

Energy efficiency – a replacement to load shedding



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Load shedding is one of the biggest problem faced by everyone in Pakistan, no matter they are domestic or commercial consumers. Pakistan is facing a serious energy crises and it may get worse if not addressed seriously and promptly. Everyone is curious about the role of government in dealing with this issue and relieving consumers through immediate supply side solutions such as new power sources. Government is playing its role in establishing new power plants and potential of utilizing unleashed sources such as coal and renewable resources i. e. ind, solar etc.

Domestic and commercial consumers contribute more than 60% in the total electrical energy requirement of Pakistan. Currently, maximum energy deficit is 5500 MW in summers and immediate solutions are unable to meet this deficit in near future. It is not recommended to a consumer to compromise on comfort by not operating some of the high priority appliances but slight change in behavior may contribute much more than expected. Main electricity demand contributors are cooling and heating appliances used by domestic and commercial users.

In order to quantify the impacts of such appliances, research has been carried regarding the usage of air conditioners in Pakistan. Consumers have been suffering from crises in form of load shedding for hours in a day no immediate solution seems to be viable in extended summers. They tend to blame government and utility companies for not reducing load shedding. Energy could be made available for extended hours but a mass level awareness about efficient usage of energy is required.

Illegal connections, usage of inefficient and unnecessary appliances at peak demand time has worsened the situation and utility companies seem helpless about it. They are not left with any other option to reduce demand except through load shedding. Air conditioners are one of the major contributors in peak load in summer. They comprise 15% of the total peak load requiring at least 3000 MW for the country. A survey regarding usage of air conditioners was floated as a part of this research and 300 domestic and commercial consumers responded to the survey.

One of the conclusions of the survey indicated that 21 0C is the average control temperature for AC in households. From the same survey consumers were asked about the maximum control temperature used in household. The maximum average temperature was found to be 26 0C. In order to investigate the influence of this control temperature on household energy consumption and peak load demand, an experiment was carried out on two similar buildings in Karachi. Two rooms of the dimension of 12 X 16 X 12 ft were used for this purpose.

One room was operated at 21 0C control temperature for 24 hours period while other at 26 0C. Observations and results indicated that a total of 0. 45 KWhr saving was recorded in the room having AC operating at 26 0C. If this saving is extrapolated to expected number of air conditioners in Pakistan, then a total of 14. 5 GWhr of electrical energy could be saved in a single day. In terms of power this can easily curtail a total of 607 MW out of peak demand, which is equivalent to some of the largest power plants in the country.

If similar energy conservation techniques are applied for refrigerators and other cooling appliances then savings could be of much significant level. Due to ongoing gas load shedding scenario, consumers may start turning towards electrical heating appliances, which may potentially add up in electrical energy demand in near future. Large scale awareness is required at each level of consumption. Peak load shifting, discouraging illegal connections and utilizing energy in efficient way are our few life lines. A single consumer contribution may seem insignificant but as a whole it can contribute towards reduction of significant peak load.