Chapter 1
Wireless Power Transfer Techniques for 6G Communication

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ABSTRACT

This chapter examines robust beamforming to increase power economy and reliability in magnetic-based wireless power transfer with many transmitters and receivers while accounting for MII imperfection. Transfer learning saves energy and improves efficiency in wireless communications by learning from prior tasks using correlation and similarity information. Since CSI procurement takes energy, its benefits gradually drop as power driven gadgets increase, yet spread. With system stability, channel state information techniques expand power insurance. ISWPT's integrated operation decreases system size, hardware cost, power consumption, and spectrum, enabling 6G wireless networks. Reconfigurable intelligent surfaces in wireless power transfer systems and designs can optimize energy efficiency by addressing multi-user circumstances and power distribution. Using simultaneous lightwave information and power transfer to combine EH and data transmission is fascinating and matures efficiency.

1. INTRODUCTION

Future power usage systems will employ wireless power transfer, or WPT, as a wireless energy source. Sensor systems and the Internet of Things (IoT) will probably be used in Beyond 5G (B5G) and 6G communications. Furthermore, civilization 5.0, where cyberspace and the actual world are combined through digital transformation techniques is anticipated to be brought about by IoT and sensor

network technologies. "WPT methods have already been covered and reported. A WPT demonstration for a flying helicopter was described by Brown (Brown, 1984). The deployment of IoT and sensor networks across Beyond-5G (B5G)/6G networks and society 5.0 is made possible by the WPT system in Figure 1. The WPT system at 2.4 GHz, 5.7 GHz, and 920 MHz has already been established in Japan. However, 99.98% of all radio stations in Japan are located in the sub-6 frequency range, which hinders the spread of these WPT systems". As a result, it is crucial to raise WPT frequency in conjunction with data-transmission enhancement.

Figure 1. Data Power Transmission from 5G/6G BTS
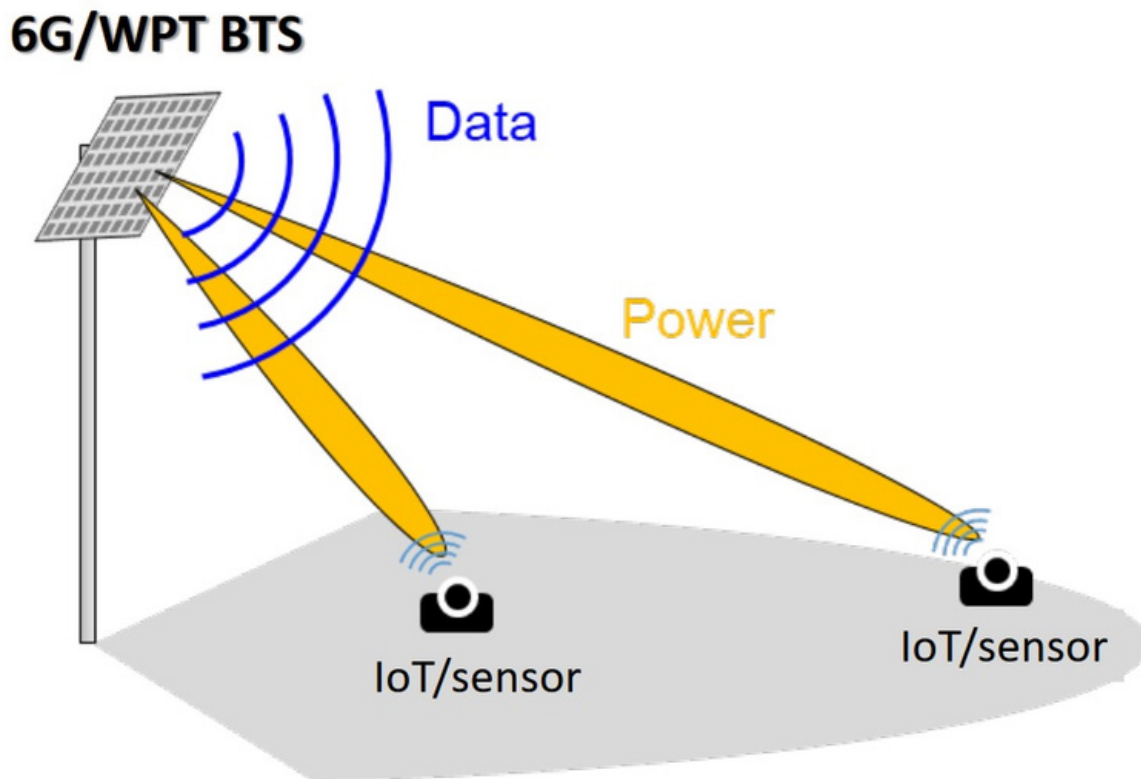
The beam-type WPT was designed to be utilized for IoT, sensors, and mobile or wearable device wireless power charging. Since 2013 (Report ITU-R, 2017), there has been discussion on ITU-R on the establishment of beam-WPT.

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