
Shyam Sunder¹, Priyanka Jhavar², Sanjay Kalraiya³

¹M.Tech. Scholar, ²HOD, ³Professor, Department of Mechanical Engineering, SSSIST, Sehore, India

Abstract—The aim of Multi Hybrid Technology is related to decrease the fuel consumption of vehicles by 30% to 40% The above Technology is widely develop in U.S.A, JAPAN etc. Which are the largest user and producer of above Technology, in present scenario. Honda is the first Japanese company launch Hybrid car in 1999 In U.S.A Market. New Model Civic Sedan Hybrid car which cost 247500 $ approximately in U.S.A. Launched this car in India in 2006 Civic Hybrid cost 21.41 lacks. However, company subsidized car to 80000 which will reduce the cost of car to 13.50 lacks on road price approximately. Only few producer of car like Honda Siel Car Japan, Audi Ltd, BMW, is producing hybrid cars.

India 33rd country where Honda launches civic hybrid car in 1.5L lit in year 2006. Sport Utility Vehicle car segment using I-Vtech Engine +Integrated Motor Assist Technology. Using Li-ion Hydride Battery for electricity storage I-VTe stands for intelligent Variable Timing & Lift Electronic Control Engine by using ECM. & IMA stands for Integrated Motor Assist. Uses Permanent Magnet rotor, Made of Neodymium Nd This rotor gives flexibility to motor act as A.C Generator, & Traction motor. & uses Electronic convertor to convert Ac to Dc & Dc to Ac ie management of power conversion with different condition of driving Plug-in Hybrid Electric Vehicles & Electrical Vehicle with

Multi Hybrid Technology, We use above two technologies to be use in vehicle to get versatile use of fuel Energy to run the vehicle at optimum fuel economy and low emission. Development of Multi hybrid technology in India & with the production of such type of vehicle in India not only produce job opportunity to increase by 85000 every year & reduce CO₂ pollution to 5% to 10% by Vehicle if it capture 60% of car market & if we export this vehicle to foreign countries it will increase 2% per capital Income of our country & growth in Gross Domestic product GDP.

Plug In Hybrid Electrical Vehicle Technology

In this type of technology A Hybrid electric vehicle with conventional fuel which utilizes rechargeable battery with conventional IC engine an arrangement is made to fuel charge the battery by connecting a plug to an internal electric power source and may behave as hybrid with electrical vehicle.

A PHEV share the characteristics of both a conventional hybrid electrical vehicles having electrical motor and Internal combustion engine ICE And all electric vehicle having is a plug to connect to electrical grid. The benefit of above technology is to convenience of vehicle parking recharging to provide emergency backup power in parking and vehicle to grid Vehicles to grid application in this system we have to increase the battery energy storage capacity by increasing no of cell Institute IEEE Electrical and electronic engineer require that hybrid electrical vehicle be able to drive at least 16 km in all electric mode with zero emission In next generation car the implementation of Multi Hybrid car with plug I hybrid & electric vehicle and electric motor plus solar cell with conventional fuel as hydrogen in fuel cell is needed to develop when there is end of conventional fuel like petrol coal diesel in next century up to 2115 so It is very is important to develop such a technology with zero emission to meet the energy or transportation demand of In next Century. As India is ranked 3rd in Carbon dioxide emission in World China & U.S.A in 1st & 2nd position respectively.

In India none of the Indian manufacturing company launched or develop the Multi Hybrid vehicle technology till 2015 So it need to be develop In our country to meet the future required demand of energy & transportation &try to produce vehicle have zero emission So that the pollution level in metropolitan city is reduce to 15% which is increasing 43% every four year & 15% by the Industrial growth in Country. An very bold step should be taken to Ban the use of petrol & diesel to be use as fuel in vehicle in country and to be use Bio fuel or Hydrogen or fuel cell or solar cell with CNG fuel such technology need to be develop in India to develop Multi Hybrid car in India & My work is try to develop awareness among engineers to develop such Technology. In addition, with zero emission car. To save our country environment from pollution & save the expenditure spends on import of crude oil to zero percent. In India, none of the Indian car manufacturing company launched or develops Hybrid Technology But in future MARUTI SUZUKI INDIA LTD.
Have planning to launch Hybrid model up to 2017. Name hybrid swift desire car of 658cc 3Cyl Petrol Engine with 42kmppl average. Weight 1600kg with Avg price of 4.65lakhs max torque of 25.5 kNm Engine max power 48bhp. Science there is great deal of difficulty of storing electrical energy in vast amount when working with Hybrid vehicle at present low capacity battery is available for storage of energy in form of chemical energy for vehicle large amount of energy is needed to run vehicle so we need to improve storage capacity of battery for use of vehicle so there is need to improve the develop a new storage technology which can store large amount of energy this need lot of research work to find out such device which can store large amount of energy in less occupied space &of lower cost with present available technology for storage we can only increase battery capacity a lot of car manufacturing company is doing research in this field like Honda Tesla Motor, BMW AUDI etc. but there is not more option available for storage device so they have develop rechargeable battery like Li-ion hydride battery with all the battery types available Li – ion battery are most suitable battery for hybrid car it provide 220v / 20kwh power when it is fully charged. Manufacturing of theist hype of battery is different than lead acid battery used in India IT is divided in two small no of cell each containing positive & negative electrode of small capacity of 2.1 volt & fitted in long box like structure & connected in series with each other. To from a complete battery But such type of battery is not manufacturing in India it is imported from USA OR JAPAN which cost $1200 to $2400 in foreign country & Imported to India with price 2.85 lacks including custom duty 100% so it is need for Engineers of our country to developed & do researches technology to produce it in our country to bring down the cost of manufacturing in India. An very bold step should be taken to ban the use of petrol and diesel to be use as fuel in IC engine in our country and use of CNG, Bio fuel OR Hydrogen fuel cell or solar base vehicle Technology need to be develop in India and My thesis is try to develop awareness among engineers to developed such Technology in India. So that we cannot depend on others county for their Developed Technology.

Main Objective
1) Reduction of Internal Combustion Engine Power to increase fuel consumption efficiency due to use of Hybrid electrical vehicle in combination of ICE. 
2 ) Reduction of Fuel Consumption By 48% In Vehicle And Reduction of Petrol & Diesel Consumption to 30% to save Indian Expenditure on Crude Oil.
3) Reduction of Pollution Emissions in India Increase Every Five Year By 44% To 15%. 
5) Development Of Vehicle Produces Zero Emissions TO Reduce Pollution In India.
6) The Above Technology is used in Commercial Vehicle & in Railways.
7) Above Technology Should Use As Integrated Technology With Industry.
8) Comparative study of ICE, Hybrid Vehicle & Multi Hybrid Vehicle on following points.
a) Increase in cost of manufacturing b) fuel consumption reduced c) Percentage of emission reduced.
9) Increase in Job opportunity in India if we start production of Multi Hybrid vehicle in India & It Increase GDP rate

I. INTRODUCTION

In Multi Hybrid car that locked radically different from conventional gas powered vehicle today there are hybrid version of many of the most popular makes & model .Sport utility vehicle SUV like sedan pickup body style all priced at several thought dollars more than a similar comparable equipped petrol powered vehicle As more hybrid vehicle are introduced their price will undoubtedly come down. 

How to work:-In this Multi Hybrid use two motor to run the vehicle, an Internal combustion engine that uses petrol with Electric Motor The Electric Motor recharged battery during driving and due to combustion of fuel of in Internal combustion engine and by the kinetic energy of engine that was recaptured during braking as result most current hybrid vehicle do not need to be plugged to an electrical outlet to recharge battery, but an Extra arrangement is provided to charge the battery from socket when vehicle is In parking or Engine is not running.

Better efficiency equal better fuel mileage. Regardless in the way the system is being designed the result in that case is that the electric motor provide some of the power necessary to propelled vehicle as a smaller combustion Engine is to be used provide better fuel millage and reduced green house gas emission CO2 Some Automaker like G.M motor have Introduce hybrid concept vehicle that are also plug in Hybrid vehicle technology. The line Plug-in Hybrid may go to produce Ten other new car Technology currently will be developing includes the use of Bio Ethanol Solar & Dual mode Hybrid combination
The fuel economy improved with the result of taking the best part of the petrol Engine and the electric motor to combining them into one unit A. vehicle powered is given by an Electric motor is undesirable because of its limited Driving range. The large Recharging time. The average fuel economy of Multi Hybrid drivers Experience vary widely as driving habit it depends largely on driving style of driver and mixing of city and highway travel.

Vehicle powered by an Internal Combustion Engine carry much more power than it is needed most of the time A Mid size Sedan for example has a petrol Engine that produces around 180hp but engine maximum power is used only by as for passing on the high way or when climbing a grade.

Hybrid vehicle also use regenerative braking for further improve fuel economy. In regenerative breaking the electric motor became generator & captures the kinetic energy would be lost in heat energy when the vehicle brake is applied and when the vehicle is braking. The energy is captured and is transformed in to electricity, which recharges the battery. The energy, which is stored, is used to power electrical accessories like Head light, Air conditioning etc .That is why city fuel Economy is greater than highway fuel economy in Multi hybrids.

Because of this hybrid vehicle, increasingly become popular with more than 35000 sold in USA 2007. The Toyota Prius remain the best selling hybrid in USA win 2007 sales up award 43% for previous year IN 2008 –2009 hybrid that are new on sale are expected to be introduced include 26 model. The selection of hybrid include every thin from concept to full size car compact, mid size, full size, SUV pickup several automaker offer numerous model to choose from. Sale will most likely to increase as the range of Auto fore casting SOME source hybrid and diesel vehicle expected to represent 11% of market same in next seven year june28, 2005.In hybrid system two type of arrangement of Motor, Engine & Battery is made

Parallel Hybrid Vehicle:- In this system, it has a fuel tank that supplies petrol to the engine like a regular car It is also has a set of batteries Li ion 210V 20kw that run an electric motor

In Both the Engine and Electric Motor can run the Transmission at the same time.

Series Hybrid Vehicle

In this type of fuel tank goes to the Engine side, but the engine turns a generator to charge the battery.

Then the generator can either charge the batteries of 12V or power an electric motor that drives the transmission The petrol engine does not directly power the car
Plan For Future Next Generation Car Multi Hybrid Technology

The above-proposed Multi Hybrid vehicle is developed for future transportation using Hydrogen as conventional fuel & parallel arrangement is used for mounting of IMA Integrated motor Assist on crank shaft which can act as both generator & motor in place of flywheel & after this CV T transmission is mounted after motor & storage battery is placed at the back of the vehicle in trunk space of rating 210V 50kw Li ion rechargeable after this an arrangement is made for fitting of Hydrogen gas cylinder & an opposite to that an auxiliary fuel tank of 10L is fitted which is used as in emergency requirement of fuel as shown in above plan. The engine is mainly driven by Hydrogen fuel an emergency petrol tank is provided when hydrogen is not available it is mainly design to driven from electric motor when battery is fully charged ECM will cut fuel supply by closing intake valve & opening exhaust valve it will start on electric motor up to 69 kmpl speed limit & run by electric motor when it is accelerating it is run on combination of electric & hydrogen fuel & when driven on high way above 70KMPL it will run only on hydrogen fuel in this operation battery is charged by IMA when it is fully charged & when it is driven above 95kmpl combined energy of hydrogen & motor is used & it is control by Electronic Control Module.

When it is driven in Econ mode an Thermal Photo Voltaic cell is used of roof of vehicle which uses solar energy for battery charging which act as heat exchanger in this arrangement we also use heat of coolant water from engine which is above 80c to pass through TPV tube by exchanging heat to photo cell which generate electricity which is used to charge battery it also increase the overall efficiency of TPV by providing extra heat to photo cell it can also provide heat to photo cell even in case of condition & electricity is continuously generated and battery is charged even if vehicle is running in electric mode by solar energy uses heat storage capacity of water from coolant.

An Intelligent Power unit having small microprocessor, which control convertor which uses integrated Bi polar resistor which can convert ac to dc & dc to ac & control solenoid switch provide with solar panel to cutoff supply when battery is 95 % charged to maintain safe working of battery monitor state of charge level not to go below 20% of charge when battery is discharge to 20% it will cut off electric supply from Battery.

Thermal Photo Voltaic Cell :- It consist of three hollow shell one is absorber here air is use as absorber & coolant as emitter & which emits heat energy absorb from engine & sun is radiated to photo cell which is at the base of solar panel which continuously generate electricity by Photo cell used at the bottom of pane it is connected with solenoid switch use to cut off power supply from battery by Intelligent power unit supply Signal to solenoid valve to control current supplied to battery.

It also control convertor & fuel pump battery state of charge and switching at different mode & it control the power system supply system of AC which runs on battery supply IPU also control the auxiliary battery charging of 12V which is supplying power to sensor head light ECM cabin light back light etc an rear ventilation for cooling of battery is provided from passenger cabin uses small fan to drive air from cabin uses 12V battery supply when it is running with hydrogen it emit H2O with zero emission vehicle.

In this Hybrid system, a method is proposed for determination of reference to the Energy Exchange Systems for Design of specifications different charge sustaining to Multi hybrid vehicles of different vehicle classes.
Hybrid drive the Vehicles combines Multiple Power sources & drive train in order to increase the driving functions. This function is enhancing the Emissions, Comfort & Fuel consumption, driving Performance and Safety. In this system, the focus is on Fuel Consumption reduction. The Optimal Energy Management determines strategy by using Dynamic Programming. Initially, the efficiencies of the energy exchange between the engine, & vehicle road, load and additional energy exchange system is assumed independent of constant Engine Torque and Speed. Therefore, the Simulation results will be Independent of the component Technology and This outcome will be the required Constant System Component Efficiencies, Sizes and Power specifications in order to achieve the required fuel Consumption reduction by Simulations maintain state-of-charge and accomplish any power demand over a defined drive cycle. These design specifications will be used to choose system component technology. Finally, the chosen system component technologies will be used to determine Optimal Energy Management System by Vehicle load & Controlling. More fuel consumption and emission reduction with the application of an Energy Exchange System can be achieved by the primary power source & shutting off at idle waste when primary power source is not needed eliminating fuel. Alternatively, by regenerative braking, this stores energy for later use. For example the comfort and drive, ability can be increased due to torque transient’s absorption of driveline & engine and by the Energy Exchange System. Alternatively, an Energy Exchange System masks deficiencies of conventional drive trains such as pauses during shifts. Also an Energy Exchange System Electromotor consisting of a high torque at low speed, which can give satisfying launch feeling. The safety can be enhanced by advancement and application of Electric braking systems or torque traction systems All Wheel Drive Confidence In this case, a safety function could also be combined with the fuel consumption function regarding brake energy recovery due to the application of an Energy Exchange System. The Energy exchange system component specification requirements are:

- Energy storage level
- Storage power level
- Energy Converter & Energy Storage Efficiency.

Furthermore, in the design required specifications of an Energy Exchange System depend on, the type of vehicle class:

- The type of engine:
- Driving Behavior of drive.


II. LITERATURE SURVEY

2) Karan C. Prajapati; - Hybrid Vehicle in Pandit Deendayal Petroleum University.
3) Wickrama Singhe: - How Can We Encourage Local Community TO Invest In Hybrid Car.
5) D.C Haworht: - Hybrid Electric Vehicles Technology and Stimulation on Fuel Economy.
6) Samule E.de Lucena Santpaul Univ Brazil: - A Survey On Electric &Hybrid In 2011
7) Ma Xianmin (2002): - Developed a novel propulsion system design

- Scheme for EVs requiring high power density. The theory analysis
- Mathematical models of EV are first set up based on the vehicle dynamic characteristics, and then the whole system is divided into seven function blocks according to power flow, the simulation models are formed in the MAT LAB language. The simulation results are verified in a PDM AC-AC converter
- Which shows that the suggested method is suitable for EV?
8) Brian: - Created By Brian in 2007 a model in MAT LAB and ADAMS

Demonstrate its fuel economy over the conventional vehicle. He used the Honda IMA Integrated Motor Assistant architecture, where the electric motor acts as a supplement to the engine torque. He showed that the motor unit acts as generator during the regenerative braking. He used a simple power management algorithm in the power
III. HYBRID ENGINE TECHNOLOGY USED

IC Engine: - In an Internal combustion Engine is a Heat Engine where the combustion of fuel occurs with an oxygen usually Air used in Combustion Chamber that is an component of the working fluid or mixture of air & fuel flow in system. In an Internal, combustion engine the Expansion of the high-pressure gases produced by combustion is applying direct force to piston, a component of Engine. The force is applied typically to Piston. This force move the component over the distance transforming chemical energy in to useful Mechanical Energy the first successful Internal combustion Engine was Created by Etienne Lenor around 1859 The First Modern Internal Combustion Engine was designed in 1864 by Siegfried Marcus.

Engine Technology Used. - In the Hybrid Internal Combustion Engine based on the Lean Burn Mixture is used with four cylinder 8 valves & Dual Sparkplug for each cylinder 1.3L.

On the other hand, 1300cc in this type of Engine Lean Burn mixture of 20: 1 to 30: 1 is used for the combination of fuel. In this system PGMFI, fuel Injection system is used that is Programmed Multi cylinder Fuel Ignition System. Using Electronic Control Module ECM or Programmed Control Module PCM. ECM is used for control the Pressure of Fuel and quantity of fuel

This dimpled surface is better able to retain a lubricating oil film. Shot penning the Integrated Motor Assist Engine's pistons accounts for another 1.5 to 2.0 % reduction in internal friction between the contacted areas.

Rocker arms are fitted with rollers and that minimize friction on the Cam's contact surfaces

Continues Variable Transmission Description: - CVT

In this type of Transmission system, It has fixed set of gear combination or ratio the Continues variable transmission allows almost limitless number of speed ratio. This provides significant benefit over a traditional automatic transmission. In this type of transmission the Computer can choose intelligently to have the Petrol Engine & Electric Motor running at the maximum speed regardless of How fast the car is travelling when cursing under low power demand condition the end line & Motor will rotate relatively slow while they will rotate faster when accelerating or climbing Hill. When this Transmission gives better fuel Efficiency than Automatic Transmission. Because of smooth transmission in gear ratio provided by CVT. Transmission, provide constant steeplees acceleration from a stop, all to way up the cursing speed this contrast with the jerk of gear changing experience with Automatic Transmission. This CVT. Transmission providing low power loss than typical Automatic transmission resulting in better efficiency and acceleration. Claims that their CVT Transmission is the world first mass produced High power, step less Transmission while such transmission existed previously they claim CVT is for superior quality endure power output and cost. They have also specifically design the CVT to respond in the way that drive are accustomed to other Automatic Transmission responding.

In this type of Engine offset of 14mm with Crank Center is used. The advantages of the Offset cylinder used in I Engine are as following:-

In the interest of friction reduction, Engineers specified new Lightweight Aluminum alloy piston design for Integrated Motor Assist Engine. The pistons have a minimum contact area and the outer contacted surface area has been shot-penned. Shot penning is a process in which a Metal outer part, such as a Piston or Connecting Rod, is blasted with shot balls-like particles, creating uniform, Microscopic dimples on the outer surface.

Continues Variable Transmission Description: - CVT

1) From its Unique Design the CVT is supervisor to conventional Automatic Transmission using Torque Convertor
2) It raises fuel Efficiency from 2% to 8%.
3) **Mobility:** - In this system by using three D maps control i.e. Manifold absolute pressure control pattern the CVT has the ability to stay in the same power band if or for example of this is when they needed it an ability to remain in High RPM Power and from start still too high speed. Because of the full Throttle, acceleration is equivalent to that of a Manual Transmission. In addition when we traveling at high speed because of its ability to adjust infinitely gear ratio CVT is having more passing ability than not only the Manual Transmission but the Automatic Transmission using Torque converter with the advantage to still shift to low speed gear to use the engine brake there is nothing but advantageous.

**Low Fuel Consumption:**

In this type of system because of CVT, it allows the engine to remain in the most optional power range excellent fuel economy is obtained compare to conventional automatic transmission using torque converter there is zero slip that translate to efficiency In addition the low friction design and side pressure regulator both contribute to excellent fuel economy.

4) **Smooth Acceleration:** - In this type of system because of newly designed clutch is installed on driving shaft smooth acceleration is possible with appropriate creep starting on hills or parking in garage can be done with ease. The different in fuel between the CVT and conventional automatic transmission using torque converter is minimized.

5) **Shock Free Shifting:** - In this type of system With the infinitely gear ratio at its disposal the nudging motion caused by sifting is no longer present Drastic jolting during lower gear acceleration is no longer present as well dreading to a stress free smooth driving experience.

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**IV. METHODOLOGY**

1) Theoretical Analysis of Hybrid Technology.
2) Analytical Survey of Manufacture like HONDA Service Center.
3) Use Of Heat Engine Using Open Cycle In Relation With Thermodynamics.
4) Use Of PHEV + HEV + ICE+ Hydrogen Fuel Cell OR CNG+ SOLAR CELL. ON ROOFOF VEHICLE5) Statistical Analysis of Data by Pie Chart & Bar Chart.

**What is Hybrid Car Battery:** - In the Hybrid car, battery is as if any other batteries expect that it is rechargeable and has enough capacity to move a vehicle down the road for 48 to 50km up to 80% discharge condition Honda battery. The Honda battery made of 120 Panasonic 102-volt nickel metal hydride D cell is capable of 100A discharge rate &50A charge rate. The system limit the usable capacity to 40Ah to extended battery life Total battery pack output is 144V. It is used with Honda integrated motor Assist power control Unit.

Li- Ion Battery for Next Generation Hybrid Car:- This battery is important because they have a higher energy density the amount of energy the hold by weight or by volume than any other type is that Li- ion hold roughly twice as much energy per pound as do previous generation of advance batteries. Nickel metal hydride NiMH It holds twice more energy than conventional lead acid battery PbA 12v battery. We use 210V 20 kW batteries each of 2.1V of 100 Panasonic cell.

As the battery is not manufacture in India battery is exported from from IMA Battery USA cost in India is 2.83 lacks with 100% custom duty. Therefore, the Federation of International automobile urges Indian gov. to cut down the custom duty by $200 to reduce pollution in India.

**Heat Generation Rates in the Battery Pack during Driving:**

During driving, the heat generation rate depends on the driving cycle and the power of the battery relative to the demands of the cycle for the vehicle being driven. As discussed below, the thermal mass of the battery pack smooth is out fluctuations in the heat generation rate. The rate that the cooling system must handle is the average rate for the most difficult driving conditions to which the battery pack will be subjected.

The best way to determine the maximum cooling rate requirement for the battery pack is by vehicle simulation studies.
These studies require a battery impedance algorithm that makes possible accurate estimates of internal heating and the use of vigorous driving cycles and high-speed driving patterns. The results of vehicle simulation studies of battery heating can be entered on line 19 in the Thermal worksheet to override the estimated default values. However, pertinent results are not always accessible and therefore we have provided some initial, although dramatically simplified, estimations for heat generation.

**Electrolyte and Separator:**

The electrolyte used in this model is based on a lithium hexafluorophosphate salt, LiPF6, dissolved in a carbonate based solvent system. The carbonate solvent system is a blend of ethylene carbonate, EC, and a linear carbonate such as ethyl methyl carbonate, EMC, or dimethyl carbonate, DMC. Other chemical additives may be used to limit the capacity and power fade of the battery over time. Polymers may be added to the electrolyte as either a minor or a major component. This is not discussed in any further detail in this work. The price of 18 $/kg, about 22 $/L, is only for the base electrolyte (i.e. no additional additives).

The separator is typically a porous membrane based on polypropylene (PP) and sometimes includes a polyethylene (PE) middle layer. PP and PE are very inexpensive raw materials and thus the suggested cost of $2/m² is in large part due to the manufacturing process required to form the porous network in the membrane. As competition and scale of manufacture increase, the prices of the separator may fall closer to $1/m². However, the cost of improved technology may offset some of this cost reduction, so we have retained our cost estimate of $2/m².

As safety is a major concern for Li-ion batteries, the separator plays a key role in isolating the oxidant from the fuel. If the two charged electrodes contact each other (short), then a run-away reaction is possible. Separators have been designed to “shut-down” or melt at key temperatures.

2) Electric Motor Used to Drive & Charge Battery: - The Technology used in this type of Electric Motor is IMA. Integrated Motor Assist. In this type of arrangement it will act as Engine drive & Battery Charger both it is mounted on the Crank shaft in place of flywheel it is also called Motor Generator Capacity of 10 kW & Assist Traction Motor.

**Working Description:** - Since the parallel hybrid system design is simpler, it can be made lighter and lower weight in turn helps in improving vehicle performance and fuel efficiency.

Since Engine is the main power source, To Power can be transmitted to the wheel directly for a motor sports more enjoyable driving experience.

**Pictorial View Of Integrated Motor Assist**

Instigated Motor Assist Electrical Motor or Generator

In this type of system, Electric Motor uses A.C Current as Motor to Produce A.C current as Alternator so Electric Convertor is used for covert A.C current to D.C for Battery charging & another converter is used to convert D.C to 3Phase A.C from battery. To Motor to run Vehicle as HEV. Hybrid Electric Vehicle. When Vehicle is used at high velocity above 60 kmph then Motor act as Generator & current convertor of 12v is used to charge other 12v Battery supplying power to ECM. Alternatively, other equipment like Ignition Coil sensor etc.
In such type of system a solenoid valve is used which can be used to cut off the Electric supply from Battery when Battery is 80% Exhausted.

In this system, 50% of the battery Energy is used to run Vehicle at constant speed 40kmph to 60kmph &rest 30% of Energy to30 – 40 kmph in city condition.

*Aluminium Body Construction figure*

**Chassis And Exterior Body:**

Exterior Body: - Exterior is made with Aluminum alloy with Monocoque chassis Technology Mono means single Coque means shell a shell like structure.

The body is made of Aluminium offering high-level rigidity & lightweight of body to enhance over all fuel economy handling and passenger safety.

Aluminium weight is one Third of steel weight. & in addition, to Aluminium alloy a highly and readily Versatile lends itself to wide variety of Manufacturing technique lastly Aluminium is recycled which helps in cost saving. The Aluminium body in white is the sheet metal & Doors, Hood etc is roughly 40% lighter than comparable steel body.

*Thin Film Photo Cell Pictorial View*

*Thin Film Solar Cell:*-

It is second-generation cell made by depositing one or more thin layer or thin film of photovoltaic material on substrate Such as glass plastic material. Copper Indium Gallium Selenide solar car CIGS cell uses an absorber made of copper indium gallium selenide CIGS while gallium free variant of the semiconductor material abbreviate.

(Cu Ag Av) (Al Ga In) (S Se Te) 2

CIS It is one of the three mainstream thin film technologies’ and other two Where cadmium Telluride and amorphous silicon with lab efficient of above 20%. A prominent manufacturer of cylindrical CIGS panel was bankrupt company Solyndra Infringement California trade fabrication involve vacuum processed including Co Evaporation and sputtering.
Thermal Photo Voltaic Cell Pectoral View

Thermo Photo voltaic (TPV):-Energy conversion is direct process from heat to electricity by photon A basic thermo voltaic system consist of a thermal emitter and photo voltaic diode cell, TPV device can extract energy from any emitter can be piece of solid material or a specially engineering structured & in this system three status is used Absorber.

Emitter.

Photo voltaic cell.

Absorber: - any material, which absorb solar heat or radiation from sun such as brine solution mixture of salt water is used. Or Air.

Emitter: - It uses poly crystalline silicon carbide Tungsten & rare earth oxide

Rare Earth oxide: - Such as ytterbium oxide YB$_2$O$_3$ and erbium oxide ER$_2$O$_3$ The most commonly used selective emitter of TPV Theses oxide emit an narrow band of wavelength in near infrared region allowing the trailing of the emission spectrum to better fit the absorber character of particular PV cell The peak of emission spectrum occurs at 1.29ev for YB$_2$O$_3$ and .87 ev for ER$_2$O$_3$

PV Cell Silicon Boron & Phosphorus for doping to form P,N Junction layer to create electron hole to flow electron in External circuit. The above photo voltaic cell is used at car roof for converting solar radiation to electrical Energy which produce DC current to be directly used for charging the battery of Hybrid car Which share 2% of energy or fuel used by car & in this system we use hot coolant liquid at 80C for the production of electricity to night or in cloudy condition.

Since roof of the car is small in area, it produces 1 kW of energy /square meter so our roof area is 2M$^2$ approximately so it produces about 2 kW / hr.

Solar Car Introduction:-

What Is Solar Car:-

A type of Renewable Energy in this case Solar Energy powers solar cars

Solar Photovoltaic Cell attached to the Car. Obtains this solar energy.

Presently, solar cars are mostly used for day-to-day transportation, but for analyzing and engineering exercises.

How does solar Car Work

Solar cars use the Solar cells to collect Energy from the Sun.

This solar energy is then stored in Batteries by the Electrical control system for the Car for running. The Mechanical Design of the car allows for maximum utility of the Electric energy Stored from the sun.

There are six ways to position Solar Panels:

Horizontal

Vertical

Adjustable

Integrated

Trailer

Remote

Position 1 of 6

Horizontal: - In this position; It gives maximum overall Power during the day in low latitudes or higher latitude summers and offers interaction with the wind

Vertical- In this position It can be found in free standing or Integrated sails to harness Energy this is most useful in Mornings, Evenings or Winters and when the car is pointing in the Right direction

Adjustable- In this position Solar Panels can be tilted around the axis of travel by electric motor or mechanically operated panel in order to increase power when the sun is low and well to the side

Integrated- In the position where a car’s surface area is covered with solar cells. Some of these cells will be at Optimal Angles while others are to be shaded depending on the Angle of the Sun.

Remote- In this option, the solar array can be mounted at a stationary location instead of on the car itself. Power can be maximized and the resistance is limited.
This grid connection does involve more electrical losses however with this true Solar Vehicles and Battery must be of larger capacity. The Electrical System stores all the energy gathered by the Solar Cells and turns it into “fuel” for the solar car to run on A side from the Solar Array, the electrical system is the most important part because it controls all of the power that comes into and exits the vehicle Battery pack- stores power gathered from PV cells Batteries- lead-acid, Nickel Metal Hydride, Nickel Cadmium, Lithium ion, Lithium Polymer

Optimal Design of Hybrid Solar Vehicles

In this optimal design a study on optimal design of a Hybrid Solar Vehicle is being performed at the University of Salerno Considering Performance Fuel consumption, Weight and costs of Components This study, that the determined Optimal Vehicle dimensions and Power Train sizing for various scenarios, has shown to economic feasibility Payback between 2 and 3 years could be achieved in a medium term scenario, with mild assumptions in terms of fuel price increase, Photovoltaic Efficiency improved and Photovoltaic cost reduced.

In prototype of Hybrid Solar Vehicle with series, structure has been developed within the framework of an Educational project funded by “Energy Conversion Systems and Their Environmental Impact This specifications of Prototype are presented in Vehicle layout is organized according to series Multi Hybrid architecture. With this approach, in photovoltaic panels photovoltaic helps to assist Electric Generator & give power to Internal Combustion Engine. By recharging the Battery in both driving conditions and parking Mode through the Electric Node. The Electric Motor EM can either provide the Mechanical Power for the Propulsion to restore a part of the braking power system during Regenerative braking system. In this structure, the Thermal Engine can work mostly at constant power, corresponding to its Optimal power Efficiency, while the electric motor is designed to assure to reach peak power of the vehicle.

In Scheme for the system to upgrade a Conventional Car to Multi Hybrid Solar Vehicle.

Analysis Of Pollution In India

As the pollution is the Metro Politian city like Mumbai, Delhi, Chennai, Hyderabad, Bangalore, etc is very high polluting city of India. This produces maximum pollution by Vehicle, which produces CO2, CO NOx, HC on burning of fuel. Since India is ranked third in most polluting country in the World Emitting 1297 Million tone of above gases on 2014 with increase in 43% of CO2 in every five year.

China ranked first with 2395 million tones with increase in 44% every five year of CO2 and USA on second position with 1403 million tones with down to 11% every five year & Russia ranked fourth with 449 million ton with 2% increase of CO2 every 5 year. So our goal is to reduce emission growth of India is to reduced to 15%
In every 5 year by development of Multi hybrid Technology to our Country & Implementation of pollution control laws by Euro VI standard. CO 1.0g/km, THC 0.1 gm / km NMHC 0.066g km

Comparative Study Of Convensnial I.C Engine With Hybrid & Multi Hybrid Cars :-

Sale of Hybrid Car in Different Country of Different model.

From the data & Bar Cart as shown below future of Hybrid Vehicle in North America Europe & asian county like China Russia. But in India the above vehicle are very costly around 21.60 lakhs & customer are on much awer of above Technecnology but upto 2020 the future of Hybrid or Multi Hybrid are bright.

### HYBRID CAR SALES IN YEAR 2014

<table>
<thead>
<tr>
<th>YEAR</th>
<th>USA</th>
<th>JAPAN</th>
<th>GERMANY</th>
<th>FRANCE</th>
<th>INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>290271</td>
<td>334000</td>
<td>83374</td>
<td>9399</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>274210</td>
<td>392200</td>
<td>10661</td>
<td>9443</td>
<td>163</td>
</tr>
<tr>
<td>2011</td>
<td>268752</td>
<td>316300</td>
<td>12621</td>
<td>13340</td>
<td>240</td>
</tr>
<tr>
<td>2012</td>
<td>434498</td>
<td>687800</td>
<td>21436</td>
<td>27730</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>495771</td>
<td>679100</td>
<td>26348</td>
<td>46785</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>452152</td>
<td>100000</td>
<td>27435</td>
<td>42813</td>
<td>0</td>
</tr>
</tbody>
</table>

### Share Of Hybrid Car Of Top Ten Models In Usa Market In 2015 Of Different Car Manufacturing Company

The above graph shows road map of reduction of CO$_2$ shows the road map of Global reduction of CO$_2$ Emission by year 2050 from 22200 Lit to 2960 Lit of CO$_2$ which is presently on year 2010 is 11470 Lit of CO$_2$ emitted. Globally from Vehicle so there is need of government & Industries to work together & reduce taxes on HEV / PHEV Vehicle and give extra price relaxations on above vehicle or for incentive scheme for government employee to for the purchase of above vehicle & promote the sales of vehicle from above graph it is analyze that in year 2050 there is high increase in emission of CO$_2$ so government have to keep check on above problem.

### Comparison Of Hybrid Vehicle With IC Engine With CO$_2$ Emission & Fuel Consumed In One Year

<table>
<thead>
<tr>
<th>CO₂ IN KG</th>
<th>COMBINE AVG KMPL</th>
<th>PRICE IN RS</th>
<th>FUEL USE IN 1 YEAR</th>
<th>COST OF FUEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3706</td>
<td>31</td>
<td>6000000</td>
<td>548.38</td>
<td>40580</td>
</tr>
<tr>
<td>2873</td>
<td>39</td>
<td>800000</td>
<td>435.89</td>
<td>37256</td>
</tr>
<tr>
<td>2040</td>
<td>42</td>
<td>700000</td>
<td>404.46</td>
<td>29952</td>
</tr>
<tr>
<td>2</td>
<td>56</td>
<td>950000</td>
<td>303.57</td>
<td>18821.23</td>
</tr>
</tbody>
</table>

HEV
PHEV
ICEV
MHEV
1) From above study we concluded that by Using Hybrid System, we could reduce the power of Conventional Engine to decrease fuel consumption of over Engine & use combined power of Motor &IC Engine.

2) By the use of above Technology and as discussed in detail in above Chapter we can reduce Fuel Consumption to 40 % and thus reduce consumption of Petrol &Diesel which is 3.5 Million Barrel per day in India is reused to 40% per day i.e. 2.5 million barrel per day when it capture 40% of Indian market & further reduce when it capture 60% of Indian market to 2 Million barrel per day.

3) With the use of above Technology We can develop the car of next generation called Multi Hybrid Car. Because In next 150 year the fuel we are using get, exhausted and available fuel is Hydrogen fuel cell produced by water, solar energy, & CNG gas. Etc. Therefore, we need to develop Technology, which can utilize above available resources such as Hydrogen or CNG as conventional fuel & Solar as second source of Energy plus PHEV for Hybrid car to Next generation .or combination of all above Technology Explain in thesis.

4) If we develop this type of vehicle up to 2019 then we can decrease the consumption of Petrol & Diesel up to 90% in India. Therefore, that Petrol & Diesel is available for long time to Next upcoming Generation.

5) By Implementation of above technology India can save about 50% of Import of Crude oil which is $150 Billion USD for 2015. So we can save $75 Billion USD many million dollar on Crude oil is saved per year.

6) By use of above Technology we can Produce low emission (LEV) Vehicle, Ultra low emission (ULEV) & Zero emission (ZEV) vehicle is possible to reduce CO2 emission level which is increasing 43% every 5year to reduce that to 15% this will provide great relief to Metro Pollitian city of India like Delhi, Mumbai, Kolkata, etc to reduce pollution by 50% from Vehicle Emission.

7) **Equation of Multi Hybrid Vehicle is** = PHEV + HEV IN PARALLEL ARRANGEMENT + THERMAL PHOTO VOLTAIC CELL + HYDROGEN OR CNG FUEL + LI-ION BATTERY FOR ELECTRICAL ENERGY STORAGE OF RATING 220V 20KW MILEAGE OF 55KMPL APPROXIMATELY

8) By the Implementation & development of above Technology we can generate about 86000 Jobs per year, which can solve some Un Employment problem of our country by different Manufacturing Company of vehicle & Its Ancillary, and Maintenance work of vehicle It is having bright future ahead. As Next generation Vehicle. In upcoming years.

Storage battery of Hybrid car is not produced in India so battery-manufacturing technology should be developed in India. & research work is needed so that it can be manufactured in our country. This will save expenditure on manufacturing & manufactured at lower cost.

We should develop Technology of Multi Hybrid Car using Hydrogen in Fuel cell Plus Solar energy plus Hybrid plug in vehicle with Hybrid Electrical vehicle shout develop for Next generation Car of zero emission to save environment from pollution. Lot of research is going on in above Technology. Still need more work & attention to be So that use of conventional fuel is stopped.

If the above Technology is develop for Car this technology is further develop to use in power generation or electricity generation for Industrial & Commercial use. Which can reduce the pollution produce by Industry & Thermal power plant. If we develop the combination of H2 + O2 by chemical, reaction to produce electricity than this system is used to change battery of car and run car based on electric Vehicle System.

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BIOGRAPHY

SHYAM SUNDER Completed his B.E Degree in Mechanical Engineering Branch from JTM COE FAIZPUR MAHARASHTRA India in 2000 and pursuing M. Tech in Thermal Engineering RGPV Bhopal M.P India. Shyam Sunder also completed MBA in Operational Management from Sikkim Manipal University gangtok HP, Shyam Sunder may be reached at Shyam.2010@rediffmail.comMob.No-9424476260