



Solar Cars and Electric Vehicles

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ABSTRACT

This article explains the difference between solar-powered and all-electric vehicles, the benefits of using solar energy to generate electricity, and how solar energy can increase vehicle range. It also discusses some factors that will contribute to the spread of solar-powered vehicles in the future.

Coal and natural gas are major sources of energy in many parts of the world. This energy source is abundant, but has been shown to contribute to global warming. Solar energy is the cleanest and most abundant renewable energy source currently in use. On bright, sunny days, the sun's rays emit about 800-1,000 watts of energy per square meter of surface. The grid of solar cells forms the solar panel. These cells absorb energy from the sun and convert it into electrical energy. Today, photovoltaic vehicles use electricity to harvest solar energy. This electricity is used to charge the battery that powers the vehicle's engine. Some PV vehicles send energy directly to an electric motor without using a battery.

Introduction

In recent years, solar energy has become an increasingly important alternative to fossil fuels. One of the clean and sustainable sources of energy is solar energy. Solar panels can be used to generate electricity for the vehicle. In addition, the process of converting solar energy into electricity does not emit pollutants or greenhouse gases. Therefore, the world is now moving away from fossil fuels and being replaced by renewable energies due to its negative impact on the environment. Solar energy is sustainable, less harmful to the environment, and is gradually replacing fuel. An example of a ground-based photovoltaic vehicle is a solar car. Regular automotive gauges are common in solar cars. The driver needs to pay attention to these instruments for the car to function properly.

Review of Literature

Electric vehicles have the advantage of cell plates, which have very low transfer efficiency. Due to the extremely mobile working environment of solar cars, the maximum point tracking algorithm often fluctuates by 14% for further transformation. The ideal traceability method is to track the current conductance along with the constant voltage. Obstruction and observation. The most common way to track the best PowerPoint is the same at the same time.

Zero emissions have led to the development of the "car of the future", also known as the solar car. A solar car does not contain an engine, transmission or other parts. It consists of a motor, memory and battery board. Aerodynamic shift presents the greatest driving resistance when the car is traveling at speeds above 60-70 km/h. The focus is on traditional methods of studying vehicle aerodynamics, requiring wind tunnel testing, better equipment and longer studies. You need money for your cycle.

Materials and Methods

The materials that can be used to make a working solar powered prototype are listed according to the solar car project which has its roots in fall of 2015.

- 9x 24' Length 1" Square Aluminum 6061 Tubing
- 1 (sealed) rack and pinion
- 2x tie rod ends 2x sleeves
- 2x angle adapter
- 1 steering wheel
- 1 solar panel
- 1 steering column with hardware
- 1 master cylinder
- 1 brake pedal assembly
- 4 wheels
- 1 (4') brake line

Sunlight provides solar cars with the energy they need to move. You can see that much of the surface of the solar car below looks black. This promotes the absorption of the sun. Most of the light that hits black objects is absorbed by them. Black ones usually only get hot in the sun. However, if you can design an ideal solar cell that can convert all the light that hits the car, the horsepower of the car's solar motor will be about 10 horsepower. But even the most advanced solar cells on the market today can only convert 20% to 24% of solar energy into electricity. Therefore, when the sun is directly above, the motor produces about 2 horsepower. The battery allows you to use the output for a short time.

Challenges

The top concern with solar automobiles is the efficiency of the solar panels. The Boston Solar Blog cited a journal that claimed that the temperature and the amount of shade have an impact on how efficient solar panels are. Typically, the maximum solar efficiency occurs between 59 and 95 degrees Fahrenheit (which is between 15 Celsius and 35 Celsius.) The efficiency will somewhat fall if the temperature of the solar panels continues to rise and reaches 144 Fahrenheit, or 62 Celsius. Because the earth is constantly revolving around the sun, there won't always be shade over the solar panels. For example, the shade produced by trees or tall buildings on a car's roof or hood where the solar panels are positioned will eventually dissipate. In addition, the cloud shifts position at any time; whether a person is driving or stopping a car on the road, there are always a few holes that let sunlight shine on the top of the solar panels. This amount of energy is adequate for a quick trip.

Economics

Let's use Lightyear One as an illustration. The cost of the reservation is 135000 dollars, but it could go up to 170000 dollars. The cost of the new Tesla Model S, a fully electric vehicle, is nonetheless between \$75 000 and \$100 000. It is clear from a comparison of these two types of electric vehicles that solar-powered vehicles are significantly more expensive than pure electric vehicles. People may believe that the Lightyear One's reservation price makes owning one prohibitively expensive. You might not believe the amount of money saved by solar cells when you take into account the energy required for recharging. The total annual traveling distance produced by solar cells, when compared to the Lightyear One, is around 20000 kilometers (12400 miles).

According to the cost of gasoline in the United States, it is known that filling an 80-liter fuel storage requires approximately \$75. So even though a solar-powered automobile costs a little bit more than the competition, the money saved is not insignificant. As we can see, there are many automobiles on the road that are more expensive than \$100 million and are comparable to the cost of Tesla and Lightyear's solar cars, indicating that some individuals can buy solar cars. In addition, the price of solar powered automobiles will drop so that more people can afford them as the cost of solar panels declines and solar cells become more efficient in the coming years.

Conclusion

The goal of this study is to develop and build a less expensive solar-powered car. According to a performance study, a storage system can power a solar car for around 12 kilometers. The solar vehicle's top speed has been determined to be 20 km/h. Because it is less expensive and has no negative environmental effects, the solar-powered car developed and built for this project can be utilized as a green vehicle in underdeveloped nations.

Since solar energy is a clean and sustainable energy source, it will receive more attention from the government in the future than conventional fossil fuels. This indicates that mounting solar panels on the hood and roof of cars is a growing trend. Second, the range of the solar-powered car is significantly greater than that of other forms of electric vehicles, such as pure electric vehicles, and it can also keep growing thanks to the solar cells. Thirdly, by using less electricity for charging, a significant sum of money can be saved. Furthermore, the price-performance ratio of solar cell technologies will lower the cost of solar-powered vehicles.

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