U.S. Department of Energy Smart Grid Investment Grant

Technical Advisory Group Guidance Document #6*

Topic: Recommendations for Content of the Consumer Behavior Study Evaluation Report(s)

July 25, 2012

OBJECTIVE

This guidance document describes the content and layout for the evaluation reports that are a deliverable to the Department of Energy (DOE) by Smart Grid Investment Grant (SGIG) recipients who have agreed to undertake a consumer behavior study (CBS).

BACKGROUND

The Department of Energy (DOE) is requiring all SGIG recipients who have agreed to undertake a consumer behavior study to document the study's design, implementation and evaluation efforts after the first year of the study and after the second year of the study in a formal interim and final report, respectively. To make these documents as consistent as possible and therefore as useful as possible for both internal and external audiences, a standard format for the evaluation reports has been developed and is contained herein.[1]

* The following individuals on the Lawrence Berkeley National Laboratory Technical Advisory Group (TAG) drafted and/or provided input and comments on one or more of the U.S. Department of Energy Smart Grid Investment Grant (SGIG) Technical Advisory Group Guidance Documents: Peter Cappers, Annika Todd, Andrew Satchwell and Charles Goldman (LBNL), Karen Herter (Herter Energy Research Solutions, Inc.), Roger Levy (Levy Associates), Theresa Flaim (Energy Resource Economics, LLC), Rich Scheer (Scheer Ventures, LLC), Lisa Schwartz (Regulatory Assistance Project), Richard Feinberg (Purdue University), Catherine Wolfram, Lucas Davis and Meredith Fowlie (University of California at Berkeley), Miriam Goldberg, Curt Puckett and Roger Wright (KEMA), Ahmad Faruqui, Sanem Sergici, and Ryan Hledik (Brattle Group), Michael Sullivan, Matt Mercurio, Michael Perry, Josh Bode, and Stephen George (Freeman, Sullivan & Company). In addition to the TAG members listed above, Bernie Neenan and Chris Holmes of the Electric Power Research Institute also provided comments.

[1] A previous version of this guidance document (dated September 17, 2010) laid out, in outline form, what the evaluation reports would contain. This version provides much more detail about what that content should look like.

Section Heading	Description
1. Introduction	
1.a. Project Background	Provide a brief background on the genesis of the project
1.b. Project Overview	Provide a brief overview of the project's objectives and expected benefits associated with achieving these objectives
1.c. Questions of Interest	List the questions of interest that are being addressed as part of the project, and the impacts that are being estimated in the evaluation.
2. Project Description	
2.a. Design Elements	
2.a.i. Target Population	Provide a brief description of the target population of customers that was used to draw a sample of customers for participation in your project (e.g., all single family households within a certain geographic location).
2.a.ii. Randomization and assignment method	Provide a detailed description of the assignment method by which customers were selected, screened, recruited, enrolled, randomized, excluded, and placed into treatment and control groups including the order in which these assignment methods occurred. It should start with all of the customers in the utility territory, and then precisely describe the assignment process and each step that led to the customers being placed into their final groupings, including the decision mechanism for each step (e.g., allocated randomly, through opt-in / opt-out, with screening criteria, depending on technology installation, or through some other method). A flow diagram may be the best way to depict this randomization and assignment process (see Figure 1 below for an example).
2.a.iii. Treatments	Provide a description of all of the rate design elements (including the baseline calculations, the base rate structures, the overlay rate structures, and any event or critical event day that occurred), the technology, and the information that customers in each treatment and control group receive.
2.b. Implementation	
2.b.i. Project schedule	Provide a brief description of the project schedule and timeline.
2.b.ii. Recruitment and customer retention approach	Provide a description of the methods used to recruit customers and maintain customer involvement (e.g., advertisements, mailers, other forms of customer contact).
2.b.iii. Recruitment and customer retention numbers	Provide a detailed description of the number of customers in each step of the assignment method (the numbers of customers that were selected, screened, recruited, enrolled, randomized, excluded, and placed into treatment and control groups). Also provide a description of the number of customers that were not retained during the study and the reason they were not retained (e.g., they dropped out, changed accounts, were excluded for some other reason). A flow diagram may be the best way to depict the assignment and retention process and number of customers in each step (see Figure 1 below for an example).
2.b.iv. Incentive approach	Provide a brief description of the incentive approach used for study participants (e.g., if customers were provided incentives to participate or to remain in the study for its duration).
2.b.v. Survey approach	Provide a detailed description of any administered surveys, including the

	population of customers that were asked to complete the surveys, the methods used to contact these customers, the number and percentage of customers that completed the surveys, the timing of the surveys, and any other relevant information. Include a copy of the survey instrument(s) or list of questions for each survey in an appendix.
2.b.vi. Technology installation	Provide a detailed description of the method by which any technology involved in the study (e.g., IHDs, PCTs) was provided to customers and installed at their premise (e.g., self-install vs. professional install, pre-provisioned vs. post-provisioned), including methods used to contact and follow up with customers, number and percentage of customers where the technology was correctly installed, a description of any problems involved with the technology installation (e.g., some customers had home layouts that prevented installation), and any other relevant information.
3. Data description	Provide a detailed description of the data collection and data cleaning. In the main body of the report: • List and describe the customers for which data was collected. • For each group of customers, describe the frequency (e.g., hourly, daily, yearly) and range of dates of the data collected and the data used in the analysis (e.g., for this group of customers, we collected hourly smart meter data from June 12, 2011-Sept 25, 2012). • Describe any demographic data or other customer specific characteristic data that you have for these customers. Either in the main body of the report or in an appendix [2]: • Describe any data values that were missing, imperfect, interpolated, or atypical in any way. • Describe the specific customers, dates, and times that were included and excluded. • Describe any other data excluded (e.g., due to missing or imperfect data). • Describe any other relevant information about the data collected.
4. Analytical methodology(ies)	Provide a detailed description of the analytical methods used. See “SGIG Guidance Document 12 – LBNL Meta Analysis Framework” and the upcoming “Analysis Methods Guidebook” for a description of different methods. Each analysis method that is described should include, at a minimum: • The specific question being addressed in the analysis. • The reference load model describing the customer groups and times that are being compared (e.g., the change in energy usage between summer 2009 and summer 2010 for Treatment Group 1 compared to the same change in energy use for Control Group 1). • Provide validation of the reference load model (e.g., that the control and treatment groups were accurately randomized). See the upcoming “Analysis Methods Guidebook” for a description of randomization validity methods.
5. Results	
5.a. Impact evaluation results	• At a minimum, the results should include an impact estimate for each rate, technology, and/or information treatment.

[2] This information will allow the TAG to understand the population and times for which the results are applicable.

	• Each estimate should have associated with it either in the body of the report or in a separate appendix: o Its standard error; o A p-value and/or confidence interval indicating statistical significance; o The number of treatment customers, the number of control customers, and the total number of observations used in the analysis; and o A description of the dates and hours used in the analysis if it is a subset of the total amount of data collected (e.g., only the hours between 2-6pm during weekdays during July and August were included in the analysis). o A description of the customers used in the analysis if it is a subset of the total number of treatment and control customers • Each estimate that is calculated should additionally be reported in the following four standardized formats (where the impact hour is the hour of interest for the evaluation, e.g., event hours for CPP rates or daily peak hours for TOU rates): o The average kWh reduction per customer per impact hour (e.g., 0.5kWh per weekday peak hour per customer) o The average percent energy reduction per impact hour (e.g., 40% per weekday peak hour per customer) o The total energy conservation; the average kWh reduction per customer per month over all hours in that month (e.g., 40kWh per month per customer) o The average percent energy reduction per month over all hours in that month (e.g., 4% per month per customer)
5.b. Process evaluation results	Provide a detailed description of the process evaluation that was undertaken that may include the following topics: customer recruitment, AMI and technology installations, back-office systems, information technology vendors, event dispatch and notification, and customer service. In addition, provide an assessment of how the results of the impact evaluation will impact future roll-outs of rate, technology and/or information feedback opportunities.
5.c. Additional results	Additional results may include: customer enrollment impacts; customer retention impacts; impact estimates for different time durations (e.g., for certain months or certain hours); impact estimates for certain subsets of customers (e.g., for high energy usage customers); cost-effectiveness results; or any other informative analysis results.
6. Conclusions	Summarize the conclusions reached by the analysis with respect to questions of interest and describe implications, if any, for future deployments.
7. Appendices	
Appendix A: Survey Instruments	Include a copy of the survey instrument(s) or list of questions for each survey in an appendix.
Appendix B: Rate Tariffs	Include a copy of any applicable base rate, control group, and treatment group rate tariffs.
Appendix C: Technology	Include a picture of any technology devices (e.g., IHDs, PCTs, web-based

Description	feedback displays) used in the study.
Appendix D: Education Material	Include a copy of any educational materials (e.g., letters, emails, or web-based tips or other education) given to customers in the study.
Appendix E: Marketing Material	Include a copy of any marketing materials used to recruit customers for the study (e.g., mailers, advertisements, or phone contact).
Appendix F: Analysis Methodology and Results	Include any analysis methodology and results not included in the main body of the report.
Appendix G: Data Description	Include any relevant description of the data that was not included in the main body of the report.

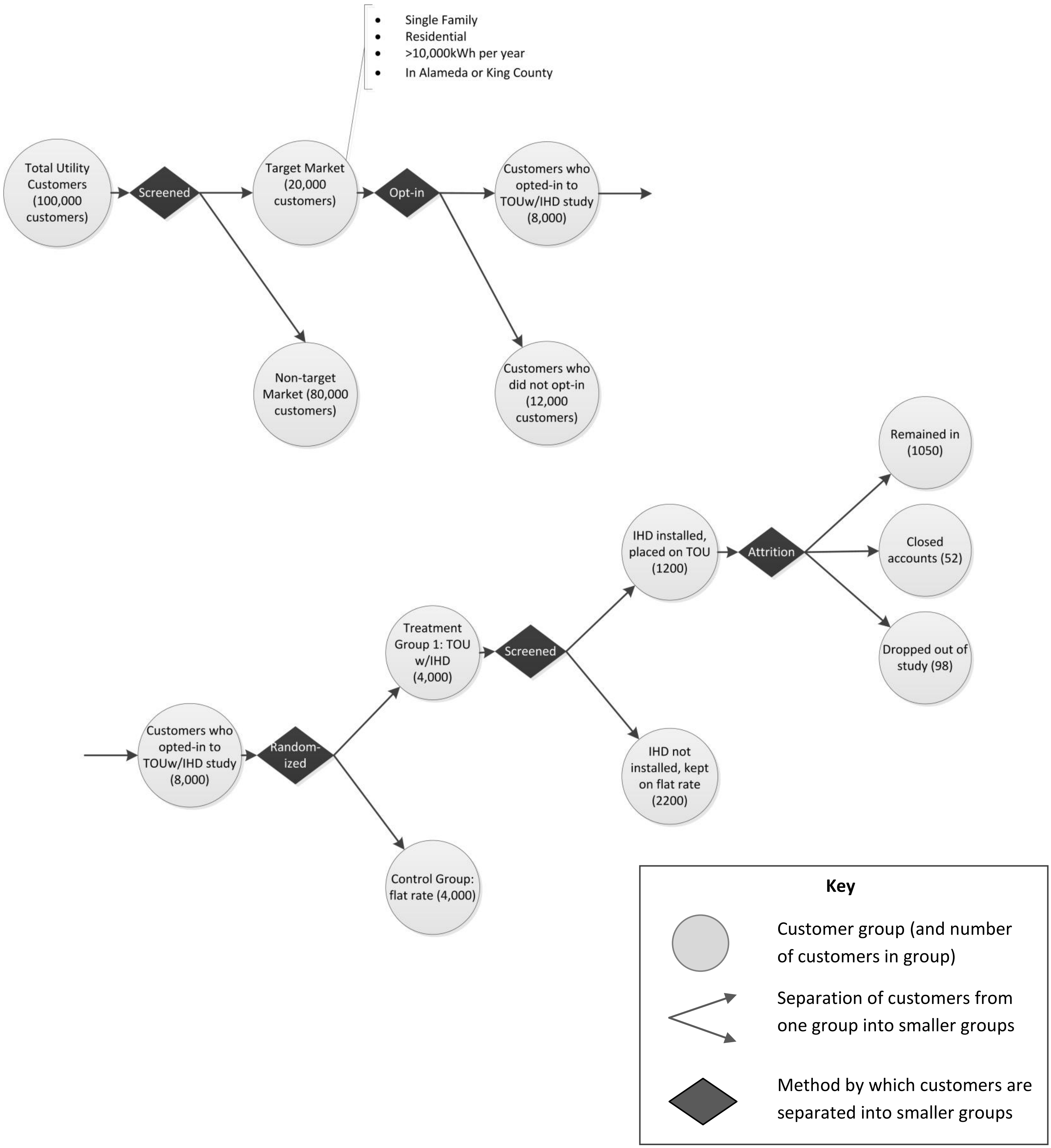

Figure 1. Customer recruitment, assignment, and retention.