

# Role of Demand Response for residential consumers in modern electricity market

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**Abstract:** Electricity is an instantaneous commodity that is expensive to store. Therefore, currently electricity generation must match the demand at each instant, responding to seasonal patterns and instantaneous fluctuations. Thus, one of the biggest drivers of costs and capacity requirement is the electricity demand that occurs during peak periods. For example, the International Energy agency has estimated that a 5% lowering of demand would have resulted in a 50% price reduction during the peak hours of the California electricity crisis in 2000/2001.

This paper will review existing demand response practises, business models, market-related problems of modern electric grids and possible solutions to address them. In particular, one techno-economical solution, namely residential demand response programs enabled by a smart grid, will be analyzed and modelled in detail. The implications of this solution from both economic and policy perspectives will be discussed.

The primary objective of the paper is to enlighten the mass in India the potential of demand response with the virtue of AMI (advanced metering infrastructure) through presence of robust and ubiquitous communication infrastructure under the umbrella of Smart grid. With MoP (Ministry of Power) funded 14 pilot projects in pipeline, a mature demand response model has to be in place to extract maximum benefits from the pilot projects before developing a road map for deployment across the utility level.