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Solar beam Based EV charging station Using TEG

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Abstract: The integration of PV with the electric vehicle (EV) charging system has been on the rise due to several factors, namely continuous reduction in the price of PV modules, rapid growth in EV and concern over the effects of greenhouse gases. Over the years, numerous papers have been published on EV charging using the standard utility (grid) electrical supply; however, there seems to be an absence of a comprehensive overview using PV as one of the components for the charger. With the growing interest in this topic, it is timely to review, summarize and update all the related works on PV charging, and to present it as a single reference. For the benefit of a wider audience, the paper also includes the bries description on EV charging stations, background of EV, as well as a brief description of PV systems. Some of the main features of battery management system (BMS) for EV battery are also presented. It is envisaged that the information gathered in this paper will be a valuable one-stop source of information for researchers working in this topic. of vehicle-to grid (V2G) connection impacts.

Keywords: Integration, Comprehensive, Greenhouse, Charging, Growing, Photovoltaic, Vehicle.

I. INTRODUCTION

Burning fossil fuels for energy has a pivotal role in global warming, which left unchecked could lead to catastrophic climate change [1]. Not only does oil consumed for transport via internal combustion engine vehicles (ICEVs) result in Greenhouse Gas (GHG) emissions, a wide range of other negative externalities also impact the environment, economy, and society [2]. Transitioning to alternative transport energy sources is critical for Australia to reach its GHG emissions target and reduce its reliance on imported oil; with existing technologies presenting some of the lowest cost options [3]. The following literature survey provides background information about the ever- changing field of research into consumer attitudes on EVs and government actions to remedy market failures.

Energy is one of the major inputs for the economic development of any country. In case of developing countries, energy sector assumes a critical importance in view of the ever-increasing energy needs requiring huge investments to meet them. The per capita energy consumption is too low for India as compared to developed countries. It is just 4% of USA and 20% of the world average. The per capita consumption is likely to grow in India with growth in economy thus increasing the energy demand A number of topics concerning solar thermoelectric (TEG) systems for heat and electric power production are presented in this introductory chapter. Starting with a historical background of people who have harnessed solar energy, this is followed by an overview of solar hot water systems (SHW).

Additionally, the harnessing of solar energy, taking Libya as an example of an oil depending country, is briefly discussed. Given the fact that the focus of the present study is Combined Heat and Power (CHP), based on solar hot water (SHW) collector, photovoltaic (PV) cells and thermoelectric devices attached to SHW collectors are also discussed in this section. The aims and objectives of the present study are highlighted in this chapter and, lastly, the thesis's structure is outlined. Aim of Project: In this project we managing the charging discharging supply of electric vehicles improving the power factor and give consumer reliable power by using hot water solar power generation.

Circuit Diagram For DC To AC Inverter

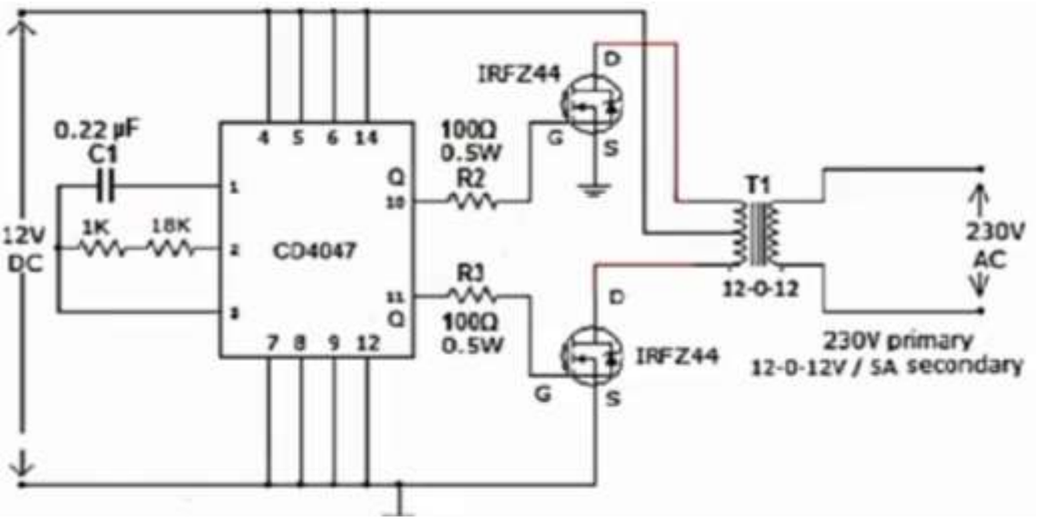


Fig . Circuit Diagram For DC To AC Inverter

System Description and Methodology :-

Working of solar system :-

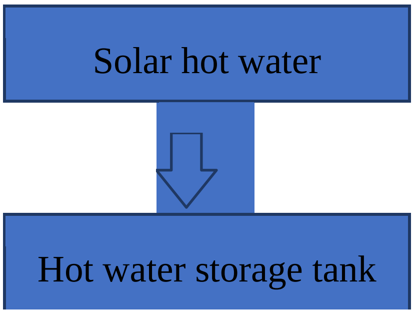
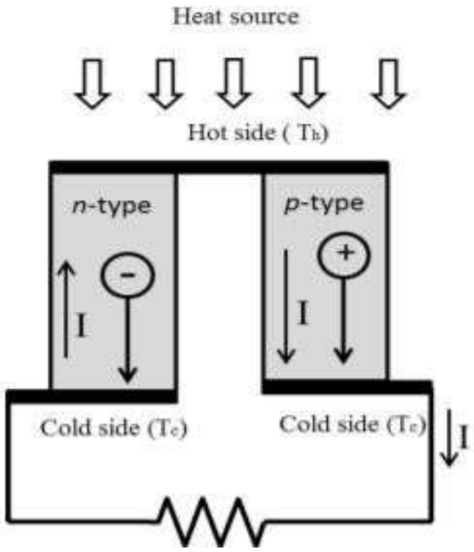


Fig 4.1.1 Flow chart for project developing

A thermoelectric (TE) power generation occurs when a voltage is generated from a temperature difference across two different semiconductor materials. This phenomenon is called the Seebeck effect. Conversely, when a voltage is applied to a circuit formed by two semiconductors, a temperature difference will be created across these two junctions. This is known as the Peltier effect. Furthermore, when electric current flows through a single conducting material and when this single material already has a temperature difference across it, heat energy will be either absorbed or dissipate throughout the material, this effect is known as the Thomson effect. The thermoelectric device is an energy converter based on these effects, which can be used for power generation or refrigeration. In regards to power generation, the efficiency of a thermoelectric device, which called figure of merit (Z), is depends on the three material parameters: the Seebeck-coefficient (α), electrical conductivity (σ) and thermal conductivity (k), this will be explained further in section 2.6. Such requirements can be summarised by the so-called thermoelectric figure of merit, Z
Great efforts have been made to develop high efficiency TE modules mainly by searching for semiconductor materials that have high Z values. Traditionally, there are three types of materials that are the most used as thermoelectric materials, bismuth telluride (Bi2Te3), lead telluride (PbTe) and silicon germanium (SiGe) . Each of those materials has a high performance at a different temperature. At room temperature, bismuth telluride has the best performance, while at a temperature of 1300 oK, silicon germanium has the highest performance. Lead telluride has the best performance in the temperature range 400-900 oK
Even though TE devices have some advantages, such as their simple construction, they are easy to control, high reliability, easy to replace, operate with almost no noise and no moving parts and hence need less maintenance. However, Figure 3.1.1 Thermoelectric figure of merit as a function of temperature for a number of established thermoelectric materials (Brown et al., 2006). 40 there are a few drawbacks, the major problem is their relatively low conversion efficiency. However, in the solar field, it has the potential to improve further, due to their capability for longer life operation, and independence from sunlight or particular position as a main source. These characters make them attractive and competitive to PV cells.

Principles of thermoelectric devices

Seebeck effect:
Figure shows the phenomenon of the Seebeck effect in a thermoelectric device, where heat is converted into electrical power by a “thermocouple” consisting of two different types of semiconductor materials.



Working:
In conventional electricity generation obtain supply from any power plant ,But this system increased the average pollution in atmospheric so for that avoiding above limitation we design the this project. As shown in the block dig.4.3.1 The hot water heat energy is converted into the electrical energy. This heat is stored in hot water storagetank which is mounted on any type fabrication by putting the number of thermoelectric generators on the surface of tin clips then this TEGS as per the see beck affect it converting the heat energy in to the electrical energy. This all thermoelectric generator is connected in series
This generated supply is stored in battery but for constant supply we connect the charging circuit, so it possible to operate the system in bike. Thermoelectric materials have been hailed as one solution to this energy problem-they can take heat and convert it into usable electricity.

II. CONCLUSION

Surplus, Grid Imports and Demand met by Generation percentages for controlled and uncontrolled charging scenarios are almost the same for each adoption rate. Ecovillage is expected that it will be net importer at 50% EV adoption scenario. In the most extreme case of 100% of EV adoption, mitigation should be implemented to remain net exporter for this adoption rate. Current generation is very wind-dependant, consequently has intermittencies on daily and annual basis. The energy output is not completely predictable, so non dispatchable. During the summer, a complimentary source of energy generation is required. Scaling-up the storage is not as effective as the installation of additional generation, in order to achieve relatively lower imports and higher surplus after the implementation of the different EV adoption rates.

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