TV

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IT sample 2

# Contribution statement

This essay is appreciative because of its content. It introduces the concept of wireless power and gradually explains the research review point that is usually taken on the topic. After gaining an initial knowledge of the same, the advantage and disadvantage of the adopted technology along with the trends and opportunities in the field are explained. This is a paper that helps an expert and a reader to understand and be informed about the technology that has a high chance of being developed into an industry.

# Introduction

The requirements for power has increased around the world and global warming, consumption of fossil fuel, environmental pollution and increase of population only increased the demand for pure energy in the world. Also the requirements of the renewable energy had to be met and this paved way to invention of the wireless power. A power station is built in the space that would that would transmit electricity to Earth through radio waves. SPS (Solar Power satellites) is a clean and stable energy source that converts solar energy in to microwaves for the conversion into normal electricity. Microwave Wireless Power Transmission is one of the main requirements of this technology as energy is to be transmitted through a well focussed micro beam.

# Wireless power

Wireless power or wireless energy transfer is a name aligned to the transmission of electricity from one point to another. There will not b the presence of a conductive physical connection in this case. This technology can be specially implemented in the absence interconnecting wires that are otherwise inconvenient. The technology transfers energy from a power source to the electrical load without having to depend on interconnecting wires.

This wireless energy can be transferred through methods of electromagnetic induction, electromagnetic radiation, evanescent wave coupling and breaking down of the evanescent wave coupling.

This method is far better than the current means of energy generation because they waste half the energy that is generated. Transmission consumes energy and causes a loss of about 26-30% of the energy that is generated.

The ideas that are generated are highly concentrated on microwave power transmission and are called solar power satellites that should be built on the surface of the earth and thus convert the microwaves into conventional electrical power (Mandal, T. K. 2006).

# Literature Review

Many researchers have studied on the impact of the wireless power and the impact of each technology that can be adapted for the same purpose. A study by Popovic (2008) conducted a feasibility study of the multi-kilowatt wireless radio frequency (RF) power system to transfer power between lunar base facilities. It revealed that WPT is more efficient and powerful than the traditional wired approaches that are usually adapted.

In his paper Tanuj Kumar Mandal discusses the various technologies that are available for the wireless transmission of energy. He also discusses the various possibility of adapting various technologies and highly concentrates on the concept of Tesla Theory, the microwave power transmission called the solar power satellite and the highly efficient fibre lasers for the purpose of the wireless transmission of power (Mandal, T. K. 2006).

Wall street journal article has listed space-based solar power as one of the main five technologies that can change everything (Totti, 2009). this is a technology that can have applications for the man's return trip to moon because the 354 hour lunar night can also be dine with the wireless power devices that are designed on earth. One of the main considerable problems that are bound to arise is the space debris removal and there are chances for earth to face a threat from this debris (Bellows, 2010).

# Advantages and disadvantages of this wireless power

Advantages

It is very important to consider the advantages of the adaptation of wireless power. Some of them are they form means of endless energy source and can be delivered anywhere in the world. For the power station will be the same. There won't be any fuel cost and will have zero CO2 emission. The impact of this technology on the environment will be minimal. The solar radiation can be effectively collected in the space. One of the main merits is that this system will remove cables, towers and other substations and also the cost of electricity that is consumed by the consumers. There won't be loss of energy during distribution and transmission. The efficiency of transmission can be calculated to be around 96 to 97 percent. There will be power supply even in remote areas.

Disadvantages

The cost involved with launching of this system is very high. The capital cost involved will be very high even in the case of launches. There are chances of health hazards. There are also chances of interference with the satellites meant for communication. This power station tends to be taking over a huge amount of space.

# Comparison of Different Wireless power technologies

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| --- | --- | --- |
| Name  | Advantages  | disadvantages |
| Wardenclyffe Tower | * High transmission integrity
* Low loss of energy
* Reduction of costs
 | * It is now used for telegraphy
* Biological impact
* Economic impact
 |
| Stationary High Altitude Relay Platform (SHARP) | * Low cost
* High efficiency power line
 | * Never used except for recharging electric toothbrushes and pacemakers.
 |
| Microwave power transmission/Solar power satellite | * Conversion on microwaves into conventional electric power
 | * Spectrum regulatory issues
* Retro-directive antenna system in unproven
 |
| Microwaves | * Current technology, used by 76 %
* Practical experience
* Cheaper for production
 | * Large wavelengths, lower frequency wave will be hard to hit.
* Higher frequency will also be impossible
 |
| Lasers  | * The power transmitter and the receiver can be smaller
* Reduction in land area requirements
* No interference issues like microwaves
* No spilling energy
 | * Cost involved
* Biological impact is more serious than all others
* Atmosphere and the weather effects
* Political and safety challenges
 |

# Trends, future, outlook and applications

MPT can be said to be a very old concept with the newest of technologies. SPS being the most suitable application for MPT the energy systems can be advanced from RF-ID to SPS. One of the main problems that are faced for implementation of the same is highly efficient phased array for MPT. Advancement in case of MPT technologies s preferred in the future. Higher efficiency in terms of costs will make the implementation of SPS possible (Shinohara, n.d).

Looking at wireless power from the manufacturer's point of view, it can be said that this is a necessary step, one of the main flaws being that it is time consuming. Wholesale implementation of the technology on large scale tends to face difficulties of integration. In this case the technology readiness seems to be unsatisfactory which is why there is a reluctance of implementing the same.

Embracing these technologies provides high hope for the future, only that the hurdles have to be passed through. Conditions are still being explored before implementation of this. It can be analysed that there is a transition of the wireless power from being a technology to an industry. This can be defined as a system that allows more flexibility through commercial applications.

The broadcasting of this power is under discussion though the safety of this power is not known. The efficiency of a system is very important to realise not only for the purpose of confusing or diffusing but for measuring on its efficiency that is calculated on the basis of the usage, reliability, cost, integrations size and mass adoption appeal. in the thee ranges of systems that can be implemented, the mid-range inductive power technologies are the ones who have a better chance of getting appreciated for bringing stability in the system.

The speed of solving the challenges will also determine the rate by which this system will be implemented. Some of them are the differences in time horizon and that of the implementation of the SSP (Space Solar power). It is also known that the power of the space is global and there are requirements for enterprise models that will provide the players with suitable stake. The concerns about efficient and being environmental friendly are also important. There is a mindset that prevails which is convinced that the future energy infrastructure is an extrapolation to the present one. This is a topic that require international consensus and worldwide implementation of the same will be time consuming (ecoupled.com, 2009).

# Conclusion

Wireless power is a technology that truly risen up to the standards of the 21st century. The opportunities that are provided by it are far too much for the concept to be rejected or not implemented. The expectations are still high on the fact that will develop into an industry from its current existence as a very promising technology. In short it can be said that wireless technology is already a reality today but with limitations. Different countries are still conducting an ongoing research on implementation of the same as this is an opportunity that cannot be implemented without proper planning.

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