Measurement and verification for residential demand response in energy and capacity markets

Problem / Opportunity Statement

- The problem to be addressed, the issue to be resolved

  Residential demand response and the PJM markets have significantly evolved over the last 10 years while the measurement and verification methodologies were based on legacy "direct load control" programs from 20 years ago. Incremental changes have been made over time but this has resulted in some inconsistency and lack of transparency regarding the underlying accuracy. Residential demand response now includes the deployment of advanced technologies (Smart Meters/AMI, thermostat controls), the implementation of more flexible retail programs, and the expansion of participation across the entire PJM RTO. Further, the cost of interval metering to accurately measure load reductions on a timely basis is significantly more cost effective than 20 years ago when a temporary load research study was considered the only viable approach.

  Load reductions for most non-interval metered residential demand response in the energy and capacity markets are based on the PJM Deemed Savings report or a load research study. A transition to newer technology, increased efficiency of residential air conditioners, longer and more frequent dispatch of demand response, more flexible retail program design, and the increased geographic diversity of the PJM footprint have made this study obsolete.

  Participant specific load research studies and switch operability studies are also used for M&V for residential demand response. The studies, including the methodologies and associated analysis vary widely from participant to participant which makes the evaluation and assessment of each study an administrative challenge. Both the deemed savings report and load research studies rely on historic data from a sample and may not account for actual performance under a variety of conditions. Both methods are highly dependent on the specific type of control technology and therefore are not flexible to enhancement in the underlying technology or retail programs.

- Why it warrants consideration in the PJM stakeholder process

  M&V for demand response is used to determine if the capacity commitment to ensure reliability of the PJM system was met and to determine the load reduction to compensate in the energy market. Residential demand response represents over 1,000 MW of capacity across 13 States and the District of Columbia.

- Document if the new work is to address specific technical issues and/or to address broader policy issues

  This work addresses specific technical issues related to ensuring the M&V methods for residential demand response are accurate and consistent.

- Include potential additional consequences if no action is taken

  If no action is taken, demand response M&V may not be as accurate as necessary and lack the appropriate transparency and consistency.