

A Conceptualisation of Electric Solar Vehicle

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Abstract— Greenhouse gas emission from transportation is one of the major environmental issues and its emission rate is increasing at faster rate. So solar power for transportation can solve this problem. The aim of proposed work is to contribute a technology that supports Green energy; consider a scenario we could use a solar energy to charge electric vehicle that too solar panels are inbuilt in the vehicle. As implemented, this prototype aims at nullifying the drawbacks of traditional Diesel and Plug-in Electric vehicles. The prototype uses a fully electric propulsion system. It also uses solar energy for charging as well as an included onboard plug-in charger. The Solar charging system helps to keep the battery topped off at all times. It is aimed to be an eco-friendly vehicle.

Keywords: Electric Solar Vehicle, Greenhouse gas emission

I. INTRODUCTION

The global automobile industry is seeing a major shift towards e-mobility over the past decade. There is a rapid increase in concept cars being turned into production cars over the years. Following the suit, India also has big plans for the emerging Electric Vehicles and its technologies in the country. Goals for the next decade have been announced. In this study we aim to highlight, counter and suggest some solutions to the challenges that may lie ahead.

Now a days, dealers of natural resources like fuel, coal etc. are facing a hard time to keep pace with the increasing demand.

II. PROBLEM STATEMENT AND OBJECTIVE:

A. Problem Definition:

Automatic on-board charging while the vehicle is in motion using available sunlight while still retaining the normal charger.

The proposed vehicle is supposed to have an onboard charger as well as top (roof) mounted solar panel to keep charging the vehicle under ideal conditions.

III. METHODOLOGY

- 1) Need
- 2) New solar vehicle concept
- 3) Brainstorming
- 4) Problems, solutions and analysis
- 5) Improvisation
- 6) Vehicle selection process
- 7) Fabrication
- 8) Inspection and testing

IV. LITERATURE REVIEW

- 1) By Ankit Chauhan, "Electric Vehicles in India: The Trends, challenges and future."

Introduction to the global Electric Vehicle trend.

- 2) By Dr. Peter Harrop, "Solar Cars, Buses, Trucks, Trains 2020-2030."

This report shows why a rapidly increasing number of car companies are incorporating solar bodywork that significantly increases range or reduces battery size.

- 3) By ResearchandMarkets.com, "Global Solar Vehicle Market report 2017-2019 & 2025-Rising Demand for Fuel Efficient & Eco-Friendly Vehicles."

This report provides comprehensive analysis of the global as well as regional markets of the solar vehicle market.

V. THEORETICAL ANALYSIS

Resources /Consumables required -

- 1) Battery
- 2) Solar panel
- 3) Structural base of vehicle
- 4) DC Motor (12-36V, 3500-9000 rpm)

A. Battery:

All-electric vehicles (EVs) have an electric motor instead of an internal combustion engine. The vehicle uses a large traction battery pack to power the electric motor and must be plugged in to a charging station or wall outlet to charge. The battery will be used to store the current produced by the solar panels and further Provide it when necessary. An advantage of battery electric vehicles is that batteries can be charged at off-peak times which enhances options to make grid electricity less costly and more efficient. Namely, lower cost base load electrical power production can be more widely used if batteries are charged in the off-peak times.



Fig. 1: Battery

B. Solar Panel:

It will produce electricity for the usage of the vehicle. The combination of a solar panel system and EV charging station brings several benefits and provides a cost-effective way to produce and make use of your solar energy. If you are trying to set up a solar panel system that can provide enough energy to fuel your electric car, you will need this type of setup.

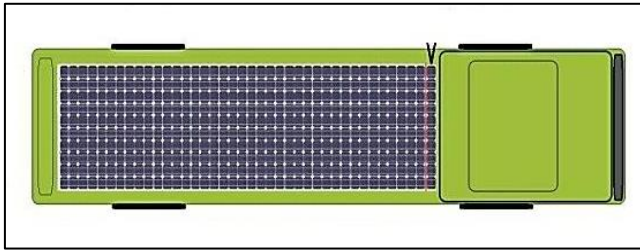


Fig. 2: Top view of bus

C. Structural base of vehicle:

A chassis is the load-bearing framework of an artificial object, which structurally supports the object in its construction and function. An example of a chassis is a vehicle frame, the underpart of a motor vehicle. It will provide a chassis for the components of the solar e-vehicle. The main pressures on vehicle designers and engineers continue to be safety ... Electronic systems today play an increasing role in chassis systems, and ... of modern technologies, from ABS to electric power steering to ESP.



Fig. 3: Side view of bus

VI. ACTION PLAN

Sr. No	Phases Expected
Phase I	Literature Review
Phase II	Theoretical Analysis
Phase III	Result analysis
Phase IV	Testing and report writing

VII. FUTURE SCOPE

As per the geographical location of the country, India stands to its benefit and has tremendous scope of generating solar energy. Solar power generation alone cater more than 60-65% of our entire need of power.

Thus, we have to focus on following future plans of installing large projects in terms of infrastructure and if we focus on vehicular infrastructure, solar powered electric vehicles can become the future of mobility in India.

VIII. CONCLUSION

- 1) As quite clear from the mentioned facts and figures, it is clear that E-mobility is a distant dream for the Indian government. It is very tough but not impossible to realize the goal which has been set.
- 2) If India really wants the mission to be accomplished, it's going to be a collective effort of every individual/organization significant to the country.
- 3) That includes the government, of course, the automotive consortiums/industries associated and the people.

- 4) The government can offer solutions and incentivize the taxes, but it is useless if the consumer is not willing to move out of the comfort zone and grab it.
- 5) The auto giants also may have to take a step forward and take risks for the change to happen.

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