

Agreement between the Norwegian Communications Authority and the Swedish Post and Telecom Authority concerning the use of the 3.6 GHz (3400-3800 MHz) frequency band for wideband systems capable of providing terrestrial electronic communications services in the border areas of the respective countries

October 2018

1. Principles and definitions

- 1.1 The 3.6 GHz band, as referred to in this agreement, corresponds to the frequencies from 3400 MHz to 3800 MHz, which are harmonized for mobile/fixed communications networks (MFCN), in accordance with EC Decision 2008/411/EC and EC Implementing Decision 2014/276/EU as well as CEPT ECC DEC (11)06.
- 1.2 This agreement is based on the concept of field strength levels on borderlines in accordance with ECC REC (15)01. In the case when LTE or 5G NR systems are used, preferential PCIs as defined in Annex 1 shall be used.
- 1.3 This agreement covers the coordination of TDD (Time Division Duplex) and downlink only base stations. User equipment, or terminals, are allowed to be used on non-interference basis, in accordance with ITU RR 4.4.
- 1.4 For the purpose of this agreement the border is defined as the land borderline, or where appropriate, a line midway between the Norwegian coastline and the Swedish coastline, due to ratified border agreement between Norway and Sweden.

2. Use of frequencies without coordination by administrations

- 2.1 Norway may use the 3.6 GHz band without coordination with Sweden, if the predicted mean field strength produced by a base station does not exceed $32 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$, calculated for 10 % of the time, at a height of 3 m above the ground at the Swedish borderline or beyond.
- 2.2 Sweden may use the 3.6 GHz band without coordination with Norway, if the predicted mean field strength produced by a base station does not exceed $32 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$, calculated for 10 % of the time, at a height of 3 m above the ground at the Norwegian borderline or beyond.
- 2.3 For base stations that are synchronized¹ between Norway and Sweden or deployed as downlink only on both sides of the border, the following applies:

¹ Synchronized TDD base stations operate aligned in time, so that there is no overlap between DL and UL transmission.

- 2.3.1 Norway may use the 3.6 GHz band without coordination with Sweden, if the predicted mean field strength produced by a base station does not exceed 67 dB(μ V/m)/5 MHz at the Swedish borderline or beyond and 49 dB(μ V/m)/5 MHz at a distance of 6 km from the Swedish borderline or beyond, calculated for 10 % of the time, at a height of 3 m above the ground.
- 2.3.2 Sweden may use the 3.6 GHz band without coordination with Norway, if the predicted mean field strength produced by a base station does not exceed 67 dB(μ V/m)/5 MHz at the Norwegian borderline or beyond and 49 dB(μ V/m)/5 MHz at a distance of 6 km from the Norwegian borderline or beyond, calculated for 10 % of the time, at a height of 3 m above the ground.
- 2.4 Field strength values are defined within a reference block of 5 MHz. In cases of other frequency block sizes a value of

$$A = 10 * \log_{10} \left(\frac{\text{frequency block size [MHz]}}{5 \text{ MHz}} \right) \text{ [dB]}$$

should be added to the field strength values.

3. General

- 3.1 A complaint in case of harmful interference shall be based on the median values of measurements of field strength, performed at 3 meter of receiving antenna height at least on two different occasions over a range of at least 100 m along the border.
- 3.2 In the presence of interference, the report of harmful interference shall be presented in accordance with Appendix 10 of the Radio Regulations. The other administration shall take all possible steps in order to eliminate the interference.
- 3.3 The latest version of 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" shall be used for prediction of field strength values.

4. Coordination procedure

- 4.1 If an intended frequency assignment has to be coordinated, the period of coordination shall not exceed 45 days from the date of the receipt of a written request and 20 days after a reminder. A request may be sent by e-mail to the administration's official e-mail address. If no reply is received after 65 days after the initial request the frequency assignment shall be considered as coordinated.
- 4.2 The exchange of the coordination information between the administrations shall be in electronic form and sent by e-mail or by other electronic means as appropriate or agreed bilaterally.
- 4.3 Preliminary coordination may take place between the operators concerned. The results of such preliminary coordination have to be covered by operators' arrangements, which must be approved by the administrations.

5. Revision and cancellation

- 5.1 This agreement may be cancelled with a notice of at least twelve months from any of the two parties.

5.2 This agreement may be cancelled without notice or revised, if mutual understanding is reached between the administrations, for example due to revision of ECC REC (15)01.

6. Enter into force

6.1 This Agreement shall enter into force from December 1, 2018.

This agreement has been drawn in two identical copies, one for Norway and one for Sweden.

Place

Place

Date

Date

For the Norwegian Communications Authority

For the Swedish Post and Telecom Authority

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ANNEX 1 - PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE and 5G NR

PCI division, according to table below, shall be used in border areas to improve coverage and service when channel centre frequencies are aligned.

The PCIs are divided between the administrations according to the following tables:

Table A1. PCI division for LTE

PCI	Set A 0 to 83	Set B 84 to 167	Set C 168 to 251	Set D 252 to 335	Set E 336 to 419	Set F 420 to 503
Country	Norway	Norway	Sweden	Norway	Sweden	Sweden

Table A2. PCI division for 5G NR²

PCI	Set A 0 to 83 504-587	Set B 84 to 167 588-671	Set C 168 to 251 672-755	Set D 252 to 335 756-839	Set E 336 to 419 840-923	Set F 420 to 503 924-1007
Country	Norway	Norway	Sweden	Norway	Sweden	Sweden

² According to working document for revision of ECC REC (15)01