



## ***Episode 6 – Demand Response & Demand Side Management***

Demand Response, you've heard about it or maybe it sounds like technical jargon that describes a phenomenon that would never touch your day to day life. So, let's break this down. Think of the electricity grid as a giant scale that constantly needs to remain in balance i.e. supply is meeting the demand. On hot summer days when the air conditioning load soars, generators are working at capacity and sometimes struggle to keep pace with the demand for power.

Demand response tips the scale on the electricity users' side. Instead of constantly generating more power to maintain the balance, demand response technologies reduce consumption on things such as air-conditioners, industrial equipment, electric water heaters, lights or dryers.

This technique has been used in the past but is getting more sophisticated as technologies — particularly smart buildings — gain momentum. Demand Response programs more easily incorporate variable loads from renewable power sources. Since renewable sources such as wind and solar are intermittent and volatile, DR can smooth this instability, by plugging in various loads at different times based on availability. In fact, without a reliable DR program, utilities will find it cumbersome to incorporate renewable sources as a load provider.

Demand response is changing how electricity is consumed based on a change in the price of power, which in turn has a lot to do with when the power is consumed. It's a technique utility companies use with commercial, industrial and residential customers. Consumers may become aware of demand response programs during heat waves when there are worried about the adequate power supply. Demand response also has been a key reliability tool in the winter when large scale generators may be affected.

Gradually, these techniques are earning energy consumers money. Just as a power plant owner can bid megawatts into the daily and hourly markets for energy, a demand response provider can bid reductions in as well.

The difference between energy efficiency and demand response can be nuanced. Energy efficiency techniques are aimed at lowering the overall energy use, while demand response is geared at lowering consumption at specific times based on a change in price. In other words, corporate efficiency initiatives are meant to lower monthly energy bills. On the other hand, a change in the price of power, which varies by the hour, triggers a demand response event that leads to the curtailment power for a particular period.

Energy cost in different buildings and facilities, either industrial or residential, has a significant impact on their general operational costs. Energy prices have been rising steadily and the energy consumption is increasing along with it.

Energy professionals know that this situation is not sustainable, and that managing energy efficiently is becoming increasingly vital. Reducing energy cost is one of the main objectives of energy managers, facility managers, and building operators. Also, they aim to meet environmental or sustainability standards and objectives set by governmental organizations at a national or international level.

To achieve said standards, energy professionals utilize “Demand Side Management” (DSM). When they want to work at a deeper more technical level, “Demand Response” is applied.

Sometimes, even energy professionals use the terms Demand Response (DR) and Demand Side Management (DSM) interchangeably but make no mistake: they are not the same.

Undoubtedly the two concepts do complement each other, helping energy managers achieve their energy efficiency goals successfully and holistically.

This article will explore some differences between the two and help clarify how these concepts affect consumer consumption behavior.

Firstly, let's go ahead define the Demand Side Management (DSM) concept. To understand it we must clarify its objective: to achieve a balance between energy production and demand since the imbalance between these makes the price of energy even more expensive for consumers.

Consequently, achieving a balance between energy demand and supply (where utilities, system operators and governments, consumers are involved) will lead to a reduction in prices and therefore in reduced costs for the consumer. Moreover, to comply with climate objectives, cover peaks in demand by increasing the system flexibility.

To generally define the concept of Demand Response (DR), we can say that its objective is to pursue the temporary reduction of electricity consumption by the consumer during periods of peak demand and that it is done in exchange for economic incentives.

So, what are the subtle differences between the two?

Demand Side Management is comprised of all demand-reducing measures, in other words, it includes both vehicles for its implementation, demand response, and energy efficiency.

DSM encompasses a broader concept of energy demand management, while DR works in detail on electric demand – at a moment. Moreover, DR is about reducing demand at peaks, this is known as peak shaving.

DSM pursues a balance between energy demand and supply both on the side of utilities, system operators and consumers. While DR does it from the consumer's side only.

DR encourages consumers to reduce their energy demand in the short term, while DSM includes not only these in DR, but also long-term or permanent energy efficiency measures. DSM can include light changes, improved automation of the building, change of air-conditioning or thermal machines.

These concepts are often confused because, ultimately, they both are projected to help the network operate uninterruptedly, continuously and smoothly balance the peaks of supply and demand.