



AN IMPORTANCE OF CONSERVATION OF ENERGY; A CASE STUDY ON CONSERVATION OF ELECTRICAL ENERGY IN APEPDCL

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Introduction

Electrical power is primary input for enhancing the country's economy through which the overall living standards of the people could be enriched. If industrialization is the yardstick to measure the overall economical position of the country, the electrical power decided about the extent of country, the electrical power decided about the extent of industrialization even.

Types of Power

1. Conventional power a) Hydro b) Thermal c) Nuclear
2. Non-Conventional power a) Solar b) Wind c) Tidal d) Geo-Thermal

Conventional Energy Sources

Thermal-electric power plants, hydro-electric power plants, and nuclear power plants supply most of the electrical energy. These three methods of producing electricity are often referred to as conventional energy sources. This means that they are the more traditional or more commonly used sources of electrical energy.

Non-Conventional & Renewable Energy Sources

Concept of Renewable Energy

Renewable energy sources also called non-conventional energy, are sources that are continuously replenished by natural processes. For example, solar energy, wind energy, bio-energy - bio-fuels grown sustainably, hydropower etc., are some of the examples of renewable energy sources.

A renewable energy system converts the energy found in sunlight, wind, falling-water, sea-waves, geothermal heat, or biomass into a form, we can use such as heat or electricity. Most of the renewable energy comes either directly or indirectly from sun and wind and can never be exhausted, and therefore they are called renewable.

Implementation of Energy Conservation Methods in APEPDCL

The following Certain Measures have been taken for effective implementation of Energy Conservation in APEPDCL.

1. Consumer Awareness programs were conducted during energy conservation week i.e 14th to 21st December of every year through exhibitions, work shops, Group Discussions, Elocutions, painting competitions & seminars etc. to educate and implement certain energy conservation methods.
 - Utilize **LEDs** in place of CFLs & Filament bulbs, Usage of Star rated appliances.
 - **Minimize usage** of Air Conditioners, geysers and avoid use of dryers in washing machines.
 - Use of more natural **sun light** and air to optimize use of Lights and fans.
 - **Switch off** appliances when not in use / required.
 - Use of Solar Energy.
2. About 1.5 Lakhs Nos., Pamphlets have been distributed through out APEPDCL to Electricity Consumers for **energy conservation tips**.
3. Posters with Energy Conservation tips have been displayed in all offices of APEPDCL.
4. Usage of EPDCL **Toll Free No. 180042555333** and publicize through News papers and TV scrolls using cable TV net work for the following:-
 - a. Furnish feedback on any wastage of energy
 - b. Pilferage of Energy and mal practice
5. Energy savings calculator has been prepared and placed in APEPDCL website www.apeasternpower.com with this the consumer can able to see the monetary savings.
6. In all department vehicles, energy saving posters are distributed with slogan "Save electricity and minimize scarcity- **1 unit of electricity saved is 1.2 units of energy produced**".
7. Awareness created in public on energy conservation tips in the Apartments through meetings.
8. Meetings are being conducted with farmers and explain them to follow DSM (Demand Side Management) Measures i.e use of ISI Standard Pump sets, Pipes and foot Values and encourage to use of solar pump sets in the range of 3HP and 5HP.



Other Energy Conservation and Energy Efficiency Measures Undertaken by APEPDCL

- Alternate lights in the corridors of APEPDCL Offices kept switched off.
- LED based yard lighting introduced for 600 Nos. Sub-Stations to replace with HPSV Lamps for energy savings through National Electricity Funding(NEF).
- 10Nos. 600 KVA auto switched line capacitor were installed on 11 KV Rural feeders feeder for minimizing re-active power management through N.E.F.
- 57 Nos., Housing Habitation are electrified through DDG Project (Solar Energy) in Visakhapatnam Agency areas, further 194Nos. are under progress in Visakhapatnam and Srikakulam Districts.
- A.P.E.P.D.CL has adopted **5-Star rated** Distribution transformers and replaced about 20,000 Nos. so far, for enhanced energy efficiency.
- For all New Service Connections to be released in APEPDCL in the Towns and for Agriculture sector **5-Star rated DTRs** are being used.
- Urban HVDS (High Voltage Distribution System) is implemented wherever possible in the Towns to minimize LT line to improve tail end voltage by installing small capacity Star rated DTRs.
- About 5000No applications were registered by farmers in APEPDCL for agricultural solar pump sets as in 3HP & 5HP capacities and it is under progress for release of services.
- GVMC (Greater Visakhapatnam Municipal Corporation) Street lights consumption has been drastically reduced to 60% after replacing LED lamps in place of fluorescent and HPSV Lamps.

Certain Tips to Reduce Power Consumption

You can reduce your electricity bills by as much as 10% - simply by unplugging appliances or switching devices off at the power point they are connected to when not in use. It's good for your wallet and for our planet.

Standby, also known as phantom power loads, are responsible for an incredible amount of electricity consumption nationally. Practically every electronic device that you plug into a socket continues to consume electricity after you've switched the device off. Examples include phone charges, notebook power adaptors, microwave ovens, game consoles CD, video and DVD players.

If an appliance or device has an adaptor, the easiest way to tell if it's still drawing power when the device is switched off is if the adaptor is warm. While the amount of power being drawn by each of these appliances in standby mode usually isn't huge - anything from .5 - 5 watts per hour; when you consider the number of electronics devices in the average home these days and multiply that by the number of hours in a year; then multiply that by the number of households in our country - it really adds up. The average home in the consumers about 50 watts of standby power an hour.

I've read that the annual collective standby power draw from households is around 8 gigawatts - equivalent to the electricity production of 8 large power plants. Globally, standby power consumption is estimated to be responsible for about 1% of the world's carbon dioxide emissions. Carbon dioxide is a gas that contributes to global warming.

Imagine that - we could knock off 1% of the amount of carbon dioxide being spewed into the environment just by switching appliances and devices off at the wall when not in use; and all save a few bucks on each power bill in the process!

Power Management

Low Power Consumption is not the Only Advantage of Power Management

- If your PC turns automatically to hibernation, it first writes all the data to the hard disk.
- A PC in stand-by starts quicker than a hibernate one.
- You can save on cooling, because a room full of PC's generates a lot of heat.
- Secure your energy saving mode with a password, hence no one can have a look at your personal documents while you are away.
- Automatic switching off of displays reduces electromagnetic radiation.

Even if your PC has been shut down without cutting off the power cord it might still consume some Watts. Therefore you better connect your PC and all equipment into a power distributor with a switch. So you counter the hidden consumption by transformers with your fingertip.

Domestic Customers

- Power is precious - use it judiciously.



- One unit saved = 1.2 units generated.
- Switch off lights, fans and other electrical gadgets when not required.
- Sunlight is available free of cost. Make maximum use of daylight & reduce the use of artificial light.
- Keep the bulbs and tubes clean to get better light.
- Use low wattage bulbs for corridors and other less important areas.
- Use light-coloured paints and distempers for interiors.
- Use tube lights in place of filament lights. They last longer, consume less power and give more light.
- Do not keep the door of your refrigerator open unnecessarily.
- Reduce the height of partition walls wherever possible.
- Eschew the use of ornamental and festoon lights.
- Use cords of suitable capacity to avoid loss of energy & to reduce fire accidents due to short circuits.
- Use air-conditioners and climate control equipment very sparingly.
- Keep the motors clean and cool.
- Use capacitors near motor terminals to avoid damage to motors and to reduce demand charges.

Rural Customers

- Use foot valves of low resistance to save up to 10% power.
- Use RPVC suction pipes to save up to 10% power.
- Motor and pump should be at same level. Pump should be within 3 meters from the water level.
- Use pump sets of suitable power depending upon water lifting requirements. It could save up to 25% power.
- The capacity of motor should match the requirements. Using motors of higher capacity, where a lower one is good enough, results in loss of power. Use only motors of good efficiency.
- The pipe in which water comes out should be as close to earth level as possible.
- Use capacitors near motor terminals to avoid damage to motors and to reduce demand charges.

Industrial Customers

- Keep the motors clean and cool.
- Use capacitors near motor terminals to avoid damage to motors and to reduce demand charges.
- Tighten belts and pulleys at regular intervals to avoid energy losses due to drag.
- The capacity of motor should match the requirements. Using motors of higher capacity, where a lower one is good enough results in loss of power. Use only motors of good efficiency.
- Use grease frequently at all required points in the motor and motor drives to reduce friction.
- The machine driven should be very close to the motor.
- Sunlight is available free of cost. Make maximum use of daylight and reduce use of artificial light.
- Change worn out bearings and repair them in time.

Safety Tips

Protect Yourself

1. Never play with electrical cords, wires, switches, or plugs.
2. Stay away from fallen power lines. Tell an adult if you see a fallen line.
3. Never use a hairdryer or play an electrical radio or television near a bathtub or sink.
4. Before you climb a tree, look up. If a power line is nearby or touching, stay away from the tree.
5. Never touch anything that runs on electricity when your hands are wet.
6. Fly kites and model airplanes in a wide open field or park-never near overhead electrical wires.
7. Never climb utility poles or electrical towers.
8. Stay away from substations and transformers.
9. If you encounter an electrical-injured victim, do not touch the person until they have been freed from the source of electricity. You can use a non-conductor, such dry rope or wood to push or pull the victim away from the power source.
10. Before you move a metal ladder or scaffolding, check to see that it's clear of power lines. They can be deadly if contact occurs with a line.
11. Never attempt to open or tamper with transformers. Don't plant shrubs and trees close to them - bushes and trees should be at least ten feet away from the front of the transformer.

Protect Your Home

1. Never install a TV or radio antenna within falling distance of power lines.



2. Never use water on electrical fires. Have everyone leave the house and call the fire department if you cannot extinguish it. If the fire is a small appliance, unplug the appliance or turn off the electricity. **DO NOT TOUCH APPLIANCES.** Use a class C fire extinguisher, which is recommended for electrical fires.
3. During severe weather, temporary low-voltage conditions can dim lights and remain low longer than a minute. In such cases, turn off or unplug all motorized appliances. Also, turn off televisions and fluorescent lamps.
4. Check for outlets that have loose-fitting plugs, which can overheat and lead to fire. Replace any missing or broken wall plates. Make sure there are safety covers on all unused outlets that are accessible to children.
5. Make sure cords are in good condition—not frayed or cracked. Make sure they are placed out of traffic areas. Cords should never be nailed or stapled to the wall, baseboard or to another object. Do not place cords under carpets or rugs or rest any furniture on them.
6. Check to see that cords are not overloaded. Additionally, extension cords should only be used on a temporary basis; they are not intended as permanent household wiring. Make sure extension cords have safety closures to help prevent young children from shock hazards and mouth burn injuries.
7. Make sure your plugs fit your outlets. Never remove the ground pin (the third prong) to make a three-prong fit a two-conductor outlet; this could lead to an electrical shock. **NEVER FORCE A PLUG INTO AN OUTLET IF IT DOESN'T FIT.** Plugs should fit securely into outlets. Avoid overloading outlets with too many appliances.
8. Check the wattage of all bulbs in light fixtures to make sure they are the correct wattage for the size of the fixture. Replace bulbs that have higher wattage than recommended; if you don't know the correct wattage, check with the manufacturer of the fixture. Make sure bulbs are screwed in securely; loose bulbs may overheat.
9. Electric-powered mowers and other tools should not be used in the rain, on wet grass or in wet conditions. Inspect power tools and electric lawn mowers before each use for frayed power cords, broken plugs and cracked or broken housings. If damaged, stop using it immediately. Repair it or replace it. Always use an extension cord marked for outdoor use and rated for the power needs of your tools. Remember to unplug all portable power tools when not in use. When using ladders, watch out for overhead wires and power lines.
10. Don't use indoor lights for outdoor purposes. Use only bulbs, extension cords, wiring, outlets, and other fixtures specifically designed for outdoor use. (Check the manufacturer's instructions and the Underwriters Laboratories approval).
11. If an appliance works improperly or gives the slightest warning of a problem, such as shocks or sparks, disconnect it and have it serviced.

Protection from Lightning

1. Do not stand under a tree or near anything that is the tallest object. Do not stand on a hilltop, seek shelter in the lowest area.
2. If you are in a pool, spa or any open water, get out as quickly as possible. If you are in a boat, get to land.
3. Do not use the telephone (except in emergencies).
4. Do not use appliances such as hair dryers, toasters and radios.
5. Keep batteries on hand for flashlights and radios in case of a power outage.
6. Use surge protectors for electronic devices and appliances.
7. Stay away from telephone poles and power lines.

Latest Initiatives for Conservation of Domestic Power Through LED Bulbs Distribution

a) In order to give utmost support to the energy conservation & efficiency activities for realizing huge energy savings potential available in the Domestic sector, the State Government has launched DSM based Efficient Lighting Programme (DELP) in the State of Andhra Pradesh. As part of the scheme, two LED bulbs of 7W capacity will be distributed to each household. through this a huge savings made in Domestic sector.

AP DISCOMs have entered into an Energy Savings Agreement with M/s Energy Efficiency Services Limited (EESL), a Government of India Undertaking, according to which M/s EESL is the implementation agency and will undertake the procurement & distribution of LED bulbs. The expenditure is to be reimbursed to M/s EESL in the coming five years with certain financial terms & conditions.

b) As per the terms & provisions of the said Agreement M/s EESL has undertaken to distribute 7W LEDs at a subsidized price of Rs 10/- per LED in 5nos operation circles of, namely Srikakulam, vizianagaram, Visakhapatnam, East Godavari & West Godavari, of APEPDCL . The programme had been launched by the Hon'ble Chief Minister Sri N.Chandrababu Naidu on 2nd October 2014 at Vijayawada. e. Whereas the cost of LEDs and its distribution will be borne by EESL upfront, and



APEPDCL has to reimburse the amount in five(5) years, on monthly installment basis as per the Agreement and the DELP-SOP price determined by the Hon'ble APERC.

c) As per the Energy Savings Agreement entered into between M/s EESL & M/s APEPDCL, about 51.25 Lakh LED Bulbs are to distributed to the consumers in 5Nos. Districts.

Conclusion

World natural resources i.e Oil, Gas, Diesel, Petrol & Coal etc.. have been exhausted about 70%, the remaining may utilize hardly one or two lives. Based on the information provided, we feel that in the short term energy conservation is a much better method for resolving the energy crisis. Today, solar power provides less than 10% of total energy produced in the world. Given current trends, renewable energy is projected to more than double in the next 10 years. The tremendous overhead of initiating such a dramatic shift to solar power should also be kept in mind.

In contrast, the study by McKinsey and Co showed that within 10 years, conservation techniques could be used to reduce energy consumption by up to 23 percent. Such a dramatic difference, in both net energy production/consumption and cost, strongly emphasizes the importance of conservation over solar energy in the short term.

Hence, it is must to switchover to renewable energy resources. The best renewable energy resources in the world in free of cost is Solar energy. As The sun is a powerful source that can help our planet by giving us clean, reusable energy to power our world. The use of this energy is free, does not create pollution, and if used wisely can help us become less dependent on other more costly and damaging forms of power. I hope you are able to see the benefits of this valuable resource and help change the future for energy use.

Last but not least, it is the warranted time to encourage and motivate people to implement energy conservation methods wisely and save energy& money and also offer gift to future human lives.

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