Demand Side Resources Evaluation 101

Presented to:

Pennsylvania Demand Side Response Working Group
Harrisburg, PA
January 19, 2007

Bill Kallock
Summit Blue Consulting
bkallock@summitblue.com

Why Evaluate Demand Side Resource (DSR) Programs?

- All programs pose challenges. Evaluation helps ensure that high expectations for program success are attained.
- Evaluation transforms guesses, initial estimates, and tracking data into information on actual program performance.
- Evaluation provides for accountability.
- Taken together, process and impact evaluations are tools for improving program performance.

Why Evaluate DSR Programs? (cont.)

- A good, *on-going* evaluation effort can help focus efforts on attaining achievable impacts with cost-effective designs.
- Evaluation helps to improve programs:
  - *Where* are the energy savings being achieved?
  - At *what cost* are impacts being achieved?
  - Which consumers *do* participate and why?
  - Which consumers are *not* participating and why?
  - Which consumers *drop out* and why?

Evaluation Objectives

- The *overall objective* is to provide the information necessary to make good decisions regarding investments in energy efficiency programs.
- Evaluations can:
  - Estimate energy and capacity reductions (kWh, kW, therms, or Btu).
  - Assess any changes in quality and reliability of service.
  - Determine the costs of programs.
  - Determine consumer satisfaction and acceptance of the program.
  - Translate program impacts into environmental changes.
  - Assess other non-energy benefits

Types of Evaluation

- Impact Evaluation
- Process Evaluation
- Market Assessment
- Non-Energy Benefits (NEBS)

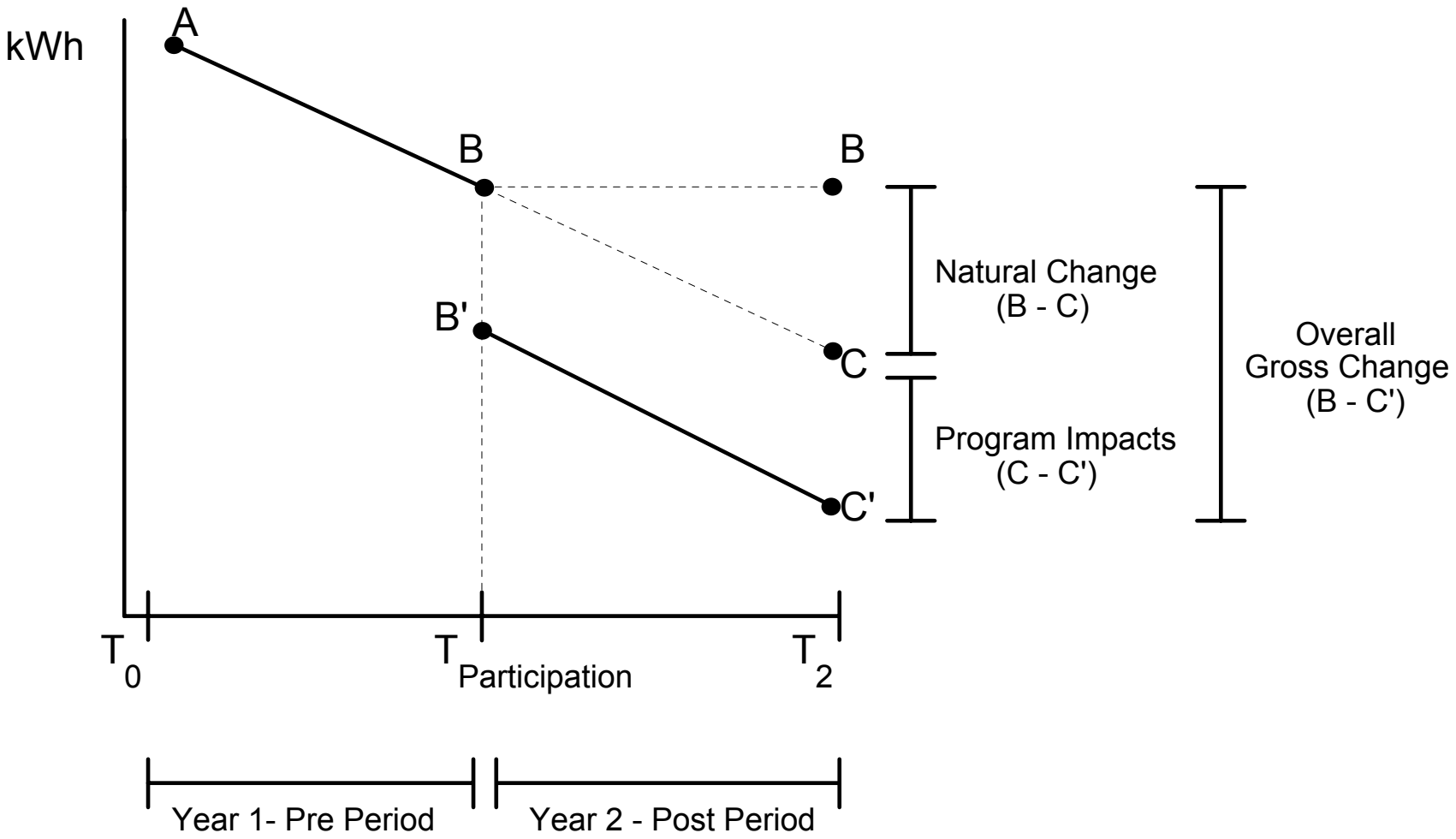
Impact Evaluation

- Definition:
  - A study conducted to measure the change in energy usage (such kWh, kW and Therms) attributed to energy efficiency or/and demand response programs.
- Key Issues:
  - To measure this change in energy usage, a baseline must be estimated against which the change can be calculated.
- Data Sources
  - Program tracking databases
  - Participant applications
  - Participant surveys

Impact Evaluation - Baseline

- What is baseline?
  - The change in overall energy use or demand that would have occurred in the **absence** of the program.
- Common approaches for estimating baseline:
  - *Engineering Approaches.* Estimates are made of the energy use with and without the measure using engineering algorithms and/or models. (e.g. DOE-2, eQuest)
  - *Statistical Comparison (or Control) Approaches.* Estimates of baseline energy use are derived from a "comparison" group of consumers or other data that serve as a proxy for the actions program participants would have taken, had the program not been offered. (e.g. billing data analysis, nonparticipant surveys)

Illustration of Impact Calculations



Impact Evaluation – Net Impacts

Net Impacts = Net-to-Gross Ratio x Gross Impacts

- Gross Impacts – total savings of participants in program
- Net-to-Gross Ratio (NTGR) – adjusts the gross impacts for the impacts attributable to the program.
- NTGR is a function of
  - Freeridership: % of participants that would have made the efficiency improvement without the program
  - Participant Spillover: additional savings achieved by participants due to their participation in program
  - Nonparticipant Spillover: nonparticipants that made efficiency improvements as a results of the program's outreach and marketing.

Process Evaluation

- Definition
  - An examination of how well a program has been or is being *implemented*, including the *efficiency* of service delivery, the *effectiveness* of promotional strategies, and the level of customer *satisfaction*.
- Uses
  - Improve the design and delivery of the program
  - Help design or redesign programs and services
  - Identify staff or staffing needs
  - Structure or revisit management operations and procedures
  - Refine program targeting

Process Evaluation - Methods

- Surveys / Interview
  - Participant Satisfaction Surveys
  - Market Actor Interviews
  - Participant / Non participant Surveys (data collection includes demographic info and usage characteristics)
  - Interviews with Program Stakeholders, Administrators, Implementers.
- Benchmarking Studies
- Focus Groups
- Project Documentation
  - Materials, databases, decision memos

Market Assessment

- Definition:
  - An investigation into the structure, barriers and baseline associated within the 'market' that the program is operating in and the effects of the program on the market.
- Considerations:
  - The number and type (manufacturers, contractors, consumers etc.) of participants.
  - The variety and characteristics of the products and services involved.
  - The rules governing the exchanges that take place.

Market Assessment - Uses

- Market Transformation Programs
  - To determine reduction in market barriers resulting from a market intervention
  - Measure market transformation
- Resource Acquisition Programs
  - Understand Impact of
    - Rebates,
    - Free Riders, and
    - Change in availability of the product
  - Used to refine program

Market Assessment - Methods

- Interviews with Market Actors
  - Equipment vendors,
  - Sales representatives, and
  - Equipment distributors.
- Sales Data Research Studies
  - Used to understand sales patterns and trends
  - Often difficult to get for program areas
- Secondary Research

Non-Energy Benefits (NEBS) Evaluation

- Definition
  - An evaluation to identify and quantify the non-energy benefits associated with program implementation or participation.
- Some examples of NEBs include:
  - Reduced emissions & environmental benefits
  - Productivity improvements
  - Reduced debt and lower levels of arrearage
  - Reduced disconnects and reconnects
  - More on-time payments
  - Higher comfort / convenience level of participant
  - Job creation

Non-Energy Benefits Evaluation - Uses

- Understand the full impact of public benefits and energy efficiency programs.
- Help program become more effective by providing sales enhancement information.
- Gain support for program from a wider range of stakeholders
- Determine the cost/benefit or cost/effectiveness ratios for the program

Non-Energy Benefits - Methods

- Surveys
  - Interviews with participants
  - Interviews with subject-area experts
- Economic impact modeling & impact estimation systems
- Use of secondary research or information

Evaluation Costs

- Typical evaluation budgets for DSR program portfolios run 4%-8%
- Performing cost-effective evaluation is an important issue
- In many cases evaluation will more than pay for itself.
  - An evaluation costing 8% of program expenditures, that results in improved selection of actions and improved delivery may increase the cost effectiveness of the program by far more than the 8% spent on evaluation.

Evaluation Frequency

- Impact evaluations - every two years or as required.
- Process evaluations - within a year of launching new programs or after more substantial changes to program occur.
- Market Assessment - every two to five years to support potential analysis, program development, and baseline assessment.
- Non-Energy Benefits - every two to five years to support potential benefit analysis and program development.
- Evaluation funds should be allocated based on a combination of program budgets and expected savings.

Other Important Evaluation Tasks

- Potential Study
  - Technical,
  - Economic
  - Achievable
  - Helps to focus programs by documenting potential savings
- Baseline Study
  - Determines the current practices in the market
  - Determines the saturation rates for high efficiency technologies

Contact Information

Bill Kallock
Senior Consultant
Summit Blue Consulting
East Coast Office
802.482.7742
bkallock@summitblue.com