

---

**Subject** WPS Territory-wide Evaluation

---

**Home Performance with ENERGY STAR Increased Incentives  
Track 1 Analysis**

---

**To** Carol Stemrich,  
Public Service Commission of Wisconsin  
**cc** Monica Curtis, Sara Van de Grift, and Carter Dedolph,  
WECC

---

**From** Laura Schauer, Tetra Tech  
Tom Mauldin and Lynn Hoefgen, NMR

---

**Date** December 21, 2010

This memo presents the results from the Track 1 analysis for the Wisconsin Public Service (WPS) Home Performance with ENERGY STAR (HPWES) Increased Incentives program. The primary objective of Track 1 activities is to identify any potential impacts of the WPS programs' enhancements over the Focus on Energy program, particularly in terms of increased participation and/or savings. We completed this review using the program participation and savings data captured in Wisconsin Energy Conservation Corporation's (WECC) program tracking database, selecting participants from calendar years 2008 through 2010.

The remainder of this memorandum provides a brief background of the HPWES Increased Incentives program and Track 1 objectives, followed by a discussion of considerations when reviewing the data analysis, review of the participation trends, and conclusions and next steps. We provide the following high-level summary of findings presented below.

- There is no clear evidence that the program influenced an increase in participation or completion rates.
- The average number of measures installed in the WPS territory is similar to the rest of the state; however, the average therms savings is higher.
- The higher savings in the WPS territory appears to be driven by the higher installation rate of higher-saving measures installed through the program (e.g., insulation and air sealing). This is especially true when reviewing the measures installed through the WPS Increased Incentives program. The pilot's program design encourages the prioritization and installation of these higher saving measures.
- Based on the program tracking data, the timeframe between assessment and installation is somewhat lower for WPS participants than the rest of the state (98 percent of WPS participants installed measures within six months compared with 85



percent of non-WPS participants). However, there are a number of caveats around this analysis, discussed later within this memorandum.

## Background

The WPS HPWES Increased Incentive program is an enhancement to the Focus on Energy (Focus) HPWES program. By increasing incentives for completing a package of the most cost-effective measures and creating urgency by limiting the time the bonus is available, the program aims to increase project completion rates.<sup>1</sup>

The Focus HPWES program works with a network of independent consultants and contractors who help customers increase the energy efficiency, comfort, safety, and durability of their homes. The consultant or contractor first completes a comprehensive evaluation of a home's insulation, air leakage, mechanical equipment, moisture and ventilation, combustion safety, and carbon monoxide levels. The consultant or contractor then provides a report with a list of recommended energy efficiency measures.

The HPWES program provides cash rewards to the homeowner, as well as to the consultant or contractor for encouraging the homeowner to have the evaluation and to install the recommended measures. The consultant or contractor also performs a post-assessment in order to verify the energy savings.

In the WPS program, the incentive amounts are increased with an option of choosing either triple rewards or reduced-interest financing plus \$250 in cash. For example, a Focus participant would receive \$100 for installing attic insulation, whereas a WPS participant would receive \$300. However, to be eligible for the increased rewards and reduced-rate financing, participants must complete at least three recommended insulation, air sealing, and/or combustion safety measures within six months of the initial assessment.

September marked the one-year anniversary of the HPWES Increased Incentives program operation in the WPS territory<sup>2</sup>. In the year's time, the program completed 105 projects. The program experienced the highest number of completed projects in October 2010, with 22 completes that month.<sup>3</sup> WECC is discussing revising the program design for 2011 to incorporate additional outreach and education.

## Track 1 Objectives

This research presents the findings of the Track 1 analysis. The objective of this analysis is to identify the incremental benefits of this program's approach compared with the Focus HPWES

---

<sup>1</sup> WECC. *Focus on Energy Proposed Implementation Plan Territory-Wide Initiatives For Wisconsin Public Service Customers*. July 1, 2009.

<sup>2</sup> WECC. *Focus on Energy Wisconsin Public Service Territory-wide Programs Monthly Performance Report, September 2010*. October 18, 2010.

<sup>3</sup> WECC. *Focus on Energy Wisconsin Public Service Territory-wide Programs Monthly Performance Report, October 2010*. November 15, 2010.



program. To do so, we first reviewed the feasibility of reviewing a number of metrics between the WPS and Focus territories to assess what effect, if any, the enhanced program design is having on program participation rates and per-project savings. Table 1 presents the metrics, as detailed in the research plan, and whether the metric is included in this analysis.

**Table 1. Track 1 Metrics**

Metric	Included in Analysis?
The average number of HPWES measures installed per participating home.	Yes.
The average HPWES energy savings per participating home.	Yes.
The percentage of participants who receive an HPWES audit that install at least one recommended measure (completion rate).	Yes.
The percentage of participants who receive an HPWES audit that install three or more recommended measures.	Yes.
The average length of time between HPWES assessment and measure installation.	Yes, with caveats. See below for more discussion.
The ratio of energy savings of installed measures to energy savings of recommended measures.	No. The program began to track recommended measures midway through the program year (April 2010 was when the process implemented), inhibiting the usefulness of the data needed to evaluate this metric.

To compare the level of participation between the WPS and Focus territories, we conducted a longitudinal analysis of WPS territory and non-WPS territory participation levels for two calendar years prior to the launch of the WPS program. It may be the case that, historically, participation has been lower in the WPS territory than in the non-WPS territory. If so, this longitudinal review provides context into the WPS territories' performance.

Note that this analysis uses a calendar year to review the trends. Doing so allows us to include the 18-month contract period (18MCP) without adjusting for the longer program period. Additionally, we excluded cases where we could not identify the utility associated with the participant (accounting for one percent of total population in 2008 and 2009).

Also note that each measure is recorded and aggregated into a category (e.g., wall insulation, air sealing). The count of measures captures a number of different categories installed in a home. For example, although WECC may record different levels of insulation in two different lines in the program database, we capture the measure as one item in our analysis. This method for capturing program data is consistent with how WECC is determining whether a home is eligible for a bonus in WPS territory.



## Considerations when Reviewing the Data Analysis

We recognize in advance that our numbers will not exactly match those produced by WECC. In working with WECC to reconcile participant numbers from the WECC database and the draft of this report, we identify the following potential reasons for these differences:

- The data preparation process requires a considerable amount of manipulation and cleaning of the program database. In previous evaluation efforts, we worked with WECC to review our manipulation processes and program counts and confirmed that these inconsistencies are a function of the data cleaning process.
- Measures and services are assigned dates and program years. Participants can cross years (e.g., an audit in 2008 with completion in 2009). We assign one year per participant, using the latest date. We selected the latest date with the assumption that date provided the best reflection of the year in which the savings were claimed. Any difference in addressing the date field would change the participant counts by year.
- This analysis takes into consideration *calendar* year, not contract year. This distinction affects the counts of participants within the 18MCP. The 2008 analysis does not include participants prior to January 1, 2008.
- WECC geocodes participants to identify the utility from which participants receive electric and gas services. They record this data in two fields, one that captures the electric utility and one that captures the gas utility. The participants also indicate their utility on the application form. In assigning participants to the WPS territory, we used the data from the customer application. That is, the information used to qualify a WPS participant. The results do not differ significantly when compared to results using the geocoded fields. However, the participant counts by territory could differ from WECC's counts should a different field be used to define WPS customers.

We strive to ensure the data analysis is as accurate as possible. We are happy to continue to review the numbers on a case-by-case basis should WECC and/or the PSCW want to continue to reconcile the exact differences and modify the numbers if warranted. However, the differences in customer counts reported by WECC and represented in this report are not substantial enough to change the story or overall findings.

## Participation Trends

### ***Participation Counts through December 13, 2010***

Table 2 presents the participation counts for 2008 through 2010. We define a participant as a customer who received an assessment of their home, but may or may not have installed recommended measures.

The 2010 participation count is reflective of assessments through December 13, 2010. The 2010 participation count in the WPS territory also includes those who received the bonus and those who did not. We project that the total number of participants will be similar to the participation rate in 2009 (Table 2), although the number of completed projects for both territories increased (Table 3).



Reviewing the percentage change from the prior year, we see that the non-WPS territory had a higher percentage increase in 2009 from the 2008 levels than did the WPS territory. The difference in participation rates between both territories is projected to be fairly similar.

**Table 2. Participants by Year and Territory (Pre-assessments)**

Year	Non-WPS Territory	Percentage Change for Non-WPS Territory	WPS Territory	Percentage Change for WPS Territory
2008 <sup>4</sup>	2,442	–	355	–
2009	3,666	33% increase from 2008	434	18% increase from 2008
2010*	3,382	8% decrease from 2009 as of 12/13/10	424	2% decrease from 2009 as of 12/13/10

\*through December 13

Although the number of assessments is currently lower than the program saw in 2009, the number of completed projects has increased. The WPS territory experienced a higher rate of increase than the rest of the state, although the rate of increase was lower in previous years. Although the WPS territory had a higher percentage of change in the number of completed projects from 2009 to 2010, this one-year snapshot is not sufficient to attribute the change to the program initiative in and of itself.

Note that in 2008, the program implemented a program design change, providing to consultants and contractors a bonus for project completions. This bonus, according to WECC staff, improved the completion rate of projects, which may be reflected in the increase in projects from 2008 to 2009.

**Table 3. Number of Completed Projects by Territory**

Year	Non-WPS Territory	Percentage Change for Non-WPS Territory	WPS Territory	Percentage Change for WPS Territory
2008 <sup>5</sup>	915		142	
2009	1,702	46% increase from 2008	197	28% increase from 2008
2010*	1,762	4% increase from 2009 as of 12/13/10	231	17% increase as of 12/13/10

\*through December 13

### ***Percentage of Participants Who Received an Assessment and Installed at Least One Measure (Completion Rate)***

One objective of the program is to increase the completion rate—the percentage of assessment recipients that install at least one measure through the program. As Table 4 shows (and consistent with Table 3), the completion rate has been increasing each year, within each territory. However, there is no difference in the completion rate between WPS and the rest of the state; the data does not indicate that the WPS HPWES Increased Incentives program is driving a higher completion rate within that territory.

<sup>4</sup> The data in this row show participants from calendar year 2008, not the 18-month contract period.

<sup>5</sup> The data in this row show participants from calendar year 2008, not the 18 month contract period.

**Table 4. Completion Rate by Territory (with Completion and Population Counts)**

Year	Non-WPS Territory	WPS Territory
2008	37.5% (915/2,442)	40.0% (142/355)
2009	46.4% (1,702/3,666)	45.4% (197/434)
2010*	52.1% (1,762/3,382)	54.5% (231/424)

\*through December 13

***Average Number of Measures per Home and Percentage of Participants Who Receive an HPWES Assessment Who Installed Three or More Recommended Measures***

The WPS HPWES Increased Incentives program includes the requirement that participants install a minimum of three measures to qualify for the bonus. A higher completion rate in less time was the primary goal; this requirement was primarily driven by the need to ensure that participants installing fewer measures and yielding lower energy savings did not merely quickly complete projects.

This requirement hypothetically drives two metrics reviewed in this memorandum: the average number of measures installed per home and the percentage of homes that received three or more measures, with WPS exhibiting a higher increase in rate or higher average than the rest of the state. Although increasing the number of measures per home is not a primary goal, as a required component of the program, it is a metric worthy of reviewing.

Table 5 presents the average number of measures installed per home. The data show that the average number of measures installed increases each year. The WPS territory increased at a slightly higher rate than the rest of the state, from 2009 to 2010. However, there is no difference in the average number of measures installed between the two territories.

**Table 5. Average Number of Measures Installed per Home**

Year	Homes with Completions Only	
	Non-WPS Territory	WPS Territory
2008	3.1	3.1
2009	3.6	3.4
2010	3.8	3.8

Note that the WPS territory, in 2010, includes projects that received increased incentives and, therefore, met the three-measure requirement.<sup>6</sup> Table 6 provides the average number of measures installed, taking into consideration those that received the WPS bonus.

---

<sup>6</sup> Although the program technically launched in October 2009, we confirmed with WECC that there were no projects completed in 2009; therefore, the 2010 calendar year data accurately represents all projects completed through the Home Performance with ENERGY STAR Increased Incentives program.





Not surprisingly, the average number of measures for those who receive the bonus is higher than those who did not receive the bonus. This is not entirely indicative that the program's influence for those in the WPS territory who received the bonus was higher than those that did not receive the bonus. A similar picture would likely emerge within the non-WPS territory if we separated out a statewide group that qualified for a bonus.

WECC and contractors, with regards to process evaluation activities, believed a primary reason participants did not qualify for the bonus is that they did not install the required number of measures. Yet, the analysis shows that WPS participants received, on average, at least three measures regardless of whether they received the bonus. The distinction may be in the three recommended measures, which qualify for the bonus (air sealing, insulation, and combustion safety). As we see later in this report, bonus recipients have a higher therms savings average, which indicates it is not the quantity, but quality of the measures, in terms of efficiency levels, that differentiates the bonus from the non-bonus recipients.

**Table 6. Average Number of Measures Installed per Home for Completed Projects by Territory and WPS Bonus**

Year	Non-WPS Territory	WPS Territory No Bonus	WPS Territory Received Bonus
2010	3.8 (N=1,762)	3.0 (N=100)	4.4 (N=131)

If the program were effective in driving the WPS market, we would also expect to see a higher percentage increase of households that receive three or more measures. While we do not see a drastic difference in households that received three or more measures in WPS territory, we do see that, in 2010, the WPS territory is experiencing a slightly higher increase from 2009 levels than the rest of the state. The difference, however, is not substantial enough to indicate a programmatic impact (Table 7).

**Table 7. Percentage of Participants that Received an Audit and Installed Three or More Measures**

Year	Non-WPS Territory	Percentage Increase for Non-WPS territory	WPS Territory	Percentage Increase for WPS Territory
2008	22.7% (N=555/2,442)	N/A	24.8% (N=88/355)	N/A
2009	34.9% (N=1,278/3,666)	53.7% increase from 2008	32.0% (N=139/434)	29.0% increase from 2008
2010	41.5% (N=1,404/3,382)	18.9% increase from 2009	42.2% (N=179/424)	31.9% increase from 2009

### **Average HPWES Energy Savings per Participating Home**

The resulting outcome of the revised program design for the WPS HPWES Increased Incentives program would ideally include a higher per home savings. Table 8 presents the average kWh and therms savings by territory. There is no substantial difference in the average savings per home by territory in 2008 and 2009. We do see a somewhat higher increase in therms savings in WPS territory for 2010, as well as a 16 percent higher average therms savings overall within WPS territory.


**Table 8. Average Savings per Home (Completed Projects Only)**

Year	Average kWh Savings for Non-WPS Territory	Average kWh Savings for WPS Territory	Average Therms Savings for Non-WPS Territory	Average Therms Savings for WPS Territory
2008	447	404	272	268
2009	435	436	310	299
2010	454	464	298	346

The analysis is similar when we review average savings for all participants, regardless of whether they installed measures. WPS participants, overall, yielded a higher electric savings than the rest of the state (253 kWh and 236 kWh, respectively) as well as higher therms savings (189 therms and 155 therms, respectively).

Again, we review the average savings per home taking into account the receipt of the WPS bonus. As Table 9 shows, the WPS bonus recipients claimed a higher kWh and therms savings than either the participants in the non-WPS territory and WPS territory who did not receive a bonus.

This finding is not surprising given the WPS bonus recipients received more measures, on average, than those who did not receive the bonus. However, the analysis does provide some indication of how the program could potentially increase the average savings per home if the program changed its requirements on a statewide basis.

**Table 9. Average Savings per Home by Territory and WPS Bonus (2010 Completed Projects Only)**

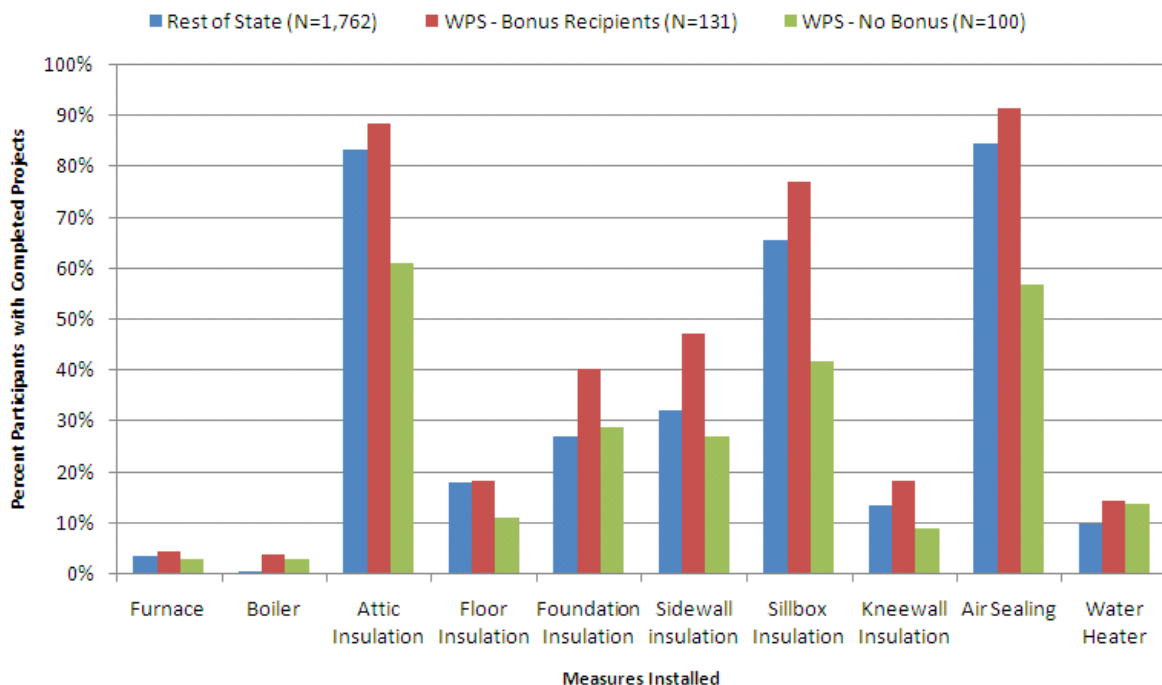
Year	Average kWh Savings	Average Therms Savings
Non-WPS territory	454	298
WPS territory – no bonus	377	267
WPS territory – received bonus	530	408

The saving analysis is further explained by a review of the measure data. WPS Bonus recipients are more likely than those who did not receive the bonus to install insulation and receive air sealing, which are measures that drive energy savings through the program (Figure 1).





**Figure 1. Measure Analysis by Territory and WPS Bonus (2010 Completed Projects Only)**



### ***The Average Length of Time between HPWES Assessment and Measure Installation***

One goal of the pilot is to decrease the amount of time between the assessment and measure installation. To assess the program performance against this goal, we calculated the difference between the date of the pre-assessment or pre-rating and the latest date of measure installation. We then calculated an average number of days difference by the two territories to determine if the program is decreasing the number of days between the assessment and installation.

This analysis comes with several caveats. First, the tracking data downloaded by Tetra Tech did not capture a pre-assessment or pre-rating date for all participants. Additionally, participants who received the WPS bonus were significantly more likely to have a pre-assessment flag in the downloaded data (approximately 80 percent) than those who did not receive a bonus (approximately 56 percent). It is unknown whether this difference creates bias in the data. Therefore, we caution the reader to review the analysis in light of the fact that these data are missing.

In running the analysis, we also needed to consider the outlier data; there were participants who installed measures well over a year past the initial assessment. Additionally, the WPS Bonus program has only existed for approximately one year, so, by nature, the longest elapse time between assessment and installation could not be longer than that for these customers. To account for these issues, we excluded participants who had greater than 352 days elapse between assessment and installation for this analysis, resulting in the removal of fewer than six percent of participants (65/1,131). The proportion of those removed was similar for WPS territory and the rest of the state.



These findings do not indicate that the program is substantially decreasing the time lapse between the assessment and the installation date. Excluding the outliers, the average elapsed time for WPS participants, regardless of whether they received a bonus, was 81 days, compared with 88 days for the rest of the state. Nearly all participants who received a WPS bonus (99 percent) installed measures within the stipulated six months after the program assessment, followed by 93 percent of WPS participants who did not receive a bonus and 85 percent of participants from the rest of the state.

## Conclusions and Next Steps

The WPS HPWES Increased Incentives program was designed to outperform the statewide Focus offerings by accomplishing the following: increase the project completion rate, increase the per household savings, and reduce the amount of time from the audit to project completion. The database analysis does not indicate that this program design is having the intended impacts to the extent initially conceptualized.

Program participation and completion rates in the WPS territory appear to parallel the trends in the non-WPS territory, indicating that the WPS program is not influencing either of these metrics. In addition, the requirement to install three or more measures does not appear to be a significant deviation from the existing program, which, on average, installed over three measures per home even in previous years.

There is some indication that the program may be driving higher therms savings. The program instituted the three or more recommended measures requirement in an effort to ensure the program did not provide bonus incentives for lower saving participants. The average therms savings per participant within the WPS territory was approximately 16 percent higher than the Focus territory. Additionally, the measure-level analysis shows that WPS bonus recipients were more likely to receive program-targeted measures, such as insulation and air sealing.

Although the WPS territory continually increased their rate of completion and savings over the years, it is not entirely clear whether the upward trends are due to the program interventions or a general increase in awareness, with the WPS territory coming “up to speed” with the rest of the state. WECC is currently recommending and putting into place program design modifications with increased emphasis on program outreach, marketing, and education for contractors and participants. We would expect to see the performance of the WPS territory continue to outperform Focus should these modifications and increased incentives affect program performance.

This Track 1 database analysis is only one component of the WPS HPWES Increased Incentives Program evaluation. As part of the program process evaluation (Tracks 2 and 3), we interviewed program participants, consultants, and contractors to note any self-reported impacts of the program on their decision-making and recommendation processes. The process evaluation research assessed program impacts by conducting a comparative analysis of the experiences of WPS participants, both those who received and did not receive the bonus, and participants throughout the rest of the state. The draft report will be delivered separately from this final Track 1 memo.