A Review on Solar Powered Electric Vehicle

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Abstract **- Solar energy is a renewable energy source that will be around for thousands of years. In 2015, COP21 started the Paris Climate Conference 2015 in Paris in order to keep global warming below 2°C, and more than 190 countries agreed on climate cooperation. Several conditions were set forward at this meeting for developing countries such as India to reduce carbon monoxide emissions, which have a significant influence on road transport and improvement. The use of renewable energy, such as solar, in transport must be considered in order to reduce carbon monoxide emissions without delaying development. This is the research article on solar electric vehicles that was published in the study.**

Index Terms **- Solar, car, photovoltaic, electric.**

INTRODUCTION

A solar vehicle is a type of solar vehicle used for ground transport. Solar cars often include regular automotive gauges. In order for the car to function effectively, the driver must keep an eye on these gauges. Wireless telemetry in cars without gauges nearly always is available, enabling a team of drivers to monitor the vehicle's energy use, solar energy collection and other data and free the driver to focus on driving. Typical aerospace, energy, alternative and automobile technologies are combined in solar cars. Due to the energy source of the car, the design of a solar vehicle is seriously restricted. Most solar cars for a solar car race have been created.

LITERATURE WORK

Xiujuan, et al [1] The advantage of electric vehicles is that the cell plate has a very low transformation efficiency (i.e). Because of the strong mobility of the working environment in the Solar Car, the max-point tracking algorithm varies by 14% on a regular basis in the interest of further transformation. The ideal technique of traceability is to record the constant voltages, disturbances, and observations, as well as the conductance at the time. Simultaneously, the most popular highest power point tracking approach is the same. The method for improving conductivity with the greatest precision is the best of all. It allows for the tracking of massive amounts of power. It keeps track of the maximum power point. It is obvious that the output voltage in the area where the constant current source works is different when changing the work voltage, the tolerance is low and the sensitivity at constant voltage is obvious in order to improve the tracking method, so that maximum power point tracking is accurate when temperature, light intensity and output power are definite.

Rattankumar, V, and N. P. Gopinath[2] No future fossil fuel exists since we conceived of the effective utilisation of non-conventional energy. We eliminate several of the disadvantages of conventional vehicles, such as reduced coupling losses, field losses, smooth speed handling, and fuel expense. The key components tilized in the creation of a solar car are photovoltaic modules, solar tubular battery, BLDC, ackerman steering, mechanical construction, and MCB. Ackerman steering, a mechanical design, and a small circuit breaker are among the solar car's equipment. The Solar Car developed at a speed of 30 Km/h presently needs a single charge of around 18 hours and has been proven to be effective at 100 Km per charging. More work is being done to improve the vehicle, which is now powered by a BLDC with a standard engine.It also proposes the use of high-efficiency solar panels that are small in size. Different vehicles flaws are being investigated , and steps are being taken to eliminate them in the hope that a commercially successful model of solar car will be developed in the future.

Alnunu, Nasser, et al.[3] The environment is promoting research and development in the field of renewable energy sources as people become more conscious of the importance of sustainable energy sources. The development of field and experience in the renewable energy sector has been recognised and

promoted by oil and gas companies. Shell is one of these car races that gained prominence in the mid-1980s. Race events such as the World Solar Challenge, Shell Eco-Marathon, and North American Solar Challenge are well-established and draw university student teams from all over the world. . Every year the shell ecomarathon race is held in three continents: America, Europe and Asia. The participation of both prototypes and urban concept cars is in two categories. In each category there are several energy-based sub-categories. The participant in the Prototype must complete eight rounds of 25.485 km, with a period of up to 51 minutes. The best outcome is preserved so each team is limited to four official efforts. The path is reasonable for safety and technical testing. The structure and design of Solar Cars has some generic principles. The design usually consists of two major phases, mechanical and electrical. Solar car races can improve both the technical and the soft skills of the engineering student. The experience of first participation of university students in the Shell Eco-Marathon race has opened the doors for further regular attendance. Over only a few months, the team managed to design, tilized and test a solar car. This car met all the tests for technical and safety inspections and participated in the race together with hundreds of participants from around the world. Shell Eco-Marathon Asia 2012 will take place after this, and the team wants to be in the list of top 10 in its category. Work on designing generation 2 of the car has been under way.

Qian, Jia, and Song Jie.[4] The development of the "future car," also known as the solar car, is due to zero emissions. The solar car lacks an engine, transmission, or any other component. It's made up of an electric battery board, storage, and a motor. When its speed exceeds 60-70 km/h, the aerodynamic shift will provide the most driving resistance in comparison to the other resistance for the standard car. . For The concentrate will be on the conventional process of auto aerodynamics study, which requires wind tunnel testing that requires higher quality facilities, longer research cycles and higher funds. Computational fluid dynamics (CFD) strategy is becoming increasingly important with the development of computer technology in car aerodynamics research. CFD has a short cycle, low cost, no true vehicle models and other features. The first upwind order is used, after a certain number of iterations, for the building and convergence of the flow zone geometry, type of boundary and mesh with the pre-processing of the GAMBIT software.

Yesil, Engin, et al.[5] The 2013 World Solar Challenge recommends using the Big Bang – Big Crunch optimization approach. The Solar Car University of Technology in Istanbul, which organised a team to virtually design solar-powered automobiles in 2004, also needed to optimally use renewables and demonstrate how powerfully the electric vehicle might be efficient, as well as to support sustainable energy. A realistic evaluation for a solar team is the solar engine, with its long-term structural design and realistic optimization assignment. Cloudy weather with low speed, bright weather with fast speed High speed for inclement weather, low speed for sunny weather, and consistent pace for racing. This study intends to move away from race standards and environmental situation constraints in order to shorten race duration to the bare minimum.

Vincent, Vineeth V., and S. Kamalakkannan[6] A hybrid system for three-input solar vehicles was developed. There are two storage elements available, one with a one-way power input port and two with two-way ports. Three distinct converter power operation modes are conceivable, depending on the state of your battery. The amorphous solar panel on the system body charges the battery.

The system's efficiency will improve when solar power is sent directly to the DC load. The capacitor connected to the plumbing acid battery charges and discharges the vehicle at high speeds. This developed scheme also retrieves and uses energy waste in the brakes to charge the battery with lead acid. Therefore, using super condensers and regenerative braking systems, competent hybrid-electric vehicles were devised. The simulation outcomes of the structures suggested show that the vehicle's performance has been improved, providing better'working conditions for the battery and increasing its operating life; the energy source extending to, and solar source, the renewable braking system will make it more reliable. Because the super condensers are able to deliver a large current in a short time, vehicle performance will improve.

Noritaka, and Mitsuharu Muta[7] Since 2008, Japan has had the country's first low-carbon society programme for an eco-model corporation. Toyota is one of the 13 villages chosen for the solar charging system initiative. It is located 20 km from Toyota City

Hall and encourages CO2 reduction with a charge station. The solar cell may produce approximately 1,400 kWh per year, lowering CO2 emissions by up to 440 kg. The electricity conditioner converts direct current (DC) from solar power or energy storage to alternating current (AC) power and serves as the system management centre. This implies it can generate approximately 1,500 kWh per year. The solar cell also serves as a source of electric power. If the generated electricity is not charged, the solar charge system is stored in the electricity storage system for future charging of PHEVs or electric vehicles, depending on whether it is for PHEVs or Evs. There are four modes: the system charges PHEV/EVs and power storage devices can supply electricity; the system does not charge PHEV/Evs and power storage devices cannot supply electricity; the system does not charge PHEV/Evs and power storage devices cannot supply electricity; and PHEV/Evs cannot be charged and power cannot be charged to the power storage device.

Menasce, Daniel, Marthie Grobler, and Pieter Janse van Rensburg[8] Solar car design has rules, and these rules are governed by the Alternative Energy Vehicles Technical Regulations. The greatest area of a solar array composed of silicone photovoltaic cells is 6 m2. This limits the teams' power to around 1 kW. The car is 4 metres long and 1.8 metres broad. The weight of a Battery pack is determined by the type of chemistry or cell used. A team member from the Nuna 2 World Solar Challenge winning team examined the difference between the first and second place teams at the 2011 World Solar Challenge. A 10 kg light car uses 1.5 percent less energy and has 1 percent more power in electrical systems to move the vehicle 1 percent more efficiently. The main features for selecting or building solar car components are electric motor drive, battery design, and photovoltaic system. Solar Car Student Design promotes student engineering development, teamwork, leadership, and ownership.

Ahmed, Shehab, Ahmed Hosne Zenan, and Mosaddequr Rahman[9] A steam track is shaped to reduce air travel. The solar tili is put on the roof of the automobile to collect energy from the sun and convert it to energy that is supplied with the charging control by a battery. The solar tili can be used as compact cars. The current value of all items present is the amount of money that needs to be invested to determine the performance. The two-seater solar car contains a 700 w battery motor with an output of 48 v with a capacity of 40 hp and an electric panel of 200w. Ashrafee, Farin, Sayidul Morsalin, and Asif Rezwan[10] The question of energy has become a worldwide concern. In 2012, the average worldwide energy demand was 17TW, with fossil fuels accounting for 85 percent of the total, but this figure is expected to rise to 30TW by 2050. Because electricity is scarce in South East Asia, it is increasingly critical to promote the use of renewable energy to reduce demand in emerging countries such as Bangladesh. A solar panel, wiping engine, wheels, shaft, battery, frame wood, steel steering pipeline, seat tin plate, washing clothes, screws, clamps, pin, isolated wire, and other components make up an automobile. Aside from investing in a project, an investor must decide how much time he should give himself to recover from his investment selections. The car's speed can be increased by changing its shape to an airfoil. The drag strength is reduced as a result of the relatively low drag coefficient value. When the batteries are charged by the solar panel, the Power Tracker protects them.

A variety of aspects tilcted to the production of electric vehicles, as well as the use and sale of new technologies, have advanced significantly in the last decade. Research activities have also increased, as have the number of new posts and initiatives pertaining to electric vehicles. This section provides a condensed synopsis of the most relevant works on Evs that have already been published in peer-reviewed journals. Furthermore, the poll identifies significant disparities. Many other studies examine broad aspects, such as the history of electric vehicles, their design and engine characteristics, or their effects on electric infrastructure. As a result, they are classified.

Habib et al. [11] Provide an overview of charging processes as well as an analysis of their implications for electric vehicle distribution networks. The authors also compare coordinated and uncoordinated loading approaches, as well as delay loading and intelligent loading schedules. Finally, charging techniques are used to investigate the economic benefits of vehicle-to-grid (V2G) technologies. Numerous works consider the use of electric vehicle electricity derived from renewable energy sources

Liu et al. [12] Present a unique idea about electric vehicles and sustainable energy. They are mostly concerned with solar and wind power, with various works in three areas: I I work on the interaction

between electricity generation and renewable energy works in order to cut energy prices; (ii) enhance energy efficiency; and (iii) propose reductions. On the opposite side.

Hawkins et al. [13] Analyze Environmental studies on hybrid and electric battery vehicles Analysis (BEVs). To this purpose, during the life cycle of two vehicles, 51 environmental risk evaluations are presented (i.e., BEVs and HEVs). The authors take issues such as greenhouse gas emissions, production generation, transmission and distribution, and car production, battery generation and lifetime into consideration.

Vasant et al. [14] Deployment of daily use of PHEVs and indicates that more extensive use of PHEV may lead to a suitable deployment of the knowledge charging station and proper control and administration of the charging system. Unlike in the past,

Shuai et al. [15] Implement the basic economic model in light of electric vehicles' one- and two-way energy sources Many charging solutions for electric vehicles, as well as various one-way charging and two-lane energy marketing models, will be investigated in this context. The use of autos as renewable energy sources for practical storage is also considered. Other authors focused on the numerous charging options available for Evs.

Tan et al. [16] revise Vehicle technology grid (V2G) advantages and difficulties, both for single direction and bi-directional charge. In addition to the benefits of battery deterioration and high investments, they analyse the difficulties. In addition, the V2G optimization strategies are complemented by grouping them by the techniques used energy loss. Renewable energy generating aid.

Hu et al. [17] present the methodologies for the smart charge of electric vehicles were revise and classified, but in that case it was focused on fleet operators. The projects on the modeling of batteries, charge and connectivity guidelines and conducting patterns are presented in particular. Finally, they display a series of different control strategies for managing EV floors and mathematical modeling algorithms.

Rahman et al. [18], present a set of Methods have been used to solve various problems related to the charging of PHEV and BEV infrastructures. In addition, the different charging systems, like home garages, apartment buildings and shopping centres, are assessed in various environments. So because enormous use of Evs has negative consequences for the existing power grid, some papers examine the various issues and possible opportunities that EV integration can bring to the smart grid. Yong et al. [9] examined the impact of EV deployment on vehicle to grid technology and in particular on the mitigation of intermittent renewable energy sources.

Mahmud et al. [19] discuss Electrical charging, energy transmission and grid implementation all aspects related to the distributed ram et al[20] Examine the impact of electronic charging and grid connectivity on future electric and independent power connections. Another significant EV Because charging challenges are vital, the most important variables in battery life are battery management, as well as battery health and battery life estimates.Li et al. [21] review Big Data Analytics recent progress to enable data-driven battery health assessment. In particular, they categorise and evaluate their benefits and constraints in terms of feasibility and cost-effectiveness. Liu et al. [22] Go a step further and propose a Gaussian Regression Process (GPR) based machine learning system for forecasting ageing of lithium-ion batteries. Eventually, other approaches investigate advanced techniques of fault diagnosis, as battery defects can lead to a degradation of performance [23]. As already demonstrated, the majority of the studies dealing with electrically processed vehicles were in general: I the impact of electricity charge on electricity demand; (ii) the use by electricity from renewable resources in the charging process; However, the present situation on the electric vehicle industry and the main battery characteristics, their techniques and charging procedure are presented in this paper. We display the various charging methods, particularly the adapters tilized, as well as compare the various standards defined by these standards. We also discuss the challenges that Evs face, as well as the lines of research that we believe should be pursued further.

CONCLUSION

Many studies have been conducted in order to improve the performance of solar electric vehicles. All major research into solar electric vehicles is covered in the above review paper. Taking into consideration the review above, the research in the new areas of solar electric cars would feel easy to carry out.

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