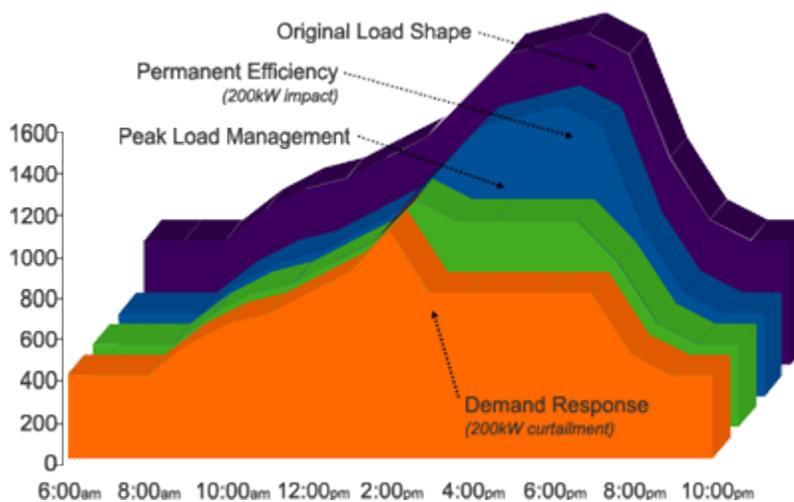


2013: A Year For Demand Response

Edmund P. Finamore, P.E.
President
Valutech Solutions

With 2012 now behind us, electric utilities have begun to focus on 2013 and the impact of national elections, EPA activism, cyber security concerns and other important issues facing the beleaguered electric utility industry. At no other time in our history have utilities experienced such a cascading challenge of threats to their energy supply, transmission and distribution facilities and information systems. More urgently than ever, electric utilities are searching for answers to counter the growing external threats to their core mission to deliver reliable, reasonably priced electric service to an increasingly demanding and skeptical customer base.

The re-invention of demand response is perhaps the most significant energy hedging strategy to come out of the 2011 and 2012 technology wars to address the worrisome issue of long term energy supply. Long accepted within the utility industry as a sort of mutual defense strategy against higher electric costs, utilities have in the past promoted demand response to reduce energy supply costs, while also encouraging customer awareness of usage options that reduce peak customer demand. This collaborative approach, originally called demand-side management in the 70s and 80s, works by giving customers some skin in the game, since their active participation in customer choice and behavior changes can actually affect their utility costs.



Demand Response Flattens and Shifts Peak Demand Load Shapes

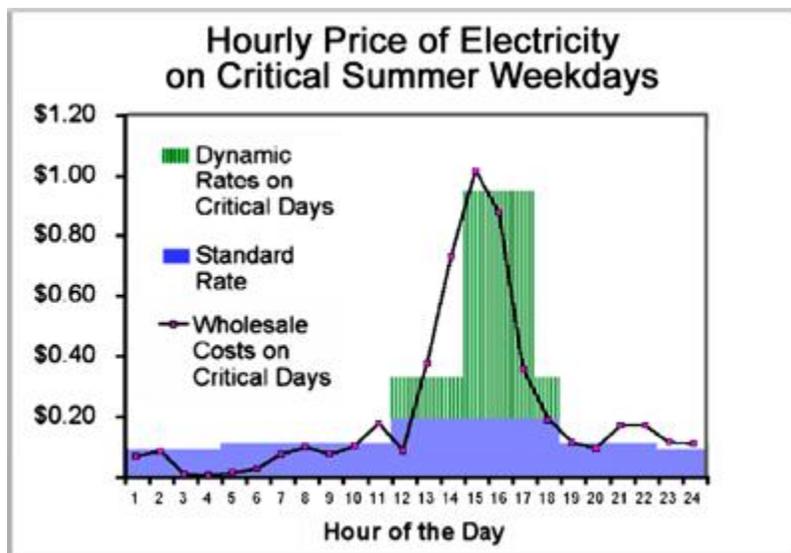
Source: Sarah Gibson Blog- Demand Response on Energy

The War on Fossil Fuels

Over the past few years, the environmentalists' war on fossil fuels has reached epidemic proportions. Coal fired power plants are shutting down, and many industry analysts believe that the current period of moderate supply costs driven by cheap natural gas prices may be short lived if regulators follow through with plans to regulate hydraulic fracturing or "fracking", the new technology for tapping into large stores of previously non accessible natural gas. Some politicians also see our increasing gas reserves and growing reliance on natural gas as a new taxing source to fund more government spending. As a result, long term gas prices could rise, and utility plans to replace aging, environmentally non-compliant coal fired power plants with cheaper, clean natural gas may see the expected benefits go up in smoke.

Faced with an increasingly difficult set of alternatives to choose from, utilities have begun looking to demand response as a more practical solution that can potentially delay the time when critical supply decisions must be made. As the deployment of Advanced Metering Infrastructure (AMI) increases, time based pricing of energy usage enabled through smart meters could become more widespread, and can help flatten system peak demand by shifting usage to off peak periods.

Until recently, the cost differential between on and off peak pricing has not been sufficiently large to justify an industry-wide migration to time-of-use rates. Simple two tier plans, which are most commonly used today, generally separate on and off peak blocks at undesirable hours that don't typically change residential customer daytime behavior patterns. Some evidence suggests that a three tiered approach may prove to be more successful by shifting usage from an expensive peak period block to a more moderately priced shoulder block still available during daytime hours.



Hypothetical Example: Source- Berkeley Laboratory

Utilities are also increasingly revisiting traditional load control methods to reduce peak system demand. Many AMI solutions support load control functionality in the form of air conditioner cycling, and water heater and pool pump controls. In some cases, these devices can be pre-scheduled for certain daytime periods that customers can plan their activities around, while in others an emergency signal can trigger equipment shut off or cycling functions. Whether load control or time-of-use rates are used, the concept is the same: shifting consumption to off peak periods presents a clear, clean option to reduce peak demands and can delay the need for additional generating capacity.

Hedging Value of Demand Response

As smart grid technologies improve, they are becoming increasingly more capable of dealing with the steady emergence of a deregulated, real time energy market that is slowly moving to time based pricing of supply. With wind, solar and other renewable sources added to the mix, the reliability, and hence cost, of various supply options becomes even more unpredictable. Supplier pricing decisions will likely be determined by a range of often uncontrollable factors such as the reliability of older coal fired plants and changing weather patterns that can affect wind, solar and even hydroelectric production. Suppliers recognize these risks, and understandably want to pass them onto distributors in the form of variable pricing schedules.

Utilities that purchase off system generation should adopt price hedging strategies that include demand response systems to let them pass some of the supply risk onto their customers, either through critical peak pricing tariffs or in the form of load shedding or shifting programs. Traditional fixed price or declining block tariffs that benefit customers will no longer work for utilities that must manage sudden increases in energy cost by absorbing them or passing them along later to customers in the form of fuel cost adjustments.

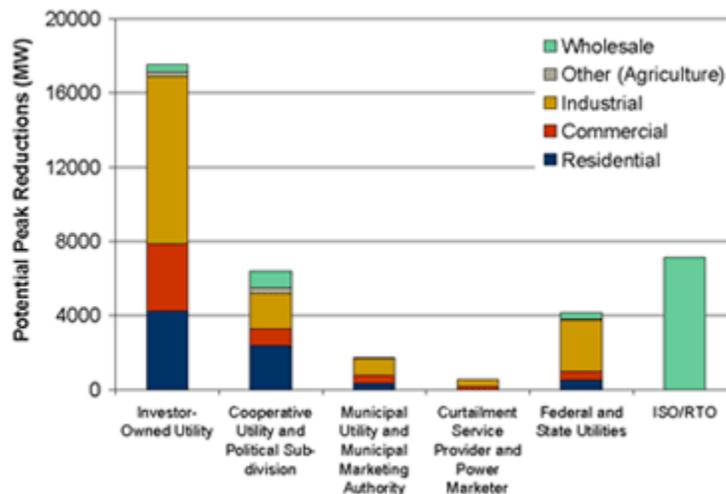
Thankfully, a wave of newer smart grid technologies supports such an alternative. By slightly changing their behavior patterns, customers can take advantage of energy cost saving opportunities provided through implementation and use of these demand response programs. For example, pricing signals dispatched by a utility, its supplier or regional control organization can trigger an air conditioner cycling event or raise the setting of a programmable thermostat. Such events are typically automated and are relatively benign in terms of the inconvenience imposed on customers. In exchange for a minor inconvenience, customers can receive pricing credits, sign up bonuses or similar incentives.

And a new generation of demand response management systems is making this all possible with their ability to aggregate the load reduction capabilities of a large number of participating customers. In this manner, the combined impact of these programs on system peak demand can be measured and supplier credits can be earned and applied to the utility's overall cost of energy supply.

Demand Response Gains Traction in 2013

The introduction of load control technologies and different energy pricing options has created a perfect storm for widespread adoption of demand response programs in 2013. Customers are now signaling that they are ready to take on a greater responsibility for managing their energy use, and any lingering belief in the old 70's perception that electricity would eventually be "too cheap to meter" is clearly gone forever. The growing availability of new home energy management devices such as in-home energy displays and programmable thermostats will provide consumers with even more choices in 2013.

As Smart Energy Profile 2.0 takes hold and provides more industry-wide clarity, demand response programs will be able to focus to a greater degree on specific in-home devices. Through use of AMI systems, or separate broadband connections, utilities can send pricing signals to specific devices or initiate load control events, while customers monitor their energy usage, thermostat settings and load control events through their smartphones and ipads.



FERC staff estimate of demand response resource contribution

An unpredictable future for energy supply, rapidly maturing load management technologies and a more educated and involved customer base could combine to make demand response the "go-to" solution for supply vs. demand uncertainty in 2013. If so, utilities may have found one alternative solution to help address the core problem of energy demand vs. supply uncertainty.

About the Author: Ed Finamore is Founder and President of Valutech Solutions Inc., a management consulting firm specializing in smart grid solutions. Mr. Finamore is a pioneer and recognized expert in the implementation of AMI technologies, and has spent over 35 years in the utility and smart grid sectors. His current focus areas are in the specification, selection and implementation of AMI/Smart Metering, meter data management, load management and related smart grid technologies for the utility industry. Mr. Finamore can be reached at EFinamore@valutechsolutions.com.