



# ELECTRIC VEHICLE USING RENEWABLE ENERGY SOURCE

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## ABSTRACT:

The ever-rapidly growing transportation sector consumes about 49% of oil resources. Following the current trends of oil consumption and crude oil sources, the world's oil resources are predicted to be depleted by 2038. Therefore, replacing non-renewable energy resources with renewable sources and use of suitable energy-saving technologies seems to be mandatory. **Electric vehicles (EVs)** as a potential solution for alleviating traffic-related environmental problems have been investigated and studied extensively. Compared to ICEV, the attractive features of EVs mainly are the power source and drive system. Electric vehicles (EVs) have been researched extensively as a promising way to reduce the greenhouse effect. This vehicle also provides a safe driving experience to a driver with a disability.

## 1. INTRODUCTION:

An electric scooter is a battery-operated one-person capacity vehicle that is specially designed for people with low mobility. It is generally used by those who have difficulty walking for long periods. Scooters are available in three common designs, those intended for indoor use, those for outdoor use, and those that are used for both. An electric scooter may have three or four. Since it runs on battery power, it does not create pollution. The servicing requirements for electric vehicles are lesser than conventional petrol or diesel vehicles. Therefore, the yearly cost of running an electric vehicle is significantly low. So, behalf of these advantages, we have chosen this project

## 2.LITERATURE REVIEW :

Conventional vehicles offer many advantages like long drive range, good performance, and easy refueling. Hence, they are dominating the vehicle market. However conventional vehicles have limitations such as air pollution and inefficient usage of fossil fuel. The necessity of the hour is fuel efficient and low-emission vehicle without sacrificing the vehicle's performance, reliability, and safety. Pollution problems can be minimized by using zero-emission electric vehicles (EV) at the cost of a limited drive range [2-3]. Reduction in Green House Gas (GHG) emissions, increase in oil prices, and dependency on foreign oil are major incentives for the development and deployment of Electric Vehicles (EVs). Compared with conventional vehicles, generate considerably low noise, greenhouse gas, and ozone-precursor emissions [4-8]. Electric motive power started in 1827, when Hungarian priest Anyos Jedlik built the first crude but viable electric motor, which used a stator, Rotor, Commutator, and the next year he used it in a small car [9]. In 1835, Professor Sibrandus Stratingh of the University of Groningen, in the Netherlands, built the small-scale electric car, and sometime between 1832 and 1839, Robert Anderson of Scotland invented the first crude electric carriage, powered by non-rechargeable primary cells American blacksmith and inventor Thomas Davenport built a toy electric locomotive, powered by a primitive electric motor, in 1835. In 1902, the Studebaker Automobile Company entered the automotive business with electric vehicles, though it also entered the gasoline vehicles market in 1904. In 2009, During the summit, Copenhagen climate conference more than 70 countries developed plans to eventually reach net zero. For many countries, adopting more EVs will help reduce the use of gasoline. Asif Faiz; Christopher S. Weaver; Michael P. Walsh (1996). Air Pollution from Motor Vehicles: Standards and Technologies for Controlling Emissions. World Bank Publications. p. 227. From the original on 4 July 2021. Retrieved 4 December 2017. Hamid, Umar Zakir Abdul (2022). "Autonomous, Connected, Electric and Shared Vehicles: Disrupting the Automotive and Mobility Sectors". Retrieved 11 November 2022[10].

### 2.2. RESEARCH METHODOLOGY

The research methodology is carried out based on the following:

- 1. Data gathering:** The data for this research is gathered through the review of existing documents on Electric Vehicle, uses and kinds of solar, wind, and automatic braking system, and the economic importance of electric vehicles through searching books, articles, journals, and manufacturer web sites and also domain expert was interviewed to find out how things are currently done.
- 2. Data Analysis:** Data analysis is done through a feasibility study to determine if this project work is worth doing and how to carry out this project at a reasonable cost. This helped in this project based on cost, reliability, compatibility, and availability criteria. Technical, economic, and operational feasibility questions were addressed.

3. **Coding:** The Arduino board would be coded using the Arduino IDE which is based on C programming to drive the Arduino microcontroller and controls the two-way DC-DC converter and sends the speed comparison signal to the frequency converter. Furthermore, electrical and mechanical parameters such as voltage, current, and speed have been observed.
4. **Testing:** Both unit and system testing would be performed to ensure the proper functioning of the hardware components and software of the system.

## MATERIALS AND MODEL

### Hardware components:

#### Rechargeable Battery:

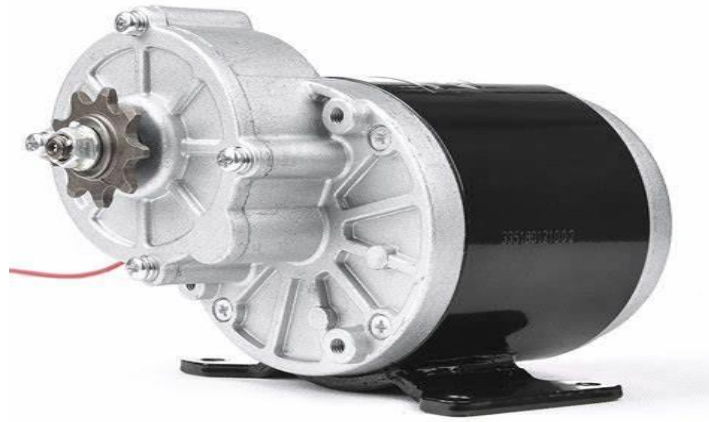
A rechargeable battery, storage battery, or accumulator is a type of electrical battery. It comprises one or more electrochemical cells and is a type of energy accumulator. It is known as a Secondary cell because its electrochemical reactions are electrically reversible. In this project, we are using a 12v,7A led dry acid battery.



**Fig: Rechargeable battery**

#### D.C Motor:

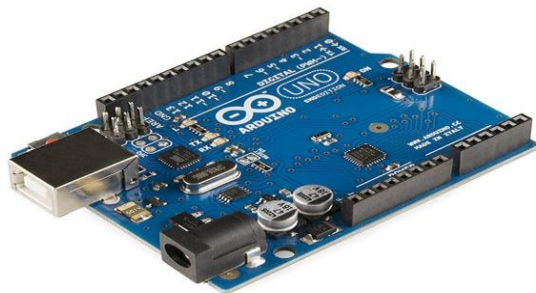
The DC motor has two basic parts: the rotating part called the armature and the stationary part that includes the wire coils. The stationary part is also called the stator. Figure shows a picture of a typical DC motor, 24V, 250 W DC Motor is used.



**Fig: DC Motor**

### **Arduino Uno board:**

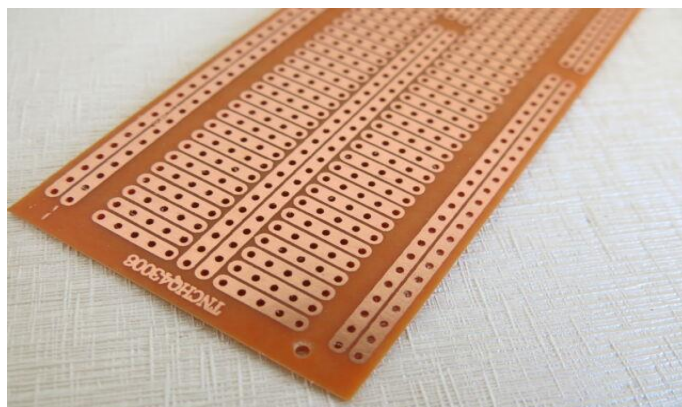
Arduino is **an open-source hardware platform** that is readily available for hobbyists & enthusiasts across the globe to build projects. It comes with an ATMEGA microcontroller that processes the data and facilitates the proper working of the IoT system.



**Fig: Arduino Uno**

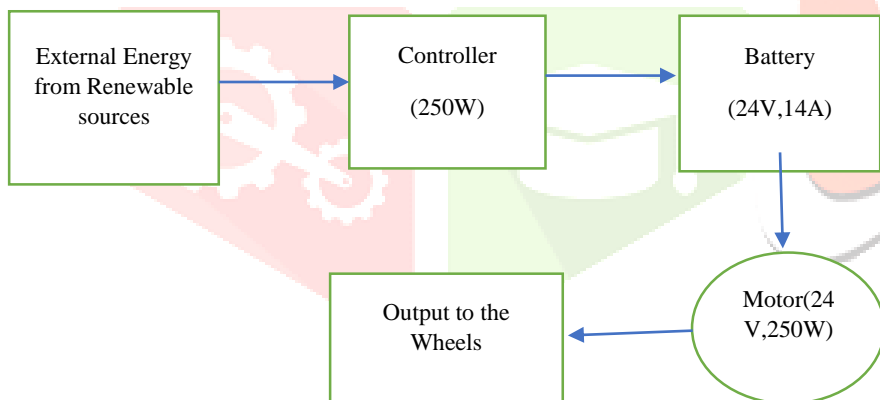
**Printed circuit board (PCB):**

It also **printed wiring board** or **PWB**) is a medium used in electrical and electronic engineering departments to connect electronic components in a controlled manner.

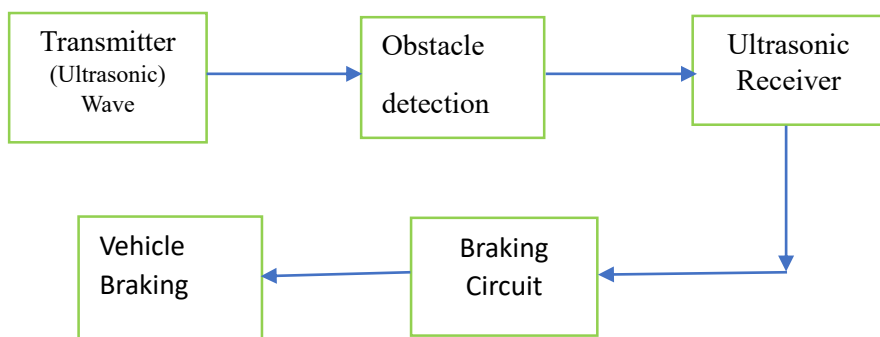


**Fig: PCB**

**Block Diagram Of EV:**



**Block Diagram Of Automatic Braking System:**





**RESULT:****CONCLUSION:**

We have demonstrated how an electric vehicle can be built by using existing renewable energy Resources around us. Our electric bike provides a low-cost and convenient form of private mobility and is thus an attractive alternative to public transit or regular bicycling. 70% of users had Switched from public transport and bicycle. Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel. Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements. With the headway of innovation, the future of electric Scooters seems to be bright. Well, for its Worth, scooters have been the cheaper alternative for getting from one point to another. And to put better motors, batteries, and revamping the entire structure of the present electric scooters could prove to be vital in the future. Thus, the future holds strong for these scooters as the government is pushing hard for an EV revolution, and there are numerous amounts of EV charging stations coming up as well. Not just e-scooters, the entire vehicle industry is currently on the rise and would continue to do so if the government introduces some policies that facilitate the manufacture and sale of these vehicles. With deteriorating air quality and increasing traffic becoming the most alarming concern in all major Indian cities, e-scooter definitely hold the potential to emerge as the cleaner and viable alternatives to petrol and diesel-run personal vehicles.

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