

# State of Wisconsin Department of Administration Division of Energy

Focus on Energy Statewide Evaluation

*Business Programs Impact Evaluation  
Report—Fiscal Year 2006*

Final: March 2, 2007

Evaluation Contractor: PA Government Services Inc.

Prepared by: Miriam L. Goldberg, J. Ryan Barry, Peter LeMoine, and  
Tammy Kuiken; KEMA Inc.



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## 1. EXECUTIVE SUMMARY

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### 1.1 INTRODUCTION

This report presents the results of the Fiscal Year 2006 (FY06) statewide Focus on Energy Business Programs Impact Evaluation. The principal objective of the impact evaluation was to determine the energy and demand savings attributable to the program. The analysis calculates a set of adjustment factors that are used to determine FY06 evaluation verified gross and net energy savings for the statewide Focus on Energy Business Program and Wisconsin Public Service Business Programs.<sup>1</sup> Since the start of the program, the evaluation team has implemented eight rounds of data collection and document review to estimate net energy savings for Business Programs. The general impact evaluation approach has remained consistent using similar methods, protocols, and instruments.

### 1.2 KEY INDICATORS PRESENTED

Overall the Business Programs' achieved kWh, kW, and therm realization rates of 70 percent, 68 percent, and 51 percent, respectively. The realization rate is the ratio of achieved attributable savings to gross reported savings. The increases in the FY06 kWh and kW realization rates compared with FY05 are statistically significant at the 95 percent level of confidence.

- FY06 net verified energy savings amounted to 90,389,205 kWh/year, 18,757 kW/year, and 4,353,232 therms/year for Focus; and 2,286,934 kWh/year, 480 kW/year, and 11,958 therms/year for WPS. These are the energy savings that would not have occurred in the absence of the programs.
- Attribution rates increased dramatically in FY06. Attribution is the fraction of verified gross that is attributable to the program; that is the fraction of verified gross savings that would not have occurred without the program. This includes effects of program attributable energy efficiency measures implemented outside the program, where these effects are well documented. Compared with the previous fiscal year, the FY06 kWh and kW attribution factors increased by 21.8 and 22.4 percentage points, respectively. These increases are largely due to a change in methodology for CFL attribution and an increase in industrial attribution. CFL attribution is now determined using a market-based approach that includes free-ridership and spillover. The increase in industrial attribution may also be partly explained by a methodological change. In FY06, a large portion of industrial savings from prescriptive lighting measures were transferred to Channel Lighting. These projects have a tendency to have lower attribution rates. The increase in the therms attribution factors was not statistically significant at the 95 percent level of confidence.

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<sup>1</sup> The statewide Focus on Energy Business Program and Wisconsin Public Service Business Programs began joint administration in FY06. In this report the joint programs will be referred to as the Business Programs. If program specification is necessary, the statewide Focus on Energy Business Program and Wisconsin Public Service Business Programs will be referred to separately as Focus and WPS, respectively.

## 1. Executive Summary...

- FY06 gross savings adjustment factors for kWh, kW, and therms are 98.5 percent, 97.9 percent, and 96.7 percent, respectively. The gross savings adjustment factor adjusts gross reported savings for installation rates, tracking system data entry errors, and errors in gross savings calculations including corrections to input assumptions. These high results indicate the program is accurately and appropriately calculating and reporting gross energy savings in WATTS.

### 1.2.1 Comparison across Years

Figures 1-1 through 1-3, show the gross savings, attribution and realization rates over time. These charts incorporate eight rounds of impact evaluation data collection (earlier fiscal years received multiple rounds of data collection) going back to the start of the program in April 2001. A cross-hatched bar in the charts indicates the increase or decrease of the adjustment factor compared to the previous fiscal year's result is statistically significant at the 95 percent level of confidence.

The Business Programs have been continuously evolving since inception. Many of these changes have resulted in methodological changes over the years that may have affected the trends in adjustment factors that may not reflect improvements or declines in program effectiveness. Three such changes in FY06 are with regards to CFLs. These changes had a significant effect on the kWh and kW adjustment factors for the Agriculture and Commercial sectors,<sup>2</sup> as well as the Business Programs overall.

1. Energy savings values for CFLs are deemed in FY06. The only potential adjustment for gross savings is based on the quantity of bulbs installed; that is, there is no other engineering adjustment for CFLs. In previous rounds other engineering adjustments have been made, such as, adjustments for actual delta watts and operating hours. The non-deemed methods used last round resulted in Agriculture and Commercial CFL ONLY kWh gross savings adjustment factors of 43 percent and 63 percent, respectively.<sup>3</sup> These were much lower than their non-CFL counterparts. The deemed values were developed with input from evaluation and are based on data collection in prior impact evaluations. Therefore the deeming method has resolved a prior source of discrepancy.
2. The attribution estimation method for CFLs changed in FY06 from one based on self-reported program response to market-based methods. The most current attribution factor calculated by the Residential evaluation team was used for all CFLs. This attribution rate is 100 percent.<sup>4</sup> This is a substantial increase compared to the CFL attribution factors calculated in FY05 with self-reported program response methods. Last round the self-reported program response

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<sup>2</sup> Results by sector and channel are provided in Section 3: Energy Savings Results.

<sup>3</sup> FY05 CFL ONLY kW gross savings adjustment factors for Agriculture and Commercial were 54 percent and 65 percent, respectively.

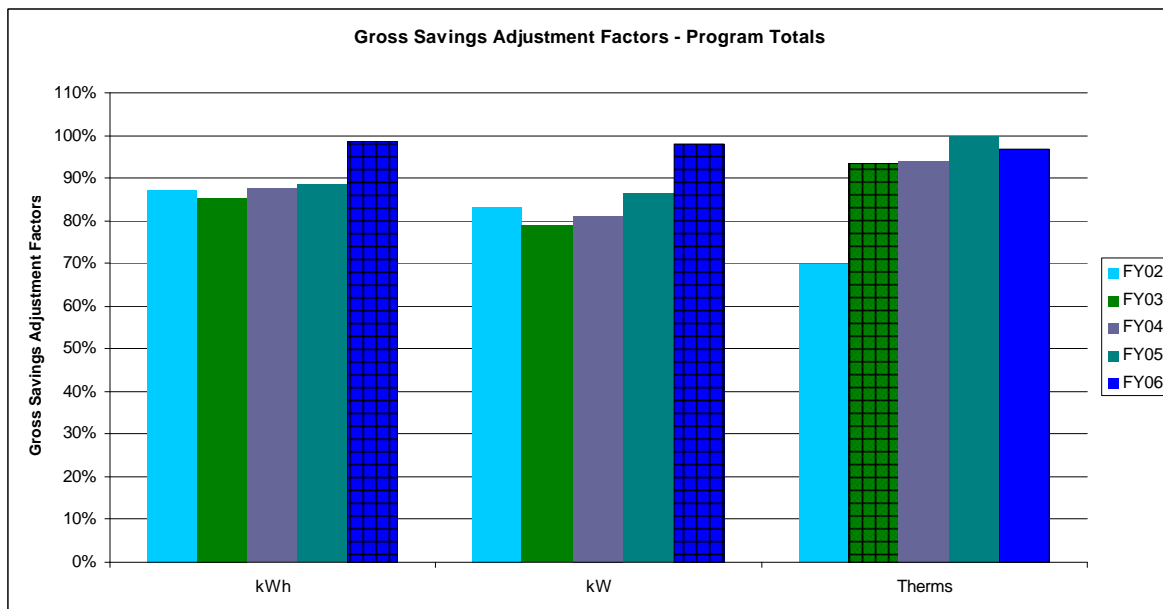
<sup>4</sup> "FY04/05 Net-to-Gross Savings Adjustments for CFLs Rewarded through the ENERGY STAR Products Program," memorandum to Oscar Bloch, Wisconsin DOA, dated January 11, 2006 (Revised Draft).

methods resulted in Agriculture and Commercial CFL ONLY kWh attribution adjustment factors of 69 percent and 57 percent, respectively.<sup>5</sup>

- In FY06 all CFL savings tracked in the Rebate Database are being credited to the Channel Lighting sector. Therefore these CFLs are not used to calculate the adjustment factors for the Agriculture and Commercial sectors.

When the CFL effect is removed; that is, comparing only adjustment factors calculated with only non-CFL measures, there is no statistical difference between FY05 and FY06 gross savings adjustment factors for Agriculture and Commercial. This is also true for three of the four attribution adjustment factors for Agriculture and Commercial. The Agriculture sector's kW attribution adjustment factor increase is statistically significant at the 95 percent level of confidence. In sum the dramatic increase in kWh and kW gross savings adjustment factors for Agriculture, Commercial, and the program overall are primarily a result of methodological changes and secondarily to improvements in program effectiveness.

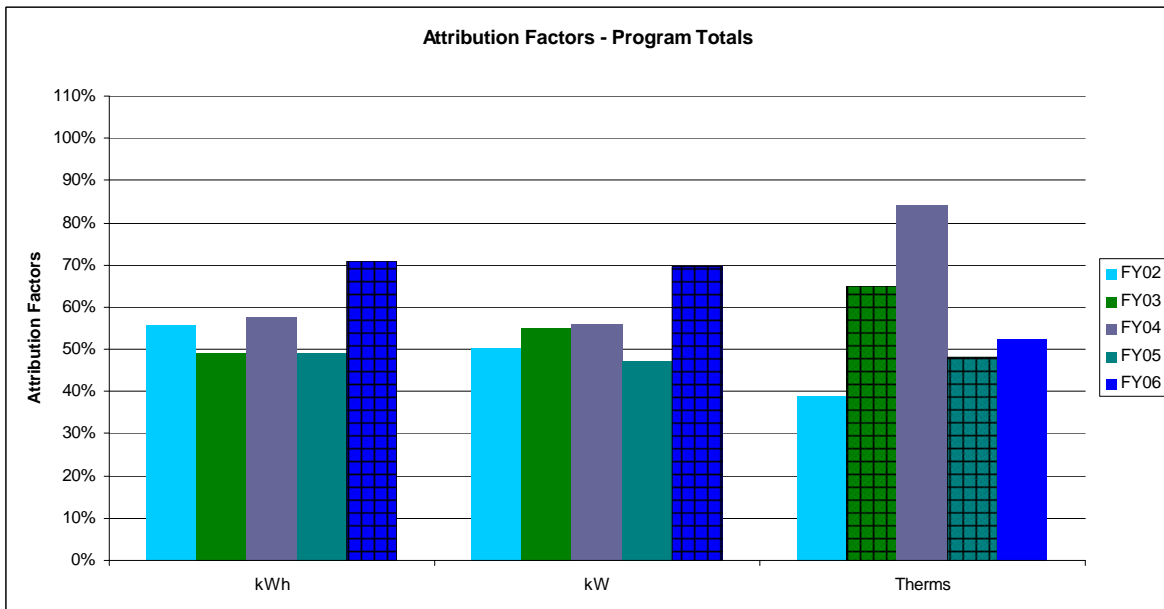
**Figure 1-1. Gross Savings Adjustment Factors by Energy Unit<sup>a</sup>  
Comparison across Fiscal Years**



<sup>a</sup> As Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

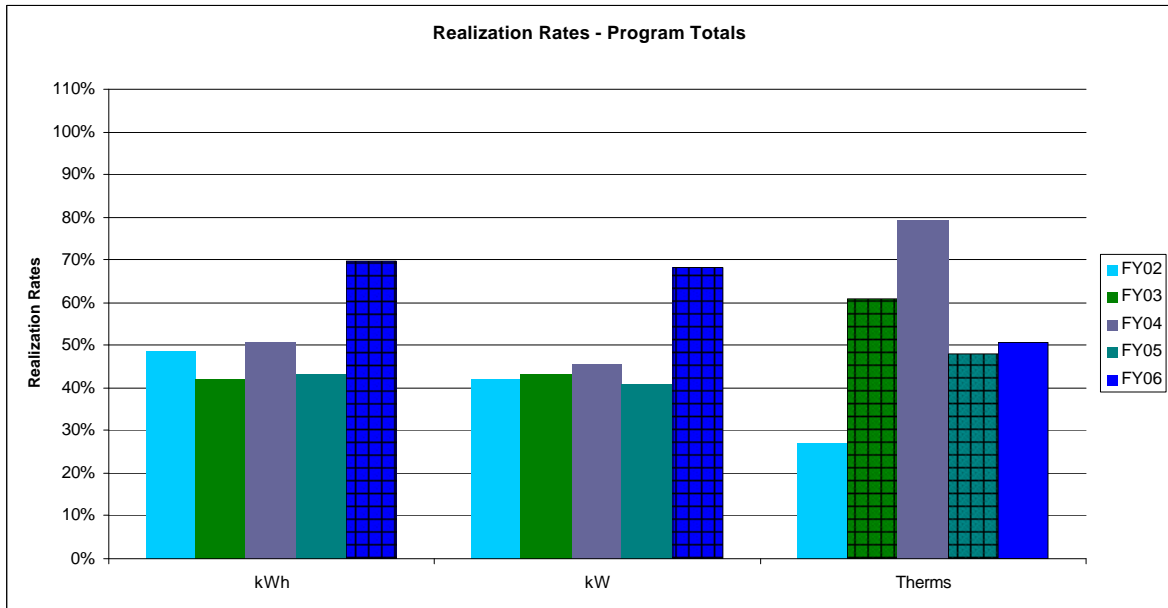
<sup>5</sup> FY05 CFL ONLY kW attribution factors from Agriculture and Commercial were 67 percent and 55 percent, respectively.

**Figure 1-2. Attribution Factors by Energy Unit<sup>a</sup>  
Comparison across Fiscal Years**



<sup>a</sup> As Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

**Figure 1-3. Realization Rates by Energy Unit<sup>a</sup>  
Comparison across Fiscal Years**



<sup>a</sup> As Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

### 1.2.2 Reasons for Discrepancies between Verified and Tracked Savings

The Table 1-1 shows the discrepancies between verified gross savings and tracking gross savings between the previous round (FY05, round 1) and this round (FY06) of evaluation.

The table shows that the number of adjustments made has decreased substantially from the previous round.

**Table 1-1. Discrepancies between Verified and Tracking Gross Savings**

Discrepancy	Measures			
	FY05, Round 1		FY06	
	Number	Percent	Number	Percent
Not installed in any quantity	2	1%	3	2%
Verified gross savings matches documented gross savings, but doesn't match tracking gross savings	4	2%	1	1%
Due to lack of documentation, verified gross savings calculated independently of tracking gross savings	24	14%	6	3%
Verified gross savings doesn't match documented gross savings	84	48%	22	13%
Verified gross savings is within 10% of tracking gross savings	3	2%	0	0%
Verified gross savings is more than 10% larger than tracking gross savings	47	27%	3	2%
Verified gross savings is more than 10% smaller than tracking gross savings	39	22%	20	11%
At least one discrepancy found for at least one applicable energy unit <sup>a</sup>	89	51%	26	15%
No discrepancy found for at least one applicable energy unit (verified gross savings matches tracking)	110	63%	165	94%
<b>Total engineering sample<sup>b</sup></b>	<b>176</b>		<b>183</b>	

<sup>a</sup> As a measure may have more than one type of discrepancy, this does not equal the sum of the number of measures above.

<sup>b</sup> As a measure may have more than one applicable energy unit, this does not equal the sum of the number of measures with at least one discrepancy and no discrepancy immediately above.

The proportion of reviewed measures that were not installed in any quantity or had the wrong value entered in the program tracking database is approximately the same in this round as it was in the previous round. However, the proportion of projects calculated independently as a result of a lack of documentation dropped from 14 percent to 3 percent in this round.

Overall, the proportion of reviewed measures with at least one discrepancy for at least one applicable energy unit (kWh, kW, therms) decreased from 51 percent to only 15 percent between the previous round and this round. In addition, the proportion of reviewed measures for which no discrepancy was found for at least one applicable energy unit increased from 63 percent to 94 percent between these two rounds.

### 1.3 METHODS

KEMA uses the statistical procedure of ratio estimation to develop estimates of evaluation verified gross and net impacts. There are two basic steps to the process.

1. Verify energy savings in a sample of participating customers. For a sample of customers that installed energy efficient equipment during FY06, KEMA estimated actual energy savings under current conditions. For the larger custom projects that accounted for a significant portion of total tracked savings, KEMA conducted detailed energy reviews of how tracking gross savings were calculated. Program tracking data, program documentation, and customer interviews by an energy

engineer were part of the engineering reviews. For smaller projects a telephone interview was used to collect information on measure installation and program attribution.

2. Expand sample results to the population of customers. The sample results obtained in Step 1 are expanded to the population by calculating the ratios of verified-to-reported and attributable-to-verified for the sample. These ratios are then applied to the population.

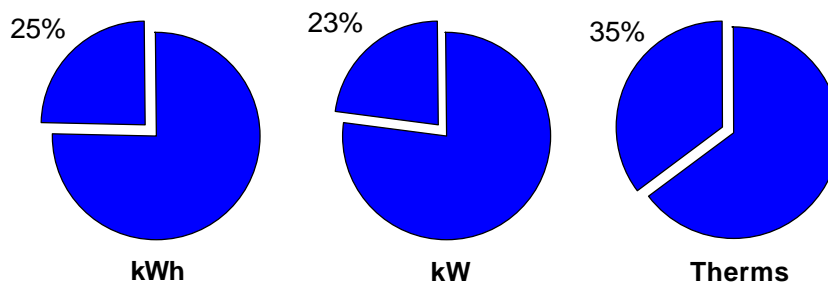
The adjustment factors estimated from the data collection and analysis include:

- Gross savings adjustment factor: This factor adjusts tracking gross savings for installation and changes based on the engineering review. Applying the gross savings adjustment factor to tracking gross savings produces the estimate of verified gross savings.
- Attribution factor: This factor adjusts verified gross savings for program attribution.
- Realization rate: This factor combines the gross savings adjustment factor and the attribution factor. (It is the ratio of net savings to tracking gross savings.)

The adjustment factors shown in the above charts are based on the data from eight rounds of data collection and documentation review. This current evaluation covers FY06 (July 1, 2005, through June 30, 2006).

During this round of data collection KEMA, obtain a total of 396 sample completes (320 CATI completes and 76 engineering completes). Figure 1-4 shows the percentage of population savings included in this round's sample.

**Figure 1-4. Percent of FY06 Tracking Gross Savings Included in Sample<sup>6</sup>**



<sup>6</sup> The percentage of tracking gross savings included in the sample are based solely on the data collected by KEMA and the KEMAFRAME. The implemented measures allocated to Itron for analysis are not included in Figure 1-4.