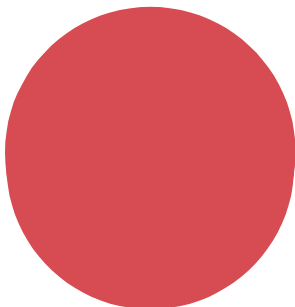


Informationsmemorandum

Bilag M



**Grænsekoordineringsaftaler mellem Danmark og
Tyskland (700 MHz- og 900 MHz-frekvensbåndene)
700 MHz-, 900 MHz- og 2300 MHz-auktionen**



2018

Agreement between the Danish Energy Agency, and the Federal Network Agency concerning the use of the 700 MHz band (694-790 MHz) for MFCN service

[February 2018]

Coordination agreement between MFCN and MFCN

This agreement is valid from the date of a potential Danish change of service to MFCN in the 700 MHz band. Denmark will inform Germany as soon as a final date of the change of service is set.

1. Principles and definitions

- 1.1. The 700 MHz band, as referred to in this agreement, covers the frequencies from 694 MHz to 790 MHz, with the FDD arrangement, including optional SDL (Supplemental Downlink, up to 4x5 MHz in the duplex gap) in accordance with ECC Decision (15)01. The use of other arrangements such as TDD is not covered in this agreement.
- 1.2. This agreement is based on the concept of field strength levels and in the case when LTE systems are used preferential PCIs as defined in Annex 1.
- 1.3. This agreement covers the coordination of the base stations. The user equipment, or terminals, are allowed to be used on non-interfering basis, in accordance with ITU RR 4.4.
- 1.4. For the purpose of this agreement the border of Denmark and Germany is the coastline, where the border is not on land.
- 1.5. The latest version of ITU-R P.1546 "Method for point-to-area predictions for terrestrial services in the frequency range 30-3000 MHz" shall be used for predictions of field strength values.

2. Use of frequencies without coordination by administrations

- 2.1. Denmark may use the 700 MHz band without coordination with Germany, if the predicted field strength E_0 produced by a base station does not exceed 54 dB(μ V/m)/5 MHz at a height of 1.5 m above the ground at the German border, and does not exceed 36 dB(μ V/m)/5 MHz at a distance of 6 km beyond the German borderline.
- 2.2. Germany may use the 700 MHz band without coordination with Denmark, if the predicted field strength E_0 produced by a base station does not exceed 54 dB(μ V/m)/5 MHz at a height of 1.5 m above the ground at the Danish border, and does not exceed 36 dB(μ V/m)/5 MHz at a distance of 6 km beyond the Danish borderline.
- 2.3. In case of using technologies with other channel bandwidths (BW) 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 and 2.2:

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

2.4. The field strength values (see 2.1 and 2.2) in this agreement are based on a receiving antenna height of 1.5 m, 10% of the time and 50% of the locations.

3. Use of Physical-Layer Cell Identities (PCI) for LTE

3.1. In the case when LTE systems are used, PCI division, according to the table in Annex 1, may 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 table.

4. Coordination procedure

4.1. Establishment of arrangements 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. Such arrangements are subject to consent of the administrations concerned. In particular, before giving consent to such arrangements, the administrations concerned should take care that all network operators concerned are parties in such an arrangement.

4.2. Any case of interference shall as far as possible be resolved among the 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 revised upon mutual agreement of the two administrations.

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

6. Enter into force

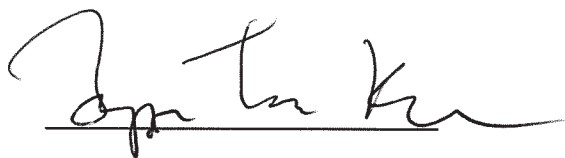
6.1. This agreement is valid from the date of a potential Danish change of service to MFCN in the 700 MHz band.

This agreement has been drawn in two identical copies, one for Denmark and one for Germany.

Place *Copenhagen*

Date *16.02.2018*

For the Danish Energy Agency



Jeppe Tanderup Kristensen

Place *Münster*

Date *05.02.2018*

For the Federal Network Agency



Tobias Schnetzer

ANNEX 1

PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE

PCI division, according to the table below, may 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 table:

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	Denmark	Denmark	Germany	Germany	Germany	Denmark

Table: Division of Preferential Physical-Layer Cell Identities (PCI) for LTE

PROPOSAL

AGREEMENT

**Between the National Telecom Agency, Denmark,
and the Regulierungsbehörde für Post und Telekommunikation, Germany,
concerning the use of frequency bands 880-890 and 925-935 MHz**

2001

General

Except as otherwise provided, the rules and procedures of CEPT Recommendation T/R 20-08 shall apply.

Specific agreements on certain issues may overrule the corresponding rules of this Agreement if all affected operators agree and such agreements are finally approved by the administrations afterwards.

If the agreement cannot be reached, the operator shall immediately bring the radio channels involved in line with the basic Agreement.

This Agreement may be revised as desired by one of the national telecommunications administrations. If no agreement is reached then, CEPT Recommendation T/R 20-08 shall apply.

Use of Channels

The numbering of channels follows the GSM channel numbering scheme. The band is shown in Annex 1.

If a country uses part of the spectrum for other purposes, the limits of this agreement shall still apply.

Preferential frequencies may be used by one part without coordination with the other part if the field strength of each carrier produced by the base station does not exceed a value of 22 dB μ V/m at a height of 3 meters above ground at a distance of 15 kilometers from the division line inside the other country.

Channels 987, 988, 1000, 1001, 1012 and 1013 may be used as preferential channels, but must be coordinated with the neighbouring country if the field strength exceeds 22 dB μ V/m at a height of 3 meters above ground at the division line.

The 10 % and 50 % locations propagation curves in CEPT Recommendation T/R 20-08 shall be used for calculating and measuring the field strength.

The channel assignment and division into preferential frequencies is indicated in Annex 1.

Definition of division line

In the Flensburg inlet, and where the border is on land, the division line is the borderline.

In the North Sea and in the Baltic, the division line is composed of straight lines, connecting the following geographical coordinates:

	Longitude:	Latitude:
1)	08°13'00"N	55°12'30"N
2)	08°40'00"N	54°54'30"N
3)	10°00'00"N	54°50'00"N
4)	10°40'00"N	54°35'00"N
5)	11°00'00"N	54°38'30"N
6)	11°30'00"N	54°31'00"N
7)	12°00'00"N	54°23'00"N
8)	12°30'00"N	54°42'00"N
9)	13°28'00"N	55°00'00"N
10)	13°58'00"N	55°00'00"N
11)	14°39'00"N	54°27'30"N

In the North Sea, west of coordinate 1), the division line is due west at latitude 55°12'30"N.

For the NTA in Denmark

Copenhagen, 2001

For the RegTp in Germany

Mainz, 2001

J. Lang Nielsen

T. Heutmann

Annex 1

Ch	Center frequency		Operators		Preferential channels
	MHz	MHz	DNK	D	DNK/D
975	880.2	925.2	TELIA	?	D
976	880.4	925.4	TELIA	?	D
977	880.6	925.6	TELIA	?	D
978	880.8	925.8	TELIA	?	D
979	881.0	926.0	MOBILIX	?	D
980	881.2	926.2	MOBILIX	?	D
981	881.4	926.4	MOBILIX	?	D
982	881.6	926.6	MOBILIX	?	D
983	881.8	926.8	Tram	?	D
984	882.0	927.0	Tram	?	D
985	882.2	927.2	Tram	?	D
986	882.4	927.4	Tram	?	D
987	882.6	927.6	Tram	?	D
988	882.8	927.8	MOBILIX	?	DNK
989	883.0	928.0	MOBILIX	?	DNK
990	883.2	928.2	MOBILIX	?	DNK
991	883.4	928.4	MOBILIX	?	DNK
992	883.6	928.6	MOBILIX	?	DNK
993	883.8	928.8	MOBILIX	?	DNK
994	884.0	929.0	MOBILIX	?	DNK
995	884.2	929.2	MOBILIX	?	DNK
996	884.4	929.4	MOBILIX	?	DNK
997	884.6	929.6	MOBILIX	?	DNK
998	884.8	929.8	MOBILIX	?	DNK
999	885.0	930.0	MOBILIX	?	DNK
1000	885.2	930.2	MOBILIX	?	DNK
1001	885.4	930.4	MOBILIX	?	D
1002	885.6	930.6	MOBILIX	?	D
1003	885.8	930.8	MOBILIX	?	D
1004	886.0	931.0	MOBILIX	?	D
1005	886.2	931.2	MOBILIX	?	D
1006	886.4	931.4	TELIA	?	D
1007	886.6	931.6	TELIA	?	D
1008	886.8	931.8	TELIA	?	D
1009	887.0	932.0	TELIA	?	D
1010	887.2	932.2	TELIA	?	D
1011	887.4	932.4	TELIA	?	D
1012	887.6	932.6	TELIA	?	D
1013	887.8	932.8	TELIA	?	DNK
1014	888.0	933.0	TELIA	?	DNK
1015	888.2	933.2	TELIA	?	DNK
1016	888.4	933.4	TELIA	?	DNK
1017	888.6	933.6	TELIA	?	DNK
1018	888.8	933.8	TELIA	?	DNK
1019	889.0	934.0	TELIA	?	DNK
1020	889.2	934.2	TELIA	?	DNK
1021	889.4	934.4	TELIA	?	DNK
1022	889.6	934.6	TELIA	?	DNK
1023	889.8	934.8	TELIA	?	DNK