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Management of Demand Side of Demand Response And Intelligent Energy System With Smart Load

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Abstract

The demand of the Energy management means to optimize one of the most complex and important technical creations that we know about the energy system. While there is plenty of experience in optimizing energy generation and distribution, it is the demand side that receives increasing attention by research and industry. Demand Side Management (DSM) is a portfolio of measures to improve the energy system at the side of consumption. It ranges from improving energy efficiency by using better materials and high quality over smart energy tariffs with incentives for certain consumption patterns, up to sophisticated real-time control of distributed energy resources.by using the best quality of material we can improve the reliability and energy efficiency of the power.

I Introduction

We electric energy sys- tems is unidirectional and topdown oriented. A limited number of large power plants feed into the grid and try to keep demand and supply balanced at all times. This balance is a very crucial aspect in operating an electric energy system.

The development is driven by the fact that despite increased efficiency of electric de- vices consumption is steadily rising some percent every year. While generation might not be much of a problem, it is the grid capacity that makes many involved people worry. In order to avoid longdistance transport, locally generated energy could be consumed by local loads, immediately when it is available. DSM's main advantage is that it is less expensive to intelligently influence a load, than to build a new power plant or install some electric storage device.

1. DSM block diagram and its working principle

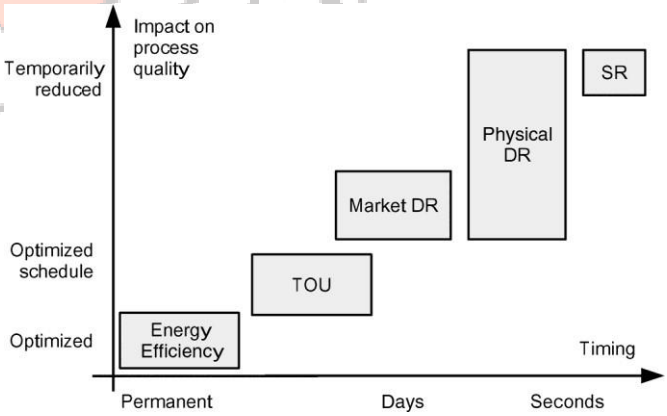

Fig 1 Block diagram of DSM

While DSM was utility driven in the past, it might move a bit towards a "customer driven" activity in the near future. The correlation and sensitivity of the component capacity variation to the expected shortage of available transmission capacity is identified as well as the contribution of DSM to transmission capacity.

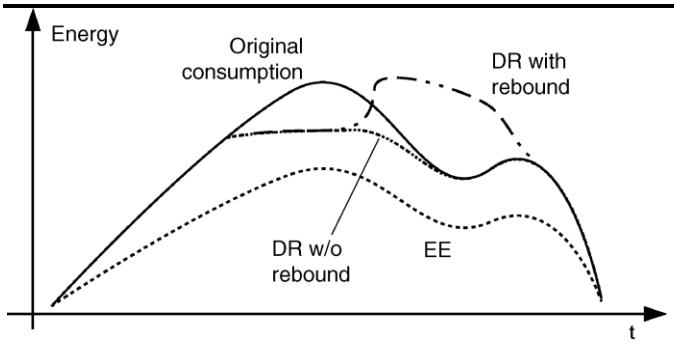

Fig 2 Impact of improve the energy efficiency versus demand response

The quicker changes are processed and done, the more un- wanted impact they potentially have onto the customers process. The processes can be manufacturing output, pump power or even optimizing human comfort or health in a building.

The lower edge of the DSM spectrum is energy efficiency mea sure. They include all permanent changes on equipment (e.g.exchanging an inefficient ventilation system with a better one) or improvements on the physical properties of the system (e.g., investing in the building shell by adding additional insulation). Time of use tariffs penalize certain periods of time (e.g. 17:00–19:00) with a higher price, so customers (re)arrange their processes to minimize costs. A change in the TOU price-schedule means a change in a supply contract or tariff and, therefore, does not happen on a frequent basis.

II.Management Of Demand Side System

1.1.1 DSM can be classified into four Energy Efficiency.

1.2 categories

Improving energy efficiency of buildings or industrial sites starts with information and insight into the processes involved. Practically, every customer site has hidden problems that waste energy compressed air leakages misconfigured controls, dirty filters, broken equipment, etc.

1.2.1 Energy Controller

If the operations of equipment needs consumption-driven adjustment, an energy controller could be used. Such a device is typically located at the energy meter and monitors the consumption trend. If the trend points to unwanted levels, the controller switches off equipment, based on certain priorities and other rules.

2.1.3 Demand Response

A much quicker response is provided by the many flavors of Demand Response (DR). The deadline is not necessarily instantaneous: the signal might refer to a situation next day at 12:00 noon since often grid emergencies can be anticipated. Classical Direct Load Control (DLC) assumes that loads are fully under control they do what they are told to do.

A. 2.1.4 Distributed Spinning Reserve

Distributed spinning reserve tries to support the traditional providers of ancillary services by imitating their behavior. On the demand side, this means that load can be reduced or in- creased when the grid frequency drops or rises. Two implementations of this scheme are the Integral Resource Optimization Network and the grid friendly controller . Both measure the frequency and react on it.

2. Important of DSM in Power System

DSM is experiencing a renaissance driven by the approaching smart power grids, microgrids and supergrid. proaching smart power grids, microgrids and supergrids. While microgrids obviously (because of their scarce re- sources) need a flexible demand side to ease system operation, supergrids import this need from offshore wind farms. One of the main challenges for DSM is on the ICT side.

Out of the classical information security needs, it is the most popular one confidentiality which seams to be the least critical one for energy systems.

- Confidentiality: keep my shed-actions private.
- Integrity : be sure to get the correct shed signals.
- Authenticity: be sure of the origin of shed information.
- Availability: be sure that your DR resources are there when you need them.

All security requirements are important and need to be taken into consideration when designing an ICT-based DSM system. These requirement stretch up to the required market platforms, in the case of freely tradable energy resource. Pro sumers and other DERs need a solid “digital identity” to act as business partner on such platforms. Digital signatures, which address the needs
“Integrity” and “Authenticity,” are the minimum measures that such a system must implement: DERs must be sure whom they are cooperating with (other DERs, energy markets, etc.) and that data is not manipulated.

III.Conclusion

Demand side management with help of using the smart load for save the more energy consumption and control power demand . We have examined the problems of DSM in households and realized that the solution lies in effective implementation of Smart Energy. Such a solution would cover ICT infrastructure, application modeling and behavioral under- standing. One of the core achievements of such a system for households would be to obtain granular consumption data and utilize it for meaningful feedback and DR. With- out a carefully designed system there is a risk that the in- vestment in the infrastructure will not fetch any benefit. The deployment of DSM in household also poses the chal- lenge due to the size involved (number of households) and need for low-cost solution

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