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| U.S. Radiocommunications Sector  Fact Sheet | |
| **Working Party:** ITU-R WP1A | **Document No:** USWP1A-02\_FD |
| **Ref: Annex 4 to 1A/43-E,** Preliminary Draft Revision of Recommendation ITU-R SM.2110-1 | **Date:** 18 March 2025 |
| Document Title: Proposed editorials and elevation of the Preliminary Draft Revision of Recommendation ITU-R SM.2110-1 | |
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| **Purpose/Objective:** To provide minor editorial updates to the preliminary draft document. Also, to provide information and request elevation of the document. | |
| **Abstract:** Simple editorial and clarifying updates were provided in the last meeting on this document along with the removal of a proposed frequency band. The intent is to provide additional minor editorial corrections and clarifications to improve the document based on comments in the last meeting and request elevation of this document. | |

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| Received: Date 2025  Subject: Preliminary Draft Revision of Recommendation ITU-R SM.2110-1 | **Document 1A/xx-E** |
| **Date 2025** |
| **English only** |
| United States of America | |
| Preliminary Draft Revision of Recommendation ITU-R SM.2110-1 | |
| US Proposal for Updates and Elevation | |

Background

In the June 2024 WP1A meetings, the preliminary draft revision of Recommendation ITU-R SM.2110-1, Annex 4 of the Chairman’s Report, was carried forward. This document provides several important updates to the published version of Recommendation ITU-R SM.2110-1 based on the most recent information. However, some small additional editorial corrections are needed along with some minor clarifications on the 55-57 kHz and 63-65 kHz bands.

Discussion

The United States of America (USA) has reviewed Annex 4 of the Chairman’s Report and suggests some minor editorial corrections as provided in the attachment. Additionally, the USA notes that there has been some confusion caused by the fact that the 55-57 kHz and 63-65 kHz bands are included in the fundamental frequency table (Table 1) even though these frequencies were included only for providing power transfer using the third harmonic by one specific technology. In all the referenced standards for WPT-EV in the Recommendation, power transfer only occurs by using the fundamental frequency. The additional usage of the third harmonic falling within the 55-57 kHz or 63-65 kHz bands was originally introduced by South Korea and represent a unique (non-standardized) use-case for the possibility to transfer power using both the 19-21 kHz band (fundamental) and the 55-57 kHz / 63-65 kHz (third harmonic) with specified restrictions as noted below the table. Finally, the USA notes that ISO recently withdrew ISO 19363 and replaced it with ISO 5474-4.

Proposal

The USA proposes the following:

1. Editorial updates to the preliminary draft revision of Recommendation ITU-R SM.2110-1.
2. Modification of Table 1 and its note to clarify the intended potential usage and restrictions for the 55-57 kHz and 63-65 kHz bands.
3. Elevation of the working document to a draft revision of Recommendation ITU-R SM.2110 to be considered for publication by Study Group 1.

**Attachment:** USA proposed updates to the preliminary draft revision of Recommendation ITU-R SM.2110-1

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Attachment

*[USA Note (not for inclusion): The new USA proposed changes are highlighted in green.]*

PRELIMINARY DRAFT REVISION OF RECOMMENDATION ITU-R SM.2110-1

Guidance on frequency ranges for operation of non-beam   
wireless power transmission for electric vehicles

(Question ITU-R 210-4/1)

(2017-2019)

**Scope**

This Recommendation provides guidance on frequency ranges for the operation of non-beam wireless power transmission (non-beam WPT) for electric vehicles (EV).

**Keywords**

Wireless power transmission, short-range devices, ISM, non-beam WPT

**Abbreviations/Glossary**

CISPR In French “Comité International Spécial des Perturbations Radioélectriques”,   
 International Special Committee on Radio Interference

ICES International Committee on Electromagnetic Safety

ICNIRP International Commission on Non‑ionizing Radiation Protection

IEC International Electrotechnical Commission

IEEE Institute of Electrical and Electronics Engineers

ISO International Organization for Standardization

ISM Industrial, scientific, medical

RR Radio Regulations

SAE Society of Automotive Engineers

SFTS Standard frequency and time signal service Frequency and Time Signal Service

WHO World Health Organization

WPT Wireless power transmission Power Transmission

WPT-EV Wireless power transmission for electric vehicles

**Related ITU Recommendations, Reports**

Recommendation [ITU-R SM.1056](https://www.itu.int/rec/R-REC-SM.1056/en); Recommendation [ITU-R SM.1896](https://www.itu.int/rec/R-REC-SM.1896); Recommendation [ITU-R SM.2129](https://www.itu.int/rec/R-REC-SM.2129); Report [ITU-R SM.2153](https://www.itu.int/pub/R-REP-SM.2153); Report [ITU-R SM.2303](https://www.itu.int/pub/R-REP-SM.2303); Report [ITU‑R SM.2451](https://www.itu.int/pub/R-REP-SM.2451).

The ITU Radiocommunication Assembly,

*considering*

*a)* that wireless power transmission (WPT) is defined as the transmission of power from a power source to an electrical load wirelessly using the electromagnetic field;

*b)* that WPT technologies utilize various mechanisms, such as transmission via radio frequency radiated transmissions in the far-field (WPT beams) and near-field inductive, resonant and capacitive coupling (WPT non-beam);

*c)* that WPT technologies are being considered for applications such as charging of electric vehicles;

*d)* that WPT standards are currently being developed at national, regional, and international levels;

*e)* that industrial alliances, consortia, and academia have investigated several fundamental frequency bands for WPT technologies, including; 19‑21 kHz and 79‑90 kHz for electric vehicles;

*f)* that for the purpose of WPT studies the standard frequency and time signal and the radio astronomy services are to be treated as radiocommunication services;

*g)* that studies have been conducted on the impact of non-beam WPT to radiocommunication services in the bands 19-21 kHz, 55-57 kHz, 63-65 kHz and 79‑90 kHz;

*h)* that as more WPT devices proliferate globally, the use of WPT technologies may have an impact on radiocommunication services including the standard frequency and time signal service and the radio astronomy service, WPT must not cause harmful interference to radio communication services;

*i)* that to mitigate the impact of WPT devices on the operation of radiocommunication services some solutions utilize frequency bands designated for industrial, scientific, medical (ISM) applications,

*recognizing*

*a)* that WPT is not a radiocommunication service and has no status in the Radio Regulations (RR), but may be regarded as subject to RR Nos. **15.12** or **15.13** as the case may be;

*b)* that the criteria to protect various radiocommunication services from harmful interference are specified in existing ITU-R Recommendations;

*c)* that both consumers and manufacturers may benefit from harmonized frequency ranges and technical conditions for WPT technologies;

*d)* that some Administrations classify the non-beam WPT energy transfer as an ISM application, even for operation outside bands designated for ISM use;

*e)* that some Administrations classify non-beam WPT systems as radio application such as short-range devices;

*f)* that some non-ISM bands are taken into consideration for the global or regional harmonized use of specific WPT applications;

*g)* that the WPT energy transfer can be treated separately from data communications, especially when the receiving device receives data communications at a frequency different from that for the energy transfer;

*h)* that in the absence of a load, the WPT-EV shuts off and does not radiate;

*i)* that for non-beam WPT-EV, the radiated RF power external to the WPT-EV system is much lower than RF power transferred to the vehicle. Most power is transferred to the receiver through mechanisms such as capacitive, resonant and inductive coupling;

*j)* that Recommendation ITU-R SM.1056 on the limitation of radiation from ISM equipment recommends that administrations consider the use of the latest edition of CISPR publication 11. These limits do not necessarily protect radiocommunication services,

*noting*

*a)* that the IEC TC 69 published IEC International Standard (IS) 61980-1 on ‘general requirement of electric vehicle wireless power transfer systems’, IEC IS 61980-2 on ‘specific requirements for communication between electric road vehicle (EV) and infrastructure’, and IEC IS 61980-3 on ‘specific requirements for the magnetic field power transfer systems of WPT-EV’;

*b)* that the International Organization for Standardization (ISO/TC22/SC37) published ISO International Standard (IS) 5474-4 on ‘electrically propelled road vehicles – functional and safety requirements for power transfer between vehicle and external electric circuit part 4: magnetic field wireless power transfer’;

*c)* that SAE International published the Standard J2954 on ‘wireless power transfer for light-duty plug-in/electric vehicles and alignment methodology’;

*d)* that issues of non-ionizing radiation exposure are dealt with by international organizations such as the WHO, ICNIRP, IEC TC106, and ICES;

*e)* and that ICNIRP 2010 provides guidelines for limiting exposure from 1 Hz to 100 kHz, ICNIRP 2020 provides guidelines for limiting exposure from 100 kHz to 300 GHz, and IEEE C95.1 provides a standard for limiting exposure from 0 Hz to 300 GHz,

*recommends*

**1** that the use of the frequency range, or portions thereof, listed in Table 1 below should be considered as guidance for the operation of non-beam WPT-EV systems;

**2** that the following Note is considered as integral part of this Recommendation.

NOTE – Additional guidance can be found in Table 1 on necessary steps that should be taken to ensure that non-beam WPT-EV applications and equipment minimize the potential for harmful interference to radiocommunication services including the standard frequency and time signal service (SFTS) and the radio astronomy service, so that these remain protected from radio frequency energy emanating from WPT-EV falling into all bands.

TABLE 1

**Frequency range for operation of non-beam WPT systems for electric vehicles**

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| Frequency range | Suitable non-beam WPT-EV |
| 19-21 kHz(1) | Magnetic induction technology or Magnetic resonant technology |
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| 79-90 kHz | Magnetic resonant technology |
| (1) When also utilizing the third harmonic for power transfer and assuming a minimum separation distance of 50 m between WPT-EV and SFTS receivers, the third harmonic must fall within the 64-65 kHz and 55‑56 kHz frequency range and the WPT emission be limited to 35 dBµA/m at 10 m. Where a separation distance of greater than 100 m between WPT-EV and SFTS receivers can be guaranteed, the third harmonic may fall within the 63‑65 kHz and 55‑57 kHz and the WPT emission be limited to 44 dBµA/m at 10 m. | |