Methodological Approaches to Creating Regional and National Estimates of Residential Lighting

Valerie Richardson, KEMA Inc., Oakland, CA
Michael Poplawski, PNNL, Portland, OR

Introduction

This poster presents two methodological approaches for leveraging the results from recent regional residential lighting metering and inventory studies to develop national and regional estimates of residential lighting hours of use (HOU), average wattage, and annual energy use. KEMA Inc. developed the methodological approaches on behalf of Pacific Northwest National Laboratories (PNNL) and the Department of Energy. The purpose of this effort is to create a resource for entities such as utilities and government agencies to draw from and build their own estimates of residential lighting HOU using a consistent approach along with consistent information and resources.

Summary

Recent regional lighting studies have generated metering data spanning several months, along with lighting equipment inventory data and household demographics. The 2006-08 California Residential Lighting Study[i] onsite lighting inventory and metered data set, represents perhaps the most comprehensive and statistically rigorous lighting inventory and metering study to date with a random sample of over 1,200 residences throughout the state and inventories for all lighting fixtures in the residence (e.g., location, switch/control type, fixture type, light source type, light source wattage, installation rate, etc.) Also, EIA is preparing to release additional data for the 2009 Residential Energy Consumption study. KEMA is working on behalf of PNNL to leverage these datasets and other local and national data sources in combination with additional metering data collected in new areas. The goal is to produce a resource of key inputs where evaluators can assist local utilities and government agencies leverage their location specific variables to create their own usage estimates and profiles that are comparable to other jurisdictions and national estimates.

For this poster, we discuss the pros and cons and expected outcomes of the two proposed methodologies that include: 1) extending the analysis and model specification from recent residential lighting end-use studies by identifying key variables that are transferable across regions; with data mining recommendations to identify availability of similar data from other data sources; and 2) extending the results of recent residential lighting studies by developing a primary data collection strategy to fill in gaps revealed and not addressed by data mining. Once identified, PNNL will reach out to interested parties to help fund the new metering data collection effort.

---

[i] Upstream Lighting Program Evaluation Report, prepared for the California Public Utilities Commission, KEMA Inc. and The Cadmus Group, February 8, 2010.