



Knowledge to Shape Your Future

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Evaluation, Measurement and Verification for Behavior Programs



What are Behavioral Energy Programs?

- Behavioral Energy Programs build on customer responses to stimuli such as lower bills, social norms, education and information regarding energy conservation actions they can perform
- These programs and campaigns can be offered at the city, state, or federal level by utilities, local or state governments or Federal entities such as EPA or DOE

What are Behavioral Energy Programs?

- Behavioral Programs and campaigns have been around for decades (Smoking Cessation / Recycling)
 - > However - fairly new to the energy industry.
- Burden of proof for behavior programs is very high
- Expectation of similar precision as with monitored equipment that has 10+ year average life
- Requires thinking differently about persistence of energy savings

Why are Behavioral Programs Important?

- Understanding how customers think about energy use allows utilities and government agencies to leverage technological advances and engage customers to create successful energy programs

Examples of Behavioral Programs

- Energy Behavior Program Examples
 - > Conservation Modification Efforts
 - Turning Off Lights / Adjusting Thermostat
 - > Advertising / Marketing Campaigns
 - > Community Outreach Efforts
 - > Social Norm-Based Programs
 - Opower
 - > Education and Information-Based Efforts
 - IOU Training Centers, Continuous Energy Improvement Programs (CEI)

What is Evaluation?

- Evaluation is the systematic measurement or assessment of an energy program
- It collects qualitative and quantitative information to document a program's effects
- Evaluation studies measure change induced by a program or activity

Why Conduct Evaluations?

- Determine if programs are delivering agreed upon energy and demand savings
- Determine which programs are offering the highest cost/benefit ratios
- Understand the non-energy related benefits of your program
- Obtain information to improve program effectiveness in the future



Are You Meeting Your Program Goals?

- Evaluation results inform stakeholders of successes and areas for program improvement
- Types of Evaluation / Research
 - > Impact - Measurement & Verification
 - > Process Evaluation
 - > Behavioral Research
 - > Market Evaluation
 - > Non-Energy Benefit and Cost Research

Process Evaluation

- Process evaluations improve the design and delivery of energy programs - ultimate goal of increasing participation and energy savings
- Process evaluations use quantitative and qualitative research to examine how well a program is being implemented

Process Evaluation

Process Methodologies include:

- Program Documentation
 - > Program Theory / Database Reviews
- Qualitative In-depth Interviews
 - > Program Managers, Administrators and Stakeholders
- Quantitative Statistical Surveys
 - > Program Participants, Non-Participants and Market Actors
- Benchmarking Studies
- Secondary Research

Process Evaluation – Behavioral Programs

- For Behavior Change Efforts – Important to Conduct Research on:
 - > Pre-program efforts - gauge goals / target market reactions:
 - Goals assessment
 - Program tracking plan
 - Pre-testing of messages and delivery methods.
 - > Program implementation - research includes:
 - Depth interviews with program staff and implementers
 - On-site event and course monitoring;
 - Website and online tracking
 - Reach and frequency verification; and
 - Data Collection - focus groups, surveys, comparison studies

Behavioral Research

- Behavioral Research incorporates insights from many fields including:
 - > anthropology,
 - > sociology,
 - > psychology, and
 - > public health



Behavioral Research

- Studies include:
 - > Efficiency of Program Channels and Delivery
 - > Segmentation and Strategic Targeting
 - > Effectiveness of Promotional Strategies
 - > Levels of Customer Awareness and Adoption
 - > Customer Satisfaction
 - > Best Practices and Lessons Learned

Market Evaluation

- Market Evaluation or Assessment studies are conducted to understand the changes that a program is having on the marketplace
- Studies Include: Baseline Analysis, Awareness Studies, Adoption Modeling and Barrier Studies
- Market effect studies are used to understand:
 - > Reductions in market barriers
 - > Impact of rebates
 - > Free Riders
 - > Changes in product availability and price

Market Assessment – Behavioral Programs

- Set Goals, Create Baselines and Define Metrics
- Determine appropriate goals for each behavioral program
- Determine Baseline (Conduct Survey)
- Determine the most appropriate metrics
 - > awareness,
 - > increased knowledge,
 - > channeling into other programs, or
 - > behavior change

Non-Energy Benefits and Costs (NEB/NEC)

- Non-Energy Benefits (NEBs) and Non-Energy Cost (NECs) studies are used to identify and quantify the non-energy costs and benefits associated with program implementation and participation
- These studies are used to:
 - > Understand public costs and benefits of energy programs
 - > Help programs become more “effective” by providing enhanced reasons for participation
 - > Gain program support from a wider range of stakeholders
 - > Help determine “true” cost/benefit ratios

Non-Energy Benefits and Costs (NEB/NEC)

- Examples of NEBs/NECs can include:
 - > Reduced emissions & environmental benefits
 - > Productivity improvements
 - > Reduced debt and lower levels of arrearage
 - > Reduced #'s of disconnects and reconnects
 - > Increased comfort level / convenience of participant
 - > Job creation
 - > Lost economic opportunities / trade-offs



Impact (Monitoring & Verification) Evaluation

- Impact Evaluations are used to measure the changes in energy usage (kWh, kW and therms) attributable to energy efficiency and demand response programs and marketing campaigns
- Program results are determined based on changes to baseline (pre-program) levels

Estimating Energy and Demand Savings

Impact Evaluation

- Behavior Based Programs Offer Unique Challenges in Estimating KW and kWh
 - > Often have numerous goals and competing messages
 - > Quasi-experimental methods such as multi-variate regression analysis and structural equation modeling useful in tweaking out program impacts
 - > Important to assess not only behavior change, but also pre-cursors to change including changes in awareness, knowledge, and intent to act.
 - > Persistence of Savings Issues

Impact Evaluation – Behavior Programs

- Important to focus on similar behaviors when assessing energy savings from behavior change:
 - > conservation actions (turning off lights and TV, drawing shades, etc),
 - > low cost measures (CFLs, programmable thermostats)
 - > high cost measures (HVAC, EE appliances)
- Calculating energy savings requires careful consideration of interactions with utility, statewide and federal efforts

Impact Evaluation – Behavioral Programs

- The following methods are some that can be used to obtain savings from behavior change programs:
 - > Pre-Post Tracking
 - > Structural Equation Modeling
 - > Billing Analysis
 - > Participant Observation (including event attendance, ethnographic research etc)
 - > Social Network Analysis
 - > Conjoint Analysis
 - > Web Statistics and Analysis

Questions?

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