



# A Concept on Time Saving Charging Station for Electric Vehicle

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## **Abstract:**

As we all know that Electrical Vehicle is playing an important role in Today's and tomorrow's world So there are been a lot Research in electrical vehicle but the main issue is about the charging station which will be the main issue in the infrastructure so there is an solution for the time saving for the people in case a person is travelling from one city to another city he/she knows that how much kilometer will the battery last for so we will provide such an option that he/she may prior only book an appointment on charging Station from his car so, when he will reach the station the battery will be exchanged with the charged battery. so, there will be a lot of time saving this was a one condition of my idea. The second condition is such that if a person is travelling by his car when the battery is low to 35% his car will show an indication to him/her and send an automatic message to the nearby station with the details of the car owner car model, battery type and etc. which will help the station worker to keep a battery ready by charging it so once the car reach the station the battery will be exchanged easily without any wastage of time. The Third condition is such that if one is traveling by his or her electric vehicle and if the battery gets discharge and small amount of energy from the battery using that energy and fast SMS will be send to the nearby charging station which will solve the problem of the travelers and will not be panic and his or hers help a team of people from charging station will contact him and come to his cars location with the charged battery and then exchange the battery with the charged one this will save the time plus help the travelers a lot without getting any type of tension. I Think that each and every electric car should be given a bar code which will be helpful for the charging station for getting information about the owner car model number by scanning the barcode and also direct transaction will be possible from the account of the by the help of barcode so there will be a lot of time saving.

## **1. INTRODUCTION**

An electric car is an automobile that is drive by one or more electric motors, using energy stored in batteries. Compared to internal combustion engine vehicles, electric cars are quieter, have no exhaust emissions, and lower emissions overall. There is now use of fuel its totally work upon the energy store in the batteries. electric car uses alternate fuel electricity instead of petrol or diesel. In the 21st century, EVs have seen a resurgence due to technological developments, and an increased focus on renewable energy and the potential reduction of transportation's impact on climate change and other environmental issues. Project Drawdown describes electric vehicles as one of the 100 best contemporary solutions for addressing climate change due to increasing public interest and awareness, such as those being built into the green recovery from the COVID-19 pandemic, is expected to greatly increase the electric vehicle market. As electric vehicle manufacturing is becoming popular every day, its market share is also expected to rise greatly.

By the year 2030, the NDA Government wants India to be 100%, electric vehicle nation. Indian government spent Rs 4.7 Lakh Crores in 2016-17 in importing crude. Aim of the 2030 vision is that Every car sold in India from 2030 will be electric, under new government plans. Indian government aims to become a 100% electric vehicle nation by 2030. The National Electric Mobility Mission Plan targets seven million electric and hybrid vehicles by 2020. India's auto industry has become one of

the largest in the world due to the competitive environment in the market. Electric vehicle is the best option to keep our environment eco-friendly. also, it has a lot of advantages which is best for us. As per the vision of Indian government the number of electric cars, buses, vans and heavy trucks on roads is expected to hit 145 million by 2030. An electric vehicle charging station is equipment that connects an electric vehicle to a source of electricity to charge electric cars Charging stations are also called electric vehicle supply equipment. Public charging stations are typically found street-side or at retail shopping centres, government facilities, and other parking areas.

An electric vehicle requires bringing together high energy electrical components on the vehicle board and it is this usage of high-power components and systems developing high performance and environment friendly transport system. Additionally, the industry is witnessing a lot of research in the battery efficiency. new battery technology, designing procedures to make the vehicles more powerful. These high voltage batteries demand continuous monitoring and controlling of various parameters in each cell is very crucial for a safe operation. Further, the vehicle incorporates protection circuits to safeguard the battery in case of any failures from electrical, mechanical and temperature variations.

For a smooth and safe operation of the vehicle, all the electrical parameters of the battery should be in specified limits while in stationary or moving condition. Therefore, electric vehicles make use of Battery Management System (BMS) to monitor the different parameters of each battery cell and control the parameters within their prescribed levels during charging and discharging procedures. Battery management system continuously observes the current, voltage and temperature parameters in each cell and controls these accordingly for the safe operation of the battery pack. BMS performs the other tasks such as balancing of cells, communication with different parts of the vehicle, maintain the battery parameters so that battery operates within permissible limits and updates the driver about the risk and failure conditions from time to time.

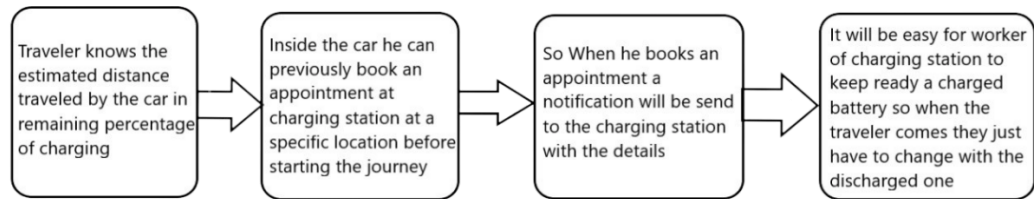
Charging stations are classified into different basis such has Ac charging station which includes on board charging another one is Dc charging station which is said to be faster and more convenient to use than Ac charging system another one is solar based charging station which is the future pf charging station due to its advantages and availability of plenty of sunlight. Charging station have different technologies which is classified has conductive charging which is further classified has Level 1 Level 2 Level 3 another technology is such that wireless charging which is classified has inductive capacitive and resonant inductive the third technology is such that Swapping of battery which is the idea we are going to use in our topic. Swapping of battery means to swap the charged batter with the discharged one this technique be done in lesser period of time and call be convenient to the people lets look out idea in detailed in further methodology.

## 2. RESEARCH METHODOLOGY

For understanding and convenient purpose, I have classified my idea in three conditions come let's look out for it:

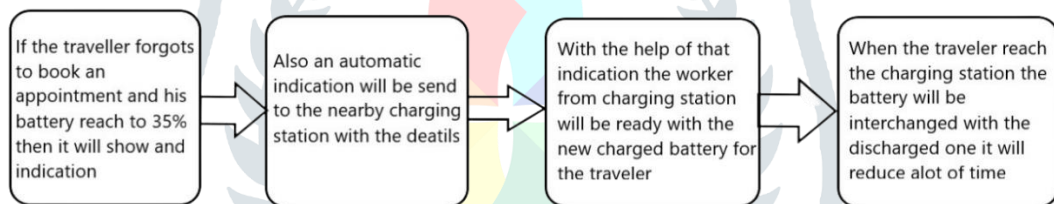
- Condition one:

Lets say that a person has his plan to travel from one city to another by his or her electric vehicle he or she have an idea that how much kilometre will his vehicle travel and where he must charged his vehicle so for this type of scenario using of new technologies an electrical must be inbuilt in such a way that a screen must be provided where he she can book an appointment from his or her vehicle at the charging station before starting the journey this will help the charging station workers will the idea about the vehicle and the details of the vehicle and they can be ready with the charged battery to swap with the discharged battery this charging can be done by the use of solar energy so once the car reaches the station they don't have to wait over there and the workers will instantly swap the batteries this will be an time saving process and there will no type of any issues or traffic.



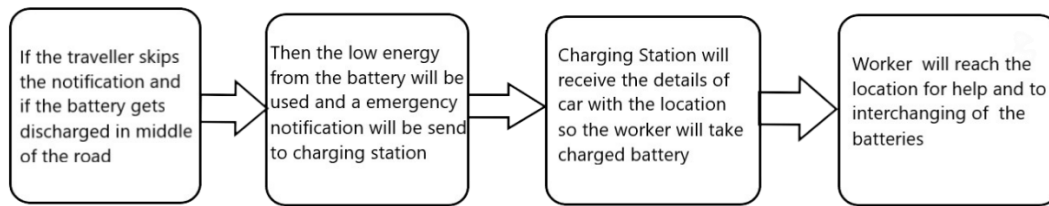
- Condition two:

Has we saw in above condition if one forgets to book an appointment by using technology software's and GPRS Once the battery reaches the 35% of charging then an indication will seen in the vehicle and the nearby charging station will automatically get the information about the vehicle and the battery details and owner details so it will be convenient to the workers to instantly charge and keep ready a battery so the traveller reaches the station till then a battery will be ready for him and there will be no wastage of time from both the traveller and worker side. And the automatic notification received had the charging station address will be shown to the traveller and if the traveller doesn't want to stop or charge his or her battery there will be option given by using it, he or she may cancel the request made to the charging station.



- Condition Three:

We talked in above scenario if he or she declines the request and travels further and in case his or her vehicle gets discharged in the middle of the road so there is no need to get panicked the little amount energy in the battery with the help of that energy and immediate notification will send to nearby charging station which will help the charging station worker to get the exact location of the vehicle and the vehicle and battery details so that will make a contact with the traveller and a team of worker will take and charged battery and reach to vehicle and the process of battery swapping will be done but extra charges will be taken in such cases.



So, this are the conditions which I have tried to cover and another concept is such that the payment process from my point of view each electric vehicle must have a barcode on it so when it passes by the charging station tolls and etc. the barcode will be scanned and directly the account will be detected from the owners account which will make a healthy process and there will be no wastage of time and no traffic or any other issues.

### 3. Area of Paper:

- Electrical Vehicle Technology
- Electrical Vehicle Charging technology
- Time management and saving technology

### 4. Features of the Paper:

- Due to this technology, there will be a lot of time saving
- This technique will solve many highways problems
- Fast Charging Process can be adopted.
- With the help of solar charging can be done without any harm to nature
- It will solve the problem of employment many people will get a job.

### 5. Advantages:

- A Great way to save time in day-to-day life.
- It will be convenient to use.
- Discharged battery can be charged using solar energy.
- The Best part is you will no longer need to run to the fuel station to recharge your vehicle before hitting road.
- More employment in various sector will be made.
- Due to barcode, there will be no chance of misplacing the car and will be found easily

### 6. Limitations:

- Once the battery gets damage swapping cannot be done.
- It might be a little bit costlier
- Due to GPRS one can easily found the location of the vehicle for misbehave purpose

## 7. Result and Conclusion:

- **Result:**

Electric vehicle charging station technology can promote smart grid planning and construction, accord with current energy utilization patterns of energy conservation and emission reduction. It is a major strategic measure of implementing the Scientific Outlook on Development, carrying out national energy development strategy, and fulfilling social responsibility, which has the remarkable social benefits and economic benefits. As we know charging of battery or electric vehicles requires a huge time so there will be a rush on charging station so to handle the rush and to reduce the time this process can be adopted

- **Conclusion:**

As Indian Government is planning to make all the vehicles into electrical vehicle so from this paper, we can conclude that the rush and the time both can be handled properly and a lot of time can be saved of the traveller and it will also be easy for the charging station worker to handle the station and to charge the battery easily by using solar energy. By adopting this the problem of employment will also be solved because this idea requires all field of knowledge for example for charging and maintaining electrical engineers will be required to manage and send and book the appointment Computer engineers will be required so I conclude that this will be a best idea for time saving and handling the rush on charging station this will make the world a little bit faster.

## 8. ACKNOWLEDGMENT

I Ms. Ankita Anil Matsagar shows deep sense of gratitude, I would like to thank all of my dear friends who helped me out there for the publication of the paper.

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