

# Agreement between the Danish Energy Agency and the Swedish Post and Telecom Authority concerning the use of the 3.6 GHz (3400-3800 MHz) frequency band

November 2020

## 1 Principles and definitions

- 1.1 The 3.6 GHz band, as referred to in this agreement, corresponds to the frequency band 3400 -3800 MHz, with the TDD arrangement in accordance with ECC Decision (11)06.
- 1.2 This agreement is based on the concept of field strength levels on borderlines in accordance with ECC REC (15)01.
- 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 borderline of Denmark and Sweden respectively is defined as the coastline, excluding the islands of Flakfortet, Middelgrund, Peberholmen and Saltholmen in Denmark and excluding the island of Ven in Sweden.
- 1.5 The latest version of ITU-R P.1546 "Method for point-to-area predictions for terrestrial services in the frequency range 30-4000 MHz" shall be used for predictions of field strength values.

## 2. Use of frequencies without coordination by administrations

- 2.1 Denmark may use the 3.6 GHz band without coordination with Sweden, if the predicted field strength E0 produced by a base station does not exceed 32 dB( $\mu$ V/m)/5 MHz at the Swedish borderline and beyond.
- 2.2 Sweden may use the 3.6 GHz band without coordination with Denmark, if the predicted field strength E0 produced by a base station does not exceed 32 dB( $\mu$ V/m)/5 MHz, at the Danish borderline and beyond.
- 2.3 For base stations that are synchronized<sup>1</sup> between Denmark and Sweden or deployed as downlink only on both sides of the border, the following applies:
- 2.3.1 Denmark may use the 3.6 GHz band without coordination with Sweden, if the predicted field strength E0 produced by a base station does not exceed 67 dB( $\mu$ V/m)/5 MHz at the Swedish borderline and beyond and 49 dB( $\mu$ V/m)/5 MHz at a

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

distance of 6 km from the Swedish borderline and beyond, excluding Onsala peninsula, see 2.3.2.

2.3.2 Denmark may use the 3.6 GHz band without coordination with Sweden, if the predicted field strength  $E_0$  produced by a base station does not exceed  $40 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$  at the Swedish borderline of Onsala peninsula.

2.3.3 Sweden may use the 3.6 GHz band without coordination with Denmark, if the predicted field strength  $E_0$  produced by a base station does not exceed  $67 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$  at the Danish borderline or beyond and  $49 \text{ dB}(\mu\text{V}/\text{m})/5 \text{ MHz}$  at a distance of 6 km from the Danish borderline and beyond.

2.4 In cases of frequency block sizes other than 5 MHz, the predicted field strength  $E$  shall be adjusted by a factor in comparison with  $E_0$  as defined in paragraphs 2.1 to 2.3:

$E = E_0 + 10 \cdot \log_{10}(BW/5)$ , where  $BW$  is measured in MHz.

2.5 The field strength values in this agreement are based on a receiving antenna height of 3 m above the ground, 10% of the time and 50% of location.

### 3. Use of Physical Cell Identifier (PCI)

3.1 In the case when LTE or 5G NR systems are used, preferential PCIs as defined in Annex 1 shall be used.

### 4. Coordination procedure

4.1 Establishment of agreements between operators shall be encouraged to the extent possible. Subject to agreement between operators other technical characteristics can be used, e.g. other field strength limits or propagation models.

4.2 Any case of interference shall as far as possible be resolved among operators concerned. If not resolved, or in case of unequal access to the spectrum band, assistance might be sought from 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.

5.3 If needed the point 2.3.2 is to be reconsidered in 2027.

### 6. Enter into force

6.1 This Agreement shall enter into force from 1 January 2021.

### 7. Abrogation of previous agreement

The previous "Agreement between the Danish Energy Agency and the Swedish Post and Telecom Authority concerning the use of the 3.6 GHz (3400-3800 MHz) frequency band" of June 2020 is abrogated from the date when both parties have signed. This agreement has been drawn in two identical copies, one for Denmark and one for Sweden.

Signed in Kopenhagen, on the 4<sup>th</sup> November 2020, for the Danish Energy Agency by Senior Adviser, Center for Telecoms

Signed in Stockholm, on the 15<sup>th</sup> December 2020, for the Swedish Post and Telecom Authority by Head of Section for Spectrum Development.

Reference number: 20-10403

## ANNEX 1 - PREFERENTIAL PHYSICAL CELL IDENTIFIER (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	Set B	Set C	Set D	Set E	Set F
	0 to 83	84 to 167	168 to 251	252 to 335	336 to 419	420 to 503
Country	Denmark	Denmark	Denmark	Sweden	Sweden	Sweden

Table A2. PCI division for 5G NR<sup>2</sup>

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

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<sup>2</sup> According to ECC REC (15)01