates net energy savings for Business Programs renewable energy projects on an annual basis. The most recent round of data collection to determine net energy savings included renewable energy projects installed between October 1, 2009, and June 30, 2010.

A. GENERAL APPROACH

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 3-6. Realization Rate Calculation



The definitions of these factors and the methods for producing them are the same as in previous renewable impact evaluations. The reporting of the results in this annual report includes results previously reported in the CY10 impact evaluation[35] as well as impacts for projects completed in the period from January 1 to December 31, 2010, based on CY10 adjustment factors.[36]

B. RESULTS

i. Program activities

In this section, we discuss renewable projects implemented by Business Programs (BP) for the period from January 1, 2010, through December 31, 2010, the CY10 evaluation period. The Focus Business Programs completed 196 renewable energy projects in this period.

[35] Bobbi Tannenbaum, Ben Jones, and Brian Bak, KEMA, Inc. *Renewables: Impact CY10 September 2009 through June 2010*. January 07, 2011.

[36] Bobbi Tannenbaum and Ben Jones, KEMA Inc. *Focus on Energy Evaluation 2010 Renewables Annual Savings*. February 8, 2011.

Table 3-22. Business Programs Renewable Projects by Type and Contract Period

Technology	Completed Projects						
	FY02 (Mar 02–Jun 05)	FY06 (Jul 05–Jun 06)	FY07 (Jul 06–Jun 07)	18MCP (Jul 07–Dec 08)	CY09 (Jan–Dec 09)	CY10 (Jan–Dec 10)	Program To Date (Mar 02-Dec 10)
Biogas	5	7	2	6	8	5	33
Biomass	10	16	14	18	6	3	67
Solar electric (PV)	15	9	18	78	96	118	334
Solar hot water	4	5	6	38	43	52	148
Wind	9	1	1	4	6	18	39
Other	3	1	2	0	0	0	6
All BP Renewable Projects	**46**	**39**	**43**	**144**	**159**	**196**	**627**

ii. Gross savings

The Business Program tracks gross energy savings (generation) for all projects completed that receive a cash-back reward or a grant that has associated energy impacts. Table 3-23 includes program-reported gross impacts by technology for the 18MCP, CY09, and CY10.

Table 3-23. Business Programs Tracked Gross Impacts Renewable Energy Projects by Technology

Technology	Energy Impacts	Completed			
		18MCP (Jul 07–Dec 08)	CY09 (Jan–Dec 09)	CY10 (Jan–Dec 10)	Program To Date (Mar 02–Dec 10)
Biogas	Peak kW	1,180	1,871	800	8,782
	Annual kWh	10,159,791	17,507,821	6,944,397	74,144,954
	Annual therms	138,637	1,929	45,099	294,318
Biomass[a]	Peak kW	-66	-98	-95.4	-259.4
	Annual kWh	-329,413	-498,735	-719,035	-1,547,183
	Annual therms	2,213,364	4,873,677	1,867,169	12,116,892
Solar electric	Peak kW	307	261	887.103	1850.103
	Annual kWh	778,759	665,436	2,233,095	4,492,770
	Annual therms	0	0	0	1283
Solar hot water	Peak kW	-13	0	4.259	-9.741
	Annual kWh	-19,107	-3,344	15,127	-11,844
	Annual therms	48,752	26,211	56,197	181,134
Wind	Peak kW	17	6	153.9711	677.9711
	Annual kWh	127,249	57,813	1,349,066	2,375,506
	Annual therms	0	0	0	0
Hydroelectric	Peak kW	0	0	0	14
	Annual kWh	0	0	0	29,973
	Annual therms	0	0	0	2638

Technology	Energy Impacts	Completed			
		18MCP (Jul 07–Dec 08)	CY09 (Jan–Dec 09)	CY10 (Jan–Dec 10)	Program To Date (Mar 02–Dec 10)
Other	Peak kW	0	0	0	10605
	Annual kWh	0	0	0	76,135,126
	Annual therms	0	0	0	10,627,800
All BP Renewable Projects	**Peak kW**	**1,425**	**2,040**	**1,750**	**21,660**
	Annual kWh	**10,717,279**	**17,728,991**	**9,822,649**	**155,619,301**
	Annual therm	**2,400,753**	**4,901,817**	**1,968,465**	**23,224,065**

a Negative biomass kW and kWh are due to parasitic loads.

iii. Gross savings adjustment factor

The evaluation confirmed installation for 100 percent of the projects sampled.

Verified gross savings are 126 and 111 percent for kWh and kW respectively. Verified gross therm savings are 56 percent of program tracked therm savings. Table 3-23 shows the verified gross adjustment factors by technology.

Overall kWh and kW verified gross adjustments are greater than 100 percent due to the program's overestimation of parasitic load[37] (negative savings) for biomass projects. Overestimation of parasitic load results in an increase in kWh and kW savings. Therm verified gross adjustments are low due to an overestimation of therm savings for biomass projects. This overestimation is due in large part to lower reported hours of use than assumed by the program. The Program's calculation of energy production from wind systems is improving, but continues to overestimate offsets. Solar electric and solar hot water had verified gross ratios near 100 percent.

Table 3-24. CY10 Gross Savings Adjustment Factors Business Programs Renewables

Technology	kWh				kW				Therms			
	n[a]	Estimate	Margin of Error (90% Confidence) CY10	Margin of Error (90% Confidence) Extrapolated	n[a]	Estimate	Margin of Error (90% Confidence) CY10	Margin of Error (90% Confidence) Extrapolated	n[a]	Estimate	Margin of Error (90% Confidence) CY10	Margin of Error (90% Confidence) Extrapolated
Biogas	1	76%	± 0.0%	N/A	1	63%	± 0.0%	N/A				
Biomass[a]	1	18%	± 0.0%	N/A	1	18%	± 0.0%	N/A	2	55%	± 0.0%	± 0.0%
Solar electric	21	99%	± 1.3%	± 1.5%	21	101%	± 1.3%	± 1.7%				
Solar hot water	9	100%	± 14.5%	± 18.8%	9	67%	± 20.7%	± 26.7%	9	103%	± 2.2%	± 4.3%
Wind	8	71%	± 2.3%	± 4.8%	8	71%	± 2.3%	± 4.7%				
Overall BP Renewable Projects[b]	**40**	**126%**	**± 3.7%**	**± 5.4%**	**40**	**111%**	**± 1.6%**	**± 2.2%**	**11**	**56%**	**± 0.0%**	**± 0.1%**

[a] Verified gross installed kWh and kW for biomass are parasitic load. Values less than 100 percent indicate lower parasitic load than tracked by the program.

[b] Overall ratios for kWh and kW are greater than the individual technology ratios because the low ratio for biomass parasitic load results an increase in verified savings for the program.

[37] Parasitic load is additional energy use associated with the installation of a renewable energy system, such as electric pumps for a solar hot water system or fans and motors for a biomass system.

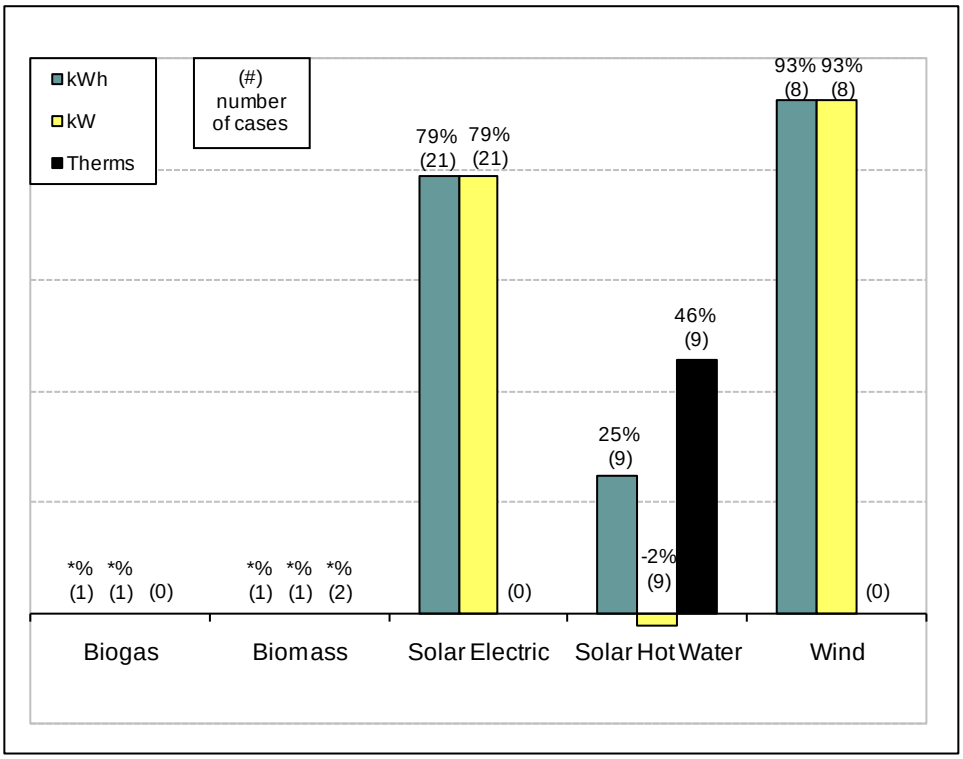
iv. Attribution adjustment factors

Attribution is the percent of tracked savings that is directly attributable to the program. The evaluation team used participant self-report surveys to estimate attribution. The CY10 attribution factors for the program overall are 80, 80, and 38 percent for kWh, kW, and therms respectively. Figure 3-7 shows attribution by renewable technology for Business Programs. Solar electric and wind projects have high attribution while solar hot water projects have substantially lower attribution.

The negative value for solar hot water kW attribution requires explanation. Solar hot water peak kW has negative attribution because verified gross savings is less than zero (there is more parasitic kW load than kW savings), but net kW savings is greater than zero. In other words, there is more attributable kW savings than attributable parasitic load).

The evaluation team does not report biogas and biomass realization ratios to protect respondent confidentiality.

Figure 3-7. CY10 Business Programs Renewable Project Attribution by Technology



* Ratios not reported to protect respondent confidentiality

v. Net energy impacts

The evaluation team calculates the net energy impacts based on an overall realization rate. The realization rate combines the effect of the gross savings adjustment factors and the attribution factors (see Figure 3-6).

We calculated the realization rates for solar electric, solar thermal, wind based on the CY10 renewables evaluation results. The CY10 evaluation period included only one biogas project

and two biomass projects. Due to the low number of biogas and biomass projects evaluated, KEMA created blended ratios for Business Programs biogas and biomass projects to apply to CY10 projects completed after the evaluation period.[38] KEMA calculated this blended ratio by using the combined results of the CY09 and CY10 evaluations.

vi. Total impacts

The CY10 realization rates for the program overall are 101, 88, and 21 percent for kWh, kW, and therms, respectively, as shown in Table 3-25. The evaluation team does not report realization rates for biogas and biomass to protect respondent confidentiality.

Table 3-25. CY10 Business Programs Renewable Project Realization Rates by Technology

	kWh				kW				Therms			
			Margin of Error (90% Confidence)				Margin of Error (90% Confidence)				Margin of Error (90% Confidence)	
Technology	n[a]	CY10	CY10	Extrapolated	n[a]	CY10	CY10	Extrapolated	n[a]	CY10	CY10	Extrapolated
Biogas	1	*%	± 0.0%	N/A	1	*%	± 0.0%	N/A				
Biomass	1	*%	± 0.0%	N/A	1	*%	± 0.0%	N/A	2	*%	± 0.0%	± 0.0%
Solar electric	21	78%	± 13.6%	± 17.2%	21	80%	± 13.8%	± 17.7%				
Solar hot water	9	25%	± 30.9%	± 51.4%	9	-1%	± -42.7%	± -54.9%	9	47%	± 23.2%	± 40.2%
Wind	8	66%	± 2.2%	± 8.0%	8	66%	± 2.2%	± 8.0%				
Overall BP Renewable Projects[b]	**40**	**101%**	**± 12.5%**	**± 16.3%**	**40**	**88%**	**± 13.5%**	**± 17.4%**	**11**	**21%**	**± 0.3%**	**± 0.5%**

[a] Realization rates are not calculated directly but are products of other adjustment factors. Therefore, sample sizes reflect the minimum sample size used in calculating the realization rate.

[b] Overall ratios for kWh and kW are greater than the individual technology ratios because the low ratio for biomass parasitic load results an increase in verified savings for the program.

* Ratios not reported to protect respondent confidentiality.

Realization rates are the combined effect of verified gross factors and self-reported attribution. The realization rates vary by technology, as do the reasons for rates below 100 percent. Solar electric has the highest realization rate, roughly equal to attribution due to high verified gross saving factors. Wind has mid-range realization rates due its low verified gross adjustment. Solar hot water (SHW) has a low realization rate for kWh, kW, and therms due to attribution. The negative realization rate for SHW is due to tracked savings being negative and net savings being slightly greater than zero.

We report the total renewable impacts for the CY10 Business Programs in Table 3-26 below.

Table 3-26. Total Impacts Business Programs Renewable Projects CY10 (January 1–December 31, 2010)

Tracked Savings			Verified Gross Savings			Net Savings		
kWh	Peak kW	Therms	kWh	Peak kW	Therms	kWh	Peak kW	Therms
9,822,649	1,750	1,968,465	9,078,160	1,786	1,150,738	4,647,442	1,062	461,200

[38] Bobbi Tannenbaum and Ben Jones, KEMA Inc. *Focus on Energy Evaluation 2010 Renewables Annual Savings.* February 8, 2011.

vii. Recommendations

Based on these findings the evaluation team has the following recommendations for renewable projects funded through the Focus on Energy Business Programs.

The program should require documentation associated with parasitic loads. This should include, at a minimum, a list of all parasitic loads and explicit calculations of the energy consumption associated with each load. This should include the assumptions related to the baseline conditions and operating characteristics of the parasitic load.

The program should consider the overall energy impacts of a project (not just a single fuel) when determining funding. This means accurate accounting of electric or gas parasitic loads.

The program should carefully review the production calculations and underlying assumptions when reviewing projects for funding. In particular, the program should assess the baseline conditions and the operating characteristics assumptions. Although it is difficult to determine what will happen, projects funded based on "best case" assumptions, (such as 100 percent use of a biomass system when there is a natural gas system in operation) are unlikely to be realized.

Continue to improve program documentation. We encourage the program to document fully the calculations and assumptions used to determine renewable energy production. This is imperative when the program uses calculation approaches or assumed values that differ from the Standard Calculation guidelines. We recognize that there are advances in knowledge and technology for renewable energy systems (e.g., wind and biogas) that may improve either the calculation approach or the default values. If this information is included in project files, the evaluation team can use this information in our evaluations. Based on our experience evaluating Business Programs, we expect that the integration of renewables into Business Programs will result in more complete documentation of large projects.

3.5.3 Findings of other renewables evaluation activities in CY10

A. STANDARD CALCULATION RECOMMENDATIONS

The evaluation team made the following changes to the standard calculations document in CY10.

i. Biogas

- Updated the factor for COD to 8.3 ft^3/lb-COD. The previous factor (6.3 ft^3/lb-COD) used for the CY09 impact evaluation resulted in estimated annual energy production consistently lower than annualized metered production.

ii. Solar Hot Water

- Added a fixed value for residential hot water consumption of 15.8 gallons (60 liters) per person per day based on the ASHRAE standard for sizing hot water systems.

iii. Wind

- Added a default value for wind shear constant, α, equal to 0.30. The 7th Wind™ Wind Turbine Performance Model calculator has consistently overestimated energy

production during past evaluations. Using a default value of 0.30 for wind shear will improve estimation of energy production.

- Updated the Rayleigh wind distribution standard shape factor, k, from 2.0 to 2.3. The 7th Wind™ Wind Turbine Performance Model calculator has consistently overestimated energy production during previous evaluations. Using a default value of 2.3 for the shape factor will improve estimation of energy production.
- Changed the source for average historic wind speed to Weather Underground. Access to the Wisconsin State Climatology Office wind data is no longer available. Weather Underground provides access to comparable wind data.
- Removed the derate factor of 0.65. The above changes to the wind shear constant and shape factor make this derating factor unnecessary.
- Added request for version number of 7th Wind™ Wind Turbine Performance Model calculator to documentation. Previous documentation has not included the version number of the 7th Wind™ Wind Turbine Performance Model calculator. Having this information will explain any discrepancies in energy estimates due to the use of different 7th Wind™ Wind Turbine Performance Model calculator versions.

B. POST YEAR 1 WIND TURBINE PRODUCTION MEMO

The analysis described in this memo was designed to address whether wind system production increases after an initial break-in period of operation. The results do not provide sufficient evidence that there is a break-in period substantial enough (in length or impact) to call into question the reliability of evaluation team estimates of annual production. For the systems examined, the evaluation team found that wind systems are likely to experience periods of down time in later years, which may offset any production issues associated with break-in. Put another way, the limited data did not allow us to reject the null hypothesis: there is no difference in annual wind turbine production after an initial operation period.

4. RESIDENTIAL PROGRAMS EVALUATION

This chapter describes the residential program evaluation activities finalized during contract year 2010 (January 1–December 31, 2010), overall and by individual program area.

- ENERGY STAR® Lighting
- Appliances and Plug Load
- Wisconsin ENERGY STAR Homes (WESH)
- Home Performance with ENERGY STAR (HPWES)
- Apartment and Condominium Efficiency Services (ACES)
- Targeted Home Performance with ENERGY STAR (Targeted HPWES)
- Efficient Heating and Cooling
- Head Start CFL
- Together We Save Pilot[39]
- Residential Renewable Projects

The savings resulting from all programs, per the program data, are reported within this section. However, only two programs received evaluations beyond the reporting of energy savings: the ENERGY STAR Lighting and ACES programs. This section also summarizes the results from these programs' evaluations.

4.1 OVERALL

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

- CY10: January 1 through December 31, 2010
- CY09: January 1 through December 31, 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

[39] The impact results for this program are included within the Home Performance with ENERGY STAR section to be consistent with WECC's reporting.

- 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. There was no specific impact evaluation planned for this contract year for the residential programs; however, for programs where evaluation activities took place, the individual sections detail key findings and recommended adjustments to gross savings or consideration for market effects.

Figure 4-1. Verified Gross Electric Energy Impacts by Program, Residential Programs CY10 (January 1–December 31, 2010)

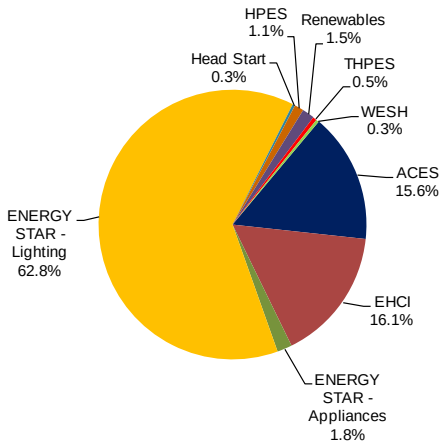
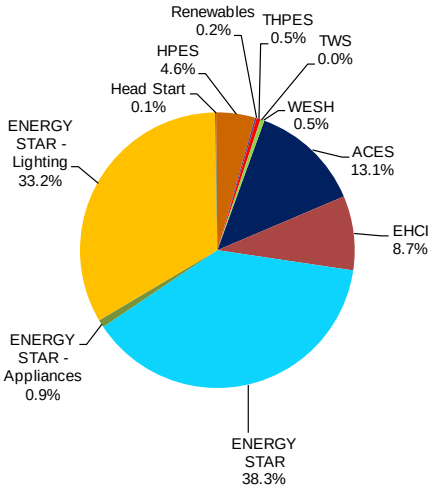


Figure 4-2. Verified Gross Electric Energy Impacts by Program, Residential Programs, Program to Date (July 1, 2001–December 31, 2010[40])



[40] Prior to July 1, 2008, the ENERGY STAR-Appliances and ENERGY STAR-Lighting programs were operated as one program. The impacts shown for ENERGY STAR are the impacts prior to July 1, 2008. While it would be relatively simple to break the historical impacts out and assign them to the current program designations for this chart, (1) the current allocation more accurately reflects historical program structure and (2) a change would also create other difficulties, such as mapping program costs, which make this change impractical.

Figure 4-3. Verified Gross Gas Energy Impacts by Program, Residential Programs CY10 (January 1–December 31, 2010)

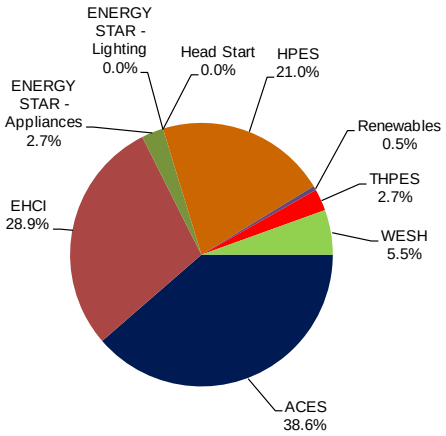


Figure 4-4. Verified Gross Gas Energy Impacts by Program, Residential Programs, Program to Date (July 1, 2001–December 31, 2010)

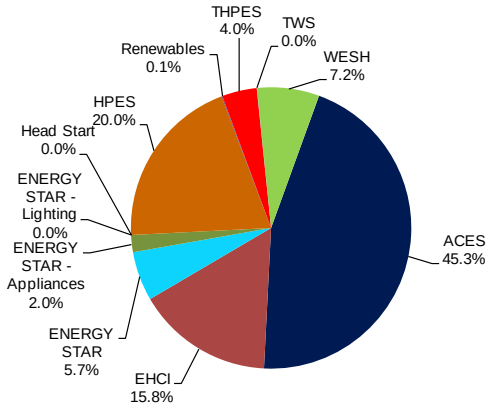


Table 4-1a. All Residential Programs: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
ACES	17,029,687	2,646	1,380,032	18,666,436	2,662	1,390,364	11,557,015	1,686	618,242
EHCI	19,316,363	5,760	999,671	19,213,319	5,763	1,040,471	7,944,251	3,165	742,077
ENERGY STAR - Appliances	2,138,590	200	96,160	2,137,846	200	97,553	2,137,846	200	97,553
ENERGY STAR - Lighting	73,661,323	3,825	0	75,195,287	6,307	0	51,739,300	3,938	0
Head Start	366,185	16	0	366,185	16	0	366,185	16	0
HPES	1,327,611	582	715,421	1,326,492	577	756,803	1,021,239	410	620,555
Renewables	1,829,405	611	20,589	1,768,818	609	19,148	1,347,924	485	6,383
THPES	570,964	125	96,324	570,964	125	96,324	570,964	125	96,324
WESH	410,115	53	196,917	407,675	53	197,657	234,410	25	194,669
Total	**116,650,243**	**13,818**	**3,505,114**	**119,653,022**	**16,312**	**3,598,320**	**76,919,133**	**10,050**	**2,375,803**

Table 4-1b. All Residential Programs: Tracked Annual Energy Impacts
CY09 (January 1–December 31, 2009)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
ACES	18,027,956	2,041	1,653,708	15,356,799	1,624	1,654,150	10,526,080	1,073	954,837
EHCI	16,344,018	4,276	866,309	16,841,694	4,264	908,469	6,613,258	1,446	640,565
ENERGY STAR - Appliances	1,730,083	126	116,369	1,725,093	126	119,369	1,725,093	126	119,369
ENERGY STAR - Lighting	91,383,714	4,856	-85	80,608,856	7,871	-85	53,688,789	4,952	-85
Head Start	322,764	13	0	322,764	13	0	322,764	13	0
HPWES	1,168,509	469	606,802	1,149,403	468	621,288	946,922	336	505,033
THPES	770,556	136	126,699	768,920	133	129,996	768,920	133	129,996
TWS	12,307	8	8,148	12,532	8	8,322	12,532	8	8,322
WESH	107,795	0	149,716	107,690	0	149,495	37,513	0	149,495
Total	**129,867,702**	**11,925**	**3,527,667**	**116,893,752**	**14,506**	**3,591,005**	**74,641,871**	**8,088**	**2,507,533**

Table 4-1c. 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 Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
ACES	26,175,716	3,102	2,377,692	26,259,528	3,113	2,377,633	19,057,866	2,034	1,532,127
EHCI	18,943,338	5,403	746,241	18,909,943	5,396	745,721	18,909,943	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	129,153,618	7,484	0	129,188,989	7,486	0	105,028,993	5,806	0
Head Start	402,388	17	0	402,388	17	0	402,388	17	0
HPWES	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	258,295	-4,062	0	258,274	-4,062	0	258,274
Total	**179,877,327**	**16,584**	**4,143,395**	**180,235,042**	**16,597**	**4,145,352**	**148,836,788**	**13,814**	**3,278,130**

Table 4-1d. All Residential Programs: Tracked Annual Energy Impacts
FY07 (July 1, 2006–June 30, 2007)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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 4-1e. All Residential Programs: Tracked Annual Energy Impacts
FY06 (July 1, 2005–June 30, 2006)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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 4-1f. All Residential Programs: Tracked Annual Energy Impacts
FY05 (July 1, 2004–June 30, 2005)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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 4-1g. All Residential Programs: Tracked Annual Energy Impacts
FY04 (July 1, 2003–June 30, 2004)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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 4-1h. All Residential Programs: Tracked Annual Energy Impacts
FY03 (July 1, 2002–June 30, 2003)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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 4-1i. All Residential Programs: Tracked Annual Energy Impacts
FY02 (June 1, 2001–June 30, 2002)

Program	Gross kWh	Gross kW	Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified 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
HPWES	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**

The program targets are set as net savings targets. Table 4-2 document the net savings targets, net savings achieved, and percentage of target achieved. Savings shown are for contract year 2010.

Table 4-2. Net Residential Program Savings versus Residential Program Portfolio Targets
CY10 (January 1–December 31, 2010)

Program	kWh			kW			Therms		
	Net Savings Target	Net Savings Achieved	% of 2010 Target	Net Savings Target	Net Savings Achieved	% of 2010 Target	Net Savings Target	Net Savings Achieved	% of 2010 Target
ACES	11,975,199	11,557,015	97%	1,012	1,686	167%	927,478	618,242	67%
EHCI	5,197,476	7,944,251	153%	1,473	3,165	215%	537,393	742,077	138%
ENERGY STAR - Appliances	1,668,084	2,137,846	128%	121	200	165%	91,725	97,553	106%
ENERGY STAR - Lighting	66,668,455	51,739,300	78%	3,959	3,938	99%	0	0	0%
HeadStart	881,250	366,185	42%	58	16	28%	0	0	0%
HPWES	654,000	1,021,239	156%	240	410	171%	396,000	620,555	157%
Renewables	531,776	1,347,924	253%	216	485	225%	2,767	6,383	231%
THPES	801,460	570,964	71%	93	125	134%	135,240	96,324	71%
WESH	36,867	177,722	482%	33	25	76%	146,359	194,669	133%
Total Residential Programs	**87,882,791**	**76,862,446**	**87%**	**6,956**	**10,050**	**144%**	**2,234,195**	**2,375,803**	**106%**

4.2 ENERGY STAR-LIGHTING

The evaluation of the ENERGY STAR lighting program consisted of an analysis of gross and net savings resulting from 2010 program activities. We present the results of evaluation efforts conducted during this reporting period for each of the four areas:

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

4.2.1 Process findings and issues

The evaluation did not include process evaluation activities for the ENERGY STAR lighting program in 2010.

4.2.2 Verified energy impacts

The evaluation team estimated the gross and net energy savings for CFLs for the 2010 program year[41]. This analysis was based on CFL reward data for the period of January 1, 2010, to December 31, 2010. The team also reviewed the lifetime energy savings considering the potential impacts of the Federal Energy Independence and Security Act of 2007 (EISA), which we also present within this ENERGY STAR Lighting section.

During the 2010 program year, focus paid CFL rewards through one of three methods: buydowns, instant lighting coupons, and mail-in rebates. A number of the savings assumptions vary by the type of reward; therefore, this report presents the analysis by reward type.

A. GROSS AND NET ANNUAL ENERGY SAVINGS

Gross annual energy savings, potential gross demand savings, and gross summer peak savings[42] were calculated using the following formulas:

$$Gross\ Annual\ Savings\ (kWh) = \frac{\#\ of\ CFLs \times Installation\ Rate \times \Delta\ Watts \times Daily\ Use \times 365}{1000}$$

$$Potential\ Gross\ Demand\ Savings\ (kW) = \frac{\#\ of\ CFLs \times Installation\ Rate \times \Delta\ Watts}{1000}$$

$$Gross\ Summer\ Peak\ Savings\ (kW) = Potential\ Gross\ Demand\ Savings \times Summer\ Coincidence\ Factor$$

Net annual energy savings and net summer peak savings were calculated using the following formulas:

$$Net\ Annual\ Savings\ (kWh) = NTG\ ratio \times Gross\ Annual\ Savings$$

$$Net\ Summer\ Peak\ Savings\ (kW) = NTG\ ratio \times Gross\ Summer\ Peak\ Savings$$

From the program's CFL rewards database, we determined that a total of 1,224,170 CFLs were rewarded to residential customers in 2010. CFLs were assumed to have an on-peak coincidence factor of 0.108 in the summer.[43] We then calculate that the CFLs rewarded during 2010 yield gross annual energy savings of over 53 million kWh. Using the on-peak

[41] Tom Mauldin, Lauren Abraham, and Lynn Hoefgen, NMR Group. *2010 CFL Savings Analysis.* February 7, 2011.

[42] Potential gross demand savings assumes that all installed CFLs are turned on at the same time. The summer coincidence peak factor is an estimate of the percentage of installed CFLs turned on during on-peak summer hours.

[43] Nexus Market Research, Inc. and RLW, Inc. *Residential Lighting Markdown Impact Evaluation.* Markdown and Buydown Program Sponsors in Connecticut, Massachusetts, Rhode Island, and Vermont. January 20, 2009.

summer coincidence factor of 0.108, we calculate gross summer peak demand savings of 5,712 kW (Table 4-3).

Table 4-3. 2010 Gross Annual Energy Savings

	Buydown	Instant	Mail-in	Total
Gross annual kWh savings per CFL	43.7	43.7	48.9	43.7
Gross annual kWh savings	52,150,398	982,999	338,237	53,471,634
Potential gross kW savings	51,580	972	335	52,887
Gross summer peak kW savings	5,571	105	36	5,712
Gross summer peak kW savings per CFL	0.0047	0.0047	0.0052	0.0047

Table 4-4 shows the net annual energy savings as well as the net summer peak demand savings. Net annual energy savings were calculated using the net-to-gross ratio of 0.62 from the 2008 program evaluation.[44]

Table 4-4. 2010 Net Annual Energy Savings

	Buydown	Instant	Mail-in	Total
Net annual kWh savings per CFL	27.1	27.1	30.3	27.1
Net annual kWh savings	32,333,246	609,460	209,707	33,152,413
Net summer peak kW savings	3,454	65	22	3,541
Net summer peak kW savings per CFL	0.0029	0.0029	0.0032	0.0029

B. LIFETIME ENERGY SAVINGS

To determine the lifetime energy savings of CFLs, we took into account the likely effects of the Federal Energy Independence and Security Act of 2007 (EISA). EISA calls for a phase-out of most inefficient light bulbs beginning in 2012 (Table 4-5).[45]

Table 4-5. EISA Phase-out Schedule

Effective Date	Lumen Range	Estimated Incandescent Wattage	CFL Equivalent Wattage
1/1/2012	1490–2600	99–173	25.4–44.3
1/1/2013	1050–1489	70–99	17.9–25.3
1/1/2014	750–1049	50–70	12.8–17.9
1/1/2014	310–749	21–50	5.3–12.7

EISA exempts a number of bulb types from the phase-out. Among other bulb types, EISA exempts the following: reflector bulbs, globe shaped bulbs, 3-way bulbs, candelabra-shaped bulbs, and bug lights.

[44] Lisa Wilson-Wright, Chris Russell, Lynn Hoefgen, NMR Group. *Results of the Multistate CFL Modeling Effort.* March 7, 2010.

[45] Rick Winch and Tom Talerico, Glacier Consulting, Group, LLC. *Analysis of Delta Watts Values for CFLs Rewarded through the Residential Lighting Program during FY07*. March 6, 2008.

i. Lifetime Calculations and Assumptions

With the first wave of EISA phase-outs becoming effective in 2012, the lighting market is currently in a state of flux and it is not clear how manufacturers will respond to the EISA requirements. At this point, we anticipate that opportunities for CFL savings, though reduced, will continue, assuming that manufacturers develop EISA-compliant incandescent or halogen bulbs. The lifetime energy savings calculations presented here assume that there are reasonably priced EISA-compliant incandescent or halogen bulbs available at the time that the EISA phase-outs become effective. It also assumes that the potentially lower lumen output of the EISA-compliant incandescent or halogen bulbs does not result in consumers shifting to higher wattage replacement bulbs.

Based on the EISA phase-out schedule, we assume that non-specialty CFL bulbs that are 25 watts or more will accrue the current annual energy savings until 2012 and will then accrue reduced savings for the remainder of the measure life.[46] Likewise, non-specialty CFLs between 18 and 24 watts will accrue reduced savings after 2013, and non-specialty CFLs of 18 watts or less will accrue reduced savings after 2014. Specialty bulbs will accrue the same annual energy savings for the full measure life.

The following calculation was used to determine gross lifetime savings:

$$\begin{aligned} &Gross\ Lifetime\ Savings\ (kWh) \\ &= Gross\ Annual\ Savings \times PreEISA\ phaseout\ savings\ duration \\ &+ \left[(Measure\ Life - PreEISA\ phaseout\ savings\ duration) \times \frac{\#\ of\ CFLs \times Installation\ Rate \times PostEISA\ \Delta\ Watts \times Daily\ Use \times 365}{1000}\right] \end{aligned}$$

The reduced delta watts values for the post-EISA period were calculated based on EISA requirements as well as common assumptions regarding bulb wattages (Table 4-6). To calculate a post-EISA wattage savings for all bulbs, we reduced the pre-EISA wattage savings presented in Table 4-6 by 37 percent. This reduced the delta watts values from 53.3 watts to 33.6 watts and from 55.0 watts to 34.7 watts.

Table 4-6. Post-EISA Savings Estimates

Incandescent Wattage	Assumed CFL Equivalent (Watts)	Pre-EISA CFL Savings (Watts)	Maximum Post-EISA Wattage Allowed	Post-EISA CFL Savings (watts)	Reduction in Savings
40 watts	9	31	29	20	35%
60 watts	13	47	43	30	36%
75 watts	19	56	53	34	39%
100 watts	25	75	72	47	37%
Average	16.5	52.3	49.3	32.8	37%

Table 4-7 shows the assumptions used to calculate the gross lifetime energy savings from CFLs rewarded during 2010. To the extent possible, we categorized program CFLs by wattage, bulb shape, and specialty feature. Overall, we estimated there were a total of

[46] For the purposes of the lifetime energy savings calculations, specialty CFLs include the following: reflectors/floods, globes, 3-ways, candelabras, and bug lights.

191,612 non-specialty CFLs of 25 watts or more, 140,542 non-specialty CFLs between 18 watts and 24 watts, 722,054 non-specialty CFLs less than 18 watts, and 169,962 specialty CFLs.

Table 4-7. 2010 Lifetime Energy Savings Assumptions

	Buydown	Instant	Mail-In
Number of CFLs 25W or more (2012 EISA phase-out)	189,237	1,922	453
Number of CFLs 18W–24W (2013 EISA phase-out)	129,195	9,865	1,482
Number of CFLs <18W (2014 EISA phase-out)	708,861	10,022	3,171
Number of specialty CFLs	167,445	711	1,806
Lifetime installation rate	97%	99%	99%
Pre-EISA Delta watts (W)	53.3	53.3	55.0
Post-EISA Delta watts (W)	33.6	33.6	34.7
Daily hours of use	2.77	2.77	2.77
CFL measure life	6.8	5.5	5.5
2012 Pre-EISA phase-out savings duration (years)	2	2	2
2013 Pre-EISA phase-out savings duration (years)	3	3	3
2014 Pre-EISA phase-out savings duration (years)	4	4	4

ii. Gross and Net Post-EISA Annual Energy Savings

We calculate that the CFLs rewarded during 2010 will yield gross annual energy savings of over 33 million kWh during the post-EISA period. Using the on-peak summer coincidence factor of 0.108, we calculate gross summer peak demand savings of 3,601 kW during the post-EISA period (Table 4-8).

Table 4-8. 2010 Gross Annual Post-EISA Energy Savings

	Buydown	Instant	Mail-in	Total
Gross annual kWh savings per CFL	27.5	27.5	30.9	27.5
Gross annual kWh savings	32,875,298	619,677	213,397	33,708,372
Potential gross kW savings	32,516	613	211	33,340
Gross summer peak kW savings	3,512	66	23	3,601
Gross summer peak kW savings per CFL	0.0029	0.0029	0.0033	0.0029

Table 4-9 shows the net annual energy savings as well as the net summer peak demand savings for the post-EISA period. Net annual energy savings were calculated using the net-to-gross ratio of 0.62 from the 2008 program evaluation.[47] We estimate that the 2010 program will achieve net annual energy savings of nearly 21 million kWh and net summer peak savings of 2,232 kW during the post-EISA period.

[47] Lisa Wilson-Wright, Chris Russell, and Lynn Hoefgen, NMR Group. *Results of the Multistate CFL Modeling Effort.* March 7, 2010.

Table 4-9. 2010 Net Annual Post-EISA Energy Savings

	Buydown	Instant	Mail-in	Total
Net annual kWh savings per CFL	17.1	17.1	19.1	17.1
Net annual kWh savings	20,382,684	384,200	132,306	20,899,190
Net summer peak kW savings	2,177	41	14	2,232
Net summer peak kW savings per CFL	0.0018	0.0018	0.0020	0.0018

iii. Gross and Net Lifetime Energy Savings

Table 4-10 presents the lifetime energy savings for CFLs purchased through the Focus program during 2010. The gross lifetime savings for these CFLs is estimated to be over 368 million kWh. The net lifetime savings, based on a net-to-gross ratio of 0.62, is estimated to be over 228 million kWh.

Table 4-10. 2010 Lifetime Energy Savings

	Buydown	Instant	Mail-in	Total
Gross lifetime savings per CFL (kWh)	302	253	274	301
Gross lifetime savings (kWh)	360,772,100	5,698,308	1,890,606	368,361,015
Net lifetime savings (kWh)	223,678,702	3,532,951	1,172,176	228,383,829

Table 4-11. ENERGY STAR – Lighting Products Program: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
CFL	54,219,469	72.1%	5,830	92.4%	0	
Multifamily CFL	14,733,324	19.6%	426	6.8%	0	
Other Lighting	6,242,495	8%	51	1%	0	
Total	**75,195,287**	**100%**	**6,307**	**100%**	**0**	

4.2.3 Market effects

The evaluation did not include market effects evaluation activities for the ENERGY STAR Lighting program in 2010.

4.2.4 Program metrics

The evaluation did not review program metrics for the ENERGY STAR Lighting program in 2010.

4.3 APPLIANCES AND PLUG LOAD

As agreed with the PSCW, the evaluation team did not conduct any activities for the Appliances and Plug Load program. To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this section.

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

4.3.1 Process findings and issues

The evaluation did not include process evaluation activities for the Appliances and Plug Load program in 2010.

4.3.2 Verified energy impacts

Table 4-12 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the Appliances and Plug Load program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting.

Table 4-12. ENERGY STAR - Appliances Products Program: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Hot Water	2,137,846	100.0%	200	100.0%	97,553	100.0%
Total	**2,137,846**	**100.0%**	**200**	**100.0%**	**97,553**	**100.0%**

4.3.3 Market effects

The evaluation did not include market effects evaluation activities for the Appliances and Plug Load program in 2010.

4.3.4 Program metrics

No program metrics were reviewed for the Appliances and Plug Load program in 2010.

4.4 WISCONSIN ENERGY STAR HOMES

4.4.1 Process findings and issues

As agreed with the PSCW, the evaluation team did not conduct any activities for the Wisconsin ENERGY STAR Homes (WESH) program. To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this WESH section.

4.4.1 Process findings and issues

The evaluation did not include process evaluation activities for the WESH program in 2010.

4.4.2 Verified energy impacts

Table 4-13 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the WESH program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting.

Table 4-13. Wisconsin ENERGY STAR Homes: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Building Shell	-3,008	-0.7%	0		21,929	11.1%
CFL	131,223	32.2%	9	17.0%	0	
ECM Furnace	279,461	69%	44	83%	4,820	2%
Hot Water	0		0		509	0%
WESH Rating	0		0		170,400	86%
Total	**407,675**	**100%**	**53**	**100%**	**197,657**	**100%**

4.4.3 Market effects

The evaluation did not include market effects evaluation activities for the WESH program in 2010.

4.4.4 Program metrics

The evaluation did not review program metrics for the WESH program in 2010.

4.5 HOME PERFORMANCE WITH ENERGY STAR

As agreed with the PSCW, the evaluation team did not conduct any activities for the Home Performance with ENERGY STAR (HPWES) program. To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this section.

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

4.5.1 Process findings and issues

The evaluation did not include process evaluation activities for the HPWES program in 2010.

4.5.2 Verified energy impacts

Table 4-14 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the HPWES program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting.

Note that the WPS Territory-wide Initiative, through the HPWES Increased Incentives Program, provided additional incentives for qualified WPS customers that participated in the Focus HPWES program. The savings related to those participants are included within this section.

Table 4-14. Home Performance with ENERGY STAR: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Air Sealing	0		0		132,634	17.5%
Boiler	0		0		9,283	1.2%
Building Shell	846,254	63.8%	508	88.0%	567,955	75.0%
CFL	78,991	6.0%	9	1.6%	0	
ECM Furnace	136,161	10%	32	6%	3,720	0%
Hot Water	166,032	13%	10	2%	32,898	4%
HVAC	73,160	6%	7	1%	8,436	1%
Other	25,893	2%	11	2%	1,877	0%
Total	**1,326,492**	**100%**	**577**	**100%**	**756,803**	**100%**

There are a number of different program initiatives under the HPWES program umbrella. These include the Together We Save Pilot, the Rental Housing Energy Efficiency Program (RHEEP), Affordable Housing, and a Mobile Home component, as well as the Whole House component. We document the overall tracked savings related to these program components in Table 4-15.

Table 4-15. Tracked Annual Energy Impacts by Home Performance with ENERGY STAR Program Component CY10 (January 1–December 31, 2010)

Program Component	Verified Gross kWh	Verified Gross kW	Verified Gross Therms
Affordable Housing	26,763	11.4	1,900
Mobile Home	108,272	2.6	6,075
RHEEP	130,723	19.0	21,046
Together We Save	55,408	27.7	28,444
Whole House	1,005,325	516.1	699,339
Total	**1,326,491**	**576.7**	**756,804**

4.5.3 Market effects

The evaluation did not include market effects evaluation activities for the HPWES program in 2010.

4.5.4 Program metrics

No program metrics were reviewed for the HPWES program in 2010.

4.6 APARTMENT AND CONDOMINIUM EFFICIENCY SERVICES

Between April 1, 2010 and March 31, 2011, the evaluation of the Apartment and Condominium Efficiency Services (ACES) program included two activities. The first activity was an examination of the effect the Whole Building component of the ACES program has had on the Wisconsin high efficiency retrofit market. This activity employed a quasi-experimental design by interviewing contractors involved in the multi-family market in both Wisconsin and a suitable comparison (in this case, Michigan). Detailed information on the methodology, results, and recommendations can be found in the *CY10 Apartment and Condo Efficiency Services Market Effects*[48] report.

The second evaluation activity was a desk review of several of the inputs used to determine deemed savings values for the Direct Install and Whole Building components of the ACES program. This research builds on the deemed savings review conducted by Patrick Engineering in 2008 and 2009, which recommended that the evaluation team, in concert with program administrators, conduct additional research on several of the key inputs into the deemed savings calculation in order to strengthen the current default estimates. The review was based on both an examination of the Existing Building forms completed by Energy Auditors and secondary research. Detailed information on the methodology, results, and recommendations can be found in the *ACES Deemed Savings Desk Review*[49] memo

Key findings of these research efforts are presented below for each of the following four areas, as relevant:

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

4.6.1 Process findings and issues

The 2010 evaluation included process-related questions as part of the market effects interviews conducted with Wisconsin contractors. This effort included 156 interviews of heating, lighting, and water heating contractors, of which 52 reported previous participation with the program. The sample was drawn from two sources: contractors that had participated with the program in 2010 and a list of contractors that were to have likely serviced the multi-family retrofit market purchased from a third-party supplier. Based on these interviews, the following key findings were identified.

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[48] Kimberly Bakalars, Jeremy Kraft, Laura Schauer, and Chelsea Merchant, Tetra Tech. *CY10 Apartment and Condo Efficiency Services Market Effects*. December 2, 2010.

[49] Steven Drake, Jeremy Kraft, and Laura Schauer, Tetra Tech. *ACES Deemed Savings Desk Review.* November 3, 2010.

Customers are influenced by both their contractors and the program. Contractors reported that not all of their customers initially request high efficiency equipment and that in many situations, they are able to convince their customers that high efficiency equipment is the right choice for them. They also reported that the program is effective in convincing customers to upgrade to high efficiency equipment and accelerate their purchases.

There is a large untapped pool of contractors in Wisconsin that are good candidates for new trade allies. The main reason that contractors have not participated in the ACES program is that they were not aware of its existence. While multi-family work is a very small percentage of their overall business, those that have not participated believe that their multi-family customers would be interested in the services offered. Furthermore, the contractors reported that they most often look to their manufacturers' representatives or the Internet for additional information regarding high efficiency equipment. This finding suggests those avenues would be the most effective for engaging additional contractors. Raising awareness among these contractors could boost program participation in the future.

For contractors that were aware of the program, lack of interest in high efficiency equipment is the main reason for nonparticipation. This finding suggests limited "lost opportunities" among contractors that are aware of the program but have not participated recently. Lost opportunities are likely when contractors do not actively promote the program due to negative previous experiences such as an unreasonable administrative burden for participation.

4.6.2 Verified energy impacts

The desk review of the 277 Existing Building forms completed by Energy Auditors and secondary research revealed opportunities to strengthen estimates of some key input assumptions in the deemed savings calculations for low-flow showerheads, faucet aerators, and common area lighting. Below are key findings from the review:

Based on a comparison of average groundwater temperatures from secondary sources, the current inlet water temperature estimate used for low-flow showerhead and faucet aerator savings should be revised from 50 degrees Fahrenheit to 48 degrees Fahrenheit. This change would have a positive effect on energy savings estimates for these water-saving measures.

The most recent results from the American Community Survey (2008) estimates an average household size of 2.10 persons for renter-occupied homes in Wisconsin, slightly higher than the assumption of 2.06 used in the most recent deemed savings review. As average household size is used in the deemed savings calculations for low-flow showerheads and faucet aerators to estimate water consumption from these fixtures, this change would have a small positive effect on energy savings.

Existing flow-rates from a random sample of ACES Existing Building forms averaged 2.45 GPM for showerheads, 2.15 GPM for kitchen faucets, and 2.05 GPM for bath faucets. Each of these estimates is lower than the current assumptions and would lower water use and energy savings estimates.

Applying all of the recommended updates to input assumptions for water-savings measures would result in approximately a two percent reduction in low-flow showerhead deemed savings and a one-and-a-half percent reduction in faucet aerator savings.

The current assumption that indoor CFLs in common areas operate 24 hours per day likely overstates common area CFL usage and, by extension, energy savings estimates. A review of indoor lighting usage recorded on ACES Existing Building forms and results from recent participants surveys indicate that a change from 21.6 hours per day to 16.3 hours per day for all common area CFLs will likely provide a more accurate estimate of indoor CFL usage in common areas.

Table 4-16 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the ACES program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting. The key findings presented above are not integrated into these tracked verified energy impacts; rather, they are to be considered for future program planning efforts.

Table 4-16. Apartment and Condominium Efficiency Services: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Appliances	538,977	2.9%	198	7.4%	19,116	1.4%
Boiler	-25,459	-0.1%	11	0.4%	751,859	54.1%
Building Shell	410,790	2.2%	191	7.2%	86,423	6.2%
Controls & Motors	48,759	0.3%	2	0.1%	7,962	0.6%
ECM Furnace	111,143	0.6%	21	0.8%	2,480	0.2%
Hot Water	2,824,478	15.1%	71	2.7%	269,023	19.3%
HVAC	2,004,646	10.7%	482	18.1%	241,140	17.3%
Multifamily CFL	3,393,244	18.2%	478	18.0%	0	
Other	117,507	0.6%	204	7.7%	12,361	0.9%
Other Lighting	9,242,351	50%	1,005	38%	0	
Total	**18,666,436**	**100%**	**2,662**	**100%**	**1,390,364**	**100%**

The ACES program includes three components: Whole Building, Direct Install, and New Construction. Table 4-17 documents the overall savings for each component.

Table 4-17. Tracked Annual Energy Impacts by Component by Apartment and Condominium Efficiency Services Program Component CY10 (January 1–December 31, 2010)

Program Component	Verified Gross kWh	Verified Gross kW	Verified Gross Therms
Direct Install	3,655,280	148.2	189,761
New Construction	4,779,791	1,111.2	318,742
Whole Building Existing	10,231,365	1,403.0	881,861
Total	**18,666,436**	**2,662.4**	**1,390,364**

4.6.3 Market effects

The 2010 evaluation included a study to estimate the impact the program has on the multi-family retrofit market in Wisconsin. Two approaches were used to inform the study: a market-based approach and a participating contractors self-report approach.

First, by comparing the amount of program-eligible equipment sales in Wisconsin to the amount of program-eligible equipment sales in Michigan, a state without a significant history of energy efficiency programs[50], we estimated that 30 percent of the sales of high efficiency heating equipment to the multi-family market are both directly and indirectly attributable to ACES program activity.

In addition to estimating the program's effect on the Wisconsin heating market by measuring untracked attributable savings, the level of nonparticipant spillover reported by participating contractors was also measured by speaking with participating contractors about their high efficiency sales outside of the program. Using this methodology in addition to the state-to-state comparison provides a supporting, albeit conservative, look at how the program has affected the high efficiency market in Wisconsin. As the state comparison methodology discussed above provides a broader market view, it includes the nonparticipant spillover savings identified by participating contractors. In other words, these two approaches are not additive; instead, they provide two different looks at the same untracked savings.

Using these two approaches, the following market effects key findings were identified:

The ACES program is influencing contractor sales practices. Comparing Michigan and Wisconsin contractors' responses to questions within the contractor survey, we see that the program is not only influencing customers directly, but also influencing customer purchasing decisions through influence on Wisconsin contractors.

Market-based findings estimate that the ACES program is likely responsible for some level of untracked savings from the sales of high efficiency equipment. Based on a comparison of sales data reported by heating contractors in Wisconsin and Michigan, the Wisconsin market shows an increase in overall high efficiency sales in multi-family buildings when adjusted for program activity in both states. This increase is, in essence, spillover resulting from the program. The analysis estimates that, in 2010, the ACES program could be responsible for up to 690,231 in additional kWh savings and 57,630 in additional therms savings for heating equipment that is not currently being tracked by the program. These amounts represent 57 percent of the gross kWh savings and 36 percent of the gross therm savings. This estimation primarily relies on the comparison of the Wisconsin market to the Michigan market and uses market data to account for both participant and nonparticipant spillover.

Participating contractor self-reported results identified nonparticipant spillover of two percent of overall savings. A majority of nonparticipant spillover savings were attributed to boiler tune and clean services, which is a service that the program no longer offers. Our analysis that found savings that could be attributed to the program without outliers skewing results (as occurred in the 2009 evaluation). Previous research only asked participating contractors to estimate the sales of "program-eligible" equipment outside of the program without specifically telling them what was eligible. To avoid confusion, this research provided examples of what equipment would be considered "program-eligible." In addition, contractors were asked to report their program-eligible sales as a percentage of their overall sales. We confirmed these percentages by converting them to an estimated number of projects based on program tracking data.

[50] Michigan began implementing their Energy Optimization programs in 2009.

As the program tracking database did not have contact information for many of the participating contractors, our analysis is limited by the small number of 2010 participating contractors we were able to interview; only 13 contractors that participated in 2010 were contacted. Greater consistency in tracking contractors involved with the ACES program would allow for more robust nonparticipant spillover analysis.

4.6.4 Program metrics

The evaluation did not review program metrics for the ACES program in 2010.

4.7 TARGETED HOME PERFORMANCE WITH ENERGY STAR

As agreed with the PSCW, the evaluation team did not conduct any activities for the Targeted Home Performance with ENERGY STAR program (Targeted HPWES). To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this section.

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

4.7.1 Process findings and issues

The evaluation did not include process evaluation activities for the Targeted HPWES program in 2010.

4.7.2 Verified energy impacts

Table 4-18 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the Targeted HPWES program for 2010. The savings are applied on a per home basis. The tracked energy savings are based on data reported within the program database and verified against program reporting.

Table 4-18. Targeted Home Performance with ENERGY STAR: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Appliances	0		31	24.8%	0	
CFL	0		24	19%	0	
ECM Furnace	0		8	6%	0	
Home Weatherization	570,964	100%	0		96,324	100%
Hot Water	0		10	8%	0	
HVAC	0		52	42%	0	
Total	**570,964**	**100%**	**125**	**100%**	**96,324**	**100%**

4.7.3 Market effects

The evaluation did not include market effects evaluation activities for the Targeted HPWES program in 2010.

4.7.4 Program metrics

The evaluation did not review program metrics for the Targeted HPWES program in 2010.

4.8 EFFICIENT HEATING AND COOLING

As agreed with the PSCW, the evaluation team did not conduct any activities for the Efficient Heating and Cooling program. To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this section:

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

4.8.1 Process findings and issues

The evaluation did not include process evaluation activities for the Efficient Heating and Cooling program in 2010.

4.8.2 Verified energy impacts

Table 4-19 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the Efficient Heating and Cooling program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting.

Note that the WPS Territory-wide Initiative, through the Heating Equipment Bonus Program, provided additional incentives for qualified WPS customers that participated in the Focus Efficient Heating and Cooling program. The savings related to those participants are included within this section.

Table 4-19. Efficient Heating and Cooling: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
Boiler	0		0		484,572	46.6%
ECM Furnace	18,175,916	94.6%	4,190	72.7%	481,280	46.3%
GSHP	253,591	1.3%	96	1.7%	1,600	0.2%
HVAC	784,542	4.1%	1,477	25.6%	72,660	7.0%
Other	-730	0%	0		359	0%
Total	**19,213,319**	**100%**	**5,763**	**100%**	**1,040,471**	**100%**

4.8.3 Market effects

The evaluation did not include market effects evaluation activities for the Efficient Heating and Cooling program in 2010.

4.8.4 Program metrics

The evaluation did not review program metrics for the Efficient Heating and Cooling program in 2010.

4.9 HEAD START CFL

As agreed with the PSCW, the evaluation team did not conduct any activities for the Head Start CFL program. To be consistent with other sections, we retain the headings for the following four topical areas, although only tracked annual impacts per the program tracking system are documented within this section:

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

4.9.1 Process findings and issues

The evaluation did not include process evaluation activities for the Head Start CFL program in 2010.

4.9.2 Verified energy impacts

Table 4-20 provides the tracked verified energy impacts (kWh, kW, and therms) by measure category and overall for the Head Start CFL program for 2010. This analysis is based on the savings documented within the program database and verified against program reporting.

Table 4-20. Head Start CFL: Tracked Annual Energy Impacts
CY10 (January 1–December 31, 2010)

Measure Category	Verified Gross kWh	kWh %	Verified Gross kW	kW %	Verified Gross Therms	Therm %
CFL	366,185	100.0%	16	100.0%	0	
Total	**366,185**	**100.0%**	**16**	**100.0%**	**0**	

4.9.3 Market effects

The evaluation did not include market effects evaluation activities for the Head Start CFL program in 2010.

4.9.4 Program metrics

The evaluation did not review program metrics for the Head Start CFL program in 2010.

4.10 RESIDENTIAL RENEWABLE PROJECTS

4.10.1 Overview of key activities

This subsection describes the evaluation activities for the Residential Program renewable energy projects conducted between January 1, 2010, and December 31, 2010. It summarizes the following:

- Reports and other deliverables
- Gross energy impacts
- Net energy impacts.

A. REPORTS AND MEMOS DELEVERD IN CY10

During CY10, the Renewable Energy evaluation team submitted the following reports and memos:

- *Renewables: Impact Evaluation CY10*. January 7, 2011
- *Standard Calculation Recommendations for Renewable Energy Systems*. January 18, 2011
- *Post Year 1 Wind Turbine Production Memo* January 24, 2011.

4.10.2 Energy impacts

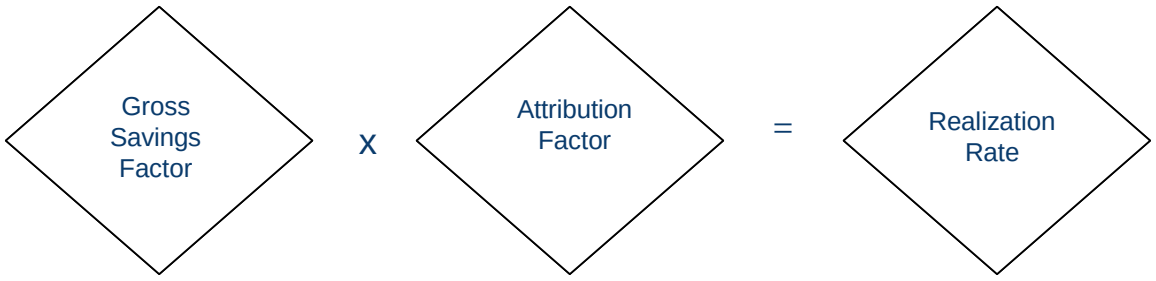
The evaluation team estimates net energy savings for residential program renewable energy projects on an annual basis. The most recent round of data collection to determine net energy savings included renewable energy projects installed between October 1, 2009, and June 30, 2010.

A. GENERAL APPROACH

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 4-5. Realization Rate Calculation



The definitions of these factors and the methods for producing them are the same as in previous renewable impact evaluations. The reporting of the results in this annual report includes results previously reported in the CY10 impact evaluation[51] as well as impacts for projects completed in the period from January 1 to December 31, 2010, based on CY10 adjustment factors.

B. RESULTS

i. Program activities

In this section, we discuss the residential renewable energy projects implemented for the period from January 1, 2010, through December 31, 2010, the CY10 evaluation period. In CY10, the Focus Residential Program completed 444 renewable energy projects.

Table 4-21. Residential Program Renewable Projects by Type and Contract Period

Technology	Completed Projects						
	FY02 (Mar 02–Jun 05)	FY06 (Jul 05–Jun 06)	FY07 (Jul 06–Jun 07)	18MCP (Jul 07–Dec 08)	CY09 (Jan–Dec 09)	CY10 (Jan–Dec 10)	Program To Date (Mar 02–Dec 10)
Solar electric (PV)	95	48	74	133	171	217	738
Solar hot water	0	-	-	160	121	215	496
Wind	11	5	5	13	24	12	70
Other	1	1	0	0	0	0	2
All Residential Renewable Projects	**107**	**54**	**79**	**306**	**316**	**444**	**1,306**

ii. Gross savings

The Residential Program tracks gross energy savings (generation) for all completed renewable energy projects that receive a cash-back reward or a grant that has associated energy impacts. Table 4-22 includes program-reported gross impacts by technology for the 18MCP, CY09, and CY10 evaluation periods.

[51] Bobbi Tannenbaum, Ben Jones, and Brian Bak, KEMA, Inc. *Renewables: Impact CY10 September 2009 through June 2010*. January 7, 2011.

Table 4-22. Residential Tracked Gross Impacts Renewable Energy Projects by Technology

Technology	Energy Impacts	Completed			
		18MCP (Jul 07–Dec 08)	CY09 (Jan–Dec 09)	CY10 (Jan–Dec 10)	Program To Date (Mar 02–Dec 10)
Solar electric[a]	Peak kW	307	261	570	1,746
	Annual kWh	778,759	665,436	1,437,034	3,806,983
	Annual therms	0	0	0	3,776
Solar hot water[b]	Peak kW	-13	0	19.418	60.418
	Annual kWh	-19,107	-3,344	185,371	455,141
	Annual therms	48,752	26,211	20,324	37,434
Wind	Peak kW	17	6	25.55	369.55
	Annual kWh	127,249	57,813	224,092	1,299,553
	Annual therms	0	0	0	0
Other[c]	Peak kW	0	0	0	0
	Annual kWh	0	0	0	-15,545
	Annual therms	0	0	0	2,253
All Residential Programs Renewable Projects	**Peak kW**	**311**	**267**	**615**	**2,176**
	Annual kWh	**886,901**	**719,905**	**1,846,497**	**5,546,132**
	Annual therm	**48,752**	**26,211**	**20,324**	**43,463**

[a] Prior to July 2007, solar electric and solar hot water included residential PV installations and projects that combined PV with solar thermal technologies. The therm savings are from both combined projects and PV installations that were off-grid and displacing fossil fuel generators on-site.

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

[c] 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.

iii. Gross savings adjustment factor

The evaluation confirmed installation for 100 percent of the projects sampled.

Verified gross savings are 97 and 100 percent, for kWh and kW respectively. Verified gross therm savings are 93 percent of program tracked therm savings. Table 4-23 shows the verified gross adjustment factors by technology.

Solar electric projects drive the kWh and kW verified gross adjustments, since they account for 83 percent of the Residential Program's renewable energy electric savings. Solar hot water projects are the only Residential Program renewable energy projects that offset therms. The Program's calculation of energy production from wind systems is improving, but continues to overestimates offsets.

Table 4-23. CY10 Gross Savings Adjustment Factors Residential Program Renewables

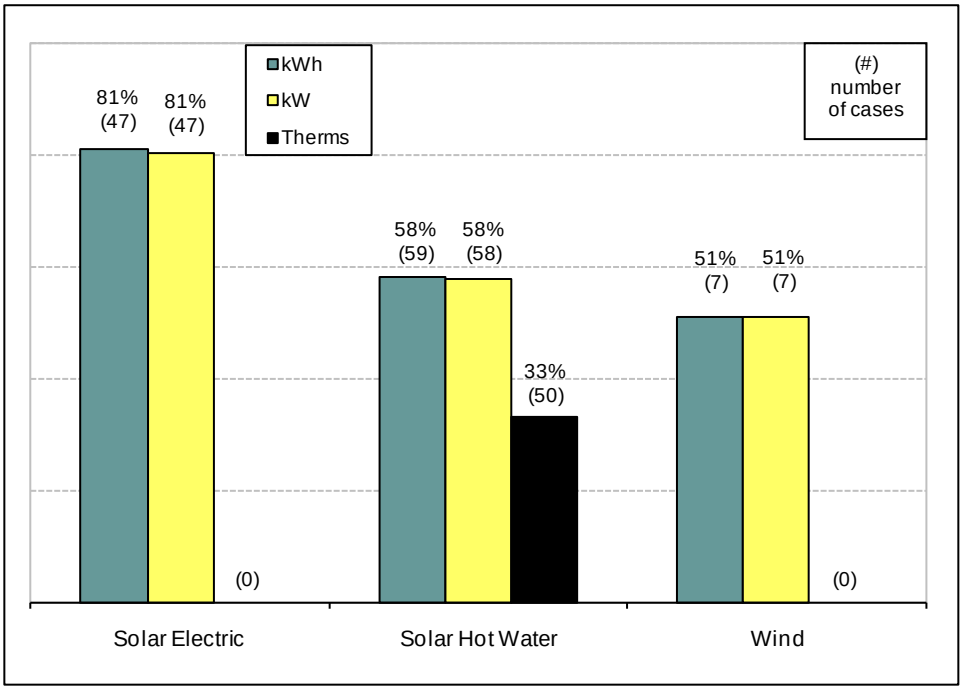
Technology	kWh				kW				Therms			
			Margin of Error (90% Confidence)				Margin of Error (90% Confidence)				Margin of Error (90% Confidence)	
	n[a]	Estimate	CY10	Extrapolated	n[a]	Estimate	CY10	Extrapolated	n[a]	Estimate	CY10	Extrapolated
Solar electric	46	101%	± 1.7%	± 2.0%	46	101%	± 1.7%	± 2.1%				
Solar hot water	57	78%	± 9.8%	± 11.8%	57	78%	± 9.9%	± 11.9%	48	93%	± 4.6%	± 6.0%
Wind	7	84%	± 4.3%	± 8.7%	7	85%	± 4.2%	± 9.0%				
Overall Residential Renewable Projects	**110**	**97%**	**± 1.7%**	**± 2.2%**	**110**	**100%**	**± 1.6%**	**± 2.0%**	**48**	**93%**	**± 4.6%**	**± 6.0%**

iv. Attribution adjustment factors

Attribution is the percent of tracked savings that is directly attributable to the program. We used participant self-report surveys to estimate attribution. The CY10 attribution factors for the Residential Renewable Program overall are 77, 79, and 33 percent for kWh, kW, and therms respectively. Figure 4-6 shows attribution by renewable technology for residential programs. Solar electric attribution is high at 81 percent. Wind and solar hot water projects offsetting electricity have lower attribution, with both below 60 percent.

Solar hot water projects with therm savings had the lowest attribution rates, at 33 percent. The low attribution rate for the solar hot water projects with therm savings is due to some unique circumstances where a large portion of these projects received substantial funding from sources outside of Focus on Energy.

Figure 4-6. CY10 Residential Program Renewable Project Attribution by Technology



v. Net energy impacts

We calculate the net energy impacts based on an overall realization rate. The realization rate combines the effect of the gross savings adjustment factors and the attribution factors. The CY10 realization rates for the program overall are 74, 79, and 31 percent for kWh, kW, and therms, respectively, as shown in Table 4-24.

Table 4-24. CY10 Residential Program Renewable Project Realization Rates by Technology

Technology	kWh				kW				Therms			
			Margin of Error (90% Confidence)				Margin of Error (90% Confidence)				Margin of Error (90% Confidence)	
	n[a]	CY10	CY10	Extrapolated	n[a]	CY10	CY10	Extrapolated	n[a]	CY10	CY10	Extrapolated
Solar electric	46	82%	± 6.1%	± 7.2%	46	82%	± 6.1%	± 7.3%				
Solar hot water	57	45%	± 18.6%	± 23.1%	57	45%	± 18.6%	± 23.1%	48	31%	± 7.8%	± 10.5%
Wind	7	43%	± 15.2%	± 31.5%	7	43%	± 15.4%	± 31.9%				
Overall Residential Renewable Projects	**110**	**74%**	**± 5.5%**	**± 7.1%**	**110**	**79%**	**± 5.8%**	**± 7.0%**	**48**	**31%**	**± 7.8%**	**± 10.5%**

[a] Realization rates are not calculated directly but are products of other adjustment factors. Therefore, sample sizes reflect the minimum sample size used in calculating the realization rate.

[b] Ratios not reported to protect respondent confidentiality

Realization rates are the combined effect of verified gross factors and self-reported attribution. The realization rates vary by technology, as do the reasons for rates below 100 percent. Solar electric has the highest realization rate, roughly equal to attribution due to high verified gross saving factors. Wind and solar hot water have mid-range realization rates due to the combined effects of verified gross adjustment and attribution.

vi. Total impacts

We report the total renewable impacts for the CY10 Residential Program renewable projects in Table 4-25 below.

Table 4-25. Total Impacts Residential Program Renewable Projects CY10 (January 1–December 31, 2010)

Tracked Savings			Verified Gross Savings			Net Savings		
kWh	Peak kW	Therms	kWh	Peak kW	Therms	kWh	Peak kW	Therms
1,846,497	615	20,324	1,779,206	614	18,894	1,354,964	485	6,265

vii. Recommendations

The Program should consider establishing criteria for Focus funding eligibility that takes into account the percent of project costs directly funded from other sources. Projects that have external funding greater than a predetermined percentage (e.g., 75 percent) should not be eligible for Focus funding.

4.10.3 Findings of other renewables evaluation activities in CY10

A. STANDARD CALCULATION RECOMMENDATIONS

The evaluation team made the following changes to the standard calculations document in CY10.

i. Solar Hot Water

- Added a fixed value for residential hot water consumption of 15.8 gallons (60 liters) per person per day based on the ASHRAE standard for sizing hot water systems.

ii. Wind

- Added a default value for wind shear constant, α, equal to 0.30. The 7th Wind™ Wind Turbine Performance Model calculator has consistently overestimated energy production during past evaluations. Using a default value of 0.30 for wind shear will improve estimation of energy production.
- Updated the Rayleigh wind distribution standard shape factor, k, from 2.0 to 2.3. The 7th Wind™ Wind Turbine Performance Model calculator has consistently overestimated energy production during previous evaluations. Using a default value of 2.3 for the shape factor will improve estimation of energy production.
- Changed the source for average historic wind speed to Weather Underground. Access to the Wisconsin State Climatology Office wind data is no longer available. Weather Underground provides access to comparable wind data.
- Removed the derate factor of 0.65. The above changes to the wind shear constant and shape factor make this derating factor unnecessary.
- Added request for version number of 7th Wind™ Wind Turbine Performance Model calculator to documentation. Previous documentation has not included the version number of the 7th Wind™ Wind Turbine Performance Model calculator. Having this information will explain any discrepancies in energy estimates due to the use of different 7th Wind™ Wind Turbine Performance Model calculator versions.

B. POST YEAR 1 WIND TURBINE PRODUCTION MEMO

The analysis described in this memo was designed to address whether wind system production increases after an initial break-in period of operation. The results do not provide sufficient evidence that there is a break-in period substantial enough (in length or impact) to call into question the reliability of evaluation team estimates of annual production. For the systems examined, the evaluation team found that wind systems are likely to experience periods of down time in later years, which may offset any production issues associated with break-in. Put another way, the limited data did not allow us to reject the Null Hypothesis: there is no difference in annual wind turbine production after an initial operation period.

APPENDIX A: GEOGRAPHIC DISTRIBUTION OF DIRECT ENERGY IMPACTS

This appendix presents the geographic distribution of direct energy impacts.[52] 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.

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

[52] At the request of the PSCW, we have reprocessed the energy impact map data to more fully allocate energy savings across legislative and senate districts, reducing the savings represented in the "not mapped" category.

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.

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 2009.

A.2.1 Commercial Programs

Figure A-1.
Commercial Programs
Per Capita Energy, Electric or Gas Bill Savings by County
(July 1, 2001–December 31, 2010)

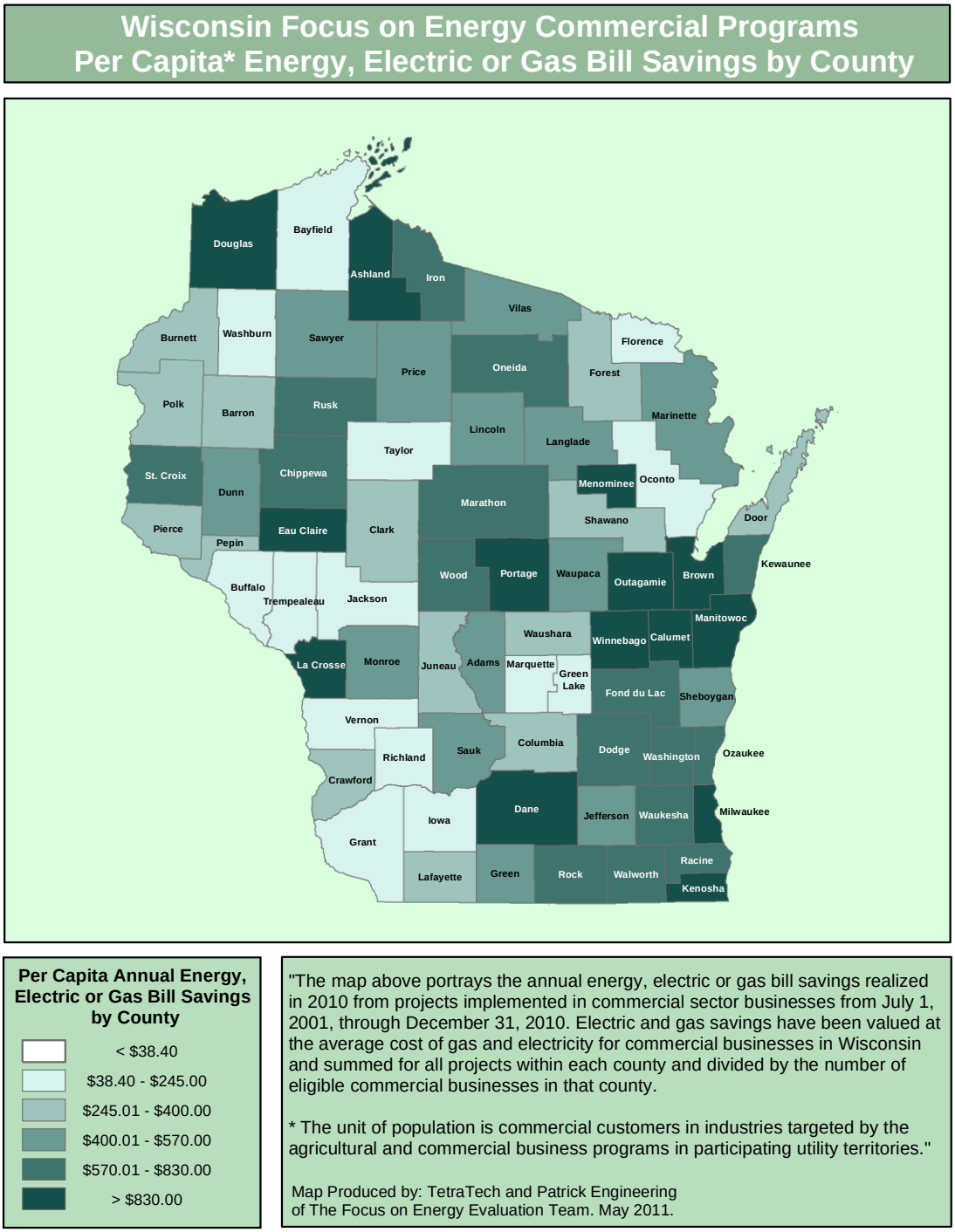


Table A-1. Commercial Program Energy Impacts
(by County)
(July 1, 2001–December 31, 2010)

County	Eligible Participants	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
Adams	786	$545	3,888,615	684	50,982	2,475,967	450	18,583
Ashland	655	$1,047	4,869,355	1,200	253,268	2,524,827	600	100,751
Barron	2,729	$374	7,010,892	1,547	407,001	3,687,749	767	166,762
Bayfield	877	$238	1,528,768	389	71,002	793,931	196	25,439
Brown	5,546	$1,680	70,148,126	19,568	2,934,374	39,024,419	9,912	1,298,900
Buffalo	1,799	$91	919,519	249	90,118	466,676	123	34,249
Burnett	971	$261	1,659,508	252	110,851	917,439	144	45,041
Calumet	1,407	$901	11,342,415	2,164	171,801	6,078,636	1,055	61,621
Chippewa	2,910	$628	12,276,060	2,750	765,046	6,786,417	1,445	310,942
Clark	3,053	$376	7,934,821	1,861	450,567	4,178,076	965	178,931
Columbia	3,088	$349	6,754,377	1,631	510,224	3,817,972	807	197,987
Crawford	2,104	$383	7,196,757	1,113	112,121	3,057,500	535	50,981
Dane	13,486	$1,231	130,727,446	27,221	4,511,300	68,224,243	13,881	1,778,502
Dodge	3,677	$593	15,892,145	3,638	752,066	8,490,458	1,829	253,521
Door	2,043	$392	7,052,651	1,840	122,051	3,896,630	980	45,924
Douglas	1,245	$893	5,998,194	1,702	650,065	3,126,100	848	277,234
Dunn	2,913	$448	9,728,697	1,996	423,001	5,494,311	1,103	171,746
Eau Claire	3,350	$1,327	26,996,847	7,796	2,220,796	15,530,235	3,916	1,065,384
Florence	241	$38	84,002	9	1,108	39,943	5	525
Fond du Lac	3,749	$722	21,395,657	4,680	726,686	11,471,312	2,331	260,274
Forest	441	$248	877,652	235	27,833	480,097	122	8,730
Grant	4,449	$201	7,529,281	1,961	178,321	4,185,879	1,108	73,964
Green	2,599	$423	9,279,881	2,251	218,171	4,867,486	1,150	77,235
Green Lake	2,599	$125	2,359,655	536	112,528	1,245,606	282	40,630
Iowa	2,945	$197	4,963,786	1,251	109,181	2,624,962	685	37,581
Iron	239	$633	1,214,018	246	38,082	636,220	110	14,510
Jackson	1,530	$202	1,601,406	374	188,309	823,574	189	64,959
Jefferson	3,174	$499	10,970,858	2,569	620,163	5,826,929	1,255	221,969
Juneau	1,432	$393	3,934,833	921	215,149	2,191,274	450	74,847
Kenosha	2,766	$1,383	33,068,826	6,622	665,146	18,773,738	3,591	255,420
Kewaunee	1,518	$821	8,906,035	1,931	452,591	4,788,158	934	206,311
La Crosse	3,106	$1,187	28,139,704	7,082	1,114,695	15,325,615	3,542	401,876
Lafayette	1,919	$245	3,610,177	794	139,902	1,982,372	395	65,556
Langlade	1,010	$563	4,807,325	1,374	112,755	2,550,184	680	39,730
Lincoln	1,348	$525	4,455,132	1,064	334,138	2,508,954	569	108,881
Manitowoc	3,091	$878	20,499,994	4,650	845,482	10,839,597	2,368	347,744
Marathon	5,348	$656	27,227,366	6,625	1,004,742	15,123,415	3,395	358,416
Marinette	1,718	$442	6,134,969	1,465	186,176	3,218,558	739	73,384
Marquette	1,115	$106	890,484	186	37,686	447,630	96	14,184
Menominee	24	$2,079	351,240	85	18,813	171,423	51	6,005
Milwaukee	14,572	$1,243	135,214,798	30,764	5,854,064	73,737,744	15,226	2,231,051
Monroe	3,325	$524	9,558,781	2,501	999,673	5,627,537	1,348	503,222

County	Eligible Participants	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
Oconto	2,140	$241	4,385,224	1,206	100,093	2,237,088	602	37,089
Oneida	1,204	$755	6,733,087	1,550	301,164	3,616,895	777	109,708
Outagamie	5,027	$964	36,478,649	8,563	1,528,168	19,190,292	4,261	576,923
Ozaukee	2,601	$618	12,067,590	2,919	509,783	6,679,178	1,698	198,384
Pepin	814	$263	1,491,305	438	83,152	776,425	204	35,383
Pierce	2,631	$318	6,267,957	1,587	266,700	3,650,661	725	95,052
Polk	2,971	$265	5,806,551	1,447	264,805	2,851,375	706	99,884
Portage	2,438	$1,130	21,095,914	5,089	824,841	11,568,648	2,514	295,276
Price	1,088	$478	2,197,934	448	381,317	1,181,906	234	100,865
Racine	3,791	$728	22,118,870	4,711	699,563	11,831,919	2,317	271,063
Richland	2,406	$146	3,117,209	716	49,731	1,691,017	361	20,146
Rock	4,383	$754	24,134,728	5,535	1,136,330	12,768,664	2,707	473,659
Rusk	1,011	$609	4,804,810	1,152	172,504	2,581,368	602	57,339
Sauk	3,693	$458	13,219,165	3,272	474,103	6,995,609	1,623	164,508
Sawyer	775	$520	3,611,325	704	54,117	1,930,315	353	20,043
Shawano	2,450	$319	6,777,992	1,542	132,087	3,485,811	752	49,197
Sheboygan	3,129	$520	11,904,735	3,145	556,087	6,277,114	1,546	204,727
St. Croix	1,457	$767	7,923,089	1,672	415,008	4,415,325	879	157,489
Taylor	1,807	$175	2,262,528	521	114,827	1,214,382	253	48,385
Trempealeau	2,868	$132	2,650,478	747	143,803	1,487,280	374	50,377
Vernon	3,554	$127	3,734,709	882	100,633	1,894,300	419	37,476
Vilas	790	$447	2,999,692	737	67,863	1,656,629	364	24,725
Walworth	3,118	$618	15,299,529	3,946	508,467	8,302,309	2,037	202,724
Washburn	1,198	$236	1,771,708	391	134,093	882,827	228	54,252
Washington	3,257	$642	16,211,162	3,744	600,477	8,613,492	1,870	246,370
Waukesha	9,382	$784	60,247,969	14,083	1,705,172	34,263,159	7,259	703,570
Waupaca	2,633	$416	8,384,715	2,207	327,606	4,309,115	1,107	112,045
Waushara	1,219	$344	2,976,875	756	155,412	1,541,221	380	62,872
Winnebago	3,796	$975	27,416,980	6,902	1,225,484	14,708,317	3,459	494,159
Wood	2,656	$820	14,634,496	3,430	910,916	7,886,751	1,723	329,442
Not mapped*			66,845,876	18,390	252,938	46,511,569	12,759	94,709

**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–December 31, 2010)

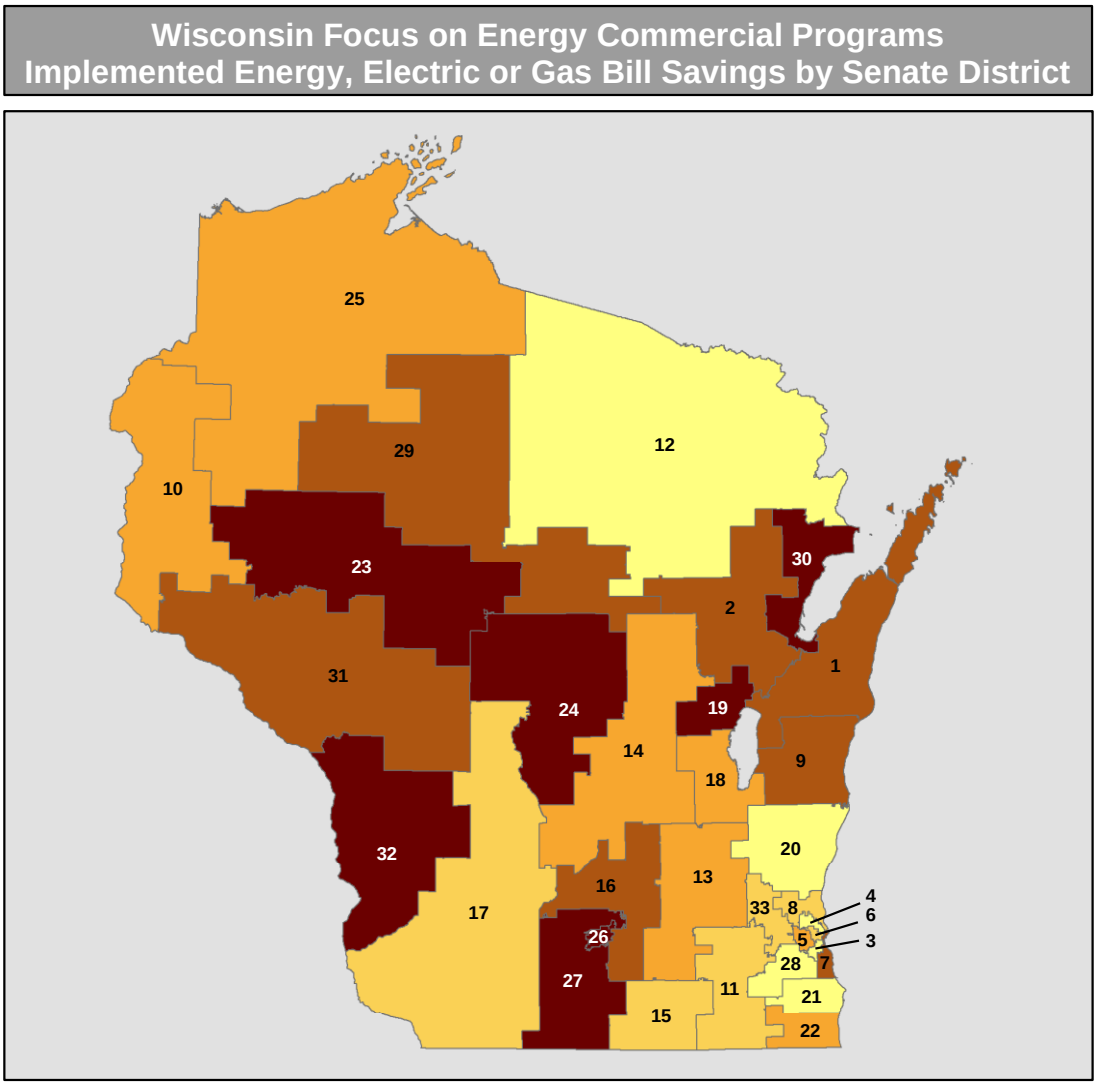


Table A-2. Commercial Program Energy Impacts
(by Senate District)
(July 1, 2001–December 31, 2010)

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	$4,745,966	39,510,768	9,497	1,017,914	21,698,074	4,832	424,368
2	$5,037,535	40,223,144	10,061	1,297,469	22,066,692	5,059	489,728
3	$2,179,420	14,075,710	3,391	982,250	8,289,831	1,724	332,630
4	$1,643,280	13,291,274	2,702	401,707	7,552,327	1,425	162,227
5	$3,920,694	27,552,578	6,634	1,484,724	14,810,413	3,325	537,608
6	$3,516,849	25,519,888	5,987	1,229,885	13,117,454	2,775	519,659
7	$4,556,191	36,805,475	8,345	1,119,623	20,486,682	4,148	445,165
8	$3,413,453	27,118,802	6,432	896,450	14,738,537	3,311	332,348
9	$4,269,179	31,942,226	7,009	1,371,112	16,566,122	3,469	555,418
10	$3,654,954	26,243,407	5,755	1,313,441	14,560,219	2,940	497,454
11	$3,516,658	27,717,620	7,106	951,534	15,535,896	3,697	380,920
12	$3,189,361	24,608,205	6,246	930,008	13,159,306	3,153	322,595
13	$3,640,985	26,138,352	5,882	1,309,023	14,124,619	2,993	457,595
14	$3,916,671	29,334,543	7,730	1,254,128	15,915,388	3,976	450,913
15	$3,491,412	25,735,232	6,013	1,170,381	13,590,856	2,909	491,246
16	$4,211,524	32,454,299	6,247	1,233,209	17,923,625	3,240	477,818
17	$3,397,163	27,169,810	6,737	869,340	14,823,850	3,531	328,129
18	$4,074,265	31,299,462	7,982	1,205,305	16,715,652	3,949	444,237
19	$5,445,579	40,320,736	8,569	1,802,506	21,415,887	4,329	704,053
20	$2,962,067	22,487,311	5,188	910,191	12,075,157	2,761	372,838
21	$2,323,078	19,304,623	3,998	502,720	10,293,918	1,975	194,802
22	$4,185,419	35,198,415	7,115	852,858	19,930,780	3,826	328,419
23	$6,674,056	41,229,885	10,499	3,245,131	23,266,353	5,408	1,457,993
24	$5,310,840	38,946,715	9,091	1,805,535	21,094,604	4,523	653,805
25	$3,783,153	25,287,307	6,025	1,596,981	13,178,452	3,026	657,589
26	$8,768,357	69,485,395	13,942	2,325,094	34,165,011	6,918	937,791
27	$5,296,743	41,729,119	10,046	1,435,566	23,128,322	5,256	535,783
28	$2,336,080	20,150,060	4,680	412,222	11,037,209	2,331	164,069
29	$4,503,027	33,014,305	8,019	1,531,960	18,396,622	4,133	507,393
30	$5,479,563	39,059,880	11,384	2,005,150	21,536,215	5,764	943,927
31	$4,536,413	29,738,663	7,883	1,988,802	16,418,746	3,998	909,486
32	$5,070,667	40,227,544	9,376	1,338,923	20,832,227	4,639	493,274
33	$3,523,189	28,039,672	6,063	919,063	15,677,219	3,060	379,666
Not mapped*	$6,980,536	67,613,479	18,576	295,070	46,938,492	12,863	106,404

* *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–December 31, 2010)

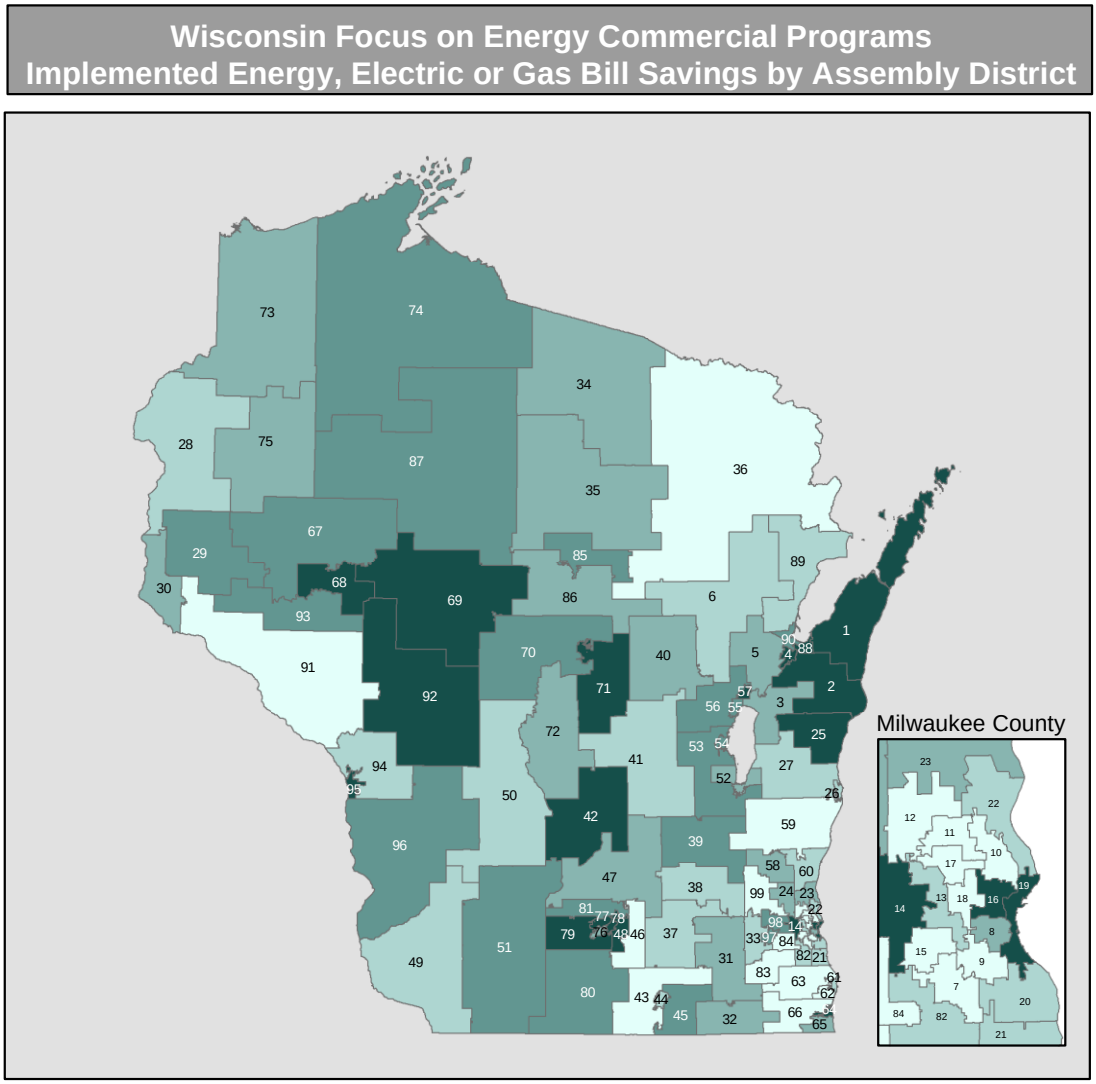


Table A-3. Commercial Program Energy Impacts
(by Assembly District)
(July 1, 2001–December 31, 2010)

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	$1,761,682	15,404,252	3,722	284,454	8,291,363	1,894	95,643
2	$1,768,703	13,257,883	3,509	564,964	7,422,768	1,816	264,342
3	$1,215,581	10,848,633	2,267	168,497	5,983,943	1,122	64,383
4	$2,654,418	20,263,790	5,090	801,473	11,610,947	2,636	297,662
5	$1,357,421	11,347,256	2,955	285,249	6,040,664	1,449	116,902
6	$1,025,696	8,612,097	2,016	210,748	4,415,081	974	75,164
7	$219,493	1,580,216	410	78,345	827,555	216	32,125
8	$1,101,364	8,892,763	1,969	271,176	5,438,001	1,072	88,610
9	$858,562	3,602,731	1,012	632,729	2,024,274	436	211,895
10	$608,226	4,308,860	1,007	225,954	2,367,413	541	85,551
11	$195,075	1,789,373	341	20,915	941,299	184	8,377
12	$839,980	7,193,041	1,354	154,837	4,243,615	700	68,299
13	$903,628	5,244,930	1,486	482,062	2,736,376	775	167,220
14	$2,342,814	18,504,805	4,131	628,957	10,057,447	2,085	228,003
15	$674,251	3,802,843	1,016	373,705	2,016,591	465	142,386
16	$2,676,479	21,021,434	4,946	733,571	10,936,842	2,269	332,998
17	$586,229	3,484,433	798	302,389	1,642,790	378	103,033
18	$254,141	1,014,020	243	193,925	537,822	128	83,627
19	$2,506,340	20,527,818	5,034	580,304	11,415,500	2,464	243,925
20	$1,089,891	8,430,511	1,832	315,124	4,698,948	931	113,303
21	$959,960	7,847,146	1,479	224,196	4,372,234	753	87,937
22	$927,965	6,719,612	1,352	326,309	3,780,508	723	107,271
23	$1,260,186	10,064,427	2,604	324,291	5,172,582	1,292	127,906
24	$1,225,302	10,334,763	2,475	245,850	5,785,447	1,296	97,171
25	$2,324,808	17,781,952	3,621	697,597	9,094,102	1,784	291,702
26	$867,487	6,379,636	1,694	292,647	3,363,645	850	110,068
27	$1,076,884	7,780,638	1,694	380,867	4,108,376	835	153,649
28	$1,081,518	7,766,006	1,773	388,595	3,912,947	884	150,438
29	$1,425,864	9,795,344	1,858	568,416	5,593,104	1,033	214,698
30	$1,147,572	8,682,058	2,123	356,430	5,054,169	1,024	132,317
31	$1,237,069	9,908,960	2,185	314,652	5,688,887	1,154	117,139
32	$1,250,485	10,304,858	2,736	281,566	5,648,020	1,457	115,434
33	$1,029,104	7,503,802	2,185	355,316	4,198,989	1,086	148,347
34	$1,252,015	9,662,253	2,272	364,822	5,238,203	1,134	133,390
35	$1,305,124	9,437,435	2,498	460,612	5,112,769	1,270	152,075
36	$632,032	5,506,606	1,476	104,573	2,807,328	749	37,130
37	$968,693	6,116,363	1,499	454,288	3,208,147	747	157,693
38	$1,043,960	7,730,293	1,502	345,492	4,387,831	778	137,594
39	$1,628,333	12,291,696	2,881	509,244	6,528,641	1,468	162,308
40	$1,210,401	9,353,608	2,943	351,115	4,849,462	1,458	119,405
41	$943,098	6,248,936	1,529	405,059	3,271,076	777	137,972
42	$1,763,171	13,731,999	3,258	497,954	7,794,850	1,741	193,537

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	$800,265	6,770,482	1,797	157,952	3,659,203	880	63,183
44	$965,098	7,425,836	1,684	284,025	3,816,359	812	103,112
45	$1,726,049	11,538,914	2,532	728,404	6,115,294	1,217	324,951
46	$756,664	4,569,814	1,281	381,147	2,529,126	676	168,775
47	$1,322,856	10,034,883	2,234	407,493	5,542,545	1,125	160,045
48	$2,132,005	17,849,601	2,732	444,569	9,851,954	1,439	148,997
49	$992,953	8,500,443	2,186	183,359	4,669,135	1,213	75,794
50	$1,013,848	7,393,346	1,836	349,949	4,077,220	893	117,119
51	$1,390,363	11,276,021	2,715	336,032	6,077,495	1,425	135,216
52	$1,225,235	9,516,971	2,587	349,251	5,172,883	1,262	120,207
53	$1,412,009	12,190,848	2,182	247,713	6,405,637	1,085	82,150
54	$1,437,022	9,591,642	3,213	608,342	5,137,132	1,602	241,881
55	$1,450,895	10,558,289	2,000	503,609	5,800,437	1,032	204,371
56	$1,626,552	14,056,310	2,742	283,685	7,366,315	1,402	106,594
57	$2,368,132	15,706,137	3,827	1,015,211	8,249,134	1,894	393,088
58	$1,145,862	8,189,390	1,831	416,605	4,254,975	858	173,232
59	$769,429	6,615,993	1,528	138,403	3,454,102	764	57,465
60	$1,046,776	7,681,927	1,829	355,184	4,366,081	1,140	142,142
61	$1,080,092	10,218,813	1,853	76,401	5,226,506	893	29,558
62	$856,554	5,949,149	1,446	333,259	3,335,084	730	127,797
63	$386,431	3,136,661	700	93,060	1,732,328	352	37,446
64	$2,146,695	19,007,815	3,294	316,630	10,469,141	1,695	120,120
65	$1,178,176	10,306,412	2,323	189,683	6,107,009	1,370	82,270
66	$860,548	5,884,187	1,498	346,544	3,354,630	761	126,029
67	$1,667,800	11,434,413	2,568	667,771	6,360,459	1,340	262,066
68	$3,180,615	17,146,798	5,143	1,863,109	10,350,958	2,642	912,493
69	$1,825,745	12,649,713	2,788	714,252	6,555,730	1,426	283,433
70	$1,408,857	9,598,886	2,518	571,712	5,009,159	1,232	219,510
71	$2,575,093	19,253,810	4,740	828,698	10,656,171	2,341	300,051
72	$1,326,890	10,094,019	1,832	405,124	5,429,274	949	134,245
73	$1,183,905	6,295,966	1,850	704,443	3,282,851	949	306,120
74	$1,386,692	10,603,586	2,426	416,470	5,518,925	1,197	160,744
75	$1,212,555	8,387,755	1,749	476,068	4,376,677	881	190,725
76	$1,096,004	8,605,737	1,455	300,701	4,641,694	716	103,919
77	$3,359,236	27,653,572	4,129	760,033	12,546,296	2,094	343,795
78	$4,313,117	33,226,086	8,358	1,264,360	16,977,020	4,107	490,076
79	$2,351,038	18,414,681	4,111	650,789	10,462,532	2,263	244,189
80	$1,472,238	12,570,394	3,048	276,053	6,646,302	1,553	98,489
81	$1,473,467	10,744,043	2,886	508,724	6,019,488	1,440	193,106
82	$979,324	8,045,776	1,761	223,614	4,196,248	837	83,923
83	$594,091	4,999,669	1,051	120,614	2,756,399	504	50,695
84	$762,665	7,104,615	1,867	67,994	4,084,561	989	29,451
85	$1,655,726	12,296,841	3,087	543,326	7,101,372	1,534	182,154
86	$1,300,872	10,506,129	2,635	319,986	5,785,949	1,422	118,650
87	$1,546,516	10,212,208	2,298	668,648	5,509,512	1,177	206,589
88	$2,827,766	17,205,008	5,620	1,408,342	9,277,078	2,832	716,843

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	$956,355	6,945,577	1,889	333,712	3,653,328	944	121,532
90	$1,695,441	14,909,295	3,875	263,095	8,605,809	1,989	105,552
91	$836,044	5,723,829	1,565	335,765	3,091,603	774	127,249
92	$1,998,369	10,719,052	2,773	1,177,445	6,287,502	1,491	565,114
93	$1,702,000	13,295,782	3,545	475,592	7,039,640	1,734	217,123
94	$978,438	8,638,301	1,870	147,511	4,708,032	975	52,219
95	$2,734,597	19,771,691	5,254	965,409	10,726,322	2,585	348,668
96	$1,357,632	11,817,552	2,252	226,003	5,397,873	1,079	92,387
97	$1,462,373	11,298,330	2,266	424,516	6,361,723	1,121	176,267
98	$1,502,767	12,196,465	2,651	362,081	6,908,655	1,366	149,923
99	$558,049	4,544,877	1,145	132,466	2,406,841	573	53,476
Not mapped*	$6,980,536	67,613,479	18,576	295,070	46,938,492	12,863	106,404

* *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–December 31, 2010)

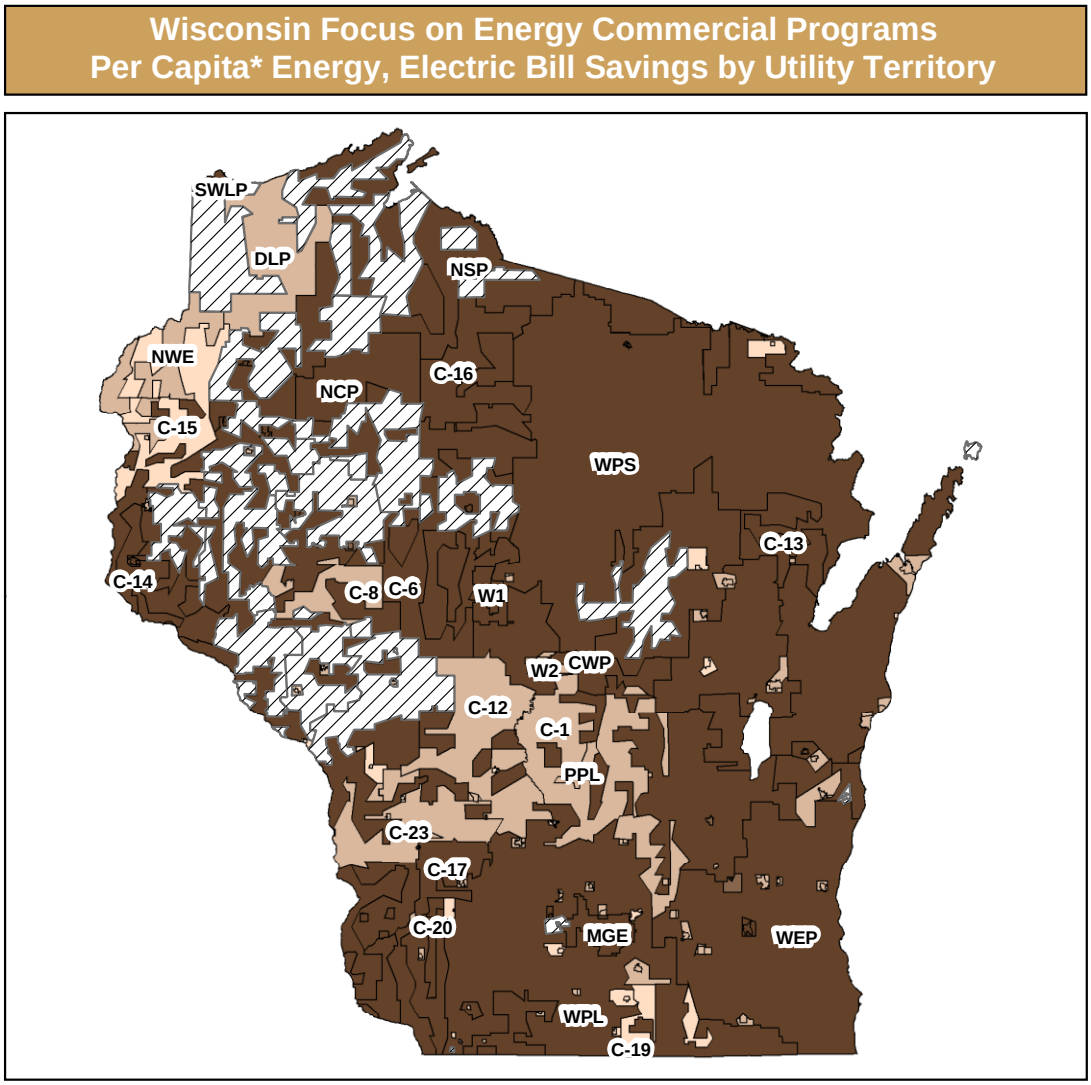


Table A-4. Commercial Program Electric Impacts
(by Participating Electric Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Adams-Columbia Electric Coop	2009	C-1	$140,473	1,764	$80	1,407,549	305	755,985	169
Algoma Utility Comm	2008	W2	$15,873	364	$44	159,051	35	97,329	22
Bloomer Electric & Water Co	2001	W1	$114,423	373	$307	1,146,525	168	629,460	84
Brodhead Water & Lighting Comm	2008	W1	$6,956	305	$23	69,696	19	38,359	9
Cedarburg Light & Water Comm	2008	W1	$122,255	866	$141	1,225,003	174	641,326	89
City of Arcadia	2009	W1	$4,083	236	$17	40,910	35	23,207	17
City of Argyle	2001	W1	$2,484	96	$26	24,885	6	12,478	3
City of Bangor	2008	W2	$16,641	442	$38	166,741	56	91,300	28
City of Barron	2009	W1	$61,663	318	$194	617,865	151	369,185	84
City of Black River Falls	2008	W1	$53,759	512	$105	538,671	99	282,879	49
City of Boscobel	2008	W1	$40,842	309	$132	409,239	40	223,947	21
City of Clintonville	2008	W1	$41,845	496	$84	419,288	93	218,356	47
City of Columbus	2008	W2	$39,969	416	$96	400,494	72	236,819	37
City of Cornell	2001	W1	$29,562	155	$191	296,211	71	152,990	34
City of Cuba City	2008	W2	$8,391	146	$57	84,076	16	47,036	9
City of Cumberland	2001	W1	$81,998	223	$368	821,626	233	432,494	116
City of Eagle River	2008	W2	$67,410	543	$124	675,449	195	364,759	87
City of Elkhorn	2009	W2	$52,086	663	$79	521,900	112	315,712	66
City of Elroy	2007	W2	$11,705	140	$84	117,284	20	55,086	10
City of Evansville	2008	W2	$34,991	574	$61	350,614	71	195,394	39
City of Fennimore	2008	W2	$38,538	235	$164	386,149	189	244,098	142
City of Kaukauna	2008	W2	$257,163	1,665	$154	2,576,779	526	1,415,215	282
City of Kiel	2007	W2	$66,248	373	$178	663,805	146	370,536	79
City of Lodi	2008	W2	$27,899	290	$96	279,550	84	165,331	39

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
City of Marshfield	2008	W2	$443,665	1,863	$238	4,445,538	1,338	2,347,356	635
City of Medford	2007	W2	$128,676	568	$227	1,289,337	321	720,390	158
City of Menasha	2008	W2	$88,308	876	$101	884,848	208	471,361	95
City of Muscoda	2008	W2	$8,722	200	$44	87,398	21	51,706	12
City of New Holstein	2008	W2	$102,671	347	$296	1,028,766	143	541,402	76
City of New Lisbon	2009	W2	$11,341	167	$68	113,641	26	66,875	9
City of New Richmond	2008	W2	$68,914	612	$113	690,517	165	393,317	82
City of Plymouth	2008	W2	$109,530	982	$112	1,097,496	320	597,428	157
City of Princeton	2001	W2	$18,842	166	$114	188,799	28	96,638	15
City of Richland Center	2008	W2	$69,650	586	$119	697,899	129	400,171	58
City of River Falls	2008	W2	$301,079	688	$438	3,016,824	908	1,878,978	370
City of Sheboygan Falls	2010	W2	$5,289	419	$13	52,996	25	24,850	11
City of Shullsburg	2007	W2	$14,004	157	$89	140,322	22	92,810	15
City of Spooner	2001	W1	$107,219	417	$257	1,074,335	183	542,736	99
City of Stoughton	2008	W1	$85,819	836	$103	859,912	277	455,936	131
City of Sturgeon Bay	2008	W1	$213,082	1,561	$137	2,135,093	554	1,193,543	274
City of Westby	2008	W2	$15,565	202	$77	155,964	63	89,114	25
Clark Electric Coop	2009	C-6	$164,641	83	$1,984	1,649,710	341	908,705	189
Consolidated Water Power Co	2001	CWP	$10,756	16	$672	107,773	26	56,413	14
Dahlberg Light & Power Co	2001	DLP	$97,159	1,128	$86	973,538	379	526,063	180
Eau Claire Electric Coop	2007	C-8	$84,571	590	$143	847,401	304	485,674	163
Florence Utility Comm	2008	W1	$3,448	182	$19	34,549	5	15,401	2
Hartford Electric	2008	W1	$155,300	839	$185	1,556,116	380	867,380	193
Hustisford Utilities	2008	W1	$41,354	201	$206	414,364	76	233,403	43

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Jefferson Utilities	2008	W1	$66,182	514	$129	663,148	186	362,161	103
Juneau Utility Comm	2008	W2	$35,368	186	$190	354,393	250	205,054	99
La Farge Municipal Electric Co	2001	W2	$25,966	139	$187	260,178	48	131,529	20
Lake Mills Light & Water	2008	W2	$46,047	451	$102	461,389	83	257,177	44
Madison Gas & Electric Co	2001	MGE	$10,811,525	19,154	$564	108,331,912	21,489	55,837,331	10,867
Manitowoc Public Utilities	2007	W1	$422,095	2,115	$200	4,229,409	1,036	2,643,120	580
New London Electric & Water	2008	W2	$33,617	501	$67	336,839	50	188,843	25
North Central Power Co, Inc	2001	NCP	$109,628	439	$250	1,098,476	195	557,011	93
Northwestern Wisconsin Elec Co	2001	NWE	$299,009	1,498	$200	2,996,085	662	1,507,052	319
Oakdale Electric Coop	2008	C-12	$201,581	1,336	$151	2,019,846	592	1,195,532	315
Oconomowoc Utilities	2008	W1	$243,727	1,143	$213	2,442,151	488	1,511,820	271
Oconto Electric Coop	2009	C-13	$112,644	275	$410	1,128,698	233	616,731	124
Oconto Falls Water & Light Comm	2008	W2	$31,101	258	$121	311,637	75	177,340	43
Pierce-Pepin Coop Services	2009	C-14	$77,687	334	$233	778,429	167	416,785	96
Pioneer Power & Light Co	2001	PPL	$24,195	136	$178	242,433	26	114,669	15
Polk-Burnett Electric Coop	2010	C-15	$34,736	1,175	$30	348,061	112	162,318	55
Price Electric Coop, Inc	2007	C-16	$100,821	298	$338	1,010,234	181	579,909	101
Reedsburg Utility Comm	2008	W1	$107,421	673	$160	1,076,367	339	633,076	165
Rice Lake Utilities	2007	W1	$215,596	911	$237	2,160,280	378	1,161,550	181
Richland Electric Coop	2006	C-17	$127,162	226	$563	1,274,172	330	674,850	164
Rock Energy Coop	2009	C-19	$33,818	450	$75	338,855	85	182,647	49
Scenic Rivers Energy Coop	2007	C-20	$347,755	814	$427	3,484,520	937	1,878,120	507

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Shawano Municipal Utilities	2007	W1	$211,186	1,328	$159	2,116,089	454	1,177,183	230
Slinger Utilities	2008	W1	$58,606	341	$172	587,234	285	306,306	119
Sun Prairie Water & Light Comm	2008	W1	$117,573	1,598	$74	1,178,088	384	763,105	198
Superior Water, Light & Power Co	2001	SWLP	$515,101	2,004	$257	5,161,331	1,366	2,660,158	679
Two Rivers Water & Light	2008	W1	$80,590	591	$136	807,516	248	495,548	132
Vernon Electric Coop	2009	C-23	$55,422	542	$102	555,334	177	292,047	96
Village of Belmont	2007	W2	$1,308	239	$5	13,103	3	7,681	2
Village of Benton	2001	W2	$5,284	79	$67	52,947	7	21,056	3
Village of Cadott	2001	W2	$31,468	151	$208	315,308	71	175,220	36
Village of Cashton	2001	W2	$6,569	112	$59	65,819	18	30,442	8
Village of Centuria	2001	W2	$1,022	71	$14	10,238	1	5,722	1
Village of Gresham	2001	W2	$12,937	174	$74	129,629	16	68,102	8
Village of Mazomanie	2007	W2	$38,755	116	$334	388,328	88	220,706	50
Village of Mt Horeb	2008	W2	$36,723	496	$74	367,969	96	222,190	58
Village of New Glarus	2008	W2	$17,928	195	$92	179,641	44	94,984	23
Village of Pardeeville	2001	W2	$10,906	135	$81	109,283	24	65,911	12
Village of Prairie Du Sac	2008	W2	$20,571	254	$81	206,122	49	116,288	28
Village of Sauk City	2009	W2	$24,228	282	$86	242,768	67	168,183	40
Village of Stratford	2001	W2	$26,943	158	$171	269,970	67	128,018	31
Village of Trempealeau	2009	W2	$924	162	$6	9,263	2	4,378	1
Village of Viola	2001	W2	$3,237	87	$37	32,433	8	12,559	3
Village of Waunakee	2008	W2	$87,600	577	$152	877,753	221	539,245	107
Waterloo Light & Water Comm	2008	W2	$28,578	302	$95	286,350	64	156,930	34

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Waupun Utilities	2008	W2	$105,320	526	$200	1,055,307	220	573,109	116
Whitehall Electric Utility	2008	W2	$21,403	201	$106	214,457	80	133,231	33
Wisconsin Dells Electric Utility	2007	W2	$47,019	698	$67	471,137	101	256,507	50
Wisconsin Electric Power Co (We Energies)	2001	WEP	$35,321,125	112,023	$315	353,919,092	79,698	193,099,884	40,221
Wisconsin Power & Light Co	2001	WPL	$15,726,964	57,068	$276	157,584,806	37,024	84,088,164	18,950
Wisconsin Public Service Corp	2001	WPS	$18,697,947	53,946	$347	187,354,176	48,269	102,682,599	24,453
Wisconsin Rapids Water Works & Lighting Comm	2008	W2	$393,956	2,174	$181	3,947,460	890	2,161,858	446
Wonewoc Electric & Water Utility	2001	W2	$18,190	86	$212	182,268	22	96,919	13
Xcel Energy (Northern States Power Co)	2001	NSP	$11,750,640	37,006	$318	117,741,886	29,079	64,455,528	14,731
Not mapped*			$8,967,109	1	$8,967,109	89,850,792	23,967	58,349,442	15,552

* *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–December 31, 2010)

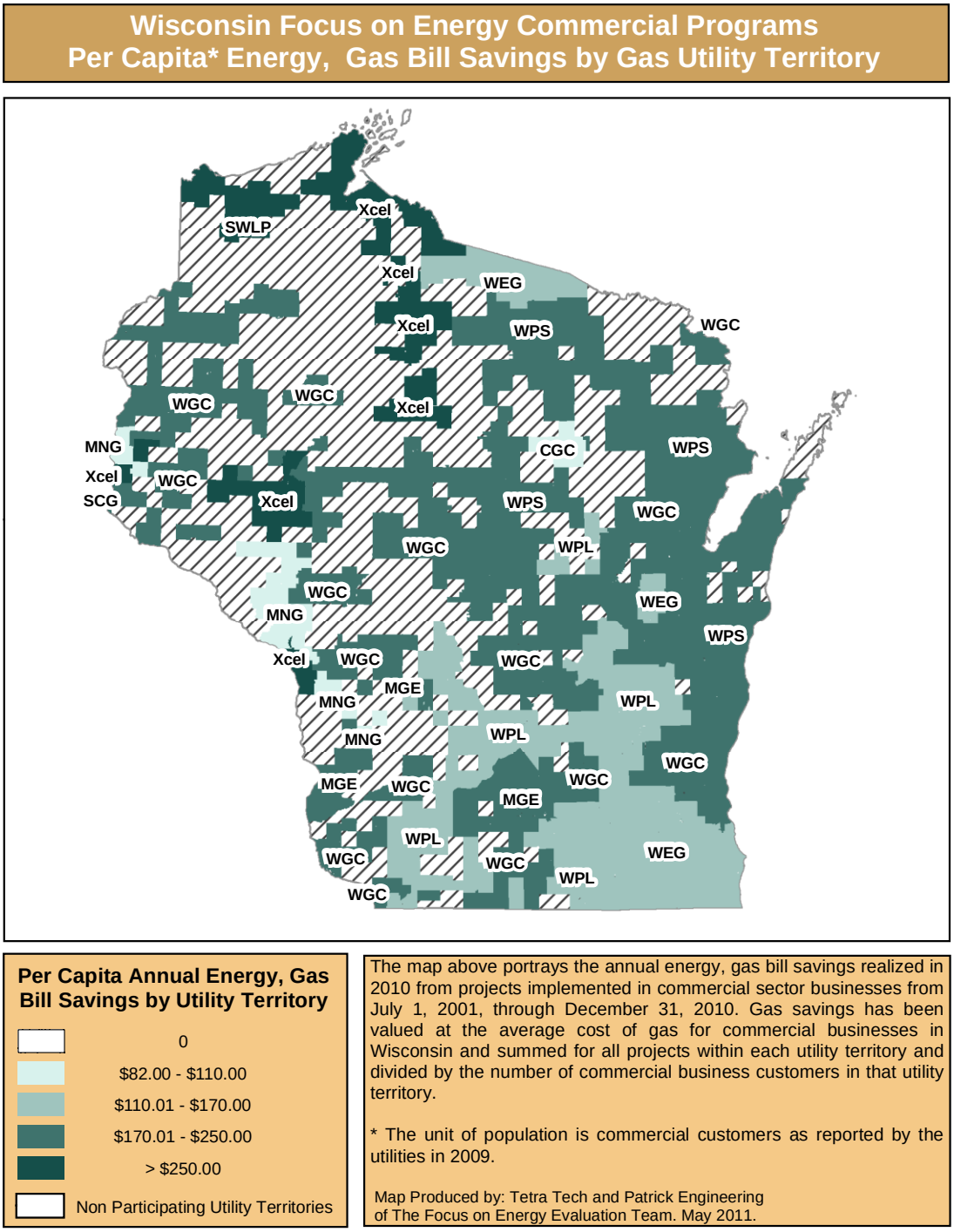


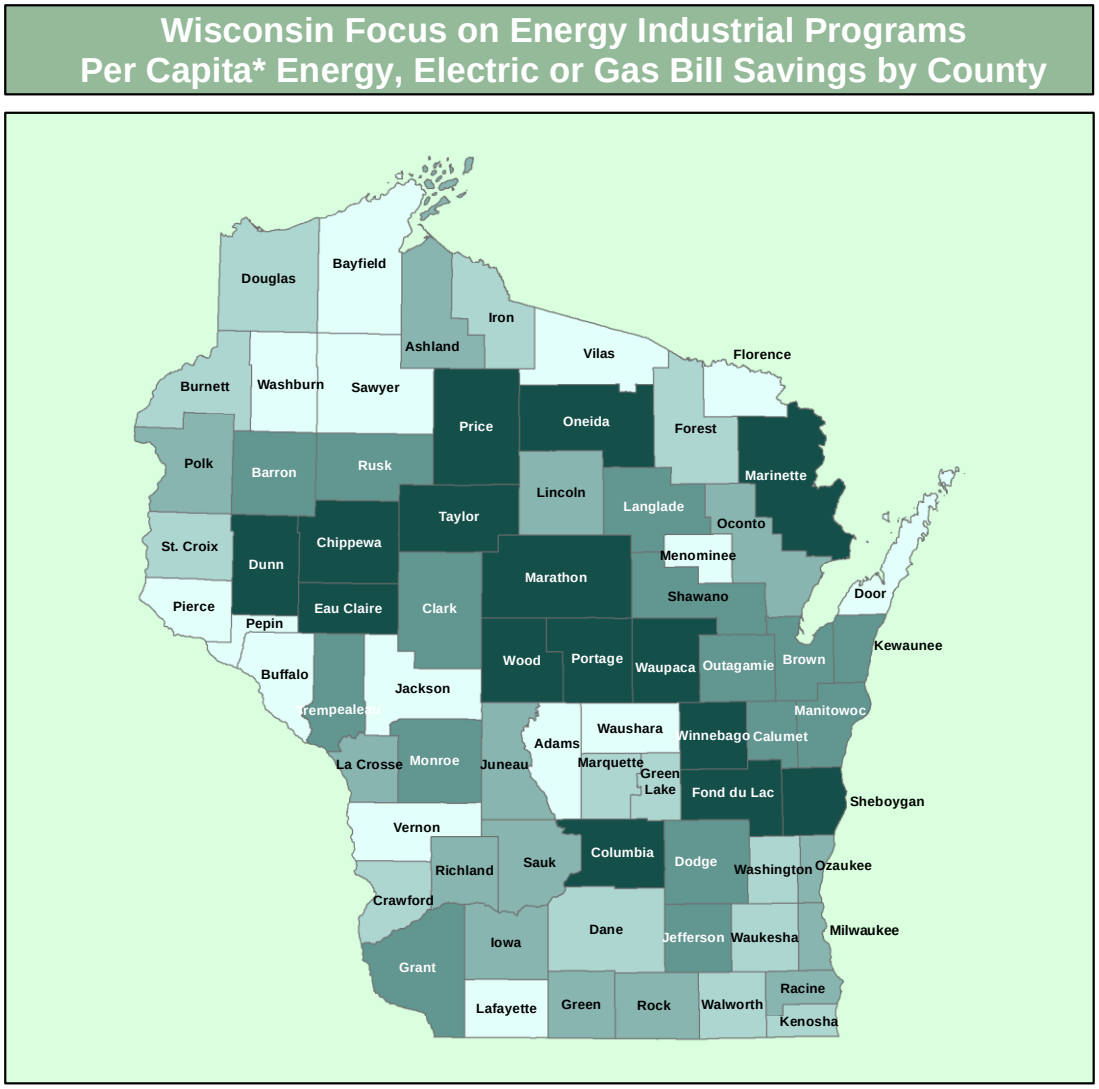
Table A-5. Commercial Program Gas Impacts
(by Participating Gas Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross Therms	Persistent Net Therms
City Gas Co	2007	CGC	$60,689	581	$104	76,951	22,534
Madison Gas and Electric	2001	MGE	$3,440,363	14,138	$243	4,362,274	1,698,409
Midwest Natural Gas Inc.	2007	MNG	$123,765	1,508	$82	156,930	53,439
St. Croix Gas	2007	SCG	$132,946	590	$225	168,572	57,085
Superior Water Light And Power Co	2001	SWLP	$533,927	1,159	$461	677,003	284,101
Wisconsin Electric Gas Operations (We Energies)	2001	WEG	$4,834,628	36,465	$133	6,130,160	2,418,417
Wisconsin Gas LLC (We Energies)	2001	WGC	$10,362,782	51,239	$202	13,139,690	5,121,726
Wisconsin Power & Light	2001	WPL	$3,155,372	18,725	$169	4,000,915	1,493,389
Wisconsin Public Service Corp	2001	WPS	$6,433,209	26,384	$244	8,157,112	3,309,473
Xcel Energy (Northern States Power Co)	2001	Xcel	$4,227,232	11,801	$358	5,360,001	2,212,482
Not mapped*			$611,739			775,666	326,292

* *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–December 31, 2010)



Per Capita Annual Energy, Electric or Gas Bill Savings by County

	$0
	$7 - $359
	$360 - $640
	$641 - $1,162
	$1,163 - $1,860
	> $1,860

"The map above portrays the annual energy, electric or gas bill savings realized in 2010 from projects implemented in industrial sector businesses from July 1, 2001, through December 31, 2010. 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: Tetra Tech and Patrick Engineering
of The Focus on Energy Evaluation Team. May 2011.

Table A-6. Industrial Program Energy Impacts
(by County)
(July 1, 2001–December 31, 2010)

County	Eligible Participants	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
Adams	197	$109	314,908	63	0	162,064	33	0
Ashland	293	$642	2,525,985	446	22,357	1,200,431	195	9,066
Barron	739	$1,287	5,048,866	876	848,615	2,657,139	429	442,548
Bayfield	242	$80	167,424	27	10,992	81,530	13	3,661
Brown	3,759	$1,530	64,439,002	9,866	1,906,748	33,915,645	4,816	899,351
Buffalo	180	$135	41,479	7	30,115	22,731	4	8,317
Burnett	257	$588	2,106,509	213	10,848	941,877	97	3,165
Calumet	506	$1,342	8,320,851	1,320	156,975	4,361,801	658	64,573
Chippewa	811	$3,398	24,164,778	3,641	1,552,508	13,009,508	1,793	878,143
Clark	458	$1,666	7,244,915	1,006	377,185	3,871,900	529	147,880
Columbia	852	$1,946	12,079,701	1,785	1,167,579	6,800,816	958	685,368
Crawford	217	$360	1,114,127	153	3,204	650,082	86	1,299
Dane	7,926	$438	29,816,842	5,346	2,013,703	15,008,236	2,618	783,066
Dodge	1,138	$1,461	15,277,613	2,573	870,616	8,119,784	1,297	452,690
Door	708	$293	2,027,864	263	97,420	984,988	124	47,288
Douglas	568	$539	2,878,702	776	154,209	1,456,828	373	79,664
Dunn	492	$2,267	10,562,345	1,604	553,527	5,378,343	761	319,954
Eau Claire	1,406	$2,029	24,836,626	3,818	1,623,827	12,491,154	1,778	772,044
Florence	56	$21	17,675	3	0	10,574	2	0
Fond du Lac	1,354	$2,211	33,862,705	5,710	960,576	13,394,616	2,163	374,330
Forest	162	$458	306,540	70	74,614	151,654	32	41,470
Grant	701	$1,290	3,266,251	487	953,434	1,791,625	248	517,543
Green	539	$1,065	7,585,866	1,333	80,228	4,280,684	705	34,784
Green Lake	539	$441	1,823,405	424	158,584	1,015,339	222	88,050
Iowa	336	$687	1,954,356	448	136,738	1,093,803	197	57,399
Iron	115	$359	607,046	26	0	253,326	13	0
Jackson	203	$281	749,022	102	8,524	420,853	51	2,468
Jefferson	1,121	$1,390	13,301,684	2,184	912,230	6,556,699	1,075	472,238
Juneau	317	$661	2,110,344	247	92,036	1,151,210	136	30,221
Kenosha	1,796	$637	13,196,329	2,237	342,003	7,102,447	1,168	154,367
Kewaunee	297	$1,782	4,470,189	761	314,315	2,517,027	393	146,293
La Crosse	1,668	$874	15,676,266	2,494	546,180	6,541,217	1,031	289,824
Lafayette	202	$187	472,989	84	7,856	267,238	44	5,968
Langlade	349	$1,164	2,849,454	394	296,421	1,524,901	205	196,961
Lincoln	456	$891	4,698,552	758	120,590	2,706,842	427	60,900
Manitowoc	1,038	$1,357	14,480,329	2,644	591,231	7,690,090	1,318	343,210
Marathon	1,941	$3,493	45,940,130	7,510	5,105,458	23,958,847	3,800	2,980,970
Marinette	615	$2,723	7,568,767	1,694	1,620,581	4,139,361	880	920,249
Marquette	201	$530	676,271	114	84,556	386,966	66	30,431
Menominee	12	$169	29,712	6	0	14,370	3	0
Milwaukee	12,404	$727	74,552,795	12,310	5,508,726	37,737,333	5,953	2,333,406
Monroe	508	$1,829	8,825,667	872	458,643	4,594,878	432	215,500
Oconto	439	$753	2,891,743	586	186,583	1,640,086	321	97,403

County	Eligible Participants	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
Oneida	770	$4,417	8,019,317	1,122	3,991,227	4,362,471	576	2,522,812
Outagamie	2,985	$1,851	50,796,490	7,424	2,887,474	24,147,958	2,772	1,750,134
Ozaukee	1,767	$720	12,234,842	1,647	614,549	5,536,470	716	272,867
Pepin	114	$317	418,082	76	10,715	207,975	36	5,578
Pierce	491	$343	1,833,156	338	60,650	849,032	149	23,027
Polk	711	$765	6,779,500	1,677	114,476	3,348,592	779	68,754
Portage	921	$4,972	26,080,419	2,968	3,918,800	13,085,022	1,391	1,696,945
Price	237	$19,913	18,221,948	2,562	4,862,797	8,871,226	1,189	2,782,832
Racine	2,529	$712	20,163,516	3,234	598,114	10,497,251	1,621	303,591
Richland	216	$673	2,131,955	302	304	1,415,457	193	179
Rock	1,939	$1,111	28,398,197	4,139	308,751	14,751,472	2,051	143,957
Rusk	168	$1,465	3,239,129	419	35,800	1,426,769	182	15,533
Sauk	993	$1,023	14,836,770	2,458	8,105	8,077,170	1,266	3,594
Sawyer	400	$8	1,805	0	4,101	916	0	1,968
Shawano	522	$1,168	3,223,123	584	545,526	1,889,491	331	348,445
Sheboygan	1,564	$3,794	37,559,425	4,691	4,718,712	18,134,410	2,234	2,622,012
St. Croix	1,308	$480	7,945,417	1,304	122,063	3,982,614	628	55,927
Taylor	251	$2,903	2,608,313	457	770,425	1,396,291	233	418,718
Trempealeau	388	$1,174	1,958,063	317	450,415	1,026,919	169	289,338
Vernon	364	$206	802,481	136	28,233	391,777	71	11,791
Vilas	532	$187	1,412,150	173	4,381	745,420	91	2,276
Walworth	1,571	$485	8,579,735	1,649	248,380	4,397,895	763	116,384
Washburn	350	$206	1,054,449	193	611	537,312	100	179
Washington	2,097	$614	15,066,215	2,596	364,303	8,099,114	1,353	166,910
Waukesha	8,052	$478	41,390,524	7,450	1,437,679	21,275,819	3,692	769,497
Waupaca	746	$2,218	9,696,102	1,653	1,390,540	5,311,697	881	779,584
Waushara	278	$357	842,431	206	58,409	421,206	92	25,128
Winnebago	2,136	$2,664	52,204,649	8,935	2,984,476	27,232,091	4,335	1,616,241
Wood	1,053	$2,598	19,024,364	2,639	2,013,120	10,231,544	1,341	973,159
Not mapped*			8,591,302	1,336	529,658	4,923,370	752	268,549

* *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–December 31, 2010)

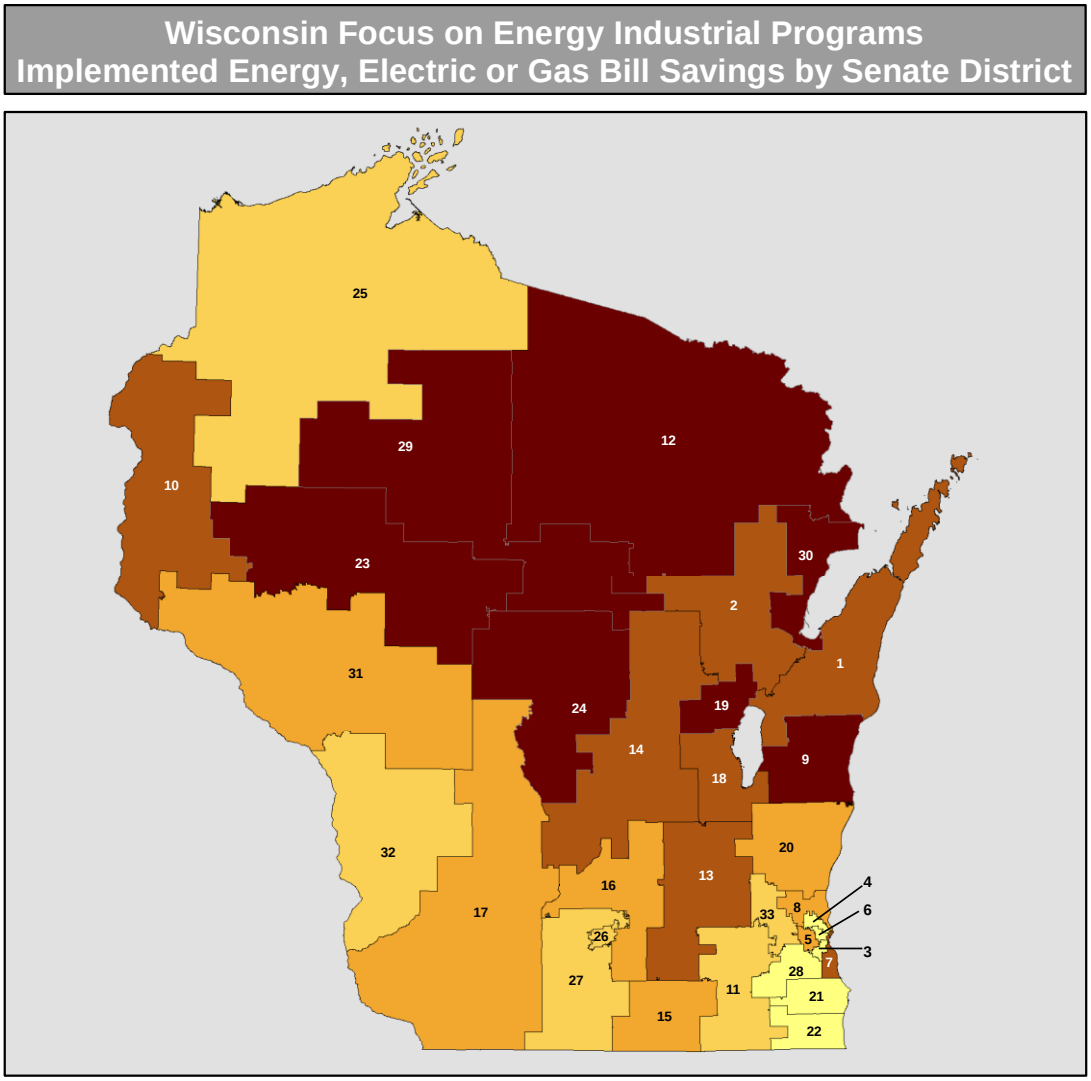


Table A-7. Industrial Program Energy Impacts
(by Senate District)
(July 1, 2001–December 31, 2010)

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	$3,339,365	34,404,589	4,950	1,392,951	16,560,134	2,323	649,505
2	$4,150,877	31,248,147	5,378	2,827,915	16,344,012	2,597	1,932,417
3	$581,353	7,625,434	1,131	86,759	4,324,186	596	25,853
4	$1,438,316	11,876,728	1,985	880,035	6,098,664	952	352,196
5	$2,382,851	21,410,362	2,800	1,292,847	9,355,923	1,233	548,675
6	$352,552	4,139,023	565	98,814	2,183,561	306	39,239
7	$2,876,182	15,188,899	3,246	2,574,799	8,690,795	1,718	1,052,833
8	$2,384,183	27,732,831	5,522	692,800	13,978,312	2,562	358,467
9	$6,939,145	49,713,737	7,084	4,967,867	24,824,113	3,458	2,798,093
10	$2,558,441	28,518,998	5,002	861,563	14,116,875	2,345	470,827
11	$1,510,449	12,277,421	2,404	942,728	6,393,917	1,157	494,498
12	$4,537,213	18,827,705	2,655	4,550,444	10,255,930	1,402	2,864,327
13	$3,071,425	26,981,409	4,512	1,725,078	13,729,186	2,229	923,651
14	$3,306,017	25,770,447	5,098	2,168,314	14,094,559	2,570	1,098,499
15	$2,206,992	29,164,974	4,373	308,751	15,053,465	2,141	143,957
16	$2,129,462	15,406,286	2,536	1,510,215	8,188,439	1,267	839,588
17	$2,284,798	21,014,019	3,052	1,193,504	11,817,223	1,585	613,204
18	$4,418,716	54,412,516	8,937	997,063	23,855,942	3,830	422,177
19	$6,212,904	58,186,052	9,568	3,146,031	29,386,871	3,855	1,669,170
20	$2,092,005	18,471,309	2,493	1,166,055	8,511,933	1,109	517,730
21	$1,435,242	16,265,545	2,722	457,916	8,296,087	1,341	212,705
22	$1,487,723	16,781,092	2,687	482,202	9,149,038	1,419	245,253
23	$5,881,102	50,997,141	7,865	3,366,577	26,789,404	3,838	1,681,022
24	$6,829,282	44,130,195	5,466	5,345,844	22,856,944	2,673	2,343,219
25	$1,614,955	12,780,982	2,419	1,040,884	6,458,177	1,161	537,086
26	$1,625,959	9,980,355	1,477	1,322,891	4,840,650	743	445,486
27	$1,554,346	18,625,926	3,597	399,707	10,043,009	1,813	204,590
28	$1,335,715	15,460,132	2,584	395,456	8,438,190	1,334	180,281
29	$12,054,313	67,081,505	10,405	10,465,261	33,978,923	5,089	6,042,000
30	$5,081,861	45,936,519	7,190	2,731,044	25,112,208	3,716	1,366,310
31	$2,237,429	19,981,241	2,501	1,225,606	10,409,774	1,256	667,040
32	$1,600,155	17,426,636	2,735	577,920	7,496,422	1,164	303,092
33	$1,789,921	21,309,496	3,268	473,553	10,905,952	1,688	267,135
Not mapped*	$1,722,975	10,868,841	1,762	1,373,930	6,092,778	958	737,843

* *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–December 31, 2010)

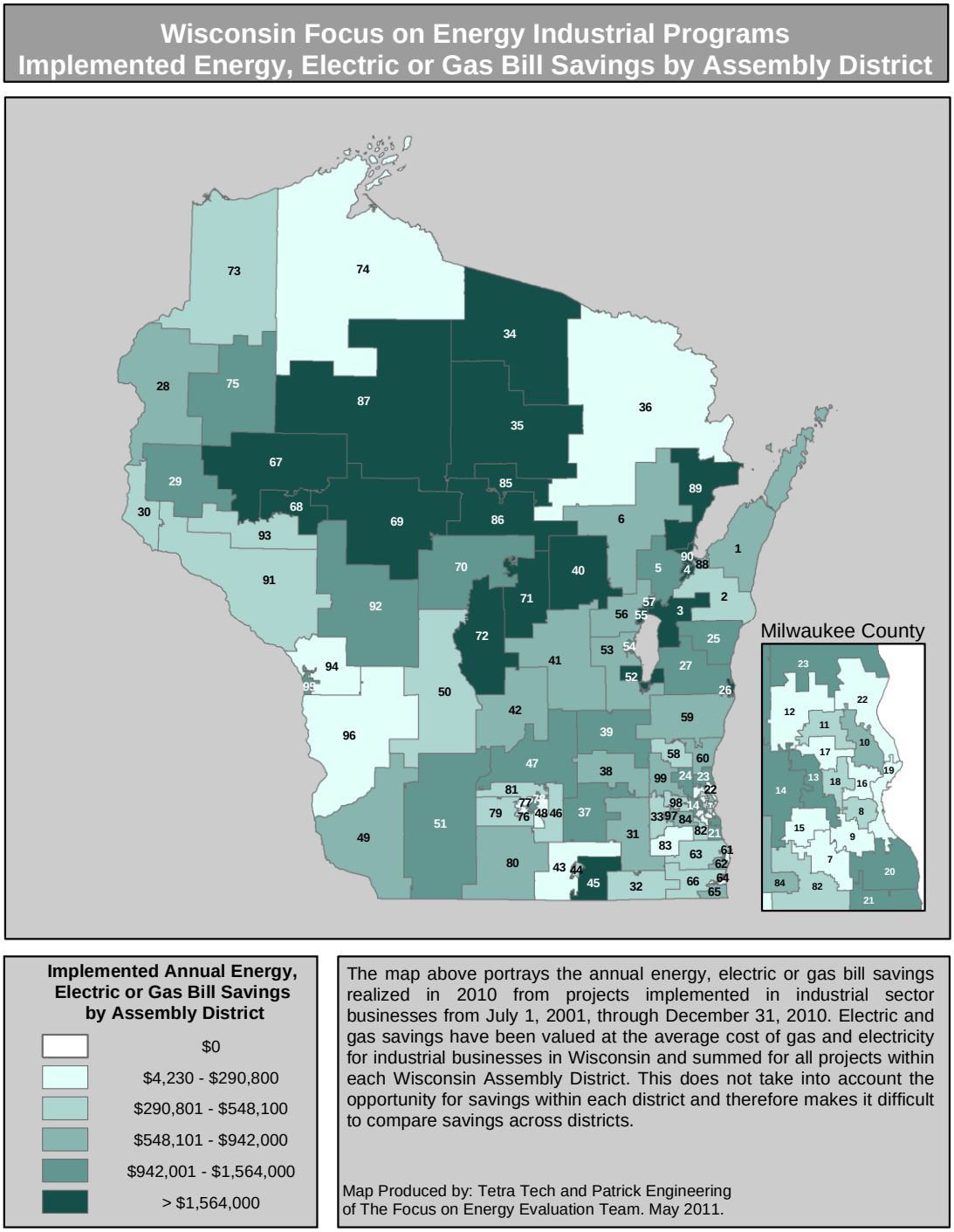


Table A-8. Industrial Program Energy Impacts
(by Assembly District)
(July 1, 2001–December 31, 2010)

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	$677,906	6,007,281	970	375,788	3,152,480	477	183,122
2	$448,022	5,874,815	1,018	67,029	3,214,344	525	22,510
3	$2,213,436	22,522,492	2,962	950,134	10,193,310	1,321	443,873
4	$1,910,208	20,565,465	3,562	712,543	10,172,806	1,631	406,900
5	$1,447,785	6,569,614	1,088	1,398,517	3,777,696	556	1,086,519
6	$792,884	4,113,069	729	716,855	2,393,510	409	438,998
7	$4,236	62,197	12	0	30,341	5	0
8	$350,466	4,417,958	690	69,343	2,492,303	356	21,814
9	$226,652	3,145,278	429	17,416	1,801,541	234	4,040
10	$890,711	5,812,772	894	691,799	2,903,554	414	280,642
11	$319,711	2,802,589	418	180,135	1,427,279	207	67,167
12	$227,894	3,261,367	672	8,101	1,767,831	331	4,387
13	$1,166,668	5,813,210	669	1,077,536	2,612,795	303	420,024
14	$1,036,143	13,077,376	1,752	203,507	5,862,402	795	123,211
15	$180,041	2,519,777	379	11,805	880,726	136	5,440
16	$34,095	435,945	70	6,160	205,713	34	1,910
17	$8,063	118,393	18	0	70,113	11	0
18	$310,395	3,584,685	477	92,654	1,907,735	261	37,329
19	$246,376	2,850,750	590	73,029	1,533,836	306	40,119
20	$1,065,828	3,477,549	704	1,158,923	1,745,714	335	365,858
21	$1,563,979	8,860,601	1,953	1,342,847	5,411,245	1,077	646,856
22	$234,482	2,841,836	633	57,251	1,307,913	257	27,353
23	$1,078,361	10,457,263	1,785	511,965	5,147,742	817	280,459
24	$1,071,340	14,433,731	3,104	123,584	7,522,657	1,488	50,655
25	$1,163,084	10,892,703	2,005	588,951	5,977,644	999	342,221
26	$4,831,323	30,629,200	3,760	3,838,080	14,426,980	1,734	2,243,052
27	$944,737	8,191,834	1,319	540,836	4,419,490	725	212,820
28	$708,399	9,085,926	1,943	125,324	4,395,650	899	71,919
29	$1,472,532	14,958,138	2,312	634,513	7,461,172	1,088	361,322
30	$377,510	4,474,935	747	101,726	2,260,053	358	37,586
31	$754,956	3,345,895	679	736,868	1,773,882	343	398,518
32	$444,931	5,853,390	1,092	64,747	2,999,287	503	18,570
33	$310,563	3,078,136	633	141,114	1,620,749	310	77,410
34	$1,820,213	9,123,248	1,264	1,676,050	4,977,517	654	1,089,486
35	$2,481,319	7,691,386	1,161	2,736,568	4,272,357	633	1,693,463
36	$235,680	2,013,070	230	137,826	1,006,056	115	81,378
37	$1,028,814	8,527,028	1,234	626,461	3,955,980	578	322,522
38	$646,424	5,734,016	1,162	357,793	3,071,316	594	222,323
39	$1,396,187	12,720,365	2,116	740,824	6,701,890	1,057	378,806
40	$1,796,536	11,262,936	1,931	1,439,248	6,198,256	1,025	793,986
41	$829,644	5,361,681	1,365	649,374	2,841,023	585	277,828
42	$679,836	9,145,831	1,802	79,692	5,055,280	960	26,685

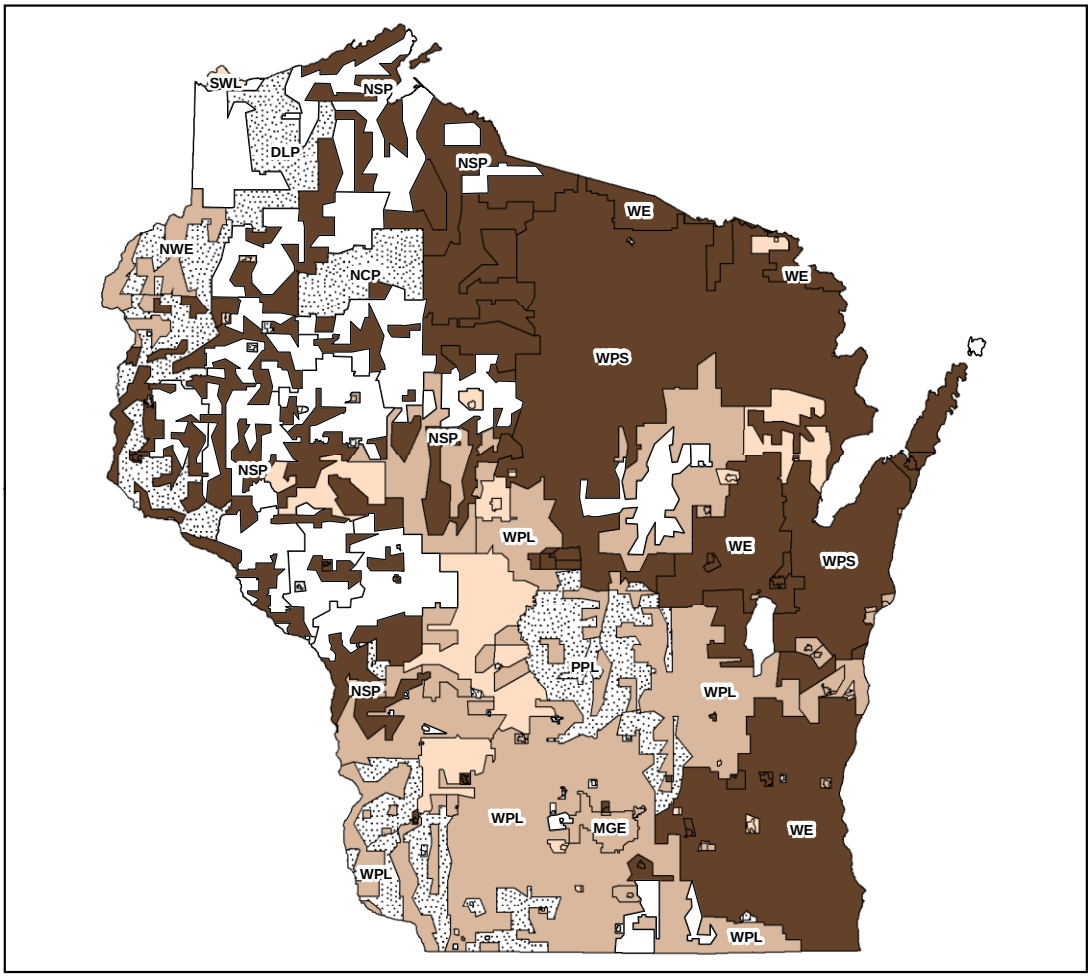
Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
43	$175,339	2,389,147	730	17,668	1,211,423	307	7,152
44	$400,647	4,974,097	933	86,549	2,550,442	446	27,955
45	$1,631,006	21,801,729	2,710	204,534	11,291,600	1,389	108,850
46	$391,647	3,030,272	646	259,023	1,697,853	328	121,598
47	$1,477,089	9,501,647	1,380	1,160,349	4,979,532	683	683,591
48	$260,726	2,874,368	510	90,842	1,511,054	256	34,400
49	$911,161	3,364,852	503	953,434	1,847,363	257	517,543
50	$423,617	5,233,766	727	93,940	3,118,112	426	31,280
51	$950,020	12,415,401	1,822	146,130	6,851,748	903	64,380
52	$2,382,154	29,552,334	4,688	516,745	11,083,257	1,736	204,914
53	$843,230	10,343,634	1,961	194,078	5,645,731	1,014	115,432
54	$1,193,332	14,516,547	2,288	286,240	7,126,954	1,080	101,830
55	$3,570,925	26,303,006	4,243	2,487,946	14,107,644	2,097	1,389,782
56	$713,184	9,579,357	1,925	85,038	4,666,712	859	37,553
57	$1,928,796	22,303,689	3,400	573,047	10,612,515	899	241,836
58	$490,361	4,767,878	784	231,599	2,297,773	367	94,828
59	$659,708	4,351,593	537	507,971	2,157,727	261	217,346
60	$941,936	9,351,838	1,172	426,486	4,056,433	481	205,557
61	$160,623	1,792,147	342	53,930	913,101	167	18,912
62	$934,056	11,306,675	1,753	229,367	5,991,516	902	113,680
63	$340,563	3,166,724	627	174,619	1,391,471	272	80,114
64	$254,750	3,712,710	725	2,676	1,952,705	365	676
65	$684,909	6,510,791	1,180	337,642	3,642,411	644	152,780
66	$548,065	6,557,592	782	141,883	3,553,921	410	91,797
67	$1,625,331	16,942,687	2,510	659,188	8,945,823	1,184	328,988
68	$2,613,888	19,719,941	3,155	1,776,759	9,846,612	1,437	893,575
69	$1,641,884	14,334,514	2,200	930,630	7,996,968	1,216	458,458
70	$1,137,748	5,129,689	794	1,102,179	2,953,095	457	524,955
71	$3,841,106	23,398,875	2,579	3,142,128	11,743,724	1,207	1,299,574
72	$1,850,428	15,601,631	2,093	1,101,537	8,160,124	1,009	518,689
73	$307,133	2,890,218	778	154,209	1,462,557	374	79,664
74	$251,589	3,301,038	500	37,449	1,535,583	221	14,695
75	$1,056,233	6,589,726	1,141	849,226	3,460,037	566	442,727
76	$186,529	2,724,013	347	1,431	1,425,587	176	414
77	$62,757	921,547	178	0	464,155	84	0
78	$1,376,673	6,334,795	953	1,321,460	2,950,908	483	445,072
79	$415,130	4,130,356	1,059	187,122	2,095,103	503	97,531
80	$715,092	9,401,954	1,616	104,594	5,181,729	835	51,776
81	$424,124	5,093,616	922	107,992	2,766,177	476	55,284
82	$303,538	3,910,540	658	52,047	2,136,740	320	30,379
83	$290,715	4,184,969	670	7,995	2,282,474	352	4,595
84	$741,461	7,364,623	1,256	335,414	4,018,976	662	145,306
85	$4,521,632	29,704,384	4,371	3,493,187	15,137,475	2,111	2,309,626
86	$1,807,206	13,036,999	2,576	1,285,271	7,003,461	1,363	505,072
87	$5,725,475	24,340,123	3,458	5,686,804	11,837,988	1,615	3,227,302
88	$885,090	10,554,802	1,404	232,492	5,322,873	648	91,071

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	$1,802,613	9,341,866	2,217	1,630,633	5,211,795	1,163	904,303
90	$2,394,158	26,039,851	3,570	867,919	14,577,540	1,906	370,936
91	$518,004	2,446,459	406	491,246	1,273,224	212	303,233
92	$1,210,774	10,411,521	1,077	701,429	5,492,525	543	345,556
93	$508,651	7,123,262	1,018	32,931	3,644,025	501	18,251
94	$130,758	876,185	186	99,381	444,266	95	46,206
95	$1,315,223	14,619,909	2,257	446,799	6,002,487	911	243,617
96	$154,175	1,930,542	292	31,741	1,049,669	158	13,268
97	$593,100	8,245,083	1,291	44,190	3,784,895	612	23,145
98	$367,866	5,160,570	956	22,970	2,896,805	509	13,976
99	$828,954	7,903,843	1,021	406,392	4,224,252	568	230,015
Not mapped*	$1,722,975	10,868,841	1,762	1,373,930	6,092,778	958	737,843

* *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–December 31, 2010)

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

- < $1,100
- $1,100 - $5,800
- $5,801 - $23,600
- > $23,600
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2010 from projects implemented in industrial sector businesses from July 1, 2001, through December 31, 2010. 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 2009.

Map Produced by: Tetra Tech and Patrick Engineering
of The Focus on Energy Evaluation Team. May 2011.

Table A-9. Industrial Program Electric Impacts
(by Participating Electric Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Adams-Columbia Electric Coop	2009	C-1	$37,199	676	$55	546,237	60	322,394	34
Algoma Utility Comm	2008	W2	$30,834	2	$15,417	452,773	69	243,636	34
Bloomer Electric & Water Co	2001	W1	$59,936	55	$1,090	880,115	153	437,550	78
Cedarburg Light & Water Comm	2008	W1	$39,889	4	$9,972	585,745	102	355,951	60
City of Arcadia	2009	W1	$18,947	52	$364	278,220	44	152,132	23
City of Argyle	2001	W1	$6,449	1	$6,449	94,696	19	53,076	11
City of Bangor	2008	W2	$9,578	15	$639	140,644	15	77,434	9
City of Barron	2009	W1	$6,029	46	$131	88,537	13	52,964	8
City of Black River Falls	2008	W1	$57,724	1	$57,724	847,631	128	468,317	64
City of Boscobel	2008	W1	$48,844	1	$48,844	717,243	104	430,897	57
City of Clintonville	2008	W1	$128,289	11	$11,663	1,883,831	358	1,059,892	192
City of Columbus	2008	W2	$34,302	1	$34,302	503,695	89	300,071	52
City of Cornell	2001	W1	$69,934	10	$6,993	1,026,938	69	632,169	37
City of Cuba City	2008	W2	$4,841	1	$4,841	71,088	10	42,526	6
City of Cumberland	2001	W1	$116,123	21	$5,530	1,705,177	304	898,373	140
City of Eagle River	2008	W2	$5,735	1	$5,735	84,214	14	47,754	8
City of Elkhorn	2009	W2	$10,414	49	$213	152,921	42	92,511	19
City of Elroy	2007	W2	$11,676	17	$687	171,461	25	102,570	16
City of Evansville	2008	W2	$13,149	1	$13,149	193,087	29	143,727	21
City of Fennimore	2008	W2	$3,586	38	$94	52,664	7	29,517	4
City of Kaukauna	2008	W2	$602,253	10	$60,225	8,843,658	1,307	5,072,796	694
City of Kiel	2007	W2	$238,781	17	$14,046	3,506,323	483	1,727,148	251
City of Lodi	2008	W2	$1,089	1	$1,089	15,991	2	8,712	1
City of Marshfield	2008	W2	$141,264	54	$2,616	2,074,364	394	1,232,405	241

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
City of Medford	2007	W2	$173,154	73	$2,372	2,542,645	429	1,366,780	221
City of Menasha	2008	W2	$209,626	12	$17,469	3,078,207	512	1,786,675	281
City of Muscoda	2008	W2	$19,211	1	$19,211	282,101	50	162,912	29
City of New Holstein	2008	W2	$17,651	1	$17,651	259,199	55	141,898	29
City of New Lisbon	2009	W2	$4	23	$0	63	0	37	0
City of New Richmond	2008	W2	$7,570	1	$7,570	111,154	20	67,574	11
City of Plymouth	2008	W2	$101,125	9	$11,236	1,484,950	239	874,166	135
City of Princeton	2001	W2	$3,780	15	$252	55,512	11	31,113	6
City of Richland Center	2008	W2	$141,422	4	$35,356	2,076,685	292	1,387,210	188
City of River Falls	2008	W2	$32,494	1	$32,494	477,153	70	277,763	40
City of Sheboygan Falls	2010	W2	$71,573	58	$1,234	1,050,998	153	705,433	119
City of Spooner	2001	W1	$40,488	16	$2,531	594,541	92	284,336	47
City of Stoughton	2008	W1	$112,500	3	$37,500	1,651,980	373	903,032	196
City of Sturgeon Bay	2008	W1	$85,866	1	$85,866	1,260,877	187	717,030	101
Clark Electric Coop	2009	C-6	$11,968	1	$11,968	175,746	53	102,417	29
Consolidated Water Power Co	2001	CWP	$622,897	1	$622,897	9,146,793	703	5,286,465	428
Dahlberg Light & Power Co	2001	DLP	$3,820	38	$101	56,094	42	27,794	22
Eau Claire Electric Coop	2007	C-8	$31,883	6	$5,314	468,172	112	277,863	54
Florence Utility Comm	2008	W1	$4,959	1	$4,959	72,815	13	38,541	7
Hartford Electric	2008	W1	$270,170	6	$45,028	3,967,260	630	2,297,518	372
Hustisford Utilities	2008	W1	$25,405	1	$25,405	373,048	71	207,270	40
Jefferson Utilities	2008	W1	$58,474	4	$14,619	858,652	168	476,505	93
Juneau Utility Comm	2008	W2	$6,734	2	$3,367	98,881	20	55,350	12
Lake Mills Light & Water	2008	W2	$30,314	1	$30,314	445,142	76	250,274	42

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Madison Gas & Electric Co	2001	MGE	$1,156,158	49	$23,595	16,977,358	2,919	8,638,410	1,459
Manitowoc Public Utilities	2007	W1	$530,410	90	$5,893	7,788,691	1,399	4,272,940	679
New London Electric & Water	2008	W2	$191,463	5	$38,293	2,811,503	499	1,604,300	274
North Central Power Co, Inc	2001	NCP	$298	3	$99	4,379	1	2,221	0
Northwestern Wisconsin Elec Co	2001	NWE	$166,515	26	$6,404	2,445,156	256	1,122,832	121
Oakdale Electric Coop	2008	C-12	$41,625	17	$2,449	611,227	90	335,578	47
Oconomowoc Utilities	2008	W1	$57,860	10	$5,786	849,637	181	472,624	90
Oconto Electric Coop	2009	C-13	$48,720	13	$3,748	715,414	121	476,460	80
Oconto Falls Water & Light Comm	2008	W2	$34,657	1	$34,657	508,921	88	308,974	48
Pierce-Pepin Coop Services	2009	C-14	$5,266	8	$658	77,330	16	45,893	9
Pioneer Power & Light Co	2001	PPL	$501	20	$25	7,352	3	3,854	1
Polk-Burnett Electric Coop	2010	C-15	$3,244	3	$1,081	47,641	7	28,500	4
Price Electric Coop, Inc	2007	C-16	$25,509	1	$25,509	374,588	67	215,463	39
Reedsburg Utility Comm	2008	W1	$66,582	7	$9,512	977,711	175	544,467	95
Rice Lake Utilities	2007	W1	$110,824	149	$744	1,627,367	332	901,596	169
Richland Electric Coop	2006	C-17	$4,944	1	$4,944	72,602	14	37,039	7
Scenic Rivers Energy Coop	2007	C-20	$1,456	18	$81	21,377	4	12,336	2
Shawano Municipal Utilities	2007	W1	$182,204	164	$1,111	2,675,537	466	1,590,811	272
Slinger Utilities	2008	W1	$889	1	$889	13,062	3	7,321	1
Sun Prairie Water & Light Comm	2008	W1	$43,616	2	$21,808	640,471	108	359,430	54
Superior Water, Light & Power Co	2001	SWLP	$163,818	117	$1,400	2,405,548	653	1,217,499	313

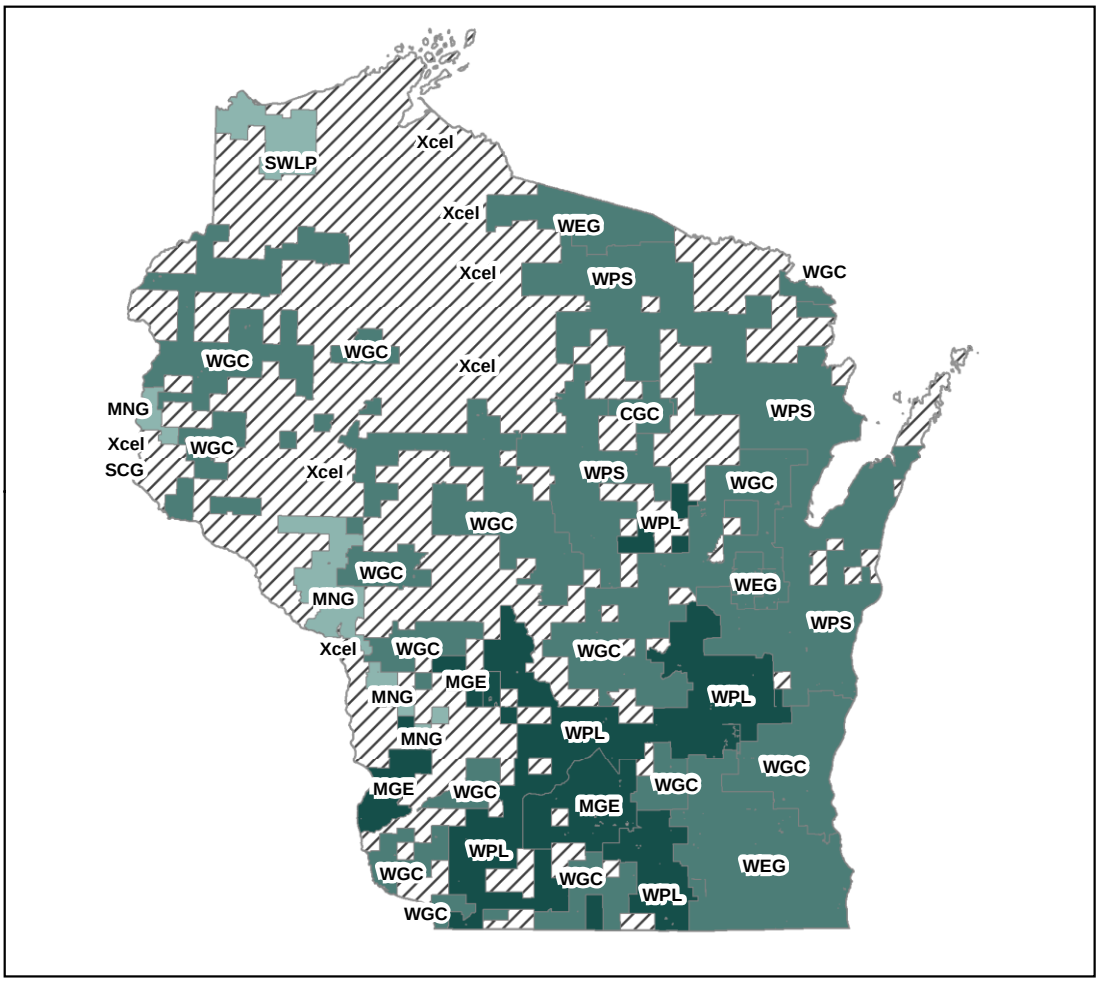
Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Two Rivers Water & Light	2008	W1	$40,621	3	$13,540	596,485	118	329,855	63
Vernon Electric Coop	2009	C-23	$8,114	1	$8,114	119,148	48	56,331	25
Village of Belmont	2007	W2	$3,640	13	$280	53,448	3	34,215	2
Village of Benton	2001	W2	$3,002	1	$3,002	44,083	5	27,412	3
Village of Cadott	2001	W2	$3,351	11	$305	49,210	10	27,047	5
Village of Mazomanie	2007	W2	$6,818	17	$401	100,113	20	56,200	11
Village of Mt Horeb	2008	W2	$2,682	1	$2,682	39,380	7	23,014	4
Village of New Glarus	2008	W2	$1,246	1	$1,246	18,297	4	9,349	2
Village of Pardeeville	2001	W2	$6,004	22	$273	88,166	17	49,415	10
Village of Prairie Du Sac	2008	W2	$48,818	1	$48,818	716,861	130	416,916	75
Village of Sauk City	2009	W2	$182	30	$6	2,667	0	1,596	0
Village of Stratford	2001	W2	$27,518	5	$5,504	404,086	80	198,026	36
Village of Waunakee	2008	W2	$71,378	3	$23,793	1,048,129	202	589,351	114
Waterloo Light & Water Comm	2008	W2	$2,444	1	$2,444	35,881	13	20,930	7
Waupun Utilities	2008	W2	$91,319	2	$45,660	1,340,955	220	784,481	127
Whitehall Electric Utility	2008	W2	$29,938	1	$29,938	439,621	73	241,643	39
Wisconsin Electric Power Co (We Energies)	2001	WEP	$17,539,214	683	$25,680	257,550,872	42,037	130,184,556	19,706
Wisconsin Power & Light Co	2001	WPL	$11,492,095	960	$11,971	168,753,229	26,110	83,438,928	12,231
Wisconsin Public Service Corp	2001	WPS	$13,218,315	211	$62,646	194,101,535	30,862	101,423,177	15,281
Wisconsin Rapids Water Works & Lighting Comm	2008	W2	$161,128	6	$26,855	2,366,050	465	1,384,446	249

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Xcel Energy (Northern States Power Co)	2001	NSP	$8,006,692	94	$85,178	117,572,568	18,997	58,096,845	8,916
Not mapped*			$2,546,730	1	$2,546,730	37,396,915	4,933	17,328,835	2,198

* *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–December 31, 2010)

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
- $1,570 - $3,060
- $3,061 - $11,630
- > $11,630
- Non Participating Utility Territories

The map above portrays the annual energy, gas bill savings realized in 2010 from projects implemented in industrial sector businesses from July 1, 2001, through December 31, 2010. 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 2009.

Map Produced by: Tetra Tech and Patrick Engineering
of The Focus on Energy Evaluation Team. May 2011.

Table A-10. Industrial Program Gas Impacts
(by Participating Gas Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross Therms	Persistent Net Therms
City Gas Co	2007	CGC	$181,829	18	$10,102	254,190	179,859
Madison Gas and Electric	2001	MGE	$1,177,227	66	$17,837	1,645,724	600,197
Midwest Natural Gas Inc.	2007	MNG	$247,845	81	$3,060	346,479	236,219
Superior Water Light And Power Co	2001	SWLP	$110,534	70	$1,579	154,523	79,845
Wisconsin Electric Gas Operations (We Energies)	2001	WEG	$6,631,700	1,567	$4,232	9,270,892	4,559,293
Wisconsin Gas LLC (We Energies)	2001	WGC	$10,366,442	1,454	$7,130	14,491,935	7,478,487
Wisconsin Power & Light	2001	WPL	$2,815,661	221	$12,741	3,936,199	1,964,112
Wisconsin Public Service Corp	2001	WPS	$16,791,760	1,445	$11,621	23,474,312	12,800,484
Xcel Energy (Northern States Power Co)	2001	Xcel	$6,315,929	19	$332,417	8,829,455	4,840,992
Not mapped*			$457,533			639,615	308,482

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

A.3 RESIDENTIAL PROGRAMS

In this section, we summarize the verified energy impacts across the Residential Programs through December 31. 2010. 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.

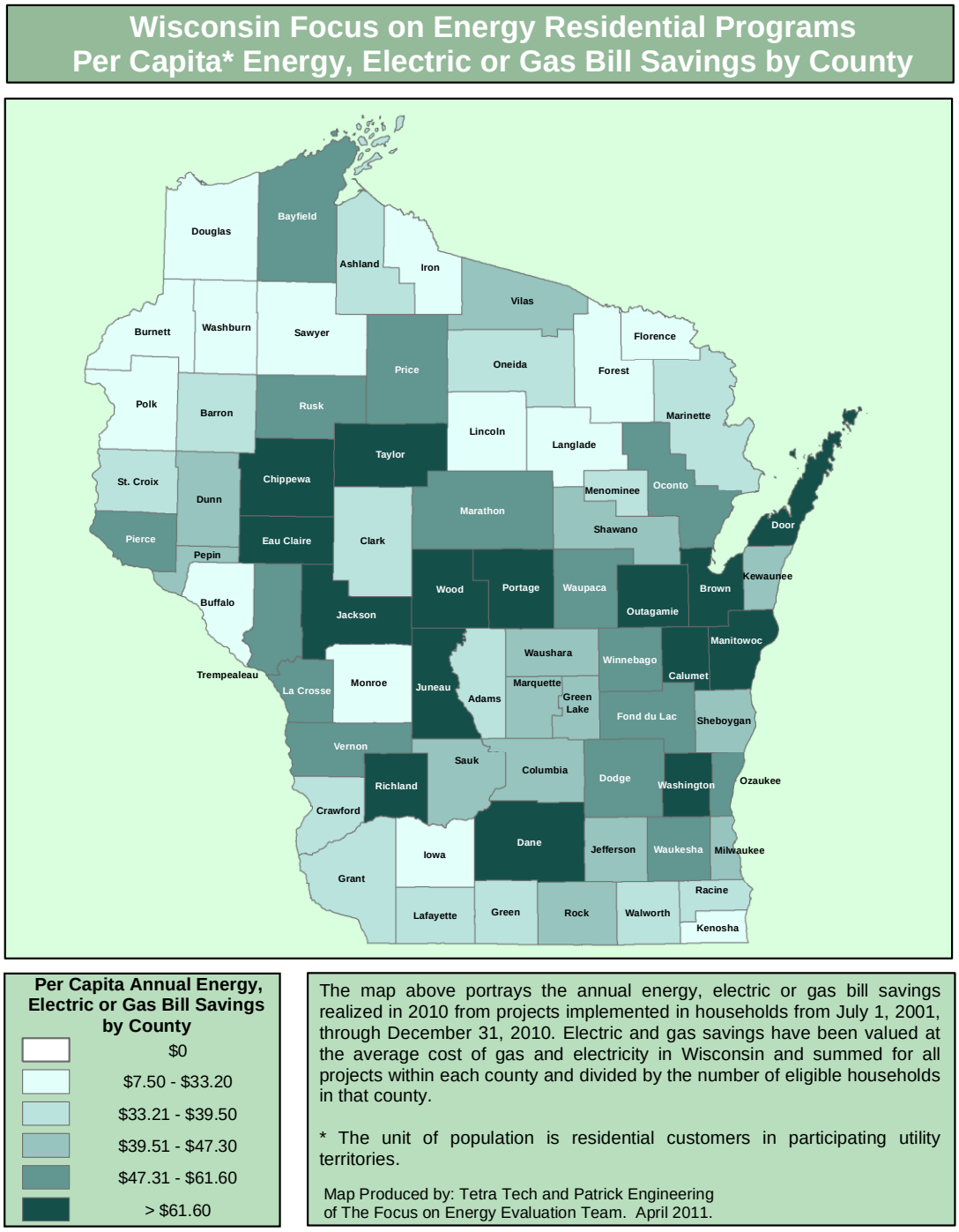
The reader should be aware of this shift since it has the effect of diminishing the levels of reported savings (compared to verified gross savings). This is because verified gross savings do not consider the lifecycle effects (i.e., the median operating life of energy efficiency measures, such as CFLs)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

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 2009.

Figure A-11.
Residential Programs
Per Capita Energy, Electric or Gas Bill Savings by County
(July 1, 2001–December 31, 2010)



The map above portrays the annual energy, electric or gas bill savings realized in 2010 from projects implemented in households from July 1, 2001, through December 31, 2010. 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: Tetra Tech and Patrick Engineering of The Focus on Energy Evaluation Team. April 2011.

Table A-11. Residential Programs Energy Impacts
(by Participating County)
(July 1, 2001–December 31, 2010)

County	Eligible Participants	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
Adams	2,519	$33	580,428	69	10,357	355,128	43	7,754
Ashland	4,950	$37	1,031,897	142	46,161	646,407	90	35,548
Barron	9,114	$39	2,239,584	251	69,986	1,464,081	172	42,827
Bayfield	3,836	$51	1,180,987	106	41,774	710,891	67	33,654
Brown	87,295	$62	32,066,908	4,775	1,223,540	20,543,597	3,114	856,344
Buffalo	2,373	$25	326,252	65	16,900	203,666	47	13,470
Burnett	3,486	$17	402,204	43	6,854	247,310	28	4,892
Calumet	13,028	$70	5,885,984	994	151,073	3,852,319	675	113,367
Chippewa	13,563	$68	5,685,334	638	188,780	3,601,245	417	150,732
Clark	7,798	$37	2,001,838	211	33,119	1,241,523	131	25,621
Columbia	15,889	$40	4,160,837	546	101,409	2,622,412	353	75,167
Crawford	4,209	$37	1,026,062	111	22,437	659,077	74	16,331
Dane	154,704	$82	66,169,910	10,340	3,989,856	43,369,162	7,040	2,754,151
Dodge	27,767	$48	8,734,371	1,499	211,599	5,433,326	991	153,548
Door	6,178	$66	2,836,713	361	44,354	1,771,480	240	36,531
Douglas	14,885	$31	2,541,006	264	132,802	1,616,000	172	103,159
Dunn	8,903	$47	2,807,444	311	61,825	1,821,794	201	46,281
Eau Claire	30,944	$74	14,029,384	1,667	486,045	9,407,763	1,122	365,487
Florence	1,756	$8	100,845	13	525	60,237	8	381
Fond du Lac	36,540	$62	14,052,017	2,183	436,031	8,977,238	1,479	322,898
Forest	4,043	$30	882,759	92	10,766	569,180	56	8,061
Grant	10,565	$38	2,692,330	390	61,335	1,620,054	248	47,414
Green	11,716	$35	2,715,473	498	58,871	1,711,300	343	45,736
Green Lake	6,843	$45	2,048,662	321	46,659	1,276,295	208	37,051
Iowa	8,753	$30	1,826,667	230	31,534	1,096,326	136	24,788
Iron	2,384	$19	306,283	31	6,395	187,839	18	5,382
Jackson	981	$106	752,367	69	8,581	475,469	43	6,699
Jefferson	22,669	$44	6,466,932	1,000	176,239	4,070,743	660	126,507
Juneau	2,814	$64	1,060,575	136	42,742	673,318	88	30,032
Kenosha	56,057	$31	11,207,103	2,049	277,772	7,028,988	1,431	200,731
Kewaunee	7,163	$40	1,969,889	271	38,271	1,223,452	172	29,939
La Crosse	37,142	$49	11,317,561	2,085	355,191	7,353,031	1,495	235,422
Lafayette	3,563	$39	937,564	164	20,765	568,592	109	16,461
Langlade	8,452	$31	1,809,512	226	33,623	1,140,511	143	23,318
Lincoln	11,553	$33	2,414,893	372	71,732	1,549,405	253	48,215
Manitowoc	13,227	$83	7,027,756	1,186	196,278	4,499,108	781	153,838
Marathon	44,418	$50	14,072,529	2,239	418,025	9,175,549	1,550	297,994
Marinette	16,834	$35	3,913,030	574	85,952	2,496,112	383	70,552
Marquette	2,534	$44	773,237	88	12,142	487,796	57	8,668
Menominee	1,289	$36	251,868	40	12,937	163,325	30	10,666
Milwaukee	377,729	$42	90,306,394	15,185	4,193,400	56,614,181	10,202	2,733,005
Monroe	11,207	$25	1,913,737	297	35,544	1,166,565	192	27,772

County	Eligible Participants	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
Oconto	8,063	$53	2,887,673	362	61,153	1,875,978	237	49,673
Oneida	15,211	$37	3,556,389	515	98,045	2,239,543	328	78,829
Outagamie	46,720	$73	21,946,936	3,612	586,388	14,364,050	2,496	407,817
Ozaukee	25,245	$57	9,296,467	2,063	243,368	5,888,642	1,474	178,849
Pepin	1,916	$44	597,196	62	8,429	382,050	40	6,479
Pierce	3,977	$53	1,330,099	249	39,870	875,334	174	26,699
Polk	8,142	$32	1,707,577	185	45,269	1,082,670	116	32,587
Portage	23,159	$80	11,061,128	1,632	426,092	7,060,166	1,100	282,262
Price	2,801	$52	1,022,076	106	15,138	641,198	68	12,418
Racine	70,819	$35	16,966,601	3,081	308,577	10,773,915	2,190	216,461
Richland	2,099	$67	957,263	167	17,639	606,548	113	14,109
Rock	54,206	$40	13,880,222	1,773	373,407	8,543,444	1,116	259,503
Rusk	3,369	$51	1,198,600	106	20,551	724,018	64	14,090
Sauk	16,064	$47	4,857,118	748	125,186	3,044,026	471	88,723
Sawyer	4,683	$25	834,846	106	10,388	506,699	67	8,677
Shawano	9,375	$44	2,834,218	359	52,178	1,805,095	233	39,109
Sheboygan	34,842	$45	9,755,153	1,849	297,416	6,154,215	1,232	224,104
St. Croix	13,910	$35	3,000,984	514	103,418	1,982,429	374	73,762
Taylor	733	$251	1,212,779	98	28,915	768,116	61	18,167
Trempealeau	2,785	$51	921,366	116	22,827	577,023	75	15,222
Vernon	4,360	$55	1,577,630	185	38,335	1,000,481	125	26,858
Vilas	8,793	$43	2,570,442	326	50,561	1,636,057	213	41,649
Walworth	31,728	$35	7,443,199	1,153	152,065	4,737,829	818	106,888
Washburn	3,684	$24	610,405	55	9,529	373,188	34	6,258
Washington	38,827	$63	15,444,659	2,280	447,245	9,823,802	1,548	343,875
Waukesha	128,672	$53	44,824,020	8,427	1,048,642	28,218,470	5,869	742,130
Waupaca	14,439	$51	5,018,381	862	98,502	3,295,439	612	73,067
Waushara	6,153	$40	1,751,457	290	26,536	1,128,693	200	20,482
Winnebago	55,533	$58	20,393,912	3,161	612,336	13,262,576	2,149	451,214
Wood	9,378	$87	5,316,755	825	137,889	3,325,785	529	104,330
*Not mapped			197,504,743	16,782	1,224,055	126,407,489	10,076	789,712

* *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–December 31, 2010)

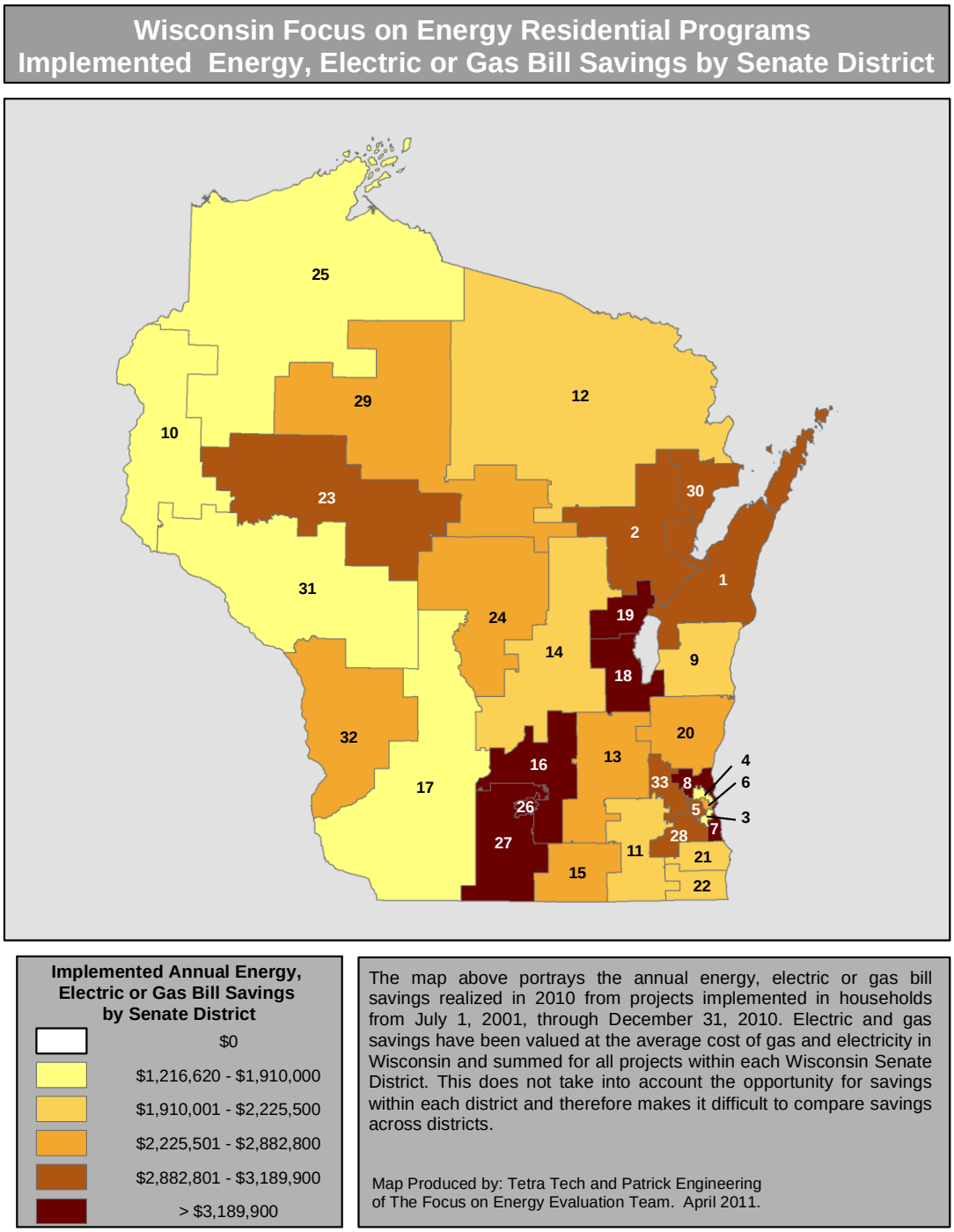


Table A-12. Residential Programs Energy Impacts
(by Senate District)
(July 1, 2001–December 31, 2010)

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	$3,113,826	20,015,390	3,080	542,022	12,794,684	2,052	397,756
2	$3,025,653	18,895,592	2,813	588,663	12,095,476	1,849	420,075
3	$1,909,993	11,063,340	1,786	468,541	7,033,576	1,214	301,648
4	$1,654,109	8,647,469	1,379	510,428	5,469,283	899	345,969
5	$3,119,996	19,843,785	3,940	566,777	12,436,368	2,700	396,071
6	$2,261,290	10,652,999	1,464	828,798	6,802,604	971	561,884
7	$4,225,720	23,148,771	3,675	1,185,475	14,296,479	2,390	713,957
8	$3,820,684	23,003,290	4,296	839,446	14,374,791	2,990	568,616
9	$2,144,312	13,308,425	2,488	426,504	8,491,339	1,660	322,084
10	$1,216,626	7,594,552	1,118	237,088	4,958,586	773	167,206
11	$2,225,471	14,812,464	2,660	330,519	9,360,664	1,872	246,118
12	$2,207,318	14,861,386	1,972	308,796	9,432,419	1,286	233,897
13	$2,451,125	15,628,332	2,542	440,932	9,786,443	1,676	320,753
14	$2,209,302	14,589,879	2,301	341,004	9,322,672	1,541	247,598
15	$2,355,644	15,336,570	1,914	388,221	9,460,279	1,217	266,126
16	$3,433,630	19,219,103	2,853	917,367	12,446,935	1,904	695,506
17	$1,547,075	10,294,925	1,484	230,014	6,335,757	954	174,773
18	$3,511,312	21,466,462	3,220	734,953	13,846,700	2,189	533,790
19	$3,949,045	25,312,316	4,213	695,455	16,610,519	2,927	495,140
20	$2,882,702	18,154,660	2,947	543,834	11,454,598	2,005	421,985
21	$2,123,671	14,582,759	2,596	265,199	9,237,752	1,830	187,328
22	$1,917,986	12,388,591	2,286	327,143	7,811,577	1,611	230,606
23	$2,961,610	19,131,895	2,050	504,884	12,521,847	1,354	387,218
24	$2,809,409	17,208,881	2,557	584,280	10,896,743	1,693	400,563
25	$1,459,533	8,788,554	960	320,551	5,530,193	624	237,671
26	$5,951,355	28,698,007	4,828	2,107,171	18,850,684	3,302	1,365,263
27	$4,167,133	23,212,485	3,432	1,125,922	15,167,961	2,349	807,797
28	$3,189,819	21,352,560	3,851	460,120	13,407,956	2,668	319,091
29	$2,564,132	16,345,509	2,399	461,637	10,571,731	1,647	326,554
30	$3,167,152	18,852,161	2,786	720,113	12,127,016	1,810	513,256
31	$1,569,814	9,477,368	1,330	341,997	6,052,000	877	259,272
32	$2,273,105	14,318,364	2,443	428,514	9,246,627	1,733	287,261
33	$3,077,059	19,869,848	3,735	525,445	12,577,961	2,616	353,414
*Not mapped	$25,659,010	196,730,726	16,783	902,315	126,046,550	10,080	594,148

* *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–December 31, 2010)

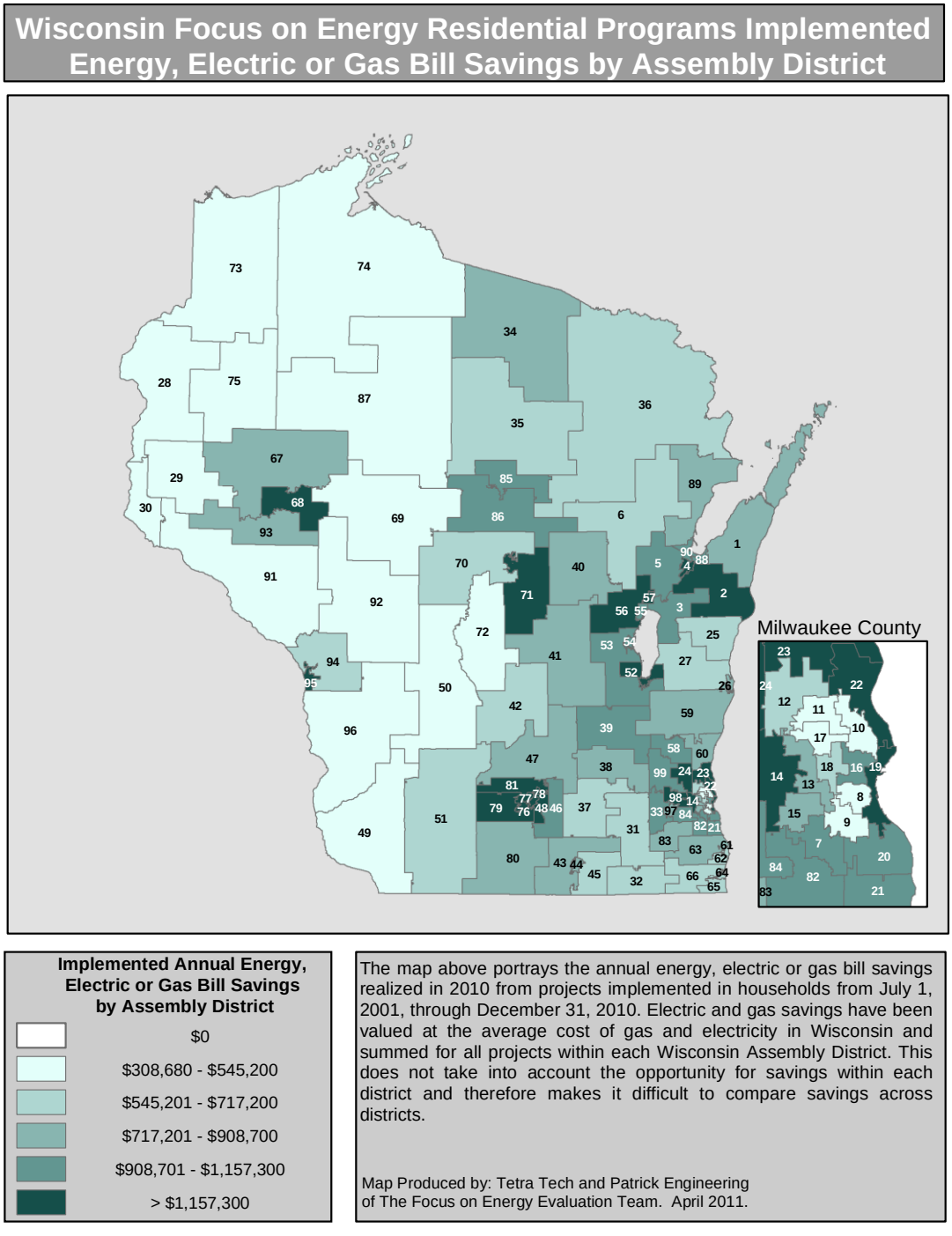


Table A-13. Residential Programs Energy Impacts
(by Assembly District)
(July 1, 2001–December 31, 2010)

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	$819,022	5,612,986	753	103,516	3,510,782	493	82,630
2	$1,204,126	7,336,841	1,061	254,793	4,701,390	699	178,373
3	$1,090,678	7,065,563	1,266	183,713	4,582,513	861	136,753
4	$1,323,469	8,431,251	1,304	238,882	5,322,015	855	177,814
5	$1,131,681	6,532,703	968	280,121	4,265,878	638	189,813
6	$570,409	3,930,889	541	69,659	2,506,903	356	52,448
7	$988,645	5,884,230	1,027	224,852	3,699,827	695	130,694
8	$376,419	2,012,614	243	111,141	1,320,058	166	71,211
9	$545,103	3,167,695	517	132,568	2,014,207	353	99,750
10	$501,572	2,628,079	349	154,112	1,677,003	232	106,818
11	$435,304	2,024,003	344	162,541	1,319,648	230	120,618
12	$717,107	3,994,559	686	193,755	2,472,081	437	118,520
13	$830,179	5,119,916	1,022	168,765	3,209,007	703	128,328
14	$1,393,645	9,231,415	1,768	211,969	5,738,556	1,209	148,232
15	$896,047	5,491,629	1,148	186,023	3,488,488	788	119,505
16	$1,124,649	4,669,999	594	482,623	2,916,615	371	308,662
17	$508,625	2,898,331	439	130,129	1,853,057	302	99,880
18	$627,979	3,084,382	431	216,046	2,032,780	298	153,342
19	$2,125,578	10,316,630	1,484	745,097	6,381,906	927	439,641
20	$1,157,201	6,704,048	1,159	283,745	4,113,838	747	168,395
21	$942,941	6,128,092	1,031	156,632	3,800,734	716	105,920
22	$1,302,125	6,968,766	1,482	383,719	4,330,878	1,042	271,927
23	$1,315,349	8,071,573	1,672	271,935	5,133,767	1,204	167,306
24	$1,203,324	7,963,691	1,141	183,812	4,910,649	744	129,397
25	$654,648	4,031,656	722	133,723	2,599,757	472	103,556
26	$815,099	4,923,081	1,051	177,339	3,122,799	711	133,419
27	$674,591	4,353,903	715	115,443	2,768,953	477	85,108
28	$308,683	1,991,097	223	52,957	1,260,868	142	38,037
29	$512,934	3,140,805	445	106,804	2,043,818	297	73,346
30	$395,010	2,462,650	450	77,327	1,653,899	335	55,823
31	$697,580	4,670,834	825	100,483	2,907,081	569	78,679
32	$590,084	3,955,435	665	84,508	2,484,957	467	58,138
33	$937,809	6,186,211	1,171	145,527	3,968,641	836	109,301
34	$885,300	5,771,486	780	145,041	3,640,637	498	117,506
35	$700,602	4,596,831	652	111,482	2,947,674	439	76,237
36	$621,516	4,493,870	540	52,274	2,844,841	349	40,155
37	$683,967	4,311,823	655	128,547	2,703,002	429	93,249
38	$798,241	4,887,654	790	166,229	3,066,588	515	120,081
39	$968,915	6,428,839	1,096	146,157	4,016,838	732	107,424
40	$784,228	5,307,033	913	106,685	3,492,636	649	78,868
41	$768,632	5,223,826	799	102,059	3,272,529	524	78,899
42	$656,480	4,059,320	590	132,261	2,557,776	368	89,831

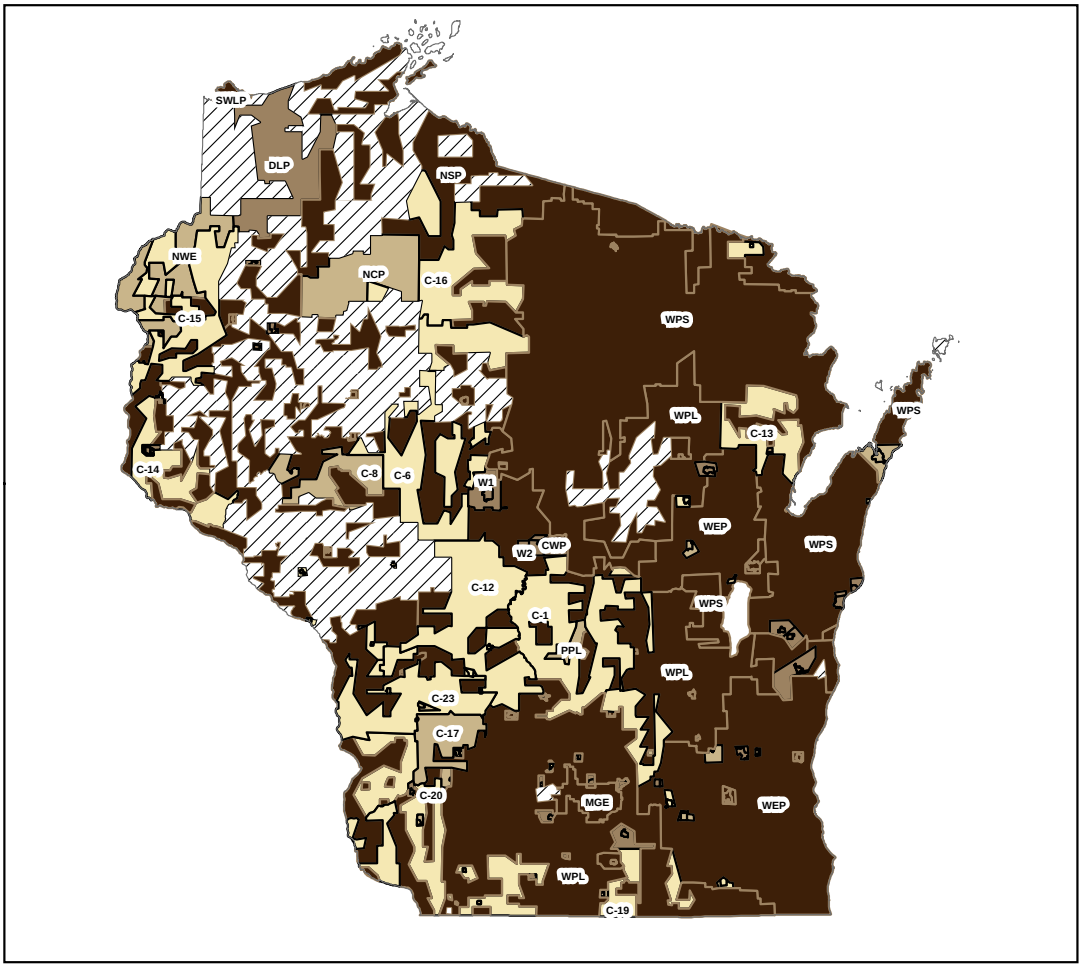
Assembly District	Annual Dollars Saved	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms	Persistent Net kWh	Persistent Net kW	Persistent Net Therms
43	$783,704	5,479,649	630	86,867	3,455,948	416	64,288
44	$898,472	5,481,871	727	189,287	3,340,062	458	126,719
45	$673,468	4,375,050	556	112,067	2,664,269	343	75,120
46	$981,171	5,682,266	655	240,805	3,644,771	427	182,770
47	$825,517	5,339,974	777	139,928	3,330,116	503	110,461
48	$1,626,974	8,197,116	1,421	536,635	5,472,292	974	402,275
49	$432,276	2,860,497	416	66,070	1,720,666	264	50,756
50	$479,073	3,081,219	452	83,193	1,970,815	303	60,932
51	$635,693	4,352,949	616	80,752	2,644,045	387	63,085
52	$1,398,140	8,400,122	1,369	309,170	5,455,781	950	221,648
53	$1,011,303	6,395,643	986	187,798	4,066,256	660	143,067
54	$1,101,869	6,670,697	865	237,985	4,324,663	579	169,074
55	$985,060	6,377,352	1,060	166,372	4,174,659	718	119,637
56	$1,673,254	10,515,529	1,688	318,163	6,863,896	1,176	231,316
57	$1,290,732	8,419,436	1,465	210,920	5,571,964	1,034	144,187
58	$1,131,035	6,854,091	1,048	243,520	4,382,722	719	184,985
59	$904,912	5,749,375	899	165,063	3,609,881	596	133,125
60	$846,710	5,550,835	1,000	135,251	3,461,694	689	103,875
61	$674,953	4,985,650	695	44,954	3,175,631	484	37,942
62	$699,960	4,526,526	926	118,787	2,867,511	656	78,122
63	$748,758	5,070,584	975	101,458	3,194,610	690	71,264
64	$648,491	3,895,722	686	143,451	2,440,754	465	95,544
65	$659,578	4,410,718	916	95,644	2,806,385	663	73,320
66	$609,917	4,082,152	684	88,047	2,564,438	483	61,742
67	$727,239	4,752,134	483	117,903	3,038,865	314	95,573
68	$1,699,735	10,929,167	1,178	295,488	7,331,540	796	222,964
69	$534,612	3,450,403	390	91,494	2,151,329	245	68,681
70	$695,597	4,614,276	671	105,049	2,903,382	430	81,514
71	$1,614,864	9,457,272	1,350	384,550	6,024,766	907	247,987
72	$498,928	3,137,184	536	94,681	1,968,474	356	71,062
73	$517,758	2,922,614	300	135,577	1,848,485	194	105,297
74	$526,380	3,267,285	376	104,656	1,999,396	237	83,086
75	$415,394	2,598,655	284	80,318	1,682,313	193	49,288
76	$1,877,000	9,255,363	1,668	641,683	5,996,459	1,147	445,260
77	$2,013,646	9,277,928	1,607	761,394	6,071,066	1,083	449,808
78	$2,060,652	10,164,261	1,553	704,094	6,782,754	1,072	470,195
79	$2,006,508	10,971,789	1,606	565,143	7,305,086	1,105	410,622
80	$781,475	5,156,463	831	121,099	3,278,677	566	93,602
81	$1,379,175	7,084,434	995	439,680	4,584,359	678	303,573
82	$1,151,559	7,615,573	1,328	176,524	4,757,797	914	117,510
83	$881,743	5,937,177	1,046	123,286	3,724,382	727	92,389
84	$1,156,518	7,799,810	1,477	160,309	4,925,777	1,028	109,192
85	$1,076,724	6,288,838	985	258,294	4,126,514	682	179,367
86	$957,343	6,421,790	1,086	136,595	4,190,249	761	101,057
87	$530,072	3,634,937	328	66,748	2,254,998	204	46,130
88	$1,156,375	6,651,493	963	288,897	4,242,763	621	184,030

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	$877,121	5,410,832	784	178,149	3,493,304	522	146,517
90	$1,133,656	6,789,836	1,039	253,066	4,390,949	668	182,708
91	$326,160	2,127,743	280	53,276	1,344,676	188	39,218
92	$383,076	2,719,290	342	37,884	1,688,600	220	30,996
93	$860,602	4,630,526	708	250,837	3,018,837	469	189,058
94	$636,668	4,243,615	786	93,879	2,750,703	569	71,286
95	$1,194,134	7,138,547	1,306	268,081	4,640,318	930	168,279
96	$442,303	2,936,202	351	66,554	1,855,606	234	47,697
97	$908,618	5,171,562	1,136	233,146	3,282,386	803	135,247
98	$1,221,967	8,262,938	1,597	166,947	5,278,554	1,136	121,436
99	$946,492	6,435,492	1,002	125,353	4,017,152	677	96,732
*Not mapped	$25,659,010	196,730,726	16,783	902,315	126,046,550	10,080	594,148

* *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–December 31, 2010)

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

- < $0.20
- $0.20 - $3.70
- $3.71 - $7.60
- $7.61 - $12.30
- > $12.30
- Non Participating Utility Territories

The map above portrays the annual energy, electric bill savings realized in 2010 from projects implemented in households from July 1, 2001, through December 31, 2010. 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 2009.

Map Produced by: Tetra Tech and Patrick Engineering of The Focus on Energy Evaluation Team. April 2011.

Table A-14. Residential Programs Electric Impacts
(by Participating Electric Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Adams-Columbia Electric Coop	2009	C-1	31,798	33,599	$1	253,778	57	134,927	30
Algoma Utility Comm	2008	W2	2,748	1,640	$2	21,933	3	13,937	2
Wisconsin Power & Light (WPL)	2001	WPL	9,564,566	397,766	$24	76,333,327	11,672	50,566,559	8,248
Bloomer Electric & Water Co	2001	W1	27,798	1,587	$18	221,851	22	137,985	13
Brodhead Water & Lighting Comm	2008	W1	7,130	1,500	$5	56,905	8	42,612	5
Cedarburg Light & Water Comm	2008	W1	69,419	5,183	$13	554,024	96	320,382	56
City of Arcadia	2009	W1	1,408	1,179	$1	11,238	2	6,195	1
City of Argyle	2001	W1	8,515	401	$21	67,958	13	46,655	10
City of Bangor	2008	W2	3,818	1,388	$3	30,471	5	18,589	3
City of Barron	2009	W1	17,553	1,478	$12	140,086	15	103,791	11
City of Black River Falls	2008	W1	14,858	2,163	$7	118,581	16	74,715	9
City of Boscobel	2008	W1	12,701	1,405	$9	101,363	10	63,338	6
City of Clintonville	2008	W1	5,811	2,919	$2	46,377	6	31,915	4
City of Columbus	2008	W2	13,120	2,294	$6	104,708	13	67,326	9
City of Cornell	2001	W1	32,725	722	$45	261,174	11	187,964	7
City of Cuba City	2008	W2	2,743	932	$3	21,890	4	12,828	2
City of Cumberland	2001	W1	27,024	1,131	$24	215,674	27	138,752	18
City of Eagle River	2008	W2	8,854	925	$10	70,659	6	43,841	4
City of Elkhorn	2009	W2	10,858	3,966	$3	86,655	14	45,172	7
City of Elroy	2007	W2	2,657	739	$4	21,203	3	14,038	2
City of Evansville	2008	W2	46,118	3,054	$15	368,063	40	254,967	28
City of Fennimore	2008	W2	5,788	1,120	$5	46,192	8	31,609	5

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
City of Kaukauna	2008	W2	241,587	12,727	$19	1,928,067	244	1,230,759	148
City of Kiel	2007	W2	21,465	2,150	$10	171,311	25	113,035	17
City of Lodi	2008	W2	12,418	1,400	$9	99,110	11	63,615	6
City of Marshfield	2008	W2	119,565	11,217	$11	954,227	103	622,132	56
City of Medford	2007	W2	36,047	2,591	$14	287,688	29	181,809	18
City of Menasha	2008	W2	59,805	8,052	$7	477,292	60	304,717	35
City of Muscoda	2008	W2	5,171	910	$6	41,271	5	26,459	3
City of New Holstein	2008	W2	25,067	2,039	$12	200,058	28	136,359	19
City of New Lisbon	2009	W2	312	667	$0	2,493	1	1,027	0
City of New Richmond	2008	W2	17,628	3,598	$5	140,686	23	91,684	14
City of Plymouth	2008	W2	56,404	6,878	$8	450,150	69	279,502	40
City of Princeton	2001	W2	12,032	731	$16	96,024	11	64,108	7
City of Richland Center	2008	W2	16,720	2,417	$7	133,443	19	83,043	11
City of River Falls	2008	W2	62,698	5,254	$12	500,384	51	320,915	33
City of Sheboygan Falls	2010	W2	5,697	3,978	$1	45,470	13	24,754	9
City of Shullsburg	2007	W2	2,798	684	$4	22,334	2	15,207	2
City of Spooner	2001	W1	12,938	1,238	$10	103,254	10	62,820	6
City of Stoughton	2008	W1	61,704	7,569	$8	492,450	82	298,038	46
City of Sturgeon Bay	2008	W1	39,057	7,059	$6	311,706	41	202,423	26
City of Westby	2008	W2	1,437	994	$1	11,466	1	6,313	1
Clark Electric Coop	2009	C-6	13,031	8,805	$1	104,002	18	61,137	9
Consolidated Water Power Co	2001	CWP	23,546	99	$238	187,920	32	123,762	22
Dahlberg Light & Power Co	2001	DLP	77,512	10,086	$8	618,613	52	388,468	33
Eau Claire Electric Coop	2007	C-8	45,006	9,834	$5	359,185	53	235,282	35
Florence Utility Comm	2008	W1	1,719	1,368	$1	13,716	2	8,594	1

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Hartford Electric	2008	W1	71,103	5,828	$12	567,461	55	347,938	30
Hustisford Utilities	2008	W1	5,873	1,317	$4	46,875	7	28,804	4
Jefferson Utilities	2008	W1	25,591	3,466	$7	204,236	32	123,704	18
Juneau Utility Comm	2008	W2	5,283	938	$6	42,167	5	31,074	3
La Farge Municipal Electric Co	2001	W2	2,316	435	$5	18,483	2	12,555	1
Lake Mills Light & Water	2008	W2	12,317	3,399	$4	98,301	17	60,951	10
Madison Gas & Electric Co	2001	MGE	5,559,367	120,851	$46	44,368,452	7,128	29,684,690	4,942
Manitowoc Public Utilities	2007	W1	182,744	15,571	$12	1,458,453	188	976,767	113
New London Electric & Water	2008	W2	18,557	3,287	$6	148,105	24	97,746	15
North Central Power Co, Inc	2001	NCP	32,454	4,443	$7	259,013	25	158,499	16
Northwestern Wisconsin Elec Co	2001	NWE	66,943	11,623	$6	534,259	55	347,062	37
Oakdale Electric Coop	2008	C-12	44,922	14,581	$3	358,518	53	211,216	30
Oconomowoc Utilities	2008	W1	93,456	7,563	$12	745,862	102	447,343	57
Oconto Electric Coop	2009	C-13	22,627	9,269	$2	180,579	34	115,430	20
Oconto Falls Water & Light Comm	2008	W2	11,272	1,341	$8	89,959	10	58,047	6
Pierce-Pepin Coop Services	2009	C-14	20,202	7,021	$3	161,230	38	104,821	25
Pioneer Power & Light Co	2001	PPL	12,789	1,991	$6	102,068	10	64,104	6
Polk-Burnett Electric Coop	2010	C-15	6,962	18,647	$0	55,563	16	37,262	12
Price Electric Coop, Inc	2007	C-16	26,372	8,633	$3	210,472	19	135,404	12
Reedsburg Utility Comm	2008	W1	70,538	4,168	$17	562,949	60	371,812	40
Rice Lake Utilities	2007	W1	43,752	4,435	$10	349,180	48	251,642	35
Richland Electric Coop	2006	C-17	26,389	3,507	$8	210,604	35	136,332	24

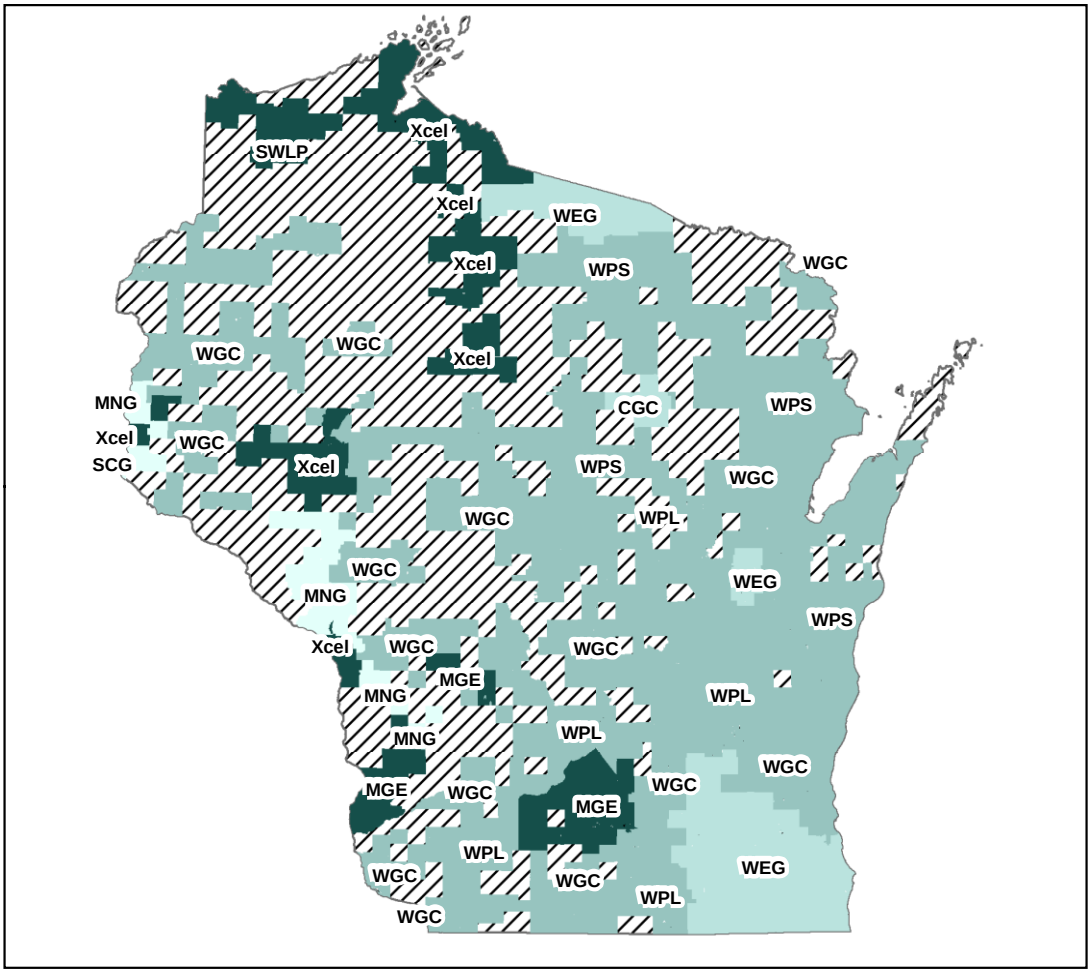
Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Rock Energy Coop	2009	C-19	4,970	6,436	$1	39,668	8	24,801	5
Scenic Rivers Energy Coop	2007	C-20	40,417	12,619	$3	322,564	51	205,398	34
Shawano Municipal Utilities	2007	W1	42,516	4,170	$10	339,311	39	218,027	23
Slinger Utilities	2008	W1	13,503	1,810	$7	107,767	14	67,896	8
Sun Prairie Water & Light Comm	2008	W1	92,075	11,784	$8	734,838	101	468,918	58
Superior Water, Light & Power Co	2001	SWLP	237,784	12,544	$19	1,897,716	202	1,226,198	135
Two Rivers Water & Light	2008	W1	67,271	5,545	$12	536,883	73	322,652	39
Vernon Electric Coop	2009	C-23	17,607	10,303	$2	140,517	36	90,089	24
Village of Belmont	2007	W2	3,588	538	$7	28,634	6	17,591	4
Village of Benton	2001	W2	1,828	437	$4	14,588	4	9,070	3
Village of Cadott	2001	W2	19,361	648	$30	154,520	17	99,603	11
Village of Cashton	2001	W2	7,071	493	$14	56,430	13	36,862	10
Village of Centuria	2001	W2	4,503	292	$15	35,939	4	21,653	3
Village of Gresham	2001	W2	11,820	951	$12	94,334	7	60,735	5
Village of Mazomanie	2007	W2	7,462	811	$9	59,550	8	37,727	4
Village of Merrillan	2010	W2	91	367	$0	730	0	277	0
Village of Mt Horeb	2008	W2	26,723	3,105	$9	213,274	24	140,975	15
Village of New Glarus	2008	W2	9,593	1,002	$10	76,560	12	49,701	8
Village of Pardeeville	2001	W2	22,399	1,222	$18	178,763	19	116,911	12
Village of Prairie Du Sac	2008	W2	10,742	1,718	$6	85,732	11	52,156	6
Village of Sauk City	2009	W2	5,095	1,505	$3	40,666	8	21,589	4
Village of Stratford	2001	W2	20,894	680	$31	166,756	12	110,608	8
Village of Trempealeau	2009	W2	681	1,001	$1	5,433	1	2,906	0
Village of Viola	2001	W2	1,170	314	$4	9,340	1	6,024	1

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Persistent Net kWh	Persistent Net kW
Village of Waunakee	2008	W2	50,633	4,496	$11	404,092	74	247,890	47
Waterloo Light & Water Comm	2008	W2	11,751	1,508	$8	93,782	11	58,581	6
Waupun Utilities	2008	W2	47,524	3,722	$13	379,283	25	260,865	15
Whitehall Electric Utility	2008	W2	19,257	749	$26	153,691	25	103,639	17
Wisconsin Dells Electric Utility	2007	W2	7,756	1,286	$6	61,899	7	43,604	4
Wisconsin Electric Power Co (We Energies)	2001	WEP	27,853,716	975,294	$29	222,296,219	38,445	144,753,960	27,180
Wisconsin Public Service Corp	2001	WPS	10,978,369	374,206	$29	87,616,675	13,146	57,745,502	9,053
Wisconsin Rapids Water Works & Lighting Comm	2008	W2	114,688	11,767	$10	915,310	177	543,440	106
Wonewoc Electric & Water Utility	2001	W2	4,088	422	$10	32,625	4	20,792	2
Xcel Energy (Northern States Power Co)	2001	NSP	5,390,469	202,097	$27	43,020,504	6,026	28,462,257	4,229
*Not mapped			31,176,345	1	$31,176,345	248,813,608	24,570	150,100,607	13,654

* *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–December 31, 2010)

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
- $2.30 - $2.50
- $2.51 - $7.90
- $7.91 - $12.60
- > $12.60
- Non Participating Utility Territories

The map above portrays the annual energy, gas bill savings realized in 2010 from projects implemented in households from July 1, 2001, through December 31, 2010. Gas savings has been valued at the average cost of gas 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 2009.

Map Produced by: Tetra Tech and Patrick Engineering of The Focus on Energy Evaluation Team. April 2011.

Table A-15. Residential Programs Gas Impacts
(by Participating Gas Utility)
(July 1, 2001–December 31, 2010)

Utility Name	Joined Focus	Map Code	Annual Dollars Saved	Number of Customers	Annual Dollars per Capita	Lifecycle Verified Gross Therms	Persistent Net Therms
Wisconsin Power & Light (WPL)	2001	WPL	$1,697,713	157,469	$11	1,518,735	1,101,524
City Gas Co	2007	CGC	$19,562	4,194	$5	17,500	12,729
Madison Gas and Electric	2001	MGE	$3,737,285	128,044	$29	3,343,289	2,353,268
Midwest Natural Gas Inc.	2007	MNG	$30,063	12,785	$2	26,894	19,511
St. Croix Gas	2007	SCG	$16,677	6,895	$2	14,919	11,008
Superior Water Light And Power Co	2001	SWLP	$148,601	11,031	$13	132,935	100,246
Wisconsin Electric Gas Operations (We Energies)	2001	WEG	$3,325,369	422,447	$8	2,974,799	2,084,151
Wisconsin Gas LLC (We Energies)	2001	WGC	$6,047,932	540,996	$11	5,410,341	3,799,261
Wisconsin Public Service Corp	2001	WPS	$3,531,020	282,318	$13	3,158,770	2,289,101
Xcel Energy (Northern States Power Co)	2001	Xcel	$1,269,459	89,270	$14	1,135,629	826,595
*Not mapped	2001		$2,756,970			2,466,322	1,503,002

* *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

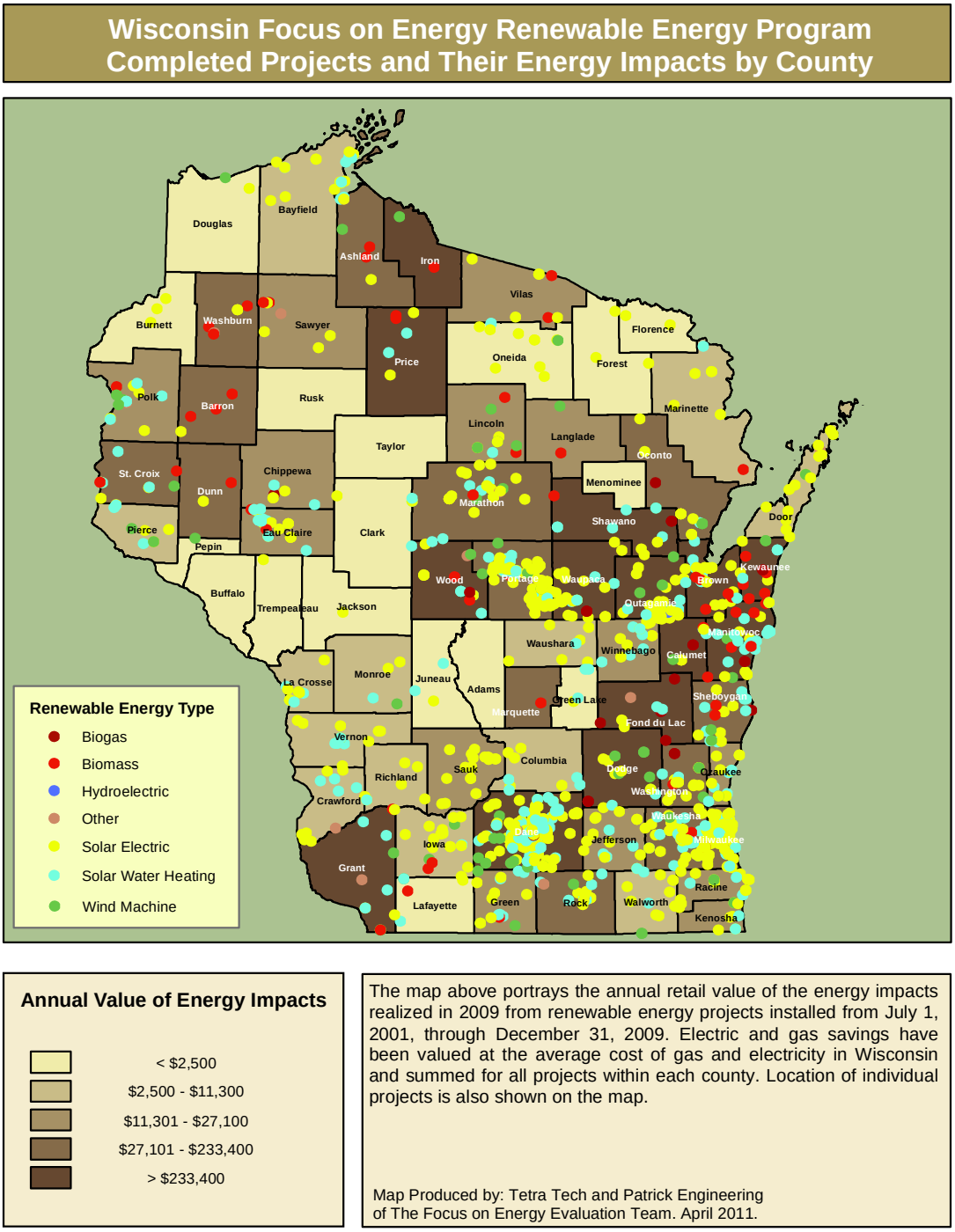
In this section, we summarize the verified energy impacts across the Renewable Energy Programs through December 31, 2009. Results from CY10 are reflected in the appropriate Business Programs and Residential tables above.

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, 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.

Figure A-16.
Renewable Energy Program
Completed Projects and Their Energy Impacts by County
(July 1, 2001–December 31, 2010)



Annual Value of Energy Impacts

	< $2,500
	$2,500 - $11,300
	$11,301 - $27,100
	$27,101 - $233,400
	> $233,400

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 December 31, 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: Tetra Tech and Patrick Engineering of The Focus on Energy Evaluation Team. April 2011.

Table A-16. Renewable Programs Energy Impacts
(by County)
(July 1, 2001– December 31, 2010)

County	Annual Dollars	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms
Ashland	$198,142	20,881	15	248,596
Barron	$198,736	450	0	251,935
Bayfield	$6,169	44,183	19	2,231
Brown	$4,339,123	-1,632,860	-13	5,708,503
Buffalo	$0	0	0	0
Burnett	$1,031	10,333	4	0
Calumet	$830,048	8,165,881	1,275	19,138
Chippewa	$22,771	226,597	41	199
Clark	$2,008	19,336	6	100
Columbia	$5,307	44,688	25	1,074
Crawford	$5,778	57,893	17	0
Dane	$1,626,811	16,056,737	2,233	30,873
Dodge	$372,731	3,734,784	602	0
Door	$7,092	63,600	43	945
Douglas	$463	4,643	6	0
Dunn	$40,157	8,971	2	49,783
Eau Claire	$27,097	42,297	15	29,006
Florence	$145	1,455	1	0
Fond Du Lac	$740,273	7,343,190	996	9,412
Forest	$401	4,013	3	0
Grant	$527,391	273,915	207	634,054
Green	$13,202	64,331	25	8,600
Green Lake	$1,030	6,434	6	491
Iowa	$10,884	91,396	37	2,235
Iron	$465,160	-437,210	-41	645,134
Jackson	$962	9,643	3	0
Jefferson	$19,930	134,156	62	8,294
Juneau	$1,100	6,099	1	623
Kenosha	$12,052	119,258	44	190
Kewaunee	$322,135	3,174,836	365	6,704
La Crosse	$8,879	65,831	34	2,927
Lafayette	$1,643	13,418	4	385
Langlade	$14,631	72,747	64	9,346
Lincoln	$15,658	56,552	44	12,697
Manitowoc	$355,195	2,578,419	364	124,095
Marathon	$233,376	168,518	58	274,589
Marinette	$6,382	8,793	7	6,980
Marquette	$43,328	0	0	54,939
Milwaukee	$57,361	458,382	246	14,727
Monroe	$2,666	26,712	8	0
Oconto	$209,502	2,098,695	261	67
Oneida	$2,473	22,206	15	325
Outagamie	$707,393	7,055,390	1,333	4,139
Ozaukee	$15,648	154,504	52	290

County	Annual Dollars	Lifecycle Verified Gross kWh	Lifecycle Verified Gross kW	Lifecycle Verified Gross Therms
Pierce	$6,347	55,633	14	1,008
Polk	$20,122	145,641	42	7,084
Portage	$42,522	371,041	171	6,964
Price	$727,683	473,240	3	862,794
Racine	$21,187	210,374	117	243
Richland	$5,756	57,676	21	0
Rock	$36,470	363,242	61	277
Sauk	$17,059	170,932	64	0
Sawyer	$20,630	11,337	6	24,723
Shawano	$700,462	6,112,391	735	114,682
Sheboygan	$65,429	82,645	37	72,504
St. Croix	$229,107	-149,261	-38	309,389
Taylor	$0	0	0	0
Trempealeau	$943	9,444	4	0
Vernon	$5,485	54,592	21	47
Vilas	$16,662	17,281	8	18,940
Walworth	$11,253	111,167	41	201
Washburn	$51,487	6,986	5	64,400
Washington	$150,565	1,452,057	218	7,164
Waukesha	$51,360	198,383	108	40,019
Waupaca	$345,184	3,359,095	461	12,611
Waushara	$2,789	27,946	15	0
Winnebago	$13,201	100,015	45	4,083
Wood	$909,039	82,498	29	1,142,194
Not mapped*	$795,755	7,846,713	1,068	16,044

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

Rate Class	kWh Cost	Therm Cost	kWh Source	kWh Report Year	Therm Source	Therm Report Year
Commercial	$0.09	$1.11	http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	2008
Residential	$0.12	$1.26	http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	2008
Industrial	$0.07	$1.06	http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls	2008	http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SWI_a.htm	2008

APPENDIX B: RESIDENTIAL DEFAULT SAVINGS VALUES USED FOR CY10

The following table lists default/deemed energy savings by measure (used for CY10) for the Residential Programs.

Table B-1. Residential Programs: Default/Deemed Energy Savings By Measure (as of December 31, 2010)

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 - 13 Watt	N/A	43.5	27.84	0.0042	0.002688	0	0
ACES	Direct Install	CFL - 20 Watt	N/A	43.5	27.84	0.0042	0.002688	0	0
ACES	Direct Install	CFL - 23 Watt	N/A	43.5	27.84	0.0042	0.002688	0	0
ACES	Direct Install	Faucet Aerator - Bath - Electric	N/A	127.1	89.0971	0	0	0	0
ACES	Direct Install	Faucet Aerator - Bath - Gas	N/A	0	0	0	0	6.3	4.1643
ACES	Direct Install	Faucet Aerator - Kitchen - Electric	N/A	223.1	156.3931	0	0	0	0
ACES	Direct Install	Faucet Aerator - Kitchen - Gas	N/A	0	0	0	0	11.1	7.3371
ACES	Direct Install	Showerhead 1.5 gpm - Electric	N/A	726.2	509.0662	0	0	0	0
ACES	Direct Install	Showerhead 1.5 gpm - Gas	N/A	0	0	0	0	36.2	23.9282
ACES	Direct Install	Showerhead Handheld - Gas	N/A	0	0	0	0	36.2	23.9282
ACES	New Construction	Central Split AC - 14 SEER	N/A	54	40.824	0.1	0.0756	0	0
ACES	New Construction	Central Split AC - 15 SEER	N/A	101	76.356	0.17	0.12852	0	0
ACES	New Construction	Central Split AC - 16+ SEER	N/A	142	107.352	0.28	0.21168	0	0
ACES	New Construction	CFL	N/A	43.5	27.84	0.0042	0.002688	0	0
ACES	New Construction	CFL Fixture	N/A	394	297.864	0.045	0.03402	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	New Construction	ENERGY STAR Clothes Washer - Common Area Electric	N/A	625.2551	472.6928556	0	0	0	0
ACES	New Construction	ENERGY STAR Clothes Washer - Common Area Gas	N/A	62.52551	47.26928556	0	0	21.326531	10.49265325
ACES	New Construction	ENERGY STAR Clothes Washer - In Unit	N/A	163	123.228	0	0	5.5	2.706
ACES	New Construction	ENERGY STAR Dishwasher	N/A	90	68.04	0	0	5	2.46
ACES	New Construction	ENERGY STAR Refrigerator	N/A	66	49.896	0.011	0.008316	0	0
ACES	New Construction	Gas Furnace 90%	N/A	1079	815.724	0.17	0.12852	20	9.84
ACES	New Construction	LED Down Light	N/A	272	205.632	0.031	0.023436	0	0
ACES	Whole Building Existing	CFL Fixture	N/A	394	211.184	0.045	0.02412	0	0
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - Common Area Electric	N/A	384	205.824	0	0	0	0
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - Common Area Gas	N/A	62.52551	33.51367336	0	0	21.326531	8.125408311
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - In Unit	N/A	384	205.824	0	0	5.5	2.0955
ACES	Whole Building Existing	ENERGY STAR Dehumidifier	N/A	50	26.8	0.05	0.0268	0	0
ACES	Whole Building Existing	ENERGY STAR Dishwasher	N/A	90	48.24	0	0	5	1.905

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 Existing	ENERGY STAR Refrigerator	N/A	142	76.112	0.28	0.15008	0	0
ACES	Whole Building Existing	Gas Furnace 90% with ECM	N/A	730	391.28	0.17	0.09112	20	7.62
ACES	Whole Building Existing	Split System A/C - 15 SEER	N/A	101	54.136	0.17	0.09112	0	0
ACES	Whole Building Existing	Split System A/C - 16+ SEER	N/A	142	76.112	0.28	0.15008	0	0
ACES	Whole Building Existing	Water Heater - Condensing	N/A	0	0	0	0	32	12.192
ACES	Whole Building Existing	Water Heater - Indirect	N/A	0	0	0	0	32	12.192
ACES	Whole Building Existing	Water Heater - Natural Gas 90%+	N/A	0	0	0	0	32	12.192
ACES	Whole Building Existing	Water Heater - Power Vented >=0.64 EF	N/A	-50	-26.8	0.005	0.00268	18	6.858
EHCI	Equipment	Gas Furnace 90%+ w/ ECM	N/A	730	277.4	0.17	0.0646	20	7.6
EHCI	Equipment	SEER 14 w/o RCA	N/A	54	54	0.1	0.1	0	0
EHCI	Equipment	SEER 15 w/ ECM	N/A	101	101	0.17	0.17	0	0
EHCI	Equipment	SEER 15 w/o RCA	N/A	101	101	0.17	0.17	0	0
EHCI	Equipment	SEER 16 w/ ECM	N/A	142	142	0.28	0.28	0	0
EHCI	Equipment	SEER 16 w/o RCA	N/A	142	142	0.28	0.28	0	0
EHCI	Equipment	SEER 17 w/ ECM	N/A	142	142	0.28	0.28	0	0
EHCI	Equipment	SEER 18 w/ ECM	N/A	178	178	0.29	0.29	0	0
EHCI	Equipment	SEER 19 w/ ECM	N/A	211	211	0.37	0.37	0	0
EHCI	Equipment	SEER 20 w/ ECM	N/A	239	239	0.39	0.39	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
EHCI	Equipment	SEER 21 w/ ECM	N/A	265	265	0.41	0.41	0	0
EHCI	New Construction	Gas Furnace 90%+ w/ ECM	N/A	1079	410.02	0.17	0.0646	20	7.6
EHCI	New Construction	SEER 15 w/ ECM	N/A	101	101	0.17	0.17	0	0
EHCI	New Construction	SEER 16 w/ ECM	N/A	142	142	0.28	0.28	0	0
EHCI	New Construction	SEER 17 w/ ECM	N/A	142	142	0.28	0.28	0	0
EHCI	New Construction	SEER 21 w/ ECM	N/A	265	265	0.41	0.41	0	0
ENERGY STAR - Appliances	Customer Rewards	Electric to Gas Conversion	N/A	2624	2624	0.25	0.25	-105	-105
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	2624	2624	0.25	0.25	0	0
ENERGY STAR - Appliances	Customer Rewards	Fuel Conversion - Electric to LP	N/A	2624	2624	0.25	0.25	0	0
ENERGY STAR - Appliances	Customer Rewards	Fuel Switch Bonus 0.64 - 0.79 EF	N/A	2624	2624	0.25	0.25	-105	-105
ENERGY STAR - Appliances	Customer Rewards	Power Vent NG EF .64 to .79	N/A	-50	-50	-0.005	-0.005	18	18
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Condensing	N/A	0	0	0	0	32	32
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Electric >=0.93 EF	N/A	208	208	0	0	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 - Appliances	Customer Rewards	Water Heater - Integrated	N/A	0	0	0	0	32	32
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Integrated	N/A	0	0	0	0	32	32
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Power Vented >=0.8 EF	N/A	-50	-50	-0.005	-0.005	49	49
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Power Vented 0.64 - 0.79 EF	N/A	-50	-50	-0.005	-0.005	18	18
ENERGY STAR - Lighting	Customer Rewards	Ceiling Fan	N/A	175	175	0	0	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	Buydown	43.7	29.1	0.0047	0.002914	0	0
ENERGY STAR - Lighting	Customer Rewards	CFL	Mail-In	48.9	30.3	0.0052	0.003224	0	0
ENERGY STAR - Lighting	Customer Rewards	Indoor Lighting Fixtures	N/A	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Customer Rewards	LED Holiday Light	Instant	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Customer Rewards	LED Holiday Light	Mail-In	15.6	15.6	0	0	0	0
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures	Buydown	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures	Mail-In	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	Customer Rewards	Lighting Fixtures - LED	Mail-In	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures - LED	Spiff	104	104	0.004	0.004	0	0
ENERGY STAR - Lighting	Customer Rewards	Torchiere	Instant	349	349	0.01	0.01	0	0
ENERGY STAR - Lighting	Customer Rewards	Torchiere	Mail-In	349	349	0.01	0.01	0	0
HPWES	Equipment	18 SEER	N/A	178	178	0.29	0.29	0	0
HPWES	Equipment	Gas Furnace 90%+ w/ ECM	N/A	730	277.4	0.17	0.0646	20	7.6
HPWES	Equipment	Gas Furnace 90%+ w/ ECM - New Construction	N/A	1079	410.02	0.17	0.0646	20	7.6
HPWES	Equipment	SEER 14	N/A	54	54	0.1	0.1	0	0
HPWES	Equipment	SEER 15	N/A	101	101	0.17	0.17	0	0
HPWES	Mobile Home	CFL	N/A	43.7	27.094	0.0047	0.002914	0	0
HPWES	Mobile Home	Duct Sealing	N/A	1080	1080	0.01	0.01	84	84
HPWES	Mobile Home	Faucet Aerator - Bath - Electric	N/A	127.1	127.1	0	0	0	0
HPWES	Mobile Home	Faucet Aerator - Bath - Gas	N/A	0	0	0	0	6.3	6.3
HPWES	Mobile Home	Faucet Aerator - Kitchen - Electric	N/A	223.1	223.1	0	0	0	0
HPWES	Mobile Home	Faucet Aerator - Kitchen - Gas	N/A	0	0	0	0	11.1	11.1
HPWES	Mobile Home	Showerhead 1.75 gpm - Electric	N/A	544.8	544.8	0	0	0	0
HPWES	Mobile Home	Showerhead 1.75 gpm - Gas	N/A	0	0	0	0	27.2	27.2

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
HPWES	RHEEP	Attic Insulation	Duplex - Side-by-side	320	208	0.236	0.1534	200	130
HPWES	RHEEP	Attic Insulation	Duplex - Stack	160	104	0.118	0.0767	100	65
HPWES	RHEEP	Floor Insulation	Duplex - Side-by-side	252	214.2	0.186	0.1581	158	134.3
HPWES	RHEEP	Floor Insulation	Duplex - Stack	126	107.1	0.093	0.07905	79	67.15
HPWES	RHEEP	Flue Closure	N/A	0	0	0	0	60	60
HPWES	RHEEP	Foundation Insulation - Interior	Duplex - Stack	172	172	0	0	140	140
HPWES	RHEEP	Furnace 90%+ w/ECM	N/A	730	277.4	0.17	0.0646	20	7.6
HPWES	RHEEP	Kneewall Insulation	N/A	160	104	0.118	0.0767	100	65
HPWES	RHEEP	Sill Box Insulation	Duplex - Side-by-side	106	90.1	0	0	78	66.3
HPWES	RHEEP	Sill Box Insulation	Duplex - Stack	53	45.05	0	0	39	33.15
HPWES	RHEEP	Water Heater - Integrated	N/A	0	0	0	0	32	32
HPWES	RHEEP	Water Heater - Power Vented Small	N/A	-50	-50	-0.005	-0.005	18	18
HPWES	RHEEP-DI	CFL - 100 Watt	N/A	43.7	27.094	0.0047	0.002914	0	0
HPWES	RHEEP-DI	CFL - 13 Watt	N/A	43.7	27.094	0.0047	0.002914	0	0
HPWES	RHEEP-DI	CFL - 20 Watt	N/A	43.7	27.094	0.0047	0.002914	0	0
HPWES	RHEEP-DI	CFL - 23 Watt	N/A	43.7	27.094	0.0047	0.002914	0	0
HPWES	RHEEP-DI	Faucet Aerator - Bath - Electric	N/A	127.1	127.1	0	0	0	0
HPWES	RHEEP-DI	Faucet Aerator - Bath - Gas	N/A	0	0	0	0	6.3	6.3
HPWES	RHEEP-DI	Faucet Aerator - Kitchen - Electric	N/A	223.1	223.1	0	0	0	0
HPWES	RHEEP-DI	Faucet Aerator - Kitchen - Gas	N/A	0	0	0	0	11.1	11.1
HPWES	RHEEP-DI	Showerhead 1.5 gpm - Electric	N/A	726.2	622.3534	0	0	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
HPWES	RHEEP-DI	Showerhead 1.5 gpm - Gas	N/A	0	0	0	0	36.2	31.856
HPWES	RHEEP-DI	Showerhead 1.75 gpm - Electric	N/A	544.8	544.8	0	0	0	0
HPWES	RHEEP-DI	Showerhead 1.75 gpm - Gas	N/A	0	0	0	0	27.2	27.2
HPWES	Together We Save	Attic Insulation	Multi-select	160	160	0.118	0.118	100	100
HPWES	Together We Save	Faucet Aerator - Bath - Electric	N/A	127.1	127.1	0	0	0	0
HPWES	Together We Save	Faucet Aerator - Bath - Gas	N/A	0	0	0	0	6.3	6.3
HPWES	Together We Save	Faucet Aerator - Kitchen - Gas	N/A	0	0	0	0	11.1	11.1
HPWES	Together We Save	Floor Insulation	N/A	126	126	0.093	0.093	79	79
HPWES	Together We Save	Foundation Insulation	Exterior	59	59	0	0	49	49
HPWES	Together We Save	Foundation Insulation	Interior	172	172	0	0	140	140
HPWES	Together We Save	Furnace 90%+ w/ECM	N/A	730	730	0.17	0.17	20	20
HPWES	Together We Save	Insulate Bath Exhaust Fan	Existing	0	0	0	0	0	0
HPWES	Together We Save	Insulate Exhaust Fan	Existing	0	0	0	0	0	0
HPWES	Together We Save	Insulate Exhaust Fan	New	0	0	0	0	0	0
HPWES	Together We Save	Insulate Kitchen Exhaust Fan	Existing	0	0	0	0	0	0
HPWES	Together We Save	No Furnace Grille Removal	N/A	0	0	0	0	0	0
HPWES	Together We Save	Pipe Insulation	N/A	0	0	0	0	0	0
HPWES	Together We Save	Revent Bath Exhaust Fan	Existing	0	0	0	0	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
HPWES	Together We Save	Revent Exhaust Fan	Existing	0	0	0	0	0	0
HPWES	Together We Save	Revent Kitchen Exhaust Fan	N/A	0	0	0	0	0	0
HPWES	Together We Save	SEER 15	N/A	101	101	0.17	0.17	0	0
HPWES	Together We Save	Showerhead - Gas	N/A	0	0	0	0	27.2	27.2
HPWES	Together We Save	Sidewall Insulation	Cavity	326	326	0.264	0.264	225	225
HPWES	Together We Save	Sill Box Insulation	N/A	53	53	0	0	39	39
HPWES	Together We Save	Water Heater >=0.64 EF	N/A	-50	-50	-0.005	-0.005	18	18
HPWES	Whole House	Attic Insulation	Cathedral	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Closed Floor	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Gable	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Open Floor	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Other	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Scuttle/Access	160	104	0.118	0.0767	100	65
HPWES	Whole House	Attic Insulation	Slope	160	104	0.118	0.0767	100	65
HPWES	Whole House	Chimney Liner	N/A	0	0	0	0	0	0
HPWES	Whole House	Electric to Gas Conversion	N/A	2624	2624	0.25	0.25	-105	-105
HPWES	Whole House	Exhaust Fan	ENERGY STAR	0	0	0	0	0	0
HPWES	Whole House	Exhaust Fan	Other	0	0	0	0	0	0
HPWES	Whole House	Floor Insulation	N/A	126	107.1	0.093	0.07905	79	67.15
HPWES	Whole House	Flue Closure	N/A	0	0	0	0	114	114
HPWES	Whole House	Foundation Insulation	Exterior	59	50.15	0	0	49	41.65
HPWES	Whole House	Foundation Insulation	Interior	172	172	0	0	140	140
HPWES	Whole House	Fuel Conversion Bonus - >=0.8 EF	N/A	-50	-50	-0.005	-0.005	49	49

Program	Program Initiative	Measure	Qualifier	Deemed Verified kWh	Deemed Net kWh	Deemed Verified kW	Deemed Net kW	Deemed Verified Therms	Deemed Net Therms
HPWES	Whole House	Fuel Conversion Bonus 0.64 - 0.79 EF	N/A	-50	-50	-0.005	-0.005	18	18
HPWES	Whole House	Kneewall Insulation	N/A	160	104	0.118	0.0767	100	65
HPWES	Whole House	Sidewall Insulation	Cavity	326	237.98	0.264	0.19272	225	164.25
HPWES	Whole House	Sidewall Insulation	R3-R4	36	26.28	0.029	0.02117	25	18.25
HPWES	Whole House	Sidewall Insulation	R5+	60	43.8	0.049	0.03577	41	29.93
HPWES	Whole House	Sill Box Insulation	N/A	53	45.05	0	0	39	33.15
HPWES	Whole House	Water Heater - Electric >=0.93 EF	N/A	208	208	0	0	0	0
HPWES	Whole House	Water Heater - Indirect	N/A	0	0	0	0	32	32
HPWES	Whole House	Water Heater - Poor Draft	N/A	0.5	0.5	-0.005	-0.005	60	60
HPWES	Whole House	Water Heater - Power Vented >=0.9 EF	N/A	0	0	0	0	32	32
HPWES	Whole House	Water Heater - Power Vented 0.64 - 0.79 EF	N/A	-50	-50	-0.005	-0.005	18	18
HPWES	Whole House	Water Heater - Power Vented 0.8 - 0.89 EF	N/A	-50	-50	-0.005	-0.005	49	49
WESH	Reward Items	CFL	N/A	43.7	27.094	0.0047	0.002914	0	0
WESH	Reward Items	Drain Water Heat Recovery	N/A	0	0	0	0	49	49
WESH	Reward Items	Furnace 90%+ w/ECM & Staging	N/A	1079	410.02	0.17	0.0646	20	7.6
WESH	WESH Home Status	Certified Home Status	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

Program	B/C Category	Measure Life	NIC Value	NIC Unit	NEBS Value	NEBS Unit	Utility Avoided Cost - kWh	Utility Avoided Cost - kW	Utility Avoided Cost - Therms
Agriculture	CFL	7	0.006	avoided cost	0.3	avoided cost	0.042	127	1.005
Agriculture	Building Shell	19	0.276	avoided cost	0.3	avoided cost	0.046	127	1.005
Agriculture	HVAC Equipment	15	0.219	avoided cost	0.3	avoided cost	0.046	127	1.005
Agriculture	HVAC Service	5	0.169	avoided cost	0.3	avoided cost	0.046	127	1.005
Agriculture	Lighting	12	0.249	avoided cost	0.3	avoided cost	0.042	127	1.005
Agriculture	Process Equipment	11	0.227	avoided cost	0.3	avoided cost	0.045	127	1.005
Agriculture	Process Service	2	0.342	avoided cost	0.3	avoided cost	0.045	127	1.005
Agriculture	Other	12	0.225	avoided cost	0.3	avoided cost	0.045	127	1.005
Agriculture	Motors	16	0.097	avoided cost	0.3	avoided cost	0.045	127	1.005
Commercial	CFL	5	0.008	avoided cost	0.3	avoided cost	0.047	127	1.005
Commercial	Building Shell	19	0.211	avoided cost	0.3	avoided cost	0.05	127	1.005
Commercial	HVAC Equipment	15	0.209	avoided cost	0.3	avoided cost	0.05	127	1.005
Commercial	HVAC Service	5	0.131	avoided cost	0.3	avoided cost	0.05	127	1.005
Commercial	Lighting	12	0.247	avoided cost	0.3	avoided cost	0.047	127	1.005
Commercial	Process Equipment	11	0.203	avoided cost	0.3	avoided cost	0.045	127	1.005
Commercial	Process Service	2	0.339	avoided cost	0.3	avoided cost	0.045	127	1.005
Commercial	Other	12	0.225	avoided cost	0.3	avoided cost	0.045	127	1.005
Commercial	Motors	16	0.099	avoided cost	0.3	avoided cost	0.05	127	1.005
Industrial	CFL	4	0.010	avoided cost	0.3	avoided cost	0.046	127	0.871
Industrial	Building Shell	19	0.229	avoided cost	0.3	avoided cost	0.049	127	0.871
Industrial	HVAC Equipment	15	0.217	avoided cost	0.3	avoided cost	0.049	127	0.871
Industrial	HVAC Service	5	0.137	avoided cost	0.3	avoided cost	0.049	127	0.871

Program	B/C Category	Measure Life	NIC Value	NIC Unit	NEBS Value	NEBS Unit	Utility Avoided Cost - kWh	Utility Avoided Cost - kW	Utility Avoided Cost - Therms
Industrial	Lighting	12	0.251	avoided cost	0.3	avoided cost	0.046	127	0.871
Industrial	Process Equipment	11	0.212	avoided cost	0.3	avoided cost	0.044	127	0.871
Industrial	Process Service	2	0.353	avoided cost	0.3	avoided cost	0.044	127	0.871
Industrial	Other	12	0.229	avoided cost	0.3	avoided cost	0.044	127	0.871
Industrial	Motors	16	0.100	avoided cost	0.3	avoided cost	0.044	127	0.871
Schools and Government	CFL	5	0.008	avoided cost	0.3	avoided cost	0.047	127	0.9
Schools and Government	Building Shell	19	0.272	avoided cost	0.3	avoided cost	0.051	127	0.9
Schools and Government	HVAC Equipment	15	0.246	avoided cost	0.3	avoided cost	0.051	127	0.9
Schools and Government	HVAC Service	5	0.161	avoided cost	0.3	avoided cost	0.051	127	0.9
Schools and Government	Lighting	12	0.244	avoided cost	0.3	avoided cost	0.047	127	0.9
Schools and Government	Process Equipment	11	0.227	avoided cost	0.3	avoided cost	0.044	127	0.9
Schools and Government	Process Service	2	0.336	avoided cost	0.3	avoided cost	0.044	127	0.9
Schools and Government	Other	12	0.247	avoided cost	0.3	avoided cost	0.044	127	0.9
Schools and Government	Motors	16	0.095	avoided cost	0.3	avoided cost	0.051	127	0.9
Channel EHCI	HVAC Equipment	15	3.13	avoided cost	0.3	avoided cost	0.05	127	1.005
Channel EHCI	HVAC Service	5	0.65	avoided cost	0.3	avoided cost	0.05	127	1.005
Channel Lighting	CFL	5	0.04	avoided cost	0.3	avoided cost	0.047	127	1.005
Channel Lighting	Lighting	12	2.89	avoided cost	0.3	avoided cost	0.047	127	1.005
New Buildings	Other	12	2.57	avoided cost	0.3	avoided cost	0.045	127	1.005
ACES	Other	8	0.052	kWh	0.0052	kWh	0.04555	127	1.087
EHCI	Other	20	1.162	kWh	0	kWh	0.0445	127	1.087
EHCI	ECM Furnace	13	850	unit	0	unit	0.04117	127	1.087
EHCI	SEER 12	20	350	unit	0	unit	0.05667	127	1.087
EHCI	SEER 13	20	700	unit	0	unit	0.05667	127	1.087
EHCI	SEER 14+	20	350	unit	0	unit	0.05667	127	1.087
ENERGY STAR	CFL	6	4	unit	0	unit	0.04333	127	1.087
ENERGY STAR	Other Lighting	25	0.067	kWh	0	kWh	0.04333	127	1.087
ENERGY STAR	Other	12	0.752	kWh	0	kWh	0.04382	127	1.087

Program	B/C Category	Measure Life	NIC Value	NIC Unit	NEBS Value	NEBS Unit	Utility Avoided Cost - kWh	Utility Avoided Cost - kW	Utility Avoided Cost - Therms
ENERGY STAR	Clothes Washers	12	200	unit	1.48	unit	0.04594	127	1.087
HPWES	Other	25	6.416	therm	0.535	therm	0.04555	127	1.087
HPWES	ECM Furnace	23	850	unit	0	unit	0.04117	127	1.087
HPWES	SEER 12	20	350	unit	0	unit	0.05667	127	1.087
HPWES	SEER 13	20	700	unit	0	unit	0.05667	127	1.087
HPWES	SEER 14+	20	1050	unit	0	unit	0.05667	127	1.087
HPWES	Air Sealing	25	375	home	31.25	home	0.0445	127	1.087
HPWES	Attic Insulation	25	900	home	75	home	0.0445	127	1.087
HPWES	Sidewall Insulation	25	1800	home	150	home	0.0445	127	1.087
THPES	Other	25	6100	home	0	home	0.04555	127	1.087
WESH	Other	12	0	unit	0	unit	0.04555	127	1.087
WESH	ECM Furnace	23	0	unit	0	unit	0.04117	127	1.087
WESH	SEER 12	20	0	unit	0	unit	0.05667	127	1.087
WESH	SEER 13	20	0	unit	0	unit	0.05667	127	1.087
WESH	SEER 14+	20	0	unit	0	unit	0.05667	127	1.087
WESH	Home Certification	50	2445	home	305.63	home	0.04555	127	1.087
Head Start	CFL	6	4	unit	0	unit	0.04333	127	1.087
Affordable Housing	Other	8	0.052	kWh	0.052	kWh	0.04555	127	1.087
TWS	Other	8	0.052	kWh	0.052	kWh	0.04555	127	1.087
Renewables	Solar Electric	20	6.8	kWh	0	kWh	0.048	127	1.062
Renewables	Wind	20	1.37	kWh	0	kWh	0.042	127	0
Renewables	Solar Water Heating	20	16.1	therm	0	therm	0.048	127	0.868
Renewables	Biogas	15	3.06	kWh	0.11	kWh	0.043	127	0.868
Renewables	Biomass-Combustion	20	1.92	therm	0	therm	0.044	127	0.893
Renewables	Other	20	0.2	kWh	0	kWh	0.043	127	0

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

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Table 2-3	Estimated Number of Buydown Participants and Verified Savings by Program Area and Year		First-Year	
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Table 2-5	All Programs: All Programs: Tracked Energy Impacts—Annual First Year Gross, Verified Gross, and Net (July 1, 2001–December 31, 2010)	First-Year	First-Year	First-Year
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Table 2-7	Verified Gross Electric Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)		First-Year	
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Table 2-8	Verified Gross Gas Energy Impacts by Measure Category, Business Programs CY10 (January 1–December 31, 2010)		First-Year	
Table 2-9	Verified Gross Gas Energy Impacts by Measure Category, Business Programs Program to Date (July 1, 2001–December 31, 2010)		First-Year	
Figure 2-5	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)		First-Year	
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Table 2-10	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)		First-Year	

Reference Number	Title	Gross	Verified	Net
Table 2-11	Verified Gross Electric Energy Impacts by Measure Category, Residential Programs Program to Date (July 1, 2001–December 31, 2010)		First-Year	
Figure 2-7	Verified Gross Gas Energy Impacts by Measure Category, Residential Programs CY10 (January 1–December 31, 2010)		First-Year	
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Table 2-14	All Programs: Tracked Energy Impacts—Lifetime Verified Gross CY10 (January 1–December 31, 2010)		Lifetime	
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Table 2-16	All Programs: Tracked Energy Impacts—Lifecycle Verified Gross (July 1, 2001–December 31, 2010)		Lifecycle	
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Figure 2-10	Lifecycle Verified Gross Electricity Demand Reductions (MW)		Lifecycle	
Figure 2-11	Lifecycle Verified Gross Gas Savings (Million Therms)		Lifecycle	
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Table 2-23	Lifecycle Verified Gross Emissions Displaced (lbs) Annually Cumulative in Current Year (July 1, 2001–December 31, 2010)		Lifecycle	

Reference Number	Title	Gross	Verified	Net
Table 2-25	Lifecycle Verified Gross Emissions (lbs) Produced Annually Cumulative in Current Year (July 1, 2001–December 31, 2010)		Lifecycle	
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Figure 3-4	Verified Gross Gas Energy Impacts by Program, Business Programs, Program to Date (July 1, 2001–December 31, 2010)		First-Year	
Table 3-4a	All Business Programs: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)	First-Year	First-Year	First-Year
Table 3-4b	All Business Programs: Tracked Annual Energy Impacts CY09 (January 1–December 31, 2009)	First-Year	First-Year	First-Year
Table 3-4c	All Business Programs: Tracked Annual Energy Impacts The 18-month Contract Period (July 1, 2007–December 31, 2008)	First-Year	First-Year	First-Year

Reference Number	Title	Gross	Verified	Net
Table 3-4d	All Business Programs: Tracked Annual Energy Impacts FY07 July 1, 2006–June 30, 2007)	First-Year	First-Year	First-Year
Table 3-4e	All Business Programs: Tracked Annual Energy Impacts FY06 July 1, 2005–June 30, 2006)	First-Year	First-Year	First-Year
Table 3-4f	All Business Programs: Tracked Annual Energy Impacts FY05 July 1, 2004–June 30, 2005)	First-Year	First-Year	First-Year
Table 3-4g	All Business Programs: Tracked Annual Energy Impacts FY04 July 1, 2003–June 30, 2004)	First-Year	First-Year	First-Year
Table 3-4h	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 4-1a	All Residential Programs: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)	First-Year	First-Year	First-Year
Table 4-1b	All Residential Programs: Tracked Annual Energy Impacts CY09 (January 1–December 31, 2009)	First-Year	First-Year	First-Year
Table 4-1c	All Residential Programs: Tracked Annual Energy Impacts The 18-month Contract Period (July 1, 2007–December 31, 2008)	First-Year	First-Year	First-Year

Reference Number	Title	Gross	Verified	Net
Table 4-1d	All Residential Programs: Tracked Annual Energy Impacts FY07 (July 1, 2006–June 30, 2007)	First-Year	First-Year	First-Year
Table 4-1e	All Residential Programs: Tracked Annual Energy Impacts FY06 (July 1, 2005–June 30, 2006)	First-Year	First-Year	First-Year
Table 4-1f	All Residential Programs: Tracked Annual Energy Impacts FY05 (July 1, 2004–June 30, 2005)	First-Year	First-Year	First-Year
Table 4-1g	All Residential Programs: Tracked Annual Energy Impacts FY04 (July 1, 2003–June 30, 2004)	First-Year	First-Year	First-Year
Table 4-1h	All Residential Programs: Tracked Annual Energy Impacts FY03 (July 1, 2002–June 30, 2003)	First-Year	First-Year	First-Year
Table 4-1i	All Residential Programs: Tracked Annual Energy Impacts FY02 (June 1, 2001–June 30, 2002)	First-Year	First-Year	First-Year
Table 4-2	Net Residential Program Savings versus Residential Program Portfolio Targets CY10 (January 1–December 31, 2010)			First-Year
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Table 4-13	Wisconsin ENERGY STAR Homes: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	
Table 4-14	Home Performance with ENERGY STAR: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	
Table 4-15	Tracked Annual Energy Impacts by Home Performance with ENERGY STAR Program Component CY10 (January 1–December 31, 2010)		First-Year	
Table 4-16	Apartment and Condominium Efficiency Services: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	
Table 4-17	Tracked Annual Energy Impacts by Component by Apartment and Condominium Efficiency Services Program Component CY10 (January 1–December 31, 2010)		First-Year	
Table 4-18	Targeted Home Performance with ENERGY STAR: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	
Table 4-19	Efficient Heating and Cooling: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	

Reference Number	Title	Gross	Verified	Net
Table 4-20	Head Start CFL: Tracked Annual Energy Impacts CY10 (January 1–December 31, 2010)		First-Year	
Table 4-25	Total Impacts Residential Program Renewable Projects CY10 (January 1-December 31, 2010)	First-Year	First-Year	First-Year
Table A-1	Commercial Program Energy Impacts (by County) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-2	Commercial Program Energy Impacts (by Senate District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-3	Commercial Program Energy Impacts (by Assembly District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-4	Commercial Program Electric Impacts (by Participating Electric Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-5	Commercial Program Gas Impacts (by Participating Gas Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-6	Industrial Program Energy Impacts (by County) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-7	Industrial Program Energy Impacts (by Senate District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-8	Industrial Program Energy Impacts (by Assembly District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-9	Industrial Program Electric Impacts (by Participating Electric Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-10	Industrial Program Gas Impacts (by Participating Gas Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-11	Residential Programs Energy Impacts (by Participating County) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-12	Residential Programs Energy Impacts (by Senate District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-13	Residential Programs Energy Impacts (by Assembly District) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-14	Residential Programs Electric Impacts (by Participating Electric Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-15	Residential Programs Gas Impacts (by Participating Gas Utility) (July 1, 2001–December 31, 2010)		Lifecycle	Persistent lifecycle
Table A-16	Renewable Programs Energy Impacts (by County) (July 1, 2001– December 31, 2010)		Lifecycle	

APPENDIX E: EVALUATION REPORTS AND OTHER DELIVERABLES

Table E-1. Evaluation Reports and Other Deliverables
CY10 (January 1–December 31, 2010)

Program Area	Program	Document Title	Draft Report Date	Final Report Date
Business Programs	Business Programs	Qualitative Assessment of State Facilities' Impacts	15-Apr-10	15-Apr-10
Business Programs	Business Programs	CY10 E&T Untracked Attributable Savings Survey Changes and Draft Survey Instrument	11-Jun-10	N/A
Business Programs	Business Programs	Initial Assessment of High-bay Lighting Sales Data for CY10 Supply-side Research	21-Jun-10	N/A
Business Programs	Business Programs	CY10 Business Programs Supply-side Research Plan (Revised Draft)	04-Aug-10	N/A
Business Programs	Business Programs	CY10 BP Impact Evaluation Report - Draft Survey Instrument	05-Aug-10	N/A
Business Programs	Business Programs	Education and Training Untracked Attributable Savings	30-Sep-10	29-Oct-10
Business Programs	Business Programs	Business Programs Impact Evaluation Report: Last Quarter of Calendar Year 2009 and First Two Quarters of Calendar Year 2010	23-Dec-10	27-Jan-11
Business Programs	Business Programs	Collecting Company Size Information During E&T Courses (Draft)	18-Feb-11	Forthcoming
Business Programs	Business Programs - General	Deemed Savings Manual V1.0	21-Mar-10	21-Mar-10
Business Programs	Business Programs - General	Business Programs Supply-side Evaluation	30-Mar-10	22-Apr-10
Business Programs	Business Programs-Renewables	Impact Evaluation CY10 September 2009 through June 2010	03-Dec-10	07-Jan-11
Business Programs	Business Programs-Renewables	Standard Calculation Recommendations for Renewable Energy Systems	14-Dec-10	18-Jan-11
Crosscutting	Crosscutting	Allocation of Energy-related Stimulus Funds in Wisconsin	24-May-10	21-Jun-10
Crosscutting	Crosscutting - General	Evaluation Contract Year 2010 Detailed Evaluation Plans	04-Mar-10	01-Apr-10
Crosscutting	Crosscutting - General	Semiannual Report Second Half of 2009	26-Mar-10	23-Apr-10
Crosscutting	Crosscutting - General	Focus on Energy Program Participation Semiannual Report Addendum	02-Aug-10	17-Sep-10
Renewables	Renewables	Biogas Supply-side Study	24-Mar-10	22-Apr-10
Renewables	Renewables	Post Year 1 Wind Turbine Production	22-Dec-10	24-Jan-11
Renewables	Renewables	2010 Renewables Annual Savings	09-Feb-11	23-Feb-11
Residential	ACES	ACES New Construction Baseline Review	25-Mar-10	15-Apr-10

Program Area	Program	Document Title	Draft Report Date	Final Report Date
Residential	ACES	Review of ACES New Construction Project Tracking	01-Apr-10	22-Apr-10
Residential	ACES	Proposed Changes to the CY10 Apartment and Condominium Efficiency Services Detailed Evaluation Plan	17-Jun-10	
Residential	ACES	Apartment and Condo Efficiency Services Market Effects Research Plan (Draft)	30-Jul-10	
Residential	ACES	ACES Deemed Savings Desk Review	06-Oct-10	03-Nov-10
Residential	ACES	CY10 ACES Market Effects	03-Nov-10	02-Dec-10
Residential	ENERGY STAR Lighting	2010 CFL Savings Analysis	10-Dec-10	07-Feb-11
Residential	Home Performance with ENERGY STAR	Review of Historic Energy Savings from the Home Performance with ENERGY STAR Program	23-Jul-10	24-Sep-10
Residential	Residential-Renewables	Impact Evaluation CY10 September 2009 through June 2010	03-Dec-10	07-Jan-11

APPENDIX F: COMPARISON OF CURRENT SAVINGS WITH MARKET POTENTIAL

Tables F-1 to F-4 show a comparison of CY10 program savings and estimated 2012 potential program savings for residential and business programs. Potential savings values are from the findings of a report prepared by the Energy Center of Wisconsin (ECW): *Energy Efficiency and Customer-Sited Renewable Resource Potential in Wisconsin: for the years 2012 and 2018* ("the Potential Study"). In the tables, the two right-hand columns show the percentage of 2012 potential that was achieved from January to December 2010 and the additional annual potential that is estimated to exist. A low percentage number indicates a market where savings are growing. A high percentage number, especially a number above 100 percent, indicates a market that is mature and has decreasing additional opportunities going forward. The table is sorted from highest to lowest estimated potential relative to current savings, grouped by program.

It is important to understand how the annual potential in CY10 can exceed 100 percent of the potential in 2012. Since these are annual potential values, as the market for a class of technologies becomes saturated, there are fewer additional opportunities for savings. The figure, below illustrates this possibility for a hypothetical measure category. The blue line represents the penetration of a technology over time, represented as months on the horizontal axis. The potential in any one year is the change in the vertical axis over twelve months. If the penetration of a technology in CY10 were at the point represented by the left bar in the figure, and a market potential study represented the time period of the right bar in the figure, the market potential in the latter year could be substantially lower than current annual savings.

Figure F-1. Hypothetical Diffusion of an Efficient Technology and its Effect on Annual Market Potential

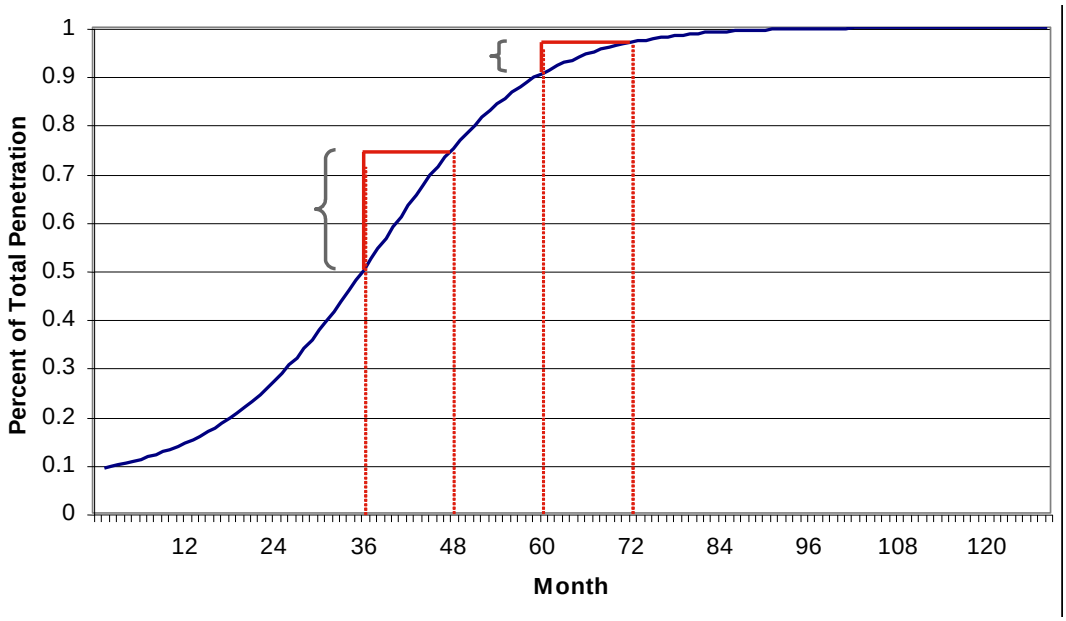


Table F-1. Comparison of Focus Electric Energy Impacts (Net, 12 Month Period from January 1 to December 31, 2010) and Achievable Potential—Residential Markets

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
ACES	Common Area Lighting Improvements in Multifamily	6,266,200	2.9%	505,062	0.7%	8.1%	5,761,138
ACES	CFL Bulbs, purchased replacement (2012)	5,276,272	2.4%	1,986,683	2.6%	37.7%	3,289,590
ACES	Wx - Direct Install	2,770,320	1.3%	0	0.0%	0.0%	2,770,320
ACES	ECM Furnace	355,566	0.2%	26,607	0.0%	7.5%	328,959
ACES	Water Heater Blanket	263,101	0.1%	0	0.0%	0.0%	263,101
ACES	Home Electronics Efficiency Upgrade (ENERGY STAR)	226,093	0.1%	0	0.0%	0.0%	226,093
ACES	Heat Pump Water Heater	215,370	0.1%	0	0.0%	0.0%	215,370
ACES	ENERGY STAR Clothes Washer (w/ Gas WH & Elec. Dryer)	161,241	0.1%	0	0.0%	0.0%	161,241
ACES	ENERGY STAR Clothes Washer (w/ Elec. WH & Elec. Dryer)	157,965	0.1%	3,949	0.0%	2.5%	154,016
ACES	Second Refrigerator Turn In	96,664	0.0%	0	0.0%	0.0%	96,664
ACES	Efficient Electric Water Heater	86,398	0.0%	0	0.0%	0.0%	86,398
ACES	Exterior Lighting Controls	77,297	0.0%	13,644	0.0%	17.7%	63,653
ACES	New Construction, Improved Plumbing Design	36,168	0.0%	0	0.0%	0.0%	36,168
ACES	Range/Oven Fuel Switch	32,364	0.0%	0	0.0%	0.0%	32,364

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
ACES	ENERGY STAR Compliant Personal Computer	31,760	0.0%	0	0.0%	0.0%	31,760
ACES	Room A/C Turn In	24,735	0.0%	0	0.0%	0.0%	24,735
ACES	Boiler	0	0.0%	-19,247	0.0%		19,247
ACES	Air Conditioning	0	0.0%	-15,972	0.0%		15,972
ACES	ENERGY STAR Dishwasher (Electric Water Heating)	9,050	0.0%	0	0.0%	0.0%	9,050
ACES	ENERGY STAR Clothes Washer (w/ Elec. WH & NG Dryer)	7,699	0.0%	0	0.0%	0.0%	7,699
ACES	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	0	0.0%	-1,314	0.0%		1,314
ACES	ENERGY STAR Dehumidifier	1,314	0.0%	27	0.0%	2.0%	1,287
ACES	LED Bulbs, purchased replacement (2018)	0	0.0%	986	0.0%		-986
ACES	ENERGY STAR Clothes Washer (w/ Gas WH & Gas Dryer)	0	0.0%	6,601	0.0%		-6,601
ACES	New Construction	0	0.0%	24,874	0.0%		-24,874
ACES	Motors & Drives	0	0.0%	28,500	0.0%		-28,500
ACES	Hot Water - Unspecified	0	0.0%	38,179	0.1%		-38,179
ACES	High Efficiency Furnace - Natural Gas	0	0.0%	46,496	0.1%		-46,496
ACES	Other	0	0.0%	89,547	0.1%		-89,547
ACES	Building Shell	0	0.0%	285,399	0.4%		-285,399
ACES	Appliances	0	0.0%	364,468	0.5%		-364,468
ACES	Low Flow Showerhead (w/ Electric Hot Water)	489,461	0.2%	1,046,131	1.4%	213.7%	-556,670

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
ACES	Hot Water - Electric	0	0.0%	855,283	1.1%		-855,283
ACES	HVAC - General	0	0.0%	1,135,094	1.5%		-1,135,094
ACES	Lighting	0	0.0%	5,136,018	6.8%		-5,136,018
Residential	Wx - Direct Install	33,254,449	15.2%	570,964	0.8%	1.7%	32,683,485
Residential	CFL Bulbs, purchased replacement (2012)	74,276,305	34.0%	45,987,085	60.9%	61.9%	28,289,220
Residential	Whole-house Electricity-Use Feedback Display Retrofit	23,478,000	10.7%	0	0.0%	0.0%	23,478,000
Residential	ECM Furnace	19,236,625	8.8%	7,081,531	9.4%	36.8%	12,155,094
Residential	Common Area Lighting Improvements in Multifamily	7,594,950	3.5%	0	0.0%	0.0%	7,594,950
Residential	Low Flow Showerhead	6,648,555	3.0%	37,510	0.0%	0.6%	6,611,045
Residential	Dryer Fuel Switch	3,697,051	1.7%	0	0.0%	0.0%	3,697,051
Residential	Home Electronics Efficiency Upgrade (ENERGY STAR)	3,597,565	1.6%	0	0.0%	0.0%	3,597,565
Residential	Exterior Lighting Controls	3,558,038	1.6%	0	0.0%	0.0%	3,558,038
Residential	Second Refrigerator Turn In	3,298,419	1.5%	0	0.0%	0.0%	3,298,419
Residential	Water Heater Blanket	3,160,533	1.4%	0	0.0%	0.0%	3,160,533
Residential	Shower Controls (Shower Start Technology)	3,157,605	1.4%	0	0.0%	0.0%	3,157,605
Residential	Pipe Wrap	2,981,026	1.4%	0	0.0%	0.0%	2,981,026
Residential	Heat Pump Water Heater	2,898,854	1.3%	0	0.0%	0.0%	2,898,854
Residential	Range/Oven Fuel Switch	2,635,970	1.2%	0	0.0%	0.0%	2,635,970
Residential	ENERGY STAR Clothes Washer (w/ Elec. WH & Elec. Dryer)	2,499,458	1.1%	0	0.0%	0.0%	2,499,458

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Residential	Second Freezer Turn In	2,253,868	1.0%	0	0.0%	0.0%	2,253,868
Residential	Efficient Electric Water Heater	1,986,901	0.9%	29,952	0.0%	1.5%	1,956,949
Residential	ENERGY STAR Dehumidifier	458,448	0.2%	0	0.0%	0.0%	458,448
Residential	New Construction, Improved Plumbing Design	419,268	0.2%	0	0.0%	0.0%	419,268
Residential	ENERGY STAR Compliant Personal Computer	339,563	0.2%	0	0.0%	0.0%	339,563
Residential	Room A/C Turn In	289,078	0.1%	0	0.0%	0.0%	289,078
Residential	Setback Thermostats	145,932	0.1%	0	0.0%	0.0%	145,932
Residential	ENERGY STAR Dishwasher (Electric Water Heating)	135,159	0.1%	0	0.0%	0.0%	135,159
Residential	ENERGY STAR Clothes Washer (w/ Elec. WH & NG Dryer)	64,865	0.0%	0	0.0%	0.0%	64,865
Residential	New Construction	3,756	0.0%	0	0.0%	0.0%	3,756
Residential	Duct Sealing (Outside Conditioned Space)- gas	58,724	0.0%	69,120	0.1%	117.7%	-10,396
Residential	Other	0	0.0%	252,861	0.3%		-252,861
Residential	Building Shell	0	0.0%	635,579	0.8%		-635,579
Residential	Air Conditioning	0	0.0%	788,582	1.0%		-788,582
Residential	Hot Water	0	0.0%	2,235,066	3.0%		-2,235,066
Residential	Lighting	0	0.0%	6,242,495	8.3%		-6,242,495
Total	**Total**	**218,714,003**	**100.0%**	**75,487,759**	**100.0%**	**34.5%**	**143,226,244**

Table F-2. Comparison of Focus Gas Energy Impacts (Net, 12 Month Period from January 1 to December 31, 2010) and Achievable Potential—Residential Markets

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
ACES	Boiler Controls-Gas	172,321	4.9%	3,210	0.1%	1.9%	169,110
ACES	Drainwater heat recovery	152,464	4.3%	0	0.0%	0.0%	152,464
ACES	Wx - Direct Install	112,544	3.2%	0	0.0%	0.0%	112,544
ACES	Mainline Air vent (MF) - gas	24,996	0.7%	0	0.0%	0.0%	24,996
ACES	Hot Water - Electric	0	0.0%	-11,898	-0.5%		11,898
ACES	ENERGY STAR Clothes Washer (w/ Gas WH & Elec. Dryer)	10,682	0.3%	0	0.0%	0.0%	10,682
ACES	ENERGY STAR Dishwasher (w/Gas DHW)	2,966	0.1%	0	0.0%	0.0%	2,966
ACES	ENERGY STAR Clothes Washer (w/ Gas WH & Gas Dryer)	3,127	0.1%	1,567	0.1%	50.1%	1,560
ACES	Water heater tank wrap - Gas	911	0.0%	0	0.0%	0.0%	911
ACES	High Efficiency Furnace - Natural Gas	1,349	0.0%	561	0.0%	41.6%	788
ACES	ENERGY STAR Clothes Washer (w/ Elec. WH & NG Dryer)	215	0.0%	0	0.0%	0.0%	215
ACES	ECM Furnace	0	0.0%	511	0.0%		-511
ACES	ENERGY STAR Compliant Personal Computer	-724	0.0%	0	0.0%	0.0%	-724
ACES	Range/Oven Fuel Switch	-809	0.0%	0	0.0%	0.0%	-809

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
ACES	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	27,357	0.8%	28,657	1.2%	104.8%	-1,300
ACES	Other	0	0.0%	1,352	0.1%		-1,352
ACES	Second Refrigerator Turn In	-1,973	-0.1%	0	0.0%	0.0%	-1,973
ACES	Home Electronics Efficiency Upgrade (ENERGY STAR)	-5,539	-0.2%	0	0.0%	0.0%	-5,539
ACES	New Construction	0	0.0%	6,057	0.3%		-6,057
ACES	Appliances	0	0.0%	7,266	0.3%		-7,266
ACES	Low Flow Showerhead (w/ Gas DHW)	68,392	1.9%	83,533	3.5%	122.1%	-15,141
ACES	Hot Water - Unspecified	0	0.0%	19,751	0.8%		-19,751
ACES	Air Conditioning	0	0.0%	21,231	0.9%		-21,231
ACES	Common Area Lighting Improvements in Multifamily	-26,858	-0.8%	0	0.0%	0.0%	-26,858
ACES	Building Shell	0	0.0%	38,036	1.6%		-38,036
ACES	Hot Water - Gas	0	0.0%	41,899	1.8%		-41,899
ACES	HVAC - General	0	0.0%	79,267	3.3%		-79,267
ACES	CFL Bulbs, purchased replacement (2012)	-126,520	-3.6%	0	0.0%	0.0%	-126,520
ACES	Boiler	0	0.0%	297,240	12.6%		-297,240
Residential	Wx - Direct Install	3,290,886	93.5%	96,324	4.1%	2.9%	3,194,562
Residential	Low Flow Showerhead (w/ Gas DHW)	1,011,447	28.7%	7,504	0.3%	0.7%	1,003,944
Residential	Drainwater heat recovery	378,750	10.8%	0	0.0%	0.0%	378,750
Residential	Setback Thermostats	323,756	9.2%	0	0.0%	0.0%	323,756
Residential	High Efficiency Boiler w/ indirect DHW	145,975	4.1%	0	0.0%	0.0%	145,975

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Residential	ENERGY STAR Clothes Washer (w/ Gas WH & Gas Dryer)	103,196	2.9%	0	0.0%	0.0%	103,196
Residential	Duct Sealing (Outside Conditioned Space)- gas	104,078	3.0%	5,376	0.2%	5.2%	98,702
Residential	Improved Plumbing Layout - Gas Heat	85,334	2.4%	0	0.0%	0.0%	85,334
Residential	High Efficiency Furnace - Natural Gas	85,604	2.4%	16,854	0.7%	19.7%	68,750
Residential	Boiler Controls-Gas	45,731	1.3%	0	0.0%	0.0%	45,731
Residential	ENERGY STAR Dishwasher (w/Gas DHW)	38,506	1.1%	0	0.0%	0.0%	38,506
Residential	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	11,947	0.3%	0	0.0%	0.0%	11,947
Residential	New Construction	9,369	0.3%	0	0.0%	0.0%	9,369
Residential	Efficient Steam Boiler (MF) - gas	2,332	0.1%	0	0.0%	0.0%	2,332
Residential	ENERGY STAR Clothes Washer (w/ Elec. WH & NG Dryer)	1,462	0.0%	0	0.0%	0.0%	1,462
Residential	New Construction, Improved Plumbing Design	0	0.0%	460	0.0%		-460
Residential	ENERGY STAR Compliant Personal Computer	-7,770	-0.2%	0	0.0%	0.0%	-7,770
Residential	Common Area Lighting Improvements in Multifamily	-19,750	-0.6%	0	0.0%	0.0%	-19,750
Residential	Second Freezer Turn In	-43,745	-1.2%	0	0.0%	0.0%	-43,745

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Residential	Second Refrigerator Turn In	-67,472	-1.9%	0	0.0%	0.0%	-67,472
Residential	Range/Oven Fuel Switch	-82,399	-2.3%	0	0.0%	0.0%	-82,399
Residential	Home Electronics Efficiency Upgrade (ENERGY STAR)	-85,371	-2.4%	0	0.0%	0.0%	-85,371
Residential	Hot Water	0	0.0%	108,828	4.6%		-108,828
Residential	Dryer Fuel Switch	-147,882	-4.2%	0	0.0%	0.0%	-147,882
Residential	ECM Furnace	0	0.0%	186,590	7.9%		-186,590
Residential	Other	0	0.0%	245,019	10.3%		-245,019
Residential	Whole-house Electricity-Use Feedback Display Retrofit	-288,838	-8.2%	0	0.0%	0.0%	-288,838
Residential	Boiler	0	0.0%	493,855	20.9%		-493,855
Residential	Building Shell	0	0.0%	588,469	24.9%		-588,469
Residential	CFL Bulbs, purchased replacement (2012)	-1,789,433	-50.8%	0	0.0%	0.0%	-1,789,433
Total	**Total**	**3,520,614**	**100.0%**	**2,367,521**	**100.0%**	**67.2%**	**1,153,093**

Table F-3. Comparisons of Focus Electric Energy Impacts (Net, 12 Month Period from January 1 to December 31, 2010) and Achievable Potential—Business Markets

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Agriculture	Dairy/Livestock Operation - Milking Parlor	19,233,789	2.3%	3,093,572	1.1%	16.1%	16,140,217
Agriculture	Dairy/Livestock Operation - Lighting	4,248,149	0.5%	102,433	0.0%	2.4%	4,145,716
Agriculture	Dairy/Livestock Operation - Ventilation	656,949	0.1%	386,332	0.1%	58.8%	270,617
Agriculture	Air Conditioning	0	0.0%	177	0.0%		-177
Agriculture	Greenhouses - Shell Improvements	0	0.0%	12,613	0.0%		-12,613

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Agriculture	Boiler	0	0.0%	16,407	0.0%		-16,407
Agriculture	Compressors	0	0.0%	33,259	0.0%		-33,259
Agriculture	Irrigation Systems - General	327,595	0.0%	365,371	0.1%	111.5%	-37,777
Agriculture	Hot Water - Unspecified	0	0.0%	51,747	0.0%		-51,747
Agriculture	Grain Drying Operations - Process Improvements	0	0.0%	182,554	0.1%		-182,554
Agriculture	Controls	0	0.0%	259,366	0.1%		-259,366
Agriculture	Motors & Drives	0	0.0%	821,424	0.3%		-821,424
Agriculture	HVAC - General	0	0.0%	836,906	0.3%		-836,906
Agriculture	Hot Water - Electric	0	0.0%	1,520,411	0.6%		-1,520,411
Agriculture	Other	0	0.0%	2,297,011	0.8%		-2,297,011
Agriculture	Lighting	0	0.0%	10,216,975	3.7%		-10,216,975
Commercial	Lighting controls / design	78,281,201	9.3%	3,429,765	1.3%	4.4%	74,851,435
Commercial	Refrig - RCx / controls	56,305,004	6.7%	7,051,410	2.6%	12.5%	49,253,593
Commercial	HVAC RCx / Controls	47,204,099	5.6%	7,205,951	2.6%	15.3%	39,998,148
Commercial	Lighting equipment	87,755,510	10.4%	57,109,659	20.9%	65.1%	30,645,852
Commercial	Cooling Equipment	27,138,539	3.2%	1,042,519	0.4%	3.8%	26,096,020
Commercial	Data / computing / office equip	28,142,465	3.3%	5,268,027	1.9%	18.7%	22,874,438
Commercial	DHW System improvements	22,438,116	2.7%	185,968	0.1%	0.8%	22,252,148
Commercial	Refrig - Displays	16,255,180	1.9%	0	0.0%	0.0%	16,255,180
Commercial	Elec heating	14,675,645	1.7%	298,484	0.1%	2.0%	14,377,161
Commercial	Refrig - Cooler/Freezer equip	21,093,405	2.5%	8,369,972	3.1%	39.7%	12,723,433
Commercial	Shell improvement	6,124,229	0.7%	490,312	0.2%	8.0%	5,633,916
Commercial	Faucets / Nozzles	2,307,754	0.3%	0	0.0%	0.0%	2,307,754
Commercial	Process equip	1,510,658	0.2%	177,314	0.1%	11.7%	1,333,344
Commercial	Pool	956,550	0.1%	2,204	0.0%	0.2%	954,346
Commercial	Clothes washing	810,620	0.1%	34,395	0.0%	4.2%	776,225

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Commercial	Process equip: cooking	359,790	0.0%	0	0.0%	0.0%	359,790
Commercial	HVAC - General	0	0.0%	-321,889	-0.1%		321,889
Commercial	Boiler	0	0.0%	-44,744	0.0%		44,744
Commercial	Controls	0	0.0%	34,174	0.0%		-34,174
Commercial	Gas Heating Equip	0	0.0%	62,270	0.0%		-62,270
Commercial	Heat Recovery	14,664	0.0%	107,810	0.0%	735.2%	-93,146
Commercial	Dishwashing	58,376	0.0%	302,086	0.1%	517.5%	-243,710
Commercial	Cooking	0	0.0%	481,865	0.2%		-481,865
Commercial	Other	0	0.0%	4,526,764	1.7%		-4,526,764
Commercial	Motors & Drives	0	0.0%	5,281,491	1.9%		-5,281,491
Commercial	Refrigeration	0	0.0%	5,283,502	1.9%		-5,283,502
Industrial	Motors - VSD, Motor Optimization and Efficient Motors	97,521,933	11.5%	19,970,580	7.3%	20.5%	77,551,353
Industrial	Motors - System Component Improvement and Replacement	61,694,668	7.3%	0	0.0%	0.0%	61,694,668
Industrial	Lighting - Efficient System Design and Controls	55,664,687	6.6%	2,751,122	1.0%	4.9%	52,913,565
Industrial	Process Cooling - VSD, Motor Optimization and Efficient Motors	25,116,332	3.0%	0	0.0%	0.0%	25,116,332
Industrial	HVAC - Efficient System Design and Controls	21,099,215	2.5%	158,444	0.1%	0.8%	20,940,771
Industrial	Motors - Improved Controls and Sensors	19,356,507	2.3%	0	0.0%	0.0%	19,356,507
Industrial	HVAC - Improved Operations and Maintenance	16,068,962	1.9%	845,760	0.3%	5.3%	15,223,202
Industrial	Process Heating (E) - Process Controls	13,192,217	1.6%	0	0.0%	0.0%	13,192,217

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Industrial	Process Cooling - Improved Operations and Maintenance	12,636,687	1.5%	0	0.0%	0.0%	12,636,687
Industrial	HVAC - Insulation and Sealing of System Components	10,781,944	1.3%	0	0.0%	0.0%	10,781,944
Industrial	Motors - Improved Operations and Maintenance	10,742,687	1.3%	0	0.0%	0.0%	10,742,687
Industrial	Motors - Process Management and Continuous Improvement	8,032,817	1.0%	0	0.0%	0.0%	8,032,817
Industrial	Process Cooling - Equipment Upgrades and Replacement	7,592,690	0.9%	0	0.0%	0.0%	7,592,690
Industrial	Process Heating (E) - Process and Waste Heat Recovery	6,009,857	0.7%	0	0.0%	0.0%	6,009,857
Industrial	Process Cooling - Efficient System Design and Controls	5,174,503	0.6%	167,774	0.1%	3.2%	5,006,730
Industrial	HVAC - Cooling - Efficient System Design and Controls	4,694,715	0.6%	0	0.0%	0.0%	4,694,715
Industrial	Air Compression - Efficient System Design and Controls	3,992,883	0.5%	192,972	0.1%	4.8%	3,799,911
Industrial	Other - System Component Improvement and Replacement	3,372,669	0.4%	0	0.0%	0.0%	3,372,669

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Industrial	Air Compression - Equipment Upgrades and Replacement	3,203,878	0.4%	0	0.0%	0.0%	3,203,878
Industrial	HVAC - Cooling - Equipment Upgrades and Replacement	3,719,056	0.4%	1,122,016	0.4%	30.2%	2,597,040
Industrial	Process Heating (E) - Process Management and Continuous Improvement	2,409,191	0.3%	0	0.0%	0.0%	2,409,191
Industrial	Process Heating (E) - Heat Containment Improvements	1,508,947	0.2%	0	0.0%	0.0%	1,508,947
Industrial	Process Heating (E) - Heat Transfer Improvements	1,497,984	0.2%	0	0.0%	0.0%	1,497,984
Industrial	Other - Improved Operations and Maintenance	476,742	0.1%	0	0.0%	0.0%	476,742
Industrial	HVAC - Heating - Waste and/or Process Heat Recovery	0	0.0%	-135,710	0.0%		135,710
Industrial	Process Heating (E) - Equipment Upgrades and Replacement	96,564	0.0%	0	0.0%	0.0%	96,564
Industrial	Other - VSD, Motor Optimization and Efficient Motors	12,953	0.0%	0	0.0%	0.0%	12,953
Industrial	Hot Water	0	0.0%	2,129	0.0%		-2,129
Industrial	HVAC - Heating - Equipment Upgrades and Replacement	0	0.0%	6,562	0.0%		-6,562
Industrial	Building Shell	0	0.0%	35,088	0.0%		-35,088

Program	Measure Category	2012 kWh Potential	Percentage of Total kWh Potential	Net kWh Saved	Percentage of Total kWh Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (kWh)
Industrial	Motors & Drives	0	0.0%	73,282	0.0%		-73,282
Industrial	HVAC - General	0	0.0%	201,092	0.1%		-201,092
Industrial	Boiler Equipment	0	0.0%	729,861	0.3%		-729,861
Industrial	Other	0	0.0%	998,959	0.4%		-998,959
Industrial	Compressors	0	0.0%	1,654,473	0.6%		-1,654,473
Industrial	Air Compression - Variable Speed Drives and Motor Upgrades	1,998,790	0.2%	4,951,707	1.8%	247.7%	-2,952,917
Industrial	Refrigeration	0	0.0%	4,761,189	1.7%		-4,761,189
Industrial	Industrial Process	0	0.0%	12,874,810	4.7%		-12,874,810
Industrial	Air Compression - Improved Operations and Maintenance	4,811,965	0.6%	18,776,994	6.9%	390.2%	-13,965,029
Industrial	Lighting - Equipment Upgrades and Replacement	6,449,047	0.8%	35,644,515	13.0%	552.7%	-29,195,468
Schools & Government	Hot Water	0	0.0%	115,397	0.0%		-115,397
Schools & Government	Refrigeration	0	0.0%	313,195	0.1%		-313,195
Schools & Government	Building Shell	0	0.0%	322,981	0.1%		-322,981
Schools & Government	Boiler	0	0.0%	534,565	0.2%		-534,565
Schools & Government	HVAC - General	0	0.0%	1,331,809	0.5%		-1,331,809
Schools & Government	Motors & Drives	0	0.0%	3,508,018	1.3%		-3,508,018
Schools & Government	Other	0	0.0%	5,230,114	1.9%		-5,230,114
Schools & Government	Air Conditioning	0	0.0%	9,096,173	3.3%		-9,096,173
Schools & Government	Lighting	0	0.0%	21,046,349	7.7%		-21,046,349
Total	**Total**	**844,829,373**	**100.0%**	**273,858,083**	**100.0%**	**32.4%**	**570,971,290**

Table F-4. Comparisons of Focus Gas Energy Impacts (Net, 12 Month Period from January 1 to December 31, 2010) and Achievable Potential—Business Markets

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Agriculture	Greenhouses - Space Heating	120,944	0.4%	1,124	0.0%	0.9%	119,820
Agriculture	Grain Drying Operations - Process Improvements	169,301	0.5%	126,367	1.4%	74.6%	42,934
Agriculture	Hot Water - Electric	0	0.0%	-6,262	-0.1%		6,262
Agriculture	Hot Water - Gas	0	0.0%	1,864	0.0%		-1,864
Agriculture	Hot Water - Unspecified	0	0.0%	4,382	0.0%		-4,382
Agriculture	Other	0	0.0%	8,744	0.1%		-8,744
Agriculture	Boiler	0	0.0%	11,073	0.1%		-11,073
Agriculture	Controls	0	0.0%	16,580	0.2%		-16,580
Agriculture	Greenhouses - Shell Improvements	6,143	0.0%	34,621	0.4%	563.6%	-28,478
Agriculture	Dairy/Livestock Operation - Milking Parlor	-36,786	-0.1%	-26	0.0%	0.1%	-36,760
Agriculture	HVAC - General	0	0.0%	39,093	0.4%		-39,093
Commercial	HVAC RCx / Controls	5,020,177	14.6%	499,382	5.7%	9.9%	4,520,795
Commercial	DHW System improvements	2,825,023	8.2%	16,670	0.2%	0.6%	2,808,352
Commercial	Faucets / Nozzles	745,842	2.2%	0	0.0%	0.0%	745,842
Commercial	Gas Heating Equip	655,827	1.9%	25,442	0.3%	3.9%	630,384
Commercial	Shell improvement	681,377	2.0%	53,357	0.6%	7.8%	628,021
Commercial	Clothes washing	354,373	1.0%	1,390	0.0%	0.4%	352,982
Commercial	Cooking	311,820	0.9%	27,656	0.3%	8.9%	284,164
Commercial	Dishwashing	209,516	0.6%	2,669	0.0%	1.3%	206,846
Commercial	Heat Recovery	192,963	0.6%	131,294	1.5%	68.0%	61,669
Commercial	Pool	31,368	0.1%	6,018	0.1%	19.2%	25,351
Commercial	Cooling Equipment	0	0.0%	473	0.0%		-473
Commercial	Process equip	-1,127	0.0%	1,205	0.0%	-106.9%	-2,332
Commercial	Controls	0	0.0%	21,599	0.2%		-21,599
Commercial	Other	0	0.0%	149,533	1.7%		-149,533
Commercial	Data / computing / office equip	-194,871	-0.6%	0	0.0%	0.0%	-194,871
Commercial	Boiler	0	0.0%	380,713	4.3%		-380,713
Commercial	Elec heating	-570,017	-1.7%	0	0.0%	0.0%	-570,017
Commercial	HVAC - General	0	0.0%	733,623	8.3%		-733,623

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Commercial	Lighting equipment	-929,311	-2.7%	0	0.0%	0.0%	-929,311
Commercial	Lighting controls / design	-1,169,619	-3.4%	0	0.0%	0.0%	-1,169,619
Industrial	Steam Production - Improved Operations and Maintenance	6,006,191	17.5%	0	0.0%	0.0%	6,006,191
Industrial	Process Heating (G) - Improved Operations and Maintenance	4,689,951	13.7%	0	0.0%	0.0%	4,689,951
Industrial	Steam Production - Improved System Design and Controls	4,597,218	13.4%	0	0.0%	0.0%	4,597,218
Industrial	Process Heating (G) - Insulation and Sealing of System Components	2,463,518	7.2%	0	0.0%	0.0%	2,463,518
Industrial	Steam Production - Waste and/or Process Heat Recovery	1,559,723	4.5%	0	0.0%	0.0%	1,559,723
Industrial	Process Heating (G) - Waste and/or Process Heat Recovery	1,373,476	4.0%	0	0.0%	0.0%	1,373,476
Industrial	Process Heating (G) - Equipment Upgrades and Replacement	1,276,295	3.7%	0	0.0%	0.0%	1,276,295
Industrial	Steam Production - Equipment Upgrades and Replacement	1,226,438	3.6%	0	0.0%	0.0%	1,226,438
Industrial	Steam Production - Insulation and Sealing of System Components	733,195	2.1%	0	0.0%	0.0%	733,195
Industrial	Process Heating (G) - Improved System Design and Controls	723,891	2.1%	0	0.0%	0.0%	723,891

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Industrial	HVAC - Heating - Insulation and Sealing of System Components	460,785	1.3%	0	0.0%	0.0%	460,785
Industrial	HVAC - Heating - Improved System Design and Controls	209,037	0.6%	0	0.0%	0.0%	209,037
Industrial	HVAC - Heating - Equipment Upgrades and Replacement	197,971	0.6%	39,934	0.5%	20.2%	158,037
Industrial	HVAC - Heating - Improved Operations and Maintenance	75,038	0.2%	0	0.0%	0.0%	75,038
Industrial	HVAC - Heating - Waste and/or Process Heat Recovery	276,175	0.8%	252,387	2.9%	91.4%	23,789
Industrial	Hot Water	0	0.0%	1,098	0.0%		-1,098
Industrial	Refrigeration	0	0.0%	18,143	0.2%		-18,143
Industrial	HVAC - Efficient System Design and Controls	0	0.0%	23,174	0.3%		-23,174
Industrial	Other	0	0.0%	25,119	0.3%		-25,119
Industrial	Compressors	0	0.0%	36,909	0.4%		-36,909
Industrial	HVAC - Improved Operations and Maintenance	0	0.0%	46,028	0.5%		-46,028
Industrial	Building Shell	0	0.0%	102,572	1.2%		-102,572
Industrial	HVAC - General	0	0.0%	329,979	3.8%		-329,979
Industrial	Boiler Equipment	0	0.0%	825,576	9.4%		-825,576
Industrial	Industrial Process	0	0.0%	2,655,488	30.2%		-2,655,488
Schools & Government	Air Conditioning	0	0.0%	17,206	0.2%		-17,206
Schools & Government	Hot Water	0	0.0%	37,811	0.4%		-37,811
Schools & Government	Refrigeration	0	0.0%	41,426	0.5%		-41,426
Schools & Government	Building Shell	0	0.0%	100,014	1.1%		-100,014

Program	Measure Category	2012 Therms Potential	Percentage of Total Therms Potential	Net Therms Saved	Percentage of Total Therms Saved	Percentage of 2012 Potential Achieved	Additional Savings Potential (Therms)
Schools & Government	Other	0	0.0%	294,582	3.3%		-294,582
Schools & Government	Boiler	0	0.0%	604,392	6.9%		-604,392
Schools & Government	HVAC - General	0	0.0%	1,056,218	12.0%		-1,056,218
Total	**Total**	**34,291,844**	**100.0%**	**8,796,639**	**100.0%**	**25.7%**	**25,495,205**

APPENDIX G: CLARIFICATION OF THE DIFFERENT APPROACHES TO CALCULATING FOCUS IMPACT VALUES

Focus impact data in Chapter 2 and elsewhere are reported in a variety of ways relative to the timing of savings and what is included when savings are summed. It is important to understand distinctions that are made between *annual first year* savings, *lifetime* savings, and *lifecycle* savings. This appendix is intended to help clarify these distinctions.

Table G-1 illustrates a simplified, hypothetical situation for a single measure. In each program year, one hundred measures are installed. Each measure conserves sixty kWh per year for a total program savings of 6,000 kWh per year. The measure has a lifetime of six years. Superimposed on Table G-1 are ovals indicating the savings that are summed in each of three definitions of program impacts.

Annual first year savings are represented by the orange circle. These represent the total energy savings in the first year of installation. In this example, the savings are 6,000 kWh. *Lifetime savings* are represented by the blue oval in Table G-1. These are all savings that will be obtained from measures installed in a given year, over the lifetimes of those measures. In this example, the savings are 36,000 kWh. Note, that there is no discounting of those savings. For benefit-cost analysis, the value of energy saved in the future is calculated and discounted to account for the time-value of money.

Lifecycle savings are represented by the green oval in Table G-1. This is the sum of savings from all program installed measures that have not passed their measure life. In this example, it is 36,000 kWh. It is important to understand that this 36,000 kWh savings is arrived at in a completely different way than what is represented by the lifetime savings. In reality, the numbers sum to different values because of the different mix of measures that are installed in each year.

Table G-1. The Timing of Energy Savings from a Hypothetical Program

Program Year	Quantity	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
FY01	100	6,000	6,000	6,000	6,000	6,000	6,000									
FY02	100		6,000	6,000	6,000	6,000	6,000	6,000								
FY03	100			6,000	6,000	6,000	6,000	6,000	6,000							
FY04	100				6,000	6,000	6,000	6,000	6,000	6,000						
FY05	100					6,000	6,000	6,000	6,000	6,000	6,000					
FY06	100						6,000	6,000	6,000	6,000	6,000	6,000				
FY07	100							6,000	6,000	6,000	6,000	6,000	6,000			
18MCP	100								6,000	6,000	6,000	6,000	6,000	6,000		
CY09	100									6,000	6,000	6,000	6,000	6,000	6,000	
CY10	100										6,000	6,000	6,000	6,000	6,000	6,000

APPENDIX H: SOURCES FOR DEEMED SAVINGS AND NET-TO-GROSS RATIOS

Table H-1. Sources for Attribution Ratios

Program/Sector	Measure Category	Source Title
Agriculture	CFL	2008 Sector-based CFL Net-to-Gross Analysis
Commercial	CFL	2008 Sector-based CFL Net-to-Gross Analysis
Business - First Half	Boilers & Burners	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Expanded Process	Business Programs Impact Evaluation Report (CY10)
Business - First Half	HVAC	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Non-Small CFL Lighting	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Other	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Refrigeration	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Small CFLs	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Boilers & Burners	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Expanded Process	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	HVAC	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Non-Small CFL Lighting	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Other	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Refrigeration	Business Programs Impact Evaluation Report (CY10)
Business - Second Half	Small CFLs	Business Programs Impact Evaluation Report (CY10)
Business - First Half	Biogas	Renewables: Impact Evaluation CY10
Business - First Half	Biomass	Renewables: Impact Evaluation CY10
Business	Solar Electric	Renewables: Impact Evaluation CY10
Business	Solar Thermal	Renewables: Impact Evaluation CY10
Business	Wind	Renewables: Impact Evaluation CY10
Business - Second Half	Biogas Hybrid	Renewables: Impact Evaluation CY10
Business - Second Half	Biomass Hybrid	Renewables: Impact Evaluation CY10
ACES	Direct Install	Residential Programs: ACES CY09 Impact Attribution Report
ACES	New Construction	Residential Programs: ACES CY09 Impact Attribution Report
ACES	Whole Building	Apartment and Condominium Efficiency Services Program: Whole Building Supply-side Impacts
HPWES	Attic Insulation	Home Performance with ENERGY STAR: Insulation Supply-side Study Results and Integration with Participant Findings
HPWES	Foundation Insulation - Exterior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Foundation Insulation - Interior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Floor Insulation	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Sill Box Insulation	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures

Program/Sector	Measure Category	Source Title
HPWES	Sidewall Insulation	Home Performance with ENERGY STAR: Insulation Supply-side Study Results and Integration with Participant Findings
Residential	Multifamily CFL	2008 Sector-based CFL Net-to-Gross Analysis
Residential	Other CFL	2008 Sector-based CFL Net-to-Gross Analysis
Residential	Solar Electric	Renewables: Impact Evaluation CY10
Residential	Solar Thermal	Renewables: Impact Evaluation CY10
Residential	Wind	Renewables: Impact Evaluation CY10
Residential	Furnace w/ECM	Net-to-Gross Savings Adjustments for ECM Furnaces

Table H-2. Sources for Deemed Savings

Program	Program Initiative	Measure	Qualifier	Source Title
ACES	Direct Install	CFL - 13 Watt	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	CFL - 20 Watt	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	CFL - 23 Watt	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Faucet Aerator - Bath - Electric	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Faucet Aerator - Bath - Gas	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Faucet Aerator - Kitchen - Electric	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Faucet Aerator - Kitchen - Gas	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Showerhead 1.5 gpm - Electric	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Showerhead 1.5 gpm - Gas	N/A	ACES: Default Deemed Savings Review
ACES	Direct Install	Showerhead Handheld - Gas	N/A	ACES: Default Deemed Savings Review
ACES	New Construction	Central Split AC - 14 SEER	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	New Construction	Central Split AC - 15 SEER	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	New Construction	Central Split AC - 16+ SEER	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	New Construction	CFL	N/A	ACES: Default Deemed Savings Review
ACES	New Construction	CFL Fixture	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	New Construction	ENERGY STAR Clothes Washer - Common Area Electric	N/A	Deemed Savings Database
ACES	New Construction	ENERGY STAR Clothes Washer - Common Area Gas	N/A	Deemed Savings Database
ACES	New Construction	ENERGY STAR Clothes Washer - In Unit	N/A	Deemed Savings Database

Program	Program Initiative	Measure	Qualifier	Source Title
ACES	New Construction	ENERGY STAR Dishwasher	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	New Construction	ENERGY STAR Refrigerator	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	New Construction	Gas Furnace 90%	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	New Construction	LED Down Light	N/A	ACES: Default Deemed Savings Review
ACES	Whole Building Existing	CFL Fixture	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - Common Area Electric	N/A	Deemed Savings Database
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - Common Area Gas	N/A	Deemed Savings Database
ACES	Whole Building Existing	ENERGY STAR Clothes Washer - In Unit	N/A	Deemed Savings Database
ACES	Whole Building Existing	ENERGY STAR Dehumidifier	N/A	Deemed Savings Database
ACES	Whole Building Existing	ENERGY STAR Dishwasher	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	Whole Building Existing	ENERGY STAR Refrigerator	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ACES	Whole Building Existing	Gas Furnace 90% with ECM	N/A	Residential Deemed Savings Review
ACES	Whole Building Existing	Split System A/C - 15 SEER	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	Whole Building Existing	Split System A/C - 16+ SEER	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	Whole Building Existing	Water Heater - Condensing	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	Whole Building Existing	Water Heater - Indirect	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	Whole Building Existing	Water Heater - Natural Gas 90%+	N/A	Residential Programs: CY09 Deemed Savings Review
ACES	Whole Building Existing	Water Heater - Power Vented >=0.64 EF	N/A	Residential Deemed Savings Review
EHCI	Equipment	Gas Furnace 90%+ w/ ECM	N/A	Residential Deemed Savings Review
EHCI	Equipment	SEER 14 w/o RCA	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	Equipment	SEER 15 w/ ECM	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	Equipment	SEER 15 w/o RCA	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	Equipment	SEER 16 w/ ECM	N/A	Residential Programs: CY09 Deemed Savings Review

Program	Program Initiative	Measure	Qualifier	Source Title
EHCI	Equipment	SEER 16 w/o RCA	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	Equipment	SEER 17 w/ ECM	N/A	Deemed Savings Database
EHCI	Equipment	SEER 18 w/ ECM	N/A	Deemed Savings Database
EHCI	Equipment	SEER 19 w/ ECM	N/A	Deemed Savings Database
EHCI	Equipment	SEER 20 w/ ECM	N/A	Deemed Savings Database
EHCI	Equipment	SEER 21 w/ ECM	N/A	Deemed Savings Database
EHCI	New Construction	Gas Furnace 90%+ w/ ECM	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	New Construction	SEER 15 w/ ECM	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	New Construction	SEER 16 w/ ECM	N/A	Residential Programs: CY09 Deemed Savings Review
EHCI	New Construction	SEER 17 w/ ECM	N/A	Deemed Savings Database
EHCI	New Construction	SEER 21 w/ ECM	N/A	Deemed Savings Database
ENERGY STAR - Appliances	Customer Rewards	Electric to Gas Conversion	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Flue Closure	N/A	Verified Gross Estimates for Home Performance with ENERGY STAR and Wisconsin ENERGY STAR Homes Programs
ENERGY STAR - Appliances	Customer Rewards	Fuel Conversion - Electric to LP	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Fuel Conversion - Electric to LP	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Fuel Switch Bonus 0.64 - 0.79 EF	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Power Vent NG EF .64 to .79	N/A	Residential Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Condensing	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Electric >=0.93 EF	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Integrated	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Integrated	N/A	Residential Programs: CY09 Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Power Vented >=0.8 EF	N/A	Residential Deemed Savings Review
ENERGY STAR - Appliances	Customer Rewards	Water Heater - Power Vented 0.64 - 0.79 EF	N/A	Residential Deemed Savings Review

Program	Program Initiative	Measure	Qualifier	Source Title
ENERGY STAR - Lighting	Customer Rewards	Ceiling Fan	N/A	Deemed Savings Database
ENERGY STAR - Lighting	Customer Rewards	CFL	Buydown	2010 CFL Savings Analysis
ENERGY STAR - Lighting	Customer Rewards	CFL	Mail-In	2010 CFL Savings Analysis
ENERGY STAR - Lighting	Customer Rewards	Indoor Lighting Fixtures	N/A	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	LED Holiday Light	Instant	Deemed Savings Database
ENERGY STAR - Lighting	Customer Rewards	LED Holiday Light	Mail-In	Deemed Savings Database
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures	Buydown	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures	Mail-In	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures - LED	Mail-In	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	Lighting Fixtures - LED	Spiff	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	Torchiere	Instant	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
ENERGY STAR - Lighting	Customer Rewards	Torchiere	Mail-In	Evaluation of Deemed Energy Savings Estimates for ENERGY STAR-labeled Products
HPWES	Equipment	18 SEER	N/A	Deemed Savings Database
HPWES	Equipment	Gas Furnace 90%+ w/ ECM	N/A	Residential Deemed Savings Review
HPWES	Equipment	Gas Furnace 90%+ w/ ECM - New Construction	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Equipment	SEER 14	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Equipment	SEER 15	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Mobile Home	CFL	N/A	2010 CFL Savings Analysis
HPWES	Mobile Home	Duct Sealing	N/A	Deemed Savings Database
HPWES	Mobile Home	Faucet Aerator - Bath - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	Mobile Home	Faucet Aerator - Bath - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Mobile Home	Faucet Aerator - Kitchen - Electric	N/A	ACES: Default Deemed Savings Review

Program	Program Initiative	Measure	Qualifier	Source Title
HPWES	Mobile Home	Faucet Aerator - Kitchen - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Mobile Home	Showerhead 1.75 gpm - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	Mobile Home	Showerhead 1.75 gpm - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP	Attic Insulation	Duplex - Side-by-side	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Attic Insulation	Duplex - Stack	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Floor Insulation	Duplex - Side-by-side	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Floor Insulation	Duplex - Stack	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Flue Closure	N/A	Verified Gross Estimates for Home Performance with ENERGY STAR and Wisconsin ENERGY STAR Homes Programs
HPWES	RHEEP	Foundation Insulation - Interior	Duplex - Stack	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Furnace 90%+ w/ECM	N/A	Residential Deemed Savings Review
HPWES	RHEEP	Kneewall Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Sill Box Insulation	Duplex - Side-by-side	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Sill Box Insulation	Duplex - Stack	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	RHEEP	Water Heater - Integrated	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	RHEEP	Water Heater - Power Vented Small	N/A	Residential Deemed Savings Review
HPWES	RHEEP-DI	CFL - 100 Watt	N/A	2010 CFL Savings Analysis
HPWES	RHEEP-DI	CFL - 13 Watt	N/A	2010 CFL Savings Analysis
HPWES	RHEEP-DI	CFL - 20 Watt	N/A	2010 CFL Savings Analysis
HPWES	RHEEP-DI	CFL - 23 Watt	N/A	2010 CFL Savings Analysis
HPWES	RHEEP-DI	Faucet Aerator - Bath - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Faucet Aerator - Bath - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Faucet Aerator - Kitchen - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Faucet Aerator - Kitchen - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Showerhead 1.5 gpm - Electric	N/A	ACES: Default Deemed Savings Review

Program	Program Initiative	Measure	Qualifier	Source Title
HPWES	RHEEP-DI	Showerhead 1.5 gpm - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Showerhead 1.75 gpm - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	RHEEP-DI	Showerhead 1.75 gpm - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Together We Save	Attic Insulation	Multi-select	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Together We Save	Faucet Aerator - Bath - Electric	N/A	ACES: Default Deemed Savings Review
HPWES	Together We Save	Faucet Aerator - Bath - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Together We Save	Faucet Aerator - Kitchen - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Together We Save	Floor Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Together We Save	Foundation Insulation	Exterior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Together We Save	Foundation Insulation	Interior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Together We Save	Furnace 90%+ w/ECM	N/A	Residential Deemed Savings Review
HPWES	Together We Save	Insulate Bath Exhaust Fan	Existing	Deemed Savings Database
HPWES	Together We Save	Insulate Exhaust Fan	Existing	Deemed Savings Database
HPWES	Together We Save	Insulate Exhaust Fan	New	Deemed Savings Database
HPWES	Together We Save	Insulate Kitchen Exhaust Fan	Existing	Deemed Savings Database
HPWES	Together We Save	No Furnace Grille Removal	N/A	Deemed Savings Database
HPWES	Together We Save	Pipe Insulation	N/A	Deemed Savings Database
HPWES	Together We Save	Revent Bath Exhaust Fan	Existing	Deemed Savings Database
HPWES	Together We Save	Revent Exhaust Fan	Existing	Deemed Savings Database
HPWES	Together We Save	Revent Kitchen Exhaust Fan	N/A	Deemed Savings Database
HPWES	Together We Save	SEER 15	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Together We Save	Showerhead - Gas	N/A	ACES: Default Deemed Savings Review
HPWES	Together We Save	Sidewall Insulation	Cavity	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Together We Save	Sill Box Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures

Program	Program Initiative	Measure	Qualifier	Source Title
HPWES	Together We Save	Water Heater >=0.64 EF	N/A	Residential Deemed Savings Review
HPWES	Whole House	Attic Insulation	Cathedral	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Closed Floor	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Gable	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Open Floor	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Other	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Scuttle/Access	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Attic Insulation	Slope	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Chimney Liner	N/A	Verified Gross Estimates for Home Performance with ENERGY STAR and Wisconsin ENERGY STAR Homes Programs
HPWES	Whole House	Electric to Gas Conversion	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Whole House	Exhaust Fan	ENERGY STAR	Deemed Savings Database
HPWES	Whole House	Exhaust Fan	Other	Deemed Savings Database
HPWES	Whole House	Floor Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Flue Closure	N/A	Verified Gross Estimates for Home Performance with ENERGY STAR and Wisconsin ENERGY STAR Homes Programs
HPWES	Whole House	Foundation Insulation	Exterior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Foundation Insulation	Interior	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Fuel Conversion Bonus - >=0.8 EF	N/A	Residential Deemed Savings Review
HPWES	Whole House	Fuel Conversion Bonus 0.64 - 0.79 EF	N/A	Residential Deemed Savings Review
HPWES	Whole House	Kneewall Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Sidewall Insulation	Cavity	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures

Program	Program Initiative	Measure	Qualifier	Source Title
HPWES	Whole House	Sidewall Insulation	R3-R4	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Sidewall Insulation	R5+	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Sill Box Insulation	N/A	FY05 Savings Adjustments for Home Performance with ENERGY STAR Insulation Measures
HPWES	Whole House	Water Heater - Electric >=0.93 EF	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Whole House	Water Heater - Indirect	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Whole House	Water Heater - Poor Draft	N/A	Deemed Savings Database
HPWES	Whole House	Water Heater - Power Vented >=0.9 EF	N/A	Residential Programs: CY09 Deemed Savings Review
HPWES	Whole House	Water Heater - Power Vented 0.64 - 0.79 EF	N/A	Residential Deemed Savings Review
HPWES	Whole House	Water Heater - Power Vented 0.8 - 0.89 EF	N/A	Residential Deemed Savings Review
WESH	Reward Items	CFL	N/A	2010 CFL Savings Analysis
WESH	Reward Items	Drain Water Heat Recovery	N/A	Deemed Savings Database
WESH	Reward Items	Furnace 90%+ w/ECM & Staging	N/A	Residential Programs: CY09 Deemed Savings Review
WESH	WESH Home Status	Certified Home Status	N/A	Wisconsin ENERGY STAR® Homes Program: Evaluation Findings