

RESIDENTIAL LOAD DISAGGREGATION, SO CLOSE BUT YET SO FAR AWAY

Moderator: Jeffrey Ihnen, Michaels Energy

PAPERS:

Disaggregation of End-Use Load from Whole House Interval Meter Data

Jeffrey Phung, ADM Associates, Inc.

Thomas Adkins, SMUD

Dan Mort, ADM Associates, Inc.

Duckhunt! Benefits and Risks of Load Disaggregation and End Use Metering for Determining End Use Loadshapes

Terese Decker, Navigant

Justin Spencer, Navigant

Hemang Nerlekar, Navigant

Mark Bielecki, Navigant

Justin Elszasz, Navigant

Vergil Weatherford, Navigant

Kimberly Crossman, National Grid

Riley Hastings, Eversource

Bob Wirtshafter, EEAC

A Snapshot of NILM: Techniques and Tests of Non-Intrusive Load Monitoring for Load Shape Development

Justin Elszasz, Navigant Consulting Inc.

Tracy Dyke-Redmond, Eversource

Justin Spencer, Navigant

Kathleen Ward, Navigant

Daniel Zafar, Navigant

Ken Seiden, Navigant

Terese Decker, Navigant

Chris Newton, Navigant

SESSION SUMMARY:

This session features three papers that describe findings of evaluations that involve the use of interval data. The first paper uses interval data to determine the baseline energy consumption of equipment that had been removed at the time of the evaluation. The other papers test results of disaggregation modeling against conventional on-site data logging.

Mr. Phung's paper reports evaluation findings for a residential pool pump retrofit program for Sacramento Municipal Utility District. Like most retrofit program impact evaluations, the original pool pump equipment was removed from the site at the time of measurement and verification. Savings were estimated by establishing pool pump power and run time before retrofit using hourly interval data from advanced metering infrastructure (AMI). This was used with traditional engineering to determine consumption on the back end, along with savings estimates. Billing regression with AMI data was also performed to determine savings. The paper compares both approaches.

Ms. Decker's paper features three case studies involving load disaggregation for purposes of load management and targeting energy efficiency opportunities for residential customers. Approaches include the use of AMI data in the southwest where AMI is prevalent, and in the Northeast where AMI is sparse, temporary loggers are used to collect interval data. Results are mixed, showing promise for large loads like HVAC, but less so for other loads.

Mr. Elszasz's paper includes results of three analysis methods against conventional end use metering. Those methods include a proprietary disaggregation algorithm provided by a third party vendor, an open-source algorithm, and the team's own econometric algorithm. Results again indicate disaggregation via any method with high frequency compared to AMI is still only useful for large loads.