GREEN CAMPUS INITIATIVES

A. Installation of Solar Panels

Installation of Solar Panels

1. Introduction

- Increasing energy demand and environmental concerns are prompting institutions to seek sustainable energy sources.
- Solar power offers a clean, renewable, and cost-effective energy solution.
- Educational campuses, with their vast rooftops and open spaces, are ideal for solar panel installations.

🎯 2. Objectives

- Reduce dependency on conventional energy.
- Lower electricity bills.
- Promote sustainability and environmental responsibility.
- Serve as a live educational model for students.

🏫 3. Suitability of Educational Campuses

- Flat rooftops of buildings suitable for solar panels.
- High daytime energy usage aligns well with solar energy generation.
- Opportunity to integrate solar energy systems into educational curricula (especially in engineering or environmental sciences).

☑ 4. Benefits

- **Economic**: Save up to 30–60% on electricity bills.
- **Environmental**: Reduce carbon footprint.
- **Educational**: Promote real-world learning and sustainability awareness.
- **PR Value**: Improves institutional reputation.

B. Development of E-vehicle in campus

1. Introduction

- Universities are evolving as eco-friendly and tech-savvy ecosystems.
- Electric Vehicles (EVs) offer a sustainable solution for intra-campus transportation.
- Developing E-vehicle infrastructure aligns with smart campus initiatives and national electric mobility goals.

2. Objectives

- Promote green and sustainable mobility within the campus.
- Reduce carbon emissions and noise pollution.
- Create awareness and hands-on experience for students and faculty.
- Encourage innovation and research in electric mobility.

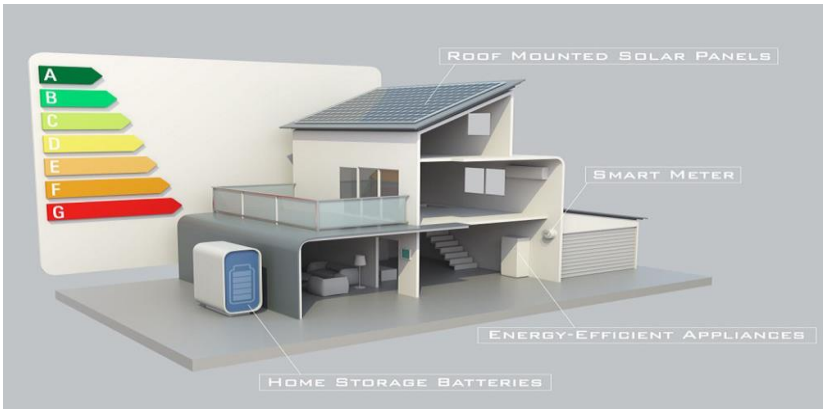
3. Campus Suitability

- Universities usually cover large areas (sprawling campuses).
- Frequent transportation needs (shuttle, security, administrative vehicles).
- Ideal testbed for pilot e-mobility projects, including student/faculty-led innovations.

4. Benefits

- **Environmental**: Zero emissions, reduced noise.
- **Economic**: Low operational cost, long-term savings.
- **Social**: Enhances safety, convenience, accessibility.
- **Educational**: Hands-on exposure to next-gen automotive technologies.

C. Smart Lighting system in classrooms



1. Introduction

- Traditional lighting in classrooms often leads to energy wastage and poor illumination control.
- Smart lighting systems use sensors, automation, and energy-efficient LED technology to optimize lighting based on occupancy, natural light availability, and usage patterns.
- Implementing smart lighting in educational institutes aligns with sustainable campus initiatives and enhances the learning environment.

2. Objectives

- Optimize energy consumption in classrooms.
- Improve lighting quality for better student focus and comfort.
- Enable automation and remote control of lighting systems.
- Reduce maintenance costs and enhance system lifespan.

3. Applicability in Classrooms

- Timetabled use of classrooms means they are often empty for long periods—ideal for occupancy-based control.
- Variable daylight across the day—smart lighting can adjust accordingly.
- Facilitates better concentration and learning outcomes with appropriate brightness levels.

4. Benefits

- **Energy Efficiency**: Up to 40–60% energy savings.
- **Cost Savings**: Reduced electricity bills and maintenance overhead.
- **Sustainability**: Supports green campus initiatives and LEED certification points.
- **Data Logging**: Usage patterns can be analyzed for further optimization.

D. Installation of Smart Meters

1. Introduction

- Educational institutions often face challenges in monitoring, managing, and optimizing electricity consumption.
- Traditional electricity meters provide limited data and no real-time insights.
- **Smart meters** offer a transformative solution by enabling real-time energy monitoring, automated reporting, and better energy management.

2. Objectives

- Accurately measure electricity consumption in different buildings/zones.
- Enable real-time monitoring and load analysis.
- Reduce energy wastage through data-driven decisions.
- Improve accountability in energy use and planning.

3. Applicability in Educational Institutes

- Large campuses with multiple buildings (hostels, labs, lecture halls, admin blocks) require **zonal metering**.
- Smart meters help **track consumption patterns** and **identify wastage**.
- Useful for **green campus certification**, research, and budgeting.

4. Benefits

- **Operational Efficiency**:
  - Identify high-energy-use zones.
  - Plan equipment usage and reduce peak demand charges.
- **Financial Savings**:
  - Lower utility bills through informed actions.
  - Prevent penalties from overuse or poor power factor.
- **Educational Value**:
  - Real-time data can be used in academic research and student projects.
- **Sustainability**:
  - Support energy conservation and carbon footprint reduction goals.

E. Waste Disposal and Composting

🗂️ 1. Introduction

- Educational institutes generate significant amounts of waste — from classrooms, hostels, canteens, labs, and offices.
- Improper waste disposal can lead to pollution, health hazards, and a poor campus environment.
- Implementing **waste segregation and composting** systems promotes environmental responsibility and aligns with Swachh Bharat and green campus initiatives.

🎯 2. Objectives

- Establish a clean, hygienic, and eco-friendly campus.
- Promote effective waste segregation and safe disposal practices.
- Convert organic waste into useful compost.
- Create awareness and involve students in sustainable practices.

🗑️ 3. Types of Waste in Educational Campuses

1. **Biodegradable Waste**: Food waste, garden waste, paper.
2. **Non-Biodegradable Waste**:
    - Recyclable: Plastics, glass, metal, e-waste.
    - Non-recyclable: Soiled paper, multi-layered packaging.
3. **Hazardous Waste**: From science/engineering labs (chemicals, expired materials).

☑️ 4. Benefits

- **Environmental**: Reduces landfill load, pollution, and methane emissions.
- **Economic**: Saves waste disposal costs, produces usable compost.
- **Social**: Promotes eco-conscious behavior among students.
- **Educational**: Hands-on learning for students in environment, biology, and sustainability fields.

F. Installation of Bio-gasifier

A. Introduction

- Educational institutes generate large quantities of **organic waste** (from canteens, laboratories, gardens, etc.).
- A **bio-gasifier** is a clean energy technology that converts organic waste into **biogas** (methane-rich gas used for cooking or heating) and **bio-slurry** (used as fertilizer).
- Installing a bio-gasifier supports sustainable campus development by **reducing waste, generating renewable energy, and enhancing student learning**.

B. Objectives

- Convert food and organic waste into clean energy (biogas).
- Reduce dependency on LPG or electricity for cooking or heating.
- Minimize environmental impact of waste disposal.
- Offer a practical, live model for student research and awareness.

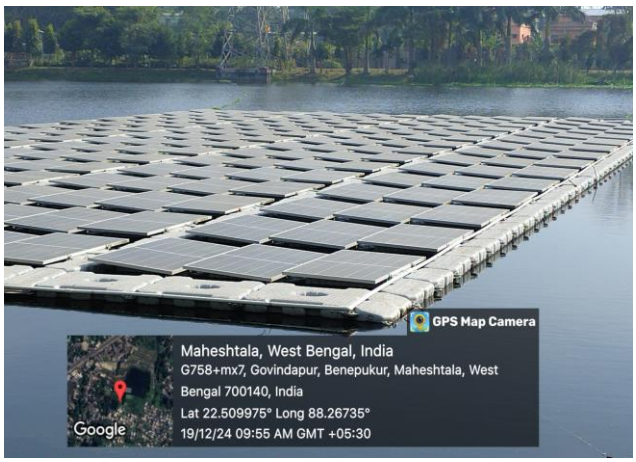
D. Application in Educational Institutes

- Uses waste from: Canteens (food scraps), Gardens (leaves, biomass), Washrooms (optional, for advanced systems)
- Gas output can fuel: Canteen kitchens, Lab burners and Hot water systems

F. Benefits

- **Environmental**:
  - Reduces greenhouse gas emissions and landfill load.
  - Converts waste into useful resources.
- **Economic**:
  - Saves on LPG or electricity costs.
  - Reduces waste disposal costs.
- **Educational**:
  - Supports practical learning in environmental science, biotechnology, and renewable energy.
- **Social**:
  - Promotes eco-awareness among students and staff.

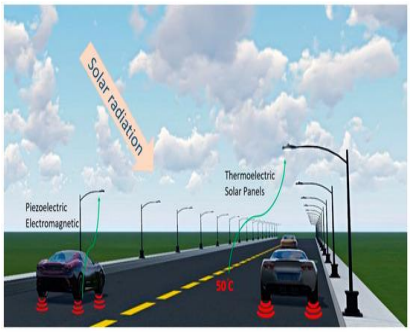
VISIT TO CESC MICROGRIDS AS PART OF NATIONAL GOVERNMENT PROJECT SPONSORED BY ICSSR



GRANT-IN AID PROJECTS UNDERTAKEN

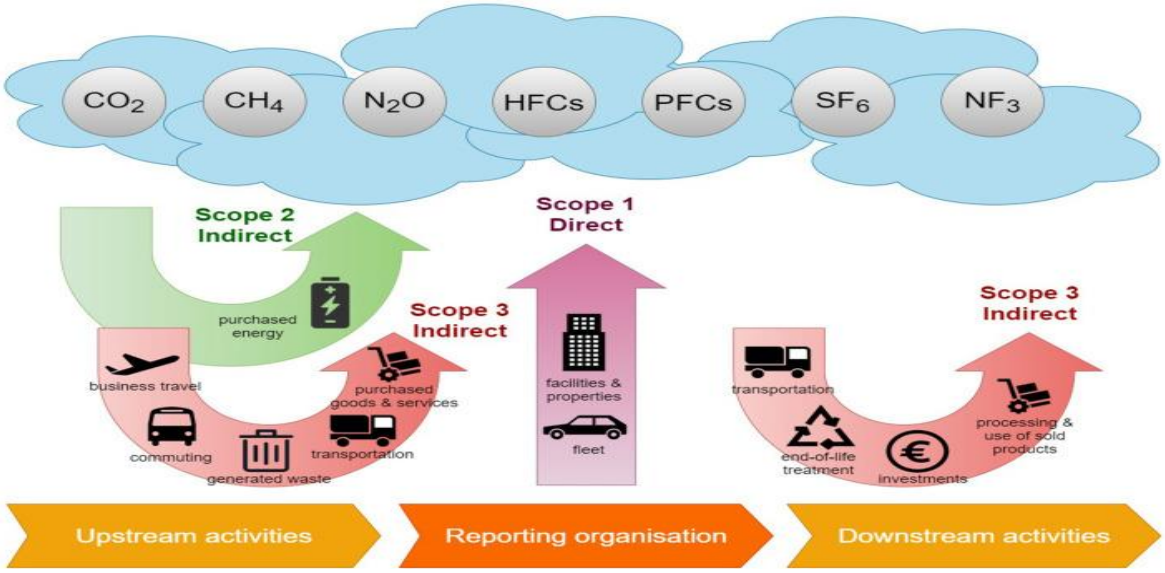
DEVELOPMENT OF GREEN BUILDING AND USE OF RENEWABLE ENERGY TECHNOLOGIES

UNDERWATER DRONES FOR MARINE LITTER MONITORING AND SURVEILLANCE



USE OF MICROPLASTICS AND PIEZOELECTRICAL MATERIAL TO MAKE ROADS TO REDUCE ENVIRONMENTAL POLLUTION AND GENERATE ENERGY

ESTIMATION OF CARBON EMISSION IN CAMPUS



CO_2 emissions under Scope 1 = 0.288 tons

CO_2 emissions under Scope 2 = 475.3 tons

CO_2 emissions under Scope 3 = 0

CONSULTANCY WORKS

ENERGY AUDIT

EMISSION ESTIMATION LEADING TO CLIMATE ACTIONS