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A STUDENT PROJECT PROPOSAL ON

Design and Implementation of Solar PV Module in rail coaches

Project Guide's

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Abstract of the project

Awareness for the need of sustainable and eco-friendly mobility has been increasing and various innovations are taking place in this regards. Hence implementing the solar PV modules in the rail coaches can be done in the railway systems. These solar PV modules are installed at the top of the train coaches. Most of the long distance trains have no self generating system, thus making power cars mandatory to supply required power for the lightning loads.

Feasibility of supplementing the diesel generators sets with the solar PV modules installed on the coach roof tops has been proposed with various applications. Here either the power from generating station can be used or the power generated by the solar PV modules can also be used by having sensors and switching actions. Not only there is a conservation of the fuel but also there is a significant reduction in CO_2 emission. The area available on coach roof top is more than sufficient to generate the required power, during the sunlight hours and for the electrical loads of non-A/C coaches during winter also. The estimation can also be done by considering the cost of the diesel and the cost of solar PV module setup. Here the cost of the PV module which is invested at the beginning can be recovered by 2-3 years of duration and also there is a significant reduction of CO_2 emission.

Methodology

Here solar PV modules are to be installed in the railway systems. At first the analysis of the availability of the sun radiations and feasibility of installationhasto be analyzed. After thisdesign of solar PV modules is carried out and also the design of Microcontroller unit is done using suitable methods. The solar panels are installed at roof of the rail coaches depending upon the requirements of generation of electricity. The necessary materials or the equipment required such as Microcontroller, Batteries, loads,etc.,are arranged. Then the solar energy is trapped using the PV modules installed on the roof of the coaches, and that trapped power and is given to Microcontroller unit, after that it can be directly fed to the comfort loads or it can be stored and then used whenever there is a requirement of the electricity to the loads in the coaches.

The applications such as:

1. Conversion of DG (Diesel Generator) system to solar system.
2. Lights and Fan control.
3. Fire system.