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S K R GOVERNMENT DEGREE COLLEGE (WOMEN)



G.O.Ms.No. 28, Higher Education Department, Dated 10-08-2022

Re-Accredited at B' Grade by NAAC

Affiliated to Adikavi Nannaya University

Opp. T.T.D. Kalyana Mandapam, Danavaipeta, Rajamahendravaram, E.G.Dist., A.P

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Environment consciousness and sustainability solar energy

Extensive fossil fuel consumption led to some undesirable phenomena such as atmosphere under environmental pollution viz., Global warming, greenhouse effect, climate change ozone layer depletion and acid rain in order to avoid for these impacts of the phenomena that to concentrate to alternatives are improved in the college to reduce harmful emission into the atmosphere and replace fossil fuel uses as much as possible with environmentally friendly clean and renewable energy sources among these sources the college is installed solar energy panels as it comes get the top of the list due to its options being cheaper and not producing any pollutants during operations and being almost infinite energy source when compare with fossil fuels.

Solar collector

1. Solar panels : solar panels are systems that converts solar raise to electrical power. Flat plate collector are made of a glass cover as a transparent material and observing plate and a body radiation passed through the glass plate is observed by the solar plate. This plate is covered with paints are special surface for observing properties almost 90% of the solar radiation. Felt on the surface are observed by this plates.
2. Alumni contributed 6 solar lights which are water resistant whether proof and have a low glare and low insect attraction. These solar panels in these lights convert solar energy into electrical energy that gets stored in the inbuilt battery and is utilised for dusk to dawn lighting operation.
3. To increase energy efficiency lower electrical bills LED bulbs are used in the campus.



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Any time you plug in an appliance or use a battery, you're encountering an example of electrical energy. Electrical energy also results from the conservation from another type of energy. For example, solar cells change sunlight into electrical energy and wind turbines turn kinetic energy into electric energy.

The kilowatt-hour (kWh) is the commercial unit of electric energy.

Generally, *one kWh is called one unit.*

Electric Power:

Electric power is defined as the *rate at which electrical energy is consumed*. It may also be defined as the rate at which an electric circuit transfers electrical energy per unit of time.

Electric Power Supply System

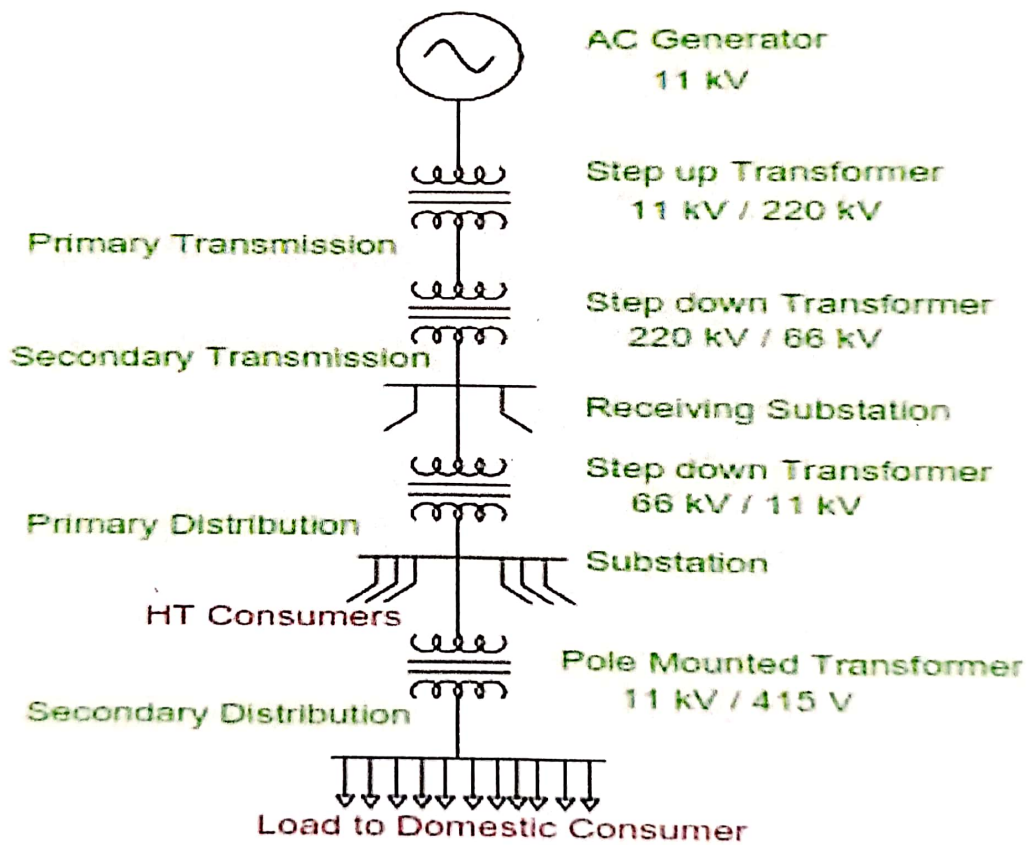


FIG : Single Line Diagram of Power Supply System

Use of electricity in Educational Institutes:

The two main purposes for educational institutes to need electricity is *lighting* and secondly, *use of computers for administrative purposes*. The most energy consuming appliances in educational institutes are the ventilation and air conditioning systems.

Educational Institutes usually get their electricity from a power plant which use a variety of energy resources to generate electricity, including fossil fuels (coal, oil and natural gas) and renewable energy sources(biomass, hydro power, solar and wind).

Let us calculate the electric energy consumption bill for a class room which uses 4 ceiling fans (each 75 watt) , 4 tube lights (each 40 watt) working for 8 hours per day on an average.

$$\begin{aligned}\text{Now, energy consumed per day} &= 4 * 75 \text{ W} * 8 \text{ h} + 4 * 40 \text{ W} * 8 \text{ h} \\ &= 2400 \text{ Wh} + 1280 \text{ Wh} \\ &= 3680 \text{ Wh} \\ &= 3.680 \text{ kWh.}\end{aligned}$$

Now, for a month of 25 working days,

$$\begin{aligned}\text{energy consumption} &= 3.680\text{kWh} \times 25 \\ &= 92 \text{ kWh} \\ &= 92 \text{ units.}\end{aligned}$$

If each unit costs at Rs.12 (roughly),

$$\begin{aligned}\text{cost of consumption} &= 92 * \text{Rs.}8 \text{ (approximately)} \\ &= \text{Rs.} 736.\end{aligned}$$

This estimate is only for one class room. The number of class rooms may vary depending on the student strength of the college. Also an educational institute has Administrative Office, Library, Laboratories etc. So, the rate of power consumption goes on increasing.

How to save Electricity in Educational Institutes:

1. Huge amounts of energy is wasted out in educational institutes because no one really cares about switching off the fans and lights when not required. Hence, planning workshops on energy conservation to educate students can generate huge results.
2. Educational Institutes have many areas where lighting is not required at all times. Installing sensor based lighting in such areas can generate massive rewards.
3. A large percentage of schools/ Colleges use traditional lighting products which are not energy efficient, wasting energy and money. To save electricity, they can shift from traditional lights to modern LED lights.
4. Most student sessions and classes happen during daytime. By avoiding artificial lighting on sunny days, schools/colleges can save electricity.
5. Replacing old computers with ones having energy efficiency certification is the easiest way to conserve energy at schools/colleges.
6. Investment in solar lights for outdoor lighting can generate long term benefits.
7. Conduct electricity conservation sessions for staff so that they can identify power wastage when they see it.
8. Unplug overhead projectors, computers, and smart boards when not in use. This simple way to conserve energy can help save large amount of power and money in the long run.
9. In case a new block is being added to the school/college property, make sure that power efficient lighting and fixtures are installed from the very beginning.
10. Traditional electrical appliances must be replaced with power efficient ones to reduce power consumption and waste. This is precisely how to save electricity at schools and educational centers.
11. Involve all the school/college community in the task of energy conservation. This is how the best schools/colleges save electricity and reduce their power bills.
12. Create student patrols and committees to make sure that energy conservation guidelines are being implemented.
13. Check the use of light fixtures beside windows and unused corners. Since schools/ colleges have large number of rooms, this can help in conserving energy at school/ college.
14. Check the use of personal gadgets by students on school premises. Even if laptops and tablets are part of teaching methodologies, they must be checked when not in use.

While the above are some of the best ways to save energy at educational institutes, there are many other ideas that can promote power savings in college premises.

LED Lighting:

LED Lighting represents the latest development in the lighting industry. The energy efficiency and considerable lifespan of LED technology holds all the potential for changing the way organizations brighten the facilities by *reducing the cost of electricity and overall energy use.*

Benefits of LED Lighting:

1. **A Long Lifespan** : An LED light can last anywhere from 6 to 12 years before you need to replace it. This is 40 times longer than an incandescent bulb.
2. **Energy Efficiency** : If you replace all the lighting in your office or school or college with LEDs, you could see as much as a 60% to 70% improvement in your overall energy savings.
3. **Improved Environmental Performance** : It is becoming increasingly important for Organizations to become *eco-friendly*.

4. **No Heat or UV Emissions**: Many traditional lighting systems like incandescent bulbs turn more than 90% of the energy they use to heat, allowing only 10% of energy to actual light production. *LEDs emit almost no heat*, and most of the light they emit is within the *visible spectrum*.

In addition to these, some more advantages of LED lighting are The Ability to Operate in Cold Conditions, Design Flexibility, Low Voltage Operation, Instant Lighting and the Ability to Withstand Frequent Switching, Dimming Capabilities, Directionality.

Solar Lighting:

Outdoor Solar lighting systems use Solar Cells, which convert sunlight into electricity. The electricity is stored in batteries for use at night.

The solar energy is Renewable Energy, Economy -friendly and Environmentally-friendly.

Because solar lighting doesn't require electricity for power, it can save you money in the long term. After the initial cost for a quality solar light which can be high, the cost is typically recouped over time as you pay nothing in energy costs to run the lights.

Solar lights typically last for between 6 and 10 hours each night and operate for 2 to 5 years. By bringing your solar lights inside during the winter, it is possible to extend their expected lifespan.

Care should be taken in purchasing solar lights, as cheap or inferior solar lights increase the risk of overheating and catching fire.

Low temperatures and shorter sunshine hours reduce the usefulness of solar-powered fixtures. For this reason, in addition to them, you should also install mains-powered light sources with monitor sensors.

Some Facts about Solar Energy in India:

1. Solar Energy Corporation of India Limited (SECI). A Government of India Enterprise, Under Ministry of New and Renewable Energy works on solar energy in India.
2. Rajasthan has topped in the installed capacity of solar energy in India with 7737.95MW.
3. The Solar Study Lamp is the scheme of Ministry of New and Renewable Energy , Government of India for distribution of 7 million solar study lamps for school going children in the States.
4. Tata Power Solar Systems Ltd. Is the India's leading solar company.
5. Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM KUSUM) scheme aims to add solar and other renewable capacity of 30,800MW by 2022.
6. Sanchi in Madhya Pradesh is known as solar city in India. First solar city in India.
7. On October 9, 2022 Modhera, a village in the Mehsana district of Gujarat was declared as the first round-the-clock solar -powered village in India.

Energy Saving Practices in S.K.R. College For Women, RAJAHMUNDRY.

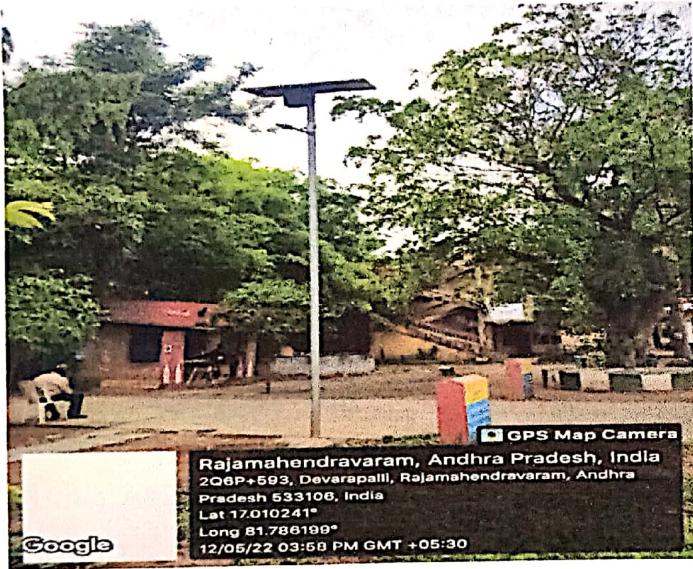
1. Students are instructed to switch off the fans and lights while coming out of the class room at the end of the Day.

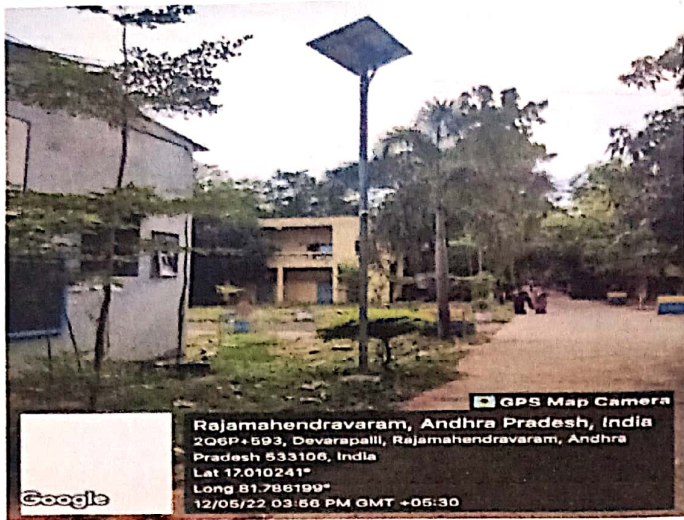


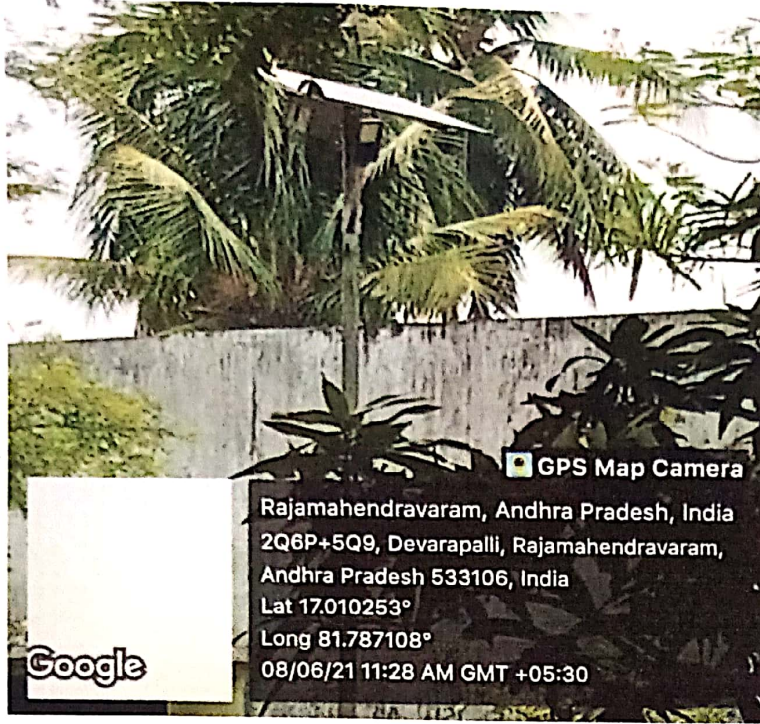
2. Class representative(s) will see whether the switches are in OFF position after all the students leave the class room at the end of the day, of their respective classes.
3. Student Union Representatives are instructed to check randomly whether the switches in the class rooms class room were in OFF position when not in use.
4. Administrative staff were also instructed to switch off the lights, fans, Computers etc. when not in use and also during the end of the day before leaving the Administrative block.
5. Electricity conservation sessions were being conducted for both Staff and Students to identify the power wastage (if any) and to take necessary steps to minimize the power loss.
6. Measures are taken to replace gradually the tube lights in the class rooms and Administrative block with LED lights as LED lights consume very little power and delivers no heat. Also measures were taken to replace older fans with new ones wherever necessary.
7. Solar lights were being installed in the College Campus for outdoor lighting during evening/ night.
8. Waste water from RO plant (RO reject water) is used for gardening.

General Measures:

1. Battery room / Generator room should be kept neat and clean.
2. Battery purchase details, warranty period details should be maintained.
3. Lubricants like petroleum jelly to be applied on battery terminals to avoid corrosion.
4. Proper ventilation to be provided.
5. Distilled water shall be added periodically to avoid dryness and failure of the batteries.







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