

# Demand Response, Smart Grid, & Renewable Energy

## Questions & Answers

### WHAT IS DEMAND RESPONSE?

Demand response refers to the policy and business area whereby electricity customers reduce or shift their electricity use during peak periods in response to price signals or other types of incentives. At present, the vast majority of electricity customers are on flat, average rates that do not vary by time of day or season, no matter how much the cost to generate or deliver electricity fluctuates as demands on the system rise and fall. Flat pricing combined with the growth in the use of air conditioning—one of the highest demands during peak periods—has led to peak power demand growing faster than overall growth in electricity consumption. Rising peak demand is straining the electricity system and threatening the reliability of the power grid. It also is adding costs that all customers pay one way or the other, while leading to increased emissions.

### WHAT TECHNOLOGIES ARE USED IN DEMAND RESPONSE ACTIVITIES?

Demand response technologies are by definition smart grid technologies. They include any products or services that help in the active monitoring and dynamic control of electricity usage. Smart meters are one of the most well known examples. Such meters allow measurement in time intervals, which is essential to being able to send time-based price signals to customers that encourage them to shift usage from one period to another. The meters and other technologies also allow new and better information to be generated and used by both the customer and electricity providers. This information can be presented to customers via in-home display devices, which help customers track and better understand their electricity use. Other technologies include smart thermostats, energy management systems, dynamic lighting controls and dynamic energy storage systems.

### DOES DEMAND RESPONSE SUPPORT GREATER USE OF RENEWABLE ENERGY?

Yes. Many renewable energy resources are intermittent or produce power off-peak. For example, much of the wind resource in the country is not available during the peak period of the day. Demand response is specifically designed to manage and reduce demand during peak periods and thus it is an ideal complement to wind and other intermittent resources and can help support the increased deployment of renewable energy.

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## **HOW DOES DEMAND RESPONSE SUPPORT RENEWABLE ENERGY & GRID RELIABILITY?**

Demand response can serve to meet unexpected needs on the grid when renewable resources that are normally available suddenly become unavailable. For example, in March 2008 Texas experienced a sudden drop in wind-energy production from 1,700 MW to 300 MW. Within ten minutes, however, the grid operators in Texas were able to deploy 1,100 MW of demand response from electricity customers—thereby preventing a state-wide blackout.

## **WHY DEVELOP DEMAND RESPONSE IN CONCERT WITH RENEWABLE ENERGY?**

Twenty-nine states have a renewable portfolio standard (RPS), which is a policy that requires electricity providers to have a certain percentage or amount of power from renewable resources by a certain date. Several other states have non-binding renewable energy goals. With climate change policy set to drive still more development of renewable energy, it is important that demand response be available to complement new renewable resources. According to a recent report from the North American Electricity Reliability Corporation (NERC), the independent entity charged by Congress to ensure grid reliability, there are challenges involved in trying to rapidly integrate large amounts of renewable energy on the existing electricity system. NERC said that deploying demand response and making the grid smarter are two essential steps that will help support the introduction of more renewable energy while maintaining and improving reliability.

## **WHAT BENEFITS COME FROM DEVELOPING DEMAND RESPONSE & RENEWABLE ENERGY?**

Deploying demand response in concert with renewable power can help meet state and national energy needs. A recent report by the American Council on an Energy Efficient Economy (ACEEE) about efficiency, demand response and renewable energy resources in Texas found that these resources collectively could meet 107% of the projected growth in summer peak demand by 2013 and yield utility bill savings of \$73 billion or more over the next 15 years.

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