

Demand Side Management (DSM) in an urban household in Zimbabwe

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Abstract

Today energy service industry struggle to balance the competing needs of increasing energy usage and supply constraints. Electric utility industry planned their supply to meet the needs of customers with little regard to how or when customers use energy. The demand for energy has sharply increased due to population growth in urban centres. Current generation cannot meet this demand, as is the case in many developing countries, because generating infrastructure is obsolete. The dwindling fossil fuel reserves and unfavourable use of alternative energy sources due to high initial costs in Zimbabwe requires that DSM be utilised as a strategy to alleviate power shortages at household level and reduce investment in energy infrastructure, networks and/or power plants. This led to carrying out an energy demand survey on randomly selected households and collecting data concerning all end use electrical equipment. The data collected included the type of equipment, energy consumption and the duration of operation per day. A usage matrix was tabulated to show the times an appliance was in use. The data obtained indicating the energy consumption patterns for the areas under study were presented graphically. Results from graphs were analysed to identify end use applications that could be potentially targeted to reduce peak demand. This led to the adoption of strategies to mitigate high consumption at peak demand. Some of the strategies which were used included natural day lighting, use of compact fluorescent lights, efficient security lights, efficient fans and solar hot water systems instead of electric geysers. After application of the strategies, a usage matrix was tabulated and graphs drawn to check on load reduction. Findings indicated a 31% reduction in load.