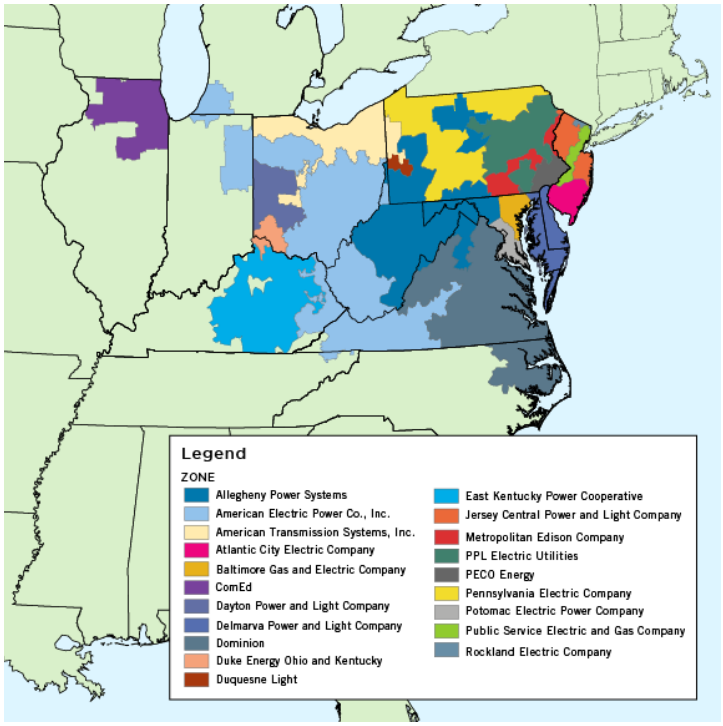
Demand Response and Why It's Important

Demand Response is a consumer's ability to reduce electricity consumption at their location when wholesale prices are high or the reliability of the electric grid is threatened. Common examples of demand response include: raising the temperature of the thermostat so the air conditioner does not run as frequently, slowing down or stopping production at an industrial operation or dimming/shutting off lights – basically any explicit action taken to reduce load in response to short-term high prices or a signal from PJM.

Demand Response does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

Demand Response is important because it is another competitive resource that can be used to maintain demand and supply in balance for grid operations and the associated wholesale markets. Retail electricity consumers tend to be unresponsive to wholesale prices. Therefore, as demand goes up, less efficient generators are called on to serve this demand. By reducing demand during these periods, the system and market potentially can avoid using less efficient generation resources to meet high demand.

What is PJM and Where is it Located?



PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia. Acting as a neutral, independent party, PJM operates a competitive wholesale electricity market and manages the high-voltage electricity grid to ensure reliability for more than 65 million people. PJM's long-term regional planning process provides a broad, interstate perspective that identifies the most effective and cost-efficient improvements to the grid to ensure reliability and economic benefits on a system wide basis. For more information please go to http://www.pjm.com.

PJM's "wholesale" market is focused on entities that buy and sell electricity but do not actually consume the electricity. The retail market is focused on entities that buy electricity from the wholesale market or produce the electricity, and then sell the electricity to a customer that physically consumes the electricity. For example, a local utility may purchase wholesale electricity in the PJM market and then sell it to the customer for their retail electricity consumption needs. PJM does not interact directly with electricity consumers. PJM interacts with the companies that provide electricity to consumers.

The Role of a Curtailment Service Provider (CSP)

A Curtailment Service Provider (CSP) is the entity responsible for demand response activity for electricity consumers in the PJM wholesale markets. A CSP may be a company that solely focuses on a customer's demand response capabilities, a local electricity utility, an energy service company or other type of company that offers these services. The CSP identifies demand response opportunities for customers and implements the necessary equipment, operational processes and/or systems to enable demand response both at the customer's facility and directly into the appropriate wholesale market. This requires the CSP to have appropriate operational infrastructure and a full understanding of all the wholesale market rules and operational procedures.

A list of Curtailment Service Providers is available on PJM's website at Markets & Operations > Demand Response > Curtailment Service Providers (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). The list includes contact names at the firms; it also indicates in what states the firms do business.

Specific opportunities for electricity consumers to provide demand response in the PJM wholesale markets

PJM's demand response opportunities enables retail electricity consumers to earn a revenue stream for reducing electricity consumption when either wholesale prices are high or the reliability of the electric grid is threatened. Demand response participation is broken in two broad classifications, economic and emergency. An electricity consumer may participate in either or both depending on the circumstances.

Pre-Emergency and Emergency demand response primarily represents a mandatory commitment (referred to as Load Management Resources AND Demand Resources (DR)) to reduce load or only consume electricity up to a certain level when PJM needs assistance to maintain reliability under supply shortage or expected emergency operations conditions. This is considered a mandatory commitment to which penalties will be applied for non-compliance. The CSP's resources must be available to respond to PJM's request to reduce load where the availability depends on the product selected by the CSP as follows:

- Limited DR (only available through 17/18 Delivery Year) – resource is available for up to 10 weekdays from June through September, where each request may be up to six hours in duration.
- Extended Summer DR (only available through 17/18 Delivery Year) – resources is available for all days from May through October, where each request may be up to ten hours in duration
- Annual DR – resources is available for all days from June through May of following year, where each request may be up to 15 hours in duration
- Base DR (only available for 18/19 and 19/20 Delivery Years) – resource is available for all days from June through September, where each request may be up to ten hours in duration

PJM considers these resources similar to a generator and fully expects them to perform at the time when the grid most needs it to avoid brownouts and/or rolling blackouts within the PJM service territory. The CSP is responsible for managing their portfolio of customers to meet their obligations and avoid creating an operational problem on the grid and/or receiving financial penalties. The revenue stream derived from participation is largely driven by the "Capacity" market as defined under the Reliability Pricing Model (RPM). The revenue earned is a function of the relevant RPM

price and the load reduction commitment. The resource is paid to be "available" during expected emergency conditions on a monthly basis for a commitment that is made for one year, which starts on June 1 and ends on May 31 of the following year.

Economic demand response primarily represents a voluntary commitment to reduce load in the energy market when the wholesale price is higher than the published monthly PJM net benefits price. The net benefit price represents the price at which the benefits incurred by a reduction in wholesale prices from the economic demand response will exceed the cost to pay for the economic demand response. The economic demand response will be used to displace a generation resource and PJM expect the resource to perform and will assess deviation charges if the amount of load reductions realized is significantly different than the amount of load reductions dispatched by PJM.

An economic demand response resource may also provide Ancillary Services to the wholesale market with the appropriate infrastructure and qualification by PJM. There are three Ancillary Services markets in which economic demand response resources may participate: Synchronized Reserves (the ability to reduce electricity consumption within 10 minutes of PJM dispatch), Day-Ahead Scheduling Reserves (the ability to reduce electricity consumption within 30 minutes of PJM dispatch) and Regulation (the ability to follow PJM's regulation and frequency response signal). Participation in the market is voluntary; however, if a resource clears, performance is mandatory. PJM fully expects the CSP to perform to maintain system reliability. Currently, there are several electricity customers that provide synchronized reserves into the wholesale market.

First Step for Interested Electricity Consumers

The first step for a consumer interested in demand response is to contact a CSPs to get a more in-depth understanding of the opportunities and determine whether you have the capability to participate. PJM posts on its website the training materials developed for its members who are interested in the rules and requirements for demand response activity at http://www.pjm.com/training/training-material.aspx. PJM also posts a variety of demand response information at http://www.pjm.com/markets-and-operations/demand-response.aspx.

Why Electricity Consumers Want to Participate

Demand response provides an opportunity to lower electricity bills by making a commitment to reduce load in response to market prices or the need to maintain system reliability. Participation may help to ensure reliability and avoid disruption of electricity service for many customers. Additionally, participation may help to delay or avoid the building power system infrastructure that would only be utilized during the highest demand periods. Load reductions during peak demand conditions also may help to reduce emissions and the associated environmental impact on the planet.

Please be advised that all detailed market rules are contained in the PJM tariff and manuals and that such rules may change over time. This summary is intended to provide only a brief overview of the demand response opportunities at PJM for end use customers that may consider participation.