



C. A. Y. M. E. Trust's

**Siddhant College of Engineering.**

(Approved by AICTE, Recognized by Govt. of Maharashtra and Affiliated to S.P. Pune University & MSBTE)  
At. Post - Sudumbare, Tal. - Maval, Dist. - Pune, PIN - 412 109. ☎ 02114-661904.

**Shri. Rajendra Singh Yadav.**  
President.

**Dr.L.V.Kamble**  
Principal.

## ALTERNATE SOURCES OF ENERGY AND ENERGY CONSERVATION MEASURES

Renewable energy is good for the planet and for people. Renewable energy is energy derived from natural resources that replenish themselves in less than a human lifetime without depleting the planet's resources. These resources - such as sunlight, wind, tides, waves and biomass - have the benefit of being available in one form or another nearly everywhere. They are virtually inexhaustible. And, what is even more important, they cause little climate or environmental damage. The alternative Energy Sources of Siddhant College of Engineering is made for proper implementation and efficient utilization of renewable Energy Sources.

- The college management has taken following measures for conserving the energy.
- To install and use Solar Energy in the college campus to save energy.
- To install and use Biogas plant in the college campus to save energy.
- To install and use geothermal plant in the college campus to save energy.
- To install and use LED bulbs in the college campus.
- To invest in power efficient equipments.
- To create awareness that small actions matter- Save Energy labels/posters are put up at various location in the institution.
- Use of natural lighting and ventilation is encouraged as and when possible.
- To take additional measure to continuously improve our energy consumption.
- To ensure the availability of necessary resources to achieve the objectives.





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## MANAGEMENT OF THE VARIOUS TYPES OF DEGRADABLE AND NON-DEGRADABLE WASTE

### E-WASTE

- E-Waste is short for Electronic-Waste and the term is used to describe old, end-of-life or discarded electronic appliances. It includes their components, consumables, parts and spares.
- It is categorised into 21 types under two broad categories:
  1. Information technology and communication equipment.
  2. Consumer electrical and electronics.
- Laws to manage e-waste have been in place in India since 2011, mandating that only authorised dismantlers and recyclers collect e-waste. E-waste (Management) Rules, 2016 was enacted in 2017.
- India's first e-waste clinic for segregating, processing and disposal of waste from household and commercial units has been set-up in Bhopal, Madhya Pradesh

### PLASTIC WASTE MANAGEMENT

**Reduce:** First step in reducing plastic waste is to minimize single use plastics by supporting a tax on plastic bags, restraint on manufacturing of plastics, and using alternatives of plastic or biodegradable plastic.

- For example **Project REPLAN** (stands for REducing PLastic in Nature) launched by **Khadi and Village Industries Commission (KVIC)** aims to reduce consumption of plastic bags by providing a more sustainable alternative.
- **Reuse:** Reusing plastics can reduce the demand for new plastics, hence it can act as the natural restraint on plastic manufacturing.
- **Recycle:** Plastic recycling is the process of recovering waste or scrap plastic and reprocessing it into useful products. It offers several benefits like:
  - Economic benefits due to value addition
  - Generates employment
  - Reduces depletion of fossil fuel reserves.



- Reduces landfill problems
- Recycling of plastics requires less energy
- **Recovery:** It is the process of converting non-recyclable plastics into a range of useful forms of energy and chemicals for industry. Since plastics contain mainly carbon and hydrogen, with similar energy content to conventional fuels such as diesel, they can be used as a potential source of fuel.

## MANAGEMENT OF SOLID WASTE

- Solid waste management can be divided into **four key components: Generation Storage and Collection Transportation Disposal**

### 1. Generation

- Generation of solid waste is the stage at which materials become of no use to the owner and they wish to get rid of them.

### 2. Storage and Collection

- Storage takes place after the materials have been discarded. Key here is to not discard items directly into family pits and poorly defined heaps close to dwelling areas, but an effective storage system must be at place, like the Government of India has directed municipal corporations to undertake **Door to Door collection of Solid wastes under Jawaharlal Nehru National Urban Renewal Mission (JNNURM)**.
- Whereas under **Swacch Bharat Abhiyan**, two different dustbins have been provided (**Blue and Green Dustbins**) which are used to segregate two different kinds of wastes, the green is meant for wet wastes while the blue one is for Solid dry waste.

### 3. Transportation

- This is the stage when solid waste is transported to the final disposal site. There are various modes and methods which may be adopted depending upon availability and the volume of waste to be transported.
- In India, Solid wastes are generally transported first by small municipal vehicles to a dumping site, then big municipal vehicles carry them for final disposal, be it to landfills or to recycling plants.

### 4. Disposal

The final stage of solid waste management is safe disposal where associated risks are minimised. **There are six main methods for the disposal of solid waste:**



- **Land application:** Open dumps or landfilling, Open dumps and landfills are uncovered/covered areas that are used to dump solid waste of all kinds. The waste is not treated nor it is segregated and thus it is also a place where a lot of insects and other disease causing organisms breed. They are generally located in urban areas. For landfills, a pit is dug where garbage is dumped and the pit is covered with soil everyday thus preventing the breeding of flies and rats. Open dumps are more harmful than landfills as landfills after they are full can be used as a park/parking lot after covering it, but open dumps cannot be treated as such.
- **Composting:** Composting is a biological process in which micro-organisms such as fungi or bacteria decompose in the presence of oxygen the degradable organic wastes. The finished product is very rich in carbon and nitrogen thus acting as a great medium for plant cultivation.
- **Burning or incineration:** The process of burning solid wastes in a large furnace at a very high temperature whereby producing ash is called Incineration. It is only used as a last resort because it also produces a lot of toxic gases resulting in Air Pollution.
- **Pyrolysis:** The process of burning solid wastes, but in the absence of oxygen in a large furnace at a very high temperature whereby producing charcoal, tar, methyl alcohol, acetic acid, acetone which can be used as fuels is called Pyrolysis.
- **Vermiculture:** It is also known as Earthworm farming. In this method, Earthworms are added to the compost. These worms break the solid waste and along with the earthworms' excreta, the compost becomes rich in nutrients.
- **Recycling:** Solid wastes are also recycled, where the solid wastes are first taken to compost plants which are either set up by Government or by Private companies (under Corporate Social Responsibility), then they are either converted to fertilizers or they are recycled to produce various other items such as Plastics bottles, electronic instruments, building materials etc.





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## WATER CONSERVATION

Water conservation is essential and can be done by everyone. We can all contribute to saving water. Very small-scale changes can be made to preserve water. Even the people who aren't facing water shortages should find ways to save water at home.

Several techniques can be implemented for the conservation of water that has been discussed below:-

- **Careful Use of Water:** Keep the taps turned off when not in use. Usage of efficient home appliances like washing machines and dishwashers can save a lot of water. Even without the appliances, make sure you don't overuse water while washing dishes or clothes.
- **Don't Wash Down Garbage:** Make sure to not wash down small bits of trash that use a large amount of water to flush down the drain. Always put them in the bin.
- **Don't Run the Faucet to Clean Vegetables:** Fill a container with water to wash fruits and vegetables. Keeping them under the faucet while water runs down will lead to unnecessary wastage of water.
- **Check for Leaks:** Leaks can cause a significant amount of water loss if left unchecked. So, check the faucet, taps, and pipes for leaks regularly. While turning the tap off make sure to turn it all the way or it may keep dripping.
- **Water the Plants Smartly:** While watering your plants keep in mind the temperature and time of the day, so water doesn't evaporate quickly. Reuse water from cleaning and laundry to water the plants.
- **Reduce Bathing Water Amount:** While bathing or taking a shower make sure to not let the water run down for a longer period or unnecessarily.
- The best way to conserve water is to recycle and reuse it.
- Try limiting your shower time to 10 to 15 minutes because humans carelessly consume gallons of water for luxuriously long showers. So Reducing the shower time would prevent excessive wastage of water.



- Rusting pipes Leaky faucets dripping water from shower heads Earth science of unnecessary water wastage that needs to be fixed immediately to avoid wasting water.
- Try using a compost Bin instead of in-sink garbage disposal. Compost bins are environmentally friendly and reduce water wastage.
- Maintenance of appliances can prevent potential leaks and wastage of energy.
- We can save gallons of water by turning off the water while brushing our teeth, shaving, showering, and washing dishes as these daily routine activities have resulted in excessive consumption of water.
- Promote plantation of drought-resistant trees and plants as these can thrive even without irrigation.
- Trees and plants with a layer of mulch around them slow down the evaporation of moisture.

These are some of the many ways to save water. Moreover, people need to be educated and made aware of the ways of saving water. Make an effort to educate the people around you on why you think saving water is important.





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## GREEN CAMPUS INITIATIVE

### 1. Grow a Campus Garden

Campus gardens are becoming more popular at universities and colleges everywhere. Students can come together to plant produce or even raise livestock that can be used in the dining halls or provide free fresh food for the surrounding community. It's a great way to reduce emissions from food transportation. Plus, students can learn about growing food in an urban setting, preparing them for life after college.

### 2. Encourage Reusable Water Bottles

There are too many single-use plastic water bottles to count that end up in landfills and in the environment through pollution. Many schools have been trying to counteract this by adding more water fountains and refill stations. This encourages students to use reusable water bottles instead of purchasing single-use plastic bottles of water. Having multiple refill stations makes it easy for people on campus to rehydrate sustainably.

### 3. Set out Distinct Receptacles for Trash and Recycling

Another simple green initiative for college campuses is to set out various receptacles for trash and recycling. Campuses can encourage recycling by providing recycling bins for different materials, like paper, plastic, aluminium and glass. When students have a place to put their recyclables, they'll be more likely to participate in this sustainable act. Students can also compost food scraps if the campus installs a compost bin to eliminate waste.

### 4. Opt for Low-Emission Transportation

College kids love their freedom, which means many bring their vehicles to campus so they can go anywhere they want whenever they want. However, having thousands of cars on campus increases emissions, and on larger campuses, students may opt to drive to their classes. Instead, colleges can encourage students to carpool, walk or bike around campus. Additionally, students can use public transportation or participate in a car sharing or bike-sharing program.



## **5. Offer Environmental Degrees and Organizations**

Colleges need to teach subjects that can help the students on campus understand the importance of environmental issues and possibly enter a career path that promotes conservation and sustainability. These can either be in the form of individual courses for a degree or electives. If this isn't an option for colleges, then the students can take the initiative to start clubs or organizations to teach others about sustainability on campus.

## **6. Limit Food Waste**

College campuses are notorious for food waste. Thousands of people on campus can lead to thousands of pounds of food waste every week. Dining halls often have to produce enough food for a certain percentage of the campus population. If students don't show up or don't like what's being served, most of that food ends up in the trash. Campuses can provide containers for students to take leftovers or start a composting program through the dining hall.

## **7. Invest in Clean Energy**

Investing in clean energy is an excellent way for college campuses to go green. Although clean energy such as solar power and wind power have been becoming more popular, many buildings on college campuses still rely on non-renewable energy sources for heating and cooling, electricity and other power needs. Colleges can easily invest in solar energy and can place solar panels on the rooftops of buildings or even create a solar field off-campus as an energy source.

## **8. Choose Electronics over Paper**

The world has adopted digital communication, learning and other applications. Many colleges are equipped with online versions of once-paper material. Professors opt to use electronic textbooks over paper ones, and students take notes digitally via laptops or tablets. As long as college students and faculty continue choosing electronic learning instead of traditional paper products, they're becoming greener. Colleges that still opt for paper can participate in recycling and textbook buy-back programs to limit paper waste.







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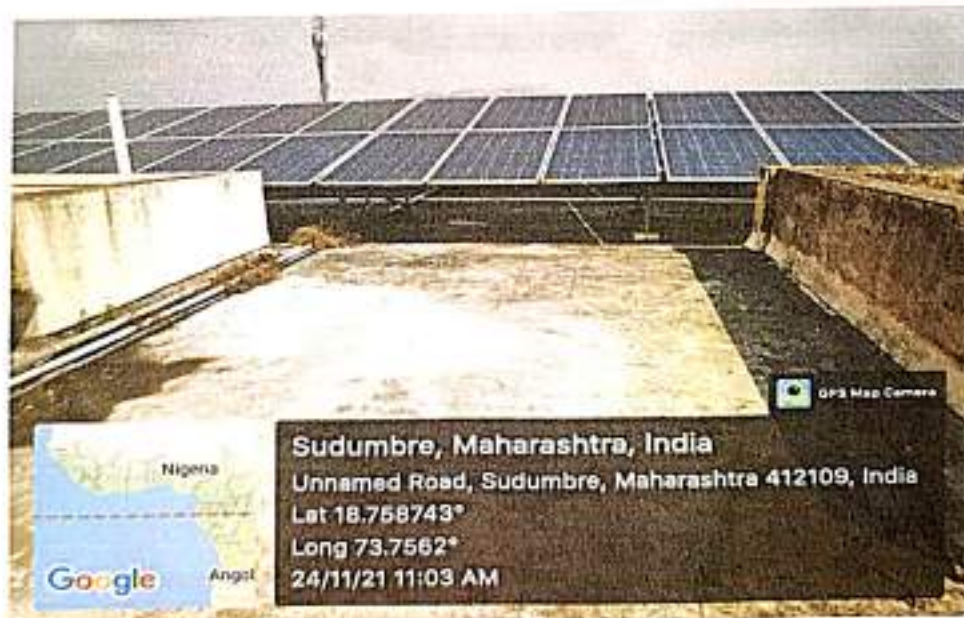
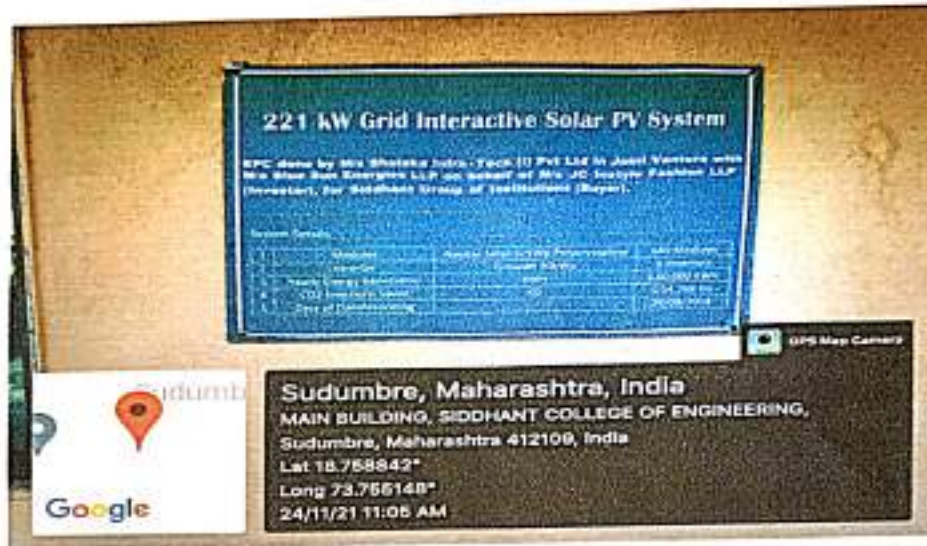
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## SOLAR DETAILS





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### E-WASTE



### SOLID WASTE





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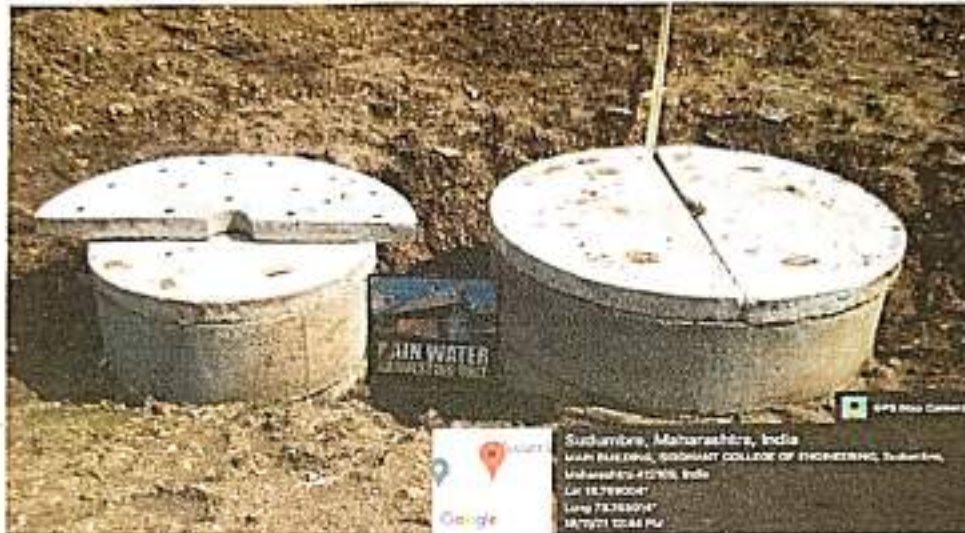
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## WATER CONSERVATION RAIN WATER



## RAIN WATER COLLECTION AT WELL





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## GREEN CAMPUS

