



DCT's
Dhempe College of Arts and Science
Miramar, Goa

Design & Development of a Photovoltaic and Human Power Hybrid Energy system

As Goa Government promotes generation and use of clean and green power by harnessing renewable forms of energy. It also promotes private sectors participation in the development of solar PV power and other renewable forms of energy .Government has also constituted bodies like .Goa Energy Development Agency which focuses on promotion of solar, thermal and hybrid based energy efficient devises. To fulfil these needs Goa government is encouraging people, education institutes, industries to use solar based applications to generate electricity so that the money which they are paying to neighboring states can be utilized in for other development in the state.

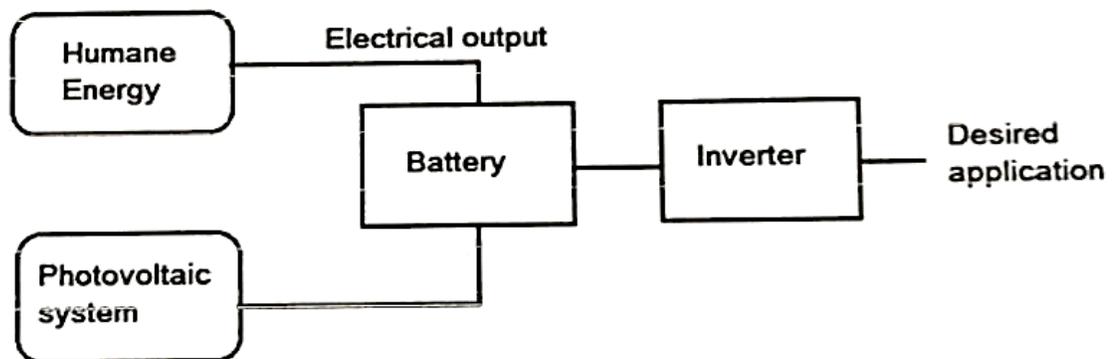
To support this state mission during academic year 2017-18 Dr. Swati Pawar and Dr. Miskil Naik faculty from Physics Department Dhempe College undertook a three-year project of 5 lakhs sanctioned by Directorate of Science & Technology titled ‘Design and development of a photovoltaic and human power hybrid energy system for varied applications’. In the present work it is planned to fabricate the hybrid energy system in the student gymnasium. The idea would be to convert any existing peddling system to an energy generator unit through associating a dynamo generator. The DC electrical output would be clubbed with the Photovoltaic output and then fed to the battery storage system.

As one of the requirement for completion of this project following items for Solar PV installation in the month of January 2020 were procured.

1. Solar panels two in number of 330Watts
2. Inverter 1KVA
3. Batteries two in number of 100Ah

With the above configuration the output generated is connected to the corridor LED tube lights (16 in number). These tube lights runs in the night around 7-8 hours.

In the second part the project the prototype is designed in which the wheel of the exercise cycle is converted into Axial Flux Dynamo Design in which six pairs of Neodymium magnets and 6 coils of 800 turns are used. When wheel rotates the change in magnetic flux induces the electromotive force by Faraday's Law. With this configuration when the peddling is done the e.m.f in the range of 50 V – 60 V and current in the range of 150 to 200mA is generated depending upon value of r.p.m. (rotations per minute). This voltage is used to charge the chargeable battery of 12V. In this manner mechanical energy is converted into electrical energy and it can be stored in the battery.



Dr. Swati Pawar