

Recent Trends in Energy Conservation Techniques

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Abstract

The process of liberalization of the Indian economy is rapidly progressing and it is expected to gather further momentum in the coming years. The demand for electricity is growing at a much faster rate than the generation and supply of electricity. The shortage of electric power will have cascading effect on industrial production & economic development. The shortage of power can be met by addition to existing generation capacities & by more efficient utilization of existing capacities. Because of severe resource constraints investment in new generation capacity is limited & again, the additional generation capacity would be available after a long gestation period. In this context it is essential that the maximum should be achieved out of the existing capacity & that we have to go for optimum investment. The paper contains CASE STUDY on Energy Saving in Indian power system Reducing energy use and greenhouse gas emissions is good for your household budget and good for the environment. There are many practical ideas that are easy to implement, are low cost or, in many cases, no cost (just little changes in the way we do things) and have an immediate impact on your wallet and the environment. Electrical energy Saving: Approach to the future.

Keywords: Energy Conservation, Generation, Power prediction, Demand, Supply, Economic etc

Introduction

Energy is that the primary and therefore the most universal measures of all types of labor by person and nature. Electricity is proved to be a perfect energy all told types of energy accessible in nature. Energy is that the causal agency of economic process and is important to the sustenance of a contemporary economy. Future economic process crucially depends on the long-run availability of energy from sources that are unit reasonable, accessible and environmentally friendly

Tips to Save Energy Today

- Easy low-cost and no-cost ways to save energy.
- Install a programmable thermostat to lower utility

bills and manage your heating and cooling systems efficiently.

- Air dry dishes instead of using your dishwasher's drying cycle.
- Turn things off when you are not in the room such as lights, TVs, entertainment systems, and your computer and monitor.
- Plug home electronics, such as TVs and DVD players, into power strips; turn the power strips off when the equipment is not in use—TVs and DVDs in standby mode still use several watts of power.
- Lower the thermostat on your water heater to 120°F.
- Take short showers instead of baths and use low-flow showerheads for additional energy savings.
- Wash only full loads of dishes and clothes.
- Air dry clothes.

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- Check to see that windows and doors are closed when heating or cooling your home.
- Drive sensibly; aggressive driving such as speeding, and rapid acceleration and braking, wastes fuel.
- Look for the ENERGY STAR® label on light bulbs, home appliances, electronics, and other products. ENERGY STAR products meet strict efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
- Visit energysavers.gov for more energy-saving ideas.

Energy Saving

With the present situation of energy crisis, fossil fuels (coal, oil & natural gas) potential is unable to meet the current energy demands and as we know that energy is the life line of growth in any economy that's why energy saving is very important. Our country's per capita energy consumption is 325.1 million tones oil equivalent which is very low as compared to the industrialized countries but the energy intensity is very high.

We can easily narrow the gap between demand & supply and decrease the energy intensity in each sector by simple approach towards energy conservation and efficiency through energy efficient technology and housekeeping habits.

In India major energy intensive sectors which are as follows having an average potential of 20 – 25% of energy savings. The sector wise saving potential would be Industrial (up to 25 %); Agriculture Sector (up to 30 %); Transport, Domestic Commercial and Municipal Sector (<20 %).

Municipal Energy Saving

Every year government allot some proportion of budget to our municipal corporation during which facility & street lighting systems takes away fifty – hour of the overall budget in municipalities. Pumping and street lighting systems offers most potential for energy savings once incorporated to alternative systems.



S. No.	Sector	Stakeholders	Energy savings steps
1	Industrial sector	Owner Workers i.e., Officers etc. Bankers Lenders Consultants Customers	<ul style="list-style-type: none"> • Top management policy • Energy management cell • Energy manager in the company • Energy audit done by accredited energy auditor • Use of std machines & tools • Using modern & energy efficient technologies • Customer should be aware about of norms & standards of the product
2	Agriculture sector	Farmers Bankers Lenders All CEBs , SEBs	<ul style="list-style-type: none"> • Using Standard fuel efficient pump sets • Through Public awareness • Proper installation of pump system • Strictly following the norms & standards for each equipment
3	Transport sector	Central government State government Consultant Public	<ul style="list-style-type: none"> • Use of energy efficient technologies with strict following of norms & std. • Fuel-mix, Ethanol blending • Strict following of Environment standards with regular check up of the vehicle
4	Domestic & Commercial sector	Central government State government Consultant, Lenders Bankers, Public	<ul style="list-style-type: none"> • Use of renewable like solar, wind etc. • No meter tempering • Correct power factor • Use of efficient technologies like CFLs etc.
5	Municipal sector	Central government State government Consultant Public	<ul style="list-style-type: none"> • Strict follow up of norms & standards • Use of efficient technology • Through public awareness

If we tend to use energy economical technologies like applicable size of pumps & motors , use of street lighting system consistent with the requirement , illumination levels of the systems then we will save this 550 – hour of the full budget in municipalities for alternative public welfare activities like new roads, flyovers, health programs, new wells etc.

Some of the measures are as follows

- Rectification of Non-riten valve.
- Rectification of Pump to boost the output and in operation potency
- Replacement of the quality forty W tube lights with thirty six W tube lights as a part of operation and

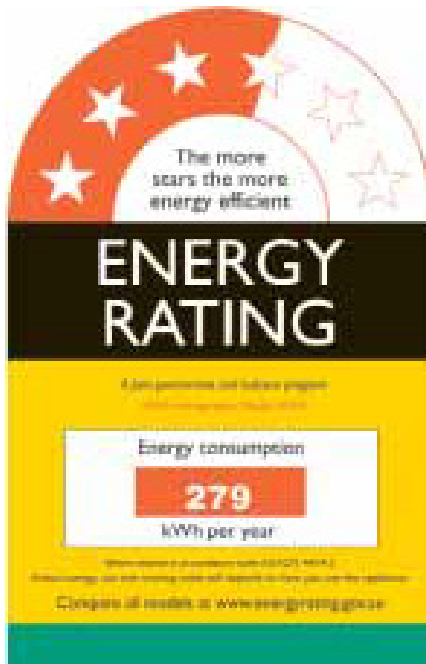


- maintenance observe.
- Replacement of the 250 W atomic number 11 vapour lamps with a hundred and fifty W SV lamps while notreduction within the illumination levels
- Installation of voltage controller to scale back the voltage for lighting circuits.
- Installation of timer controller for lighting feeders
- Replacement of conventional choke with electronic chokes.

Buy energy-efficient appliances with low standby power usage

If you are buying new fridge freezer, heater or air conditioner or dishwasher look at the energy or water rating label and choose one with a high star rating. When purchasing home entertainment and office equipment (TV, DVD, VCR, computer) look for the energy star labeled products. These products use minimal power when in standby mode. Most computers are energy star compliant but do not have this

feature switched on. To energy star enable your computer go to www.energystar.gov.au/consumers/stepbystep.html Install a new energy-efficient furnace to save money over the long term. Look for the ENERGY STAR and EnergyGuide labels to compare efficiency and ensure quality.



Indoor Lighting

You have many choices in energy-efficient lighting. The most popular light bulbs available are halogen incandescent, compact fluorescent lamps (CFLs), and light-emitting diodes (LEDs). Although they can initially cost more than traditional incandescent bulbs, over their lifetime they save you money because they use less electricity.

CFL Lighting

CFL bulbs last about 10 times longer and use about one-fourth the energy of traditional incandescent bulbs. A typical CFL can pay for itself in energy savings in less than 9 months and continue to save you money each month.

You can buy CFLs that offer the same brightness and colors as traditional incandescent bulbs. Some CFLs are encased in a cover to further diffuse the light and provide a similar shape to traditional incandescent bulbs.

CFLs contain a very small amount of mercury and require special handling if they are broken. CFLs should be recycled at the end of their lifespan. Many retailers recycle CFLs for free. Visit epa.gov/cfl for cleanup and safe disposal steps.

LED Lighting

LED bulbs are rapidly expanding in household use. ENERGY STAR-qualified LEDs use only about 20%-25% of the energy and last up to 25 times longer than traditional incandescent

bulbs. They come in a variety of colors, and some are dimmable or offer convenient features such as daylight and motion sensors.

In addition to standard screw-in bulbs, you'll find LEDs in desk lamps, kitchen under-cabinet lighting, and even holiday light strings.



Indoor Lighting Tips

- Replacing 15 inefficient incandescent bulbs in your home with energy-saving bulbs could save you about \$50 per year. Replace your old incandescent bulbs with ENERGY STAR-qualified bulbs for the best quality in savings.
- Visit energystar.gov to find the right light bulbs for your fixtures. They are available in sizes and shapes to fit in almost any fixture and provide the greatest savings in fixtures that are on for a long time each day.
- When replacing incandescent bulbs from recessed light fixtures, use energy-efficient bulbs that are rated for
- Consider purchasing ENERGY STAR-qualified fixtures. They are available in many styles, distribute light more efficiently and evenly than standard fixtures, and some offer convenient features such as dimming.
- Controls such as timers and photocells save electricity by turning lights off when not in use. Dimmers save electricity when used to lower light levels. Be sure to select products that are compatible with the energy-efficient bulbs you want to use.
- Keep your curtains or shades open to use daylighting instead of turning on lights. For more privacy, use light-colored, loose-weave curtains to allow daylight into the room. Also, decorate with lighter colors that reflect daylight.

Outdoor Lighting

Many homeowners use outdoor lighting for decoration and security. A variety of products are available from low-voltage pathway lighting to motion-detector floodlights.

LEDs work well indoors and outdoors because of their durability and performance in cold environments. Look for LED products such as pathway lights, step lights, and porch lights for outdoor use. You can also find solar powered outdoor lighting.

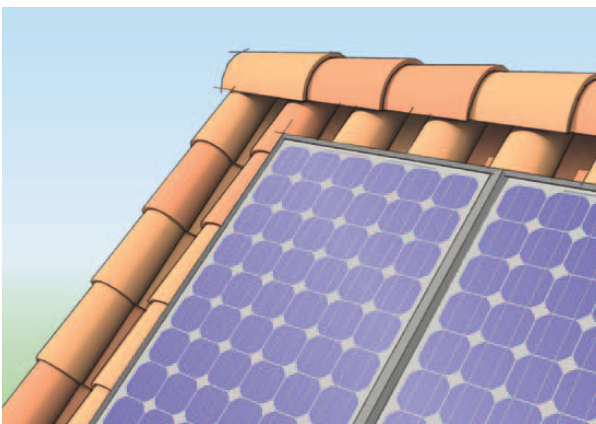
Outdoor Lighting Tips

- Because outdoor lights are usually left on a long time, using CFLs or LEDs in these fixtures will save a lot of energy. Most bare spiral CFLs can be used in enclosed fixtures that protect them from the weather.
- CFLs and LEDs are available as flood lights. These models have been tested to withstand the rain and snow so they can be used in exposed fixtures.
- Look for ENERGY STAR-qualified fixtures that are designed for out-door use and come with features like automatic daylight shut-off and motion sensors.

Renewable Energy

You have many options for using renewable energy at home including solar panels and small wind turbines. Solar panels are the most popular form of renewable energy today. You can use them to generate heat, electricity, and indoor and outdoor light.

Use Solar Power to Heat Water and More!



Today's solar power is highly efficient. You can buy systems to heat your water, provide electricity, and even offload your home heating system.

A small wind turbine system can provide additional electricity in your home, or even power your sailboat battery.

Use of Renewable Energy sources in day to day life for future is important as compare to Non-Renewable Energy Sources..



Conclusion

Everything what happens within the world is that the expression of flow of energy (Electrical) in one among its forms. In development method to deal with increasing energy demands, conservation and energy potency measures are 2 parallel ways.

References

- Books: Guidebooks for National certificate of examination for Energy Managers Electric energy utilization & conservation-S.C.Tripathy Renewable energy sources & conservation technology-N.K.Bansal Energy efficiency & Demand Side Management-Paper by RanganBanerjee, IIT Mumbai.
- Journals: Electrical India –March 2009 IEEMA – magazine Power India – magazine
- Websites: www.beeidia.nic.in
- www.energy.com
- www.mahaurja.com
- www.energyconservation.net
- www.energymanagert

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