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Analyzing Microwave Power Transmission & Solar Power Satellite Systems 2016

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Abstracts

Microwave power transmission (MPT) involves the usage of microwaves to transmit power through outer space or the atmosphere without the need for wires. It is a sub-type of the more general wireless energy transfer methods, and is the most interesting because microwave devices offer the highest efficiency of conversion between DC-electricity and microwave radiative power.

Following World War II, which saw the development of high-power microwave emitters known as cavity magnetrons, the idea of using microwaves to transmit power was researched. In 1964, William C. Brown demonstrated a miniature helicopter equipped with a combination antenna and rectifier device called a rectenna. The rectenna converted microwave power into electricity, allowing the helicopter to fly. In principle, the rectenna is capable of very high conversion efficiencies - over 90% in optimal circumstances.

Most proposed MPT systems now usually include a phased array microwave transmitter. While these have lower efficiency levels they have the advantage of being electrically steered using no moving parts, and are easier to scale to the necessary levels that a practical MPT system requires.

Aruvian's R'search presents a complete analysis of the myriad uses of Microwave Power Transmission, and one of its biggest application – Solar Power Satellite Systems. In its report, Analyzing Microwave Power Transmission & Solar Power Satellite Systems, Aruvian's R'search puts forth an analytical view of wireless transmission systems, the basics of microwave power transmission systems, its uses, benefits, challenges facing the technology, global activities going on in the field of MPT, and its applications.

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One of the biggest applications of microwave power transmission at the moment is its utility in solar power satellite systems, or SPS. The report takes an in-depth view on the basics of the system, how microwave power transmission is used in SPS, the challenges facing SPS, environmental and health impact of the SPS and much more. The report further also analyzes the Space Solar Power System (SSPS), delving into the vast amount of research conducted on this topic by NASA.

The leading industry contributors to the field of microwave power transmission is also looked at in the report.

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