

## SESSION 8A

### THE CURRENT STATE-OF-THE-ART IN USING BUILDING MODELING FOR EVALUATION PURPOSES

*Moderator: Bob Wirtshafter, Wirtshafter Associates, Inc.*

#### PAPERS:

##### **Welcome to the Machine: Integrating Modeling, Benchmarking and Program Savings Evaluation into a Program TQM Process**

Gregory Thomas, Performance Systems Development, Inc.

Michael McQueeney, Public Service New Hampshire

##### **DrCEUS: Energy and Demand Usage from Commercial On-Site Survey Data**

Tom Mayer, Itron, Inc.

Fred Sebold, Itron, Inc.

Alan Fields, Itron, Inc.

Robert Ramirez, Itron, Inc.

Brad Souza, Itron, Inc.

Mark Ciminelli, California Energy Commission

##### **Calculating Energy Savings in High Performance Residential Buildings Programs**

Robert Hendron, National Renewable Energy Laboratory

Sara Farrar-Nagy, National Renewable Energy Laboratory

Ren Anderson, National Renewable Energy Laboratory

Ron Judkoff, National Renewable Energy Laboratory

Paul Reeves, Partnership for Resource Conservation

Ed Hancock, Mountain Energy Partnership

#### SESSION SUMMARY:

This session includes three papers in which the use of building modeling plays a large role in the design and evaluation of programs. The models being built represent advancement in the specification of the models, methods for calibrating the models to reflect actual data, and novel ways to integrate the model and billing data into a real-time information system for providing feedback to users. All of these reports demonstrate that building modeling can play an important role in program evaluation especially when the modeling links to other data collection activities.

The first paper by Greg Thomas of Performance Systems Development and Michael McQueeney of Public Service of New Hampshire uses the concept of Total Quality Management to make an argument for tying, through web-based data access, building modeling/building diagnosis packages to customer billing records. This system which is being prototyped in several jurisdictions is geared to enhance

energy savings by providing real-time feedback to planners, and contractors, and customers. The paper discusses the issues involved in designing and implementing such a system, and the potential benefits to be expected from its use.

The second paper by Tom Mayer, Fred Sebold, Alan Fields, Robert Ramirez, and Brad Souza, all from Itron, Inc., and Mark Ciminelli of the California Energy Commission discusses the development of California's statewide effort to collect data from buildings in the commercial business sector. On-site information will be collected from 3000 commercial buildings. The data collected will include detailed information relating to energy using equipment, business characteristics, operating schedules, and installation of energy efficient measures. This paper discusses the building simulation tool built to feed off of that database. The modeling system allows for easy weighting and aggregation of the site-level results via user-defined segments. Also designed into the system are procedures that allow for "what if..." scenarios, where energy efficiency measures can be substituted for installed equipment and results generated for comparison to baseline usage.

The third paper by Robert Hendron, Sara Farrar-Nagy, Ren Anderson, Ron Judkoff of the National Renewable Energy Laboratory, Paul Reeves of Partnership for Resource Conservation and Ed Hancock of Mountain Energy Partnership looks at the building model specification requirements for buildings meeting the Building America Program. This program seeks to encourage construction of homes using whole-house techniques to save 50 to 70 percent over conventional designs. Because Building America addresses all major end-use loads and because the technologies applied to Building America houses often exceed what is envisioned by energy codes and home-rating programs, the methodologies used in HERS and IECC have limited suitability, and a different approach was needed. The authors provide a detailed account of the process by which the program guidelines were established.