CEPT Report <No>

Report from CEPT to the European Commission in response to the Mandate on shared use of 3800-4200 MHz by terrestrial wireless broadband systems providing local-area network connectivity

**Report approved on DD Month YYYY by the ECC(Arial 9pt bold)**

1. This is a working document. The modifications inserted are based on inputs for ECC PT1 #72-74 and there was no time to review them. All texts will be further reviewed and discussed in upcoming correspondence group meetings until the ECC PT1 #75.

# Executive summary

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**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **Abbreviation** | **Explanation** |
| **CEPT** | European Conference of Postal and Telecommunications Administrations |
| **ECC** | Electronic Communications Committee |
|  |  |
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|  |  |
|  |  |

# Introduction

1. drafting managed by FM60

# Existing and planned use of 3.8-4.2 GHz

1. drafting managed by FM60

## Fixed Satellite Service

The 3400-4200 MHz band has been used for decades by the FSS for space-to-Earth links (downlink), together with the 5850-6725 MHz frequency band for Earth-to-space links (uplink). In CEPT countries, the 3600-3800 MHz and 3800-4200 MHz have been usually used more extensively by FSS earth stations than the lower part 3400-3600 MHz.

Due to the introduction of 5G in 3.4-3.8 GHz, as primary band in Europe, CEPT recommended in areas intended for 5G, such as urban, suburban areas, or along transport routes such as roads and railways that administrations consider relocation of earth stations operating in 3400-3800 MHz to a different geographical location or to a different band above 3800 MHz (See ECC report 287). In addition, in the areas where 5G is intended to be used, CEPT recommended administrations not to issue authorisations to new sites in this band for FSS and to consider the higher bands above 3800 MHz for future FSS usage.

In consequence, administrations maintained a limited number of FSS earths station in 3600-3800 MHz and many stations have migrated from the band below 3800 MHz to the 3800-4200 MHz frequency band.

C-band is an essential frequency band for FSS because of its unique characteristics such as a wide geographic coverage over continents and a resistance to rain fade. The band is therefore critical for services provided to inter-tropical regions, and as part of their global reach, many earth stations are located in European geographic area for inter-continental communications. Applications of C-band services include connectivity for enterprises and public institutions (remote locations or large continental networks), mobile backhauling, video contribution and distribution.

For example:

* Various international broadcasters use C band FSS for international distribution of content from Europe to the rest of the world. Although this content is uplinked in a different band, the downlink is in the 3.8-4.2 GHz band. Successful operation of this system relies on interference-free reception of the downlinked signal for continuous power control (at an uplink site) and monitoring use. Large dish earth stations also need to receive beacon signals transmitted from the satellite for tracking purposes.
* Many video contribution links are also received in Europe in the C-band from other regions before being distributed from Europe.

Existing FSS earth stations in 3800-4200 MHz are limited in number and locations are well identified. New C-band earth stations sites could be established in European geographic area in the future in locations that would be well identified. In addition, CEPT is currently studying the possibility to exempt from individual licensing small C-band IoT terminals in other frequency bands. The development of such application could lead to the need for more gateway earth stations in the band 3.8-4.2GHz.

Due to introduction of 5G below 3800 MHz, some administrations have implemented in addition to 5G harmonised technical conditions in 3400-3800Mhz, national measures in order to protect the earths stations above 3800 MHz. Those national frameworks are giving visibility and legal certainty for the future development of earth stations in 3800-4200 MHz while also ensuring development of 5G in 3400-3800 MHz.

Downlink C-band satellite communications are and will remain concentrated in the band 3800 – 4200 MHz in European geographic area. As this is the only remaining part of C band, CEPT assessed and proposed conditions in order to preserve this band for long term development of FSS in accordance with the objectives of the EC mandate.

## Fixed Service

# Terrestrial wireless broadband systems providing local area (i.e. low/medium power) network connectivity in 3.8-4.2 GHz

1. drafting managed by PT1

## Background and description

CEPT assessed in this CEPT report the technical feasibility of the shared use of the 3.8-4.2 GHz frequency band by terrestrial wireless broadband systems providing local-area network connectivity (WBB LMP) according to the objective of the EC mandate.

CEPT noted early initiatives in few CEPT countries in the 3.8-4.2 GHz band either with framework or trials (experimental authorisations) in order to support a different demand compared to others frequency bands already harmonised for 5G. Other national initiatives have been also launched in part of 2.6 GHz and 3.4-3.8 GHz in order to respond to some vertical markets with different adjacent and usages conditions.

Within 3.4-3.8 GHz, current equipment in CEPT/Europe typically rely on standardised equipment taking into consideration the protection of radars below 3.4 GHz and 5G harmonisation in 3.4-3.8 GHz (i.e. hardware band filters for 3.4-3.8 GHz). It should be noted that the “in-band blocking” parameters of those 5G commercial networks stops at 3860 MHz. Therefore from a blocking perspective, 5G networks operating below 3.8 GHz may be protected from unsynchronised WBB LMP as long as they operate above 3860 MHz. CEPT developed a detailed analysis in this CEPT report in order to address and analyse the issue.

Moreover, within 3.8-4.2 GHz, the current initial/early launch of WBB LMP in CEPT/Europe benefit from 5G equipment designed for the US market (3.45-3.98 GHz). Even when operating above 3860 MHz, this equipment will not be protected from blocking effect originating from un-synchronisation with 5G networks below 3.8 GHz. CEPT developed a detailed analysis in this CEPT report in order to address and analyse the issue. Additional studies have been done to assess WBB LMP OOB emissions in order to properly protect 5G networks operating below 3.8 GHz.

## Use cases

The 400 MHz available in the 3.8-4.2 GHz frequency band could enable terrestrial wireless broadband systems to provide a variety of services for various local users, such as local communities as well as industrial connectivity and automation. The wide range of local use-cases for different industrial and non-industrial environments will benefit from harmonised technical conditions to respond to various vertical/industrial needs for both indoor and outdoor environments. Some industrial use-case examples in 3.8-4.2 GHz band are listed below:

* Indoors: Connectivity for remote asset monitoring and control, IoT based automation, quality and control management, predictive maintenance, energy optimisation etc.
* Outdoors: Connectivity for logistics in ports, IoT services in agriculture, location tracking of moving assets, etc.

The WBB LMP could also respond to Broadcasting use case as systems deployed within TV production environments (indoor and outdoor) to support multiple camera feeds and control signals.

Some of them are time-critical in nature and have strict requirements in e.g., latency and reliability.

## Parameters to be used for studies

1. See Annex 5.

### Coexistence scenarios

1. See Annex 6 section 4.

### Propagation parameters

1. See Annex 6 section 3.

# Sharing Studies with in-band services

1. ’ drafting managed by PT1
2. ’From PT1 WI Scope, point i): protection and the future evolution and development of incumbent users sharing this band, in particular receiving satellite earth stations and terrestrial fixed links

## WBB LMP

## Fixed Service

1. See Annex 6 section 1.1.

## Fixed Satellite Service (Space-to-Earth)

1. See Annex 6 section 1.2.

In the 3.8-4.2 GHz band, licensed earth stations communicate only with geostationary satellites (GSO).

Due to its unique characteristics which cannot be substituted by Ku or Ka bands, a large number of FSS downlink earths stations migrated from the band below 3.8 GHz to 3.8-4.2 GHz (others remain below 3.8 GHz). This migration took place during the last years prior the introduction of 5G in 3.4-3.8 GHz. Sharing solutions shall ensure protection and the future evolution and development of incumbent users sharing this band, in particular receiving satellite earth stations and terrestrial fixed links.

# Compatibility studies with Adjacent band Services

1. ’ drafting managed by PT1
2. ’From PT1 WI Scope, point ii): coexistence of terrestrial wireless broadband systems providing local-area network connectivity and uses operating in adjacent bands such as terrestrial systems providing wireless broadband electronic communications services in the 3.4-3.8 GHz frequency band and radio altimeters on board aircraft in the 4.2-4.4 GHz frequency band.

## Mobile Service below 3.8 GHz

### 5G commercial

1. See Annex 6 section 2.1

## Fixed Satellite service (space-to-Earth) below 3.8 GHz

1. See Annex 6 section 2.2.

Due to its unique characteristics which cannot be substituted by Ku or Ka bands, FSS downlink earths stations are still in operation below 3.8 GHz.

## Aeronautical Mobile (R) service above 4.2 GHz (WAIC)

## Aeronautical radionavigation service in 4.2-4.4 GHz in 4.2-4.4 GHz (Radio altimeters)

# technical Feasibility

1. drafting managed by FM60

# Harmonised technical conditions

1. drafting managed by FM60
2. ’From PT1 WI Comments section: PT1 will assist WG FM in defining the harmonised technical conditions, possibly a BEM.

# Standardisation needs

1. drafting managed by FM60
2. ’There is no specification for 3.8-4.2 GHz 5G local access connectivity - CEPT work in response to this EC Mandate should trigger follow up action from ETSI side: Harmonised standard to be developed taken into due consideration results of CEPT studies. This section will highlight parameters to be included in future harmonised standard 3.8-4.2 GHz 5G LAN

# Conclusions

1. drafting managed by FM60
2. cept mandate

|  |  |
| --- | --- |
|  | EUROPEAN COMMISSION  Communications Networks Content & Technology Directorate-General  Connectivity  **Radio Spectrum Policy** |

Brussels, 13 October 2021

DG CONNECT/B4

**RSCOM21-40rev2**

**INTERNAL**

**RADIO SPECTRUM COMMITTEE**

**Working Document**

**Subject: Draft Mandate to CEPT on technical conditions regarding the shared use of the 3.8-4.2 GHz frequency band for terrestrial wireless broadband systems providing local-area network connectivity in the Union**

*This is a Committee working document which does not necessarily reflect the official position of the Commission. No inferences should be drawn from this document as to the precise form or content of future measures to be submitted by the Commission. The Commission accepts no responsibility or liability whatsoever with regard to any information or data referred to in this document.*

**Draft Mandate to CEPT   
on technical conditions regarding the shared use of the 3.8-4.2 GHz frequency band for terrestrial wireless broadband systems providing local-area network connectivity in the Union**

1. **Purpose**

The Commission Communication on Connectivity[[1]](#footnote-2) for a competitive digital single market, towards a European gigabit society updated with the Commission Communication “2030 Digital Compass: the European way for the Digital Decade”[[2]](#footnote-3), set out ambitious connectivity objectives for the Union to be achieved through the widespread deployment and take-up of very high capacity networks, including 5G. The Commission Communication ‘5G for Europe: an Action Plan’[[3]](#footnote-4) highlighted 5G as a key enabler of the digitalisation of “vertical industries” (such as transport, logistics, automotive, health, energy, smart factories, media and entertainment). It also identified a need for coordinated action at Union level, including the identification and harmonisation of spectrum for 5G to serve innovative business models and solutions for locally licensed access to spectrum. The RSPG recognised that there is a specific demand for mid-band spectrum and recommended that Member States investigate the possible use of the band 3.8-4.2 GHz for local vertical applications (i.e. low/medium power) while protecting receiving satellite earth stations and other existing applications and services.

In addition, the Commission Communication on ‘A New Industrial Strategy for Europe’[[4]](#footnote-5), which lays out the vision for the industrial transformation in the Union for the next 10 years stresses the importance of strengthening the digital single market to underpin the Union’s digital transition. It calls on the Union to speed up investments in 5G as a major enabler for future digital services, thus setting it at the heart of the industrial data wave.

This mandate invites CEPT to assess the technical feasibility of the shared use of the 3.8-4.2 GHz frequency band by terrestrial wireless broadband systems providing local-area network connectivity with focus on vertical users and other terrestrial wireless use cases and, on that basis, deliver harmonised technical conditions for the shared use of the band. Those harmonised technical conditions should in particular ensure the protection and the possibility of future evolution and development of incumbent spectrum users in this band (notably receiving satellite earth stations in the fixed satellite service and terrestrial fixed links) and the coexistence with spectrum users in adjacent bands (such as radio altimeters on board aircraft operating in the 4.2-4.4 GHz frequency band).

1. **Policy context and inputs**

The RSPG has developed three Opinions (November 2016[[5]](#footnote-6), January 2018[[6]](#footnote-7) and January 2019[[7]](#footnote-8)) on a strategic spectrum roadmap towards 5G for Europe, in which it had identified 5G pioneer bands and addressed implementation challenges for 5G. In particular in its third opinion, the RSPG concludes that connectivity for vertical industries (‘verticals’) could be provided by mobile operator’s solutions, third-party providers and directly by verticals themselves in EU-harmonised bands for electronic communications services or in dedicated spectrum for verticals. The RSPG recommends that Member States also consider other spectrum solutions including dedicated or shared spectrum for the business/sectoral needs (‘verticals needs’) that may not be met by mobile operators. This is also confirmed by the RSPG’s Opinion of 16 June 2021[[8]](#footnote-9) ‘on a radio spectrum policy programme’.

In its recent Opinion of 16 June 2021[[9]](#footnote-10) ‘the RSPG recommends to study the possible use of the 3.8-4.2 GHz frequency band for local vertical applications (i.e. low /medium power), while protecting receiving satellite earth stations, as well as other existing radio applications and services.

Furthermore, in its Opinion of 16 June 2021[[10]](#footnote-11) ‘on spectrum sharing – pioneer initiatives and bands’, the RSPG *inter alia* urges Member States to promote studies on sharing approaches and technologies that would lead to increased possibilities of sharing or co-existence solutions and to encourage CEPT and ETSI[[11]](#footnote-12) to cooperate in support of this policy.

At present, a number of industrial sectors are looking at 5G as an enabler of the fourth industrial revolution (Industry 4.0). The deployment of reliable and resilient wireless local- area connectivity is increasingly becoming a necessity for business-critical industrial processes, such as related to automated manufacturing in smart factories, which has also been highlighted by ICT companies[[12]](#footnote-13). Due to different national circumstances e.g. priorities for efficient spectrum use, Member States have addressed demand for locally licensed access to spectrum in mid-bands in a dissimilar way.

The potential deployment of terrestrial wireless broadband systems providing local-area network connectivity (with base stations operating at low/medium power) for vertical and possibly other terrestrial wireless use cases[[13]](#footnote-14) within the 3.8-4.2 GHz frequency band in the Union, subject to an authorisation decision at Member State level, requires harmonised technical conditions. This promotes ecosystem development and efficient spectrum use. It would also foster the development of innovative sharing conditions in the 3.8-4.2 GHz frequency band between terrestrial wireless broadband systems providing local-area network connectivity and the incumbent users in need of protection and the possibility of future evolution and development.

In addition, any possible usage of the frequency band 3.8-4.2 GHz in combination with spectrum resources in other bands may be further assessed in a second stage taken into account the results of this mandate.

1. **Justification**

Pursuant to Article 4(2) of the Radio Spectrum Decision[[14]](#footnote-15), the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised technical conditions for the availability and efficient use of radio spectrum necessary for the functioning of the internal market. Such mandates shall set the task to be performed and their timetable.

The results of this Mandate should facilitate the deployment of terrestrial wireless broadband systems providing local-area network connectivity. These should support innovation and digital industrial transformation. In recognition of existing services within the 3.8-4.2 GHz frequency band other than terrestrial wireless broadband, particular attention should be paid to ensuring the protection and the possibility of future evolution and development of receiving earth satellite stations and terrestrial fixed links. Furthermore, the coexistence with terrestrial systems providing wireless broadband electronic communications services and radio altimeters operating in adjacent bands should also be duly addressed.

1. **Task order and schedule**

The CEPT is herewith mandated to study the feasibility of using the 3.8-4.2 GHz frequency band by terrestrial wireless broadband systems providing local-area network connectivity in a shared manner and to develop, if feasible, relevant harmonised technical conditions therefor, which are suitable for 5G technology and protect as well as ensure the possibility of future evolution and development of incumbent spectrum users within the band and in adjacent bands.

The CEPT shall, where relevant, take full account of EU law applicable and support the principles of service and technological neutrality, non-discrimination and proportionality insofar as technically possible.

The CEPT is requested to collaborate actively with all concerned stakeholders and ETSI, which develops harmonised standards for the presumption of conformity under the Radio Equipment Directive 2014/53/EU. In particular, the CEPT should take into consideration ETSI standards, which define 5G systems and facilitate shared spectrum use[[15]](#footnote-16).

Specifically, CEPT is mandated to perform the following tasks:

1. Study and assess the technical feasibility of the **shared use** of the 3.8-4.2 GHz frequency band by terrestrial wireless broadband systems providing local-area (i.e. low/medium power) network connectivity. In this regard, consider sharing solutions, including innovative features, which ensure:

i. protection and the future evolution and development of incumbent users sharing this band, in particular receiving satellite earth stations and terrestrial fixed links;

ii. co-existence of terrestrial wireless broadband systems providing local-area network connectivity and uses operating in adjacent bands such as terrestrial systems providing wireless broadband electronic communications services in the 3.8-4.2 GHz frequency band and radio altimeters on board aircraft in the 4.2-4.4 GHz frequency band.

2. Subject to the sharing solutions and the results of Task 1, as appropriate, develop a harmonised frequency arrangement as well as the least restrictive harmonised technical conditions for the **shared** use of the 3.8-4.2 GHz frequency band[[16]](#footnote-17) by terrestrial wireless broadband systems providing local-area connectivity. These harmonised technical conditions shall avoid interference, protect relevant incumbent uses within the band and in adjacent bands, and facilitate cross-border coordination.

Based on the results of sharing studies within the 3.8-4.2 GHz frequency band and co-existence studies with uses in adjacent bands, the CEPT may include, where necessary, guidance on appropriate receiver characteristics for radio equipment as part of the harmonised technical conditions or/and recommend to ETSI to consider the results of those studies when developing relevant harmonised standards.

In performing the aforementioned tasks, the CEPT shall allow to the greatest extent possible channelling arrangements and effective coordination with other existing systems and services to accommodate national circumstances and market demand, and the guidance provided by the Commission in consultation with the Radio Spectrum Committee.

CEPT should provide deliverables according to the following schedule:

|  |  |  |
| --- | --- | --- |
| **Delivery date** | **Deliverable** | **Subject** |
| November 2022 | Interim Report from CEPT to the Commission | Description of work undertaken and interim results under this Mandate |
| July 2023[[17]](#footnote-18) | Final Draft Report from CEPT to the Commission | Description of work undertaken and final results under this Mandate |
| March 2024 | Final Report from CEPT to the Commission, taking into account the outcome of the public consultation | Description of work undertaken and final results under this Mandate, taking into account the results of the public consultation |

In addition, the CEPT is requested to report on the progress of its work pursuant to this Mandate to all the meetings of the Radio Spectrum Committee that will be taking place during the course of the Mandate.

The Commission, with the assistance of the Radio Spectrum Committee may consider applying the results of this mandate in the Union, pursuant to Article 4 of the Radio Spectrum Decision.

1. Proposal for EC Decision
2. The list of other annexes as part of CEPT Report

Table 1 provides the list of other annexes to this CEPT Report.

Table 1: List of additional annexes to this CEPT Report

|  |  |
| --- | --- |
| Number | Title |
|  | WBB LMP parameters for studies on 3800-4200 MHz |
|  | Other parameters and assumptions for studies on 3800-4200 MHz |
|  | Potential deployment scenarios for local area networks in the 3.8-4.2 GHz band ([ECC PT1(22)100](https://cept.org/Documents/ecc-pt1/70279/ecc-pt1-22-100_nokia-potential-deployment-scenarios-for-local-area-networks-in-the-38-42-ghz-band)\_Nokia) |
|  | Sharing and Compatibility studies (blank) |
|  | Coexistence study between WBB LMP applications (low/medium power) and FSS receiving earth stations ([ECC PT1(23)047](https://www.cept.org/Documents/ecc-pt1/74926/ecc-pt1-23-047_france-update-of-study-on-38-42-ghz-wbb-lmp-local-area)\_France) |
|  | Coexistence study between local 5G-vertical applications (for the scenarios of [ECC PT1(22)100](https://cept.org/Documents/ecc-pt1/70279/ecc-pt1-22-100_nokia-potential-deployment-scenarios-for-local-area-networks-in-the-38-42-ghz-band)) and FSS receiving earth stations ([ECC PT1(22)212](https://www.cept.org/Documents/ecc-pt1/73004/ecc-pt1-22-212_france-shared-local-area-38-42-ghz-and-rx-earth-stations-for-nokia-parameters)\_France) |
|  | Adjacent band co-existence study between MFCN in 3400-3800 MHz and LAN in 3800-4200 MHz ([ECC PT1(22)102](https://www.cept.org/Documents/ecc-pt1/70281/ecc-pt1-22-102_orange-adjacent-band-co-existence-between-mfcn-in-3400-3800-mhz-and-lan-in-3800-4200-mhz)\_Orange) |
|  | Sharing study between FSS ES and LANWBB LMP in the band 3800-4200 MHz ([CG4G(22)017](https://www.cept.org/Documents/ecc-pt1/74425/ecc-pt1_cg4g-22-017_an1_input_wd_cg4ghz_28nov)\_Intelsat) |
|  | Sharing study between FSS SATPAQ and WBB LMP in the band 3800-4200 MHz ([CG4G(22)017](https://www.cept.org/Documents/ecc-pt1/74425/ecc-pt1_cg4g-22-017_an1_input_wd_cg4ghz_28nov)\_Intelsat) |
|  | Coexistence studies between WBS in 3.8-4.2 GHz and 5G Commercial systems in 3.4-3.8 GHz ([ECC PT1(22)206](https://www.cept.org/Documents/ecc-pt1/72985/ecc-pt1-22-206_nokia-study-between-3800-4200-mhz-wbs-and-5g-commercial)\_Nokia) |
|  | Sharing study between WBS base stations and FSS earth stations in the band 3.8-4.2 GHz ([ECC PT1(23)049](https://www.cept.org/Documents/ecc-pt1/74928/ecc-pt1-23-049_ericsson_sharing-study-between-wbs-base-stations-and-fss-earth-stations-in-the-band-38-42-ghz)\_Ericsson) |
|  | Coexistence study of WBB LMP with MFCN and FSS ES ([ECC PT1(23)039](https://www.cept.org/Documents/ecc-pt1/74918/ecc-pt1-23-039_nokia_coexistence-study-of-wbb-lmp-with-mfcn-and-fss-es)\_Nokia) |

1. List of References

1. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions ‘Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society’ COM(2016) 587 final. [↑](#footnote-ref-2)
2. COM(2021) 118 final. [↑](#footnote-ref-3)
3. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions ‘5G for Europe: An Action Plan’, COM(2016) 588 final. [↑](#footnote-ref-4)
4. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions ‘A New Industrial Strategy for Europe’, COM(2020) 102 final. [↑](#footnote-ref-5)
5. Document RSPG16-032 final of 9 November 2016, *Strategic roadmap towards 5G for Europe: RSPG opinion on spectrum-related aspects for next-generation wireless systems (5G) (RSPG 1st opinion on 5G)*. [↑](#footnote-ref-6)
6. Document RSPG18-005 final of 30 January 2018, *Strategic spectrum roadmap towards 5G for Europe: RSPG opinion on 5G networks (RSPG 2nd opinion on 5G)*. [↑](#footnote-ref-7)
7. Document RSPG19-007 final of 30 January 2019, *Strategic spectrum roadmap towards 5G for Europe: RSPG opinion on 5G implementation challenges (RSPG 3rd opinion on 5G*). [↑](#footnote-ref-8)
8. Document RSPG21-033 final of 16 June 2021, *RSPG Opinion on a Radio Spectrum Policy Programme (RSPP).* [↑](#footnote-ref-9)
9. Document RSPG21-024 final of 16 June 2021, *RSPG opinion on additional spectrum needs and guidance on the fast rollout of future wireless broadband networks.* [↑](#footnote-ref-10)
10. Document RSPG21-022 final of 16 June 2021, *RSPG opinion on spectrum sharing – pioneer initiatives and bands.* [↑](#footnote-ref-11)
11. European Telecommunications Standardisation Institute [↑](#footnote-ref-12)
12. https://5g-ppp.eu/wp-content/uploads/2020/09/5GPPP-VerticalsWhitePaper-2020-Final.pdf [↑](#footnote-ref-13)
13. Wireless local-area connectivity could serve both private (e.g. enterprise) and public (e.g. community-type) networks, which could be subject to an authorisation decision at Member State level. [↑](#footnote-ref-14)
14. Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJL 108 of 24.4.2002. [↑](#footnote-ref-15)
15. Such as on Licensed Shared Access. [↑](#footnote-ref-16)
16. In particular as a primary (pioneer) 5G frequency band in the European Union. [↑](#footnote-ref-17)
17. Subject to subsequent public consultation [↑](#footnote-ref-18)