Working document on the availability of the 3400-3800 MHz band for 5G

**Summary**

In this document the results of the questionnaire on on the availability of the 3400-3800 MHz band for 5G are presented. The questionnaire closed on 30th November 2016.

40 responses were received to the questionnaire, including 30 from administrations and 10 from industry. A summary of all responses is provided below.

The full responses ordered by respondent are provided in **ECC PT1(17)017 Annex 1**.

The full responses to Q1 are provided in a spreadsheet in **ECC PT1(17)017 Annex 2.**

The full responses to Q2 to Q4 by question in table form are provided in
**ECC PT1(17)017 Annex 3**.

**Background**

ECC Plenary (14-17 June 2016, Stockholm) tasked ECC PT1 to assess the suitability of the technical conditions of ECC Decision (11)06 for 5G (doc. ECC(16)080 Annex 17).

ECC PT1#53 (12-16 September 2016, Budapest) considered the scope of the new task and, in connection with this work item, and based on information from EFIS (ECO Report 03) identified some spectrum fragmentation in the 3400-3800 MHz.

ECC PT1 identified the need to update the information on the current utilisation,  the national plans on the usage of this band in CEPT countries and any on-going action regarding availability in a short time frame of a large contiguous spectrum blocks for the initial deployment of 5G networks.

ECC PT1#53 agreed a questionnaire on this issue.

**Respondents**

The following 30 CEPT administrations **indicated in bold** provided a response:

|  |  |
| --- | --- |
| AlbaniaAndorra**Austria****Azerbaijan**Belarus**Belgium**Bosnia Herzegovina**Bulgaria****Croatia****Cyprus****Czech Republic****Denmark****Estonia****Finland****France**Georgia**Germany****Greece****Hungary**Iceland**Ireland**Italy**Latvia**Liechtenstein | **Lithuania****Luxembourg**Former Yugoslavian Republic of Macedonia (FYROM)**Malta**MonacoMontenegroMoldova**Netherlands****Norway**Poland**Portugal****Romania**Russian FederationSan Marino**Serbia****Slovak Republic****Slovenia****Spain**Sweden**Switzerland****Turkey****United Kingdom**UkraineVatican City |

Responses to Question 4 were also received from the following organisations:

|  |
| --- |
| ETNO |
| GSMA |
| Orange |
| CAR 2 CAR Communication Consortium |
| Telecom Italia |
| The 5G Infrastructure Association |
| Telia Company AB |
| GSA - Global Supplier Mobile Association |
| CLEPA - European Association of Automotive Suppliers |
| ACEA (European Automobile Manufacturers Association) & CLEPA (European Association of Automotive Sup |

**List of questions**

**Questions for CEPT administrations**

**Question 1:** *What is the current situation with the authorisation of the 3400-3800 MHz band in your country? Please fill in the table below for each authorised portion of the band. If portions of the band are vacant (e.g. not assigned or previously assigned but licences have expired), please indicate this. If the band is authorised to other users than MFCN operators, please indicate this under Application.*

**Question 2:** *What is the current situation with the actual utilisation (e.g. deployment areas) and the plans of the authorised users in the 3400-3800 MHz band in your country (to the extent this information is known to your administration)?*

**Question 3:** *Do you have national plans with regard to the future utilisation of the 3400-3800 MHz band?*

**Question 3.1:** *If yes:*

***3.1:*** *What are the possible steps that you’re planning to undertake at national level in order to make the spectrum available?*

***3.2:*** *What is the intended timing?*

***3.3:*** *Is this intended to facilitate the early availability of a large contiguous spectrum blocks for the initial deployment of 5G networks? If yes please explain*.

**Questions for industry**

**Question 4*:*** *What type of 5G services are targeted in this band?*

*How much bandwidth will be neede*d?

**Summary of responses**

**Question 1:** *What is the current situation with the authorisation of the 3400-3800 MHz band in your country?*

The responses to this question are illustrated in the following figures showing the following information at a resolution of 5 MHz:

* Figure 1: applications
* Figure 2: Licence expiry date
* Figure 3: Extent of coverage
* Figure 4: Paired spectrum
* Figure 5: Technology/service neutrality
* Figure 6: Spectrum trading

The full information for all licences including detailed frequency information, exact licence expiry dates and licence holder names is provided in a spreadsheet in Annex 2.

It should be noted that some administrations provided supplemental information on specific details under Q2 and Q3. The responses to these questions should also be taken into account when reading the tables for Q1 below.

**Figure 1: Applications**

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**Legend**

|  |  |  |
| --- | --- | --- |
|  | **Category** | **Definition** |
| 1 | Vacant | Unused or no information provided |
| 2 | Mobile/Wireless broadband | Includes MFCN, BWA, FWA, WLL, WiMAX, LTE and similar terms |
| 3 | FS | Fixed Service point to point links |
| 4 | FSS | Fixed Satellite Service Earth station receivers |
| 5 | Other | Includes Military and related terms, PMSE/ENG-OB, amateur and other miscellaneous terms |
| 6 | Unknown | Technology neutral or information not available |
| 7 | Mixed | Combination of 2 or more above categories in use within the same range |

**Figure 2: Licence expiry date**

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**Legend**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | N/A (Vacant) | 9 | 2020 |
| 2 | Unspecified | # | 2021 |
| 4 | Annual | # | 2022-2025 |
| 5 | By end 2016 | # | 2026-2030 |
| 6 | 2017 | # | 2031-2035 |
| 7 | 2018 | # | 2036-2037 |
| 8 | 2019 | # | Unlimited |

For cases where multiple licences are in use in the same frequency range the latest expiry date is shown

**Figure 3: Extent of coverage**

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**Legend**

|  |  |
| --- | --- |
| 1 | National |
| 2 | Regional |
| 3 | Individual transmitter |
| 4 | N/A (Vacant or unspecified) |

For cases where multiple licences with different coverage types are in use in the same frequency range the widest extent of coverage is shown

**Figure 4: Paired spectrum**



**Legend**

|  |  |
| --- | --- |
| 1 | Yes |
| 2 | No |
| 3 | Mixed\* |
| 4 | N/A |

\*Applies where multiple licences have different types within the same frequency range

Note: Some information has been corrected where paired spectrum was indicated with no counterpart uplink/downlink range provided.

**Figure 5: Technology/service neutrality**

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**Legend**

|  |  |
| --- | --- |
| 1 | Yes |
| 2 | No |
| 3 | Mixed\* |
| 4 | N/A |

\*Applies where multiple licences have different types within the same frequency range

**Figure 6: Spectrum trading**

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**Legend**

|  |  |
| --- | --- |
| 1 | Yes |
| 2 | No |
| 3 | Mixed\* |
| 4 | N/A |

\*Applies where multiple licences have different types within the same frequency range

**Question 2:** *What is the current situation with the actual utilisation (e.g. deployment areas) and the plans of the authorised users in the 3400-3800 MHz band in your country (to the extent this information is known to your administration)?*

Existing mobile and wireless broadband services

Actual utilisation for MFCN/BWA is generally limited. 17 administrations indicate that services are operational. This is mainly within 3400-3600 MHz. Deployments are typically focussed on specific areas, e.g. for rural coverage, typically using WiMAX.

3 administrations note that the existing authorisations expire by the end of 2018, 1 by 2019, and 1 beyond 2020. Others did not provide information on expiry dates in this question.

3 administrations specifically note they have authorisations which are not currently in use. A further 3 administrations have no authorisations for mobile services in this range. In some cases information on actual usage is not available as this not provided to the administration.

Other existing usage

3 administrations note fixed link usage (point-to-point links) is expected to decrease or be migrated to other bands, 1 administration expects existing usage to continue.

1 administration notes video PMSE usage is planned to continue in 3400-3600 MHz, and 1 notes temporary usage for ENG/OB with national licences.

1 administration notes a satellite earth station used for reception of defence services requires protection, which results in restrictions on mobile broadband usage within 3410-3800 MHz. 1 administration reports registered FSS and VSAT stations.

**Question 3:** *Do you have national plans with regard to the future utilisation of the 3400-3800 MHz band?*

22 administrations have plans and 8 have no plans.



**Question 3.1:** *If yes:*

***3.1:*** *What are the possible steps that you’re planning to undertake at national level in order to make the spectrum available?*

11 administrations are currently reviewing or planning to review the use of the band for MFCN (including future 5G), but have not made final plans. Many are undergoing or planning public consultations to determine the market needs. Decisions are also subject to sharing studies with existing services and ongoing international work in this band.

7 administrations have decided to release at least parts of the band for MFCN. In some cases the final plans are still subject to public consultation.

1 administration is currently undergoing an award process.

3 administrations indicate the majority of spectrum is already available for MFCN.

***3.2:*** *What is the intended timing?*

5 administrations intend to make final decisions and start award process in 2017, 3 by 2018, 1 by 2019, 1 by 2020, 1 by 2021 and 2 by 2022.

8 administrations have not decided yet

1 administration is currently undergoing an award and services are planned to be launched in 2017.

***3.3:*** *Is this intended to facilitate the early availability of a large contiguous spectrum blocks for the initial deployment of 5G networks? If yes please explain*.

8 administrations intend to facilitate large contiguous blocks. In some cases this will depend on market and award designs.

10 administrations have not made any decisions yet.

3 administrations indicate that this is already possible with available spectrum,.subject to market demand.

1 administration believes it is not necessary to make specific plans to facilitate 5G as the licences will be technology neutral.

**Questions for industry**

**Question 4*:*** *What type of 5G services are targeted in this band?*

Mobile industry respondents indicate that this band will be one of the primary bands for enhanced mobile broadband (eMBB), for the provision of high capacity (order of Gbit/s) using small cells. The propagation properties of this band are noted as suitable for dense urban coverage (indoor and outdoor).

The need for suitable protection measures for FSS above 3.6 GHz is noted.

Automotive industry respondents indicate that this range is suitable for LTE-V2V (vehicle to vehicle) and V2X applications.

*How much bandwidth will be neede*d?

Mobile industry respondents indicate that a minimum of 100 MHz per operator would provide the full benefits of this range to provide high capacity to dense urban areas.

Automotive industry respondents indicate that 100-200MHz may be required for LTE V2X, and at least 50 MHz for LTE-V2V. However it is difficult to determine the bandwidth requirements at present.