

“Quality is the only way to maintain past, present and get new customers.”

Tips for Electrical Energy Conservation

General

- Improve power factor by installing capacitors to reduce KVA demand charges and also line losses within plant.
- Improvement of power factor from 0.85 to 0.96 will give 11.5% reduction of peak KVA and 21.6% reduction in peak losses. This corresponds to 14.5% reduction in average losses for a load factor of 0.8.
- Avoid repeated rewinding of motors. Observations show that rewound motors practically have an efficiency loss of upto 5%. This is mainly due to increase in no load losses. Hence use such rewound motors on low duty cycle applications only.
- Use of variable frequency drives, slip power recovery systems and fluid couplings for variable speed applications such as fans, pumps etc. helps in minimizing consumption.

• Illumination

- Use of electronic ballast in place of conventional choke saves energy upto 20%.
- Use of CFL lamp in place of GLS lamp can save energy upto 70%.
- Clean the lamps & fixtures regularly. Illumination levels fall by 20-30% due to collection of dust.
- Use of 36W tubelight instead of 40 W tubelight saves electricity by 8 to 10%.
- Use of sodium vapour lamps for area lighting in place of Mercury vapour lamps saves electricity upto 40%.

• Compressed Air



- Compressed air is very energy intensive. Only 5% of electrical energy are converted to useful energy. Use of compressed air for cleaning is rarely justified.
- Ensure low temperature of inlet air. Increase in inlet air temperature by 30C increases power consumption by 1%.
- It should be examined whether air at lower pressure can be used in the process. Reduction in discharge pressure by 10% saves energy consumption upto 5%.
- A leakage from a ½” diameter hole from a compressed air line working at a pressure of 7kg/cm² can drain almost Rs. 2500 per day.
- Air output of compressors per unit of electricity input

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must be measured at regular intervals. Efficiency of compressors tends to deteriorate with time.

Refrigeration & Air Conditioning

- Use of double doors, automatic door closers, air curtains, double glazed windows, polyester sun films etc. reduces heat ingress and air-conditioning load of buildings.
- Maintain condensers for proper heat exchange. A 50C decrease in evaporator temperature increases the specific power consumption by 15%.
- Utilisation of air-conditioned/refrigerated space should be examined and efforts made to reduce cooling load as far as possible.
- Utilise waste heat of excess steam or flue gases to change over from gas compression systems to absorption chilling systems and save energy costs in the range of 50-70%.
- Specific power consumption of compressors should be measured at regular intervals. The most efficient compressors to be used for continuous duty and others on standby.

Cooling Towers



- Replacement of inefficient aluminum or fabricated steel fans by moulded FRP fans with aerofoil designs results in electricity savings in the range of 15-0%.
- A study on a typical 20ft. diameter fan revealed that replacing wooden blade drift eliminators with newly developed cellular PVC drift eliminators reduces the drift losses from 0.01-0.02% with a fan power energy saving of 10%.
- Install automatic ON-OFF switching of cooling tower fans and save upto 40% on electricity costs.
- Use of PVC fills in place of wooden bars results in a saving in pumping power of upto 20%.

Pumps

- Improper selection of pumps can lead to large wastage of energy. A pump with 85% efficiency at rated flow may have only 65% efficiency at half the flow.
- Use of throttling valves instead of variable speed drives to change flow of fluids is a wasteful practice. Throttling can cause wastage of power to the tune of 50 to 60%.
- It is advisable to use a number of pumps in series and parallel to cope with variations in operating conditions by



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switching on or off pumps rather than running one large pump with partial load.

- Drive transmission between pumps & motors is very important. Loose belts can cause energy loss upto 1-20%.
- Modern synthetic flat belts in place of conventional V-belts can save 5% to 10% of energy.
- Properly organized maintenance is very important. Efficiency of worn out pumps can drop by 10-15% unless maintained properly.

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