**3GPP TSG-RAN WG4 Meeting #94-e draft R4-2002867**

**Electronic Meeting, 24 Feb. – 6 Mar., 2020**

**Source:** Huawei

**Title:** TP to TR 38.820: summary on the frequency bands of interest within 7-24 GHz range

**Agenda Item:** 10.3.2

**Document for:** Agreement

# Introduction

During RAN4#90, summary of operator’s interest in the 7-24 GHz frequency range was submitted in [1], capturing the following ranges:

Table 1: Frequencies of interest in 7.125 – 24.250 GHz frequency range [1]

|  |  |  |
| --- | --- | --- |
|  | Frequency range of interest (GHz) | Region |
| Operator #1 | 7.125 - 8.5 | Region 1/ Europe |
| Operator #2 | 10.7 - 11.7 | Region 1/ MENA |
| Operator #3 | 12.2 - 12.7 | Region 2/ USA |
| Operator #4 | 21.4 - 22 | Region 1/ Europe |

At that time the above information was not captured in the TR 38.820.

During RAN4#91 meeting in Reno, additional information was provided in [2], based on GSMA and ETNO contributions to the CEPT ECC PT A meeting #6 [3, 4]. Both GSMA and ETNO were proposing introduction of new agenda items for additional spectrum for IMT below 24 GHz at WRC-23.

This contribution provides a list of frequency bands of interest, capturing inputs collects during RAN Drafts discussion, and later extended by inputs from CEPT and ATU regional preparatory meetings towards WRC-19.

Related TP to TR 38.820 is attached.

# Discussion

## CEPT region

Based on the contributions submitted to the CEPT ECC PT A meeting #6 [3, 4], and PT A meeting #7 [5, 6] for new IMT agenda proposals for WRC-23, it was identified that the list of the frequency ranges of interest within 7-24 GHz range shall be updated and extended in the TR 38.820.

GSMA proposals [4, 6] included the following items from 7 – 24 GHz range:

* 7.125 – 8.5 GHz
* 10.7 – 11.7 GHz
* 14.3/14.5 – 15.35 GHz

All the frequency ranges indicated by GSMA were recognized to have potential country/region specific allocations due to spectrum fragmentation.

ETNO proposals [3, 5] included the following items from 7 – 24 GHz range:

* 6.425 – [7.125 / 8.5] GHz
* 14.3 – 15.35 GHz

Based on the above additional inputs on the operators interest in Region 1 and globally, it is proposed to update the information on the frequency ranges of interest for the IMT allocation.

## ATU region

Based on contributions submitted to the ATU meeting WG19-3 [8] and discussed in [9] a list of bands in 7 – 24 GHz range was indicated by the SADC, EACO and ECCAS as the starting point for discussion. This was further discussed and concluded in the report from the 4th and final African preparatory meeting for the WRC-19 (APM19-4) [10]. The following was concluded for the proposed WRC-23 agenda items:



Based on the above additional inputs on the operators interest in Africa region, it is proposed to update the information on the frequency ranges of interest for the IMT allocation in 7- 24 GHz range.

# Conclusion

Based on the above additional inputs on the operators and industry interest in CEPT and ATU regions, it is proposed to update the TR 38.820 with the information on the frequency ranges of interest, for the purpose of keeping the record of the operators and industry interest, as this information may be found useful durinf future WRC-23 preparations:

**Proposal**: Agree on the attached TP to TR 38.820, capturing the updated list of frequency ranges of interest in the 7 - 24 GHz range.

# References

[1] R4-1901752 Summary of operator’s interest in the 7-24 GHz frequency range, RAN4#90, Huawei

[2] R4-1907017 ECC CPG PT A group discussion on the IMT spectrum allocations in 7-24 GHz range, RAN4#91, Huawei

[3] PTA(19)035 ETNO\_Proposal for a new agenda item for WRC-23, ETNO

[4] PTA(19)036 GSMA input to PTA on AI 10, GSMA

[5] PTA(19)087 New Resolution IMT below 24GHz, ETNO

[6] PTA(19)073 GSMA\_Input to PTA on AI 10, GSMA

[7] R4-1909283 Updates on CEPT ECC PT A decisions on WRC-2023 agenda for IMT in 7-24 GHz

[8] WG19-3 Input Doc 78 - EACO&EACO on AI 10 (WRC-23 agenda) IMT in 6 -24 GHz band, [http://atu-uat.org/17-21-june-2019/#](http://atu-uat.org/17-21-june-2019/)

[9] R4-1909284 ATU report on the IMT in 6-24 GHz for WRC-2023 agenda

[10] APT19-4 4th / Final African Preparatory Meeting for WRC-19 (APM19-4), report, 26-30.08.2019

# Draft TP to TR 38.820

In this section we provide Draft TP to TR 38.820.

*---------------------------------------------- Start of modified section ----------------------------------------------*

# 1 Scope

The present document is a technical report for the study item on 7.125 – 24.250 GHz frequency range, covering the regulatory framework study, general RF aspects, as well as BS- and UE-specific aspects.

During the NR study item in Rel-14, frequency range of 6 – 24 GHz was discussed as part of the RAN WG4 studies. This frequency range was included within the Rel-14 study item objectives and the operational requirements for Next Generation access technologies described in TR 38.913 [2].

As the frequencies below 7.125 GHz and above 24.25 GHz (i.e. up to 52.6 GHz) were already addressed in Rel‑15 NR specifications, the discussion on the 7 - 24 GHz intermediate range was triggered at later stage.

NOTE 1: During Rel-15 work on NR frequency bands, the FR1 frequency range was initially defined up to 6 GHz. At later stage of Rel-15, the FR1 was agreed at RAN#82 meeting to be extended up to 7.125 GHz in order to incorporate the NR-U work and potential licensed operation.

NOTE 2: For simplicity purposes, whenever the term “7 – 24 GHz” will be used in this technical report, the frequency range of 7.125 – 24.250 GHz shall be considered.

This TR intends to provide information on the feasibility of NR operation in 7 – 24 GHz frequency range for set of potential deployment scenarios, considering BS RF and UE RF technology capabilities taking into account possible ranges for key requirements.

This TR does not intend to provide specific recommendations on NR system parameter values to be defined, nor specific RF or EMC requirement values to be defined for UE or BS operation in this frequency range, as those aspects are considered to be covered by the follow-up WI.

*---------------------------------------------- Next modified section ----------------------------------------------*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

*---------------------------------------------- Unchanged part omitted ----------------------------------------------*

[55] RP-170021, Reply LS to ITU-R WP5D/374 (Attachment 4.13) on Characteristics of terrestrial IMT systems for frequency sharing/interference analysis in the frequency range between 24.25 GHz and 86 GHz, RAN #75

[56] PTA(19)087 New Resolution IMT below 24GHz, ETNO[57] PTA(19)073 GSMA\_Input to PTA on AI 10, GSMA

[58] APT19-4 4th / Final African Preparatory Meeting for WRC-19 (APM19-4), report, 26-30.08.2019

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# 4 Regulatory landscape survey

## 4.1 General

For the summary of spectrum within the 7 – 24 GHz range which was identified by the interested operators, industry and regional regulatory bodies for potential use for IMT purposes, refer to annex B.

The regulatory landscape survey for the frequency range from 7.125 to 24.25 GHz is provided in this clause. Tables 4.1-1 and 4.1-2 below summarize the radio regulation for regions 1, 2, and 3.

*---------------------------------------------- Next modified section ----------------------------------------------*

Annex B (informative):
Frequency ranges of interest in 7 – 24 GHz

In order to facilitate adequate and timely availability of the 7 - 24 GHz spectrum for IMT services with appropriate regulatory provisions, the RAN-level discussion was initiated capturing number of requests from operators. Three operators expressed their interest by providing frequency ranges of interest, as captured in table B-1 in rows 1 – 3.

Additionally, MNO’s provided their harmonized views (in form of European Telecommunications Network Operators (ETNO) and GSM Association (GSMA) contributions) as inputs to the CEPT ECC PT A meeting discussion on the potential additional agenda items for the WRC-2023 conference.

Africa Telecommunication Union (ATU) provided Africa’s common proposal with the list of frequency ranges of interest for studies on frequency-related matters for IMT identification including possible additional allocations to the mobile services on a primary basis in portions of the 7 – 24 GHz frequency range for the future development of IMT-2020 and beyond.

For future reference, all the above mentioned requests were listed in table B-1 and depicted on figure B-1 below.

Table B-1: Frequency ranges of interest in 7.125 – 24.250 GHz

|  |  |  |
| --- | --- | --- |
| Source | Frequency range of interest (GHz)(Note 4) | Region, applicability |
| 1 | Operator #1 | 7.125 – 8.521.4 – 22.0 | Region 1/ Europe (Note 1) |
| 2 | Operator #2 | 10.7 – 11.7 | Region 1/ MENA (Note 1) |
| 3 | Dish Network | 12.2 – 12.7 | Region 2/ USA (Note 1) |
| 4 | ETNO [56] | 8.5 14.3 – 15.35 | Region 1/ Europe (Note 2) |
| 5 | GSMA [57] | 7.125 – 8.510.7 – 11.714.3 / 14.5 – 15.35 | Global (Note 3) |
| 6 | ATU [58] | 7.125 – 8.5 8.5 - 10.010.0 - 10.5 14.3 / 14.8 - 15.3515.35 - 15.63 15.63 - 17.3  | Africa |
| NOTE 1: Interest indicated by individual company during RAN Drafts discussion, before creation of this study item.NOTE 2: Those frequency ranges offer large amounts of contiguous spectrum with primary Mobile allocation on a global basis (except 14.3 - 14.4 GHz in Region 2).NOTE 3: As usage of frequency ranges varies across countries and regions, it is likely to be necessary to consider frequency ranges from within which different portions may be used in different countries/regions according to their particular situations and needs. NOTE 4: this table captures only proposals for 7 – 24 GHz range. It shall be noted that proponents formulated also other frequency ranges of interest for IMT, not belonging to 7 – 24 GHz range.  |

Figure B-1: Summary of frequency ranges of interest in 7.125 – 24.25 GHz

The above initial proposals for IMT in 7 – 24 GHz and for introduction of new agenda items for WRC-23 conference were not agreed during WRC-19.

For the summary of WRC-19 conclusions for IMT in 7 – 24 GHz range, refer to subclause 4.4.

Annex C:
Change history

*---------------------------------------------- End of modified section ----------------------------------------------*