

# Frictionless Electricity Generation by Using Flywheel For Electric Vehicle

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**Abstract:** *The intention of this project is to build a straight forward powered generator from a used bicycle wheel and to use it to power light bulbs, cell phones, laptops, and other small appliances. This project will help to develop engineering skills while learning about a clean way of generating electricity and satisfying our basic requirement. We are going to use the hard drive magnet and inductive coil to generate electricity due to which our mobile phone will be charge and followed by ac to dc converter. This is totally clean way of generating energy. As fuel is not a renewable energy source and the prices are increasing day by day. It will not be affordable by a common man after some period. Here no fuel is required to generate electricity, so everybody can afford this method for power generation also it eliminates the emission of CO<sub>2</sub> which will reduces the pollution. Conventional methods for generating electricity make use of dynamo and wind turbine, but they have disadvantage that they produce friction and reduces speed which require more efforts. For the project to work we need strong electromagnets so we have used Neodymium magnets and also used coil. The basic idea of this project comes from the functioning of motor, that is how it rotates in the magnetic field and cut's the magnetic line and how flux is introduced into the coil. The motivation behind the project is to generate electricity without having any friction and without using natural resources.*

**Keywords:** *Flywheel, Electricity, Renewable Energy, CO<sub>2</sub>, Flux.*

## I. INTRODUCTION

This is a mechanical device which uses the wheel to store energy in the form of inertia. In this system we applied an additional energy source to start the main motor like electricity. In this system main motor is used to drive a series of pulley and belt arrangement which forms a gear train arrangement which produce a twice/ thrice speed at the shaft of generator. The significant thing about the system is that the electricity generated at the output of the shaft is more than that of input. The inertia of wheel can be increased by increasing the radius of wheel and weight of wheel. It also increases if the wheel weight is concentrated as far out toward the rim of the wheel as is possible. Firstly, the requirement for an effective system needs to be a suitable wheel with a large diameter and vast majority of the weight needs to be close to rim. The construction needs to be robust and secure as ideally.

The rate of rotation will be as high as possible as the weight on the wheel is concentrated outward of the rim which needs to be exactly at right angles to the axle on which it rotates and exactly centered on the axle. The main motor is at low speed, low voltage input motor, the generator is high speed, and high voltage output generator. Therefore, when we apply an extra energy to the main motor it starts running, which causes to rotate the wheel. When the motor is reaches the highest speed (constant speed) we switch the power by applying the electrical energy generated by the generator. We add the extra thing in the system like transformers, rectifier, inverter etc. to run the system and take the efficiency output. Electric trains, cars, and other electric vehicles are powered by electric motors connected to batteries. When we're driving along, energy flows from the batteries to the motors, turning the wheels and providing us with the kinetic energy we need to move. When we stop and hit the brakes, the whole process goes into reverse: electronic circuits cut the power to the motors. Now, our kinetic energy and momentum makes the wheels turn the motors, so the motors work like generators and start producing electricity instead of consuming it.

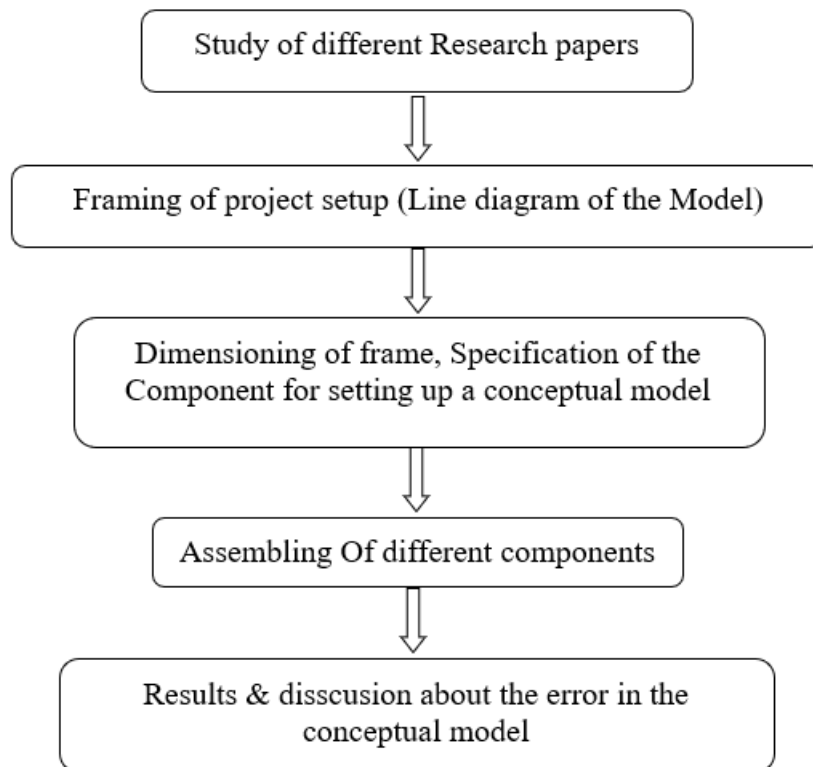
Power flows back from these motor-generators to the batteries, charging them up. So, a good proportion of the energy we lose by braking is returned to the batteries and can be reused when we start off again. In practice, regenerative

brakes take time to slow things down, so here our system zero friction no physical contact of vehicle connected, the wheel plate just connected parallel with the type shaft to get the good output continuously even when there is braking.

### II.OBJECTIVE

The main aim of this project is to develop much cleaner cost-effective way of power generation method, which in turns helps to bring down the global warming as well as reduce the power shortages. In this project the conversion of the force energy in to electrical energy by using electromagnetic induction. The control mechanism carries the copper coil, bar magnetic and dc rechargeable battery.

### III. METHODOLOGY



1. We have used the wheel of cycle which is linked to the pulley installed on the same shaft and its diameter is less than the wheel diameter due to which its velocity of rotation will be increased. The wheel of cycle rotated by electric motor by using belt and pulley arrangement.
2. There is a circular wooden plate on its periphery neodymium magnets are mounted which is inter connected to the wheel. As the wheel rotate the neodymium magnet plate also rotate due to their physical contact.
3. There is another wooden plate with copper coils on its periphery which is stationary plate and placed slightly apart from neodymium magnets plate.
4. As neodymium magnet plate rotate with wheel due to this rotating magnetic field produced which induced emf in a stationary copper coil, according to Faradays law of electromagnetic induction.
5. This generated AC voltage converted into Dc voltage by AC to DC converter used in battery charging unit which is further stored in a battery.

#### IV.WORKING

To avoid Dynamo mechanism we have designed this system, in this we are replacing the conversion of energy to mechanical energy and then electrical energy we directly converting kinetic energy to electrical energy hence there is no chance of energy loss and we get 100% energy output without any friction and no effect to other parts by using this energy we can charge battery also we can make bicycle which can run on battery so this friction less energy generator will help to charge that battery or mobile or any other stuff To do this mechanism we are using some coils and strong magnets which are different from normal magnets called as neodymium magnets, there is no physical contact like dynamo with tyre just small coin size magnets are placed on Tyre when Tyre rotates e m f induced in a coil and it generates electricity this energy is up to 230 volt. can easily charge the battery with this.

In design, the flywheel, copper wire and neodymium magnet are main component of system. Flywheel is used for energy storage system with copper wire used to transfer electric flux to system and neodymium magnet for magnetic flux generation. The wheel which is connected to the pulley mounted on the same shaft and its diameter is less than the wheel diameter due to which its speed of rotation will be increased. On another shaft connected to the pulley is having the assembly of flywheel and copper magnet-coil arrangement. Flywheel will store the kinetic energy while wheel is in running condition and will release the K.E when the brake is applied on the wheel. So, the use of flywheel provides such kind of energy which help to run the cycle by less efficient power. Copper magnet will start rotating shaft and coil is steady. So here variable E. M. F. is produced from magnet and coil arrangement. By this way power will be generated and stored into battery.

#### V.RESULT AND DISCUSSION

The system arrangement generates electricity without any friction with flywheel and it can be utilized in the maximum amount. The voltage output taken from the assembly is totally dependent on the rpm of the wheels so voltage is fluctuating so a battery is used to provide a constant power supply to charging vehicle or appliance. A battery connected to the generator assembly is continuously charged when shaft moves. The result of this experiment is based on trial-and-error method. So, with the help of iteration process, the output voltage from design is equal to 12 V.

#### VI.CONCLUSION

We can conclude that, the system arrangement generates electricity without any friction and can be utilized in the maximum amount. We have successfully designed the project and implemented on frame, the generated power is utilized to charge the battery of electrical vehicle; we also understand the concept of electromagnetism and how to generate power by just placing the magnet and coil of equal quantity on different disks without making any contact. The voltage output taken from the assembly is totally dependent on the rpm of the wheels so voltage is fluctuating so a battery is used to provide a constant power supply. A battery connected to the generator assembly is continuously charged when shaft moves at 80- 90 rpm which is normal speed of vehicle. By this assembly battery is continuously charging.

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