

Panel 8 Introduction

Measurement and Evaluation

The Measurement and Evaluation papers in this session highlight the changing needs and priorities of the DSM evaluator's chief clients: the energy service industry. Just when we thought the techniques for measuring the net load impacts from DSM programs were finally converging, some of our more progressive clients are asking that evaluators start measuring customer values in addition to the resource value (load impacts) provided by DSM programs. As one of our authors asks, can we afford to do both? Should DSM programs maximize net resource value or net customer value? Would looking at customer values produce different types of programs?

The need to continue to improve current methods of load impact measurement while pioneering new measurement and cost effectiveness techniques is a recurring theme in these sessions. Evaluators are under a lot of pressure to produce more accurate estimates while at the same time reducing the cost of their evaluations. Session topics run the gamut from evaluating the impacts of a DSM program on an entire market infrastructure to evaluating the impacts of a specific thermal storage system at a specific customer premise. What follows is a brief overview of the papers in each session.

Papers in the first session, Market Transformation, focus on the definition and measurement of induced or indirect effects from DSM programs. Nelson attempts to clearly define program spillover effects through the use of technology trees and then suggests ways to measure or infer the effects for different populations. Weisbrod et al. discuss the use of manufacture and distributor survey data to infer and confirm market spillover effects. Uhlaner et al. provides an approach to simultaneously evaluate the market impacts of a number of different utility DSM programs using both billing and market data.

Free ridership is a key issue that cuts across program design and evaluation. In the Free Ridership Session, the three papers by Seratt et al., Paquette et al., and Fielding address measurement from different angles. Seratt develops a causal model to describe the decision-making process in the industrial sector. Paquette uses discrete choice modeling to look at free ridership as well as spillover savings in a C&I program. Fielding argues that actual behavior may be more valid than survey information about hypothetical situations. She demonstrates her approach in a residential refrigerator buy-back program.

In the Commercial Lighting Session, several papers address issues in short-term metering. Vine et al. examines the performance of twenty lighting programs and discusses the problems encountered in comparing the various programs. Based on an in-depth comparison of three well documented short-term metering studies, Sonnenblick and Eto echo Vine's concerns and warn that realization rates are very variable, making their interpretation risky. Pointing up one of the problems, Owashi et al. describe the relationship between the hours of operation and the type of space within the building.

Papers in the Spotlight Session provide an overview of emerging evaluation issues from the perspective of a utility practitioner and a respected DSM theorist. Hicks focuses on new developments in the evaluation of utility program impacts and how they might be effected by the emergence of more competition. Feldman presents a provocative paper that suggests the focus of M&E efforts should shift to measuring real changes in the structure of the market, (so called market transformation effects) rather than focusing on program load impacts.

In the Interactive Session, Benenson et al. discuss the importance to differentiating between different market segments. Working with low income appliance replacement programs, he identifies four different market segments with very different net impacts. Mahone et al. discuss three ways of determining an appropriate baseline for commercial new construction. Weaver et al. make the point that results for program cost-effectiveness can be distorted if free ridership is handled improperly. Wright et al. discuss the use of double ratio analysis to reduce the cost of large scale commercial or industrial program evaluations. Finally Foley and Weaver discuss the need to include all relevant costs in the evaluations of the cost effectiveness of different fuels for residential water heating technologies.

Papers in the Persistence Session describe new techniques for estimating the persistence of energy savings over three to five years. Skumatz and Hickman present the results of a persistence evaluation that focuses on determining the frequency of equipment removal or repair due to renovation or remodeling in the commercial sector. Bordner et al. provide a good overview of the application of survival analysis techniques from other disciplines to the problem of estimating persistence before a significant fraction of the population has “failed.” Hopkins presents the results of a statistically adjusted billing analysis used to estimate the persistence of HVAC measures over a five-year period. The analysis produced an average realization rate of over 90 percent, remarkably high given the significant potential for confounding effects for multi-year billing analyses in the commercial sector.

Papers in the Metering and Monitoring session focus on the most cost efficient methods of obtaining reasonable estimates of gross and net impacts in complex markets. Complex markets exist when the variation in customer operation of specific technologies is likely to be a significant factor in determining the net impacts from a program. Jacobsen et al. focus on the measured performance of thermal energy systems and their possible extrapolation to other potential customers. Thompson and Dent compare customer reports of the hours of operation for motor systems with actual field measurements. Hickman and Warwick focus on reducing the cost of estimating savings from low flow showerheads through the development of an algorithm that could be applied to a number of different program delivery mechanisms and markets.

Papers in the Cost Effectiveness Session deal with three different hot topics: whether electric utilities are using the “right” cost effectiveness tests, how to factor uncertainty into a cost effectiveness of different technology/fuel type combinations, and how to estimate the cost effectiveness of proposed measurement and evaluation projects. Herman and Hicks provide an overview of current deficiencies in the estimation of the total resource cost test and how this can be remedied using the customer value test. Sedmak et al. provide a framework to prioritize and evaluate how much a utility should be willing to spend to improve the accuracy of program load impact estimates. McMahon and Xi provide a sensitivity analysis of the relative cost effectiveness of heat pumps and resistance water heaters.

In the Methodology Session, Wright et al. continue the discussion of short-term metering for commercial lighting. He describes the difficulties of before/after sampling in monitoring studies and offers a methodology for dealing with variation to get statistically reliable results more cost-effectively. Schutte and Violette review techniques that can help identify and reduce the influence of outliers in regression analysis. Fels et al. discuss the search for an automated selection process for choosing between three PRISM models: the heating-only, cooling-only, and the new heating and cooling model.

The final session, Triangulation, is dedicated to the problem of combining information from different evaluation studies of the same program. Carlson et al. discuss ways of combining telephone surveys, on-site surveys, lighting loggers, and tracking data to evaluate a residential lighting program. O’Meara and Flanagan propose a method to combine survey data with a billing analysis to evaluate the educational component of a residential program. Caulfield and Lee discuss the combination of engineering modeling, billing analysis, and load data to evaluate a residential new construction program.

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