# SOLAR VEHICLE

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*Abstract :* The solar vehicle is project implemented for the cost effective and efficient purpose .The prower is given using battery and it is charged using soalr panel by using this the huge amount of naturalelements are saved and many affectrs are reduced

***IndexTerms* - Component,** Keywords-cycle,hub motot,sensor,acclerometer**.**

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## I. INTRODUCTION

The design of a solar car is severely limited by the amount of energy input into the car. Solar cars are built for solar car races and also for public use List of prototype solar-powered cars. Even the best solar cells can only collect limited power and energy over the area of a car's surface. This limits solar cars to ultralight composite bodies to save weight. Solar cars lack the safety and convenience features of conventional vehicles. The first solar family car was built in 2013 by students in the Netherlands.[2] This vehicle is capable of 550 miles on one charge during sunlight. It weighs 850 pounds and has a 1.5kw solar array. Solar vehicles must be light and efficient. 3,000 pound or even 2,000 pound vehicles are less practical. Stella Lux, the predecessor to Stella, broke a record with a 932 mile single charge range. The Dutch are trying to commercialize this technology. During racing Stella Lux is capable of 700 miles during daylight. At 45 mph Stella Lux has infinite range. This is again due to high efficiency including a Coefficient of drag of .16. The average family who never drive more than 200 miles a day would never need to charge from the mains. They would only plug in if they wanted to return energy to the grid.[3][4][5][6] Solar cars are often fitted with gauges and/or wireless telemetry, to carefully monitor the car's energy consumption, solar energy capture and other parameters. Wireless telemetry is typically preferred as it frees the driver to concentrate on driving, which can be dangerous in such a small, lightweight car. The Solar Electric Vehicle system was designed and engineered as an easy to install (2 to 3 hours) integrated accessory system with a custom molded low profile solar module, supplemental battery pack and a proven charge controlling system.

Solar buses are propulsed by solar energy, all or part of which is collected from stationary solar panel installations. The Tindo bus is a 100% solar bus that operates as free public transport service in Adelaide City as an initiative of the City Council.[7] Bus services which use electric buses that are partially powered by solar panels installed on the bus roof, intended to reduce energy consumption and to prolong the life cycle of the rechargable battery of the electric bus, have been put in place in China.[8]

Solar buses are to be distinguished from conventional buses in which electric functions of the bus such as lighting, heating or air-conditioning, but not the propulsion itself, are fed by solar energy. Such systems are more widespread as they allow bus companies to meet specific regulations, for example the anti-idling laws that are in force in several of the US states, and can be retrofitted to existing vehicle batteries without changing the conventional engine.

The first solar "cars" were actually tricycles or Quadracycles built with bicycle technology. These were called solarmobiles at the first solar race, the Tour de Sol in Switzerland in 1985. With 72 participants, half used solar power exclusively while the other half used solar-human-powered hybrids. A few true solar bicycles were built, either with a large solar roof, a small rear panel, or a trailer with a solar panel. Later more practical solar bicycles were built with foldable panels to be set up only during parking. Even later the panels were left at home, feeding into the electric mains, and the bicycles charged from the mains. Today highly developed electric bicycles are available and these use so little power that it costs little to buy the equivalent amount

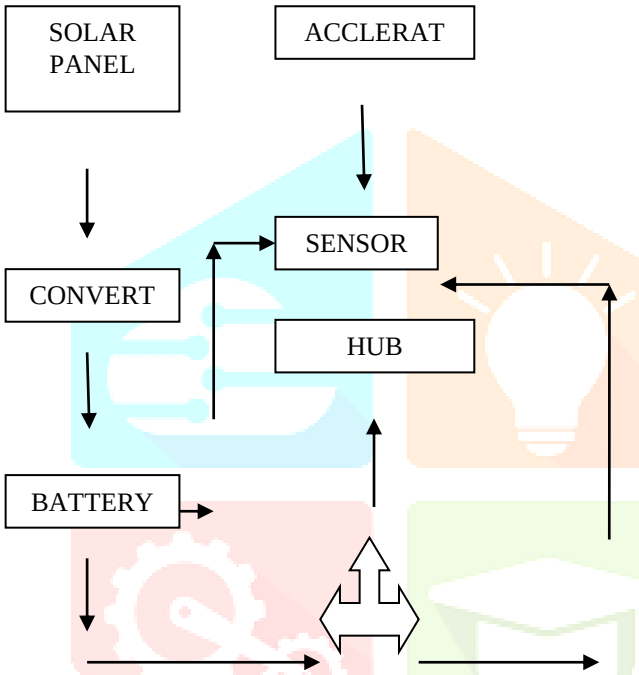
of solar electricity. The "solar" has evolved from actual hardware to an indirect accounting system. The same system also works for electric motorcycles, which were also first developed for the Tour de Sol

Power density: Power from a solar array is limited by the size of the vehicle and area that can be exposed to sunlight. This can also be overcome by adding a flatbed and connecting it to the car and this gives more area for panels for powering the car. While energy can be accumulated in batteries to lower peak demand on the array and provide operation in sunless conditions, the battery adds weight and cost to the vehicle. The power limit can be mitigated by use of conventional electric cars supplied by solar (or other) power, recharging from the electrical grid.

2. CHALLENGES:

Power factor is the great problem and the charging time is more so some times delay occurs problem is over came by using batteries .In winter season the batteries plays a vital role and some recycle energies are also used

. **Fig1.BLOCK DIAGRAMB N**




**BASIC DESIGN**:

THE DESIGN IS BASE ON NORMAL VEHICLE AND FURTHER WORKS ARE MADE.

**HUB MOTOR**:

The hubmotor is a electrically operated motor use in future vehicles Comparison with conventional EV design in automobiles .Main use is for the cost efficient purposed vehicles it eliminates the mechanical transmission and all the normal vehicle working nature by using this the weight is eliminated

*Specifications*

| | |
|---|---|
| Range/Autonomy: | 65 km |
| Top Speed: | 45 km/h |
| Weight: | 140kg payload |
| Motor: | Rear wheel hub motor |
| Wattage: | 800W (1500 Peak) |
| Batteries: | Sealed Lead Acid, 48V 33AH |
| Voltage: | 48V |

**Solar panel.**

And site solar panel is used .Solar panel can charge and can maintain all of our appliances and it is charged in batteries for working we need a convertor unit because it totally damages the circuit.Inbetween a diode is used because a reverse voltage occurs in order to protect the panel

**Batteries** :

12V 6AH Sealed Lead Acid

**ALL BATTERIES ARE NOT CREATED EQUAL. GRUBER MANUFACTURES BATTERIES SPECIFICALLY FOR ELECTRONIC EQUIPMENT AND OFFERS ONE OF THE LONGEST SHELF LIVES ASSURING YOUR EQUIPMENT LONG LIFE AND RELIABILITY.**

| | | |
|---|---|---|
| Battery Type | 12V | |
| Capacity | 20hour rate (300mA) | 6.00Ah |
| | 10hour rate (558mA) | 5.58Ah |
| | 5hour rate (1.01A) | 5.05Ah |
| | 3hour rate (1.47A) | 4.41Ah |
| | 1hour rate (3.64A) | 3.64Ah |
| Dimensions | Length | 90mm (3.54in) |
| | Width | 70mm (2.76in) |
| | Height | 101mm (3.98in) |
| | Total Height | 107mm (4.21in) |

**Torque sensor:**

A torque sensor, torque transducer or torque meter is a device for measuring and recording the torque on a rotating system, such as an engine, crankshaft, gearbox, transmission, rotor, a bicycle crank or cap torque tester. Static torque is relatively easy to measure.

**Convertor:**

Here compact (0.4″ × 0.5″) D24V6F12 switching step-down (or buck) voltage regulator takes an input voltage between 15 V and 42 V and efficiently reduces it to **12 V** while allowing for a maximum output current of **600 mA**. The pins have a 0.1″ spacing, making this board compatible with standard solderless breadboards and perfboards.

**MODULE WORKING PRINCIPLE:**

Supply to trigger the motor so we need to give power so by using the accelerator we give the rotation to the rear wheel

**5. RESULT:**

This cycle made a huge impact ang cost efficient in future and still progress is going on to make the vehicle work in all conditions

**6.CONCLUSION:**

The car culture has developed over generations and will not change overnight. Rising levels of congestion, pollution, obesity and recognition of climate change have led to Government action to encourage cycling, particularly as an alternative to motoring. To an extent these efforts are succeeding and there has been a rise in the number of cyclists on the roads in recent years