Measurement Tools & Verification of Savings Calculations

F. Application in IPMVP

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- What are the four IPMVP Options for M&V
- How do measurement boundaries and savings calculation methods map to IPMVP options?

IPMVP - Overview

- Presents a framework and defines terms used in determining ‘savings’ after implementation of a project.
- Specifies the topics to be addressed in an M&V Plan for a specific project.
- Allows flexibility in creating M&V Plans, while adhering to the principles of: accuracy, completeness, consistency and transparency.

IPMVP Options

- Option A. Retrofit Isolation, Key Parameter Measurement
  - Savings are determined by field measurement of the key performance parameters which define energy use of affected systems. Parameters not selected for field measurements are estimated.
- Option B. Retrofit Isolation: All Parameter Measurement
  - Savings are determined by field measurement of the energy use of the affected system.
- Option C. Whole Facility
  - Savings are determined by measuring energy use at the whole facility or sub-facility level.
- Option D. Calibrated Simulation
  - Savings are determined through simulation of the energy use of the whole facility or sub-facility. Simulation routines are demonstrated to adequately model actual energy performance measured in the facility.

Summary of IPMVP Options (I)

- Retrofit Isolation Options
  - Option A: Key Parameter Measurement
    - Useful with contracts where installation party is responsible for equipment performance but owner responsible for operation hours
  - Option B: All Parameter Measurement
    - Useful when savings due to EEMs must be known (e.g. EE Programs)

Summary of IPMVP Options (II)

- Whole Building Options
  - Option C: Whole Building – Utility Meter Data
    - Monthly Data: Useful when savings a large % of annual use (rule of thumb – 15%)
    - Interval Data: Can verify smaller savings at whole building level
  - Option D: Calibrated Simulation
    - Useful when savings large and detailed building model desired
    - Projects and investment must be large

Mapping Options to Boundaries and Methods

IPMVP Option	Measurement Boundary	Savings Method
Option A	**Equipment** **System**	**Load and Schedule** **Calibrated Simulation**
Option B	**Equipment** **System**	**Load and Schedule** **Regression Method** **Calibrated Simulation**
Option C	**Whole Building**	**Regression Method**
Option D	**Whole Building**	**Calibrated Simulation**

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