

**Japanese Trial for a Bright and Clean Energy from Space
-- Solar Power Station (SPS) and Microwave Power Transmission (MPT) --**

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Radio and its application has been one of the key/core technologies during the whole 20th century. It has expanded the horizon of human activity into modern life style and is now indispensable media to human life. Its main application today is telecommunications, especially mobile communications and radio links among various computers and computer controlled systems. However, radio can be used for other purposes in the light of human welfare. To maintain the human welfare and even to avoid perishing disaster during this century, energy, food and environmental issues should be seriously discussed, steered and controlled. In this regard, power transmission via microwave is one of the new technological frontiers in the scope of the SPS which will provide a clean and limitless energy resource from space. The original idea of radio power transmission was conceived by N. Tesla, but was not completed due to the limited capability of generating radio waves with sufficiently short wavelengths for accurate beam control. Since P. E. Glaser proposed an idea to place a power station in the geosynchronous orbit in space in 1968 [1], the SPS research was a boom in the 1970's in the USA. The SPS research, however, entered into the dark era in terms of research budget in the US in the early 1980. During this era, however, SPS research has been continued in Japan and other countries [2]. In early 1980's, Japan started to examine the SPS feasibility by Committee activities and fundamental space and lab experiment on the MPT such as high efficiency MPT system development with a phase-controlled magnetron, retrodirective system and rectenna development. In 1983 and 1993, two rocket experiments on MPT in space and several demonstration programs of the available MPT technologies have been carried out in Japan. NASDA (National Space Development Agency) and METI (Ministry of Economy, Trade and Industry) have formed respective Committee on the SPS since 1998 and 2000, respectively. We, as Chairs of the two Committee, will report their research outcome. The impact of SPS and MPT from space to Earth should be carefully examined taking into account of positive and negative sides of the projects. In this respect, URSI is a unique body to discuss and hopefully promote the SPS for the safety, wealth and welfare not only for scientists, engineers and industries, but also for all people in the world.

REFERENCES

- [1] P.E. Glaser, Sciences, no. 192, pp.857-886, 1968.
- [2] H. Matsumoto, The Radio Science Bulletin, no. 273, pp. 11-35, June, 1995.