

# Wireless Transfer of Power Generated Using Non-Conventional Methods

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**Abstract**— With all-time growing demand for electricity in many under developed/developing countries, majority of the people are unable to get the electricity and also in remote places like small villages, there's no access to electricity resulting in economic degradation. Power is very important to modern systems. This paper presents an overview of a system for wireless power generation including power transmission and power reception device. The power is generated in a way where solar energy is captured by solar cell in the panels and converted to solar electricity. Alternatives are dynamo and ac power supply. The power can be transmitted using Inductive coupling for short-range, resonant induction for mid-range electromagnetic wave power transfer. Loads are led, dc motor and LCD.

**Index Terms**— Wireless power transfer (WPT), solar panel, dynamo, inductive coils, DC motor.

## I. INTRODUCTION

Wireless power transmission is rapidly advancing as an important way to develop much cleaner cost effective way to transfer power without the use of wires, cables or any other substance. This can be used for applications where either an instantaneous amount or a continuous delivery of energy is needed, but where conventional wires are unaffordable, inconvenient, expensive, hazardous, unwanted or impossible. The power can be transmitted using Inductive coupling. WPT is a technology that can transport power to locations, which are otherwise not possible or impractical to reach. The objective of this paper is to design and implement a method to transmit wireless electrical power through space. The system will work by using resonant coils to transmit power from an AC line to a resistive load.

Resources used for power generation are mainly natural and hence depleting fast. In power transmission, usage of wires leads to a loss of almost 40% of the power. Thus by generating power using dynamo, solar panel and by creating a wireless power transfer system, we can reduce the power loss and provide an efficient system for the future.

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Thus in this paper we have discussed about the generation of power using non-conventional (dynamo and solar panel) methods and it's transmission wirelessly. By adopting such measures, we can reduce the power loss and provide an efficient system for the future.

## II. POWER GENERATION

The power is generated in the following ways:

### A. Solar Panel

The sun is very promising as a source of energy. Solar energy is captured by solar cell in the panels and converted to solar electricity. When the sunlight strikes the cell, photons in the light knock some of the extra electrons loose from the silicon, and they flow to the part of the cell that is missing electrons. This flow produces an electrical current that eventually reaches the inverter, where it gets converted into usable electricity.



Fig. 1. A solar panel

### B. Dynamo

It is a machine for converting mechanical energy into electrical energy, typically by means of rotating coils of copper wire in a magnetic field. A voltage is produced when a magnet moves in a coil of wire. This process is called electromagnetic induction. As this happens, a potential difference is produced between the ends of the coil, which causes a current to flow. One simple example of a generator is the bicycle dynamo. The dynamo has a wheel that touches the back tyre. As the bicycle moves, the wheel turns a magnet inside a coil. This induces enough electricity to run the bicycle's lights.

AC Source Supply:

An AC power supply typically takes the voltage from a wall outlet (mains supply) and lowers it to the desired voltage. The power supply used in this case is 50Hz, 230V, 1A, single phase ac source.



Fig. 2. AC power source

### III. POWER TRANSFER

**Inductive Coils:** The electric current flowing through the circuit induces magnetic field in the first coil which is also known as Ampere's law which also states that magnetic field created by an electric current is proportional to the size of electric current. When receiver coil is brought near the transmitter coil the change in magnetic field causes an electromagnetic force to be induced in second coil which is known as faraday's law. This high frequency, the output of secondary coil is given to rectifier to convert ac voltage to dc voltage. The output of rectifier is given to filter which consists of two types of capacitor which are ceramic and electrolytic capacitor. The work of ceramic capacitor is to reduce noise and whereas electrolytic capacitor to reduce ripples. The output of filter is given to regulator which produces constant dc voltage. Thus, high frequency, high voltage coil is rectified and regulated to supply to the load.

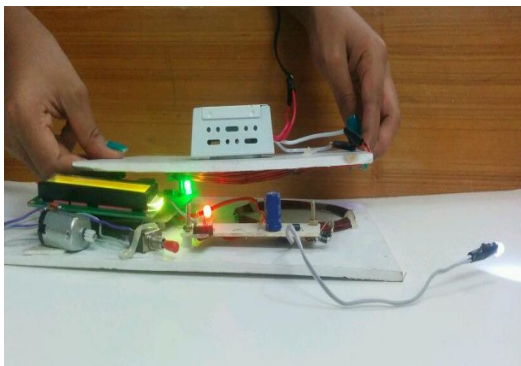


Fig. 3. Transmission of power

### IV. POWER RECEPTION

The power reception basically means power delivered to the load. The three types of concerned load in our circuit are:

#### 1. LED:

A light emitting diode (LED) is a two lead semiconductor light source. It is a p-n junction diode, which emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the colour of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. The voltage transferred is range of 1.9 to 3 volts.

#### 2. DC Motor:

A DC motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced

by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings of the motor. The voltage transferred is 5 volts.

#### 3. LCD:

A liquid crystal display (LCD) is a flat panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly. The voltage transferred is 5 volts.

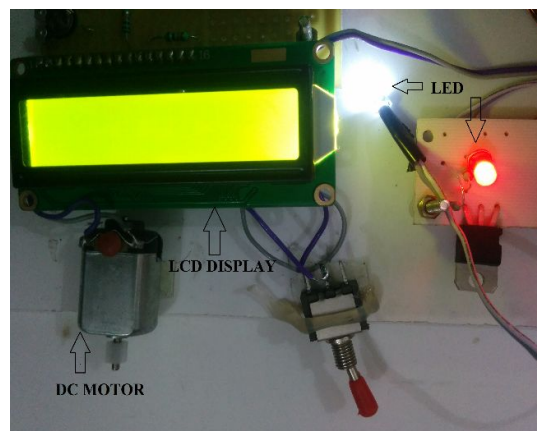


Fig. 4. Loads on receiver side

### V. APPLICATIONS

#### A. Pacemaker

A wireless pacemaker inserted directly into the heart without surgery was effective and safe for most patients. The new wireless device studied is inserted through a catheter threaded from a leg vein to the right ventricle of the heart, according to researchers. At 6 millimetres by 42 millimetres, the new device is smaller than conventional pacemakers. All components are self-contained. According to a study recently presented at the European Society of Cardiology congress in London.

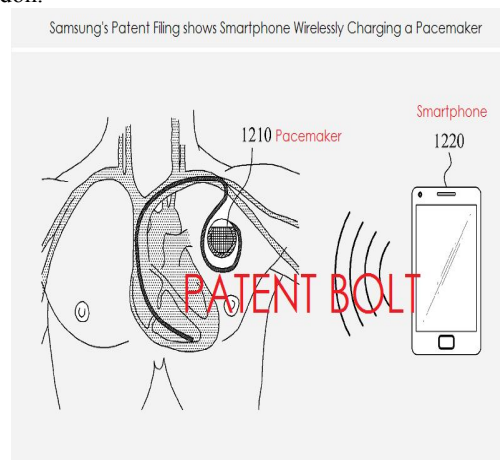


Fig. 5. Smartphone wirelessly charging a pacemaker

### B. Electrical Car Charging

Our research team has developed a wireless fast charging system that is capable of charging an electric vehicle while it is stationary or it is moving. The CTI wireless charging system is safe, fast, and with expected efficiency exceeding 90%.



Fig. 6. Charging an electrical car wirelessly

### C. Street Lights

The Smart Street Lighting Controlling system establishes a wireless network between all participating light poles and provides the operator with a web-accessed efficient, automatic or manual, control of the light pole's operation.

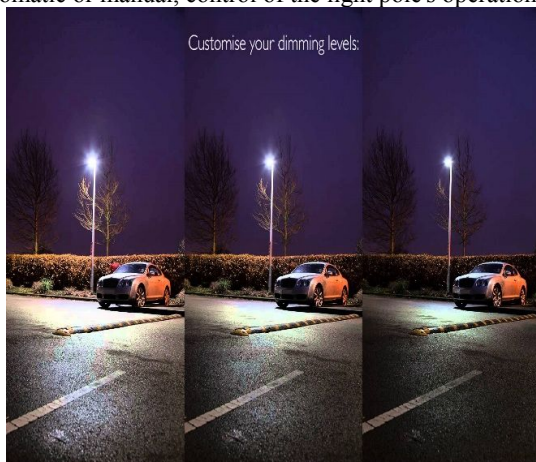


Fig. 7. Dimming level customised wirelessly

### CONCLUSION

We proposed an Inductive Coupling Wireless Power transfer. The wireless transmission unit is not able to function as our design that we expect to see the unit can charge a battery since the voltage produced by the solar panel and the dynamo is not sufficient enough to drive the load. Hence, the AC power supply is used. However, the transmission does transfer power the charging annex that an LED can be lighted up, DC motor runs and LCD clubbed with a microcontroller shows a message.

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