Emerging Technology

Wireless Electricity (WiTricity)

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About the Industry (ELECTRONICS)

- In the US alone, the Consumer Electronics Industry is a $170 Billion market.
- Electronics Hardware is a $15-billion (2006-07) industry in India.
  - India constitutes 0.7% of the global market.
Wireless energy transfer is the process that takes place in any system where electrical energy is transmitted from a power source to an electrical load, without interconnecting wires.

Wireless transmission is useful in cases where instantaneous or continuous energy transfer is needed, without connecting wires.

Most common form of wireless power is carried out, using electrodynamic induction or resonant inductive energy transfer.
How WiTricity Works!!

- 2 copper coils are setup—one at the ‘sender end’ and other at the ‘receiving end’. The sender coil is attached to a power source and the receiver is attached to a light bulb.

- When turned on, the sender coil emits electricity in the form of magnetic field, oscillating at a specific freq.

- The receiver coils picks up the transmission while the rest of the environment remains unaffected
WiTricity power sources and capture devices are specially designed magnetic resonators that efficiently transfer power over large distances via the magnetic near-field.

- Power source: left (connected to AC)
- Blue lines: magnetic field induced by the power source.
- Yellow lines: flow of energy from the source to the WiTricity capture coil, which is shown powering a light bulb.
HOW IT WORKS

When electric current is passed through a coil of wire a powerful electromagnetic field is created around it. Electronic devices would pick up the power when brought into the room.

Copper coil hidden in the ceiling

Desk lights would have no trailing wires

Laptops and portable game players could operate without batteries

Mobile phones and MP3 players would charge their batteries automatically
ADVANTAGES

- Get electricity without tumbling wires.
- Nature of power delivery is Omni-directional i.e. in every direction.
- Non-Radiative Energy Transfer is Safe for People and Animals.
- Your home would keep your gadgets constantly powered up.
- Could eliminate batteries.
WiTricity Applications

- **Direct Wireless Power.**
- **Automatic Wireless Charging** - charging mobiles and laptops i.e. devices that use batteries for operation.
  - **Industrial** - Direct wireless power for wireless sensors and actuators.
  - **Transportation** - Automatic wireless charging for existing electric vehicle classes: golf carts, industrial vehicles.
MAJOR PLAYERS

- WILDCARCHE
- POWERCAST
- WiTricity
- Ecoupled
- Wipower
- Powermat
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<thead>
<tr>
<th><strong>STRENGTHS</strong></th>
<th><strong>WEAKNESSES</strong></th>
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<td>- Helps Businesses be the market leader.</td>
<td>- High cost.</td>
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<td>- Wide range of products catering to different business needs.</td>
<td>- High initial investment costs followed by subsequent added costs in upgrading and keeping up to date.</td>
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<td>- Strong advancements and growth opportunities.</td>
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<td>- Remote connectivity ability, reducing the limitations of geographical space.</td>
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<th><strong>OPPORTUNITIES</strong></th>
<th><strong>THREATS</strong></th>
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<td>- Becoming increasingly popular.</td>
<td>- Fear of businesses in investing in these technologies and their inertia to changes associated with use of this technology.</td>
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<td>- Can be implemented on smaller levels.</td>
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<td>- Current competitive market place makes use of wireless technology a necessity.</td>
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Learnings

The Wireless transfer of electricity had been a Sci-fi Dream up to this point, and truly, if electricity is just in the air as radio waves or wi-fi, it is going to change the world.

The key learnings from this study are:

- Basic understanding of the electronics industry
- The basic mechanism as to how the coils work