



California Commissioning Collaborative

Guidelines for Verifying Savings from Commissioning Existing Buildings

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Project Summary

- California Commissioning Collaborative project sponsored by PIER
 - Project team: QuEST, PECCI, AEC
- Expansion of existing CCC guideline
 - Focus on interval meter data
- Now includes common industry approaches
 - Focus on practical applications and tips for best practice
 - How to integrate M&V into EBCx process

Overview of CCC Methods

CCC Method	May Comply with Formal Method
Method 1: Engineering Calculations with Field Verification	No
Method 2: System or Equipment Energy Measurement	<ul style="list-style-type: none"> •IPMVP Option A or B •GL-14 Retrofit Isolation Metering
Method 3: Energy Models with Interval Data	<ul style="list-style-type: none"> •IPMVP Option B or C •GL-14 Whole Building Metering •GL-14 Retrofit Isolation Metering
Method 4: Calibrated Simulation	<ul style="list-style-type: none"> •IPMVP Option D •GL-14 Whole-building Calibrated Simulation

Method 3 – Energy Models w/ Interval Data

If whole building model is insufficient



1. Collect Whole Building Data
2. Develop and Assess Whole Building Baseline Model
3. Collect Building Subsystems Energy Use Data
4. Develop and Assess Systems Baseline Model
5. Document Savings Verification Requirements in the EBCx Plan
6. Collect Post-Installation Period Data
7. Develop Post-Install Model
8. Adjust Models to Uniform Conditions
9. Calculate Savings

Method 3 – Energy Models w/ Interval Data

- Analysis Methods
 - Modeling Techniques
 - Selecting a Time Interval for Data Analysis
 - Hourly or Daily
 - Amount of Data to Collect
 - Developing, Assessing, and Selecting the Appropriate Model(s)
- Model Development
 - Model Uncertainty Assessment
 - Example of Model-Development Procedure

