

# **Appendix A: Analysis of LightSavers Spillover and Market Effects Annual Allocation to FINAL Annual Report on Evaluation, Measurement & Verification Findings for Ameren Missouri Program Year 2013**

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## Background

To evaluate the market effects from Ameren Missouri's LightSavers Program, the evaluator conducted a longitudinal in-home lighting saturation study to estimate the total number of Compact Fluorescent Lamps (CFLs) and Light-Emitting Diodes (LEDs) sold and installed between 2011 and 2013. The analysis then divided the sales of these bulbs into two categories: program and non-program sales. The evaluator estimated and removed (based on free ridership estimates) the non-program sales due to naturally occurring adoption, and then recommended that the remaining non-program bulb sales be attributed to the program through either spillover or market effects.

One key assumption in the analysis was the timing for allocating these spillover and market effects. The analysis assumed that 26 percent of the attributable non-program bulb sales should be credited to the PY2013 program. This percentage was based on the percentage of program bulbs sold between January and July of 2013.<sup>1</sup> The EM&V Auditor Team believes, however, that the actual timing of program influence could vary, particularly since the program was essentially shut down during the 2012 bridge year, and there was the possibility of a "momentum" effect from 2011 to 2012. In order to investigate this question, the EM&V Auditor conducted an independent analysis of Missouri CFL and LED lighting sales between 2011 and 2013. This appendix presents the results of this analysis.

## Methodology

In order to investigate the timing of the claimed spillover and market effects savings, the EM&V Auditor purchased data from LightTracker, a company that cleans and analyzes point-of-sales (POS) lighting data.<sup>2</sup> The data contain lighting sales from Missouri grocery drug, dollar, club, and discount stores for 2009 through 2013. Sales are provided by bulb type (incandescent, CFL, LED, Halogen, etc.).

The EM&V Auditor also worked with the Ameren Missouri EM&V contractor, the Cadmus Group, to collect program sales data for calendar years 2011 through 2013. Sales were provided in total, as well as isolated for the same group of retailers as represented by the LightTracker data. As Table 1 shows, the retailers in the LightTracker data represented approximately 50 percent of the program sales between 2011 and 2013.

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<sup>1</sup> The Cadmus Group allocated the percentage of sales into the following bins: 2011 (June 2010 through the end of 2011); 2012 (calendar year 2012); 2013 (January through July 2013).

<sup>2</sup> The information contained herein is based in part on data reported by LightTracker through its Advantage service for, and as interpreted solely by LightTracker Inc. Any opinions expressed herein reflect the judgment of LightTracker Inc. and are subject to change. LightTracker disclaims liability of any kind arising from the use of this information.

**Table 1: Program Sales Represented by LightTracker Retailers**

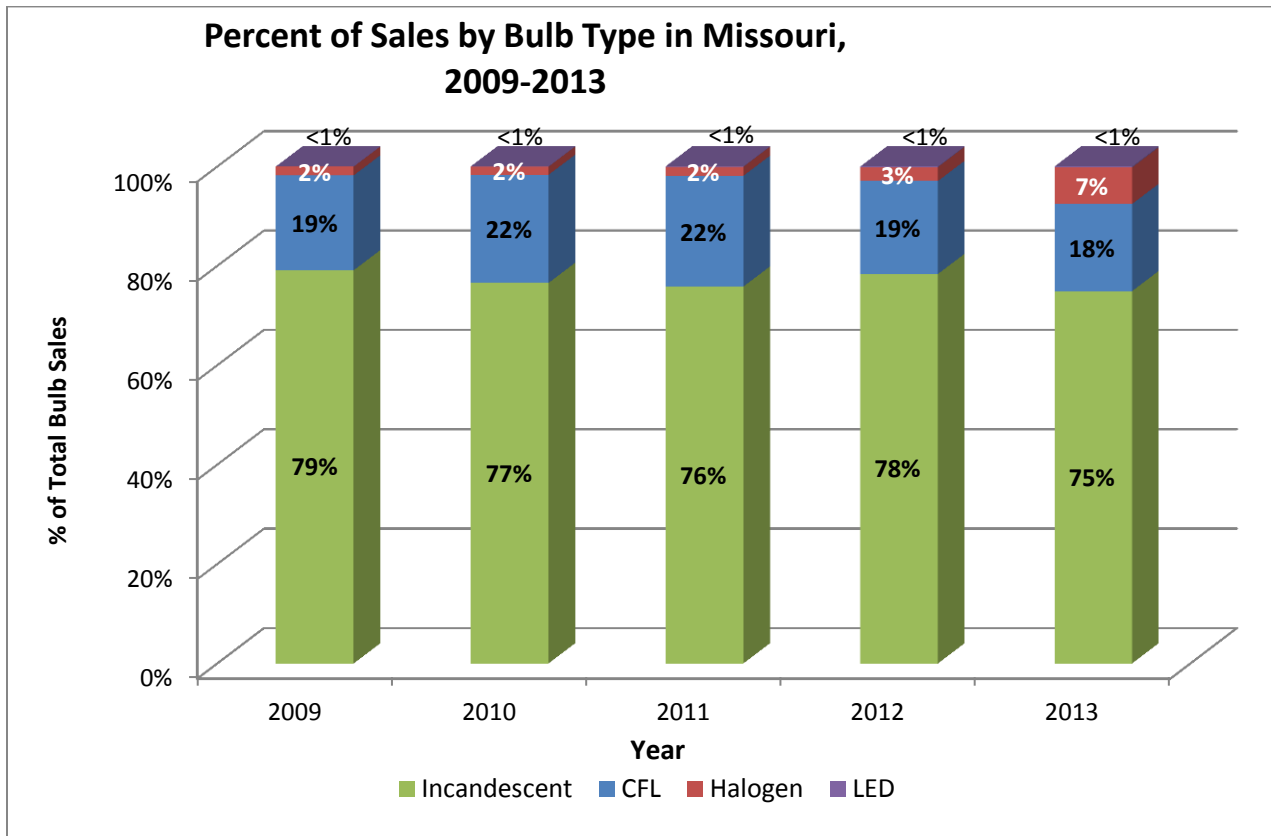
Year	Total Program Sales	Program Sales for LightTracker Retailers	% of program sales through LightTracker retailers
2011	2,082,803	1,054,163	51%
2012	220,035	66,138	30%
2013	3,509,936	1,774,111	51%
Total	5,812,774	2,894,412	50%

(Source: Cadmus Group)

The EM&V Auditor then excluded the non-program sales, by year, to estimate the total number of non-program CFL and LED sales for 2011 through 2013. The allocation of these non-program bulb sales was then investigated to see what percentage occurred in 2013.

## Findings

The analysis of the Missouri state-level sales data reveals that CFL and LED bulb sales, as a percentage of total bulb sales, remained relatively constant between 2009 and 2013, ranging from a high of 22 percent to a low of 18 percent (see Figure 1). The decrease in CFL and LED sales appears to occur in 2013, which also corresponds with an increase in halogen sales, likely a result of the phase-in of the 2007 Energy Independence and Security Act (EISA).



(Source: LightTracker Analysis)

**Figure 1: Percent of Sales by Bulb Type in Missouri, 2009-2013**

As stated previously, the EM&V Auditor submitted a data request to Cadmus to provide program sales through the same retailers contained in the LightTracker data. Using these data, non-program bulb sales were calculated as the difference between the total CFL and LED sales contained in the LightTracker data and the Cadmus supplied CLF and LED program sales through the same retailers. As Table 2 shows, from 2011 through 2013 these retailers sold approximately 14.2 million CFLs and LEDs; program sales, during this same period, were approximately 2.8 million bulbs. The difference – about 11.3 million – represents the number of energy-efficient bulbs sold by these retailers outside of the program.

**Table 2: Estimated Sales of Non-Program CFLs and LEDs by Year for LightTracker Retailers**

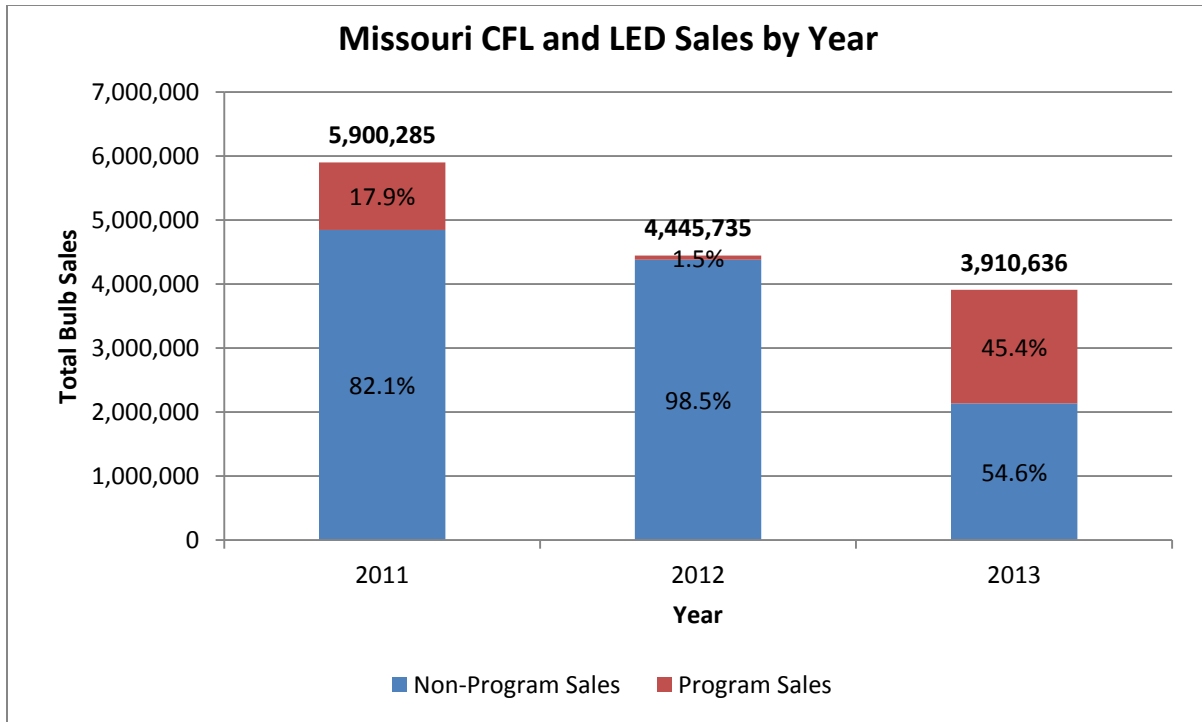
<b>Year</b>	<b>Program Sales for LightTracker Retailers (A)</b>	<b>Total CFL/LED sales (LightTracker) (B)</b>	<b>Non-program CFL/LED Bulbs (B-A)</b>
2011	1,054,163	5,900,285	4,846,122
2012	66,138	4,445,735	4,379,597
2013	1,774,111	3,910,636	2,136,525
Total	2,894,412	14,256,656	11,362,244

(Sources for Column A: Cadmus Group (program sales) and LightTracker Analysis (Total and non-program sales))

(Source: LightTracker Analysis)

Figure 2 summarizes the trends of total CFL/LED sales, as well as the proportions of program vs. non-program sales, by year. The proportion of program sales by year fluctuates with the activity of the program. In 2011, the program represented 18 percent of CFL/LED sales for these retailers. In 2012, during the bridge year, there was almost no program activity, and program sales only represented 1 percent of CFL/LED sales for these retailers. Finally, 2013 was the most aggressive year of program activity, and program sales were just under half (45%) of total CFL/LED sales for these retailers.

The total sales trend, interestingly, does not follow the program activity. The actual number of CFL and LED total market bulb sales steadily increase from 2009 to 2011, then experiences a sharp decline after its peak of 5.9 million in 2011. While this steep decline might be due to the cutback in program activity, the 2013 sales continue to show a substantial decline in sales of CFLs and LEDs, despite the surge in program activity.

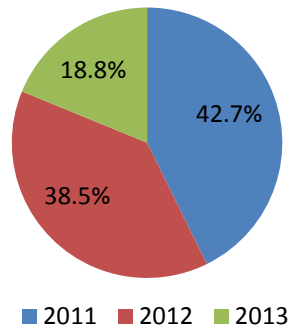


(Source: LightTracker Analysis)

**Figure 2: Missouri CFL and LED Sales, by Year**

The yearly proportion of non-program bulb sales attributable to the program, as calculated using the LightTracker data, differs substantially from that allocation factor that was presented in the prior market effects analysis. Whereas the LightSavers report showed non-program spillover and market effects allocated as follows: PY2011 – 68%, PY2012 – 5%, and PY2013 – 26%. As Figure 3 illustrates, CFL and LED non-program sales for 2011 through 2013 do not follow a similar pattern, revealing instead the following distribution: PY2011 – 43%, PY2012 – 39%, and PY2013 – 19%. *The key difference is in PY2012, where there was inconsequential program activity, yet these retailers still sold about 4.4 million CFLs and LEDs.* In fact, the sales in 2012 were higher than in the following year despite more aggressive program activity.

### Yearly Distribution of Missouri CFL and LED Sales, 2011-2013



(Source: LightTracker Analysis)

**Figure 3: Yearly Distribution of Missouri CFL and LED Sales, 2011-2013**

Table 3 compares the calculation of NTG based on the original allocation of non-program sales (26.3 percent) compared to the recommended allocation of non-program sales (18.8 percent). As shown in the table, revising the allocation – plus making recommended changes to the non-participant spillover, as discussed in the main body of the report – drops the NTG with spillover to 87 percent, and with spillover and market effects to 94 percent.

**Table 3: Revised NTG Calculations**

	<b>Analysis in Report<sup>3</sup></b>	<b>Based on new Allocation</b>
<b>PY2013 Program Calculations</b>		
PY2013 Program Bulbs	1,052,200	1,052,200
Freeridership	24%	24%
Non-FR CFLs and LEDs	799,672	799,672
<b>Calculation of PY2013 Non-Program Bulbs</b>		
% of Nonprogram Bulbs Attributable to PY2013	26.3%	18.8%
Increase in CFLs and LEDs for PY2013	1,783,320	1,274,769
PY2013 Non-program	731,120	222,569
Naturally occurring adoption	31%	31%
Program attributable non-program	504,473	153,572
<b>Spillover and Market Effects</b>		
Energy Efficient Proportion	42%	42%
Lighting SO for PY2013	292,594	89,072
ME for PY2013	211,879	64,500
Nonparticipant SO (non-lighting)	0.8%	3% <sup>4</sup>
<b>Results</b>		
NTG (w. FR Only)	0.76	0.76
NTG (w. FR&PSO)	1.04	0.84
NTG (w. FR,PSO,NPSO)	1.05	0.87
NTG (w. FR,PSO,NPSO&ME)	1.25	0.94

(Sources: Cadmus Group and LightTracker Analysis)

The EM&V Auditor understands that there are certain limitations with these data. Each of these, along with their potential impacts, are discussed next:

***Non-participating retailers.*** The LightTracker data may include non-participating retailers in the total sales estimates. For example, there may be a grocery, drug, or dollar store that did not participate in the program. The EM&V Auditor believes, however, that these stores do provide potential for market effects due to increased demand due to both program marketing and outreach, as well as retailer price matching

<sup>3</sup> Note the figures presented in this table represent only the upstream markdown and coupon portion of the LightSavers Program. The social marketing distribution (SMD) portion assumed a NTG of 1.0, for an assumed reported weighted NTG of 1.23 for the entire program.

<sup>4</sup> The revision to the NPSO is discussed in the main body of the report.

and advertising. So it is actually important to examine full category sales data, and not just limit the data to program retailers.

***Lack of certain channels.*** The data do not include certain key program retailers, particularly the large “do-it-yourself” retailers. However, as noted above the retailers presented in this analysis do represent approximately 50 percent of the program sales. In addition, the program sales patterns by year presented in Table 1 for the retailers in this analysis are nearly identical to those retailers not included in this analysis (i.e., the percentage of program bulb sales by year are nearly identical between the two sets of retailers).

***Inclusion of non-Ameren Missouri Sales.*** The data presented here are at the state level, and thus include sales to customers outside of the Ameren Missouri service territory. This can be through either “leakage” (i.e., customers of surrounding utilities purchasing program bulbs) or through the inclusion of stores that sit outside the Ameren Missouri service territory. Given that the other Missouri utilities, however, had limited support of CFLs during the 2011-2013 time period, the EM&V Auditor does not believe that these additional sales would influence the results (i.e., the non-program sales are not fluctuating due to sponsorship or influence of other Missouri utilities). In fact, the inclusion of stores outside the service territory understates the percentage of total Ameren Missouri CFL and LED sales represented by the program. So in 2013, the proportion of program bulbs is likely greater than 50 percent, providing even less opportunity for non-program influenced sales (i.e., the program is representing an even larger percentage of the market, so the magnitude of the non-participant spillover may even be decreased).

## **Conclusions and Recommendations**

The EM&V Auditor believes any impacts due to potential spillover and market effects need to incorporate the sales pattern of non-program bulbs, not just program bulbs. The sales data analysis provides strong evidence that sales of CFLs and LEDs were extremely high in 2012, despite the lack of program activity. This could be due to a “momentum effect” of prior program activity. In fact, were it not for the momentum effect, it would suggest that the naturally occurring adoption is significantly higher than suggested in the report. In other words, sales of CFLs and LEDs were still 75 percent of what they were in 2011; if some of these sales were not due to the momentum effect, it would suggest that naturally occurring adoption (free ridership) could even be in the 75 percent range.

Reallocating the percentage to match the non-program sales effectively drops the percentage of spillover and market effects that is attributable to the 2013 program, when more than on half of the total sales for these retailers were already in the program.

Ultimately, the EM&V Auditor believes that the sales data used and presented here, along with the supplemental data provided by Cadmus, represents the best and most comprehensive data currently available. Any calculation of spillover and market effects should be relocated in this manner. Making this adjustment, the proportion of spillover and market effects attributable to the 2013 program drops to 18.8 percent, a downward revision from the 26.3 percent as presented in the LightSavers report. This then drops the NTG with spillover to 87 percent, and with spillover and market effects to 94 percent.