

Integrating Energy Efficiency into the New England ISO Forward Capacity Market

Adapting Program Monitoring & Evaluation to The Requirements of the FCM

ACEEE “Energy Efficiency as a Resource”
October 1, 2007

Paul Horowitz
PAH Associates

A Brief History

- Evaluation of large energy efficiency programs has been around for nearly 20 years
- There is a body of accepted practice, methodologies, and tools, and an understanding of the issues related to estimating energy (kWh) savings
- The focus of the EE programs has remained on energy savings, and the application of the evaluation methodologies has thus focused on estimating energy savings

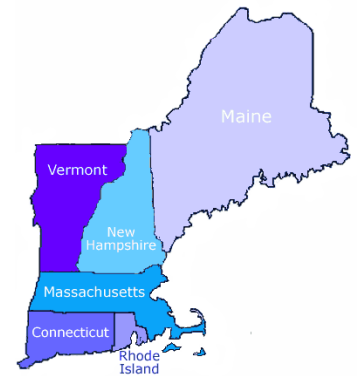
A Brief History (cont'd)

- Interest in ensuring the reality of the claimed savings led to regulatory directives regarding confidence and precision of the evaluated savings
- The most stringent was from the Massachusetts DPU, requiring that samples be designed with a confidence level of 90 +/-10%.
- Over the years a body of third-party derived evaluation results has developed to provide planners, decision-makers, and others with savings estimates about which there is a high degree of confidence

A Brief History (cont'd)

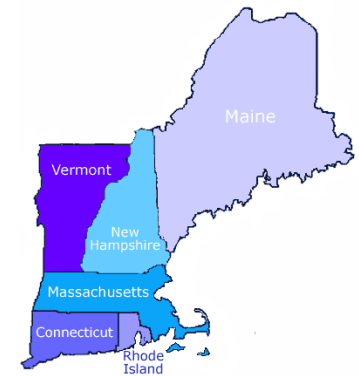
- These studies often included estimates of demand reductions associated with the energy savings, but there generally was less focus on the time differentiation of the demand reductions
- Typically the levels of demand reduction were estimated as occurring during seasonal on-peak and off-peak periods.

The Forward Capacity Market (FCM)



- For decades, regional system dispatch relied solely on supply resources to meet the forecasted loads
- In recent years the ISO-NE has added a demand-response contract program, to acquire load shedding commitments from individual customers.
- With the FCM, for the first time in New England, demand-side resources can be bid into the regional resource procurement system intended to meet the system peak and critical peak hours needs of the region.

The Forward Capacity Market (cont'd)



- The Forward Capacity Auction is held three years before the delivery date of the winning resources
- There are penalties for not delivering the resources
- A program administrator must thus anticipate and commit the demand component of its energy efficiency program portfolio three years ahead...
- ...to meet the system peak or critical peak period over the entire period during which these system peaks might occur, and
- ...with the uncertainties of possible reductions in funding brought on from economic downturn, regulatory or legislative actions, or other events

The ISO-NE M&V Manual for Demand Resources

- In early 2007 the ISO finalized an M&V manual which defined the rules under which savings from all demand resources (energy efficiency, demand response, and distributed generation resources) would have to be estimated.
- Various stakeholders participated in the drafting and comment process: representatives from the six New England states' PUCs, program administrators, and merchant providers.
- The resulting manual was somewhat of a balance between those who sought the level of precision as can be provided by generators (measure the electricity across a meter) and a recognition that megawatts can't be measured the same way.

Impacts on M&V Practice in New England – Evaluating Future Demand Savings

- Each bid has to include an M&V plan that will (presumably) verify the availability of the planned demand resources during the system peak period being bid into (peak or critical peak hours) during the entire period during which the system peak might occur
- The M&V plan undergoes a rigorous review by ISO to ensure it meets the requirements of the M&V Manual
- Successful bidders in the FCM have to implement their M&V plan in time to supply results ahead of the time the demand resources are included in the overall resource mix (3 years after the bid)

Impacts on M&V Practice in New England – Meeting Statistical Confidence Levels

- The confidence and precision level of the overall demand resource portfolio bid into the FCA must equal or exceed 80+/- 10% (not just target the level, as is the case with evaluation of energy savings).
- The demand resources bid in to the auction must be submitted by load zone (Massachusetts has three zones)
- The bid can be a single energy efficiency program or a portfolio of programs
- To ensure that the confidence level is met, higher evaluation costs may need to be incurred to draw larger samples.

Impacts on M&V Practice in New England – Estimating the Right Demand Reduction Values

- The definitions of peak and critical peak hours are different from those used in the past - this has made it difficult to estimate the demand reductions from evaluation studies of past EE programs.
- Data underlying past EE studies have been examined to develop reliable factors that can be applied to the demand savings estimates – in particular, coincidence factors (lighting, HVAC) and measure lives.
- For the remainder, program administrators have had to plan new evaluation studies to estimate demand savings from EE programs across the new peak hours or to enhance existing data

Impacts on M&V Practice in New England – Issues of Bias and Accuracy

- The M&V Manual permits use of results from one load zone to another, or from outside the region, so long as homogeneity of the populations in the two areas can be demonstrated and bias in claimed demand reductions is not introduced into the bid.
- The Manual specifies the standards which the demand resource metering equipment must meet to ensure their accuracy. Evaluation contractors have had to address this more than had been anticipated.

Impacts on M&V Practice in New England – Working across the Region

- The six New England states have a long history of implementing a number of energy efficiency programs across states
- Evaluation studies for energy savings are often conducted jointly by program administrators across states
- The requirements of the ISO M&V Manual have encouraged the states to work even further together to conduct region-wide studies, to establish more common factors across the region and to reduce overall evaluation costs associated with participation in the FCM

Impacts on M&V Practice in New England – Working across the Region (cont'd)

- Facilitated by the Northeast Energy Efficiency Partnerships (NEEP), the six state “State Program Working Group” of PUC representatives, program administrators, and stakeholders, has established an evaluation subcommittee to continue to develop common methodologies, definitions, impact factors, and region-wide studies to support the involvement of the program administrators in the FCM.

So What Have We Learned So Far From the M&V Process within the Forward Capacity Market?

- Participating in setting the rules for M&V matters
- Meeting the requirements of the M&V Manual has upfront and on-going costs, potentially making participating in the FCM not worth it
- The cost of implementing an M&V plan can be reduced through joint studies, use of common values, and common methods
- The FCM process has not completed a full cycle – stay tuned until 2011

The Larger Context

- While including demand reductions in the regional capacity market is important, especially for their impact on prices, the region's focus remains on energy reductions
- M&V studies continue to be needed, to support energy efficiency programs that produce savings at a cost of less than 3.2¢/lifetime-kWh
 - reduce customer bills
 - reduce the need for additional baseload generation
 - support state level regulatory requirements
- The process of regional level work on M&V is setting the stage to support verification of energy reductions in the much broader, and more enduring, efforts to address climate change at the regional New England level, through the RGGI process

Finally,



Thanks!