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IDENTIFYING SPECTRUM FOR USE IN LONG-DISTANCE WIRELESS POWER TRANSMISSION

Abstract

Wireless power transmission (WPT) has transitioned in recent years from a visionary future concept to a tangible industry – at least for very short range WPT. Such short-range applications usually involve magnetic coupling and magnetic resonance coupling, and have emerged in mass-market applications ranging from homes to coffee shops. Similarly, harvesting of power from ambient electromagnetic fields has emerged as an important new design option for many low-power applications. However, long-range WPT over distances ranging from a few meters to many thousands of kilometers remains a challenging "final frontier" for wireless energy. A critical requirement for long-distance WPT is the identification of spectrum that may be used without interfering with communications and other operations.

This paper will summarize key target mission and market applications for long-distance WPT, and discuss both the hurdles and the prospects for the use of various segments of the electromagnetic (EM) spectrum for these applications. The paper will conclude with a notional roadmap and plan forward for the identification of spectrum required for long-distance WPT – and the role this process in proceeding with technology development and demonstrations, and the future deployment of systems.