**WIRELESS ELECTRICITY**

**Abstract**

This paper gives a thorough insight on wireless power transmission (WPT) which is an emerging trend in the world today. This technology eliminates the drawbacks of existing wired technology. Wireless power transmission has been attracting a wide range of subjects in various fields and also become a highly active research area because of their potential in providing high technology to our daily lives. The wireless power transmission will be mandatory to use in the near future because this technology enables the transmission of electrical energy from a power source to an electrical load across an air gap without interconnecting wires.

**Introduction**

One of the major issues in power system is the lossses occurring during the transmission and distribution of electrical power. The percentage of loss of power during the transmission and distribution is approximated as 26%. The main reason for power loss during transmission and distribution is the resisitance of wires used in grid. According to the World Resources Institute (WRI), India's electricity grid has the highest transmission and distribution losses in the world - a whopping 27-40%. Method of transmission of electricity is done using electromagnetic induction which was actually proposed by Tesla.

By the name it indicates that transmission without wires. The technology used for wireless power transmission is known as witricity.

**History**

 Various methods of Transmitting power wirelessly have been known for centuries. In 1899, Sir Nikola Tesla proposed a method to transmit energy over long distances wirelessly using ElectroMagnetic radiation principle, but such radiation is excellent for wireless transmission of information, it is not feasible to Power transmission.

1899: Tesla continues wireless power transmission research in Colorado Springs and writes, *"the inferiority of the induction method would appear immense as compared with the disturbed charge of ground and air method".*

1961: William C.Brown publishes an article exploring possibilities of microwave power transmission.

2009: Sony shows a wireless electrodynamics induction powered TV set, 60W over 50cm

**Need of Witricity**

Now a days there is a Rapid development of autonomous electronics like laptops, cell-phones, house-hold robots and all the above devices typically rely on chemical energy storage(Battery) .As they are becoming daily needs to present generation, Wireless energy transfer would be useful for many applications as above and they need midrange energy. If we adopt this witricity concept to these devices, we may eliminate the problems caused by the batteries. We may use this by fixing on our room ceiling to charge our devices wirelessly.

**Basic principle**

The basic concept behind Witricity-Wireless Electricity is Magnetic Resonance. Two resonant objects of the same resonant frequency tend to exchange energy efficiently, while dissipating relatively little energy in extraneous off-resonant objects. If one can operate in that regime in a given system, the energy transfer is expected to be very efficient. Midrange power transfer implemented in this way can be nearly omni directional and efficient, irrespective of the geometry of the surrounding space, with low interference and losses into environmental objects. The above considerations apply irrespective of the physical nature of the resonances.

**Methods**

Different methods of transmission proposed by different acientist and scholars are:

1. Atmospheric conduction method of Tesla

2. Electrodynamic induction method

a. Microwave method

b. Laser method

**Advantages**

1. An electrical distribution system, based on this method would eliminate the need for an inefficient, costly, and capital intensive grid of cables, towers, and substations.

2. System would reduce the cost of electrical energy used by the consumer

3. It will rid the landscape of wires, cables, and transmitting towers.

4. The electrical energy can be economically transmitted without wires to any terrestrial distance, so there will be no transmission and distribution loss.

5. More efficient energy distribution systems and sources are needed by both developed and under developed nations.

6. To transmit wireless power to any distance without limit. It makes no difference what the distance is.

7. The power failure due to short circuit and fault on cables would never exist in the transmission.

8. Power theft would be not possible at all.

**Disadvantages**

1. Capital Cost for practical implementation of Wireless Power Transmission to be very high.

2. The other disadvantage of the concept is interference of microwave with present communication systems.

3. Common belief fear, the effect of microwave radiation.

4 . But the studies in this domain repeatedly proves that the microwave radiation level would be never higher than dose received while opening the microwave oven door, meaning it is slightly higher than the emissions created by cellular telephones.

**Applications**

This technology can potentially be used in a large variety of applications, including consumer, industrial, medical and military. Its aim is to reduce our dependence on batteries. Further applications for this technology include transmission of information — it would not interfere with radio waves and thus could be used as a cheap and efficient communication device without requiring a license or a government permit.

**Conclusion**

Wireless power transfer is quickly becoming a viable reality. This technology offers an extremely efficient alternative to previous attempts at providing wireless power. Future improvements in wireless technolgy offer world changing implications.