The Market for Demand Response
– the DR Maturity Model Perspective

Demand Response (DR) is a proven alternative to adding new generation with an approach that is ‘zero-carbon,’ cost-effective and environmentally-friendly.

DR technologies deliver a temporary adjustment in energy consumption – usually due to a severe network reliability issue or extremely high price in the real time energy market. It is an effective tool for postponing capital expenditures in relieving network reliability constraints, or avoiding spikes in energy prices and energy consumption. But what is the path to implementing a successful DR strategy?

This article examines the traditional 4-stage Demand Response (DR) Maturity Model. There are points along the DR maturity path when a utility fully embraces and implements DR such that it becomes a real and reliable resource, but there can be challenges in fielding successful DR programs.

The market for DR is heating up. Utilities of all sizes with multiple DR programs in place are growing their portfolios. Much of the industry is not implementing its first DR program, but perhaps its eighth or tenth.

THE UTILITY DR MATURITY LIFECYCLE

Stage 1: Getting Started
Most utilities use some form of DR – perhaps just a phone call to a few large industrial customers to reduce energy consumption during a network reliability emergency, or a legacy residential hot water heater cycling program.
These first load reduction programs usually were launched to preserve reliability. They reduce overall network outages and provide either time for a network upgrade or replace the need for network upgrades all together. For Retailers, Coops, and Muni’s in Texas and other markets where scarcity pricing allows peak energy prices to reach $5,000 per MW this year and up to $7,000 in 2014, it is not hard to justify DR. The measurable success of these programs usually prompts utilities to extend DR deployment until the targeted network segment or audience is saturated.

Stage 2: Scale & Learn

Whether the first program was a success or failure, need often arises for another program, possibly due to network capacity issues, avoiding peak energy prices, or the unfavorable economics of building high cost peaker plants.

Usually, the latest available device technology is studied and deployed in a new program with different rules often targeted at new customer segments or load profiles. A DR Aggregator is sometimes hired to handle part of, or most of the DR management – recruiting customers, installing devices, scheduling DR events when needed and signaling the devices to reduce energy consumption. In either case, a new program is created with new rules, incentives, device technology and even new communications infrastructure.

Stage 3: DR Challenges Emerge

Multiple DR programs, device technologies, and communications paths managed by multiple systems can quickly become unmanageable.

Typical challenges faced by utilities include:
- No single system for registering customers and devices
- No single view or forecast of DR availability by network segment
- No ability to forecast device response profiles or snap back
- No optimization of DR resources across programs or geography
- Device technologies not using or supporting open standards for communications protocols and messages
- No performance measurement capabilities or settlements
- Very little integration into back office systems; No data sync across disconnected systems

Stage 4: Demand Response Management Systems (DRMS)

When DR challenges reach a level of complexity, frustration, and operational risk at which tools are not being effectively used, or when the cost of operating many disparate systems in parallel is significant enough, or when the lack of integration and automation mandate investment in large-scale harmonization, there is a cost effective solution – implement a DRMS.

A DRMS is an integrated command and control system that manages the entire lifecycle of DR programs and resources across customer segments, device types, and communications technologies. It also acts as the integration hub managing all DR related data flows between operational and back office systems.

Conclusion

The Market for DR is maturing at every level. Utilities like Nevada Energy have proven the value and shown that DRMS is the ultimate command and control tool for forecasting and efficiently using DR so control rooms can preserve reliability, energy traders can hedge against high prices, and network planning engineers can push out infrastructure upgrade projects and direct capital to more pressing needs.

Whether you are just beginning your DR journey, in the middle of it, or at Maturity Level 4, it is never too soon to consider the savings and flexibility of DR, and of implementing a DRMS.