TECHNIQUE FOR ELECTRIC VEHICLE

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ABSTRACT

The efficiency and life of an electric vehicle. In hybrid type electric vehicle, batteries based on lithium-ion plays a major role and are very helpful. In enhancing battery life nanotechnology is playing a very important role. So in battery design the use of Nano structure materials are increasing. This paper describes different energy storage techniques, nanotechnology in lithium-ion(Li-ion) battery, configuration of parallel battery, batterycharging. Super-capacitors are used to enhance the efficiency, life and performance of the battery

Keyword : - ***Battery charger, Efficiency, Electric vehicle,***

1. INTRODUCTION

Hybrid electric vehicles are environmentally friendly. As population increases day by day, increment in vehicles are also increasing on same pace. This leads to an increase in transportation and it depends on fuels and cause environmental problems. To avoid such problems hybridelectric vehicles must be used. Efficiency of battery is used to calculate the hybrid electric vehicle performance. Hybrid electric vehicle uses different type of batteries for an exampleNickle-Mh battery, lead acid battery and so on. However, lithium-ion battery is most popular out of them. Improved performance of the battery such as high energy density,maximum life period, and increased capacity is demanding parameters for development of the vehicle based on theelectricity. In electric vehicles, the battery is a key component that calculates vehicle performance. Electrochemical systems consist of batteries and super-capacitors. Batteries and super capacitors are store and deliver energy. Depending on the requirement for particular application, storage capacity ofthe system becomes the main parameter that can be further scrutinized by the power density and power required

2. DIFFERENT METHODS TO IMPROVEEFFICIENCY

Different methods are discussed to enhance the performanceof the battery used in the electric vehicles.

A. The Hybrid Energy Storage System

The formation of source is the combination of solarphotovoltaic (PV), ultra-capacitor and battery. The battery isthe main energy source connected with the large capacitor.When it is stimulated, battery exhibits a source of energy.This system is very advantageous in terms of travel range,small size and large life. When solar irradiation is non- uniform, the power source is deficient that demands for the extra storage to eliminate the problem. Generally, V (valve)R (regulated) L (lead) A (acid) batteries are used. VRLAbatteries are added with super-capacitors, to construct an advanced hybrid storage system. Battery can behave like a constant origin of the source and the large capacitor willsupply instantaneous energy in the hybrid system. Embeddedsystem contains solar panels, energy holding devices,capacitor, and regulators. Sunlight sometimes not covers the entire system for better charging so, to charge the battery, the photovoltaic panel is not enough. DC to DC bi-directional conversion unit is required for handling the rotatory engine mounted at the vehicle As the use of aforementionedtechnique, overall efficiency is now boosting-up that result in high conversion of the energy by the solar panel

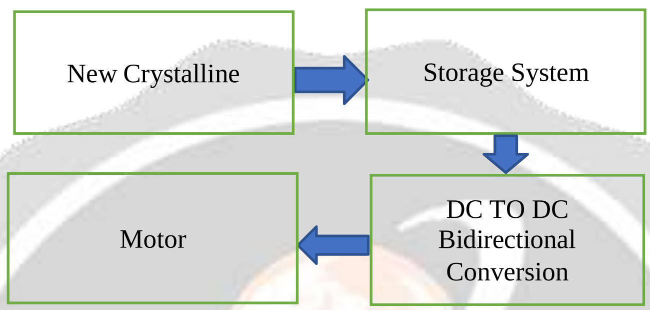

Fig 1 The Hybrid Energy Storage System

B. The Configuration Of The Parallel Battery

Demonstrates the proposed management system for providing the un-interrupted supply to the Li-ion battery while other unable to power the vehicle. In this proposed system, both batteries are connected in such a manner or in parallel that during the time of Pb-acid battery when it supplying the power to vehicle, Li-ion holds its state at rest. But when Pb-acid comes below its cut-off region and unableto power the vehicle, it must supply to Li-ion battery so that it can be boost-up to supply the vehicle. All the incorporatedcomponents and configuration are explored in the To enhancing battery life nanotechnology plays an important role. And how it is structured it matters on the material that isused. Anode-cathode is the main part of the battery. Use ofnanostructure materials on the anode and cathode make battery efficient. From a battery performance point of view it important to know that how it structured using Nano partial. To fulfill requirements for hybrid electric vehicles battery must be efficient. Lithium-ion batteries are some issues such as slower to charge, safety issues. To overcome these problems nanotechnology is used. This system makes use of nanotechnology that contains Nano partials, high valued capacitors that are useful to enhance the overall efficiency. Large amount of power can be store in lithium-Ion battery. For this, coated anode-cathode and Lithium Manganese Silicate (Li_2MnSiO_4) are used to improve the electro- chemical strength of the battery**.**

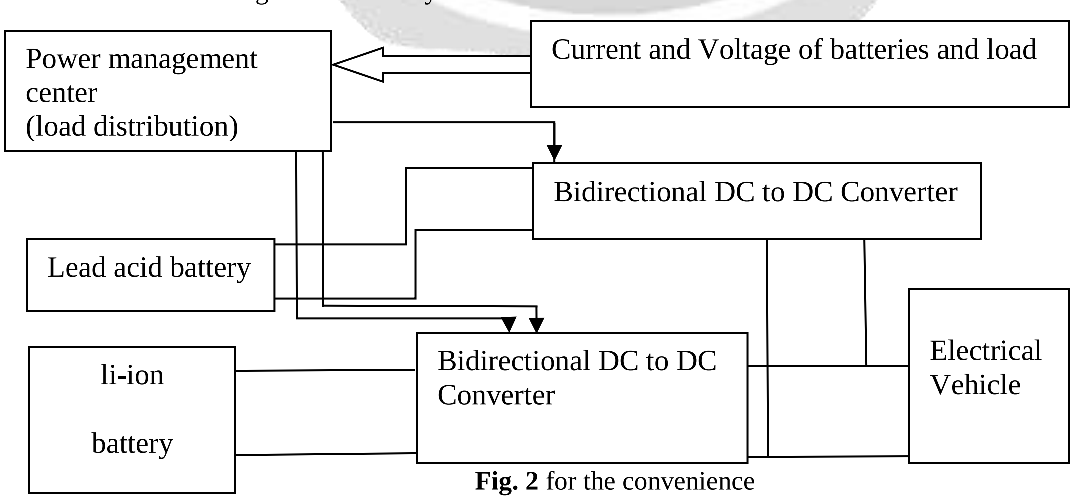

Fig. 2 for the convenience

C. Nano-Technology Enabled Hybrid Power System

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D. Battery Charging With Rest Periods

For enhancing battery performance authors consider a method that increases capacity and expands the life of the battery. This will be achieved for an electric vehicle battery by realizing the greatest charging profile and recognizing plugged-in time for an enhance durability & life. In this method, for a pre-set finite time the charger will charge and pause for the rest until fully charged . For electric vehicle batteries, there are some usual charging methods Uniform voltage: Battery charges at a uniform voltage for all kinds of batteries this is the suitable method. The battery charging current changes through the charging process. The drawbackof this method is, in the early stage of charging it requires very high power. Constant current: The voltage applied to the battery is controlled to keep constant current to the battery. Another method that can be implemented is constant V-I mechanism. Through the plugged-in procedure of a battery, constant-voltage and constant-current both the techniqueswill be used

3. SPECIFICATION OF THE POWER STORAGESYSTEM

- Storage Capacity: Amount of power consumed after charging the battery.
- Available Power: Expressed as an average value orpeak value, used to express the highest power of charge or discharge.
- Power Transmission Rate: Time required to extracting stored energy.
- Efficiency: Energy utilization compared to the stored one.
- Autonomy: System can continuously release energyin maximum amount of time.
- Self-discharge: Portion of stored energy dissipatedduring ideal time

4. TECHNOLOGY STATUS AND PERFORMANCE

The term “electric vehicle” (EV) typically means a vehicle with an electric drive (motor) propulsion system that can be plugged in to recharge the batteries that provide at least some of the energy storage on the vehicle. There are two main type, and plug-in hybrid electric vehicles (PHEV) that have both batteries and liquid-fuel storage systems and that can either be plugged in or refueled with liquid fuel to increase energy stored on the vehicle. Regular (non-plug-in) hybrids also have an electric drive system, but no plug. They rely on liquid fuel to recharge the batteries on board the vehicle, along with features such as regenerative braking. PHEVs typically are provided with a much smaller battery pack than BEVs, since they also have an internal combustion engine operating on liquid fuel. The vehicles may have a shorter driving range on batteries but usually have a longer overall driving range vehicles due to the liquid fuel typically similar conventional vehicles

5. CHARGING TECHNIQUES AND STANDERDS

There are four key standards related to safety, installation andconnection of the Electric Vehicle Supply Equipment EVs typically charge from conventional power outlets or dedicated charging stations, a process that typically takes hours, but canbe done overnight and often gives a charge that is sufficient for normal everyday usage. To date, mainly three charging techniques are available.

Conductive charging, this is a direct electrical connection (typically through an insulated wire/cord set) between the source and the charging circuitry. The circuitry and its controls may be housed within the vehicle or external to it. are compatible with All new EVs this approved standard. There are three modes of

EV charging:

In Standard mode, AC Level 1 supplies 120V single phase power at up to 12 Amps. For example, a Nissan Leaf with its battery charge totally depleted would take about twenty hours to completely recharge. Meanwhile, Semi-Quick mode provides up to 3 phases 32A current. It takes much shorter time to charge electric vehicles compared to standard charging.

And finally, Quick mode uses a specialized fast charger connected to a high powered electrical source; the high powergreatly reduces charging time. Nevertheless, it requires infrastructure investment, spaces and extra costs. It is suitablefor emergency charging purpose

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The actual charge time will vary based on the charge level and condition of the batteries

Inductive charging: No wiring is required; instead the energy is transferred between the charger and the "Paddle" inside thevehicle's inlet via a magnetic field generated by a high AC current.

Inductive charging:

is still expensive and complicated to set up for end user. Batteries swapping: Instead of recharging EVs from electrical socket, batteries could be mechanically replaced in a couple of minutes in some special stations. Here battery size and geometry should be standardized in order to relay on Battery swapping technique

5. COSTS, MARKET AND CONSUMER

Two main factors are needed to make the deployment of EVsa success: support of government actions and popularity with consumers. This means they must compete well with conventional vehicle models; thus they must have desirable attributes such as an enjoyable driving experience, sufficientdriving range, and good "green" credentials

6. Comparing Major Available VEs: Advantages & Disadvantages

TECHNOLOGY	ADVANTAGES	DISADVANTAGES
Hybrid ElectricVehicle	Reduced fuel consumption and emissions; Possibility to recover energy from regenerativebraking	Higher initial cost;Component availability; Build complexity involving two power trains(Transmission Energy loss)
Battery ElectricVehicle	Possibility torecover energyfrom regenerativebraking; Lower operationalcosts; Quietoperation	Short distance range;Battery technology still to be improved; Public recharging infrastructure to be improved.

Solar Electric Vehicle	Able to utilize their full power at any speed, do not require any expense for running, quite, requires very low maintenance, no harmful emissions.	Don’t have speed or power that regular cars have, can operateonly in sun

7. CONCLUSION

In the near future, combining diverse energy sources and powertrains in optimal way, as well as performing an accurate and robust power management control algorithm, will be essential to build a reliable and affordable EV while preserving our environment and intelligently using our limited resources. Many different approaches have been proposed to enhance our understanding of the fundamental vehicle system performance challenges. But among all the control methods, each control technique has its advantages and disadvantages. As a first step in improving PMCalgorithms, our future work will focus on enhancing power management supervisory level taking advantage of today’s respectful achievements and aiming to optimize a multipower source management in BEVs and HEVs.

This enhancement will take advantage a whole new area: Smart PMC through vehicles’ intercommunication and PM experience sharing; the vehicle will be able, not only to learn from its own experience, but also from other EVs’ experience with a comprehensive breakthrough communication system and a cloud experience database

8. ACKNOWLEDGEMENT

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9. REFERENCES

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