

# Electricity: *Efficient end-use and new generation*



By  
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**How much power  
do we spend for  
being lazy?**

We are in the age of conveniences. Hundreds and hundreds of entertainment channels on your TV. One does not even has to walk up to the TV to switch a channel. We have travelled a lot from the times when we had only the National channel. Also gone are the days, when candles and other emergency light sources were part of every house hold. Invertor has banished them all. With all these added conveniences, comes a set of responsibilities too. If it is ignored , quite a lot of resources will be wasted. This paper analyses, the domestic energy scenario in the context of efficient utilization of electricity.

TVs and air conditioners switched off with the remote controller, consumes power. This is true with all the equipments with standby mode like microwave ovens, DVD players etc. Typical power consumption of these equipments in standby mode and normal operating mode are given in table-1.

Equipment	Standby power Wattage	Hours of operation per day	Energy per day (kWhr)	Energy per month (kWhr)	
TV	10	16	0.16	5	Only remote is used for switching off
Audio/ CD/DVD	5	24	0.12	4	Only remote is used for switching off
Computer + monitor	20	22	0.44	13	Only Shutdown command given
Modem	5	22	0.11	3	Put on along with computer

Printer	5	22	0.11	3	Put on along with computer
Total				28	

Table 1. Standby power consumed by typical house hold equipments.

**Measure...  
Measure...  
Measure...  
To conserve**

With all the loads known, the document attempts to sort all the major equipments used in a house hold, based on their energy consumption. This list forms table 2. Major energy consuming equipments are picked out of the list and various methodologies to be adopted to save energy with these are enumerate.

Alongside certain misnomers like the zero watt bulb are also analysed.

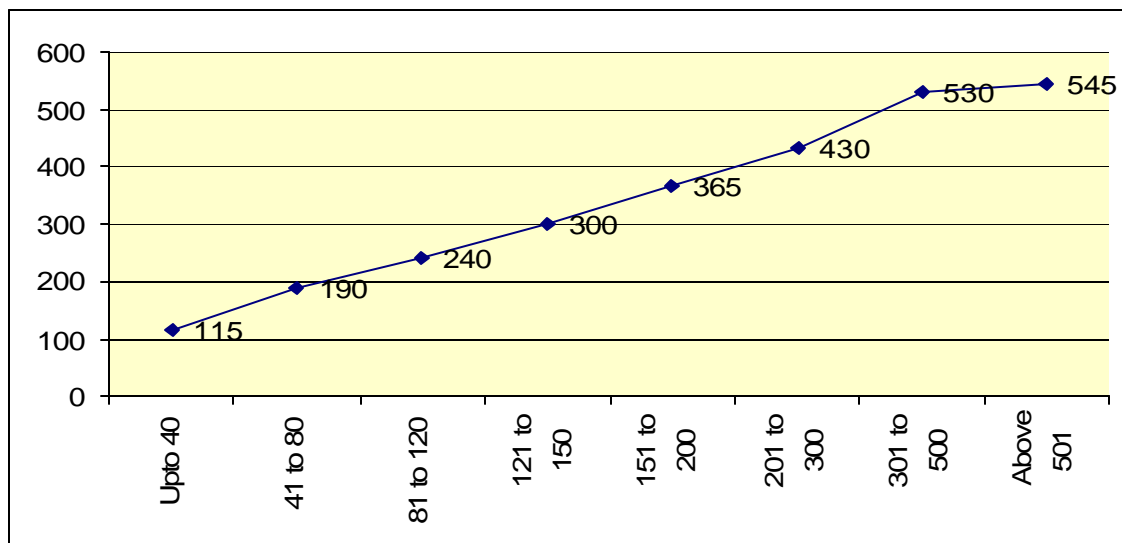
Equipment	Wattage	Hours of operation per day	Energy per day (kWhr)	Energy per month (kWhr)	Assumptions on usage pattern in the house
Zero watt lamp	15	24	0.36	11	In front of god s photo
Mosquito repeller	7	24	0.17	5	Forgets to switch off in the morning
Voltage Stabiliser(AC)	25	24	0.60	18	AC is switched off with the remote
Inverter	25	24	0.60	18	Remains on
Storage water heater	2000	2	4.00	120	Used for 1 hour but not switched off
Fridge	125	9	1.13	34	Frost free 185 lts
Fan	75	48	3.60	108	1 fan round the clock 3 fans in night
Washing Machine	175	1	0.18	5	One wash cycle of one hour per day
Iron box	1000	0.25	0.25	8	Half an hour ironing per day

CF lamps	15	15	0.23	7	3 lamps for 5 hours
Gate light	5	12	0.06	2	
TV 29" CRT	120	8	0.96	29	
Computer	250	2	0.50	15	
Vacuum cleaner	750	0.1	0.11	3	1 hour per week
Motor	375	1	0.38	11	0.5 HP used for 1 hour

**Table 2. Power consumed by typical house hold equipments.**

# What is the money involved

For all these analyses to be meaningful, the tariff schemes of KSEB applicable to the domestic sector has to be clearly understood. The tariff structure applicable to house holds forms graph 1.



**Graph 1: Variation in energy charges with increase in the per month consumption.**

**Money saved per unit  
is more than the  
average unit price**

As can be seen from the graph, all the energy that is saved will be shaved off from the top most band of the energy tariff. Thus the money saved for each unit conserved will be much higher than the average price of power.

**Which lamp to use?**

Lighting is an area where we can generate savings, albeit, with an investment. For selection of the appropriate lighting system, a comparison of various light systems available in the market is given as table 3.

<b>Luminous Performance Characteristics of Commonly Used Luminaries</b>					
<b>Type of Lamp</b>	<b>Lumens / Watt</b>		<b>Color Rendering Index</b>	<b>Typical Application</b>	<b>Typical Life (hours)</b>
	<b>Range</b>	<b>Avg.</b>			
Incandescent	8-18	14	Excellent	Homes, restaurants, general lighting, emergency lighting	1000
Fluorescent Lamps	46-60	50	Good w.r.t. coating	Offices, shops, hospitals, homes	5000
Compact fluorescent lamps (CFL)	40-70	60	Very good	Hotels, shops, homes, offices	8000-10000

High pressure mercury (HPMV)	44-57	50	Fair	General lighting in factories, garages, car parking, flood lighting	5000
Halogen lamps	18-24	20	Excellent	Display, flood lighting, stadium exhibition grounds, construction areas	2000-4000
High pressure sodium (HPSV) SON	67-121	90	Fair	General lighting in factories, ware houses, street lighting	6000-12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor	Roadways, tunnels, canals, street lighting	6000-12000

**Table 3. Comparison of various lighting technologies available.**

***"Money Plant"  
Nurture it with  
your attitude***

Once all the mechanisms of measurement are known, then it is just a matter of conservation. Here again there are many possibilities. A lot of money can be invested into cutting edge high end technology or it can be a simple change in the way we operate equipments. The latter approach is used through out this presentation.

Zero investment activities like switching off the TV or AC from the wall outlet and judiciously using the geyser alone can generate enough savings to buy a energy star rated fridge. Conservation is an attitude. And the payback of having this attitude is quite attractive. Through out this paper it was endeavored to impart the basic data and areas to look upon, for effectively implementing this attitude.