

Date: May 10, 2011
To: Karen Kansfield, Ameren Illinois; and Jennifer Hinman, ICC Staff
From: Jane Colby, The Cadmus Group
Re: L&A Program Addendum #3

This memorandum supplements the PY2 Lighting and Appliances (PY2 L&A) evaluation, providing an update to gross savings estimates in the December 2010 PY2 L&A report. Based on recent studies performed in two neighboring utility program areas, Cadmus revised gross savings estimates to include the assumption that three percent of CFLs sold through retailers have been installed in nonresidential buildings rather than in residential homes. Cadmus assumed that CFLs installed in nonresidential buildings operate 10 hours per day, rather than the 2.3 hours assumed for average residential installations. Our assumptions and revised results are detailed further below.

Assumptions

Cadmus performed secondary research to estimate the percentage of CFLs purchased through the upstream program and installed in nonresidential businesses. Most commonly, evaluators use a store intercept approach for estimating residential/nonresidential splits: evaluators intercept CFL purchasers in retail outlets, and ask where they intend to install the CFLs purchased. Table 1 lists areas examined and store intercept research results.

Table 1. Secondary Research on Residential/Nonresidential Upstream CFL Splits

Utility	Residential/Nonresidential Split
Ameren Missouri ¹	97% / 3%
Commonweath Edison ²	90% / 10%
California IOU utilities ³	94% / 6%

As the Ameren Missouri service area shares greater demographic and economic similarities with Ameren Illinois than with ComEd or the California utilities, Cadmus adopted a conservative approach, developing Ameren Illinois estimates using the Ameren Missouri residential/nonresidential split.

¹ The Cadmus Group. *Lighting and Appliances Evaluation—PY2*. Ameren Missouri. March 2011.

² Navigant Consulting. *Evaluation: Residential ENERGY STAR Lighting*. Presented to Commonwealth Edison. December 21, 2010.

³ Kema, Inc., and The Cadmus Group. *Evaluation Report: Upstream Lighting Program*. California Public Utilities Commission. December 10, 2009.

The analysis also required a second assumption regarding hours of use (HOU). Both ComEd and Ameren Missouri relied on ComEd's *ex post* evaluation results, drawn from the PY1 Small C&I Intro Kit final report, which estimated HOU at 10.0 hours with a 0.86 coincidence factor. Cadmus applied these results in estimating Ameren Illinois' HOU.

To calculate per-unit energy savings for the nonresidential portion of CFLs sold, we used the following formula:

$$\frac{(CFL\ Watts^4 * Watt\ Ratio^5 - CFL\ Watts) * HOU * 365}{1,000} =$$

$$\frac{(14.5\ Watt * 4 - 14.5\ Watt) * 10\ hours * 365\ days}{1,000} = 158.8\ kWh$$

By applying these unit savings to three percent of CFLs sold, and adjusting for the same installation rate used to calculate realized savings in the residential sector, we calculated the gross realized energy savings shown in Table 2.

Table 2. Realized Gross Energy Savings

Bulb Type	Quantity Sold	Per Unit Savings (kWh)	Installation Rate ⁶	Realized Gross Energy Savings kWh
Residential	974,208	40.86	0.937	37,298,352
Nonresidential	30,130	158.8	0.937	4,483,211
Grand Total	1,004,338			41,781,564

Using the 0.86 coincidence factor, we calculated peak demand savings for the nonresidential sector using the following formula:

$$(CFL\ Watts * Watt\ Ratio - CFL\ Watts) * .86 = (14.5 * 4 - 14.5) * \frac{0.86}{1000} = 0.037kW$$

Table 3, below, shows realized gross demand savings for each sector.

⁴ Average CFL Wattage from the PY2 program tracking database.

⁵ The equation used a 4.0 delta watts ratio, per discussions from: The Cadmus Group. *Ameren Illinois Lighting and Appliances Evaluation—PY2 Report*. Prepared for Ameren Illinois, December 2010. 132.

⁶ The Cadmus Group. December 2010. 21.

Table 3. Realized Gross Demand Savings

Bulb Type	Quantity Sold	Per Unit Demand Savings (kW)	Installation Rate	Realized Gross Demand (kW)
Residential	974,208	0.0023	0.937	2,100
Nonresidential	30,130	0.0374	0.937	1,056
Total	1,004,338			3,156

Results

Based on the above analysis, Table 4 summarizes the revised results for the program.

Table 4. Ex Ante Gross Savings, Revised Realized Savings, and Revised Net Savings

Measure	Ex Ante Gross Savings (kWh)	Realized Gross Savings (kWh)	Realization Rate	PY1 NTGR	Prospective Net Savings (kWh)	PY2 NTGR	Retrospective Net Savings (kWh)
Ceiling Fan	18,880	20,532	1.088	0.76	15,604	0.76	15,604
Room Air Conditioner	499,720	172,980	0.35	0.76	131,465	0.76	131,465
Dehumidifier	2,428,380	1,708,860	0.7	0.76	1,298,734	0.76	1,298,734
CFLs—PY2	41,032,887	41,781,564	1.02	1.0	41,781,564	0.83	34,678,698
Total—PY2	43,979,867	43,683,936	1.00	0.99	43,227,367	0.83	36,124,501