

## HYBRID ENERGY CAR BY USING SOLAR AND WIND ENERGY

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**Abstract** - Hybrid vehicle technology and its incorporation into society were the focus of this paper. The overarching question addressed in this investigation was whether hybrids meet environmental expectations. Many people have suggested that there are ntal benefits. The research has been completed. Regions of hybrid types, consumer trends, and hybrid's future get rid of technology. Data on hybrid production and efficiency were analyzed, to look into the technology's technical elements. What buyers search for in their cars was revealed by a focus group of persons who recently purchased cars, both hybrids and non-hybrids? Analysis Understanding hybrid technology's requirements aided in determining its viability the transition to hybrids would be commonplace in the future. With all of the information, taking all of this information into account, we came to the conclusion that hybrids had a number of advantages. Significant disadvantages that outweigh their fuel economy their higher cost is a good thing. This repels customers and makes the vehicles less appealing. Investment in the economy Techniques for energy-efficient processing are required. Should be developed before sophisticated hybrid materials can be produced bolsters their squeaky-clean image. Because of both expense and the limited number of hybrids on the road today, widespread adoption of sophisticated hybrid technology is not a viable choice in the near future. Overall, hybrid technology holds a lot of promise for the future. But they aren't a substantial improvement right now. In today's world, an internal combustion engine is referred to as an I.C.E.

**Keywords** - hybrid electric vehicle; hybrid solar vehicle; plug in hybrid electric vehicle; Toyota Prius series.

### 1. INTRODUCTION

Solar energy applications for electric and hybrid cars have gotten a lot of attention in recent years. However, while cars powered solely by the sun are not a realistic alternative to cars for everyday usage, the concept of a hybrid electric car powered by the sun is. PV cells convert sunlight into electricity, which is used to power electric motors in solar cars. PV cells, unlike solar thermal energy, which turns sunlight into heat, convert sunlight directly into electricity. The amount of energy input into the car substantially limits the design of a solar car. Solar cars are designed for both racing and everyday use by the general public Solar-powered car prototypes are listed below. Even the most advanced solar cells can only capture a certain amount of power and energy. over the surface of a car's body To conserve weight, solar cars must have ultra-light composite bodywork. Cars that run on solar power don't have the same range of Traditional automobiles include safety and convenience features. In 2013, students in the United States developed the first solar family automobile.

The Netherlands is a country in Europe. This automobile with a single charge range of 932 miles, Stella's predecessor set a new record. This technique is being commercialized by the Dutch. Stella Lux can travel 700 kilometers in daylight during racing. Stella Lux has an infinite range at 45 mph. The typical family who never drive more than 200 miles per day, and you'll never need to plug in. They would only connect if they were able to. Wanted to put energy back into the grid The Solar Electric Vehicle system was created to be simple to use. Installing an integrated accessory system with a custom moulded low profile solar module takes about 2 to 3 hours. Battery pack with a tried-and-true charge-control system A battery-powered electric vehicle, as an alternative, might employ a solar array This technique is being commercialized by the Dutch. Stella Lux can travel 700 kilometers in daylight during racing. Stella Lux has an infinite range at 45 mph. The typical family who never drive more than 200 miles per day, and you'll never need to plug in. They would only connect if they were able to. Wanted to put energy back into the grid The Solar Electric Vehicle system was created to be simple to use. Installing an integrated accessory system with a custom moulded low profile solar module takes about 2 to 3 hours. Battery packs with a tried-and-true charge-control system A battery-powered electric vehicle, as an alternative, might employ a solar array can be connected to the general electrical distribution grid to recharge. The approach employed avoids the challenge that arises from continuous recharging. The solar panel receives sunlight and creates electrical energy using photovoltaic cells, as does the dynamo required for continuous recharging in the hybrid vehicle. It sends a signal to the battery, and the vehicle operates on the charge.

### **PROBLEM STATEMENT:**

Electric vehicles are primarily used to minimize fuel consumption and emissions. Electric vehicles are not provided with a continuous charging medium. The limited distance can only be covered by a single charge. The dynamo can be added to the system to keep the batteries charged.

Due To Above Conditions Following Problem Occurs-

- The car does not run after a certain distance has been reached.
- The automobile battery will not charge if it is dark for several days.
- The speed at which you can run is limited.
- The cost of investment is higher.
- Works based on whether or not the condition exists.
- Cannot run in hilly or high-altitude environments.
- Limitation on the amount of luggage that can be carried.

### **PROBLEM SOLUTIONS:**

The solar panel can be fixed and used to generate electricity from sunlight.

The dynamo can be added to the system to allow for continuous charging.

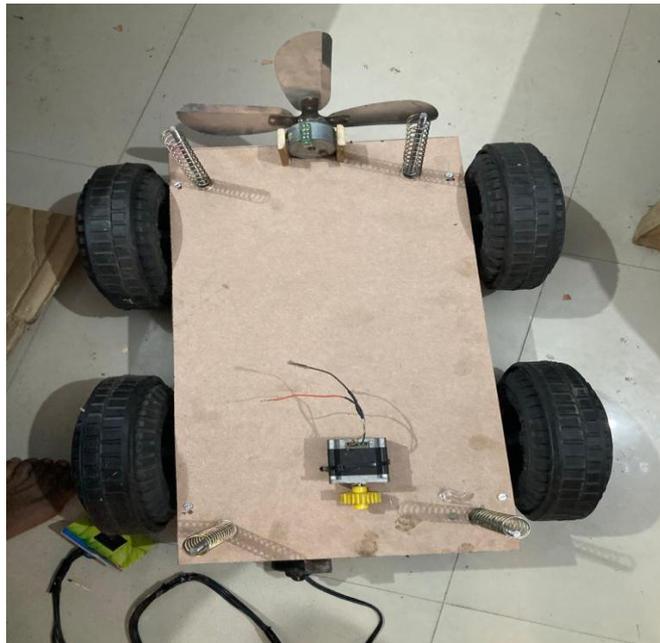
### **EXISTING METHOD:**

Solar automobiles are powered by the sun's energy. The conversion of solar rays into useful electricity is required because direct exposure to sunlight does not drive cars or other machines that can use this energy. Specially developed batteries function as converters in solar vehicles. Solar because the sun isn't always present, energy must be conserved. Photovoltaic cells made of silicon are still the most common. A combined solar collector and storage space where gathered sunlight is stored due to electron motions and interactions electrons are moved around. Electrons move and interact, causing an electrical current or energy to flow. The car is eventually driven by DC motors.

### **COMPONENTS USED:**

Solar Panel

- Solar controller circuit
- Batteries
- PMDC Motor
- Pic Microcontroller 16F877
- Starter switch
- Dynamos
- LCD display



fig(a)



fig (b)

## **SOLAR PANEL:**

A solar cell, also known as a photovoltaic cell, is a large-area electrical device that uses the photovoltaic effect to convert solar energy into electricity. Photovoltaic is a subject of technology and research concerned with the use of solar cells to generate solar energy. The phrase solar cell is sometimes used to refer to devices that are designed to capture energy from the sun. When the source is unknown, the phrase photovoltaic cell is used instead. Cell assemblies are used to create photovoltaic arrays or solar modules.

### Regenerative Braking

When the driver brakes, the motor becomes a generator and the kinetic energy generates electricity stored into the battery

The Toyota Prius uses about 30% of the heat lost kinetic energy from braking

## **WIND ENERGY:**

The hybrid system, which includes a wind turbine with solar panels, was designed and installed to generate electricity. The hybrid model system is a renewable energy system that aids in energy conservation by reducing vehicle fuel consumption. Using the wind to power a car increasing the power sent to the battery and reducing the time between gas refueling and electric charging.

## **BATTERY:**

Despite having a low energy-to-weight and energy-to-weight volume ratio, the lead acid battery's capacity to produce strong surge currents implies that the cell has a comparatively big power-to-weight ratio. These characteristics, together with their low cost, make it appealing for use in automobiles to produce the high current required by means of a vehicle starter motor.

## **PMDC MOTOR:**

The stator is the motor's stationary component around which the rotor spins. The stator is made up of two permanent magnets that are arranged in such a way that poles of opposite polarity repel each other. As a result, one magnet's North (N) pole is close to the armature, while the other's South (S) pole is close to the armature. As a result, magnetic lines through the metallic armature, the field passes from one permanent magnet to the next.

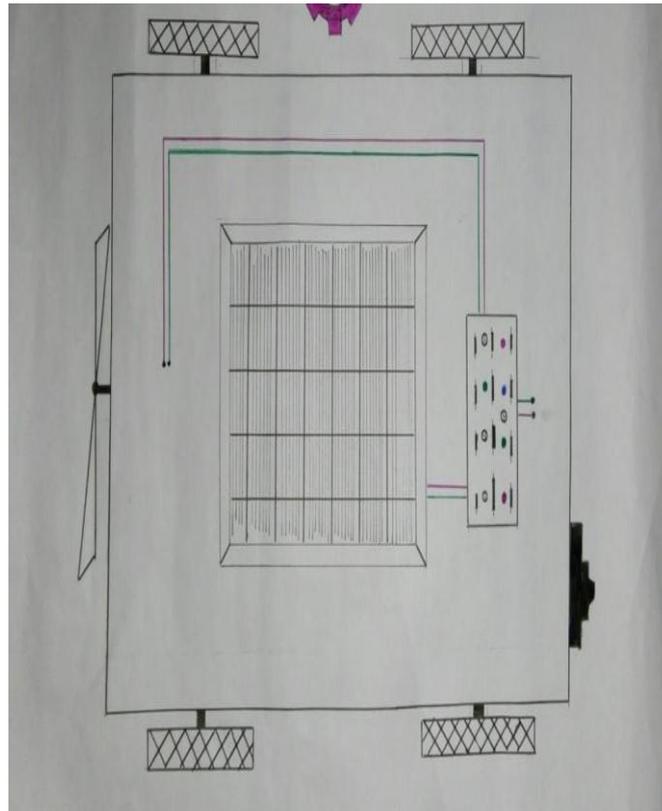
## **PIC MICROCONTROLLER:**

Microchip Technology's PIC (commonly pronounced "pick") family of microcontrollers is based on the PIC1650, which was initially created by General Instrument's Microelectronics Division. The initials PIC stood for Peripheral Interface Controller. The initial members of the family were released in 1976;

by 1977, the entire family had been released. In 2013, the company shipped over twelve billion individual parts, which were used in a wide range of embedded systems.

### **STARTER SWITCH:**

A starting solenoid (or starter relay) is a component of a vehicle that, in response to a modest control current, switches a large electric current to the starter motor, which then starts the engine. It performs the same purpose as a transistor, but it does it utilizing an electromagnetic solenoid rather than a semiconductor switching.



### **DYNAMO:**

As stated in the introduction, a dynamo is a device that converts mechanical energy into electrical energy. This is the main idea used in this application, and it is used for low-power applications. Each dynamo can produce 24 volts, which can be employed in low-power applications. As a result, when observing this condition, At this time, dynamos are utilised to fill up or produce a charge, so your car's efficiency will not be affected.

### **APPLICATIONS :**

Riding Through Pollution-Free Zones

It Is Better For City Riding And Can Be Used In Desert Areas.

Applied To Areas With A Fuel Availability Gap Islands, for example.

Using Solar Electric Taxis to Reduce Pollution.

**CONCLUSION:**

The solar electric hybrid car solves environmental and pollution issues. The use of a dynamo in the car helps ensure that the vehicle continues to run. When compared to existing electric vehicles, the efficiency of the solar electric hybrid vehicle was 100 percent. The house is wired for electricity. 230v is decreased to 48v using a step-down transformer. Then a charge controller device converts it to D.C. The goal of the solar electric hybrid vehicle we built is to solve the problem of electric vehicles' limited range. Theoretical results were used to verify the efficiency and operation of a solar electric hybrid vehicle.

**REFERENCES:**

1. Journal Of Scientific Computing(Solar Car With Abs Pneumatic Breaking System) ISSN NO: 1524-2560 International journal of advanced science and technology - vol - 76(2015), pp21-26 (<http://dx.doi.org/10.14257/ijast.2015.76003>) concept of an electro solar based power break for automobile
2. International journal of innovative research in science, engineering and technology vol-4, issue-8, aug-2015, issn (online) 2319- 8753
3. American journal of optics and photovoltaic 2015;3(5);94-113,published online aug-21 ,2015.
4. Electric and hybrid car ;a history by Curtis D. Anderson and Judy Anderson.
5. Online-[http://en.wikipedia.org/wiki/stand-alone\\_photovoltaic\\_power\\_system](http://en.wikipedia.org/wiki/stand-alone_photovoltaic_power_system).
6. The international journal of science and technology design and fabrication of hybrid green vehicle.
7. Arsie I, Rizzo G, Sorrentino M, "Effect of engine thermal transients on the management of series Hybrid solar vehicles", International journal of control engineering practice, (2010) pp1231-1238. 8. X. Zhang, K. T. Chau and C. C. Chan, "Overview of power networks in hybrid electric vehicles," Journal of Asian Electric Vehicles, Vol. 8, No. 1, Jun. 2010, pp.1371-1377.

**BIBLIOGRAPHY:**

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