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# Study of a Solar Assisted Electric Tri-cycle For Physically Challenged People

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**Abstract –** Solar energy is an important renewable energy source that can be used as a viable alternative to fossil fuels. A lot of work has been done to integrate solar energy into everyday vehicles, including tricycles. However, the development cost of most tricycles is high, and this research is developing a cheaper and more solar-powered solar tricycle for developing countries. The main contents of the tricycle are photovoltaic solar panels, brushless permanent magnet DC motors, controllers and batteries. solar tricycles transfer is also easy. It has been found that a tricycle can run on solar panels for 24 hours. In addition, the total cost of manufacturing tricycles is very low, with little or no impact on the environment. The advantages of dual-carriage, including the economic and environmental feasibility of tricycles.

***Key Words***: solar energy, PMDC, Tricycle

## 1.INTRODUCTION

Since the beginning of the industrial revolution, energy consumption has increased significantly due to the synergy between private and public energy consumption, which can be overcome by the mass production of oscillating photovoltaic cells and the solar conversion of photovoltaic cells. It can be managed, reduce the pressure on the energy sector, and help create a cleaner environment. It is not a popular car, but in order to reduce carbon dioxide emissions and keep the environment free of pollutants, the electrical system will require a lot of renewable energy, such as photovoltaic solar energy for tricycles. Also make a light tricycle. The main goal of this tricycle is to increase efficiency and reduce costs to make this possible.

## 2. Methodology

### 2.1 Main parts of Tricycle

A solar tricycle is a tricycle driven by solar or full solar energy. It has a brushless DC motor, solar panels, batteries, and a charge controller. It is used as a component that obtains energy from solar radiation in two direct ways:

i) Get electricity from solar cells by exciting the semiconductors in photovoltaic cells.

ii) Solar panels store heat

The main components of a photovoltaic solar system are: i) solar panels or solar panels, ii) balancing system, iii) charging. The working principle of solar cells is based on the photoelectric effect. Due to the potential difference, electromagnetic radiation will be generated when two different materials are combined. The conversion of chemical energy into electrical energy is carried out with the help of batteries. The chemical reaction takes place in the galvanic cell. Cells generate electricity to transfer electrons. The battery can store energy or discharge. Energy However, in many cases, primary or non-rechargeable batteries remain fully charged and discharged after discharge.

The charging process is completed by converting the positive electrode active material into an oxidant and the negative electrode material into absorbing electrons. The electrolyte acts as a buffer for the flow of electrons between the electrodes. The external circuit is controlled by using the current of the DC component, the DC component is converted into AC power by the DC brushed motor, and its main components are the commutator and the brushes. As current flows through the armature winding, adjacent magnets repel the EM (electromagnetic) field of the same polarity, and the attraction of the magnets of the opposite polarity causes the magnets to rotate. Figure 1 shows a power generation system for a tricycle.

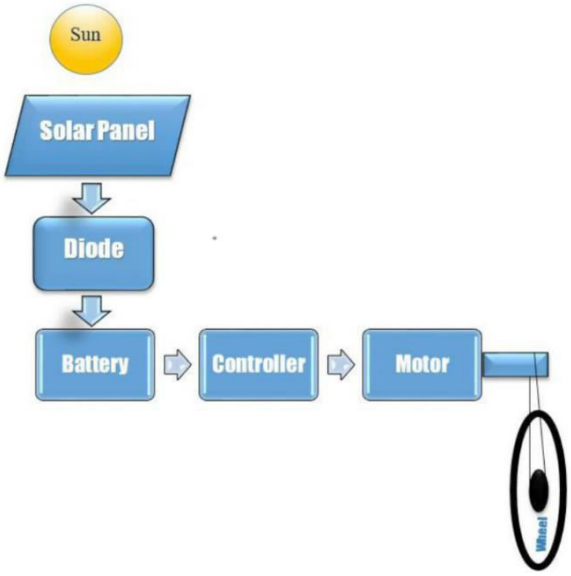


**Fig -1:** Block diagram of power generation system for a tricycle.

### 2.2 Design and Construction

The necessary modifications to tricycle frame are made with the help of the CATIA software shown in the fig.

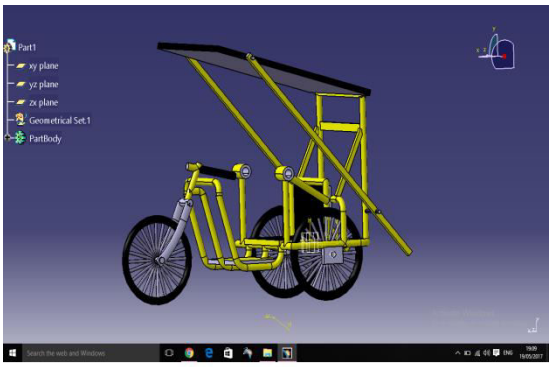



**Fig -2:** Figure

Chassis weight should be kept at a minimum level to increase acceleration and top speed. The material of the chassis must be strong enough to withstand the stress and strain of the vehicle and the driver. Enough to carry drivers, cars and small loads.

## 3. RESULTS

Among the experimental values, the results of observation are shown in Table 1

**Table -1:** Data found from the experiment

| Features of E-tricycle | Capacity |
|---|---|
| Maximum load carrying capacity in (kg) | 150 |
| Maximum speed in (km/hr) | 20 |
| Charging time of battery | 10 |
| Movement of fully charged battery in (km) | 30 |

It can be said that the tricycle is good quality and cheap, and it can carry a load of 150kg at a speed of 20km/h, which is indeed better, and the driving distance corresponding to 30km can also be shown in Table 1. A fully charged battery, that is, when the solar system is active, the memory can run about 24%, which is equivalent to 6 kilometers.

## 4. CONCLUSION

The goal of this research is to design and manufacture more efficient solar tricycles. Developed tricycle body, charging system, battery and power transmission system. After performance research, the original storage system can drive a tricycle. 30 kilometers, about 24% of the solar system's energy can be recovered, which is equivalent to 6 kilometers. The maximum speed of the tricycle is 20 km/h, which ensures the continuous energy supply of the tricycle without additional costs. Therefore, the tricycle designed and manufactured in this study can be used as an environmentally friendly vehicle in developing countries due to its low cost and zero pollution effect.

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