



Solar Energy: A source for E-vehicles

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Abstract

Demand and availability of power are growing day by day throughout the world. Renewable energy sources will play an important role in the future as normal energy sources such as coal and petroleum are limited and depleted. In this case, the power problem is a very important problem and therefore needs to be solved. Basically, it is to ensure the availability to increase generation or install additional generators. Otherwise, a demand side management (DSM) approach must be adopted. In the current situation, fuel consumption for domestic transport is also showing an increasing threat in the near future. The negative effects of the practice of such vehicles as well means that it leads to environmental pollution and health issues related to habitats. In line with this future transport system E-cars are always worried about environmental pollution. The drawback of this method of transporting energy consumption by moving it will also create an additional burden on the setting of the existing power system and infrastructure. But power consumption and controls in electric vehicles (EVs) and the latest technology promotes and supports green transport systems. The E-Vehicle Charger plays a role in reducing dependence on mineral oil and is the natural emergence of our most powerful infrastructure. Consumer incentives as well it is important to make the purchase of an electric car and a quick local charging station affordable and attractive. To address this issue many developed countries have already taken action to remove solar photovoltaic conversion systems for storage and transfer to the grid. The current rate of use of E vehicles is 70% compared to a decade ago. The concept of solar energy is basically, released as heat or light energy. But the storage system is the bottleneck issue in this case due to technology, economic barriers as well as challenges. Power electronics connect the male E-car battery to be charged to the grid if you do not have a solar power source known as a car grid (G2V). Another mode says to transfer stored power from storage battery to grid (V2G) as and when the grid receives lack of ability to meet its responsibilities. Then solar PV systems are installed on the roof of the car to generate electricity and are used for its operation with battery support.

Therefore, E cars equipped with solar PV panels can transmit even electricity to the grid (V2G). Therefore, proper design and application can prove solar photovoltaic source as a promising source for this E car car app in the near future. This creates an opportunity for engineers and businesses.

Keywords: Solar energy, e-vehicles, demand

Introduction

The main objectives of the concept “Solar energy a promising source for E-vehicles” is to explore the ability and to utilize solar energy for E-vehicles thus reducing the fossil fuel consumption and protecting the environment. The conventional vehicles and potential for the use of alternative technologies in automobiles such as electric/hybrid vehicles need to be worked out or develop a plug-in hybrid electric vehicle by converting available conventional vehicles with a suitable motor and battery. It is also necessary to know why E-vehicle couldn't get enough consumer attraction. Need for E-vehicles marketing and production can be done and problems can be solved by applying suitable engineering solution techniques considering consumer requirements and cost constraints. Consumers should be aware of the CO₂ emissions caused by fossil fuel based vehicles and the initiatives taken by the government for promoting E-vehicles by giving subsidies.

The demand for electricity is growing exponentially, which is very important in all aspects of modern life. This is evidenced by the exponential growth of the world's population. Therefore, energy sources will play an important role. In this regard, current practices have the potential and priorities to reduce greenhouse gas emissions and improve residential, office and industrial energy efficiency, energy marketing, energy management, energy conservation and energy security. They are also working to find viable and

affordable alternative energy sources by developing cleaner and more efficient vehicles and systems, energy policies and energy strategies. Over Extraction or depletion of fossil fuels and environmental degradation are major problems facing the modern world? In order to overcome these problems, interest in renewable energy sources has recently increased due to environmental benefits. The competition between fossil fuels and renewable fuels is important for the foreseeable future.

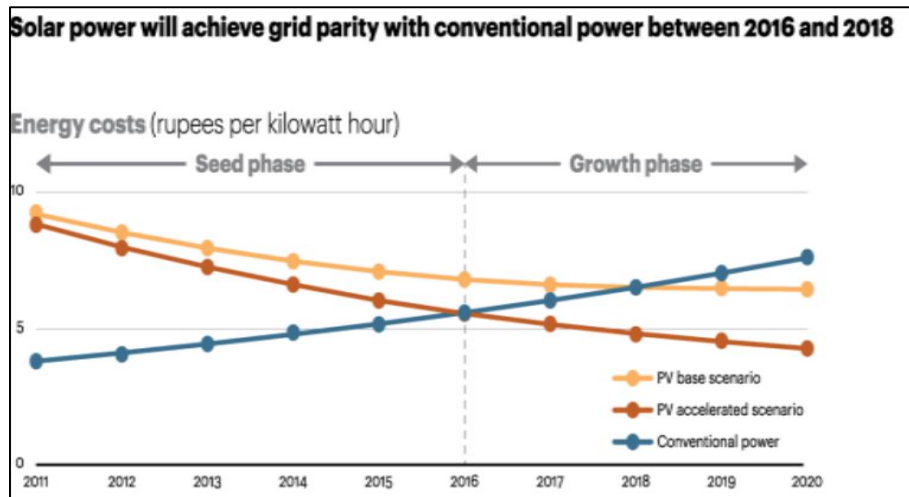


Fig 1: Variation of energy costs

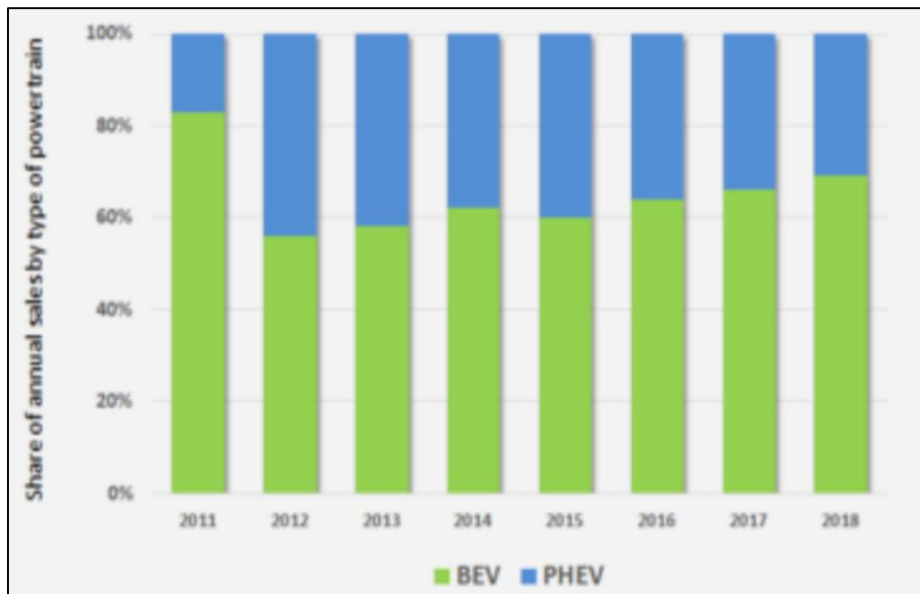


Fig 2: Global sales of electric vehicle

The first law of thermodynamics, also known as the law of conservation of energy, states that energy cannot be created or destroyed, it can only be transformed from one form to another. Solar energy is the energy of the sun is a huge source of energy in the form of heat and light produced by nuclear fusion in its core. Nuclear reactions release energy transfer moving towards the surface of the sun. Earth absorbs approximately 3,850,000 exajoules of solar energy per year and the fundamental energy from it is light energy. Of the heat and light, some systems use thermal energy for heating

and relaxation, while others convert or convert light into electrical energy. In the current situation, the energy crisis is an important and urgent issue that needs to be resolved. It's basically checking the availability of to increase generation or to mount more generators. In addition, systematic demand-side management plans such as demand control and shift-or-reduce methods (DSM) 4244 should be adopted. In the current scenario, fossil fuel use for transportation is recommended. Inland transportation is increasing rapidly and presents a threat in the near future.

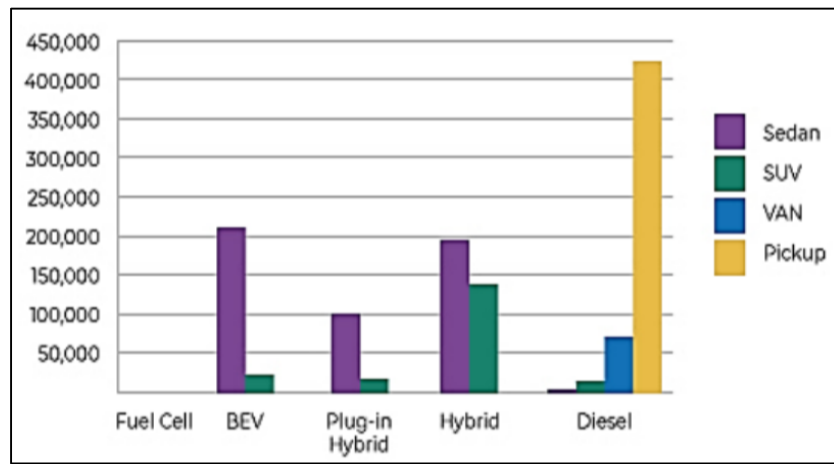


Fig 3: Sales of different E-vehicles

Harms of practicing means and these vehicles lead to environmental pollution and health problems related to the living environment. In line with this the upcoming mode of transport is E-vehicles keeping concern about the environment. The disadvantage of this mode of transport is

the use of electric power for propulsion and the switch to transport mode will place additional load on the existing vehicle infrastructure and configuration. The advent of power electronics has made E-vehicle applications (EVs) smart and green among other transportation systems.

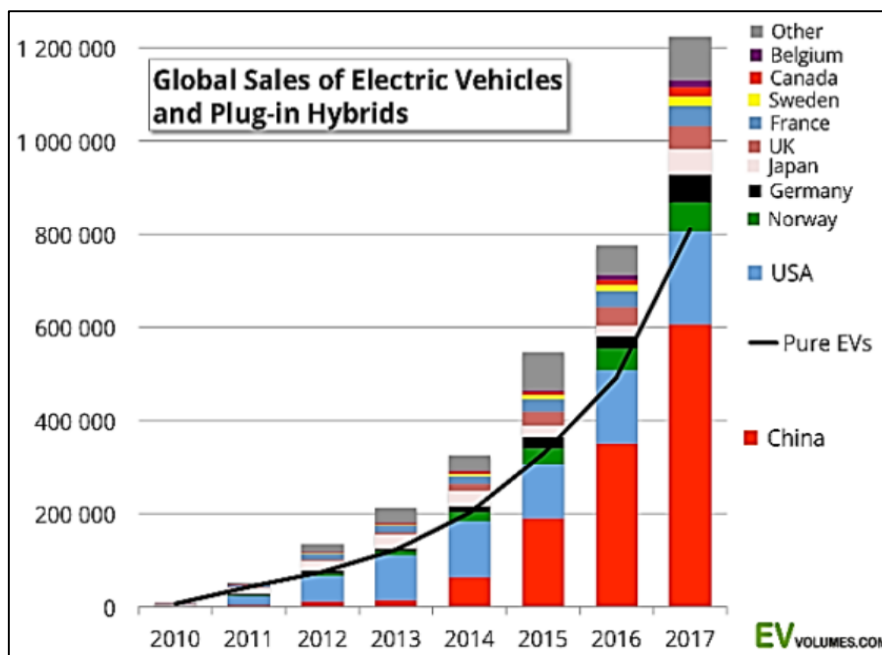


Fig 4: Global sale of E-Vehicles

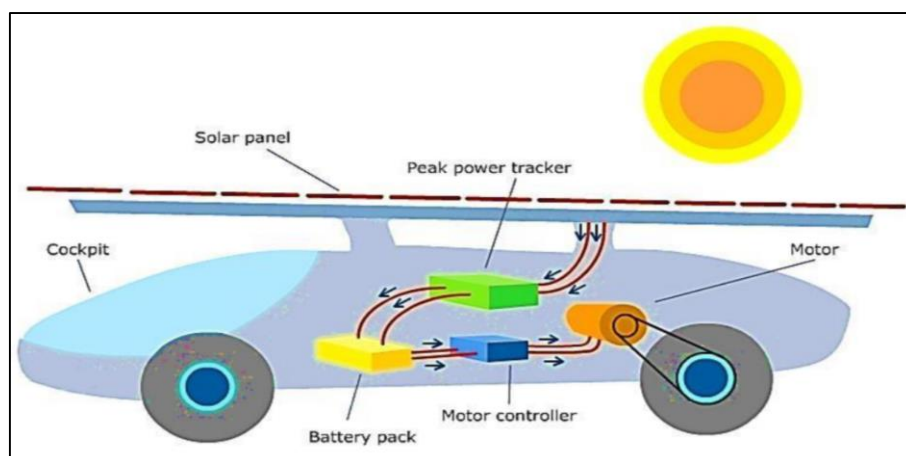


Fig 5: Working of the E-vehicle

Electronic charging controller and solar panel helps to charge and control the battery power in automotive operation with proper protection of output depth and overcharging etc. The 140 Wp solar module is used with output from 24V to 25V DC standard test conditions (STC) are present in the sample. Batteries are fully charged before use. Solar panel installed charger after converting light into electricity. The

integrated features maintain a good setting as the availability of solar insolation is as important as the location of the car. Typically, in India, between 9:30 am and 3:30 pm with proper solar panel installation the best power output can be achieved. The motor installed in the car can perform the intended movement as in conjunction with a powerful battery controller.

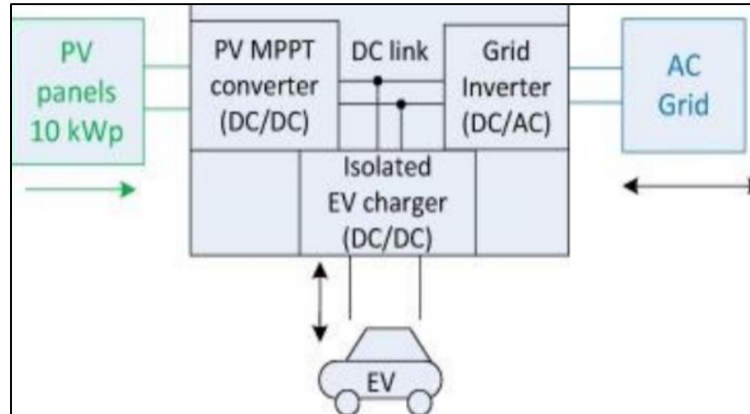


Fig 6: Functional block diagram

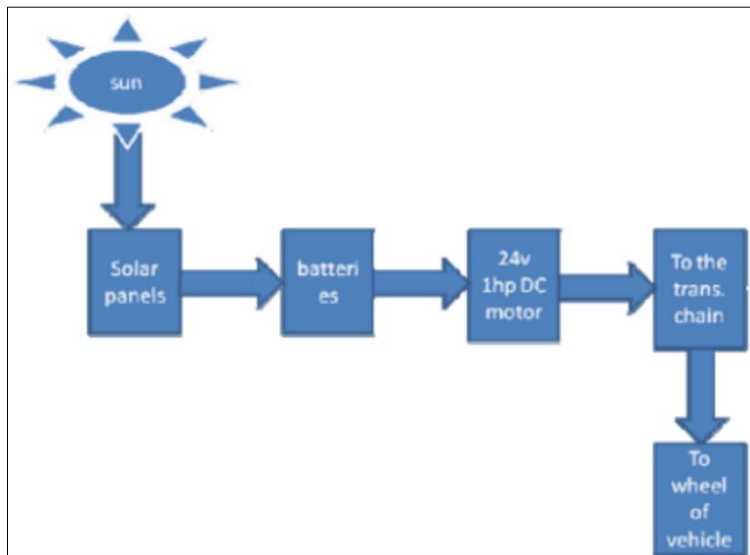


Fig 7: Block diagram solar E-vehicle

Components used	Range	Quantity
Batteries(heavy inverter batteries)	24V 190Ah	2*12V
Solar module	140Wp(Watt Peak)	1
Connecting Cables	Motor connection:-25Sq.m m high voltage cables.	10 meters
	Solar module to charge controller unit:-1Sq.mm	1 meter
	Charge controller to battery unit:-2Sq.mm	1 meter
Motor	High torque DC motor 1Hp=746W	1

Fig 8: The important parts of the E-vehicle

Battery

The battery is a very important component and can be charged electrically in a special power station. Battery autonomy is an important design limit. In addition to the standard technology of lithium ion batteries, there are at least four major battery technologies now represented: Solid state, aluminum ion, lithium sulfur, and air metal. Battery-based EVs provide a 200-mile run with full charge and usually a distance of 70–125 miles looks very normal.

Motor Controller

Vehicle controls are electronic circuits that control the operation of the engine as required by the road conditions used by the user. The controls are built with enough precision to feed the engine and take adequate safety. Power consumption adjustment is a special function of reducing consumption and improving battery autonomy.

Electric Engine

Electric motors can be programmed to use current or direct current power (AC or DC) to move forward with suitable motors. AC motors are usually less expensive and easier than DC motors which typically show 82% to 96% efficiency compared to those DC motors reaching approximately 95% - 96% efficiency when fully charged. AC motors are more common due to their less maintenance and cost compared to DC motors.

DC/DC Converter

An optical power connector capable of setting the DC output as required. The pulsating DC input may appear on a simple converter or battery. A certain level of output voltage is controlled by changing the elements in the converter. For example, a 48V / 12V module, 100W that converts a 48V battery to a 12V battery in loads such as lights, signals and wipers, etc.

Peak Power Tracker

The Maximum power point tracker (MPPT) is a machine that attempts to increase the efficiency of solar systems by setting the appropriate operating environment to output and give maximum effect to subsequent connected systems. It can be a microprocessor-controlled DC / DC step down converter controlled by a microprocessor used by the solar power system to charge the battery.

Conclusion

The present mix mode of transportation is having adverse emissions to the atmosphere and the current practice to reduce the impacts of these emissions is of greater importance. The practice of electric vehicles (EV) in this regard added greater value and provided large scope to the development and research. The associated government policies and benefits to both the manufacturers and users need to be revisited to enhance the E-vehicle market. But the popularity of silent and eco-friendly electric vehicles is increasing now a day's creating bundle of opportunities for the enterprises and users.

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