

Abstract

There are more number of pollutions due to fuel consumptions are more this could be prevent step by step using an "electric vehicles" more in India. But electric vehicle price range comparing to ordinary fuel consuming vehicle. Our project mainly focusses on the reduction of charging vehicle to "Renewable energy" by solar bicycle for middle families to reduce the amount of buying an electric vehicle for short distance of travelling to the nearest shopping complex. This could be short out by manufacturing an solar bicycle, to travel a distance up to 25-30km range. This solar bicycle attached with battery for night time using this vehicle and charge this battery through electricity. When you should go out for any place parking this vehicle outside it generally charge itself. This solar bicycle made should be eco-friendly, and cost of this solar bicycle is varied for motor and battery efficiency for its range.

Keywords: solar bike, renewable energy, reduce of pollution, low cost

*Associate Professor, Mechanical Engineering,

K.S. RANGASAMY COLLEGE OF TECHNOLOGY

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1.Introduction

Given the current price of fuels and pollution rates are high in India. Most of them are using more fuel vehicles for going nearby shops. This could be avoided by using an alternative to them by using the electric vehicle. But the charging of electric vehicles time is taken to more than 3hours. This could be solved by using renewable energy source with a transportation by using a solar bicycle for transporting. It could be alternative to the various of the model with the cycles run with the solar energy for charging the battery and it could be externally charging the battery during night time. It is a bicycle with the electric driven mod of the bicycle. It has solar panel with the photovoltaic cell to collect the sun rays and charging the battery even if you parked the bicycle outside of your house or any shop.

2.Construction history of solar bicycle

The first invention of solar bicycle was invented by **"Subhomoy Biswas of Nadia"** with attached the solar panel in a trailer attached at the back side of the bicycle. At present the solar panel were placed at top of the bicycle with an aerodynamic model with balancing support of the frame. As per depending upon the regulations with a motor power of 240watts, a 24-volt lithiumion battery use in this project. This could be varied for the different specification for need.

3.Selection of solar panel and charging calculations

This refers to the selection of solar panel and calculation to select the solar panel. We select **"Monocrystalline perc"** solar panel was used. Compared to other solar panel the monocrystalline perc solar panel gives more efficiency with its reflective layer attached under the solar cells, it could reflect the solar rays and passed to the solar cells and additionally using DC boost convertor for an extra efficiency for charging the battery. The calculation for selecting the solar panel is follow as: Power output of the solar panel = 125 watts

1.Voltage output of the solar panel = 12v Boost convertor output voltage= 24v boost convertor input current = output power / Input voltage / convertor.

2.Efficiency = 125W/12V/0.9 = 11.57A

Charging current = 12Ah / 5.21A = 2.30h

Total time of battery charging by the solar panel is about 2hours and 30minutes.

4.Modelling and material selection of Solar frame

The frame fixed in the solar panel at the top side of the bicycle with the use of old writing table can be used. The two stand can be attached at the center outside shaft of the rear wheel, and front side of the handle bar a support is given for the frame with an rubber material for vibration absorption. The "v" shaped frame built in front side for the better visualizing the object while driving on the roads. Light materials rod was fixed in the frame withstand the solar panel to carry load.



5.Components used in solar bicycle

(1) Battery:

In this used 24v/12Ah lithium-ion battery. The battery is extensively used in Electric cycle conversion kit. This battery fits for both Hub and BLDC motor of 240 watts rated. This battery is less weight comparing to lead acid battery.

(2) BLDC motor

BLDC various motor are development by which it could offer a benefit such compactness, noiseless operation and high efficiency for electric bicycles. These motors have stators fixed at the axle, with the permanent magnetic rotor fixed in the wheel. There is an "radial air gap" located between the stator and rotor, the stator consists of stacked laminated steel plates with wound coils. BLDC motor run at r low speed – equal to the actual rotation of wheel if there is no final stage. The benefit is about 10% increases in their efficiency due to the number of transmissions.

(3) DC controller

This controller supplies a power to the motor, if controls the speed of rotation, and optimize the energy producing. While batteries produce constant voltages which decreases as they are used up, some controller required an DC-to-DC boost convertor which increase this changeable voltage to the motor expect outcome of an operating voltage.

6.Block diagram of solar bicycle



7.Assembled view of Solar bicycle



8. Proposed Methodology

The proposed system differs from the previous systems not only in the structure but also in the performance. The point of difference is the total performance and capabilities that may exist in other systems individually, but in this case, there is all together as well. The existence of some similarities between systems seems natural and inevitable. Due to the fact that the Corona virus has had the highest mode of transmission among people by contact, so that in this proposed model there is no need to make contact and touch the user with the device. Also, in this design, a special disinfectant box is used. The bike is designed and built to allow the disinfection of objects inside the box through UV light, insulates the inner walls and the space inside the box. Due to their wavelength, UV lamps have antiseptic properties and have the ability to disinfect equipment. This allows the goods to reach the consumer in a sterile and hygienic way. A potentiometer is used to adjust the switching distances of radiation so that the frequency of radiation can be adjusted as needed.

9. Challanges to make a solar bicycle

- * Light Weight of the frame.
 - *Proper alignment of frame.
 - *High charging time.
- *Balance the vehicle.
- *Short-range vehicle.

*Development of renewable energy drives with high efficiency, high power density, good controllability, good performance. *Charging output from solar panels to battery.

10.Result

11.Conclusion

[2] IJSRD - International Journal for Scientific Research & Development | Vol. 7, Issue 11, 2020.

S.NO	Battery percentage	Current (Ampere)	Weight of the bicycle (kg)	Riding persons weight (kg)	Total speed (km/hr)	Distance should be covered (km)	Time taken to drain battery (min)
1	Fully charged	5.8	22.5	60	22	19	48
2	Fully charged	7.2	22.5	70	22	19	46
3	Fully charged	8.7	22.5	80	22	19	42

a. Electric bicycles that have been fixed the solar panel at the top side for getting shelter from heat.

b. The total hours should require the solar panel to recharge the battery is 2 hours 30min.

c. The maximum speed of the solar bicycle is 22km/hr. With the different types of loads can be acted in the bicycle.

12.References

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