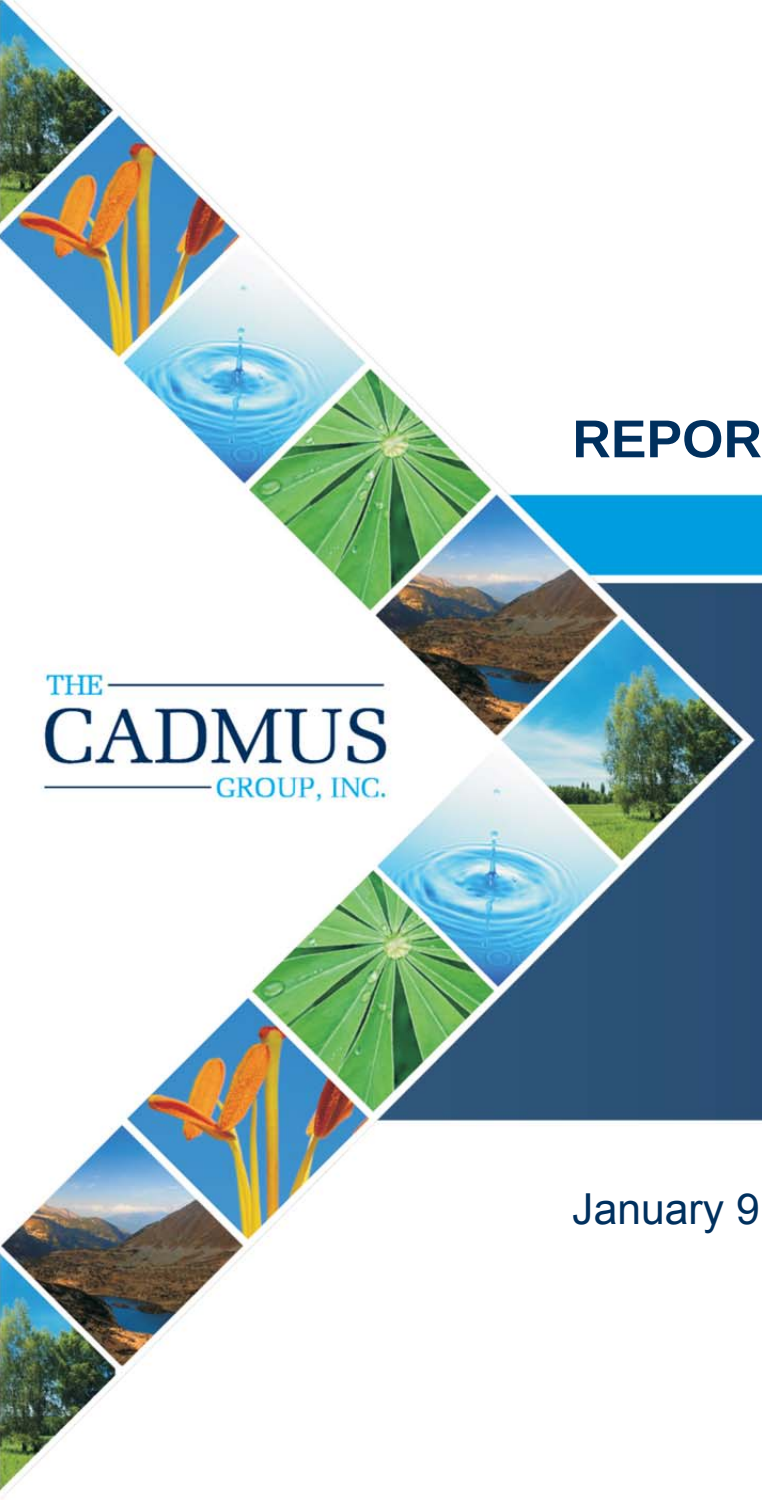


THE CADMUS GROUP, INC.

REPORT

Focus on Energy Wisconsin Public Service Territory-Wide and Community Pilot Programs Calendar Year 2011 Evaluation Report

January 9, 2013

Prepared by:

The Cadmus Group, Inc.
Energy Services Division
720 SW Washington Street, Suite 400
Portland, OR 97205
503.467.7100

Prepared for:

Public Service Commission of Wisconsin
610 N Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

Prepared by:

M. Sami Khawaja
Charlie Bicknell
Bryan Ward
of The Cadmus Group, Inc.

and

Salil Gogte
Irwin Kim
of Nexant

720 SW Washington Street
Suite 400
Portland, OR
Tel: 503.467.7100
Fax: 503.228.3696

An Employee-Owned Company
www.cadmusgroup.com

Corporate Headquarters:
100 5th Avenue
Waltham, MA 02451
Tel: 617.673.7000
Fax: 617.673.7001

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THE CADMUS GROUP, INC.

Executive Summary

Focus on Energy (Focus), Wisconsin's statewide energy-efficiency and renewable resources initiative, works with eligible residents and businesses to install cost-effective energy-efficient and renewable resource measures. Focus receives funding from all investor owned utilites, including the Wisconsin Public Service Corporation (WPS), as well as participating Municipal Utilities, and Cooperatives.

In 2008, WPS reached an agreement with the Citizens Utility Board (CUB) that resulted in WPS providing funding to support additional programs for its customers. The new programs were offered to all WPS customers through either the Territory-Wide programs or—for regionally targeted customers—through Community Pilot programs. These programs were approved for the years 2009 through 2013, or until funds are exhausted.

The Public Service Commission of Wisconsin (PSC) provides oversight of both the Focus and the WPS programs. Shaw Environmental & Infrastructure, Inc., began administering the programs in 2011.

In November 2011, the PSC contracted with a team of energy consulting and market research firms to evaluate both the Focus programs and the Territory-Wide programs during the current (2011-2014) quadrennial cycle. These firms, collectively referred to as the Evaluation Team (or the Team), are The Cadmus Group, Inc.; Nexant, Inc.; TecMarket Works; and St. Norbert College Strategic Research Institute.

This evaluation report examines the CY 2011 WPS Territory-Wide programs. By design, these programs are an expansion of select existing Focus programs; therefore, the programs are largely affected by the status of the Focus programs. Because CY 2011 was a transitional year for the Focus and WPS programs, this evaluation entails measurement and verification of gross savings; however, it does not include a process evaluation. The Evaluation Team used stipulated net-to-gross (NTG) ratios—based on the Focus 2010 program evaluation—to estimate net savings for the Territory-Wide programs.

Due to the dependency of the Territory-Wide programs on the Focus programs, the savings for those programs are attributed to Focus.

The Community Pilot programs are unique to WPS, so their savings are attributed to WPS.

The tasks performed by the Team for the WPS CY 2011 evaluation report were as follows:

- Task 1: Summarize CY 2011 Programs
- Task 2: Review the Focus on Energy Evaluation of High Priority Measures as they apply to WPS Measures
- Task 3: Compile CY 2011 Savings
- Task 4: Report on CY 2011 Program Evaluation Findings

Although this report focuses on the analysis of savings for the Territory-Wide programs, the report also provides savings for the Community Pilot programs to show the effects of the entire WPS portfolio. The Evaluation Team, however, has not reviewed the Community Pilot program savings. Thus, the reported savings for Community Pilot programs reflect the savings provided by the Program Administrator, and the Evaluation Team applied a NTG ratio of 100% to determine net savings.

Summary of Findings

Savings by Program

This section provides gross, verified gross, and verified net savings—by first year annual savings and lifecycle savings—for all WPS programs and measure categories. The savings for both the Territory-wide and the Community Pilot programs are reported here to show the entire effect of the WPS portfolio. However, only the Territory-wide program savings have been reviewed by the Evaluation Team.

As previously mentioned, because the Territory-Wide programs were largely an extension of existing Focus programs, those savings are allocated to both Focus and WPS. The Community Pilot programs are unique to WPS customers, so those savings are attributed solely to the WPS programs.

Gross Reported, Gross Verified, and Net Savings

First-Year Annual Savings

Table 1 summarizes the following savings, based on the first-year annual savings of the programs:

- Annual gross as reported by the Program Administrator
- Verified gross as determined by the Evaluation Team
- Verified net as determined by the Evaluation Team

The CY 2011 WPS Territory-Wide programs consisted of enhanced incentives to WPS customers who participated in select Focus on Energy programs. The three programs which contributed the most savings in 2011 are the Non-Residential Bundle Bonus, the Non-Residential Renewable Energy Bonus, and the Residential Heating Equipment Bonus programs. Both the Non-Residential Renewable Energy Bonus, and the Residential Heating Equipment Bonus programs were discontinued in 2010, and the savings from these programs come from residual projects that met the 2010 eligibility requirements but were completed in 2011.

Table 1. First Year Annual Net kWh, kW, and Therm Savings by Program

Program Name	Reported Gross kWh	Reported Gross kW	Reported Gross Therms	Verified Gross kWh	Verified Gross kW	Verified Gross Therms	Verified Net kWh	Verified Net kW	Verified Net Therms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)									
Residential Programs									
Multi-Family Bundle Bonus	180,053	18	18,187	180,053	18	18,352	115,907	13	10,479
Heating Equipment Bonus	1,968,830	451	108,980	1,968,830	451	113,214	748,155	171	82,652
Home Performance With ENERGY STAR Bonus	140,197	77	106,847	139,698	77	112,211	106,445	54	91,027
Total Territory-Wide Residential First Year Savings	*2,289,080*	*546*	*234,014*	*2,288,581*	*546*	*243,778*	*970,508*	*238*	*184,158*
Non-Residential Programs									
Non-Residential Bundle Bonus	11,205,399	1,851	259,019	10,547,163	2,618	173,264	6,420,907	1,515	88,091
Renewable Energy Bonus	3,842,477	454	-	3,317,435	454	-	1,127,223	147	-
Total Territory-Wide Non-Residential First Year Savings	*15,047,876*	*2,305*	*259,019*	*13,864,597*	*3,072*	*173,264*	*7,548,130*	*1,662*	*88,091*
Total Territory-Wide First Year Savings	17,336,956	2,851	493,033	16,153,179	3,618	417,042	8,518,637	1,900	272,249
Community Pilot Programs (Savings Allocated To WPS, Included Only In This Report)									
Allouez	402,375	87	63,026	402,445	86	61,865	326,718	76	60,925
Brillion	158,176	45	23,855	158,459	44	22,775	120,663	37	21,493
Plover	37,667	4	6,759	37,667	4	6,756	35,358	3	6,754
Total Community Pilot First Year Savings	**598,218**	**135**	**93,640**	**598,571**	**133**	**91,396**	**482,739**	**117**	**89,172**
Total WPS Program First Year Savings	**17,935,174**	**2,986**	**586,672**	**16,751,750**	**3,752**	**508,438**	**9,001,376**	**2,017**	**361,421**

Figures 1 through 3 show the allocation of Territory-Wide first-year verified savings by program.

Figure 1. Residential Verified Gross kWh – First Year Annual

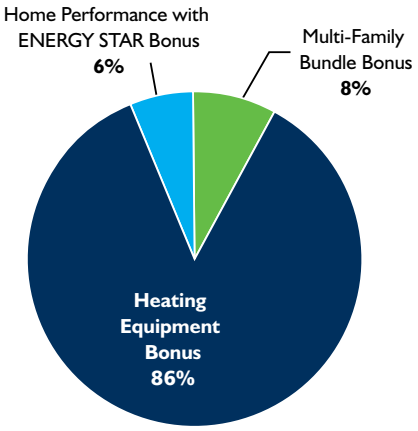


Figure 2. Residential Verified Gross Therms – First Year Annual

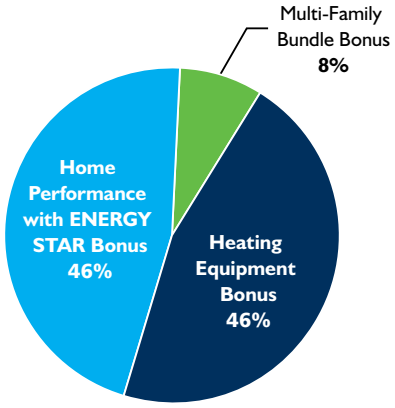
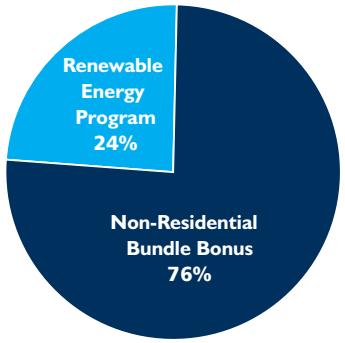


Figure 3. Non-Residential Verified Gross kWh – First Year Annual



Unique Customers

Table 2 shows the number of unique customers for each WPS program.

Table 2. Unique Customers by Program

Program Name	Number of Unique Customers
Territory-Wide Programs	
Residential Programs	
Multi-Family Bundle Bonus	39
Heating Equipment Bonus	2,875
Home Performance With ENERGY STAR Bonus	262
Total Residential Customers	*3,176*
Non-Residential Programs	
Non-Residential Bundle Bonus	144
Renewable Energy Bonus	49
Total Non-Residential Customers	*193*
Total Territory-Wide Customers	**3,369**
Community Pilot Programs	
Allouez	431
Brillion	124
Plover	126
Total Community Pilot Unique Customers	*681*
Total WPS Unique Customers	**4,050**

Program Cost-Effectiveness: Residential and Non-Residential

As noted above, the CY 2011 WPS Territory-Wide programs consisted of bonus measures that were based on Focus programs and measures. To determine the cost-effectiveness of the WPS Territory-Wide programs, the Evaluation Team conducted a benefit-cost analysis test that included the savings, benefits, and costs associated with all WPS Territory-Wide measures and with the Focus measures that provided the basis for the WPS bonus measures.[1]

In the current quadrennial cycle, the Program Administrator has—with PSC approval—elected to use a new cost-effectiveness calculator for program planning purposes. Consistency between planning and evaluation approaches is critical for an effective understanding of program performance relative to expectations. As a result, the same calculator is being used for the evaluation.

[1] This approach was used because the available data for 2011 was insufficient to determine incremental participation resulting solely from the WPS-specific activities.

Table 3. WPS Program TRC Test Inputs and Final Benefit-Cost Ratio

Electric Benefits	Gas Benefits	Emission Benefits	Program Costs*	Incentive Costs	Incremental Measure Costs	TRC Net Benefits	TRC B/C Ratios
$25,737,771	$15,325,094	$13,224,296	$6,094,163	$10,612,607	$20,076,201	$28,116,797	2.07

* Program administrative costs were obtained from the Focus on Energy Fiscal Agent, Wipfli

Table 3, shows the 2011 cost-effectiveness results. For details on the processes used to calculate the cost-effectiveness of the Focus portfolio, see the Program Cost-Effectiveness section in the Evaluation Findings section of this report and in the *Benefit-Cost Analysis: CY09* report available at focusonenergy.com.[2]

Evaluated Measures

Identifying High Priority Measures

As part of the Focus on Energy CY 2011 evaluation, the Team reviewed CY 2010 and CY 2011 savings by measure for the Targeted Market and Mass Market programs. The Team identified the measures that: (1) that provided the highest percentage of savings in the portfolio, and (2) had the greatest increase in percentages from CY 2010 to CY 2011.

Two of the three top measures prioritized for Focus on Energy were identified as WPS priority measures and targeted for the CY 2011 evaluation:

- Residential furnaces with electronically commutated motors (ECMs);
- Non-residential heating, ventilation, and air conditioning (HVAC) efficiency.

Complete details about the selection process and additional information can be found in the *Focus on Energy Calendar Year 2011 Evaluation Report.*

[2] *Focus on Energy Benefit-Cost Analysis CY09 Evaluation Report*. Submitted by PA Consulting Group and KEMA, Inc., to Public Service Commission of Wisconsin. Final: November 24, 2009. http://www.focusonenergy.com/files/Document_Management_System/Evaluation/bcanalysiscy09_evaluationreport.pdfbcanalysiscy09_evaluationreport.pdf

INTRODUCTION

This report presents the findings of CY 2011 impact evaluation of the Wisconsin Public Service Corporation (WPS) Territory-Wide programs. Specifically, this report discusses energy savings by measure and by program for both the WPS Territory-Wide programs and the Community Pilot programs. Together, these programs include the entire energy efficiency portfolio of programs offered by WPS.

Because the Territory-Wide programs are largely an extension of existing Focus on Energy (Focus) programs, the energy savings achieved by these programs are attributable to the latter program. The Community Pilot programs are unique to WPS customers; therefore, savings reported by these programs are allocated to the WPS programs.

Although this report presents savings for the entire portfolio, the Evaluation Team reviewed only the Territory-Wide program savings. The findings presented in this report should be reviewed in conjunction with findings presented in the yet to be released evaluation report for the Community Pilot programs commissioned by WPS.

Due to significant changes in the program tracking databases instituted during 2011, the Evaluation Team and the Public Service Commission of Wisconsin (PSC) anticipate that the savings and participation numbers presented in this report will likely vary from those presented in the *WPS Community Pilot Program Evaluation Report*. Any significant differences will be discussed in the 2012 evaluation report.

Overview of Evaluation Activities

CY 2011 evaluation activities consisted of a database review and an application of verified and evaluated savings from the 2010 Focus evaluation. In addition, the Evaluation Team applied results from the evaluation of applicable high-priority measures that were identified for the Focus on Energy and reported upon in the *Focus on Energy Calendar Year 2011 Evaluation Report*. The high-priority measures that were applicable to the Territory-Wide programs were residential ECM furnaces and non-residential HVAC efficiency.

WPS TERRITORY-WIDE PROGRAMS

This section describes the WPS Territory-Wide programs. The Focus programs that are the foundation for these programs are listed in Appendix B.

Descriptions of Programs

WPS Home Performance Bonus

WPS offered bonus incentives to customers who participated in the Focus Home Performance with ENERGY STAR® program. Qualified customers were eligible for up to double the Focus Cash-Back Reward. In CY 2011, 262 customers received this bonus, for a total of 139,698 verified gross kWh and 112,211 verified gross therms (first year annual).

WPS Heating Equipment Bonus

Building on the Focus on Energy Efficient Heating and Cooling Program, WPS offered a Heating Equipment Bonus to its residential customers who purchased a furnace or boiler that was eligible for a Focus on Energy reward. Furnace customers received $250 in addition to the $150 Focus reward. Boiler customers received $200 in addition to the $400 Focus reward.

This WPS bonus program ended December 31, 2010. All activity reported as part of the WPS program for CY 2011 reflected equipment that was installed in late 2010, for which incentives were not paid until 2011.

In CY 2011, 2,905 customers received a Heating Equipment Bonus, for a total of 1,968,830 verified gross kWh and 113,214 verified gross therms (first year annual).

WPS Energy Bundle Bonus

WPS customers who participated in these Focus on Energy programs—Apartment and Condo Efficiency Services (ACES), Agricultural, Commercial, Industrial, and/or Schools and Government—were eligible to receive a bonus from WPS for up to double the Focus on Energy incentives.

To be eligible for the WPS bonus, customers were required to complete multiple projects on unrelated energy-using systems. The bonus increased as more measures were installed—up to 100% for five or more measures.

Table 4 shows the number of customers and savings that the multifamily and non-residential sectors achieved through the Energy Bundle Bonus.

Table 4. Energy Bundle Bonus Results by Sector

	Number of Unique Customers	First Year Annual Savings	
		Verified Gross kWh	Verified Gross Therms
Multi-Family Bundle Bonus	39	201,479	20,837
Non-Residential Bundle Bonus	144	10,525,737	170,780
Total Bundle Bonus	183	10,727,216	191,617

WPS Renewable Energy Bonus

To help commercial customers install renewable energy projects, WPS offered a bonus to those customers that received an incentive through Focus on Energy's Renewable Energy Program. The WPS Renewable Energy Bonus ended in 2010. Savings continued into 2011, however, for those large projects that were approved but not completed before the program ended.

In CY 2011, 49 customers received the WPS Renewable Energy Bonus, for a total of 3,317,435 verified gross kWh (first year annual).

Summary of Measures by Programs

This section provides gross claimed and net savings—by both first year annual savings and lifecycle savings—for all WPS programs and measure categories. The following tables show savings for both Territory-Wide and Community Pilot programs and are presented to demonstrate the effect of the entire WPS portfolio.

Because the Territory-Wide programs were largely an extension of existing Focus on Energy programs, those savings are allocated to Focus on Energy. The Community Pilot programs are unique to WPS customers; therefore, savings achieved reported by these programs are attributable solely to the WPS programs.

Summary of Gross Reported Savings by WPS Program and Measure

First-Year Annual Savings

Table 5 through Table 9 —and their accompanying figures—summarize gross reported savings for all WPS programs and measures, based on the first year annual savings of the measures.

The largest portion of 2011 Territory-Wide residential kWh savings comes from the Heating Equipment Bonus Program. Although this program was discontinued in December 2010, the savings shown in 2011 represent the November and December 2010 installations for which program applications were submitted in early 2011. The largest portion of 2011 Territory-Wide non-residential kWh savings comes from the Non-Residential Bundle Bonus Program. This Program contributes the most savings, gross and verified - kWh and Therm, of any WPS Program.

The biogas measure has the greatest measure level kWh savings across the WPS portfolio. The measure was offered as part of the WPS Renewable Energy Bonus. Biogas contributes the entirety of the Renewable Energy Bonus's savings. As noted above, this Bonus was discontinued in 2010. Any savings reported in 2011 were from residual pre-approved projects being completed after the Program's end-date.

Table 5. Summary of Reported Gross kWh, kW, and Therm Savings by WPS Program – First Year Annual

Program Name	Reported Gross kWh	Reported Gross kW	Reported Gross Therms
Territory-Wide Programs (Savings Reported By Focus On Energy)*			
Residential Programs			
Multi-Family Bundle Bonus	201,427	20	20,671
Heating Equipment Bonus	1,968,830	451	108,980
Home Performance With ENERGY STAR Bonus	140,197	77	106,847
Total Territory-Wide Residential First Year Savings	*2,310,454*	*547*	*236,498*
Non-Residential Programs			
Non-Residential Bundle Bonus	11,184,025	1,850	256,535
Renewable Energy Bonus	3,842,477	454	-
Total Territory-Wide Non-Residential First Year Savings	*15,026,502*	*2,304*	*256,535*
Total Territory-Wide First Year Savings	**17,336,956**	**2,851**	**493,033**
Community Pilot Programs (Savings Allocated To WPS Only)			
Allouez	402,375	87	63,026
Brillion	158,176	45	23,855
Plover	37,667	4	6,759
Total Community Pilot First Year Savings	**598,218**	**135**	**93,640**
Total WPS Program First Year Savings	**17,935,174**	**2,986**	**586,672**

*Reported by Focus on Energy and included in the Focus on Energy Calendar Year 2011 Evaluation Report

** Allocated to WPS; savings are included only in this Report.

Figure 4, Figure 5, and Figure 6 show the allocation of Territory-Wide first year reported savings by program:

Figure 4. Residential Reported Gross kWh by Program – First Year Annual

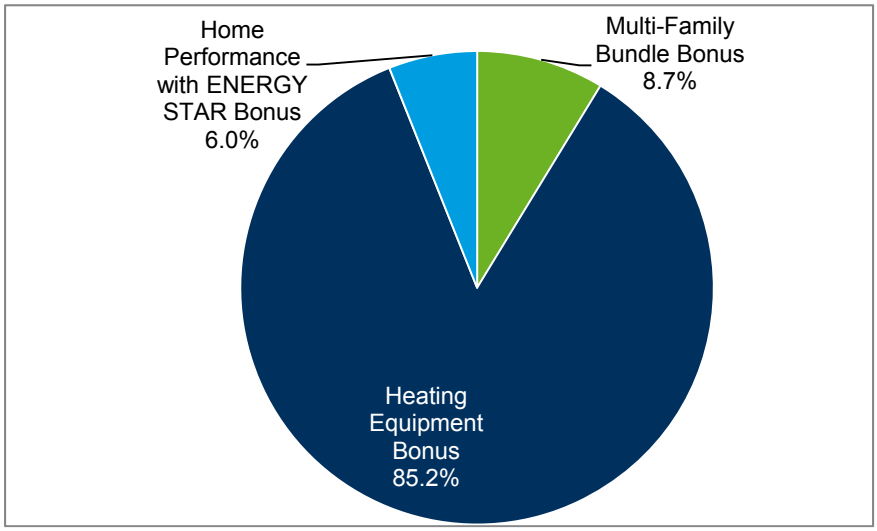


Figure 5. Residential Reported Gross Therms by Program – First Year Annual

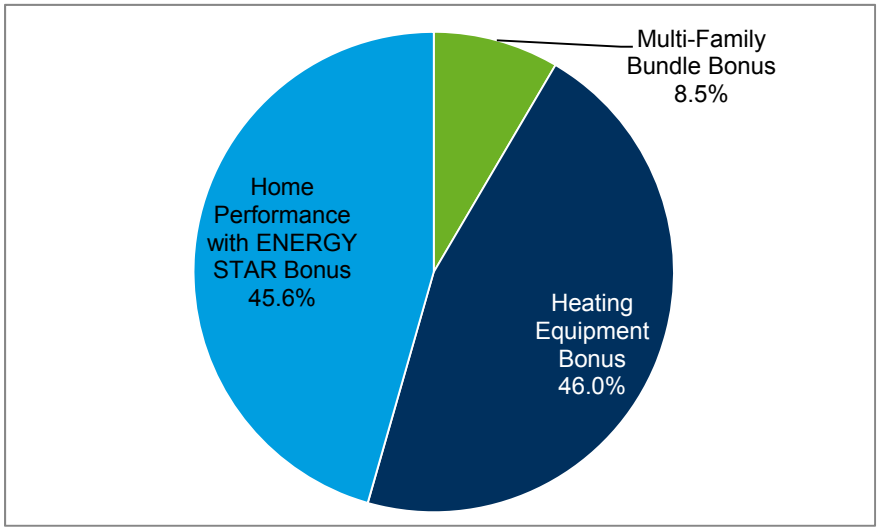


Figure 6. Non-Residential Reported Gross kWh by Program – First Year Annual

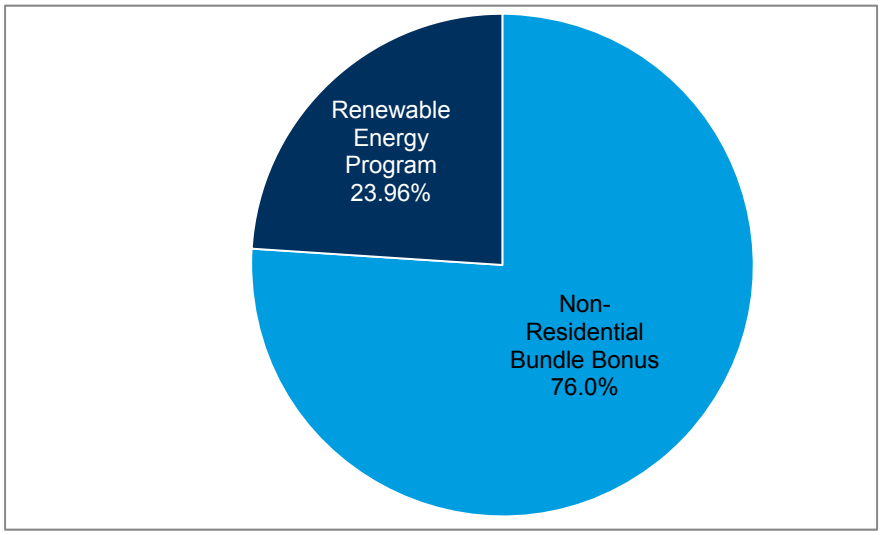


Table 6. Territory-Wide Residential Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – First Year Annual

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Territory-Wide Programs (Savings Included In The Focus on Energy Calendar Year 2011 Evaluation Report)			
Residential Programs			
Appliances	2,250	-	125
Boiler	-	-	67,543
Building Shell	128,771	75	102,281
Controls	27,494	2	-
Conversion	13,120	1	(525)
Furnace	1,971,020	452	45,120
Hot Water	59,470	7	16,687
HVAC	-	-	3,865
Lighting	105,879	10	-
Non Energy	-	-	-
Other	800	0	1,402
Refrigeration	1,650	0	-
Renewables	-	-	-
Total Territory-Wide Residential First-Year Savings	**2,310,454**	**547**	**236,498**
Total Territory-Wide First-Year Savings: Residential and Non-Residential	**17,336,956**	**2,851**	**493,033**

Table 7. Territory-Wide Non-Residential Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – First Year Annual

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Territory-Wide Programs (Savings Included In The Focus on Energy Calendar Year 2011 Evaluation Report)			
Non-Residential Programs			
Agriculture	239,764	23	(248)
Appliances	85,350	7	-
Biogas	3,842,477	454	-
Boiler	-	-	4,329
Building Shell	9,125	-	29,790
Compressor	128,304	19	-
Controls	624,259	114	19,500
Conversion	3,000	15	(107)
Energy Recovery	356,293	38	4,905
Food Service	15,170	3	6,305
Greenhouse	-	-	1,340
Hot Water	90,388	22	4,904
HVAC	2,414,636	464	169,776
Industrial	1,500,388	161	-
IT	171,600	-	-
Laundry	(2,413)	-	3,669
Lighting	2,991,350	491	-
Motors & Drives	1,653,253	268	(91)
Other	794,491	209	3,898
Pools	-	-	7,300
Refrigeration	44,591	4	-
Renewables	31,651	14	1,265
Scheduling	24,771	-	-
Service	8,054	-	0
Total Territory-Wide Non-Residential First-Year Savings	**15,026,502**	**2,304**	**256,535**
Total Territory-Wide First-Year Savings: Residential and Non-Residential	**17,336,956**	**2,851**	**493,033**

Table 8. Community Pilot Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – First Year Annual

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Community Pilot Programs (Savings Allocated To WPS, Included Only In This Report)			
Appliances	3,609	-	-
Boiler	-	-	2,496
Building Shell	81,261	54	57,417
Controls	28,256	1	-
Food Service	8,412	2	-
Furnace	90,520	21	2,480
Hot Water	3,044	(1)	25,757
HVAC	2,048	4	-
Lighting	227,728	38	-
Motors & Drives	62,062	7	-
Non Energy	-	-	-
Other	65,880	-	5,490
Refrigeration	1,786	0	-
Renewables	23,612	10	-
Total Community Pilot First-Year Savings	**598,218**	**135**	**93,640**

Table 9. Summary of Total Reported Gross kWh, kW, and Therm Savings by Measure Category – First Year Annual

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Total Territory-Wide Residential First-Year Savings	**2,310,45**	**547**	**236,498**
Total Territory-Wide Non-Residential First-Year Savings	**15,026,5**	**2,304**	**256,535**
Total Territory-Wide First-Year Savings: Residential and Non-Residential	**17,336,956**	**2,851**	**493,033**
Total Community Pilot First-Year Savings	**598,218**	**135**	**93,640**
Total WPS Program First-Year Savings	**17,935,174**	**2,986**	**586,672**

Figure 7, Figure 8, Figure 9, and Figure 10 show the allocation of Territory-Wide first year savings by measure category:

Figure 7. Residential Reported Gross kWh by Measure – First Year

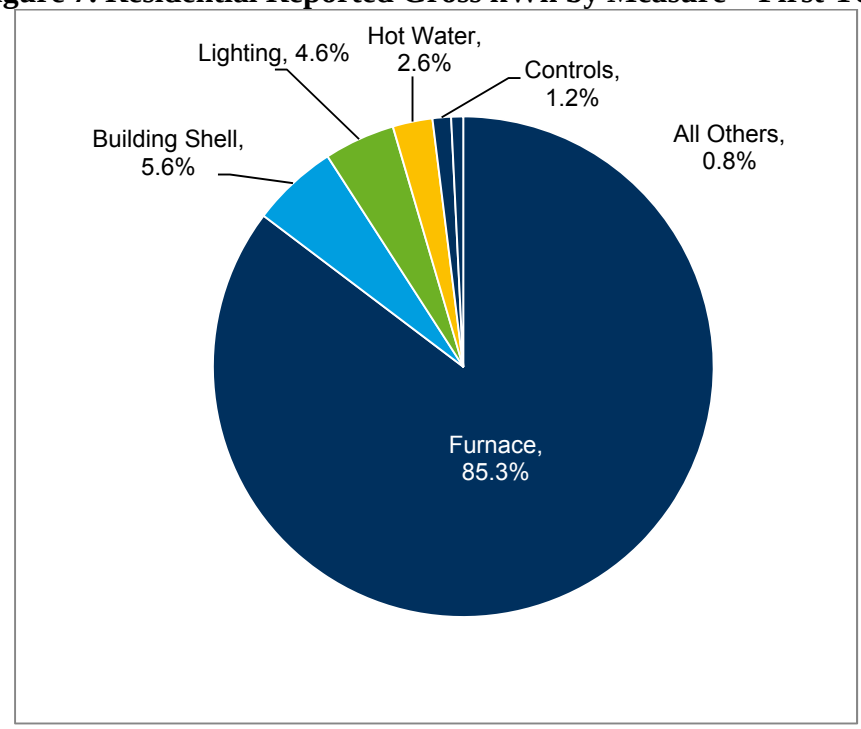


Figure 8. Residential Reported Gross Therms by Measure – First Year

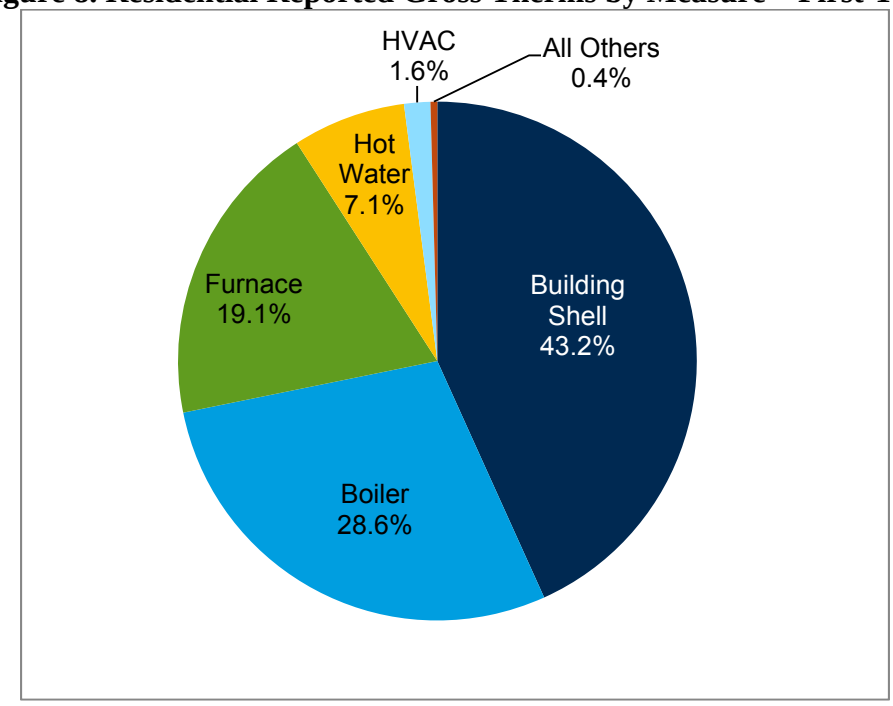


Figure 9. Non-Residential Verified Gross kWh by Measure – First Year

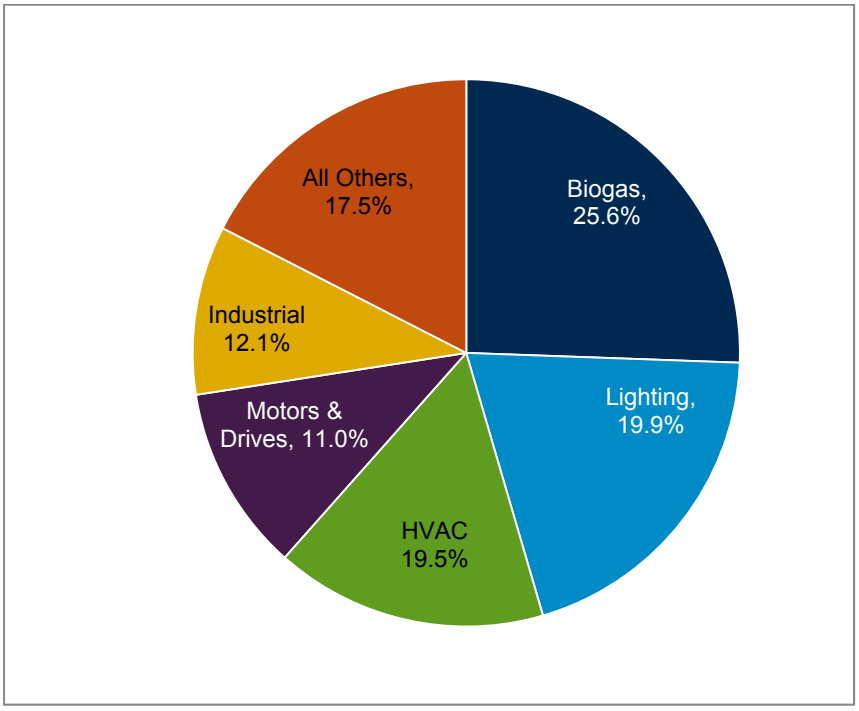
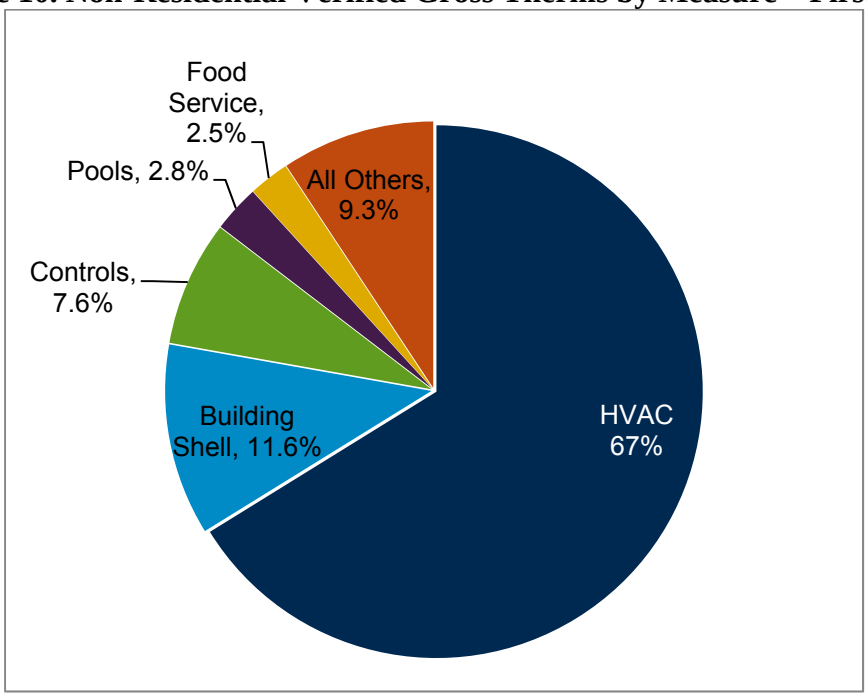


Figure 10. Non-Residential Verified Gross Therms by Measure – First Year



Lifecycle Savings

Table 10 through Table 14—and their accompanying figures—summarize the reported gross savings for all WPS programs and measures, based on these measures' lifecycle savings. Lifecycle electric (kWh) and gas (therm) savings were determined by multiplying each measure's first-year savings by its estimated useful life. Peak demand (kW) savings are not cumulative; therefore, kW savings reported in this section are the same as the kW savings reported in the first-year results above.

Table 10. Summary of Reported Gross kWh, kW, and Therm Savings by WPS Program – Lifecycle

Program Name	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Territory-Wide Programs (Savings Included In The Focus on Energy Calendar Year 2011 Evaluation Report)			
Residential Programs			
Multi-Family Bundle Bonus	1,611,416	20	165,366
Heating Equipment Bonus	25,594,790	451	1,864,180
Home Performance With ENERGY STAR Bonus	3,500,545	77	2,671,055
Total Territory-Wide Residential Lifecycle Savings	*30,706,751*	*547*	*4,700,601*
Non-Residential Programs			
Non-Residential Bundle Bonus	145,170,815	1,850	3,880,091
Renewable Energy Bonus	57,637,155	454	-
Total Territory-Wide Non-Residential Lifecycle Savings	*202,807,970*	*2,304*	*3,880,091*
Total Territory-Wide Lifecycle Savings	**233,514,721**	**2,851**	**8,580,692**
Community Pilot Programs (Savings allocated to WPS, Included Only In This Report)			
Allouez	6,055,708	87	1,519,832
Brillion	2,061,050	45	547,056
Plover	605,999	4	168,634
Total Community Pilot Lifecycle Savings	**8,722,756**	**135**	**2,235,521**
Total WPS Program Lifecycle Savings	**242,237,477**	**2,986**	**10,816,213**

Figure 11, Figure 12, and Figure 13 show the allocation of Territory-Wide lifecycle savings by program.

Figure 11. Residential Reported Gross kWh by Program – Lifecycle

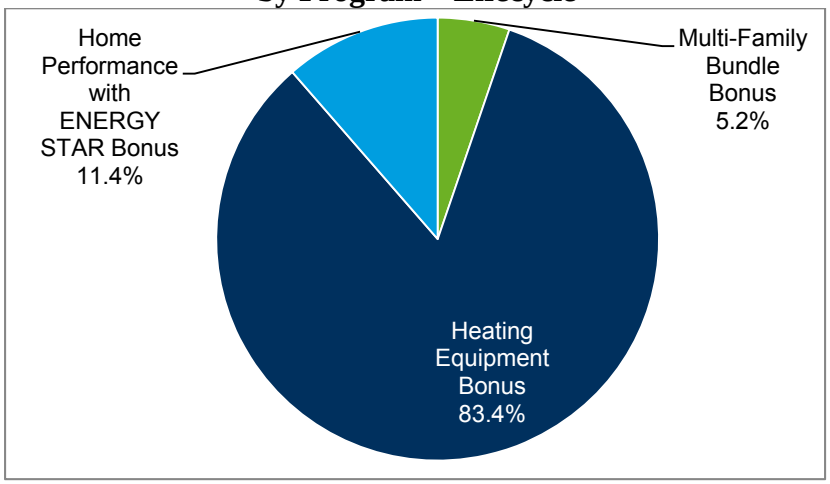


Figure 12. Residential Reported Gross Therms by Program - Lifecycle

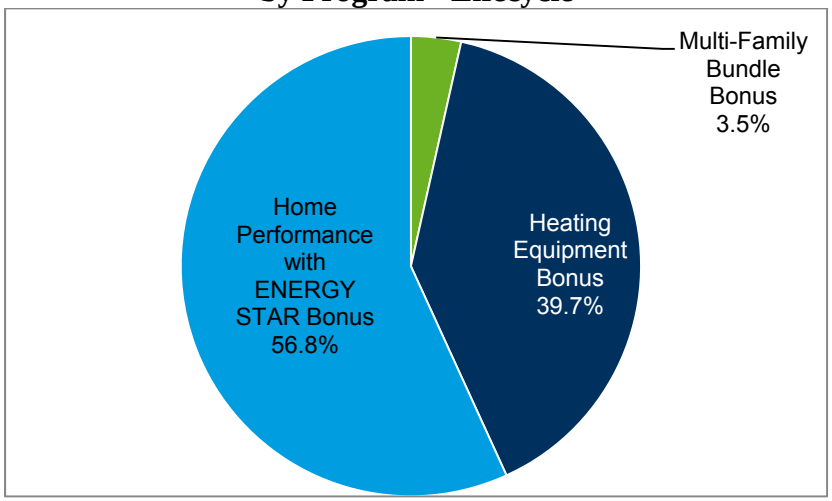


Figure 13. Non-Residential Reported Gross kWh by Program – Lifecycle

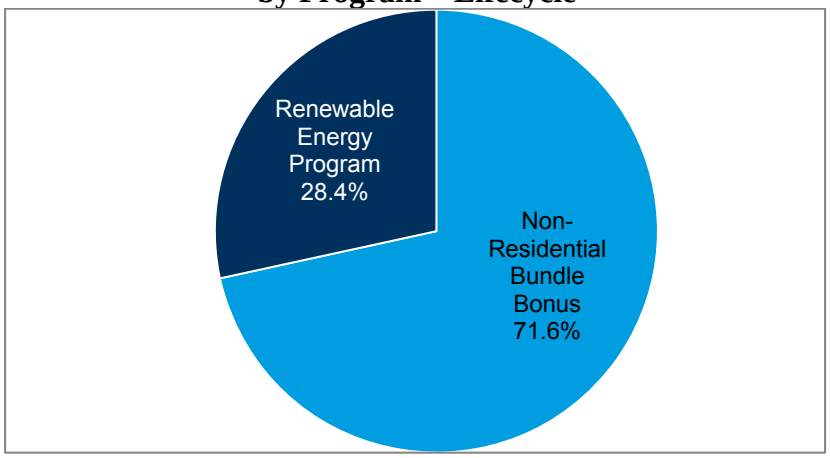


Table 11. Territory-Wide Residential Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)			
Residential Programs			
Appliances	18,000	-	1,000
Boiler	-	-	1,330,502
Building Shell	3,174,497	75	2,546,825
Controls	219,952	2	-
Conversion	328,000	1	(13,125)
Furnace	25,645,160	452	587,160
Hot Water	440,910	7	149,272
HVAC	-	-	63,917
Lighting	847,032	10	-
Non Energy	-	-	-
Other	20,000	0	35,050
Refrigeration	13,200	0	-
Renewables	-	-	-
Total Territory-Wide Residential Lifecycle Savings	**30,706,751**	**547**	**4,700,601**

Table 12. Territory-Wide Non-Residential Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)			
Non-Residential Programs			
Agriculture	2,637,404	23	(2,725)
Appliances	1,024,200	7	-
Biogas	57,637,155	454	-
Boiler	-	-	64,934
Building Shell	173,375	-	566,010
Compressor	1,411,344	19	-
Controls	7,491,111	114	292,500
Conversion	36,000	15	(1,284)
Energy Recovery	3,940,215	38	54,036
Food Service	182,040	3	75,660
Greenhouse	-	-	23,224
Hot Water	1,084,656	22	58,852
HVAC	36,219,540	464	2,546,634
Industrial	16,504,268	161	-
IT	2,059,200	-	-
Laundry	(28,956)	-	44,028
Lighting	34,969,006	491	-
Motors & Drives	26,452,048	268	(1,456)
Other	9,533,892	209	46,776
Pools	-	-	87,600
Refrigeration	535,092	4	-
Renewables	633,020	14	25,300
Scheduling	297,252	-	-
Service	16,108	-	2
Total Territory-Wide Non-Residential Lifecycle Savings	**202,807,970**	**2,304**	**3,880,091**
Total Territory-Wide Lifecycle Savings	**233,514,721**	**2,851**	**8,580,692**

Table 13. Community Pilot Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Community Pilot Programs (Savings Allocated To WPS, Included Only In This Report)			
Appliances	43,308	-	-
Boiler	-	-	62,400
Building Shell	2,031,525	54	1,431,777
Controls	339,072	1	-
Food Service	100,944	2	-
Furnace	1,176,760	21	32,240
Hot Water	(29,161)	(1)	571,854
HVAC	40,960	4	-
Lighting	1,885,681	38	-
Motors & Drives	992,992	7	-
Non Energy	-	-	-
Other	1,647,000	-	137,250
Refrigeration	21,434	0	-
Renewables	472,240	10	-
Total Community Pilot Lifecycle Savings	**8,722,756**	**135**	**2,235,521**
Total WPS Program Lifecycle Savings	**242,237,477**	**2,986**	**10,816,213**

Table 14. Summary of Total Reported Gross kWh, kW, and Therm Savings– Lifecycle

Measure Category	Reported Gross kWh	Reported Gross kW	Reported GrossTherms
Total Territory-Wide Residential Lifecycle Savings	**30,706,751**	**547**	**4,700,601**
Total Territory-Wide Non-Residential Lifecycle Savings	**202,807,970**	**2,304**	**3,880,091**
Total Territory-Wide Lifecycle Savings: Residential and Non-Residential	**233,514,721**	**2,851**	**8,580,692**
Total Community Pilot Lifecycle Savings	**8,722,756**	**135**	**2,235,521**
Total WPS Program Lifecycle Savings	**242,237,477**	**2,986**	**10,816,213**

Figure 14, Figure 15, and Figure 16 show the allocation of Territory-Wide lifecycle savings by measure category:

Figure 14. Residential Reported Gross kWh by Measure – Lifecycle

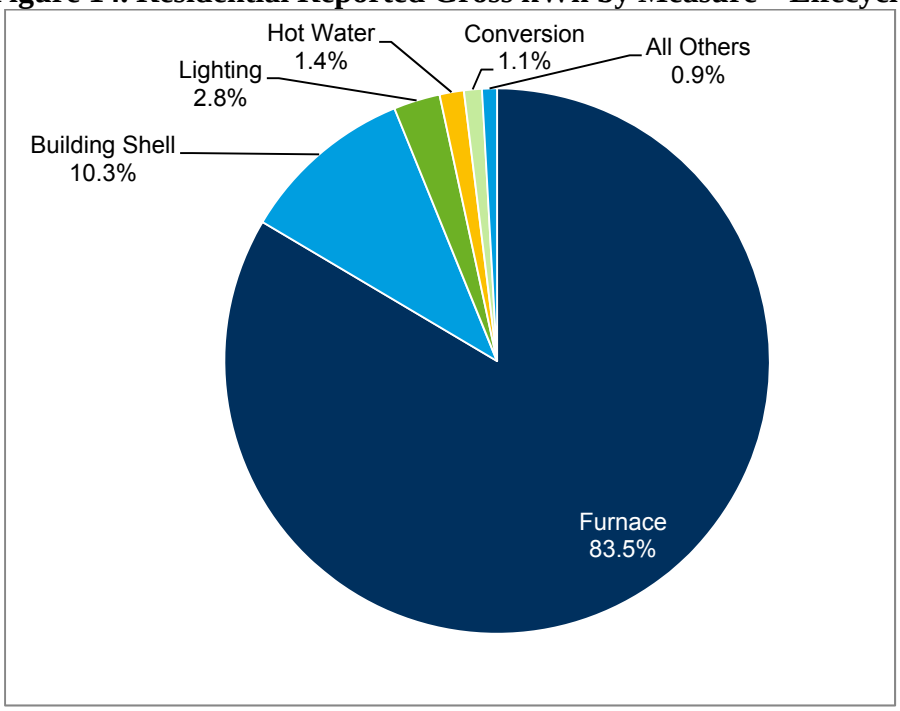


Figure 15. Residential Reported Gross Therms by Measure - Lifecycle

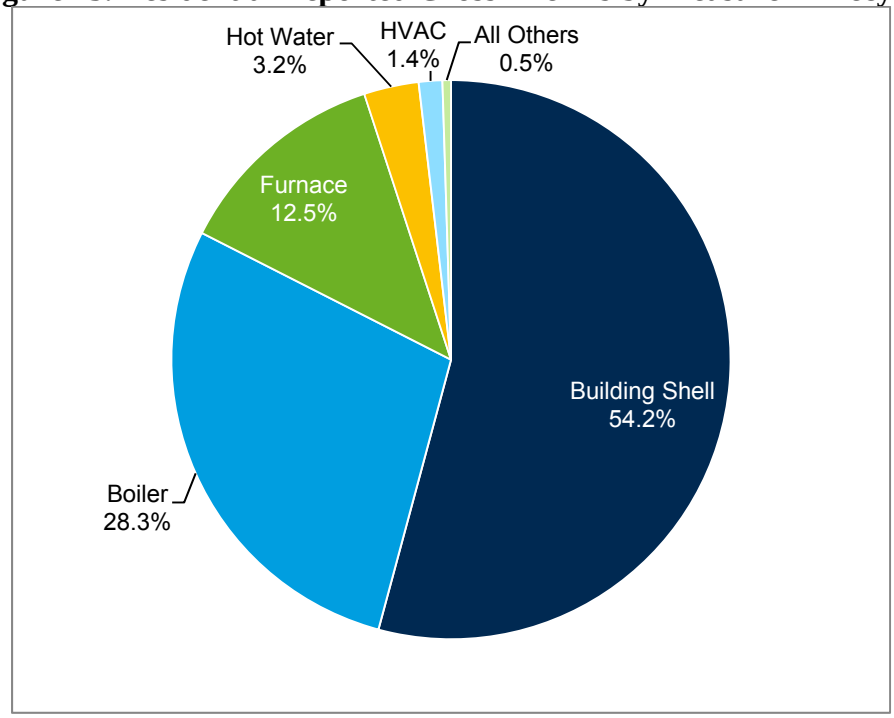


Figure 16. Non-Residential Reported Gross kWh by Measure – Lifecycle

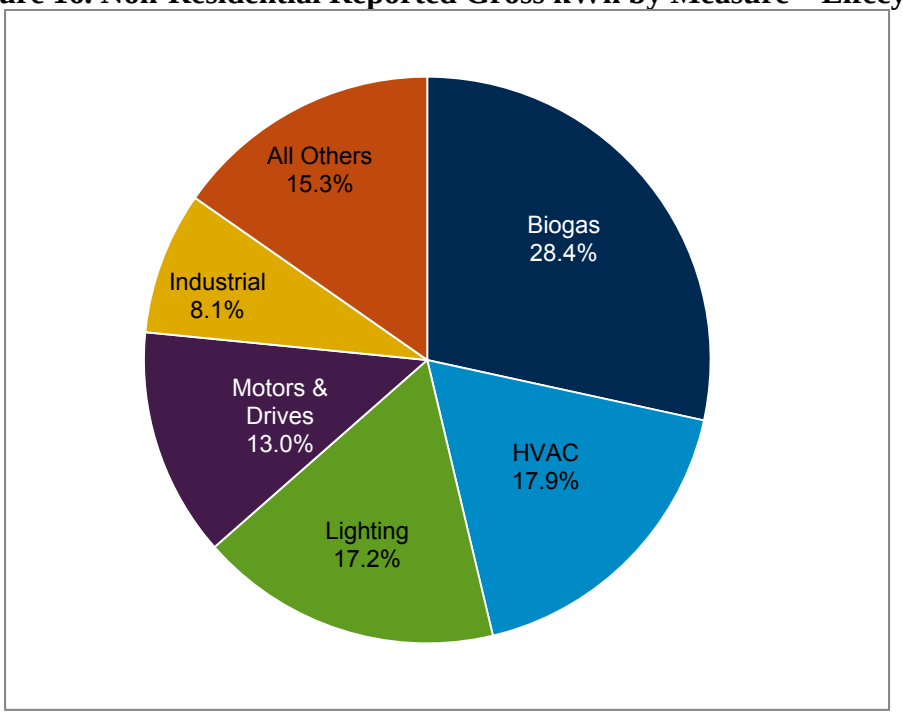
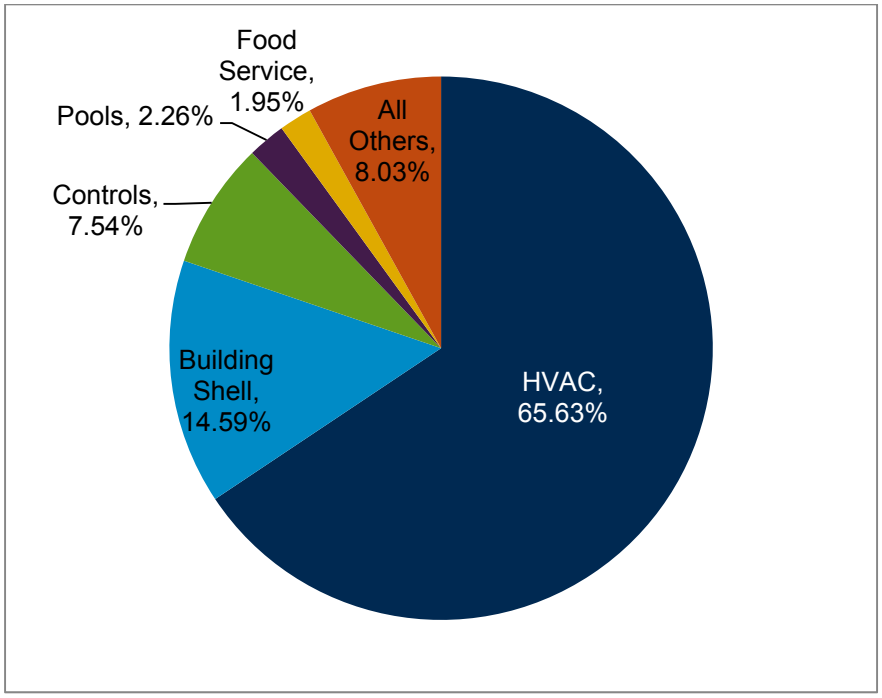


Figure 17. Non-Residential Reported Gross Therms by Measure – Lifecycle



EVALUATION FINDINGS

The following sections describe evaluation results from the *Focus on Energy Calendar Year 2011 Evaluation Report* that apply to the WPS programs and measures.

High Priority Measure Results

Summary of ECM Study

To study energy savings of ECM furnaces, the Evaluation Team installed meters in homes of residential customers who had received a furnace reward.

Thirty meters were installed in February and March of 2011, and data from 20 of those sites were collected to examine energy use. Data from all sites will be collected in the spring of 2013 and evaluated; the results will be presented in the *Focus on Energy Calendar Year 2012 Evaluation Report*.

Because only partial ECM metering results were available for the CY 2011 evaluation, the Evaluation Team chose to report savings using the most conservative approach. These savings are shown in Table 15.

Table 15. Residential ECM Furnace Preliminary Savings

Measure	2010 Savings (kWh)	2011 Preliminary Savings (kWh)
Residential ECM Furnace	733	348

These preliminary savings were not applied to ECM furnaces for this report for two reasons: the sample size is small and future calculated savings will be based on a higher confidence level. The Evaluation Team expects that energy savings will increase when full data sets are available for the CY 2012 Evaluation Report.

Additional details about the ECM study may be found in the *Focus on Energy Calendar Year 2011 Evaluation Report*.

Summary of HVAC Efficiency and Process Efficiency Study

The HVAC Efficiency and Process Efficiency measures are part of the Custom Incentives offered through Focus on Energy's non-residential programs. Because these measures represent various types of projects in all types of non-residential buildings, the Evaluation Team could not identify one new savings number for each measure. Instead, the Team determined a realization rate for each measure category that can be applied to all different types of projects within that category.

Table 16 summarizes findings from the analysis of the HVAC Efficiency and Process Efficiency measures.

Table 16. HVAC and Process Efficiency Realization Rates

Program	Number of Projects in Sample	Realization Rate for kWh	Realization Rate for kW	Realization Rate for Therms
Custom HVAC Incentive	25	68.1%	52.8%	103.7%
Custom Process Incentive	28	93.9%	100.7%	100.6%

Although these measures are available through the WPS non-residential programs, no measures were paid in 2011; therefore, savings are not affected by the recommended realization rate.

Additional details about the HVAC efficiency and Process efficiency measures study may be found in the *Focus on Energy Calendar Year 2011 Evaluation Report*.

Summary of Net Savings by Program and Measure

Using the verified gross savings determined through the ECM study, the Evaluation Team applied stipulated net-to-gross (NTG) ratios from the Focus on Energy 2010 Program evaluation to estimate net savings for the WPS Territory-Wide programs. Appendix C summarizes the NTG ratios by measure from the 2010 Evaluation Report.

A review of Community Pilot programs was not included in this Evaluation Report. Savings for those programs reflect the reported savings provided in the Focus on Energy Program tracking database, and the equivalent measure category NTG ratio was applied to determine net savings.

First-Year Annual Savings

Table 17 athrough Table 21 summarize the verified electricity, peak demand, and gas savings for all WPS programs and measure categories, based on the first year annual savings of the measures.

Table 17. Summary of kWh, kW, and Therm Savings by WPS Program - First Year Annual

Program Name	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings Included In The Focus on Energy Calendar Year 2011 Evaluation Report)									
Residential Programs									
Multi-Family Bundle Bonus	201,427	20	20,671	201,479	20	20,837	129,540	14	11,589
Heating Equipment Bonus	1,968,830	451	108,980	1,968,830	451	113,214	748,155	171	82,652
Home Performance With ENERGY STAR Bonus	140,197	77	106,847	139,698	77	112,211	106,445	54	91,027
Total Territory-Wide Residential First Year Savings	*2,310,454*	*547*	*236,498*	*2,310,007*	*547*	*246,262*	*984,141*	*239*	*185,268*
Non-Residential Programs									
Non-Residential Bundle Bonus	11,184,025	1,850	256,535	10,525,737	2,617	170,780	6,407,274	1,514	86,982
Renewable Energy Bonus	3,842,477	454	-	3,317,435	454	-	1,127,223	147	-
Total Territory-Wide Non-Residential First Year Savings	*15,026,502*	*2,304*	*256,535*	*13,843,171*	*3,071*	*170,780*	*7,534,497*	*1,661*	*86,982*
Total Territory-Wide First Year Savings	**17,336,956**	**2,851**	**493,033**	**16,153,179**	**3,618**	**417,042**	**8,518,637**	**1,900**	**272,249**
Community Pilot Programs (Savings allocated to WPS, Included Only In This Report)									
Allouez	402,375	87	63,026	402,445	86	61,865	326,718	76	60,925
Brillion	158,176	45	23,855	158,459	44	22,775	120,663	37	21,493
Plover	37,667	4	6,759	37,667	4	6,756	35,358	3	6,754
Total Community Pilot First Year Savings	**598,218**	**135**	**93,640**	**598,571**	**133**	**91,396**	**482,739**	**117**	**89,172**
Total WPS Program First Year Savings	**17,935,174**	**2,986**	**586,672**	**16,751,750**	**3,752**	**508,438**	**9,001,376**	**2,017**	**361,421**

Table 18. Residential Summary of kWh, kW, and Therm Savings by Measure Category - First Year Annual

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)									
Residential Programs									
Appliances	2,250	-	125	2,250	-	125	2,250	-	125
Boiler	-	-	67,543	-	-	67,543	-	-	66,208
Building Shell	128,771	75	102,281	128,771	75	107,527	96,042	52	86,226
Controls	27,494	2	-	27,494	2	-	16,324	2	-
Conversion	13,120	1	(525)	12,573	1	(503)	12,573	1	(503)
Furnace	1,971,020	452	45,120	1,971,066	452	49,357	749,005	172	18,756
Hot Water	59,470	7	16,687	59,472	7	16,996	41,613	5	10,537
HVAC	-	-	3,865	-	-	3,814	-	-	2,517
Lighting	105,879	10	-	105,879	10	-	64,423	6	-
Non Energy	-	-	-	-	-	-	-	-	-
Other	800	0	1,402	800	0	1,402	800	0	1,402
Refrigeration	1,650	0	-	1,702	0	-	1,111	0	-
Renewables	-	-	-	-	-	-	-	-	-
Total Territory-Wide Residential First-Year Savings	**2,310,454**	**547**	**236,498**	**2,310,007**	**547**	**246,262**	**984,141**	**239**	**185,268**

Table 19. Non-Residential Summary of kWh, kW, and Therm Savings by Measure Category - First Year Annual

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)									
Non-Residential Programs									
Agriculture	239,764	23	(248)	239,764	21	(155)	163,233	17	(81)
Appliances	85,350	7	-	85,350	6	-	57,044	5	-
Biogas	3,842,477	454	-	3,317,435	454	-	1,127,223	147	-
Boiler	-	-	4,329	-	-	4,545	-	-	1,255
Building Shell	9,125	-	29,790	9,125	-	18,678	6,099	-	9,682
Compressor	128,304	19	-	112,871	15	-	67,565	9	-
Controls	624,259	114	19,500	624,259	105	20,475	373,441	64	5,655
Conversion	3,000	15	(107)	3,000	15	(107)	3,000	15	(107)
Energy Recovery	356,293	38	4,905	356,058	36	4,903	236,772	27	4,896
Food Service	15,170	3	6,305	15,170	2	3,953	10,139	2	2,049
Greenhouse	-	-	1,340	-	-	840	-	-	436
Hot Water	90,388	22	4,904	90,388	21	3,075	60,411	17	1,594
HVAC	2,414,636	464	169,776	1,913,183	1,324	102,535	765,273	591	53,511
Industrial	1,500,388	161	-	1,294,835	126	-	760,697	68	-
IT	171,600	-	-	171,600	-	-	114,690	-	-
Laundry	(2,413)	-	3,669	(2,413)	-	2,319	(1,613)	-	1,195
Lighting	2,991,350	491	-	2,991,446	454	-	1,815,948	283	-
Motors & Drives	1,653,253	268	(91)	1,715,602	265	(57)	1,112,494	195	(30)
Other	794,491	209	3,898	794,491	209	3,898	794,491	209	3,898
Pools	-	-	7,300	-	-	4,577	-	-	2,373
Refrigeration	44,591	4	-	49,658	4	-	27,661	2	-
Renewables	31,651	14	1,265	31,651	14	1,300	25,305	11	655
Scheduling	24,771	-	-	22,748	-	-	10,540	-	-
Service	8,054	-	0	6,951	-	0	4,083	-	0
Total Territory-Wide Non-Residential First-Year Savings	**15,026,502**	**2,304**	**256,535**	**13,843,171**	**3,071**	**170,780**	**7,534,497**	**1,661**	**86,982**
Total Territory-Wide First Year Savings	**17,336,956**	**2,851**	**493,033**	**16,153,179**	**3,618**	**417,042**	**8,518,637**	**1,900**	**272,249**

Table 20. Community Pilot Summary of Reported Gross kWh, kW, and Therm Savings by Measure Category – First Year Annual

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Community Pilot Programs (Savings Allocated To WPS, Included Only In This Report)									
Appliances	3,609	-	-	3,609	-	-	2,412	-	-
Boiler	-	-	2,496	-	-	2,496	-	-	2,496
Building Shell	81,261	54	57,417	81,261	54	57,190	81,261	54	57,007
Controls	28,256	1	-	28,256	1	-	16,903	0	-
Food Service	8,412	2	-	8,412	2	-	5,622	1	-
Furnace	90,520	21	2,480	90,520	21	2,531	78,300	18	2,164
Hot Water	3,044	(1)	25,757	3,044	(1)	23,689	359	(1)	22,015
HVAC	2,048	4	-	2,048	4	-	2,048	4	-
Lighting	227,728	38	-	227,789	36	-	168,812	27	-
Motors & Drives	62,062	7	-	62,062	7	-	41,480	5	-
Non Energy	-	-	-	-	-	-	-	-	-
Other	65,880	-	5,490	65,880	-	5,490	65,880	-	5,490
Refrigeration	1,786	0	-	2,079	0	-	1,059	0	-
Renewables	23,612	10	0	23,612	10	0	18,603	8	0
Total Community Pilot First Year Savings	**598,218**	**135**	**93,640**	**598,571**	**133**	**91,396**	**482,739**	**117**	**89,172**
Total WPS Program First Year Savings	**17,935,174**	**2,986**	**586,672**	**16,751,750**	**3,752**	**508,438**	**9,001,376**	**2,017**	**361,421**

Table 21. Summary of Total Reported Reported Gross kWh, kW, and Therm Savings– First Year Annual

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Total Territory-Wide Residential First-Year Savings	**2,310,454**	**547**	**236,498**	**2,310,007**	**547**	**246,262**	**984,141**	**239**	**185,268**
Total Territory-Wide Non-Residential First-Year Savings	**15,026,502**	**2,304**	**256,535**	**13,843,171**	**3,071**	**170,780**	**7,534,497**	**1,661**	**86,982**
Total Territory-Wide First Year Savings	**17,336,956**	**2,851**	**493,033**	**16,153,179**	**3,618**	**417,042**	**8,518,637**	**1,900**	**272,249**
Total Community Pilot First Year Savings	**598,218**	**135**	**93,640**	**598,571**	**133**	**91,396**	**482,739**	**117**	**89,172**
Total WPS Program First Year Savings	**17,935,174**	**2,986**	**586,672**	**16,751,750**	**3,752**	**508,438**	**9,001,376**	**2,017**	**361,421**

Lifecycle Savings

Table 22 through Table 26 summarize the verified electricity, peak demand, and gas savings for all WPS programs and measure categories, based on the lifecycle savings of the measures.

Table 22. Summary of Verified kWh, kW, and Therm Savings by WPS Program – Lifecycle

Program Name	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings Included In The Focus On Energy Calendar Year 2011 Evaluation Report)									
Residential Programs									
Multi-Family Bundle Bonus	1,611,416	20	165,366	1,611,833	20	166,692	1,036,319	14	92,713
Heating Equipment Bonus	25,594,790	451	1,864,180	25,594,790	451	1,919,226	9,726,020	171	1,521,914
Home Performance with ENERGY STAR Bonus	3,500,545	77	2,671,055	3,487,986	77	2,805,156	2,659,437	54	2,275,624
Total Territory-Wide Residential Lifecycle Savings	*30,706,751*	*547*	*4,700,601*	*30,694,609*	*547*	*4,891,074*	*13,421,776*	*239*	*3,890,251*
Non-Residential Programs									
Non-Residential Bundle Bonus	145,170,815	1,850	3,880,091	136,247,035	2,617	2,572,756	81,877,691	1,514	1,295,496
Renewable Energy Bonus	57,637,155	454	-	49,761,519	454	-	16,908,341	147	-
Total Territory-Wide Non-Residential Lifecycle Savings	*202,807,970*	*2,304*	*3,880,091*	*186,008,554*	*3,071*	*2,572,756*	*98,786,031*	*1,661*	*1,295,496*
Total Territory-Wide Lifecycle Savings	**233,514,721**	**2,851**	**8,580,692**	**216,703,163**	**3,618**	**7,463,830**	**112,207,807**	**1,900**	**5,185,746**
Community Pilot Programs (Savings Allocated To WPS, Included Only In This Report)									
Allouez	6,055,708	87	1,519,832	6,056,121	86	1,505,902	5,100,840	76	1,494,624
Brillion	2,061,050	45	547,056	2,064,449	44	532,561	1,636,011	37	515,530
Plover	605,999	4	168,634	605,999	4	168,598	588,250	3	168,569
Total Community Pilot Lifecycle Savings	**8,722,756**	**135**	**2,235,521**	**8,726,568**	**133**	**2,207,061**	**7,325,102**	**117**	**2,178,723**
Total WPS Program Lifecycle Savings	**242,237,477**	**2,986**	**10,816,213**	**225,429,731**	**3,752**	**9,670,891**	**119,532,909**	**2,017**	**7,364,469**

Table 23. Residential Summary of kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings included in the Focus on Energy Calendar Year 2011 Evaluation Report)									
Residential Programs									
Appliances	18,000	-	1,000	18,000	-	1,000	18,000	-	1,000
Boiler	-	-	1,330,502	-	-	1,330,502	-	-	1,319,821
Building Shell	3,174,497	75	2,546,825	3,174,497	75	2,677,987	2,369,939	52	2,151,159
Controls	219,952	2	-	219,952	2	-	130,588	2	-
Conversion	328,000	1	(13,125)	314,333	1	(12,566)	314,333	1	(12,566)
Furnace	25,645,160	452	587,160	25,646,214	452	642,274	9,745,561	172	244,064
Hot Water	440,910	7	149,272	440,964	7	155,925	299,079	5	104,057
HVAC	-	-	63,917	-	-	60,903	-	-	47,667
Lighting	847,032	10	-	847,032	10	-	515,385	6	-
Non Energy	-	-	-	-	-	-	-	-	-
Other	20,000	0	35,050	20,000	0	35,050	20,000	0	35,050
Refrigeration	13,200	0	-	13,617	0	-	8,890	0	-
Renewables	-	-	-	-	-	-	-	-	-
Total Territory-Wide Residential Lifecycle Savings	**30,706,751**	**547**	**4,700,601**	**30,694,609**	**547**	**4,891,074**	**13,421,776**	**239**	**3,890,251**

Table 24. Non-Residential Summary of kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Territory-Wide Programs (Savings included in the Focus on Energy Calendar Year 2011 Evaluation Report)									
Non-Residential Programs									
Agriculture	2,637,404	23	(2,725)	2,637,404	21	(1,708)	1,795,560	17	(886)
Appliances	1,024,200	7	-	1,024,200	6	-	684,531	5	-
Biogas	57,637,155	454	-	49,761,519	454	-	16,908,341	147	-
Boiler	-	-	64,934	-	-	68,181	-	-	18,831
Building Shell	173,375	-	566,010	173,375	-	354,888	115,876	-	183,953
Compressor	1,411,344	19	-	1,241,582	15	-	743,219	9	-
Controls	7,491,111	114	292,500	7,491,111	105	307,125	4,481,290	64	84,825
Conversion	36,000	15	(1,284)	36,000	15	(1,284)	36,000	15	(1,284)
Energy Recovery	3,940,215	38	54,036	3,936,688	36	54,017	2,613,080	27	53,901
Food Service	182,040	3	75,660	182,040	2	47,439	121,668	2	24,590
Greenhouse	-	-	23,224	-	-	14,561	-	-	7,548
Hot Water	1,084,656	22	58,852	1,084,656	21	36,900	724,937	17	19,127
HVAC	36,219,540	464	2,546,634	28,697,746	1,324	1,538,031	11,479,098	591	802,671
Industrial	16,504,268	161	-	14,243,183	126	-	8,367,664	68	-
IT	2,059,200	-	-	2,059,200	-	-	1,376,281	-	-
Laundry	(28,956)	-	44,028	(28,956)	-	27,823	(19,353)	-	14,343
Lighting	34,969,006	491	-	34,969,486	454	-	21,051,359	283	-
Motors & Drives	26,452,048	268	(1,456)	27,449,634	265	(913)	17,799,900	195	(473)
Other	9,533,892	209	46,776	9,533,892	209	46,776	9,533,892	209	46,776
Pools	-	-	87,600	-	-	54,925	-	-	28,470
Refrigeration	535,092	4	-	595,893	4	-	331,932	2	-
Renewables	633,020	14	25,300	633,020	14	25,992	506,110	11	13,104
Scheduling	297,252	-	-	272,979	-	-	126,480	-	-
Service	16,108	-	2	13,901	-	2	8,167	-	1
Total Territory-Wide Non - Residential Lifecycle Savings	**202,807,970**	**2,304**	**3,880,091**	**186,008,554**	**3,071**	**2,572,756**	**98,786,031**	**1,661**	**1,295,496**
Total Territory-Wide Lifecycle Savings	**233,514,721**	**2,851**	**8,580,692**	**216,703,163**	**3,618**	**7,463,830**	**112,207,807**	**1,900**	**5,185,746**

Table 25. Community Pilot Summary of kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported			Verified					
	Gross kWh	Gross s kW	Gross Therms	Gross kWh	Gross kWh	Gross kW	Gross kWh	Gross kW	Gross Therms
Community Pilot Programs (Savings allocated to WPS, included only in this Report)									
Appliances	43,308	-	-	43,308	-	-	28,945	-	-
Boiler	-	-	62,400	-	-	62,400	-	-	62,400
Building Shell	2,031,525	54	1,431,777	2,031,525	54	1,427,468	2,031,525	54	1,423,979
Controls	339,072	1	-	339,072	1	-	202,838	0	-
Food Service	100,944	2	-	100,944	2	-	67,467	1	-
Furnace	1,176,760	21	32,240	1,176,760	21	32,900	1,017,897	18	28,138
Hot Water	(29,161)	(1)	571,854	(29,161)	(1)	547,043	(61,380)	(1)	526,955
HVAC	40,960	4	-	40,960	4	-	40,960	4	-
Lighting	1,885,681	38	-	1,885,984	36	-	1,301,403	27	-
Motors & Drives	992,992	7	-	992,992	7	-	663,673	5	-
Non Energy	-	-	-	-	-	-	-	-	-
Other	1,647,000	-	137,250	1,647,000	-	137,250	1,647,000	-	137,250
Refrigeration	21,434	0	-	24,944	0	-	12,706	0	-
Renewables	472,240	10	-	472,240	10	-	372,068	8	-
Total Community Pilot Lifecycle Savings	**8,722,756**	**135**	**2,235,521**	**8,726,568**	**133**	**2,207,061**	**7,325,102**	**117**	**2,178,723**
Total WPS Program Lifecycle Savings	**242,237,477**	**2,986**	**10,816,213**	**225,429,731**	**3,752**	**9,670,891**	**119,532,909**	**2,017**	**7,364,469**

Table 26. Summary of Total kWh, kW, and Therm Savings by Measure Category – Lifecycle

Measure Category	Reported			Verified					
	Gross kWh	Gross kW	Gross Therms	Gross kWh	Gross kW	Gross Therms	Net kWh	Net kW	Net Therms
Total Territory-Wide Residential First-Year Savings	**30,706,751**	**547**	**4,700,601**	**30,694,609**	**547**	**4,891,074**	**13,421,776**	**239**	**3,890,251**
Total Territory-Wide Non-Residential First-Year Savings	**202,807,970**	**2,304**	**3,880,091**	**186,008,554**	**3,071**	**2,572,756**	**98,786,031**	**1,661**	**1,295,496**
Total Territory-Wide First Year Savings	**233,514,721**	**2,851**	**8,580,692**	**216,703,163**	**3,618**	**7,463,830**	**112,207,807**	**1,900**	**5,185,746**
Total Community Pilot First Year Savings	**8,722,756**	**135**	**2,235,521**	**8,726,568**	**133**	**2,207,061**	**7,325,102**	**117**	**2,178,723**
Total WPS Program First Year Savings	**242,237,477**	**2,986**	**10,816,213**	**225,429,731**	**3,752**	**9,670,891**	**119,532,909**	**2,017**	**7,364,469**

Program Cost-Effectiveness

As explained above, the CY 2011 WPS Territory-Wide programs consisted of bonus measures that were based on Focus on Energy programs and measures. To determine the cost-effectiveness of the WPS Territory-Wide programs, the Evaluation Team conducted a benefit-cost analysis to determine the savings, benefits, and costs of all WPS Territory-Wide measures and of the Focus on Energy measures that provided the basis for the WPS bonus measures.[1]

In the current quadrennial cycle, the Program Administrator, with PSC approval, has elected to use a cost-effectiveness calculator for program-planning purposes. It is critical that planning and evaluation approaches are consistent so that program performance can be effectively compared to expectations. Therefore, the Evaluation Team used the same calculator for its evaluation.

The Benefit Cost (B/C) Test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. The B/C Test is based upon the Total Resource Cost (TRC) Test, which is commonly administered in the energy industry to account for the avoided cost of supplying the displaced energy against the program and participant costs. For this evaluation, the TRC test has been applied to determine the cost-effectiveness of the WPS Territory-Wide programs from a regulatory perspective.

The TRC Test measures the net costs of an energy-efficiency program as a resource option based on the total program costs, both to participants and to Focus on Energy. The TRC test measures the net direct economic impact on a population (e.g., a utility service territory, county, or political districts).

The TRC is essentially the ratio of program benefits to program costs. A value greater than one translates into a program or portfolio of programs that is cost-effective (net benefits are positive). Conversely, a value less than one is not cost-effective (net benefits are negative). From a TRC perspective, a conservation measure or practice fails the test if the net benefit is negative (i.e., the costs of achieving the savings outweigh the value of the savings achieved). The equation used for the TRC is as follows:

$$TRC = \frac{(Value\ of\ Net\ Saved\ Energy + Value\ of\ Avoided\ Emissions)}{(Program\ Costs\ Exclusive\ of\ Incentives + Net\ Incremental\ Measure\ Cost)}$$

These inputs to the TRC ratio are discussed in more detail below.

Value of Net Saved Energy: The value of energy saved or displaced can be defined as the net energy saved multiplied by the utility's avoided cost of the saved energy. In the case of energy efficiency and renewable resource programs, avoided cost is the incremental (or marginal) cost to an electric or gas utility for the additional energy and capacity required should the utility have to generate or purchase that energy from another source rather than pay for the efficient measure that offsets this demand.

[1] This approach was used because the available data for 2011 was insufficient to determine incremental participation due to the WPS-specific activities.

For the 2011 evaluation, the Team used the avoided costs from generation-level costs on the Midwest Independent Transmission System Operator (MISO) forward-looking capacity market Locational Marginal Prices (LMP). Avoided costs were inflated from average 2009 dollars to 2011 dollars based on an inflation rate of 2.5%.

The avoided costs are held constant over the forecasted time period and the present value of the stream of benefits are discounted back to the base year (2011) at a rate of 2%. The energy savings are decreased by the conventional attribution factor of net-to-gross to derive net savings. Net savings are then increased by the line loss factor of eight percent (8%) to account for distribution losses.

Table 27 shows the 2011 avoided cost assumptions that were used for the cost-effectiveness tests.

Table 27. Avoided Cost

	2011 Report
Electric Energy ($/kWh)	0.04127
Electric Capacity ($/kW)	114.3
Gas ($/therms)	1.0005
Avoided Cost Inflation	0%
Real Discount Rate	2%
Line Loss	8%

Emissions Benefits: The emissions benefits require three key parameters: net energy savings, emissions factors, and the value of the reduced emissions. Emissions factors are simply the rate at which the criteria pollutants are emitted per unit of energy and are most often expressed in tons of pollutant per energy unit (tons/MWh for electric and tons/MThm for gas).

The product of the emissions factor and the net energy savings is the total weight of air pollutant offset or avoided by the program. The product of the total tonnage of pollutant saved and the dollar value of the reduced emissions per ton is therefore the avoided emissions benefit.

The electric and gas emission factors were derived from the 2010 Evaluation Report and were originally detailed in the report *Focus on Energy Evaluation Emission Factors Update*.[2] The emissions factors and allowance prices are shown in Table 28 below.

Table 28. Emission Factors and Allowance Price

Service Fuel Type	CO2	NOx	SO2
Electric Emissions Factor (Tons/ MWh)	0.9005	0.0013	0.0019
Gas Emission Factor (Tons / MThm)	5.85		
Allowance Price ($ / Ton)	$30.00	$15.89	$2.12

[2] PA Consulting Group, December 22, 2009

The 2011 nitrogen oxides (NOx) and sulfur dioxide (SO2) emission allowance prices were collected from the Energy Information Administration (EIA).[3] Due to the continued decline in and uncertainty surrounding forecasted NOx and SO2 allowance prices, the forecasted values remained constant at 2011 values. The CO2 emission price was derived from the PSC's order in docket 5-GF-191, Electronic Regulatory Filing System reference number 137513, which states: "A levelized carbon value of $30 per ton shall be used in the benefit/cost modeling of energy efficiency programs."

Table 29 shows total program level emission benefits.

Table 29. Program Emission Benefits

	Total
2011 Emissions Benefits	$13,149,903

Program Costs: The program costs represent all costs associated with running the efficiency and renewables programs (including administration and delivery costs). Incentive costs are not included as program costs as they are deemed transfer payments. The 2011 program costs were provided to the Evaluation Team from the fiscal agent Wipfli.

Table 30 shows the 2011 program and incentive cost values used for the cost effectiveness tests.

Table 30. Program Cost

Cost Category	Cost
Incentive Costs	$10,487,915
Administrative Costs	$1,598,811
Delivery Costs	$4,495,352
Total Non-Incentive Program Costs	**$6,094,163**

Incremental Costs: The gross incremental costs are the additional costs incurred by participants as a result of purchasing efficient equipment over and above a baseline non-qualified product. The gross incremental cost values used in this evaluation were derived from the *Focus on Energy Benefit-Cost Analysis CY09 Evaluation Report* with the notable exception of renewable-based measures.

Similar to the 2010 evaluation effort, the renewable energy projects received actual project cost values from the program tracking databases. The gross incremental costs, similar to the energy savings values used in the cost-effectiveness tests, required the application of attribution factors to account for freeridership. The values for attribution factors, namely the NTG ratios, were derived from the 2010 evaluation and carried forward to the 2011 evaluation on a measure-by-measure basis.

[3] From the Energy Information Administration: http://www.eia.gov/todayinenergy/detail.cfm?id=4830

Table 31 shows the 2011 total measure gross incremental costs used for the cost effectiveness tests.

Table 31. Gross Incremental Measure Cost

	Costs
Net Incremental Costs	$20,003,757

In 2012, the Evaluation Team will be conducting an analysis of the relative impacts of using the cost-effectiveness calculator that the Program Administrator has used to determine program design. The Team will also analyze the current approaches to working with the tool to assess any systematic differences compared to other commonly used approaches.

The cost-effectiveness results for 2011 are shown in Table 32.

Table 32. WPS Program TRC Test Inputs and Final Benefit-Cost Ratio

Electric Benefits	Gas Benefits	Emission Benefits	Program Costs[4]	Incentive Costs	Incremental Measure Costs	TRC Net Benefits	TRC B/C Ratio
$25,594,214	$15,251,613	$13,149,903	$6,094,163	$10,487,915	$20,003,757	$27,897,810	2.07

For additional details on the processes used for calculating the cost-effectiveness of the Focus on Energy portfolio, refer to the *Benefit-cost Analysis: CY09* report available on the Website (focusonenergy.com).[5]

[4] Program administrative costs were obtained from the Focus on Energy Fiscal Agent, Wipfli

[5] Focus on Energy Benefit-Cost Analysis CY09 Evaluation Report. Submitted by PA Consulting Group and KEMA, Inc. Submitted to Public Service Commission of Wisconsin. Final: November 24, 2009. http://www.focusonenergy.com/files/Document_Management_System/Evaluation/bcanalysiscy09_evaluationreport.pdf

APPENDIX A. GLOSSARY OF TERMS

Below is a table of commonly used industry terms.

Term	Definition
Attribution	The establishment of a causal relationship between action(s) taken by a group and an outcome.
Avoided Costs	Costs avoided by the implementation of an energy-efficiency measure, program, or practice. These costs generally include generation or distribution costs.
Baseline	Conditions (including energy consumption) that would have occurred without implementation of the subject measure or project.
Benefit-Cost Ratio	Mathematical relationship between the benefits and costs associated with the implementation of energy-efficiency measures, programs, practices, or emissions reductions.
Claimed Savings	Energy savings reported by the administrator or implementer, before being verified by the evaluation team. (These are also called "reported savings" or "tracked savings.")
Coefficient of Variance (CV)	The mean of a sample (average) divided by its standard error.
Cost-Effectiveness	Indicator of relative performance or economic attractiveness associated with the implementation of energy-efficiency measures, programs, practices, or emissions reductions.
Custom Savings	Savings for non-prescriptive measures that are calculated by a program implementer or administrator at the time of project completion. The result reflects the savings for the specific project based on pre-installation and post-installation energy use.
Deemed Savings	An estimate of energy, demand, or gas savings for a single unit of an installed energy-efficient measure. Savings are developed from data sources and analytical methods that are: (1) widely considered acceptable for the measure and purpose, and (2) applicable to the situation being evaluated.
Ex Ante Savings Estimate	Forecasted savings used for program and portfolio planning purposes.
Ex Post Evaluation	An assessment of the impact(s) of an activity after completion.
Estimated Saving	Savings estimates reported by an evaluator after the energy impact evaluation has been completed.
Freeridership	Savings achieved by program participants that would have been achieved even in the absence of the program. Freeridership can be full, partial or deferred. Partial freeridership means that some of the savings are a result of the program. Deferred free ridership means savings that would have happened at a different time.
Gross Savings	Change in energy consumption and/or demand that directly results from program related actions taken by participants in an efficiency program, regardless of whether they participated and unadjusted by any factors.

Interactive Effects	The influence in energy use between one technology application and the energy required to operate another application.
Locational Marginal Prices (LMP)	The value of energy at a specific location at the time that it is delivered
Life cycle Savings	Energy savings—expressed either as verified gross or verified net—that are generated in the current program cycle. Savings incorporate annual savings and each measure's estimated useful life.
Lifetime Savings	Energy savings—expressed as either verified gross or verified net—that are produced as a result of measures installed in the current program cycle and in the previous program cycle(s), provided the reporting period is within the measure's useful life. Savings incorporate annual savings and each measure's estimated useful life.
Market Effects	Changes in marketplace practices, services, and promotional efforts that induce businesses and consumers to buy energy-saving products and services without direct program assistance. In evaluation, these effects are generally considered as a result of program impacts on the market.
Measure Life	The life of an energy consuming measure, including its equipment life and measure persistence.
Net Savings	Savings "net" of what would have occurred in the program's absence. (These are the observed impacts attributable to the program.) The savings are typically calculated by applying the net-to-gross ratio to the gross verified savings.
Net-to-Gross (NTG)	The ratio of the verified net to the verified gross savings.
Non-Energy Benefits (NEBs)	An array of valued attributes derived from energy-efficient measures in addition to energy savings, such as increased property value or reduced water usage.
Participant Spillover	Participants who, after an initial program experience, go on to adopt more energy saving products or practices without program assistance.
Persistent Savings	Energy savings (expressed as verified net) that are life cycle impacts and include an exponential decay rate, such that half the savings remain after the measure life.
Precision	The degree to which repeated measurements under unchanged conditions produce the same results.
Realization Rate	Ratio of gross savings to verified gross savings.
Reported Savings	Energy savings as reported by the administrator or implementer, before being verified by the evaluation team. Also referred to as tracked savings or claimed savings.
Spillover	Savings as a result of Participant Spillover or as a result of customers making energy efficiency upgrades without taking advantage of program benefits.
Standard Error	A measure of the variability in a data sample, how far a "typical" data point is from the mean of a sample.
Total Resource Cost Test	A test that counts the avoided cost of supplying the displaced energy against the program and participant costs.

Tracked Savings	Energy savings as reported by the administrator or implementer, before being verified by the evaluation team. (These are also called "reported savings" or "claimed savings.")
Unclaimed Rewards	Customers who fail to submit the paperwork to claim program incentives.
Verified Gross Savings	Energy savings verified by an independent evaluation team based on reviews of the number and types of implemented improvements and the engineering calculations used to estimate the energy saved. Verified gross savings reflect the total calculated savings, without considering the influence of freeriders or spillover.
Verified Net Savings	Energy savings that can confidently be attributed to program efforts. For verified net savings, the evaluation team makes adjustments for outside influences, such as freeridership and spillover.

APPENDIX B. FOCUS ON ENERGY PROGRAMS

Focus on Energy Home Performance with ENERGY STAR®

WPS Territory-Wide Program: WPS Home Performance Bonus

Program Purpose: The program offered incentives to customers installing specific energy-efficient shell and mechanical measures. The 2011 model of Home Performance with ENERGY STAR (HPwES) was consultant-based, using an independent third party (Home Performance Consultant) to deliver the home energy assessment and a post-test of installed measures.

Target Audience: The target audience was home owners.

Program Implementer: The Program Implementer was WECC.

Process and Associated Measures: The customer was responsible for: (1) contacting a Home Performance Consultant to perform an energy assessment, (2) contacting a contractor to install the recommended measures, and (3) upon completion, contacting the Home Performance Consultant to conduct a post-assessment.

In 2011, this was a consultant-based program that provided incentives for energy-efficient improvements to a home's shell and mechanical measures. Measures installed through the HPwES program in CY 2011 included boilers, building shell measures, domestic hot water measures, and HVAC measures.

Focus on Energy Efficient Heating and Cooling Program

WPS Territory-Wide Program: WPS Heating Equipment Bonus

Program Purpose: This program was developed to provide prescriptive incentives for the purchase of high-efficiency home heating and cooling equipment to replace older and failed units. Incentives were only available for installed equipment noted on a pre-qualified list available from the Focus on Energy Website (focusonenergy.com), which was updated as needed to include new technologies and equipment.

Target Audience: The target audiences were the owners of existing residential buildings with one to three dwelling units. Additionally, the program targeted HVAC contractors.

Program Implementer: The Program Implementer was the WECC.

Focus on Energy Apartment and Condo Efficiency Services (ACES) Whole-Building Existing Program

WPS Territory-Wide Program: WPS Energy Bundle Bonus

Program Purpose: Applying a holistic approach to building energy efficiency, the program designers focused on the common areas and individual living units, with the goals of lowering operating costs and energy bills. To qualify, buildings must have a minimum of four living units within the structure and be served by a utility participating in Focus on Energy.

Target Audience: The target audiences were building owners, managers, and condominium and apartment associations.

Program Implementer: Before May 2011, the Program Implementers were the WECC for prescriptive projects and Franklin for custom projects. As of May 2011, when restructuring of the portfolios began due to a change in Program Administration, Franklin was designated as the exclusive Program Implementer. The main purposes of the change were to streamline the process for customers and to reduce non-incentive costs.

Process and Associated Measures: The ACES Whole-Building Existing Program was communicated and delivered to eligible participants through a Program Implementer and trade allies. The process for customer participation included eligibility verification, a free energy assessment of the building, and the direct installation of energy savings devices in individual living units.

The energy assessment contained a financial analysis of recommended energy-efficiency measures for the building. This assessment provided the building owner with annual energy savings information for each recommended measure and a simple payback that factors contractor costs for each measure.

The associated measures were building envelope improvements, HVAC tune-ups and upgrades, appliances, boilers, water heaters, upgraded common-area lighting, and direct-install measures for individual units. The latter measures included free installation of high-efficiency showerheads, faucet aerators, and compact fluorescent lamps (CFLs).

Focus on Energy Agricultural Sector

WPS Territory-Wide Program: WPS Energy Bundle Bonus

Program Purpose: The program provided support and services to help agricultural and agribusiness customers identify cost-effective energy-efficiency and renewable energy measures. Incentives assisted these customers to install measures.

Target Audience: The target audiences were owners and operators of large farms and rural businesses, especially dairy, livestock, grain drying, and greenhouse facilities, and other agribusinesses.

Program Implementer: The Program Implementer was GDS Associates, Inc.

Process and Associated Measures: The Program Implementer staff reached out to eligible customers to identify energy-saving opportunities and lead the customer through the incentive application process.

The program offered prescriptive and custom incentives to eligible customers including, but not limited to, the following measures:

- Low-energy livestock waterers
- Lighting
- Fans
- Milk pre-coolers (plate coolers)
- Heat recovery tanks
- Scroll compressor replacements
- Commercial water heaters
- Variable speed controllers for vacuum pumps
- Agricultural irrigation systems
- Fans and unit heaters for greenhouses
- Greenhouse climate controls, thermal curtains, and glazing

Focus on Energy Commercial Sector

WPS Territory-Wide Program: WPS Energy Bundle Bonus

Program Purpose: Although all commercial customers were elgible for this program, Focus identified large commercial facilities as having significant opportunties for reducing energy use.

Target Audience: The target audiences were as follows: Large commercial facilities that purchase natural gas and/or electricity from a participating utility. The program specifically targeted businesses in the sectors of hospitality (restaurants and lodging), healthcare, grocery, and office buildings larger than 100,000 SF.

Program Implementer: The Program Implementer was Franklin Energy Services.

Process and Associated Measures:The PI worked with eligible building owners, managers, tenants, and other parties to: (1) identify energy-saving opportunities, and (2) lead the customer through the incentive application process.

The associated measures were all non-residential systems offering opportunities for energy efficiency such as, HVAC, lighting, commercial refrigeration, and information systems.

Focus on Energy Industrial Sector

Program Purpose: Focus identified the industrial sector as a target market because of the tremendous opportunity for energy savings achievable through equipment and process upgrades.

Target Audience: The target audiences were all industrial facilities that received electricity and/or natural gas from a participating utility. Special efforts were made to target the following facilities: pulp and paper; food processing, metal casting; plastics; and water/wastewater.

Program Implementer: The Program Implementer was SAIC.

Process and Associated Measures: The PIs who worked with building owners, managers, and other staff to (1) identify opportunities for savings at the facilities and (2) lead the customers through the incentive application process.

Incentives were offered for prescriptive non-residential energy-efficiency projects and custom energy-efficiency projects such as all Focus on Energy prescriptive non-residential incentives and custom incentives such as HVAC, lighting, motors and drives, and compressed air.

Focus on Energy Schools and Government Sector

Program Purpose: The Schools and Government Sector program provided support and services to help school and government and rural business customers identify cost-effective, energy-efficiency and renewable energy measures. Incentives assisted these customers to install measures.

Target Audience: The target audiences were schools and government-sector entities, specifically: K-12 public and private schools, private colleges, universities and technical schools, and all government buildings.

Program Implementer: The Program Implementer was CESA 10 (Cooperative Educational Service Agency 10).

Process and Associated Measures: Program staff worked with the decision making bodies (boards and committees) to encourage efficiency upgrades at these facilities and lead them through the incentive application process.

Incentives were offered for prescriptive and custom energy-efficiency projects such as, HVAC, lighting, information systems, and food service systems.

Focus on Energy Non-Residential Renewable Energy Program

WPS Territory-Wide Program: WPS Renewable Energy Bonus

Program Purpose: The program offered prescriptive and custom incentives for renewable energy projects. Incentives were tiered for certain projects, with the higher tier offered to customers who met a defined level of efficiency before installing the renewable project. This efficiency could be achieved through participation in another Focus program or by achieving a prescribed benchmark.

Target Audience: The target audience was all non-residential customers.

Program Implementer: Because this is not a stand-alone program, it was implemented by all of the sector implementers.

Process and Associated Measures: The program offered prescriptive and custom incentives to all non-residential customers. Targeted measure categories were as follows:

- Photovoltaic (PV)
- Solar hot water
- Wind
- Biomass
- Biogas

APPENDIX C. LIST OF MEASURES BY MEASURE CATEGORY

This appendix breaks down the Cadmus-defined measure group into measure categories and measure descriptions.

WPS Territory-Wide Programs			
Program Name	Cadmus Group	Cadmus Category	Measure Description
HPwES Bonus	Boiler	Boiler Equipment	Boiler
	Building Shell	Building Shell	Air Sealing
			Attic Insulation
			Building Shell
			Floor Insulation
			Foundation Insulation
			Kneewall
			Sidewall Insulation
			Sill Box Insulation
	Conversion	Conversion	Water Heater - Fuel Switch
	Furnace	Furnace	Furnace
	Hot Water	Hot Water	Water Heater
	HVAC	HVAC	Chimney Liner
			Exhaust Fan
			Ventilation
			Water Heater
	Non Energy	Non Energy	Referral
	Other	Bonus	EPS
		Other	Affordable Housing - Existing Homes
			Assessment-Post
			Assessment-Pre
			Facilitation
			Performance Test - Blower Door
			Performance Test - Blower Door & CO
			Priority Measures
			Rater Coupon
			Rating-Post
			Rating-Pre
			Referral
			Training
			WPS HP Bonus
Heating Equipment Bonus	Boiler	Boiler Equipment	Boiler
	Furnace	Furnace	Furnace

WPS Territory-Wide Programs			
Program Name	Cadmus Group	Cadmus Category	Measure Description
MF Bundle Bonus	Building Shell	Building Shell	WPS Air Sealing
			WPS Bundled Measures
	Controls	Lighting Controls	Lighting Occupancy Sensors & LED - Prescriptive
	Hot Water	Hot Water	WPS Bundled Measures
			WPS Stipulation - Energy Bundle
	HVAC	HVAC	WPS Bundled Measures
	Lighting	CFL	WPS Stipulation - Energy Bundle
		Lighting	WPS Bundled Measures
	Other	Bonus	Other
		Other	Bonus
	Renewables	Solar Electric	Photovoltaics
Non-Res Bundle Bonus	Agriculture	Agriculture	Livestock Waterer
			Pasteurization
	Appliances	Dishwasher	Dishwasher, Commercial
			Dishwasher, Residential
		Vending, Plug Loads	Controls
	Boiler	Boiler Equipment	Boiler
	Building Shell	Building Shell	Air Sealing
			Insulation
	Compressor	Compressor Equipment	Compressor
	Controls	Boiler Controls	Controls
		Lighting Controls	Controls
	Conversion	Conversion	Fuel Switching
	Energy Recovery	Energy Recovery	Energy Recovery
			Heat Exchanger
	Food Service	Food Service	Fryer
			Oven
			Steamer
	Greenhouse	Greenhouse	Greenhouse
	Hot Water	Hot Water	Fuel Switching
			Water Heater
	HVAC	HVAC	Chiller
			Controls
			Dampers / Shutters
			Fan
			Furnace
			Infrared Heater
			Other
			Packaged Terminal Unit (PTAC, PTHP)
			Tune-up / Repair / Commissioning

WPS Territory-Wide Programs			
Program Name	Cadmus Group	Cadmus Category	Measure Description
	Industrial	Aeration System	Aeration
	IT	IT	Computer Management
	Laundry	Laundry	Other
	Lighting	CFL	Fluorescent, Compact (CFL)
		High Intensity Discharge (HID)	High Intensity Discharge (HID)
		LED Lighting	Light Emitting Diode (LED)
		Lighting	Delamping
			Induction
			Other
			Reconfigure Equipment
		T8/T5 Fluorescent Lighting	Fluorescent, Linear
	Motors & Drives	Motors & Drives	Motor
			Variable Speed Drive
	Other	Bonus	Other
		Other	Other
			Scheduling
			Scholarship
			Study
	Pools	Pools	Other
	Refrigeration	Refrigeration	Other
			Refrigerated Case Door
			Refrigerator / Freezer - Commercial
			Refrigerator / Freezer - Residential
	Renewables	Solar Electric	Photovoltaics
		Solar Thermal	Solar Thermal
	Scheduling	Scheduling	Scheduling
	Service	Boiler Service	Tune-up / Repair / Commissioning
		Compressor Service	Tune-up / Repair / Commissioning
Renewable	Biogas	Biogas	Biogas
	Renewables	Solar Electric	Photovoltaics
		Solar Thermal	Solar Thermal

Community Pilot Programs (All Programs)		
Cadmus Group	**Cadmus Category**	**Measure Description**
Appliances	Vending, Plug Loads	Controls
Boiler	Boiler Equipment	Boiler
Building Shell	Building Shell	Air Sealing
		All Insulation Types
		Attic
		Existing
		Floor
		Foundation
		Insulate Existing Exhaust
		Insulation
		New
		Rater Coupon
		Rating-Post
		Rating-Pre
		Revent Existing Exhaust
		Sidewall
		Sill Box
Controls	Lighting Controls	Controls
Food Service	Food Service	Hot Holding Cabinet
		Oven
Furnace	Furnace	Furnace
		Furnace Clean & Tune
Hot Water	Hot Water	Aeration
		Faucet Aerator
		Pre-Rinse Sprayer
		Showerhead
		Water Heater
HVAC	HVAC	Central A/C
		Central A/C Clean & Tune
Lighting	CFL	CFL
		Fluorescent, Compact (CFL)
	LED Lighting	Light Emitting Diode (LED)
	Lighting	Induction
	T8/T5 Fluorescent Lighting	Fluorescent, Linear
Motors & Drives	Motors & Drives	Variable Speed Drive
Non Energy	Non Energy	Assessment-Post
		Contribution Regular

Community Pilot Programs (All Programs)		
Cadmus Group	**Cadmus Category**	**Measure Description**
Other	Bonus	Bonus
	Other	Behavior Change
		Installation Incentive
		Other
Refrigeration	Refrigeration	Refrigerator / Freezer - Commercial
		Tune-up / Repair / Commissioning
Renewables	Solar Electric	Photovoltaics

APPENDIX D. NET-TO-GROSS RATIOS BY MEASURE

The net-to-gross ratios listed in this appendix reflect a MMBtu weighted average across electric energy (kWh) and gas (therms) savings by the Cadmus-defined measure category.

WPS Territory-Wide Programs			
Program Name	Cadmus Group	Cadmus Category	NTG Ratio
HPwES Bonus	Boiler	Boiler Equipment	100%
	Building Shell	Building Shell	80%
	Conversion	Conversion	100%
	Furnace	Furnace	38%
	Hot Water	Hot Water	99%
	HVAC	HVAC	91%
	Non Energy	Non Energy	100%
	Other	Bonus	100%
		Other	100%
Heating Equipment Bonus	Boiler	Boiler Equipment	100%
	Furnace	Furnace	38%
Multi-Family Bundle Bonus	Appliances	Dishwasher	100%
	Boiler	Boiler Equipment	41%
	Building Shell	Building Shell	47%
	Controls	Lighting Controls	59%
	Hot Water	Hot Water	61%
	HVAC	HVAC	44%
	Lighting	CFL	58%
		Lighting	70%
	Other	Bonus	100%
		Other	100%
	Refrigeration	Refrigeration	65%
	Renewables	Solar Electric	100%

WPS Territory-Wide Programs			
Program Name	Cadmus Group	Cadmus Category	NTG Ratio
Non-Res Bundle Bonus	Agriculture	Agriculture	68%
	Appliances	Dishwasher	67%
		Vending, Plug Loads	67%
	Boiler	Boiler Equipment	28%
	Building Shell	Building Shell	52%
	Compressor	Compressor Equipment	60%
	Controls	Boiler Controls	28%
		Lighting Controls	60%
	Conversion	Conversion	100%
	Energy Recovery	Energy Recovery	76%
	Food Service	Food Service	54%
	Greenhouse	Greenhouse	52%
	Hot Water	Hot Water	59%
	HVAC	HVAC	47%
	Industrial	Aeration System	59%
	IT	IT	67%
	Laundry	Laundry	51%
	Lighting	CFL	80%
		High Intensity Discharge (HID)	60%
		LED Lighting	60%
		Lighting	60%
		T8/T5 Fluorescent Lighting	60%
	Motors & Drives	Motors & Drives	65%
	Other	Bonus	100%
		Other	100%
	Pools	Pools	52%
	Refrigeration	Refrigeration	56%
	Renewables	Solar Electric	79%
		Solar Thermal	51%
	Scheduling	Scheduling	46%
	Service	Boiler Service	28%
		Compressor Service	59%
Renewable	Biogas	Biogas	34%
	Renewables	Solar Electric	100%
		Solar Thermal	100%

Community Pilot Programs (All Programs)		
Cadmus Group	**Cadmus Category**	**NTG Ratio**
Appliances	Vending, Plug Loads	67%
Boiler	Boiler Equipment	100%
Building Shell	Building Shell	100%
Controls	Lighting Controls	60%
Food Service	Food Service	67%
Furnace	Furnace	86%
Hot Water	Hot Water	93%
HVAC	HVAC	100%
Lighting	CFL	86%
	LED Lighting	60%
	Lighting	60%
	T8/T5 Fluorescent Lighting	60%
Motors & Drives	Motors & Drives	67%
Non Energy	Non Energy	100%
Other	Bonus	100%
	Other	100%
Refrigeration	Refrigeration	51%
Renewables	Solar Electric	79%