QUANTA TECHNOLOGY

ABOUT Demand Response

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We define “demand response” (DR) as a mechanism to achieve changes in electric usage by end-use customers through which an end-user’s load becomes a resource option for electric system planners and operators in balancing supply and demand. This change is affected by the user, a third party, or a utility, often in return for economic compensation.

DR (or load management) grew out of concern about a potential shortfall in generating capacity during the 1980s. Initially, utilities focused on industrial interruptible-curtailable programs and direct control of residential air conditioners and electric water heaters. The latter was particularly important for winter-peaking companies (e.g., Florida Power) as they provide a cost-effective option for shifting loads to off-peak hours. Although the initial focus was on the residential sector, it quickly became obvious that the most effective opportunities were in the commercial building sector. For most utilities, the commercial cooling load that drives summer peaks and thermal energy storage became the primary load-shifting measure. Energy storage and intelligent building energy management systems continue to offer customers a solution for controlling peak demand and demand charges.

A much broader spectrum of DR options is now accessible primarily due to the penetration of new communications and control technologies. These options include remotely-controllable thermostats, remotely-accessible Energy Management Systems (EMS) in small business establishments and large buildings, process controls for refrigerated warehouses, and large pumping loads in cities and agriculture. Customer and DER storage for renewables and transportation is yet another opportunity to shift or curtail load for system reliability services. It has been recognized that DR is an effective complement to Battery Energy Storage Systems (BESS) on the bulk power system, and its value grows with increasing penetration of variable renewable resources and the proliferation of renewable mandates. In fact, some utilities want to implement several non-wires solutions, including fast-acting DR with dispatch notices as short as 5 minutes and curtailment durations that last as long as 12 hours. The flexible load delivered by DR will be one of the essential elements of any modern grid.