Note: The Smart Grid Research Consortium (SGRC) provides consulting support for smart grid initiatives including developing/improving customer engagement strategies and programs. SGRC evaluations are based on experience gained in 20 municipal and cooperative business case evaluations and information from reviews of more than 200 smart grid applications.

Executive Summary

Developing a Timely, Cost-Effective Customer Engagement Demand Response Strategy

A Roadmap for Utilities with AMI and Older AMR/Electromechanical Metering Systems

Background

The Smart Grid Research Consortium (SGRC) recently completed a review of utility customer engagement demand response (DR) technologies and programs. The objective of the study was to develop a roadmap for customer engagement DR program implementation as an aide to assist SGRC utility clients in moving forward with DR programs with more timely and cost-effective strategies. The roadmap recognizes newer, innovative technologies and recent utility experience.

The next section provides a brief aside on opportunities for older AMR/electromechanical metering systems. Newer technologies and program designs now provide most of the DR functionality for older metering systems without requiring an AMI system.

Remaining sections provide an executive summary of roadmap steps the Consortium recommends and applies for clients to develop and improve utility customer engagement DR programs.

Opportunities for Older AMR/Electromechanical Metering Systems

One of the interesting insights developed from the Consortium study is the extent new technologies and programs now provide customer engagement DR benefits for utilities with older AMR and electromechanical metering systems. These programs, based on new technologies, provide new avenues for utilities with older metering systems to provide utilities and interested customers with most of the benefits of an AMI-based system.

For older metering systems, old-fashioned load control technologies have been replaced by a variety of smart load control and information gathering equipment and software. These systems use wireless communications and the internet providing most of the functionality of AMI-embedded systems. For example, programmable communicating thermostats that communicate with the utility via WiFi and the

internet provide nearly all the functionality of AMI-based systems. Interestingly, these programs can be quite cost-effective with their ability to target high-value customers.

Developing customer engagement DR programs at utilities with older metering systems provides new customer services, increases customer satisfaction, and reduces utility peak power costs proving both utility and customer cost savings.

Utilities who plan on making AMI investments in the future may want to take advantage of the non-AMI based options in the meantime.

A Roadmap for Developing/Improving Customer Engagement-DR Strategies

The Consortium's study of existing customer engagement DR strategies and programs shows that most customer engagement programs can significantly boost returns by applying the following recommendations:

1. Develop and continually revise customer engagement DR objectives. A list of customer engagement objectives identifies all important outcomes that provide customer value (e.g., reduced energy bills, greater control over energy use, etc.) and utility value (reduced wholesale power cost, reduced line losses, etc.). Ascertaining utility and customer objectives is essential in designing cost-effective customer engagement programs.

2. Evaluate, identify and initiate programs/technology applications that can most cost-effectively meet the objectives in step 1.

   Beginning with objectives identified in step one, program developers should attempt to identify the most cost effective paths to achieving these objectives. In many cases, technologies and resources often support more than one initiative providing significant cost savings. These synergies should be considered in evaluating individual programs.

   A sample of items that should be included in customer engagement DR evaluations include:

   a. Identify DR end-use targets (e.g., AC, water heating) based on hourly contributions to system load reductions, required incentives, program costs and avoided power costs. Each utility customer population is unique with respect to appliance holdings, building ages, income, demographics, business size, end-use load contributions and a variety of other factors that help determine costs and benefits for individual programs.

   b. Design programs to recognize customer segment wants and needs and likely responses. Different customer segments respond differently to programs and provide variations in program impacts and economics. Recognizing these differences reduces program costs through target marketing, increased participation, more focused messaging, etc.

c. Select appropriate, cost effective technology enablers (hardware and software). A variety of alternative technologies are available for most customer engagement programs. For example, programmable communicating thermostats come with a variety of capabilities with a cost range from less than $100 to more than $400 per unit.

d. Consider both in-house and turnkey solutions. In-house, vendor-supplied or a combination of the two can be used to develop most programs. Strategies for individual programs depend on utility resources, vendor offerings and management objectives.

e. Use social media, target marketing, messaging, PR and promotional activities.

f. Consider newer, innovative technology applications, program designs and experiences at other utilities. Evaluating technologies, programs and rapidly evolving experiences at other utilities can uncover important options and benefits.

g. Carefully identify and evaluate supporting data and analytics requirements. For utilities with AMI systems, AMI data provides a wealth of information. Other relevant data is available to utilities with AMI, AMR and electromechanical metering systems including information on individual customers and customer facilities (income, square feet, etc.) through customer list providers like InfoUSA. IT budgets can mushroom to levels that make some of these programs uneconomical by gathering and processing more customer data than is required. A careful assessment of information resources and utility needs is essential.

3. Reconcile objectives and applications; calculate costs and benefits, gather preliminary vendor cost estimates. Consider results with various program participation and impact assumptions prioritize program/technology applications, identify applications that require pilot programs.

   Steps 1 and 2 match objectives and technologies/programs while step 3 prioritizes objectives-technologies/programs combinations to identify those that provide the most attractive benefits/cost relationships while meeting management views of the importance of the various objectives.

4. Proceed with program development including vendor evaluations, RPF development, proposal evaluation, vendor interviews, pilot programs, etc. Revisit steps 1-3 with this information and adjust the customer engagement strategy as appropriate. Develop a timeline to ensure a timely program development and implementation schedule. Timeliness is important as delays in developing and implementing programs bypass savings that can never be captured.

Summary

An SGRC review of customer engagement DR strategies and programs indicates that utilities who develop a comprehensive customer engagement DR strategy supported with careful analysis of individual programs are much more likely to achieve customer engagement objectives and significant utility and customer benefits. Comprehensive, well-planned DR strategies achieve greater savings sooner and provide greater customer satisfaction.

Technology and program advances now provide customer engagement-DR benefits to utilities with older AMR and electromechanical metering systems. Utilities who plan on making AMI investments in the future may want to take advantage of the non-AMI based options in the meantime.

The recommendations and roadmap provided in this paper reflect a compilation of characteristics associated with the more successful strategies and programs reviewed by the Smart Grid Research Consortium.

Smart Grid Research Consortium Customer Engagement Consulting Services

The Smart Grid Research Consortium (SGRC) works with electric cooperatives, municipal, and public utilities to develop smart grid development strategies including comprehensive business case and risk analysis. Individual utility strategy and program development projects apply the SGRC's Smart Grid Investment Model (TM) quantitative business case analysis across metering, customer engagement, and distribution automation applications including CVR. The Consortium was initially established at Texas A&M University in 2010 by Professor Jerry Jackson who continues to lead the SGRC as an independent consulting organization. The SGRC has conducted 20 coop and public utility business case analyses and has complied one of the largest databases on smart grid investment results from more than 200 utility initiatives.

For further information contact:
Dr. Jerry Jackson, Smart Grid Research Consortium
37 N Orange Ave, Suite 500, Orlando, FL 32801
979-204-7821
jjackson@smartgridresearchconsortium.org