EXPRESSION OF INTEREST (EOI)

PRE-ELECTRIC CAR

BY

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Introduction:

India is a developing country and the major factors for developing India or growth factors are GDP (gross domestic production), industries, natural resources and its utilization, population and manpower resources, capital formation, and capital accumulation, capital output ratio, and technological advancement. But to fulfil these needs from the above sources a negative aspect is introduced. That is the pollution from industries so to overcome the negative aspect and for better and healthy future our team has contributed a small innovation for electric vehicle technology.

An electric vehicle (EV) is a vehicle powered by various types of an electric motor, instead of an internal combustion (IC) engine, and electric motor is run by using power which is stored in batteries. The batteries have to be charged frequently by plugging it into any mains (120v or 240v) supply. EV has much longer history than most people realise. The first known

electric car was a small model built by a professor in 1835. The EV as built in 1834 by Thomas Deventhor in the US.

EV's are known as zero emission vehicles (ZEV). EVs are also more energy efficient than gasoline engines and they are very quiet in operations.

This electrical energy is used to power an electric motor which then turns the wheels and provides horizontal propulsions. Since no fuel is burned in an EV, they don't produce the pollution like the IC engine vehicles do.

Concept:

As India is developing we also want to develop or upgrade our innovation in electric vehicle.

So, in upgradation we design an electric vehicle which is very efficient as compare to others electric vehicle. The purpose of doing that is to achieve the concept vehicle which having many specifications like to reduce battery space, compact and sporty design of EV, fast charging system, more miles per unit charge, maximum space accommodation to design, least running cost, easily accessible service centre*, affordable maintenance, etc.

Battery pack:

Battery pack which is used in the pre-electric vehicle is made up of many lithium ion battery cells. These lithium ion cells are connected in parallel as well as series connections through the copper wire and this battery pack is fixed in space, which is available between front seats of EV and back seats, that's why this battery pack does not required more space like lead acid battery required. The much greater density is one of the chief advantages of lithium battery. Also, lithium ion cells having much lower rate of self-discharge than that of other rechargeable cells. There is no requirement for priming of lithium ion cells. Another advantage of li-ion batteries is that they do not require maintenance to ensure their performance.

Fast charging system:

Charging point is an element in an infrastructure that supplies electric energy for the recharging of electric vehicle.

The charging time depends on the battery capacity and the charging power. It can be calculated using the formula:

Charging time (h)=Battery capacity[kWh]/Charging power[kW]

For normal charging (up to 7.4 kW), car manufacturers have built a battery charger into the car. A charging cable is used to connect it to the electrical network to supply 230volt ac current for quicker charging (22kW, even 43kW and more)

Currently charging stations are being installed by public authorities, commercial enterprises and some major employers in order to stimulate the market for vehicles.

Currently ongoing research for charging infrastructure:

A costly charging of electric vehicle and slow charging is the main point of electric vehicle, due to which electric vehicle have a bad image in India.

For solving this problem, according to the research charging stations are connect to the Earth by some means because the Earth is the large reservoir. According to our electrical technology's theories we assume the Earth having 0 volt and by the pre-electric system, the current is provided to the charging stations and further this current charge the vehicle in minimum time as compare to nowadays charging stations take time.

That's why this electric vehicle will be known as highly efficient electric vehicle. And running cost of this vehicle will be least.

Affordable maintenance:

This electric vehicle is made by keeping in mind that the cost of maintenance of this electric vehicle must not be high so that every average family can purchase it.

Design and Implementation:

The main parts of prototype pre-electric vehicle are as mention below:

BLDC Motor:

Brushless motor also known as electronically commutated motors powered by dc electricity via a controlling unit, BLDC motor are high power to weight ratio, high speed and electronic control.

Controlling unit:

The controller gets its power from an array of battery pack, further provides current to the BLDC motor.

DC/DC convertor:

It is an electronic circuit or electromechanical device that converts a source of direct current from one voltage level to another level.

Gear box:

It is used to easily transfer the power from motor to axles.

Aerodynamic structure:

The body designing of pre-electric vehicle is based on the aerodynamic factors for reducing air drag, wind noise, minimizing noise emissions and preventing from undesired lift forces and other causes of aerodynamic instability at high speed.

Application areas:

- Pre-electric vehicle will be use in commercial as well as public sectors.
- At the starting, the vehicles will be given to the cab companies by 15 days trial pack.
- In government offices etc.

Advantages:

1. Harmful pollutants can be reduced.
2. Easily affordable.
3. Low maintenance cost.
4. High torque.
5. Long lasting battery life.
6. One time charged for running 250-300 km.
7. Highly efficient.
8. Having quick charging system. Etc.,

Comparison with similar electric vehicle:

Here, the pre-electric car is compare with the Mahindra's Reva car,

- Battery backup of pre-electric car gives range from (250-3000) km while Reva gives above 120 km.
- Top speed of Reva is 80 km/h while pre-electric gives (130-150) km/h.
- Reva car is charged in 8 hours while pre-electric charged within (2-3) hours (standard charging system) and through fast charging system less than 50 minutes (approximate).
- Reva car is 2-seaterHatchbag while pre-electric has sedan type body design.
- In Reva car, lead acid batteries are used while in pre-electric car, lithium ion batteries are use.
- Cost of the Reva car is 3.76 lacs (on road prize) while cost of pre-electric 9 lacs (approximate on road prize).
- Kerb weight of the Reva car is ~400 kg while pre-electric's kerb weight is ~900 kg.

Future scope:

- Electric vehicle will achieve market value like gasoline car's market value.
- Electric vehicle will not be expensive, because of the battery and charging infrastructure.
- Electric vehicles will easy to affordable.
- Through the electric vehicle, air pollution will be control as much as possible. It delivers the healthy environment for the people.

Estimated cost:

S. NO.	ITEM/ MATERIAL NAME	PROPERTIES	COST(INR)
1.	BLDC & CONTROLLING UNIT	72V, 20KVA	1,81,780/-
2.	LITHIUM ION BATTERY	12V,25A	50,000/-
3.	WIRING	_____	10,000/-
4.	BODY DESIGN MATERIAL	_____	162220/-
5.	GEAR BOX	GEAR REDUCER	11,000/-
6.	CHARGER	1.5 Kw,24-120vdc	15000/-
7.	OTHER ACCESSORIES	_____	20,000/-
		TOTAL	~ 4,50,000/-

REFERENCES:

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