

# WITRICITY OR WIRELESS ELECTRICITY

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# WHAT IS WITRICITY

- The Transfer of Electricity from one place to another without wires is known as “WiTricity”.



# What Happening Today!!!

- Currently, wired electricity powers nearly everything. It travels through wires in the form of Alternating Current, and powers most of our devices in the form of Direct Current.
- In our present electricity generation system we waste more than half of its resources. Especially the transmission and distribution losses are the main concern of the present power technology
- The resistance of the wire used in the electrical grid distribution system causes a loss of 26-30% of the energy generated. This loss implies that our present system of electrical distribution is only 70-74% efficient. We have to think of alternate technology to transmit and distribute the electricity. The transmission of power without wires may be one noble alternative for electricity transmission

# History of Witricity:



→ In 1899, Sir Nikola Tesla Proposed a method of Wireless Power Transmission.

→ As it is in Radiative mode, most of the Power was wasted and has less efficiency.

→ The efficient midrange power transfer concept is Witricity. In this model source and load are in Magnetic resonance so there is no power loss.



# Need of Witricity

Now a days there is a Rapid development of autonomous electronics like *Laptops, Cell-phones, House-hold robots* and all those devices typically rely on chemical energy storage (Battery) As they are becoming daily needs to present generation, Wire less energy transfer would be useful for many applications as above and they need midrange energy.



# Engineering Specifications and Principles

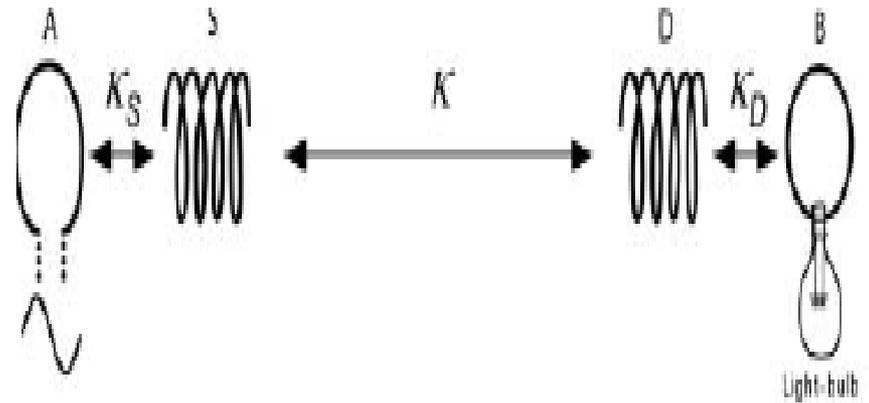
|                        |               |
|------------------------|---------------|
| Transmitter            | Copper Coil   |
| Transmission<br>signal | 1.35 MHz      |
| Receiver               | Copper coil   |
| Output                 | Nearly 1 watt |

- Magnetic Induction
- Short distance magnetic resonances



# How Witricity works?

- Two copper coils were set up-one at the 'sender end' and one at 'receiver end'. The sender coil was attached to the power source, while the receiver coil was attached to the light bulb.
- When turned on ,the sender coil emits electricity in the form of a magnetic field, oscillating at a specific frequency.
- The receiver coil picks up the transmission, while the rest of the environment is unaffected.

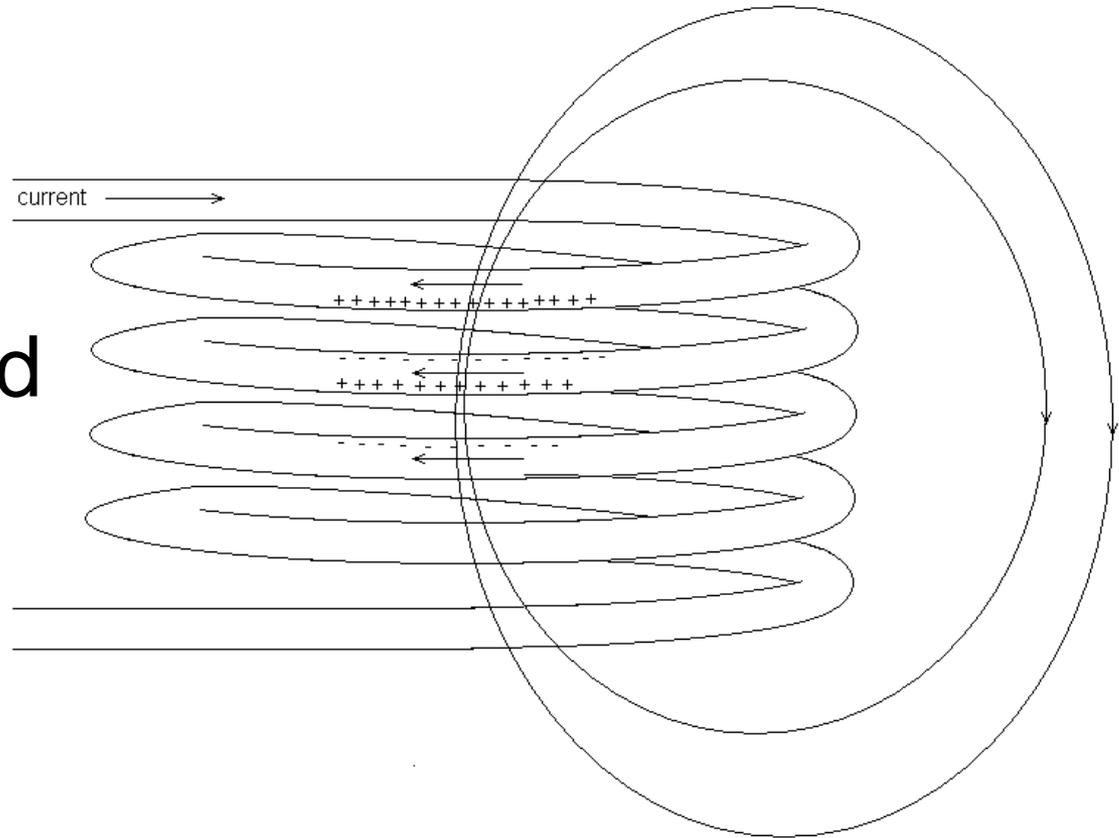


# Principle of Primary Coil

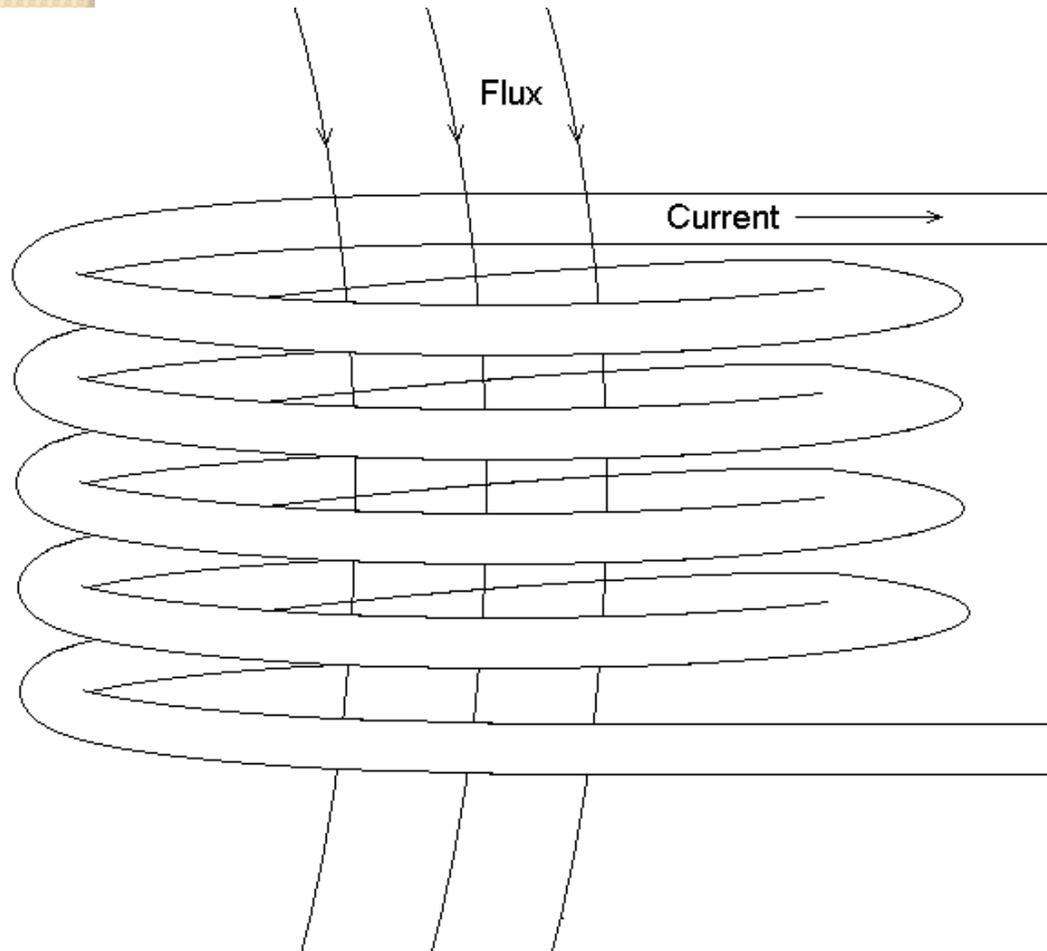
- Projecting Magnetic Field

Magnetic Vector Equation

$$d\overline{B} = \mu d\overline{H}$$



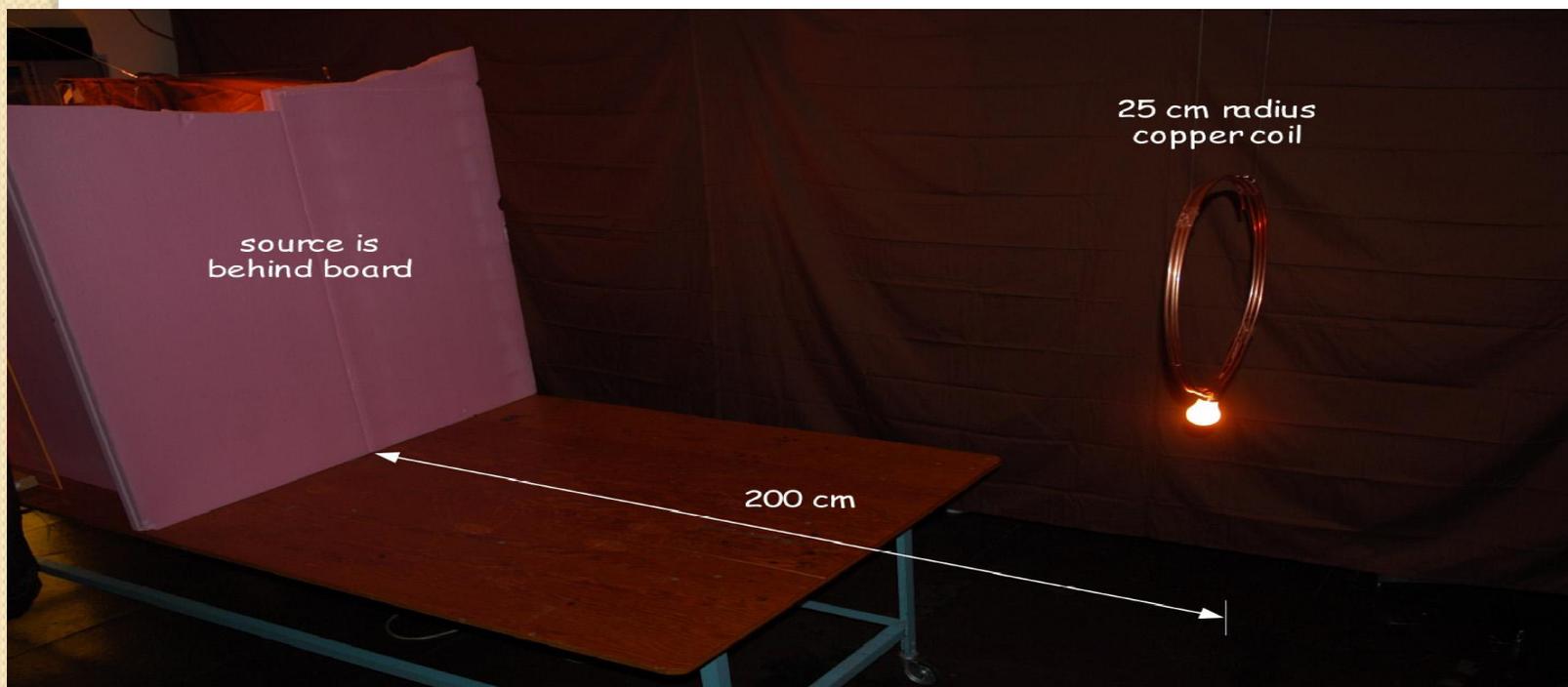
# Principle of Receiving Coil



The Changing in Flux creates an induced emf

Induced Voltage

$$V_{emf} = -N \frac{d}{dt} \int \bar{B} \cdot d\bar{s}$$



# Safety

Human beings or other objects placed between the transmitter and receiver do not hinder the transmission of power. However, does magnetic coupling or resonance coupling have any harmful effects on humans? MIT's researchers are quite confident that WiTricity's coupling resonance' is safe for humans. They say that the magnetic fields tend to interact very weakly with the biological tissues of the body, and so are not prone to cause any damage to any living beings.



# ADVANTAGES

- The main advantages of this system is that we can get electricity anywhere without wires.
- The nature of power delivery is Omni directional i.e. in every direction.
- Magnetic resonances are particularly suitable for everyday application because most of the common materials do not interact with magnetic fields, so interactions with environmental objects are suppressed even further.



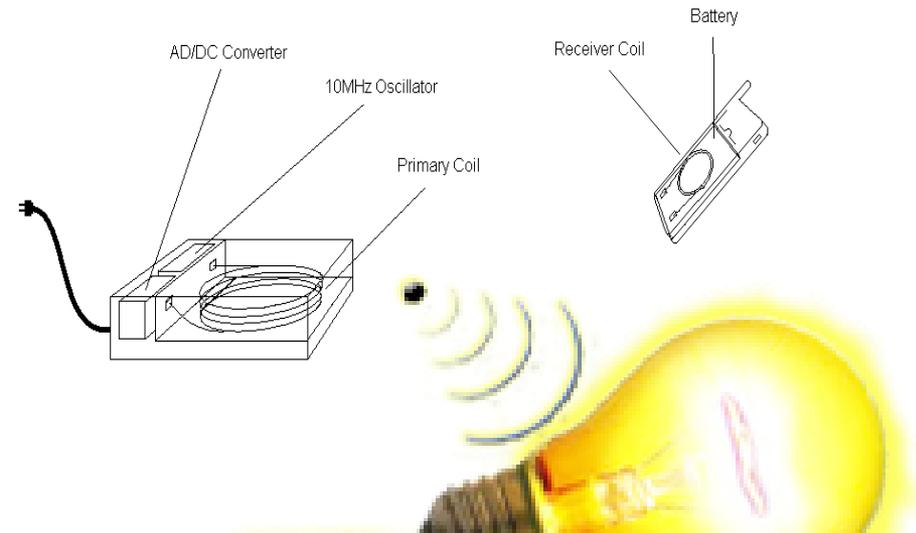
# LIMITATIONS

- The resonance condition should be satisfied and if any error exists, there is no possibility of power transfer.
- If there is any possibility of very strong ferromagnetic material presence causes low power transfer due to radiation.



# APPLICATIONS

- Direct Wireless Power
- Automatic Wireless Charging
- Other Applications



# FUTURE SCOPE

Wireless energy transmission holds great potential for the future. Magnetic induction, resonant induction, and electromagnetic wave power transmission all have applications that could revolutionize the way we live and use electricity. Keep your eyes open for wireless energy technology in new products, and look forward to when everything will truly be wireless.

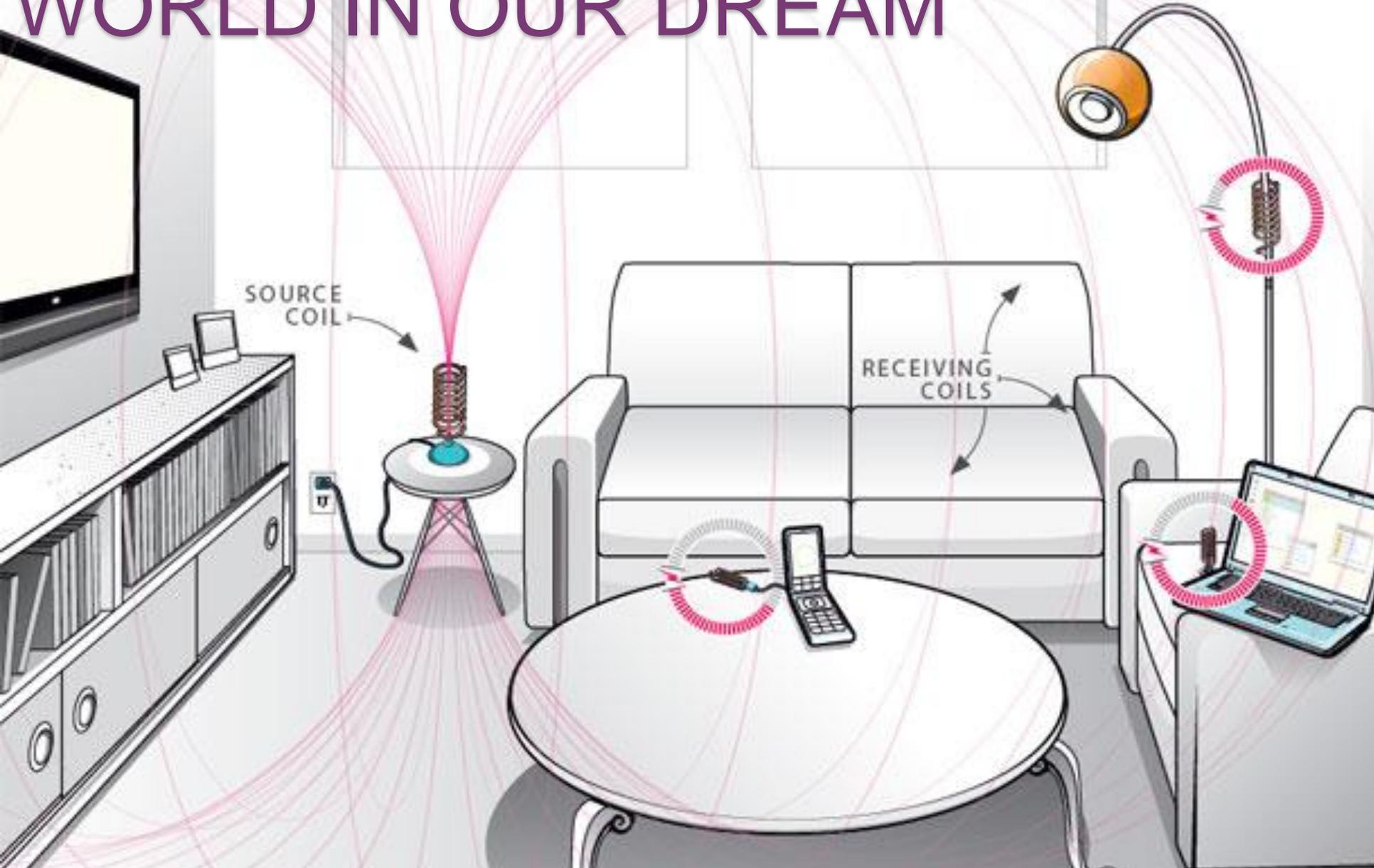


# CONCLUSION

- Safe to use
- Convenient
- Low cost



# WORLD IN OUR DREAM



Thank you

