

## SESSION 6B

### IT'S NOT YOUR FATHER'S MODEL ANYMORE: INNOVATIVE IMPACT EVALUATION METHODS

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

#### PAPERS:

##### **A Matter of Size: Using Ordinary Least Squares to Estimate Energy Savings Savings in the Commercial Sector**

Hossein Haeri, Quantec, LLC,  
Matei Perussi, Quantec, LLC,  
Iris Sulyma, BC Hydro,

##### **Eliminating the Guesswork: The Information-Theoretic Approach to Model Selection**

Kathryn Parlin, West Hill Energy and Computing, Inc.  
Larry Haugh, University of Vermont

##### **The Gift that Keeps Giving: A Structured Approach Measuring Participant Spillover**

Christopher Dyson, KEMA Inc.  
Miriam Goldberg KEMA Inc.

#### SESSION SUMMARY:

This session first presents two innovative impact evaluation models using fixed effects models. The first looks at the implications of heteroscedasticity when applied to fixed effects models. The second examines the information-theoretic approach based on Akaike's Information Criterion as an effective tool for model selection. A third paper looks at a structural approach for measuring participant spillover.

The Haeri paper is about the application of regression analysis for assessing savings in the commercial sector. Using data from BC Hydro's Power Smart Partners Program, it demonstrates the effects of large variances in annual consumption on parameters derived by Ordinary Least Squares (OLS) and the accompanying problem of *heteroscedasticity*. Using visual inspection of data and statistical tests, the paper examines the presence and extent of heteroscedasticity and applies two alternative methods to correct for the problem: 1) assigning a unique intercept to each facility (fixed-effects model); and 2) by transforming all to deviations from individual facility means (deviation model).

The Parlin paper introduces a new approach for deciding model specification. The Akaike's Information Criterion is an information-theoretic method for model selection. The paper introduces the concept, explores the strengths and weaknesses of this approach in comparison to other model selection techniques and provides a step-by-step description of how to implement this approach. The author gives an example of how to use the Akaike's Information Criterion using a fixed effects billing analysis conducted for a low income retrofit program, based on a pooled, cross-sectional, time series data set. Although the example is from an impact evaluation, the potential applications of this methodology extend to many other types of evaluations, including, but not limited to, market characterizations, process evaluations and attribution studies.

The Dyson paper discusses a comprehensive approach for measuring participant spillover. The paper describes how they approached the various challenges of a self-report participant spillover methodology including: finding the right decision-maker, avoiding double-counting, estimating program

attribution, estimating spillover savings, and recording other indicators of market effects. The paper also summarizes the levels of participant spillover savings and other market effects that was found. Finally the paper discusses both the advantages and disadvantages of this approach.