

# CONSERVATION OF ELECTRICITY

## Energy Consumption Pattern in Tamil Nadu

S.No.	Appliances	Energy consumption in %
1	AC and Refrigeration	56%
2	Lights and Fans	28%
3	TV, Washing machines, Mixers, etc.	12%
4	Others	4%

Source: B.E.E.<sup>1</sup>

## Lighting

Increasing your lighting efficiency is one of the efficient ways to decrease your energy bills. If you replace 25% of your lights in high-use areas with fluorescents, you can save about 50% of your lighting energy.



**Fig:** Compact Fluorescent bulbs are four times more energy efficient than incandescent bulbs and provide the same lighting.



Fluorescent lamps are much more efficient than incandescent bulbs and last 6 to 10 times longer.

Compact Fluorescent Lamps (CFLs) use only one-third the electricity used by ordinary incandescent bulbs and they last eight times longer. An estimate shows, if every family in India replaces the regular incandescent bulbs with CFLs, about 1,000 MW of power could be saved.

**Use CFLs in your table lamp**

<sup>1</sup> Bureau of Energy Efficiency (BEE), "State-wise Electricity Consumption & Conservation Potential in India". Prepared by National Productivity Council. For Ministry of Power, Government of India. p.181.



Install light fixtures of smaller lumens/wattages on two or three (multiple) locations of a large room, where you may need high levels of lighting periodically but not all the time.

Use electronic dimmer control switches to keep lighting levels low, whenever possible.

Check wattages of the light bulbs in your house. In many cases, you can substitute lower wattage bulbs and get light for the same amount of energy. Look for the lumens of a bulb instead of watts. Lumens indicate the

brightness of the bulb. Watts only tell you the amount of power it takes to make the bulb work. For example: **A 60-watt regular incandescent bulb yields about 855 lumens.**

**A 15-watt compact fluorescent bulb (CFL) yields about 900 lumens.**

Reduced lighting would result in a saving of 15-28% of lighting cost.

### COMPACT FLOURESCENT LAMP (CFL)

A regular incandescent bulb will cost less but will need to be replaced at least once a year. Compare that to a 15-watt CFL which may cost you more but may last you as long as 10 years and reduce your electricity bill.

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The benefits of CFL are lower operating costs, longer life and

a more efficient use of energy. You could save over Rs.2,500 a year by simply replacing five old bulbs with energy-efficient CFLs.

Train everyone to turn off lights when leaving a room. Having wall switches in convenient places help everyone remember. Turning of unnecessary lights would save up to 17% of lighting cost.


Use 4-foot fluorescent fixtures with reflective backing and electronic ballasts (chokes), which consume only one-third energy, compared to the ordinary choke.

Keep lights and fixtures clean and dirt free. Dust on lamps, reflectors and light bulbs impair lighting efficiency. Dust and dirt reduce lighting levels by as much as 30%. Improved maintenance of light can result in saving 10% of lighting cost.

Choose light colours for walls, ceilings, floors and furniture. Light colours reflect light. Dark colours absorb light and require higher bulb lumens/wattages.

# YOU CAN HELP!



 Use electronic dimmer switches to adjust the amount of lighting according to your needs.

- 🌿 Use light colours for walls. This helps reduce lighting requirements by up to 40%.
- 🌿 Use your oven, hair dryer and vacuum cleaner sparingly to save on power.
- 🌿 Use a table lamp with CFL bulb instead of an overhead light when reading at a desk.
- 🌿 Keep light fixtures clean and dirt free.
- 🌿 Remember to switch off lights when you leave a room.

## Refrigerator

- Refrigerator consumes 20% of the total energy (Cost of operating 315 Ltrs. refrigerator is Rs.4,000/year)
- Use a refrigerator of the size your family needs. Anything larger, uses more energy than necessary.
- Avoid opening the fridge door frequently. Remove all ingredients for a meal from the refrigerator at one time. Each time you open the door, compressor has to run a bit longer to replace the cool air that spills out which increases power consumption.
- Do not spend more time taking inventory every time the fridge is opened. Think about what you want before you reach for the refrigerator door.
- Discourage leisurely open-door inspections of refrigerator contents by family members looking for snacks.
- Get in the habit of keeping items in the same place in the fridge. This would help to pick up the item quickly.

- Locate refrigerators and freezers away from direct sunlight and other warm-air sources such as water heater, oven etc.

### RIGHT LOCATION FOR THE REFRIGERATOR

While placing the refrigerator in home, ensure that it is at least 4 inches away from the walls to facilitate effective heat rejection particularly from the rear side. Care should be taken that the unit is sufficiently away from heat sources. These heat sources affect the heat dissipation from the fridge condenser and may force the compressor to run longer leading to more electricity consumption.

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- which makes the compressor to work harder consuming more power.
- Refrigerator motors and compressor generate heat, so allow enough space for continuous airflow around refrigerator. If the heat does not escape, the refrigerator's cooling system will work harder and use more energy.
- Defrost your fridge regularly. Do not allow ice to accumulate more than one-fourth of an inch on manual defrosts of refrigerators and freezers. In manual

defrost refrigerators, accumulation of ice reduces the cooling power by acting as unwanted insulation.

- Make sure refrigerators and freezers have tight-fitting door gaskets periodically to prevent infiltration of warm air. Replace such gaskets immediately. Test them by closing the door over a piece of paper so it is half in and half out of the refrigerator. If you can pull the paper or bill out easily, the latch may need adjustment or the gasket to be replaced by a new one.
- Do not keep unnecessary food items inside.
- Keep refrigerators and freezers filled to capacity, but do not overcrowd to the point where air cannot circulate freely around food.
- Avoid putting hot or warm food straight into the fridge. Allow hot and warm foods to sufficiently cool down to room temperature before putting them inside the refrigerator.
- Always keep food in airtight containers so that refrigerator will use less energy and water condensation will also be lesser.
- Do not place uncovered liquids in your refrigerator. In addition to absorbing undesirable flavours, the liquids give off vapours that add to the compressor workload.
- Freezer works more efficiently when full than when nearly empty, so put some plastic containers like old milk jugs with water in them in the freezer to take up empty space.
- Clean the vacuum condenser coils in the back of your refrigerator every three months or so. Dust-covered coils impair the efficiency of compressor operation and increase energy usage.
- Turn down your refrigerator and remove perishables before going on an extended vacation.
- If refrigerator is older and needs major repairs, it is likely to become inefficient after repairs. It may be advisable to replace old refrigerator with a new and energy-efficient one. A fridge that is older than 15 years costs over Rs.5,000 a year to operate, while a new fridge costs less than Rs.2,500 a year to operate.
- When buying a new refrigerator, check for BEE star rating.

**Oversized refrigerators mean more power consumed**

## Air-Conditioner

- Air-conditioner consumes 20% of total energy. (One ton AC consumes Rs.3,600/year)
- Use ceiling or table fan as first line of defence against summer heat, as running cost of an air conditioner could be 25 times or more than that of a ceiling fan.
- Seek professional help in determining the size of the cooling equipment you need. Avoid over-sized units. They draw more energy than necessary.
- Locate the window air conditioners on the north side of your house. Direct sunlight on your unit makes it work harder.
- Plant trees or shrubs to shade air conditioning units but not to block the airflow. A unit operating in the shade uses as much as 10% less electricity than the same one operating in the sun.

- A roof garden can reduce the load on air conditioner.
- Set the cooling thermostat as high as comfort permits. The higher the setting, the more energy you save. Increasing the temperature by 2 degrees, you can cut down electricity bill by 10%. You could save about 900 kg of carbon dioxide (at 25° C) a year with this simple adjustment.
- The less difference between the indoor and outdoor temperatures, the lower your overall cooling bill will be.
- Consider using a small interior fan (ceiling/pedestal fan) in case of a large room, in conjunction with your window air conditioner to spread the cooled air more effectively throughout the room instead of lowering the thermostat temperature.
- Provide adequate insulation for wall and roof. This would result in saving of up to 20% of energy consumption.
- Position heat-producing appliances such as lamps and TV sets, away from the cooling thermostat. Heat from these equipments may cause the thermostat to read a temperature higher than the true room temperature. It could lead to overcooling the entire room and ultimately more electricity consumption.
- Remove obstructions (e.g. furniture, piled books, etc.) to air passage to the unit. Air conditioner operates most efficiently when intake and discharge airflows are free from nearby obstacles.
- Draw shades or draperies to block the sunlight during the hottest part of the day.
- Install sun blinds over windows exposed to direct sunlight.
- Keep windows and doors of air-conditioned rooms closed as often as possible.
- Shut air vents in the rooms, if you are using a window unit, so that cool air cannot escape.
- Check air conditioner filters at least once in a month during the summer and clean or replace them as needed. Periodical maintenance of air conditions units by annual checkups and adjustments would result in a saving of 15% towards cooling cost.
- Switch on the AC an hour later and switch it off an hour earlier.
- If room air conditioner is older and needs major repairs, it is likely to become inefficient after repairs. It may be advisable to replace the old air conditioner with a new and energy-efficient one.
- Look for BEE star rate of the equipment while purchasing.

**An AC switched off for an hour can keep a 40 watt tube light on for 50 hours**

## Washing Machine

- Running a maximum-load wash in your washing machine is more efficient than in two half-loads. Sort clothes and schedule laundering so you can wash only full loads. It takes almost as much electricity to run a small load as it does a full one.
- Use the amount of laundry detergent the manufacturers recommend. Over dosing hampers effective washing



- action and may require extra rinsing which uses more energy and water.
- Avoid over rinsing, this wastes energy and harms fabrics as well.
- Remove clothes from the dryer as soon as it stops, before wrinkles have time to set. Clothes, you promptly fold or place on hangers, require little or no ironing so you can save electricity as well as your own energy.
- Up to 60% of the cost of washing clothes comes from heating the water.
- Front-loading washing machines use much smaller amounts of water compared to other machines.
- Check for BEE star rating while purchasing.

## Water Heater

- Locate your water heater as close as possible to the point of greatest hot water use. Hot water remaining in a supply pipe after you turn off the tap eventually cools and is wasted. The longer the supply pipe the more heat lost.
- Mix hot water in a bucket for a bath rather than having a geyser shower.
- The higher the temperature of the water remaining in the heater tank, the more heat it loses.
- Insulate the outer body of the water heater to minimize heat loss.
- The electricity consumption by your **geyser** can be considerably reduced if the members of the family bathe in quick succession and switch it off as soon as it is no longer required.
- Look for BEE star rate of the equipment while purchasing.



## Computer

- Turn off computer at the power point when not in use.
- Shut down your computer when you leave the office or home for more than two hours. A computer that runs 24 hours a day, for instance, uses more power than an energy-efficient refrigerator.
- Save up to Rs.3,000 a year by shutting down your computer for 12 hours a day.
- Screen savers do not save power – they just protect the monitor screen. Instead, use the sleep-mode or energy-saving feature on your computer and save Rs.900 a year. With sleep mode, the average computer uses 200 kWh less power per year.
- Turning down the brightness of the computer monitor saves energy. The brighter a monitor, the more energy it uses.





- Consider upgrading to a flat panel LCD monitor. They use approximately one-third energy as equal-sized CRT monitors. Flat-screen LCD monitors use about 66 per cent less electricity than standard monitors.
- Smaller your computer monitor, the lesser electricity it will use.
- Consider using a laptop instead of a desktop computer. Laptops use up to 90% less power.
- Turn off your laptop's Bluetooth or wireless capabilities when not in use to get some extra minutes, or even hours, out of the device before the battery dies.
- Laser printers and fax machines in particular are energy spendthrifts. A typical multifunction laser printer and fax machine uses 300 watts when printing, 85 watts when on standby, and 10 watts when idle.
- Look for the Energy Star certification.

## Television

- Turn off television/video/audio player at the power point when not in use - they still consumer power in standby mode.
- Many, after buying a TV never think to change the picture settings. Not only is that bad for the picture quality, it is bad for power consumption also. Power consumption increases with the increase in brightness.
- You can limit your power consumption by buying a smaller set.
- A plasma TV that is the same size as your older TV can use twice the energy.
- You can cut power consumption by watching with your family or housemates.
- Many LCDs give you the ability to control the intensity of the backlight in the TV. By turning down the backlight, you can save power consumption.
- Look for the BEE star rate of the equipment while purchasing.



## Fan

- Run kitchen and bath exhaust fans only long enough to rid the house of unwanted vapour, smoke and odours.
- Replace old fan regulators with electronic regulators.
- Clean fan blades periodically. This will reduce drag on the rotating blades.
  - Lubricate the bearings periodically.
  - Switch off fans when not required.
  - Use light weight/energy efficient fans.
  - Look for BEE star rate of the equipment while purchasing.



## Iron

- Iron fabrics that require a cooler iron first and work up to those requiring higher heat. An iron heats faster than it cools, so it is quicker to go from low to high than the reverse. You will use less energy.
- Iron when there is more number of clothes. Avoid ironing one or two clothes daily.
- When ironing, ensure that you have collected all the clothes first.
- Do not iron wet clothes and do not spray more water on clothes while ironing.
- Turn off the iron a few minutes before you finish ironing and complete the rest of your clothes with the heat remaining in the iron.
- Select iron with automatic temperature cut-off.
- Use appropriate regulator positioning for ironing.
- Turn off the iron when the telephone or doorbell interrupts your work.
- Look for BEE star rate of the equipment while purchasing.



## Grinder

- Always use nylon belts for the grinder.
- Clean and lubricate grinder parts periodically.
- Use energy efficient motor.
- Use grinder to its full capacity.



## Microwave Oven

- Consumes 50% less energy than conventional electric stove; cuts down cooking time; and produces less heat in the kitchen.
- Do not bake large food items.
- Unless you are baking breads or pastries, you may not even need to preheat.
- Do not open the over door often to check food condition as each opening leads to a temperature drop of 25°C.



## Other Appliances

- Dry your hair with a towel instead of blow-drying it. Many **hair dryers** consume as much energy as an electric toaster, plus you use them for longer periods.



- Idle operation of electrical appliances is the biggest loss of energy. Switch off TV, audio/video systems at the source and not through the remote. About 93% of such equipments' energy use occurs when the unit is not turned off at the source.

### CONSIDER USING SOLAR ENERGY IN YOUR HOUSE

## Batteries

- Do not mix new batteries with used batteries in appliances/toys; it reduces useful power life of the new batteries.
- Do not leave batteries near children.
- Use rechargeable batteries or appliances that use alternative energy (Example: Calculators with in-built solar panel)

## At the Office

The feeling, people generally have is - "Who cares about energy conservation at the office. After all, I am not paying for it". But ultimately, it is we who pay for all the energy that is wasted in the office - in the form of energy shortages, higher price to be paid for energy, more taxes and so on.

### YOU CAN HELP!



- Ask the cleaning staff not to switch on all lights and fans before people come to the office.
- Switch off fans and lights when you leave the room.
- Minimize the use of air-conditioners.
- Switch off computers at the terminal when not in use.
- Avoid printing and unnecessary photocopying of documents.
- Encourage people to use the stairs instead of the lift, especially in places like hospitals.