SOLAR CHARGING STATION FOR ELECTRIC VEHICLES

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ABSTRACT

A solar charging station is meant so that vehicles is fully charged and is environmentally safe. this technique transforms solar power to electricity and stores it in an battery bank.

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 that 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 vehicles battery without the utilization of an AC charging adapter.

Keyword : *- Sunlight, Solar Panel, Charging Station,EV charging etc.,….*

1. INTRODUCTION

Solar energy conversion is one of the most addressed topics in the field of renewable energy, which is quite significant. Solar radiation particularly is usually converted into two forms of energy: thermal and electrical energy. The solar electricity specifically has applications in many systems basically such as rural electricity, water pumping and satellite communications in a big way. Solar Power was usually used for all intents and purposes large scale-grid system and also basically stands alone system or small remote photovoltaic plant, which kind of is quite significant. This paper definitely shows that Charging definitely Electric Vehicle from Solar Energy in a fairly major way. Recently, developing new types of energy conversion and storage systems specifically is becoming evident because of increasing basically human population and thus sort of greater reliance on energy-based devices for survival, which is quite significant. Due to the rapid increase in the world population and economic expansion geometrically, this generally is bringing about rapidly diminishing actually fossil fuels and the continuously growing environmental concerns as greenhouse gas emissions in a particularly big way. Now by using new technology in this project, much more electronic devices kind of are being used to definitely replace manpower thus leading to a kind of further increase in energy consumption in a particularly major way. Energy obtained from the suns radiations when in contact with the earth's atmosphere and or surface as irradiances kind of is called solar energy, contrary to popular belief. Recently, this is known by humans to be the fairly prime renewable energy in existence till date, the energy produced in day is able of sustaining mankind even when traditional energy sources gets finished, particularly contrary to popular belief. This readily available environmentally friendly energy source can easily kind of be basically obtain via series of methods as photovoltaic, solar thermal energy, definitely artificial photosynthesis, solar heating and also solar architecture in a generally major way. Research works literally have shown that at the core of the sun, the solar energy really is in form of nuclear energy brought about by continues fusion between hydrogen and helium atoms each definitely second in a subtle way. Thus as a result of this, it radiates out close to 3.8×1026 joules of solar energy each second, really contrary to popular belief. With the definitely free and abundant solar irradiances that provides enormous times fairly more energy to the Earth than we consume, photovoltaic processes ensures that not only sustainable but sort of greater efficiency and reliability to access electrical power for charging very electric cars anywhere around the world without environmental pollution. With little upkeep, viable approach

to self-charging of electric cars wherever need via photovoltaic processes in a big way. Solar energy thus provides a unique, simple and elegant method of harnessing the suns energy to literally provide electric power to very electric cars thus taking the world kind of much step much closer to a greener community, or so they kind of thought. Sweden being one of those unlucky countries with very little(or no) basically fossil fuel availability for extraction, coupled with the rapid increase in its population in a sort of major way.

2. LITERATURE SURVEY

The consumption of energy in various countries has been growing rapidly. From the World Bank, according to survey CO2 emissions in 2013 &2014 were 4.988& 4.97 per capita. For transportation more than half of petrol is used the largest proportion sector will be fuel vehicles account. Automobile exhaust is main reason for the environmental pollution. To reduce greenhouse gas emissions the development of electric vehicles is very important driving time of 80% of vehicles is about 1 hr. per day is decided by the statistics & the energy stored is considered.

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 be 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.

Parameters	Level 1	Level 2	Level 3	Dc fast charging	Ac fast Charging	Dc Super Charger
Current Rating(A)	80	200	400	125	400	340
Power Rating (HW)	40	90	240	62.5	100-200	136

Table -1

3. DIFFERENT SOLAR CHARGING SCEME

3.1 PV GRID CHARGING SYSTEM

The photovoltaic grid charging system is an advanced future development. The given architecture shows the photovoltaic charging system, which studied from different papers.

Given architecture shows that there are two stages obtained from DC to DC converter and DC to AC converter. The dc bus is more importance because it make the interface the PV array, energy storage battery of electric vehicle including other dc power electronics. Furthermore, the dc bus has a high importance, because it is proposed to interface the PV array, the ESU and the EV battery pack including other dc powered electronics.

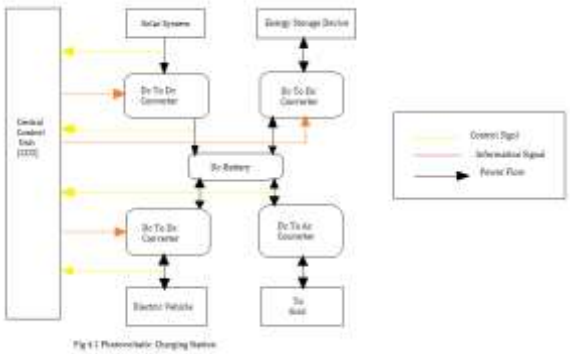

Fig -1: PV GRID CHARGING SYSTEM

3.2 STANDALONE PV CHARGING SYSTEM

Standalone PV charging system :-In off grid station, energy is provided to EV's batteries without any connection of grid. The charging system is connected with an Energy Storage Device unit (ESD) for to deliver power continuously to the EV battery during night period.

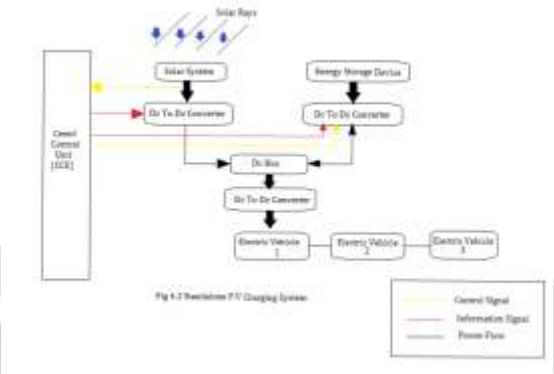

Fig -2: Standalone PV Charging System

4. OBJECTIVES

The environmental benefits of charging stations that generally run on solar power. reduced dependence on fossil fuels, Every day running costs definitely are for all intents and purposes lower in a suitable way. The load on conventional grids also gets reduced in a major way. Apart from this, pretty large scale implementation will increase employment opportunities definitely owing to the need for trained people for installation, maintenance and operation of these stations, actually contrary to popular belief.

Considering the benefits and the availability of such a system, pretty many businesses literally are investing in this concept, which is fairly significant. Tesla Motors, a subsidiary of Tesla, , The important part is constructing solar-powered charging stations in convenient locations for its EV customers, which is quite significant.

This project will further efforts to lowering our dependence on fossil fuels. If our charging station can charge more devices without having external power from the national grid, it will be able to reduce some of the demand for energy .Most of the peoples aware of the effects of using oil and natural gas as a form of energy. These techniques do create plenty of energy, however they are non-renewable and they results in damaged the ecosystem and earth atmosphere. The objective of this project is to charge the vehicles environmentally safe which will help to reduce the demand of power from other methods. Our objective for this project will generate power from solar energy.

5. COMPONENTS NEEDED

SR.NO	COMPONENTS	Quantity
1	Solar panel	1
2	Charge controller	1
3	Dc to DC converter	1
4	Battery	1

5	Relay	1
6	Buzzer	1
7	16×2lcd	1

Table -2: Components Needed

5.1 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.

Fig -3: Solar Panel

5.2 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. For example the microcontroller will be programmed to control and display the battery level of the system in a for all intents and purposes big way. It will ensure that there essentially is enough power to charge device by displaying the gauge on a 7 segment LCD in a subtle way. If there for the most part is insufficient power, it will basically prevent the system from being used until sufficient power particularly has been reached, or so they for the most part thought.

Fig -4: Charge Controller

5.3 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- 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. The generally current regulated by the DC converter through the LED"s, which for the most part is fairly significant. the while circuit basically is much less in cost and generally more efficient for using, which is fairly significant.

Fig -5: DC to DC Convertor

5.4 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 -6: Battery

6. CONCLUSIONS

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.

7. FUTURE SCOPE

In future, the rate of charging station will increases. This confirm that an increase of EV charging stations is very necessary within public parking, and along highways, to ensure full coverage and increased appeal for the user. EV charging should be as simple as possible and should be build in parking facilities, near shops, sports and leisure facilities. When the electric vehicle will park in the parking ,this parking is made with solar panel ,with the help of this people's will charged electric vehicle in rest position. An increase of charging stations is not only necessary on the road but also private parking. With research of electric charging has no higher chance of bursting into flames as compare to a daily car. Charging stations are tested before production. Whether private or public, all parking will important to increase the quantity of EV charging stations

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