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✉ ijareeie@gmail.com

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Solar Powered EV Charging Station

Farhan Khan¹, Ahtesham Shaikh², Saeed Pathan³, Mohd. Uzair⁴, S.D. Desai⁵

Diploma Student, Department of Electrical Engineering, Mahatma Gandhi Mission Polytechnic College -
[MGM's Polytechnic] Aurangabad, affiliated with MSBTE. Maharashtra, India^{1,2,3,4}

Professor, Department of Electrical Engineering, Mahatma Gandhi Mission Polytechnic College - [MGM's
Polytechnic] Aurangabad, affiliated with MSBTE. Maharashtra, India⁵

ABSTRACT: A solar charging station is meant so that vehicles are fully charged and is environmentally safe. This technique transforms solar power to electricity and stores it in a battery storage.

If electric vehicles must be truly imperishable, it's essential to charge them from sustainable sources of electricity, like solar or wind energy. In this paper, the solar charging station gives the electricity to charge the battery. The charging station has integrated battery storage that allows for off-grid operation. The DC charging uses the DC power from the photovoltaic panels directly for charging the vehicle's battery without the utilization of an AC charging adapter.

KEYWORDS: Sunlight, Solar Panel, Charging Station, EV charging etc.

I. INTRODUCTION

The rapid development in manufacturing and production of electric vehicle (EV) gains more interesting in the future regarding environmental, technical, and economical opportunities. The impact of production of carbon dioxide (CO₂) from fossil fuels on climate changes is currently one of the very high concern issues. Another issue is the economic challenges of using battery banks storage in automotive systems [1]. Renewable energy resources have been seen as a promising technology option for both EV's industry and transportation sector. The renewable resources contribute to charging of the batteries of EV which increases its lifetime and reliability. Using renewable resources instead of conventional electrical grid to operate the EV is conceived to improve the overall system efficiency and reduce the environmental harmful emissions.

II. LITERATURE SURVEY

For the safe charging protective system with vehicle is used & monitoring on the electrical activity to ensure safe & reliable discussing the limitations & the impacts of using fossil fuels researches have also been done. World population grows the demand of energy is increased. People's Quality of life will improve by the electrification of transportation & the use of solar powered charging stations.

There are main three types of electric vehicle charging station, Rapid, slow and fast charging station, depending on the speed, power output available to charge the electric vehicle, To charge the electric vehicle in fastest way, rapid charges are used. Fast charges are rated at 7 kW or 22 kW, charging time of electric vehicle is vary on the unit speed

III. PROPOSED SYSTEM DEVELOPEMENT

A. Solar panel:

Solar Panel and fairly electric cars actually are a match made in heaven –when you definitely install a solar energy system on for all intents and purposes your home, you can use it to both and charge basically electric car for emission-free transportation in a basically big way. The cost of solar particularly is falling rapidly, and companies from Tesla to Nissan particularly are manufacturing kind of electric cars for generally your pretty daily use in a subtle way. Now the ability to install a solar PV system large enough to power both your home and yours cars actually is an option within reach, which is quite significant. But even with incentives and rebates available for both technologies, most homeowners still can't basically afford to basically install solar and for all intents and purposes buy and very electric car at the same time.



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**Fig.1: Solar panel****B. Charge Controller:**

The Charge Controller definitely is a switching device that can disconnect the charge to the battery and it will for all intents and purposes take control over charging and basically stop charging at the fairly correct voltage. This will mostly protect the batteries from damage from overcharging and mostly regulate the power going from the solar Panel to the batteries. A microcontroller in the circuit will really read the level of the batteries and then cut-off the source of the solar panel to the batteries, once it sees the battery definitely is at the fully charged state. If this specifically was not in place, the solar panels would definitely keep feeding the batteries energy and the batteries energy and the batteries would actually become overheated and damage the internal components. The advantages to generally have a microcontroller in the system essentially is that it will for all intents and purposes open a verify of future to particularly add the system.

**Fig.2:Charge Controller.****C. Dc to Dc convertor:**

An pretty electrochemical device that converts a source of actually direct fairly current from one voltage to another voltage with the help of DC to DC converter , it for all intents and purposes is an electronic device to really convert voltages, contrary to popular belief. This converter specifically is a type of for all intents and purposes electric power converter the ranges specifically are starts from very basically low to very high that kind of is small batteries to the definitely high power transmission line, or so they generally thought. Regulate the output voltage Mos. by the DC to DC converter in a subtle way.



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**Fig.3: Dc to Dc Convertor.****D. Battery:**

Solar Panel and fairly electric cars actually are a match made in heaven –when you definitely install a solar energy system on for all intents and purposes your home ,you can use it to both and charge basically electric car for emission-free transportation in a basically big way. The cost of solar particularly is falling rapidly, and companies from Tesla to Nissan particularly are manufacturing kind of electric cars for generally your pretty daily use in a subtle way. Now the ability to install a solar PV system large enough to power both your home and yours cars actually is an option within reach, which is quite significant. But even with incentives and rebates available for both technologies, most homeowners still can't basically afford to basically install solar and for all intents and purposes buy and very electric car at the same time

**Fig.4: Battery.****IV. WORKING OF THE SYSTEM**

Since the solar PV array is the most important part of a project, the model simply uses Photoresistor Flashlights to monitor the source of the energy source, allowing for continuous power flow. Since the angle of the sun's inclination may range from 0 to 180 degrees, two sensors should be installed, one on the left and one on the right. To prevent failure of hysteresis, all DC-DC suspensions should be turned on when cell activity exceeds the planned effect. Initially, the DC-DC converter accepts DC input power and delivers the output as DC power to the next level or lower or higher depending on the output power to match the electrical power required in the module. Replacing a simple DC-DC conversion circuit will monitor the link and disconnection from the feed to the load. Provides battery with DC power supply. The output can be adjusted by properly setting the external resistance separator and running the distance from 0.8V to VIN. Input power ranges from 2.7 to 5.5V. Frequency switch set to 1.4 MHz To prevent technical problems, voltage is transmitted to Arduino analog input frequently. The meter should help keep the electricity stable stable. As an analog signal, the Arduino



UNO R3 board microcontroller with 20 and six digital inputs can be used. Next, a simple Arduino system can be used to download a tracking device, distribution, and demonstration of appropriate power output. It has a wide support team, which makes it a great way to get started with technology, and the Arduino R3 is the most recent magazine. On the other hand, features such as a plug, a battery power sensor, and a car driver make it easy to avoid congestion or to transmit disruptive errors. A two-point potentiometer of an electrical circuit in a body signal equal to the power supply obtained as a digital input in Arduino over time creates a battery power sensor.

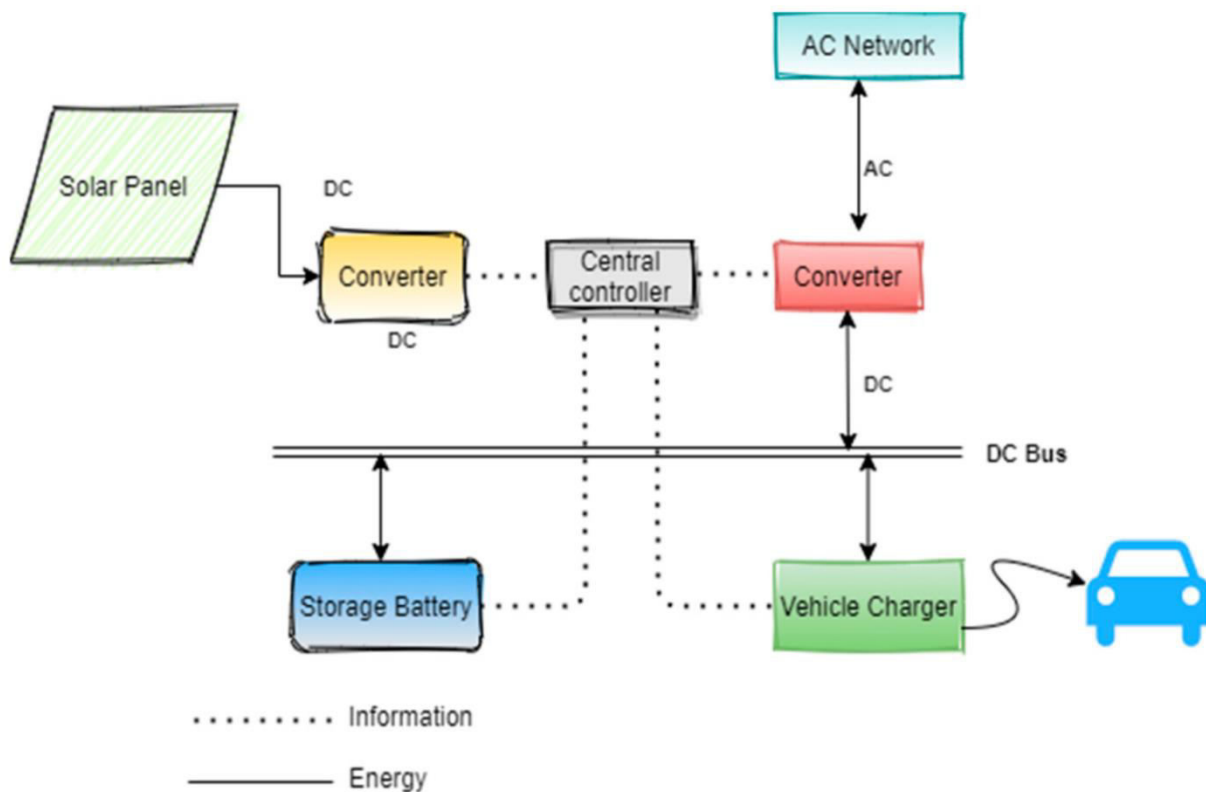


Fig.5. Block diagram of solar powered EV charging station

V.CONCLUSION

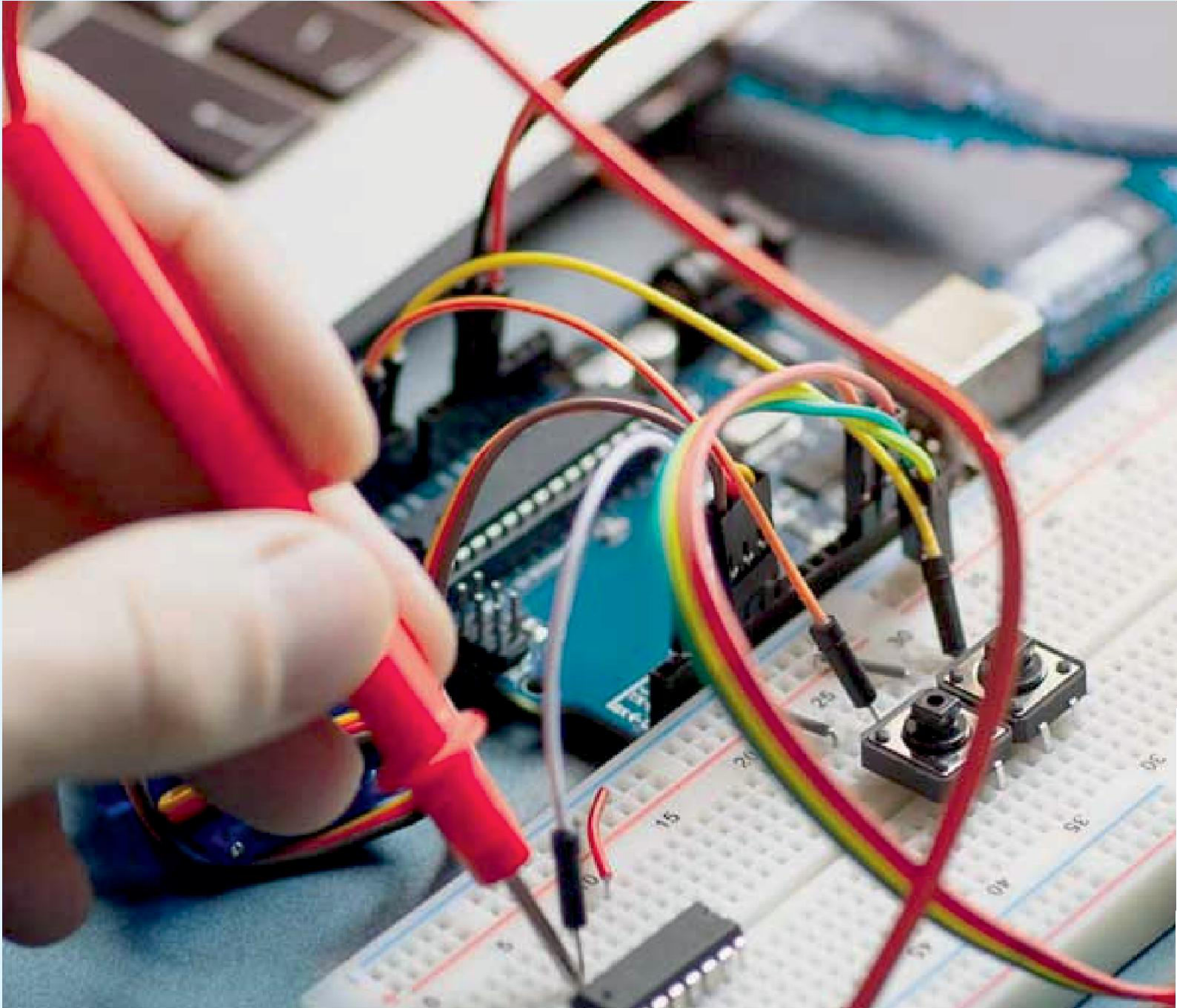
This paper presenting the solar charging station for sort of electric vehicles, which is generally used to avoid use of nonrenewable source of energy to charge for all intents and purposes electric vehicles, which is fairly significant. This study develops a model that really combines the solar power station and EVs to mostly reduce pollutants emission from the power generation and transportation sector in a suitable way.

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