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City Office: 10, Pandian Saraswathi St, Sivagami Nagar, Narayanapuram, Madurai - 625 014. Telefax- 0452 2682338, Mobile: 98423-02628

#### 7.1.2 1: The Institution has facilities for alternate sources of energy and energy conservation measures

The Alternative Energy Sources of Pandian Saraswathi Yadhav Engineering college is made for proper implementation and efficient utilization of renewable energy sources in such a systematic way so as to minimize its impact on the environment. An alternative Energy source offers the opportunities for student's community to engage in initiatives for contributing to environmental protection.

#### The following alternative energy conservation facilities are available at our institution

- Solar energy
- Solar water heater
- ❖ Wind solar hybrid system
- ❖ Fuel cell trainer
- Solar pv emulator
- **❖** Wind mill
- Solar power electric bicycle

#### **SOLAR ENERGY**

Pandian Saraswathi Yadav Engineering college campus is equipped with a rooftop, on grid solar power plant with a capacity of 2kwp ON GRID solar power plant inside the premises.9 no's of 225watts panels has been arranged in the roof top with 2kw single phase ON GRID inverter.

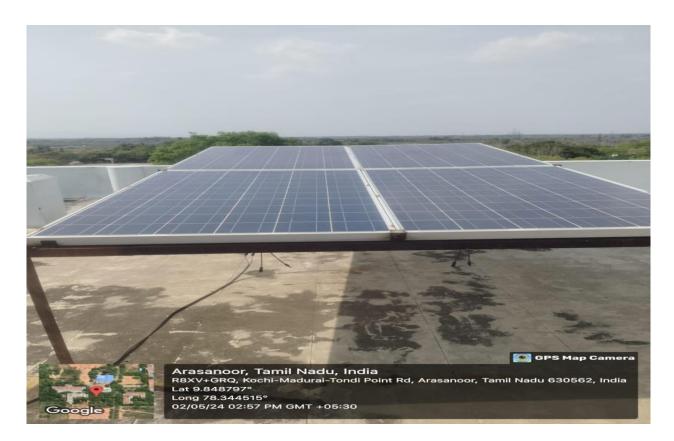
The output has the provision of both DC and AC. It provides an alternate energy source designed to work on cloudy days, in part sun, and even in wintery environments, solar panels can generate a significant amount of power for institutions that install them.



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#### SOLAR PANELS ON THE ROOF TOP OF EEE BLOCK

#### **SOLAR WATER HEATER**

Solar water heater and water heat pump have been installed at Pandian Saraswathi Yadav Engineering College campus to supply hot water. Solar hi-tech 500 litres stainless steel outer tank and solar water tube arrangements. Solar water heater converts solar energy into thermal energy and is transferred to water to generated hot water.

The performance such as hot water generation, temperature of hot water, efficiency of hot water system etc. can be assessed by the following procedures. The assessment can be carried out for a specific period say 8 hours in a day.



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#### SOLAR WATER HEATER ON THE ROOF TOP OF MECHANICAL BLOCK

#### WIND – SOLAR HYBRID SYSTEM

Reaching the non-electrified rural population is currently not possible through the extension of the grid, since the connection is neither economically feasible, nor encouraged by the main actors. Further, the increases in oil prices and the unbearable impacts of this energy source on the users and on the environment, are slowly removing conventional energy solutions, such as fuel genets-based systems, from the rural development agendas. This problem can overcome by using "HYBRID POWER GENERATION USING SOLAR AND WIND ENERGY". Hybrid systems have proved to be the best option to deliver "high quality" power. Pandian Saraswathi Yadav Engineering college implemented a wind-solar hybrid system for an excellent way to promote sustainability, reduce energy costs, and serve as an educational tool for students.



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WIND - SOLAR HYBRID SYSTEM IN RENEWABLE ENERGY SOURCES LABORATORY

#### **FUEL CELL TRAINER**

Pandian Saraswathi Yadav Engineering College implemented a Fuel Cell Trainer to provide hands-on educational experiences and promote understanding of hydrogen fuel cells and related technologies. The Fuel Cell Trainer is ideal for teaching the basic engineering principles of PEM fuel cell systems. Extensive experimenting capabilities and comprehensive and revised instruction material with predefined experiments make it a complete instruction package. All components of the fuel cell system are displayed individually. Integrated displays for operating parameters support the instruction. The Fuel Cell Trainer modularity allows to easily adapt the difficulty level. The system can be operated by inexperienced users. The included software enables computer aided measuring and experimentation.



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#### FUEL CELL TRAINER IN RENEWABLE ENERGY SOURCES LABORATORY

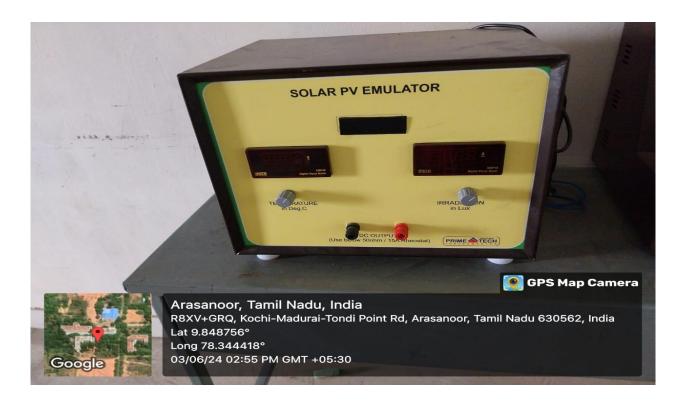
#### SOLAR PV EMULATOR

PV Emulator is a programmable power supply designed to mimic the characteristics of Solar Panels. With fast transient response, the emulator responds to change in load conditions and maintains the output on IV characteristics of the panels defined by user for a given ambient condition. It is a flexible instrument designed to emulate the output of solar panels, with adjustable parameters such as Voc, Isc, shading, coefficient of temperature etc. The PV Emulator uses an internal algorithm to adjust Voc (Open circuit voltage) and Isc (short-circuit current) so as to match the solar panel selected by the user based on user defined parameters such as Irradiation, temperature, Voc, Isc, temperature coefficient etc. The Emulator makes sure the response matches that of the actual panel under all the load conditions within range. The user is presented with a complete set of information with tables and plots on user application.



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### SOLAR PV EMULATOR IN RENEWABLE ENERGY SOURCES LABORATORY

#### WIND MILL

A windmill, developed at Pandian Saraswathi Yadav Engineering College in Sivagangai has been set up in renewable energy sources lab at the campus. The windmill generates 10watts of electricity per hour and the power generated is used for the functioning of 1 led lights. Implementing a windmill on a college campus can have multiple significant benefits, ranging from educational opportunities to environmental and economic advantages. students can gain practical experience with the installation, maintenance, and operation of wind energy systems. Windmills provide a live case study for research in renewable energy technologies, efficiency improvements, and integration with other renewable sources. Wind energy is a clean, renewable resource that reduces the dependence on fossil fuels, thereby decreasing greenhouse gas emissions. Wind energy can reduce the college's electricity bills, providing long-term financial savings.



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WIND MILL IN RENEWABLE ENERGY SOURCES LABORATORY

#### **ENERGY CONSERVATION-LED LAMPS:-**

LEDs are extremely energy effective and consume up to 90 lower power than incandescent bulbs. Since LEDs use only a bit of the energy of an incandescent light bulb there's a dramatic drop in power costs. Also, plutocrat and energy issaved in conservation and relief costs due to the long LED

lifetime.



LESS POWER CONSUMPTION LED BULBS



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LESS POWER CONSUMPTION LED BULBS

#### SOLAR POWER ELECTRIC BICYCLE

The bicycle can run for up to 50 km continuously with the help of the solar panel and go up to a maximum speed of 30 km per hour. It is first designed to run on battery and then run on solar energy. The bicycle can also be pedaled when solar power is low. The advantage is that, while normally battery-powered chargeable bicycles can cover only around 30 km in a time, this bicycle, with the help of the solar panel can provide the power for the bicycle to run up to 50 km.



SOLAR POWER ELECTRIC BICYCLE IN COLLEGE CAMPUS



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#### **BIO-GAS PLANT:**

Bio-gas plant is the technology of micro-organism. A waste treatment plant is a system compressing a gas holder fermentation chamber in which Bio Degradable. Organic matter and other materials can be treated an aerobically which methane gas, otherwise called Bio Gas and manure. Methane gas is a renewable source of energy, which is used for Cooking, lighting, running diesel engine, for generation of Electricity. Methane Gas is a new source of mechanization of Agriculture and scale Industries.

Bio-Gas a renewable fuel that's produced when organic matter, such as food or animal waste, is broken down by microorganisms in the absence of oxygen. This process is called anaerobic digestion. For this to take place, the waste material needs to be enclosed in an environment where there is no oxygen.





**BIO-GAS PLANT -WASTE MANAGEMENT** 



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#### 2. Management of Various Types of Degradable and Non-Degradable Waste

#### **Solid waste Management**

#### A. Biodegradable solid waste

In PSYEC solid waste comprises of paper waste, food waste, dried leaves waste, vegetable waste. For disposal of paper waste an agreement has been signed with the company named. For the management of dried leaves waste a compost pit is constructed to convert a leaves waste into vermicompost which can be further used for generation of plant manure. The vegetables waste from food preparation is converted into bio gas with the help of . More than have been provided across the campus for collection of the further solid waste generated at different sources in college.

### B. Non-biodegradable solid waste

For the disposal of non-biodegradable waste (tea cups, juice bottles) dustbins are provided across the campus. The dustbins are cleared in fortnight basis. An agreement has been made with Sivagangai Municipality to clear the non-biodegradable waste from time to time.



Non-biodegradable solid waste



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#### DEGRADABLE AND NON-DEGRADABLE WASTE BIN

### Liquid waste Management

The toilet waste water is stored in the septic tanks. In underground watertight tanks made of concrete, fibre glass or PVC in which sewage is collected and partially treated.



LIQUID WASTE MANAGEMENT SYSTEM



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### E- waste Management

E-Waste from laboratories is properly collected and is given to licensed recycler. Non-Working Computers, monitors and printers are discarded and scrapped on a systemic basis. Students are also imparted awareness and education about E-waste.



#### E-WASTE MANAGEMENT

### Water Recycling system

Water recycling system usually hand washing water let to the plants directly to optimize the usage of waste water and also to keep the plants irrigated during summer seasons.



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#### 7.1.2\_3 WATER CONSERVATION

#### Rain water harvesting

Water scarcity is one of the growing concerns of the present times, the only solution for which is water conservation. Water conservation is implemented on different level in the PSYEC from rain water harvesting to replenish the underground water, recycling the water for gardening purpose and many more.

Rain water harvesting is a conservation process used for many drivers and for the future needs. PSYEC has setup the rain water harvesting unit in the college campus which has the total storage of 890cft.



**RAIN WATER HARVESTING** 



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#### **RAIN WATER HARVESTING**

### **Bore well & Sump**

The bore well project is implemented in PSYEC as per the government needs. The average depth of the bore well is 1000 ft. In order to satisfy additional demands a sump is constructed with the capacity of 40\*14\*12 that is 6720 cft capacity and 107520 liters capacity.



**BORE WELL AND SUMP** 



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**BORE WELL** 

#### 3. Water storage tanks

Our college campus depends on water source brought from outside and stored in underground sumps which is distributed to all buildings with help of motors and further distributed by small tanks fixed on top of the buildings. PSYEC has 7 water sintex tanks, 2 sintex tanks with 3000 liters capacity and 5 sintex tanks with 5000 liters capacity.



WATER STORAGE TANKS



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#### WATER STORAGE TANKS

### **RO** plant

Our Institution has Reverse Osmosis Plant to provide drinking water to the college and hostel. Reverse osmosis (RO) is a membrane-based process technology to purify water by separating the dissolved solid from feed stream resulting in permeate and rejects steam for a wide range of applications in domestic as well as industrial applications. The entire college campus is facilitated with pure Reverse Osmosis (RO) drinking water with water coolers in every block to cater to the need of pure and safe drinking water to all.

We have 10000 litre / day RO systems installed in each the campus. 2 Water dispensers are available in each floor in every building. The water treatment plant provides safe drinking water at every tap on the campus. A high level of maintenance attention and regular testing ensure the quality of the water. Water treatment plant with reverse osmosis technology is available to provide quality drinking water.



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### **RO PLANT**



**RO REJECT WATER RECYCLING** 



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### **Water Purifier and Dispensers**

In our campus, the RO water is further purified through water doctor, which is distributing the purified water to the students. We have 8 Dispensers, 13 water coolers to distribute the purified water with 3 level of filtration. The purified water is maintained in three different modes (hot, normal and cool water).



WATER PURIFIER AND DISPENSERS



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#### WATER PURIFIER AND DISPENSERS



WATER PURIFIER IN HOSTEL



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### 7.1.2\_4. Green Campus Initiatives

### GREEN CAMPUS INITIATIVE POLICY

"Every green tree is far more glorious than if it were made of Gold and Silver".

A Green Campus is a place where environmentally friendly practices and education combined to promote sustainable and eco – friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental culture. Continuing to develop and implements the integrated green campus policy, our institute implement the following practices towards establishment and maintenance of the green campus.

This involves efforts to reduce and waste, conserve resources and maintain an ecological balance by:

- Conserving energy or shifting to renewable energy.
- Reducing waste or using biodegradable or reusable/recyclable Products.
- Transitioning too locally- sourced materials or eco-friendly delivery methods.



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**ENVIRONMENT BEAUTIFICATION** 

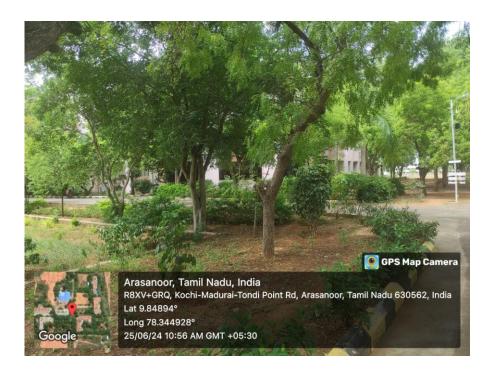


LAWN MAINTENANCE AND CLEAN ENVIRONMENT



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### **GREEN VIEW OF LAWN**



PEDESTRIAN PATHWAY



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#### 5. Disabled-Friendly, Barrier Free Environment

#### **DIVYANGJAN FACILITIES**

### Ramp for easy access to Classrooms:

Students who have mobility limitations often face environmental and social barriers that have an impact on educational performance. So, PSYEC campus provide wheelchair facility to easily assess the classrooms. User friendly ramps built in different blocks of the college to enables differently abled students to move without difficulty.



#### RAMP FACILITIES FOR DIVYANGJAN STUDENTS



RAMP FACILITIES FOR DIVYANGJAN STUDENTS



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### **Disabled-friendly Washroom:**

Our institution has separate toilet facility for people with disabilities. Toilets are clearly hygienic and easily accessible.

### **Sign Boards:**

The sign boards are very important component in any institution as for as disabled persons are connected. The sign boards make the disabled students to feel comfort to move to any place in the campus without any confusion. We placed sign boards at different places in the campus for the benefit of disabled students.



### **Screen Reading Software**

For assisting the visually challenged people screen reading software is installed inside the library premises. A physically disabled/blind/bearing impaired candidate and the scribes such a candidate shall be allowed an extra time of 30 min per hour