CEPT ECC
Electronic Communications Committee

ECC Recommendation (14)04

Cross-border coordination for Mobile/Fixed Communications Networks (MFCN) and between MFCN and other systems in the frequency band 2300-2400 MHz

approved 30 May 2014

amended 28 June 2024

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INTRODUCTION

Considering the possible introduction of Mobile/Fixed Communications Networks (MFCN) in the frequency band 2300-2400 MHz (see ECC Decision (14)02 [1]), this Recommendation provides guidance to administrations on:

- coordination between MFCN systems in border areas in the frequency band 2300-2400 MHz;
- coordination between MFCN systems and other systems in neighbouring countries in the frequency band 2300-2400 MHz.

In this Recommendation, MFCN includes LTE and New Radio (NR) for non-AAS and AAS base stations. For AAS base stations the SSB field strength values are derived from the cross-border values given in 3400-3800 MHz band in ECC Recommendation (15)01 [2] considering frequency conversion factor.

ECC RECOMMENDATION (14)04 OF 30 MAY 2014 ON CROSS-BORDER COORDINATION FOR MFCN AND BETWEEN MFCN AND OTHER SYSTEMS IN THE FREQUENCY BAND 2300-2400 MHz, AMENDED ON 28 JUNE 2024

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that ECC Decision (14)02 provides the harmonised conditions for Mobile/Fixed Communications Networks (MFCN) operating in the band 2300-2400 MHz [1];

b) that some Administrations may decide to introduce MFCN in the 2300-2400 MHz band under Licensed Shared Access (LSA), on a shared basis with incumbent services;

c) that MFCN for the purpose of this Recommendation includes IMT and other communications networks in the mobile and fixed services;

d) that the introduction of MFCN in the 2300-2400 MHz frequency band in one country can have an impact on incumbent usage in neighbouring countries;

e) that there are several existing services in the 2300-2400 MHz frequency band, that need to be considered by neighbouring countries when introducing MFCN;

f) that in some CEPT countries the band 2300-2400 MHz is used by aeronautical mobile service for telemetry (see RR footnote No. 5.395, WRC-03 [3]), PMSE (SAP/SAB video links) and other services/systems;

g) that frequency coordination in border areas should be based on the concept of equitable access;

h) that in many CEPT member countries there may be multiple operators for MFCN systems;

i) that frequency planning of MCFN in border areas will be based on coordination between national administrations in cooperation with their operators;

j) that administrations may diverge from the technical parameters, propagation models and procedures described in this Recommendation subject to bilateral/multilateral agreements;

k) that in the case of MFCN operator arrangements approved by national administrations it is possible to deviate from this Recommendation;

l) that this Recommendation considers only MFCN TDD (Time Division Duplex) systems;

m) that Physical-Layer Cell Identity (PCI) coordination is necessary for LTE/NR systems to avoid unnecessary signalling load and handover failures;

n) that in some CEPT countries frame structures as recommended in ECC Recommendation (20)03, annex 1 [4] are used also in the 2300-2400 MHz frequency band or parts thereof;

o) that methodologies for field strength measurements in the field are described in ECC Recommendation (15)01, annex 6 [2].

recommends

1. that coordination between MFCN systems in border areas should be based on bilateral/multilateral agreements between administrations;

2. that in case of MFCN TDD systems in the 2300-2400 MHz frequency band, administrations should preferably facilitate synchronised networks for efficient usage of the spectrum in border areas;

3. that coordination between MFCN systems and other systems in neighbouring countries should be based on bilateral / multilateral agreements between administrations;

4. that coordination between MFCN systems in border areas should be based on the principles and the field strength limits provided in Annex 1;

5. that bilateral / multilateral agreements regarding coordination between MFCN systems and other systems should be based on the guideline provided in Annex 2 with the aim to increase the spectrum efficiency;

6. that interference field strength predictions should be made using the appropriate propagation models defined in Annex 3 for MFCN systems;

7. that if the levels in Annex 1 are exceeded coordination is required and the procedure detailed in Annex 4 should be used;

8. that MFCN TDD systems in the 2300-2400 MHz frequency band, in border areas should use the PCIs provided in Annex 5 when synchronisation signal centre frequencies are aligned;

9. that administrations should encourage and facilitate the establishment of arrangements between MFCN operators in neighbouring countries with the aim to enhance the efficient use of the spectrum as well as the coverage in their respective border areas;

10. that coordination in coastal areas is based on prediction of field strength levels at the coastline of the neighbouring country while other principles for coordination in coastal areas may be agreed between the administrations concerned.

Note:

Please check the Office documentation database https://docdb.cept.org/ for the up to date position on the implementation of this and other ECC Recommendations.

ANNEX 1: FIELD STRENGTH LEVELS FOR THE CROSS-BORDER OPERATION BETWEEN MFCN TDD SYSTEMS

In this Annex, field strength values are given for cross-border scenarios of wideband vs wideband MFCN TDD systems for non-AAS and AAS base stations.

Preferential and non-preferential PCIs for LTE and NR are given in Annex 5.

Administrations/operators may agree on other field strength values and preferential frequency usage based on bilateral or multilateral agreements/arrangements.

Synchronisation signal means Synchronisation Signal Block (SSB) for 5G NR and Primary/Secondary Synchronisation Signal (PSS/SSS) for LTE.

For non-AAS base stations the field strength values in this Annex are given for 5 MHz frequency block size. In cases of other frequency block sizes other than 5 MHz, a factor of 10 × $\log_{10}$ (channel bandwidth[1]/5 MHz) should be added to the field strength values. The data and control channels are fixed and therefore the same field strength values in dBµV/m/(5 MHz) apply to both channel types. The mean value is with respect to e.g. changing traffic load and downlink transmission time. The field strength values are upper bounds of each cell produced by the base station.

For AAS base stations the upper bound field strength for each cell of a base station is given as the median for a random beamforming data channel with 5 MHz frequency block size and for a static SSB field with SCS 30 kHz. In the case of a SCS other than 30 kHz, a correction factor of 10 × $\log_{10}$ (SCS in kHz /(30 kHz)) dB, should be added to the SSB field strength value.

For field strength predictions the calculations should be made according to Annex 3.

A1.1 SYNCHRONISED OPERATION IN THE 2300-2400 MHZ FREQUENCY BAND

Base stations of synchronised MFCN TDD systems on both sides of the borderline with

- synchronisation signal centre frequencies not aligned, for all PCIs or with
- synchronisation signal centre frequencies aligned and for preferential PCIs

may be used without coordination with a neighbouring country if the field strength of each cell produced by the base station does not exceed the field strength values as listed below:

For non-AAS base stations field strength value

- 65 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries and
- 49 dBµV/m/(5 MHz) at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

For AAS base stations median field strength value

- 76 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries and
- 58 dBµV/m/(5 MHz) at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

Base stations of synchronised MFCN TDD systems on both sides of the borderline with

- synchronisation signal centre frequencies aligned and for non-preferential PCIs

may be used without coordination with a neighbouring country if the field strength of each cell produced by the base station for data channel does not exceed the values as listed below:

For non-AAS base stations field strength value:

- 49 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries;

[1] not occupied bandwidth

For AAS base stations median field strength value:

- 58 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries

Table 1 and Table 2 give an overview of the field strength values for non-AAS and AAS base stations respectively.

Table 1: Field strength values at 3 m height above ground for synchronised operation for non-AAS base stations

Synchronised operation		
Synchronisation signal centre frequencies aligned		Synchronisation signal centre frequencies not aligned
Preferential PCIs	Non-preferential PCIs	All PCIs
65 dBµV/m/(5 MHz) @ 0 km and 49 dBµV/m/(5 MHz) @ 6 km	49 dBµV/m/(5 MHz) @ 0 km	65 dBµV/m/(5 MHz) @ 0 km and 49 dBµV/m/(5 MHz) @ 6 km
@ stands for “at a distance from the borderline into the neighbouring country”.		

Table 2: Field strength values at 3 m height above ground for synchronised operation for AAS base stations with median data channel value from beamforming and SSB value

Synchronised operation		
Synchronisation signal centre frequencies aligned		Synchronisation signal centre frequencies not aligned
Preferential PCIs	Non-preferential PCIs	All PCIs
76 dBµV/m/(5 MHz) @ 0 km and 58 dBµV/m/(5 MHz) @ 6 km	58 dBµV/m/(5 MHz) @ 0 km	76 dBµV/m/(5 MHz) @ 0 km and 58 dBµV/m/(5 MHz) @ 6 km
Note @ stands for “at a distance from the borderline into the neighbouring country”. For NR base station using AAS the median data channel value of 76 dBµV/m/(5 MHz) from beamforming, considering the SCS of 30 kHz, corresponds to SSB field strength level of a) 66 dBµV/m/(30 kHz) for single-beam antenna pattern, b) 73 dBµV/m/(30 kHz) for multi-beam antenna pattern For NR base station using AAS the median data channel value of 58 dBµV/m/(5 MHz) from beamforming, considering the SCS of 30 kHz, corresponds to SSB field strength level of a) 48 dBµV/m/(30 kHz) for single-beam antenna pattern, b) 55 dBµV/m/(30 kHz) for multi-beam antenna pattern		

A1.2 UNSYNCHRONISED OPERATION IN THE 2300-2400 MHZ FREQUENCY BAND WITH NON-PREFERENTIAL FREQUENCY BLOCKS

MFCN TDD systems are considered unsynchronised having either

- common phase clock reference and non-compatible frame structures or
- no common phase clock reference and compatible or non-compatible frame structures.

Base stations of unsynchronised MFCN TDD systems on both sides of the borderline in the frequency band 2300-2400 MHz with non-preferential frequency blocks and for all PCIs may be used without coordination with

a neighbouring country if the field strength of each cell produced by the base station for data channel does not exceed a value the field strength values as listed below:

For non-AAS base stations field strength value:

- 30 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries.

For AAS base stations median field strength value:

- 12 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries.

Table 3 and Table 4 give an overview of the field strength values for non-AAS and AAS base stations respectively.

Table 3: Field strength values at 3 m height above ground for unsynchronised operation with non-preferential frequency blocks for non-AAS base stations

Unsynchronised operation with non-preferential frequency blocks
All PCIs
30 dBµV/m/(5 MHz) @ 0 km
@ stands for “at a distance from the borderline into the neighbouring country”.

Table 4: Field strength values at 3 m height above ground for unsynchronised operation with non-preferential frequency blocks for AAS base stations with median data channel value from beamforming and SSB value

Unsynchronised operation with non-preferential frequency blocks
All PCIs
12 dBµV/m/(5 MHz) @ 0 km
@ stands for “at a distance from the borderline into the neighbouring country”. For NR base station using AAS the median data channel value of 12 dBµV/m/(5 MHz) from beamforming, considering the SCS of 30 kHz, corresponds to SSB field strength level of a) 1 dBµV/m/(30 kHz) for single-beam antenna pattern, b) 4 dBµV/m/(30 kHz) for multi-beam antenna pattern

A1.3 UNSYNCHRONISED OPERATION WITH PREFERENTIAL FREQUENCY BLOCKS

Another way to handle the situation of unsynchronised operation is through introduction of preferential frequency blocks. If preferential frequency blocks are defined in the 2300-2400 MHz band and are distributed between administrations of neighbouring countries with unsynchronised MFCN TDD systems, the following provisions apply.

Base stations on both sides of the borderline in the frequency band 2300-2400 MHz with preferential frequency blocks and for all PCIs may be used without coordination with a neighbouring country if the field strength of each cell produced by the base station for data channel does not exceed the trigger field strength values as listed below:

For non-AAS base stations field strength value

- 65 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries and
- 49 dBµV/m/(5 MHz) at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

For AAS base stations median field strength value

- 47 dBµV/m/(5 MHz) at a height of 3 m above ground at the borderline between countries and
- 29 dBµV/m/(5 MHz) at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

Table 5 and Table 6 gives an overview of the field strength values for non-AAS and AAS base stations respectively.

Table 5: Field strength values at 3 m height above ground for unsynchronised operation with preferential frequency blocks for non-AAS base stations

Unsynchronised operation with preferential frequency blocks
All PCIs
65 dBµV/m/(5 MHz) @ 0 km and 49 dBµV/m/(5 MHz) @ 6 km
@ stands for “at a distance from the borderline into the neighbouring country”.

Table 6: Field strength values at 3 m height above ground for unsynchronised operation with preferential frequency blocks for AAS base stations with median data channel value from beamforming and SSB value

Unsynchronised operation with preferential frequency blocks
All PCIs
47 dBµV/m/(5 MHz) @ 0 km and 29 dBµV/m/(5 MHz) @ 6 km
@ stands for “at a distance from the borderline into the neighbouring country”. For NR base station using AAS the median data channel value of 47 dBµV/m/(5 MHz) from beamforming, considering the SCS of 30 kHz, corresponds to SSB field strength level of a) 41 dBµV/m/(30 kHz) for single-beam antenna pattern, b) 43 dBµV/m/(30 kHz) for multi-beam antenna pattern For NR base station using AAS the median data channel value of 29 dBµV/m/(5 MHz) from beamforming, considering the SCS of 30 kHz, corresponds to SSB field strength level of a) 23 dBµV/m/(30 kHz) for single-beam antenna pattern, b) 25 dBµV/m/(30 kHz) for multi-beam antenna pattern

ANNEX 2: GUIDELINE FOR THE CROSS-BORDER OPERATION BETWEEN MFCN TDD SYSTEMS AND OTHER SYSTEMS

Cross-border coordination between MFCN systems (non-AAS/AAS) and other systems in neighbouring countries should be based on bilateral / multilateral agreements.

The following steps can be used to define the coordination trigger levels:

1. Identify in cooperation with the administration of the neighbouring countries the non-MFCN systems operating in the 2300-2400 MHz band as services required to be addressed in the coordination process.

2. Determine in which sub bands of the 2300-2400 MHz band the identified systems are used.

3. Conduct studies on a case by case basis in order to define frequency coordination conditions.

In the case that coordination agreements for existing systems exist between neighbouring administrations, the following apply when one (or both) administration(s) wishes to introduce MFCN:

- The agreement is assumed to remain valid for the coordination between these existing systems;
- Additional agreement is recommended to define the cross-border conditions between MFCN and the non-MFCN systems of the neighbouring countries.

In case of aeronautical/terrestrial telemetry, in consistency with ECC Report 347 [5][5] and ECC Decision (14)02 (considering v) [1][1], the conclusions from ECC Report 172 [6][6] related to isolation, separation or coordination distances with co-channel services (such as aeronautical/terrestrial telemetry) remain valid for AAS MFCN under the assumptions used in the simulations, in particular 46 dBm/(20 MHz) TRP in-block base station power. Higher in-block base station power will typically result in larger coordination distances, noting that coexistence also depends on many other parameters such as the actual radio propagation condition, interferer (i.e. base station) and victim antenna heights, antenna gain, etc.;

ANNEX 3: PROPAGATION MODELS

The following methods are proposed for assessment of anticipated interference inside neighbouring country based on established trigger values. Due to complexity of radiowave propagation nature different methods are proposed to be considered by administrations and are included here for guidance purposes only.

It should be noted that the following methods provide theoretical predictions based on available terrain knowledge. It is practically impossible to recreate these methods with measurement procedures in the field. Therefore only some approximation of measurements could be used to check compliance with those methods based on practical measurement procedures. The details of such approximation are not included in this recommendation and should be negotiated between countries based on their radio monitoring practices.

A3.1 PATH SPECIFIC MODEL

Where appropriate detailed terrain data is available, the propagation model for interference field strength prediction is the latest version of Recommendation ITU-R P.452 [7][7]. For the relevant transmitting terminal, predictions of path loss would be made at x km steps along radials of y km at z degree intervals. The values for those receiver locations within the neighbouring country would be used to construct a histogram of path loss – and if 10% of predicted values exceed the threshold the station shall be required to be coordinated.

Values for x, y and z are to be agreed between the administrations concerned.

A3.2 SITE GENERAL MODEL

If it is not desirable to utilise detailed terrain height data for the propagation modelling in the border area, the basic model to be used to trigger coordination between administrations and to decide, if coordination is necessary, is Recommendation ITU-R P.1546 [8]. This model is to be employed for 50% locations, 10% time and using a receiver height of 3 m.

For specific reception areas where terrain roughness adjustments for improved accuracy of field strength prediction are needed, administrations may use correction factors according to terrain irregularity and/or an averaged value of the terrain clearance angle (TCA) parameter in order to describe the roughness of the area on and around the coordination line.

Administrations and/or operators concerned may agree to deviate from the aforementioned model by mutual consent[2].

A3.3 AREA CALCULATIONS

In the case where greater accuracy is required, administrations and operators may use the area calculation below.

For calculations, all the pixels of a given geographical area to be agreed between the Administrations concerned in a neighbouring country are taken into consideration.

For the relevant base station, predictions of path loss should be made for all the pixels of a given geographical area from a base station and at a receiver antenna height of 3 m above ground.

For evaluation,

- only 10 percent of the number of geographical area between the borderline (including also the borderline) and the 6 km line itself inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the borderline in Annex 1 at a height of 3 m above ground;

[2]e.g. as used by members of the HCM-Agreement [9]

- only 10 percent of the number of geographical area between the 6 km (including also 6km line) and 12 km line inside the neighbouring country may be interfered by higher field strength than the trigger field strength value given for the 6 km line in Annex 1 at a height of 3 m above ground.

It is recommended that during area calculations not only detailed terrain data but also clutter data should be taken into account. Use of correction factors for clutter is crucial in particular where the border area is ‘open’ or ‘quasi-open’ from the point of view of clutter or where the interfering base station is just a few kilometres from a borderline.

If the distance between a base station and a terrain point of a borderline is closer than or equal to 1 km, free space propagation model needs to be applied. Furthermore, if there is no terrain obstacle within the 1st Fresnel zone,” also the free space propagation model should be applied.

If clutter data is not available, it is proposed to extend the usage of free space propagation model to a few kilometres, depending on the clutter situation in border areas.

For area type interference calculations, propagation models with path specific terrain correction factors are recommended (e.g. Recommendation ITU-R P.1546 [8] with the terrain clearance angle correction factor TCA, HCM method with the terrain clearance angle correction factor [9] or Recommendation ITU-R P.1812 [10]).

As to correction factors for clutters ‘open area’ and ‘quasi-open area’, 20 dB and 15 dB should be used respectively. Recommendation ITU-R P.1406 [11] should be used if a finer selection of clutter is required. It must be noted that terrain irregularity factor Δh is not recommended to be used in area calculations. Administrations and/or operators concerned may agree to deviate from the aforementioned models by mutual consent.

ANNEX 4: EXCHANGE OF INFORMATION

When requesting coordination the relevant characteristics of the base station should be forwarded to the Administration affected. All of the following characteristics should be included:

1. carrier frequency (MHz)
4. channel bandwidth (MHz)
5. subcarrier spacing (kHz) (only for NR)
6. name of transmitter station
7. country of location of transmitter station
8. geographical coordinates (W/E, N; WGS84)
9. AAS or non-AAS base stations
10. effective antenna height (m)
11. antenna polarization
12. antenna azimuth (deg)
13. directivity in antenna systems or antenna gain (dBi)
14. effective radiated power (dBW)
15. expected coverage zone
16. date of entry into service (month, year).
17. PCI numbers used (only for LTE and NR)
18. antenna tilt (deg / Electric and mechanic tilt)
19. antenna pattern or envelope
20. SSB antenna patterns
21. frame structure including the special slot “S” configuration (the format at symbol level for slots between downlink and uplink slots)
22. clock phase, frequency and time synchronisation
23. Global Synchronisation Channel Number (GSCN) in case of NR

The affected administration shall evaluate the request for coordination and shall notify the result of the evaluation within 30 days to the administration requesting coordination.

If in the course of the coordination procedure an Administration may request additional information.

If no reply is received by the administration requesting coordination within 30 days it may send a reminder to the affected administration. An administration not having responded within 30 days following communication of the reminder shall be deemed to have given its consent and the code coordination may be put into use with the characteristics given in the request for coordination.

The periods mentioned above may be extended by common consent.

As a basis during the exchange of information besides listed characteristics above administrations could use formats created within ITU in accordance with Resolution 906 (rev. WRC-15) [12] .

ANNEX 5: PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE & NR

ETSI TS 136 211 [13] defines 168 “unique physical-layer cell-identity groups” in §6.11, numbered 0..167, hereafter called “PCI groups” for LTE. Within each PCI group there are three separate PCIs giving 504 PCIs in total.

For NR in ETSI TS 138 211 [14] (§7.4.2) the number of physical-layer cell-identity groups (different cell IDs) have been increased to 336, numbered 0..335.

Administrations should apply sharing of PCIs in border areas, an equitable distribution of these PCIs when channel centre frequencies are aligned as provided in Table 7.

Sharing of PCIs between operators of neighbouring countries should only be applied where synchronisation signal centre frequencies used in the neighbouring countries are aligned independent of the channel bandwidth or where it is not known whether or not the synchronisation signal centre frequencies used in the neighbouring countries are aligned, or where there is no network in operation in the neighbouring country unless otherwise stated in Annex 1 or administration/operator agreements/arrangements.

As shown in Table 7, the PCIs for LTE and NR are divided into 6 sub-sets containing each one sixth of the available PCIs. Each country is allocated three sets (half of the PCIs) in a bilateral case and two sets (one third of the PCIs) in a trilateral case, therefore dividing the PCI groups or PCIs is equivalent.

The preferential PCIs of a two country PCI sharing should be applied for a base station if the level of field strength relating to non-preferential PCIs could be exceeded at the borderline of only one neighbouring country. The preferential PCIs of a three country PCI sharing should be applied for a base station if the level of field strength related to non-preferential PCIs could be exceeded at the borderline of only two neighbouring countries.

Four types of countries are defined in a way such that no country will use the same code set as any one of its neighbours. The following lists describe the distribution of European countries:

- Type country 1: AZE, BEL, CVA, CYP, CZE, DNK, E, FIN, GRC, IRL, ISL, LTU, MCO, SMR, SRB, SUI, SVN and UKR.
- Type country 2: AND, BIH, BUL, D, EST, G, GEO, HNG, I and MDA.
- Type country 3: ALB, AUT, F, HOL, HRV, MLT, POL, POR, ROU and S.
- Type country 4: LIE, LUX, LVA, MKD, MNE, NOR, SVK, TUR.

(Note: Country type map can be found in Figure 1).

For each type of country, the Table 7 and Figure 1 describe the sharing of the PCIs with its neighbouring countries, with the following conventions of writing:

■	preferential PCI
	non-preferential PCI

Table 1: Table 7: PCI sub-sets for LTE and NR for use in border areas

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 1 LTE	0..83	84..167	168..251	252..335	336..419	420..503
Country 1 NR	0..83 504..587	84..167 588..671	168..251 672..755	252..335 756..839	336..419 840..923	420..503 924..1007
Border 1-2						
Zone 1-2-3						
Border 1-3						
Zone 1-2-4						
Border 1-4						
Zone 1-3-4						

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 2 LTE	0..83	84..167	168..251	252..335	336..419	420..503
Country 2 NR	0..83 504..587	84..167 588..671	168..251 672..755	252..335 756..839	336..419 840..923	420..503 924..1007
Border 2-1						
Zone 2-3-1						
Border 2-3						
Zone 2-1-4						
Border 2-4						
Zone 2-3-4						

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 3 LTE	0..83	84..167	168..251	252..335	336..419	420..503
Country 3 NR	0..83 504..587	84..167 588..671	168..251 672..755	252..335 756..839	336..419 840..923	420..503 924..1007
Border 3-2						
Zone 3-1-2						
Border 3-1						
Zone 3-1-4						
Border 3-4						
Zone 3-2-4						

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 4 LTE	0..83	84..167	168..251	252..335	336..419	420..503
Country 4 NR	0..83 504..587	84..167 588..671	168..251 672..755	252..335 756..839	336..419 840..923	420..503 924..1007
Border 4-1						
Zone 4-1-2						
Border 4-2						
Zone 4-2-3						
Border 4-3						
Zone 4-3-1						

Note

1. In certain specific cases (e.g. AUT/HRV) where the distance between two countries of the same type number is very small (< few 10s km), it may be necessary to address the situation in bilateral /multilateral coordination agreements as necessary, and may include further subdivision of the allocated codes in certain areas.

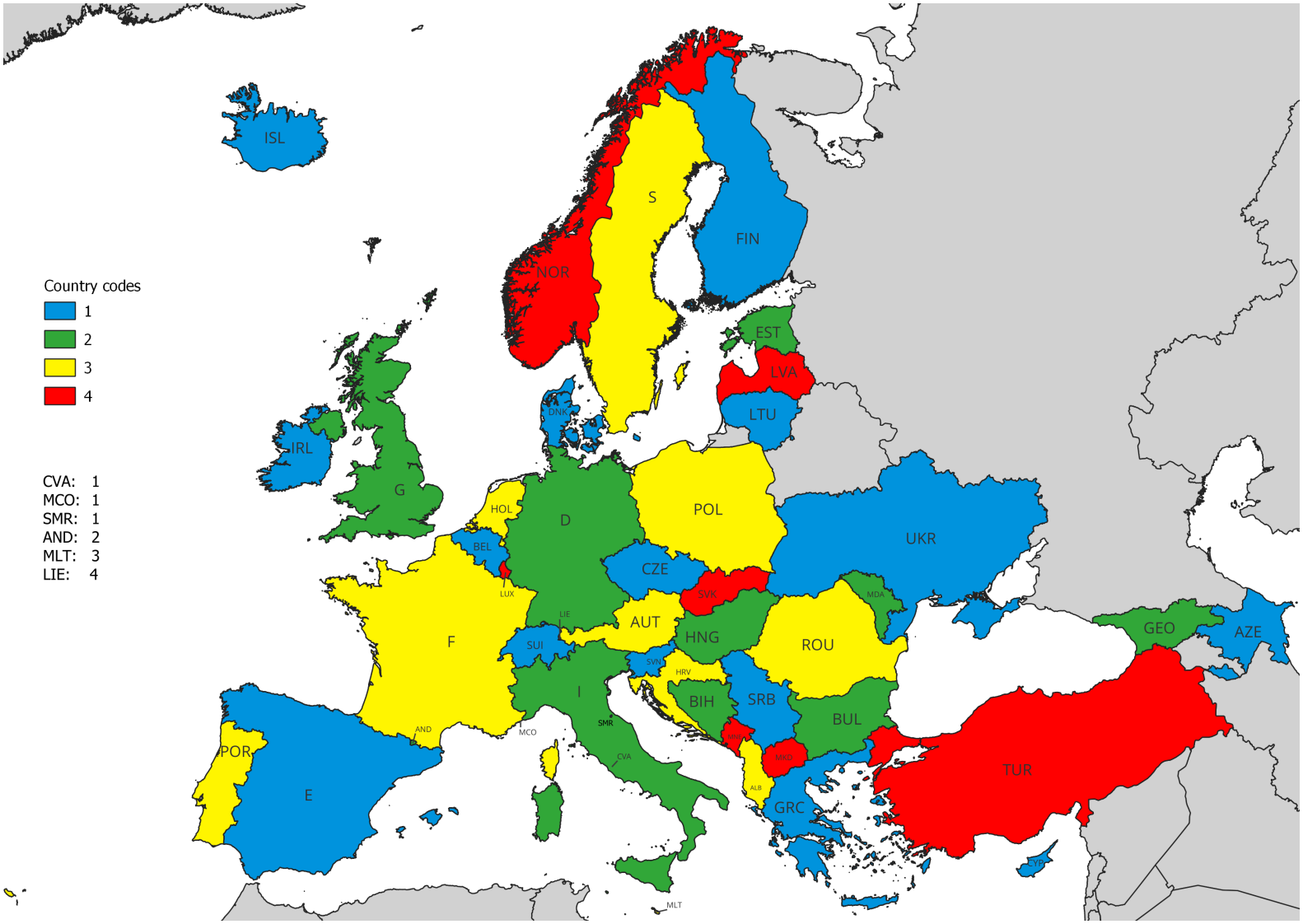

Figure 1: Country type map

ANNEX 6: LIST OF REFERENCES

[1] ECC Decision (14)02: “Harmonised technical and regulatory conditions for the use of the band 2300 - 2400 MHz for MFCN”, approved June 2014, amended March 2023

[2] ECC Recommendation (15)01: “Cross-border coordination for mobile/fixed communications networks (MFCN) in the frequency bands: 694-790 MHz, 1452-1492 MHz, 3400-3600 MHz and 3600-3800 MHz”, approved February 2015, latest amended June 2022

[3] ITU Radio Regulations, Edition of 2020

[4] ECC Recommendation (20)03: “Frame structures to facilitate cross-border coordination of TDD MFCN in the frequency band 3400-3800 MHz”, approved October 2020

[5] ECC Report 347: “Analysis of the suitability and update of the regulatory technical conditions for 5G MFCN and AAS operation in the 2300-2400 MHz band”, approved November 2022

[6] ECC Report 172: “Broadband Wireless Systems Usage in 2300-2400 MHz”, approved March 2012

[7] Recommendation ITU-R P.452: “Prediction procedure for the evaluation of interference between stations on the surface of the Earth at frequencies above about 0.1 GHz”

[8] Recommendation ITU-R P.1546: “Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 4 000 MHz”

[9] HCM Agreement: http://www.hcm-agreement.eu/

[10] Recommendation ITU-R P.1812: “A path-specific propagation prediction method for point-to-area terrestrial services in the VHF and UHF bands”

[11] Recommendation ITU-R P.1406: “Propagation effects relating to terrestrial land mobile and broadcasting services in the VHF and UHF bands”

[12] Resolution 906 (rev. WRC-15): “Electronic submission of notice forms for terrestrial services to the Radiocommunication Bureau and exchange of data between administrations”

[13] ETSI TS 136 211 V16.6.0 (2021-08): “LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation”

[14] ETSI TS 138 211 V16.2.0 (2020-07): “5G; NR; Physical channels and modulation”