

Calibrated Simulation Model for Energy Assessment and Verification

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An engineering simulation model is a useful tool to assess commercial facilities for conservation opportunities beyond simple lighting retrofits. The simulation tool explicitly develops assumptions regarding the HVAC system and allows the implications of those assumptions to be compared to existing utility bills. Conventional engineering simulations used during design studies are not adaptable for this purpose since these tools are not designed for easy calibration to actual weather and consumption. Since consumption data are most readily available as monthly bills, an hourly model is both unnecessary and overly complicated to use. A spreadsheet tool has been developed that allows quick adjustment of a simplified engineering model to match actual utility bills. The tool is designed to operate with only simple information about the facility and to focus on the HVAC system. It represents a quick approach to treating the facility as an integrated whole.

Application

The tool utilizes billing analysis of commercial facilities to:

- Diagnose energy patterns and end-use consumption;
- Calibrate savings estimates to agree with actual usage;
- Verify vendor claims for energy products and services;
- Generate performance targets and compare against actual energy bills for on-going commissioning;
- Provide a low-cost method of verification for performance contracting or LEED certification consistent with IPMVP protocol.

Presentation

Examples of the graphic outputs used to assess and verify energy savings. Case examples illustrate how the tool is useful in diagnosing energy problems, guiding on-site audits, and establishing predicted targets for O&M tracking and performance verification.

