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Energy 2020 : A Vision of the Future

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Abstract:
Now-a -days Energy sector has more importance in the economy of any nation. So there is a need for saving the energy to improve the per capita of the individuals in the nation. In this paper the need , measures and advantages of Energy Conservation is discussed. Also the Energy Audit and the procedure to conduct the Audit are well discussed. The daily consumptions of electrical energy in our day to day life is depicted so that the knowledge about the consumption can reduce the Power loss.
Keywords: Energy Audit, energy Conservation

I. Introduction

In recent days the development of any nation depends upon Energy sector which plays a vital role for the status of the nation. The growing demand of Energy rely completely on the conservation of the energy. So the consumption of the energy needs to be reduced. The efficient energy use is different from the energy conservation (i.e.) using 1 Star rated air conditioner in a room for less hours is different from using a 5 Star rated air conditioner in the same room. Energy conservation results in increased financial security and offers higher savings for the nation.

Petroleum Conservation Research Association (PCRA) is an Indian Government organization which was formed in 1977 to promote energy efficiency and conservation in all aspects. As an outcome of the PCRA the usage of fossil fuels have reduced a lot and there by less polluting the environment. It has been studied that the implementation of the energy efficiency by the end user have saved nearly 30,000MW throughout India. There is a fact that if the energy is saved per unit at the consumption level then 2 to 2.5 times of the generation of the same unit and thereby saves the cost of generation. To conserve the energy and to use the energy efficiently there is a need for auditing the usage of energy.

Figure 1 Description of fossil fuel

The strategy for environmental provisions are based on the policies like Energy efficiency, water conservation, environmental friendly building, Greening the environment, to provide facilities for collection of recyclable waste and to reduce the construction waste and environmental nuisance.

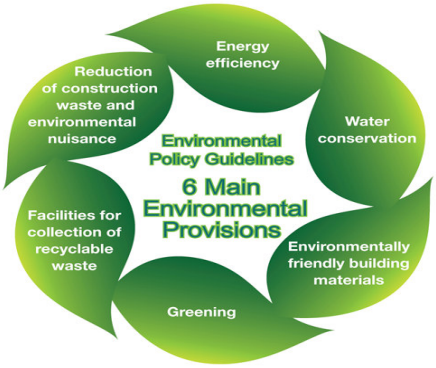

Figure 2 Environmental provisions

II. Energy Conservation

Energy conservation minimize the energy consumption by utilizing in an efficient manner. Energy conservation can also be defined as switchover from scanty resource to the one available in abundant.[1]

A. Need for Energy Conservation:

- To save the fuel and the environment
- To reduce pollution
- To save the money
- To meet out the future demand

B .Approach for Energy conservation

The following are some of the measures need to be taken into account for Energy Conservation.

- Energy conservation should be given main importance.
- The distribution companies need to carry out energy conservation
- Maintenance of the power station should be improved.

Advantages of Energy Conservation:

- Cost and the energy can be saved.
- The emission of green house gases can be reduced.
- Controls the global warming

III. Energy Audit

Energy audit refers to the verification, monitoring and analysis of the usage of electrical energy in addition to a submission of a technical report which includes the recommendation for improving the energy efficiency with cost benefit analysis and thereby reducing the energy consumption[3]. A systematic study is required on the energy equipments including the materials by which it is made, the flow of direction of the energy, utilization of the energy and to mention the reason why the energy is wasted and to suggest recommendation to save energy.

A. PROCEDURE FOR ENERGY AUDIT

To audit the energy used in any place say for instant Commercial , Domestic or Industry the following procedure need to be followed.

- Firstly the Auditing team need to be identified.
- Detailed audit need to be carried out.
- The energy consumption need to be identified and furnish the base line energy information
- Material balance and energy to be constructed.
- Evaluation of energy efficiency and the utility need to be performed.
- Energy norms and energy consumption levels needs to be compared.
- Energy saving measures need to be identified in advance.
- The technical and financial details of energy saving measures need to be analyzed.
- Energy efficient methodologies and renewable energy sources need to be suggested.
- Finally the report need to be furnished for follow up to the end user.

The energy Audit procedure is well described in the figure 3. By following the simple steps the audit can be completed.

Fig 3 Process for Energy Audit

IV. ENERGY ANALYSIS

By espousing simple techniques the energy in domestic sector can be saved which eventually saves the natural resources.. The practical solutions for saving energy in home is discussed in detail. [10]

The following are simple ideas to save the energy.

(a) *Lighting*
- Turn off when not in use.
- Utilize the daylight when available
- Clean the lighting fixture for illumination.
- Use LED lamps instead of incandescent bulbs.
- Use electronic items instead of conventional devices such as chokes, regulators etc.

(b) *Electric Iron*
- Select auto temperature cutoff
- Don't use more water and wet clothes.

(c) *Electronic Devices*
- Switch off the power of all devices when not in use.
- Use sleep mode for computers when not in use.

(d) *Kitchen Appliances*
- Use mixers only for wet grinding
- Microwave Ovens utilize only 50% less energy than conventional cooking.
- The doors of Microwave oven should not be opened often as 25% of power gets lost.
- Defrost the refrigerator often .
- Cover the food kept in the refrigerator.
- Do not frequently open the doors of refrigerator.

(e) *Washing Machines*
- Utilize only on full load.
- Use optimum amount of water and the time facility.

(f) *Air Conditioners*
- Automatic temperature cutoff should be preferred.
- Avoid Lamp and TV near the Air conditioner as it consumes more power.
- Keep the regulators at low cool position.

In the following table all the electrical appliances are discussed with respect to the ratings and the units consumed per day ,per year and also the amount is estimated.

Table 1: Description of Electrical appliances and its consumption

S.NO	Electrical Appliances	Ratings In watts	Operating Hrs / Day	Units / Month	Units / Year	Amount in Rs (X 5.75)
1.	Incandescent Bulbs	40	6	7	84	483
2.		60	6	11	132	759
3.	Fluorescent Tube light	40	10	12	144	828
4.	Night Lamp	15	10	4.5	54	310.5
5.	Mosquito Repellent	5	10	1.5	18	103.5
6.	Fans	60	15	27	324	1863
7.	Air coolers	175	8	42	504	2898
8.	Air Conditioners	1500	6	270	3250	18687.5
9.	Refrigerator	225	15	101	1212	6969
10.	Mixer / Blender	450	1	13.5	162	931.5
11.	Toaster	800	0.5	12	144	828
12.	Oven	1000	1	30	360	2070
13.	Electric Kettle	1500	1	45	540	3105
14.	Electric Iron	1500	1	45	540	3105
15.	Water Heater	2000	1	60	720	4140
16.	Immersion rod	1000	1	30	360	2070
17.	Vacuum Cleaner	700	0.5	11	132	759
18.	Washing Machine	300	1	9	108	621
19.	Water Pump	750	1	22.5	270	1552.5
20.	TV	100	10	30	360	2070

In the fig 4, fig 5, fig 6 the analysis of electrical appliances and its consumption for one day, one month and one year respectively is clearly described in the graphical representaion.

By analyzing the electrical equipment individually it is clear that the equipments can be utilized optimally.

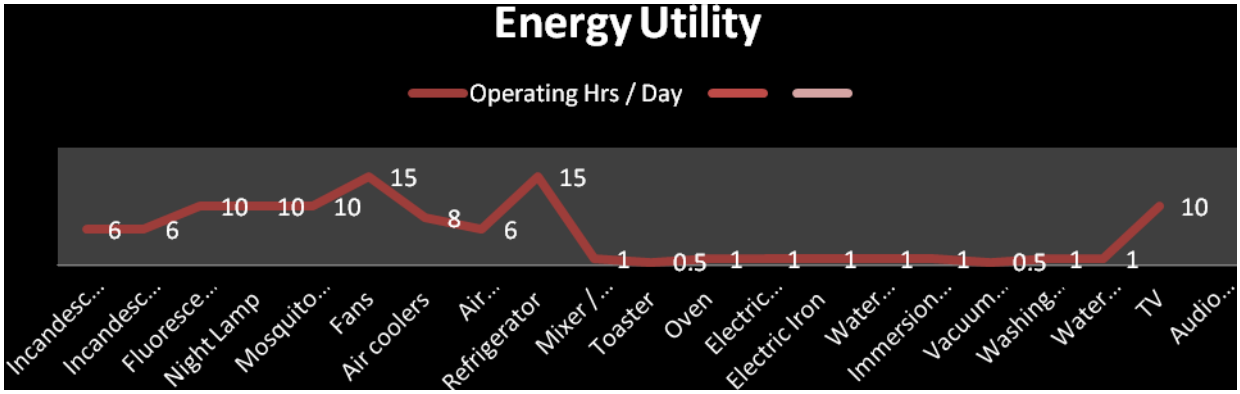

Fig 4. Operating Hours per Day

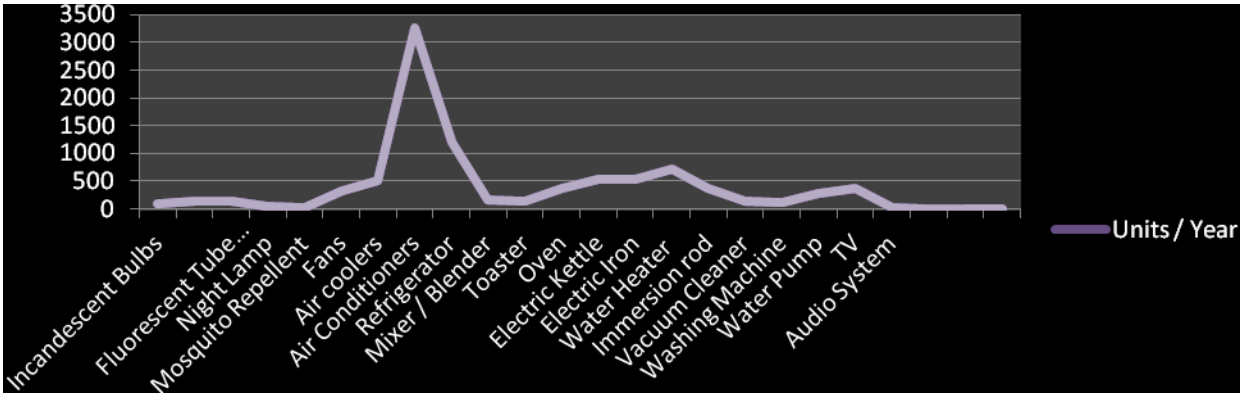

Fig 5 Units Consumed per Year

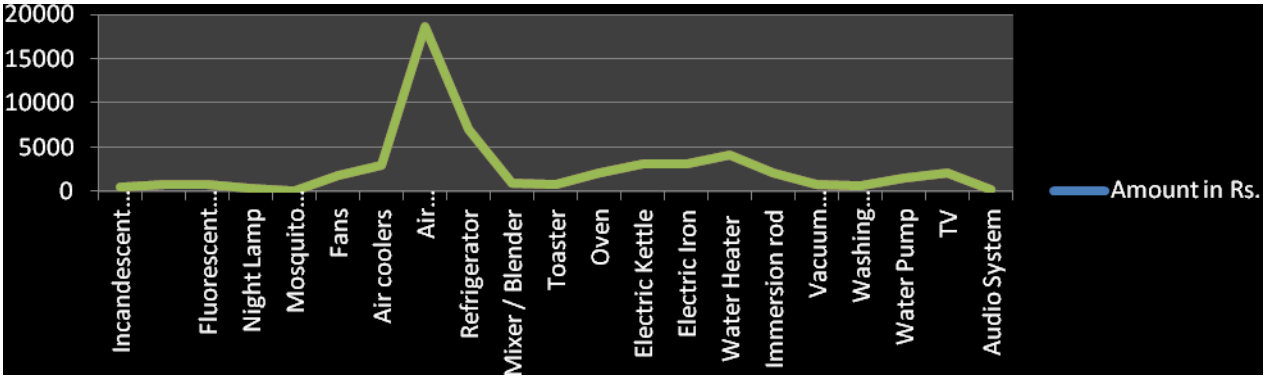

Fig 6 Amount paid per year.

Conclusion:

In this paper the Energy Conservation is described in detail. The energy conservation measures are also well depicted.The procedure to conduct the energy audit is also discussed. In addition to this the energy consumption day, per month and per year is depicted. The amount paid is also described. Energy conservation measures and energy audit procedure helps an individual to create awareness within us. This in turn helps for to meet the future demand and protects our nation from black out.s

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