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| Summary:  |
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| Proposal: |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.13

1.13 to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 238 (WRC-15)

# ISSUE

This agenda item considers possible new spectrum allocations suitable for delivery of terrestrial wireless broadband in the frequency range between 24.25 GHz and 86 GHz. This will encompass the following elements, set out in full in Resolution 238 (WRC-15):

* Spectrum needs for the terrestrial component of IMT
* Sharing and compatibility studies[[1]](#footnote-1) for the following frequency bands:

24.25-27.5 GHz[[2]](#footnote-2), 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz

31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz

# Preliminary CEPT position

CEPT supports studies on IMT spectrum needs in the range 24.25-86 GHz and sharing and compatibility studies for the bands listed in Resolves 2 of Resolution 238 (24.25-27.5 GHz, 31.8-33.4 GHz, 37-43.5 GHz, 45.5-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz), with the focus on the frequency bands 24.25-27.5 GHz, 31.8-33.4 GHz and 40.5-43.5 GHz.

* CEPT intends to harmonise the 24.25-27.5 GHz band for Europe for 5G before WRC-19 through the adoption of a harmonisation decision and to promote it for worldwide harmonisation. Hence the 24.25-27.5 GHz is a clear priority for immediate study within CEPT. Studies need to take into account the compatibility with and protection of all existing services, including their future deployments, in the same and adjacent frequency bands; in particular the protection of current and future EESS/SRS earth stations should be addressed.

CEPT supports the identification of global bands for IMT among the bands listed in resolves to invite ITU‑R 2 of Resolution 238, taking into account the results of sharing and compatibility studies with existing services. Bands outside those listed in resolves to invite ITU-R 2 of Resolution 238 are not supported for consideration under this Agenda item.

Note: CEPT has developed a Roadmap on 5G ([http://cept.org/ecc/topics/spectrum-for-wireless-broadband-5g#roadmap](http://cept.org/ecc/topics/spectrum-for-wireless-broadband-5g%22%20%5Cl%20%22roadmap)). In this respect it is noted that “Europe has harmonised the 27.5-29.5 GHz band for broadband satellite and is supportive of the worldwide use of this band for ESIM. This band is therefore not available for 5G”.

# Background

This agenda item received widespread worldwide support at WRC-15.

The Agenda item considers new spectrum allocations to the mobile service and identification of frequency bands for IMT. The rationale for this agenda item is to address demand for terrestrial wireless broadband, where terrestrial wireless provides a key means of delivery, alongside cable, fibre and satellite.

Other radiocommunication services with allocations in spectrum bands under consideration are potentially affected, so technical studies will assess any potential impact and consider what technical measures might be necessary to manage compatibility.

CPM19-1 agreed a decision (see Annex 9 of Circular [CA/226](http://www.itu.int/md/R00-CA-CIR-0226/en)) on the establishment and terms of reference of SG5 TG5/1 on WRC-19 Agenda item 1.13 “to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 238 (WRC‑15)”.

The CPM19-1 decision requests WP 5D to conduct and complete the studies as indicated in resolves to invite ITU-R 1 of Resolution 238 (WRC-15), with regards to spectrum needs, technical and operational characteristics including protection criteria, and deployment scenarios for the terrestrial component of IMT by 31 March 2017 and report the results of these studies to TG5/1.

RSPG has agreed an opinion on spectrum related aspects for next-generation wireless systems (5G). The RSPG opinion recommends the 24.25-27.5 GHz as a pioneer band for 5G above 24 GHz which can be studied and harmonised in Europe for early implementation. ECC#43 has approved a comprehensive list of actions regarding the fifth generation of mobile technology (5G) named “CEPT roadmap for 5G”.

## 24.25-27.5 GHz

[placeholder]

## 31.8-33.4 GHz

[placeholder]

## 37-40.5 GHz

[placeholder]

## 40.5- 42.5 GHz

[placeholder]

## 42.5-43.5 GHz

[placeholder]

## 45.5-50.2 GHz

[placeholder]

## 50.4-52.6 GHz

[placeholder]

## 66-76 GHz

[placeholder]

## 81-86 GHz

[placeholder]

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

* ECC PT1 (16)133 Annex 31Rev1 Summary of responses to questionnaire on bands for AI1.13
* ECC PT1 (16)133 Annex 33 Table of information for AI1.13
* ECC(16)110 Annex 17 CEPT roadmap for 5G

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

* 5G action plan – COM(2016)588
* RSPG Opinion 16-032 - Opinion on spectrum related aspects for next-generation wireless systems (5G)

# Actions to be taken

Carry out sharing and compatibility studies for the bands listed in Resolves 2 of Resolution 238.

Review positions of other regional groups

Continue Correspondence Group on 26 GHz

For 24.65-25.25 GHz, ECC PT1 needs to investigate ways to safeguard the use of existing and possible future deployment of FSS earth stations in that band.

Consider contributions to TG5/1

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations

APT (date of proposal)

ATU (date of proposal)

Arab Group (03 Nov 2016)

Arab States support identification of spectrum for IMT systems in the frequency band 24.25-86 GHz taking into account the spectrum needs and technical parameters for IMT 2020.

Arab states support that sharing studies should ensure protection of the existing services

CITEL (date of proposal)

Brazil

Agenda Item 1.13 is key to the future development of IMT systems for the delivery of IMT-2020 services. With that in mind, we support appropriate sharing and compatibility studies under Agenda Item 1.13 in the bands 24.25-27.5 GHz, 31.8-33.4 GHz, 37-43.5 GHz, 45.5-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz.

USA

Support studies under WRC-19 agenda item 1.13 and take appropriate action based on the results of these sharing and compatibility studies in accordance with Resolution 238 in the following bands:

24.25-27.5 GHz, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis; and 31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz, which may require additional allocations to the mobile service on a primary basis.

RCC (16 September, 2016)

The RCC Administrations support identification of spectrum requirements for IMT systems in separate bands in the frequency band 24.25-86 GHz using different approaches to the assessment of such requirements, as well as taking into account parameters of IMT-2020 systems and possible differences in spectrum requirements for IMT-2020 systems in lower and upper parts of the considered frequency band.

The RCC Administrations support identification of frequency bands for future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in separate bands in the frequency band 24.25-86 GHz.

The RCC Administrations consider that when developing technical conditions and regulatory provisions for the allocation of frequency bands to the MS and their identification for IMT it is necessary to ensure protection of other services having allocation in the considered and adjacent frequency bands taking into account the need in their development.

The RCC Administrations consider it reasonable to perform studies on IMT system compatibility first of all in the frequency bands 24.25-27.5 GHz, 31.8-33.4 GHz and 40.5-42.5 GHz, where global harmonization could be achieved.

The RCC Administrations consider that when conducting studies it is necessary to identify priority frequency bands which are non-overlapping with the frequency bands in Agenda items 1.6 (non-GSO FSS), 1.14 (HAPS) and 9.1 (issue 9.1.9, Resolution 162 (WRC-15)).

## International organisations

IARU (9/1/21017)

The IARU is of the view that the spectrum requirements identified for IMT in the frequency range between 24.25 GHz and 86 GHz can be fully met in the frequency bands that are already allocated to the mobile service on a primary basis, and do not justify the allocation of 47.0-47.2 GHz to the mobile service. This narrow primary allocation is the only spectrum in which amateur experimentation with millimeter wavelengths can be conducted without practical constraints imposed by sharing with other services. Therefore, the IARU opposes additional allocations in this band to other services, including the mobile service. If either or both of the bands that are adjacent to 47.0-47.2 GHz are identified for the terrestrial component of IMT, suitable emission limits must be included in order to ensure the protection of existing and future amateur and amateur-satellite stations in the 47.0-47.2 GHz band.

IARU is further of the view that any allocation to IMT in the frequency range 24.25-27.5 GHz shall include full consideration and protection for the amateur and amateur-satellite service’s primary allocation at 24-24.05 GHz.

IATA (date of proposal)

ICAO (16/09/2017)

Document PTC(16)INFO003 provides the following draft position of ICAO:

The frequency band 24.25-24.65 GHz is used for airport surface detection equipment (ASDE) in some countries. Additionally, the frequency range 31.8-33.4 GHz is identified in the “Handbook on Radio Frequency Spectrum Requirements for Civil Aviation”[[3]](#footnote-3) as also being used for ASDE. The higher frequency ranges give greater resolution; a factor that is gaining greater importance with the ever increasing density of traffic at airports.

The 31.8-33.4 GHz frequency range is also used for embedded systems that generate navigation information and a video image of the external scene and provide them to the pilot. The band offers a good compromise between resolution and atmosphere penetration in bad weather conditions.

The frequency range 76-81 GHz is allocated to the radiolocation service on a primary basis in all three ITU Regions and is planned to be used for non safety-critical, advisory applications on the airport surface such as wing-tip radar. According to Resolution 238 (WRC‑15) the frequency range 76-81 GHz is excluded from consideration for IMT, however, any new identification for the terrestrial component of IMT should ensure adjacent band protection of these aviation applications.

Finally, the frequency bands 43.5-47 GHz and 66-71 GHz have allocations to the Radionavigation and/or Radionavigation-Satellite services. However no aeronautical systems have currently been identified as operating in those frequency bands.

ICAO Position:

To oppose any identification of a frequency band for IMT that could impact aviation systems, within a new or existing allocation to the mobile service in the frequency range 24.25 GHz to 86 GHz, unless agreed ITU-R studies demonstrate no adverse impact to those systems.

IMO (date of proposal)

SFCG (14/09/2016)

SFCG supports the protection of existing space science service allocations. No new allocation/identification of spectrum to support mobile broadband systems (IMT-2020) should be made in space science service bands unless acceptable sharing criteria and conditions are developed.

SFCG does not support consideration of any frequency band that is not included in the list of potential candidate bands as identified in Resolution 238 (WRC-15).

A particularly critical situation concerns the band 25.5-27 GHz which is expected to be heavily used by many future EESS and SRS satellite missions for data downlinks. As recognized in Resolution 238 (WRC-15) (footnote 2 of resolves to invite ITU-R 2) for the 25.5-27 GHz band, it is fundamental for SFCG Member Agencies to be assured that EESS and SRS earth stations will continue to be able to expand in the future both in terms of number of satellites serviced and number of earth stations. Licences for these earth stations, which inherently provide protection from interference by IMT systems, must not be refused or restricted on the basis that such action may limit IMT operational areas. Negative experiences in the past with earlier cellular mobile systems in the band 2110-2120 MHz must not be repeated.

Protection of the 31.8-32.3 GHz band usage by current and future SRS deep space systems (s-E) should also be ensured.

Other specific concerns for SFCG are:

* 24.25-27.5 GHz: 25.25-27.5 GHz is allocated to inter-satellite service (ISS) on primary basis and is used for data relay satellite return links.
* 31.8-33.4 GHz: The adjacent 31.3-31.8 GHz band is allocated to EESS/SRS (passive) and is protected under RR No. 5.340.
* 37-40.5 GHz: The adjacent 36-37 GHz band is allocated to EESS/SRS (passive). 37-38 GHz is allocated to SRS (space-to-Earth), while 40-40.5 GHz is allocated to EESS/SRS (Earth-to-space).
* 47.2-50.2 GHz: The adjacent band (50.2-50.4 GHz) is allocated to EESS/SRS (passive) and is protected under RR No. 5.340.
* 50.4-52.6 GHz: The adjacent band (50.2-50.4 GHz) is allocated to EESS/SRS (passive) and is protected under RR No. 5.340.
* 81-86 GHz: The adjacent band (86-92 GHz) is allocated to EESS/SRS (passive) and is protected under RR No. 5.340.

Frequency overlaps with other WRC-19 AI’s (1.6 and 1.14) need to be taken into account.

WMO and EUMETNET January 2017

WMO supports the need to conduct studies under Agenda Item 1.13. WMO does not oppose new IMT 5G identification/allocations provided that protection of ISS, EESS (Earth-to-space and space-to-Earth) and EESS (passive) is ensured and that guarantees are given on the long-term usage and future deployment of receiving EESS earth stations (in particular in the 25.5-27 GHz band).

The protection of EESS (passive) would require appropriate unwanted emission limits in Resolution 750 (rev. WRC-15).

Furthermore, WMO would appreciate the development of a solution to ensure the effective operation of the ground-based radiometers in the 22-28 GHz and 50.4-51.4 GHz frequency bands.

## Regional organisations

ESA and Eumetsat : see SFCG

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (9/3/17)

5G developments are still ongoing and there are many issues that will need to be addressed, including technical, market-related and regulatory. Nevertheless the large scale delivery of audio-visual content is considered to be one of the key 5G applications to be included in next IMT-2000 standards.

We believe that the performance targets proposed for IMT-2020, in particular the very high throughput, can only be achieved if the system has access to a large amount of radio spectrum and uses large contiguous bandwidth (e.g. 100 MHz or more per channel), which can only be found in the higher frequency ranges. The WRC-19 discussions point towards bands in the range 24.25-86 GHz. EBU supports that considerations of bands above 6 GHz for IMT-2020 shall be limited to the bands identified by WRC-15 in order to strengthen the opportunities for global harmonisation.

GSMA (date of proposal)

CRAF (8/3/2017)

CRAF supports the protection of existing RAS, SRS, and EESS (passive) frequency allocations. No changes should be made to the RR unless acceptable sharing and compatibility criteria are developed to ensure the protection of RAS, SRS, and EESS (passive) from future IMT operations. A number of RAS and passive frequency bands, which may be affected by the future IMT allocations are listed in the Table below.

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| Frequency Band (GHz) | RAS Status | RR Footnote |
| 23.6-24.0 | PRI | 5.340 |
| 31.3-31.5 | PRI | 5.340 |
| 42.5-43.5 | PRI | 5.149 |
| 48.54-49.04 | PRI | 5.340, 5.149 |
| 50.2-50.4 |  | 5.340 |
| 76.0-77.0 | PRI | 5.149 |
| 81.0-86.0 | PRI | 5.149 |

1. Including studies with respect to services in adjacent bands, as appropriate. [↑](#footnote-ref-1)
2. When conducting studies in the band 24.5-27.5 GHz, to take into account the need to ensure the protection of existing earth stations and the deployment of future receiving earth stations under the EESS (space-to-Earth) and SRS (space-to-Earth) allocation in the frequency band 25.5-27 GHz. [↑](#footnote-ref-2)
3. Doc 9718, AN/957, Volume I, ICAO spectrum strategy, policy statements and related information, First Edition, 2014 [↑](#footnote-ref-3)