Agreement between the Communications Authorities of:

Denmark,

Germany,

Norway,

and The Netherlands,

concerning the offshore use of the following frequency bands:

700 MHz (694 - 791 MHz),

800 MHz (791 – 862 MHz),

900 MHz (880 – 960 MHz),

1400 MHz (1452 – 1492 MHz),

1800 MHz (1710 – 1880 MHz),

2100 MHz (1920 – 2170 MHz),

2600 MHz (2500 – 2690 MHz),

3600 MHz (3400 – 3800 MHz)

for wideband systems capable of providing terrestrial electronic communications services in the border areas of exclusive economic zones of the respective countries

June 2019

1. Introduction

1.1. The agreement describes the procedures of co-ordination of civil mobile wideband communication networks operating on fixed offshore installations in the border areas of exclusive economic zones (EEZ)[1], as defined in UN Convention on the Law of the Sea, of Denmark, Germany, Norway and the Netherlands.

1.2. The Communication Authority of Denmark is Energistyrelsen.

1.3. The Communication Authority of Germany is Bundesnetzagentur.

1.4. The Communication Authority of Norway is Nasjonal kommunikasjonsmyndighet.

1.5. The Communication Authority of the Netherlands is Agentschap Telecom.

2. Principles and definitions

2.1. The 700 MHz-band, as referred to in this agreement, covers the frequencies from 694 MHz to 791 MHz, with the Frequency Division Duplex (FDD) arrangement, excluding Supplemental Downlink (SDL, 4×5 MHz in the duplex gap), as defined in ECC Decision(15)01.

2.2. The 800 MHz-band, as referred to in this agreement, covers the frequencies from 791 MHz to 862 MHz, with the FDD arrangement, as defined in ECC/DEC/(09)03.

2.3. The 900 MHz-band, as referred to in this agreement, covers the frequencies from 880 MHz to 960 MHz, with the FDD arrangement, as defined in ECC/DEC/(06)13.

2.4. The 1400 MHz-band, as referred to in this agreement, covers the frequencies from 1452 MHz to 1492 MHz, for SDL, as defined in ECC/DEC/(13)03.

2.5. The 1800 MHz-band, as referred to in this agreement, covers the frequencies from 1710 MHz to 1880 MHz, with the FDD arrangement, as defined in ECC/DEC/(06)13.

2.6. The 2100 MHz-band, as referred to in this agreement, covers the frequencies from 1920 MHz to 2170 MHz, with the FDD arrangement, as defined in ECC/DEC/(06)01.

2.7. The 2600 MHz-band, as referred to in this agreement, covers the frequencies from 2500 MHz to 2570 MHz paired with 2620 MHz to2690 MHz for the FDD arrangement and 2570 MHz to 2620 MHz for SDL or TDD, as defined in ECC/DEC/(05)05

2.8. The 3600 MHz band, as referred to in this agreement, covers the frequencies from 3400 MHz to 3800 MHz, with the TDD arrangement, as defined in ECC DEC (11)06.

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[1] The exclusive economic zones start at 12 nautical miles (22.224 km) from the coastline

2.9. This agreement is based on the concept of field strength levels and preferential Physical-layer Cell Identities (PCIs, when LTE or 5G NR is used) and preferential Scrambling Codes (SCs, when UMTS is used) as defined in Annex 1. Preferential PCI/SC shall be used in border areas to improve coverage and service when channel centre frequencies are aligned.

2.10. This Agreement covers the co-ordination of base stations. User equipment, or terminals, are allowed to be used on non-interfering basis, in accordance with ITU RR 4.4.

3. Co-ordination thresholds

3.1. The co-ordination threshold in this agreement is based on the concept of field strength level of 5 MHz block assignment.

3.2. In case of other frequency block sizes, a value of

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

should be added to the field strength values.

3.3. For field strength calculations the latest version of Recommendation ITU-R P.1546 "Method for point-to-area predictions for terrestrial services in the frequency range 30-3000 MHz" shall be used.

3.4. The field strength values in this agreement are based on a receiving antenna height of 3 m (above mean sea level), 10% of the time and 50% of the locations.

3.5. For field strength calculations in the 3600 MHz band 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.

3.6. The respective bands may be used without coordination between the countries being party to this agreement if the predicted field strength produced by a base station[2] does not exceed the threshold at the border line for the respective band given in the table below:

[2] The values in the table are only valid if the centre frequencies of the stations of the MFCN systems are not aligned on both sides of the borderline or with centre frequencies aligned using preferential PCI codes for LTE and 5G NR systems or SC's for UMTS systems as given in Annex 1

Frequency band [MHz]	Threshold @border line [dBµV/m/5MHz]	Threshold @secondary line D/NOR [dBµV/m/5MHz]
700	59	41
800	59	41
900	59	41
1400	65	47
1800	65	47
2100	65	37
2600	65 for FDD and synchronised TDD BS 30 for non-synchronized TDD BS	49
3600	67 for synchronized TDD BS[3] 32 for non-synchronized TDD BS	49

4. Individual operator agreements

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, assistance might be sought from the administrations. Because of the location, enforcement could be limited to an administrative exercise.

5. Status of existing assignments

This Agreement shall not apply to existing assignments which are already coordinated, possible harmful interference caused by them shall be accepted.

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

6. Border area Germany and The Netherlands

This Agreement shall not apply for the bi-lateral situation between Germany and The Netherlands and when no other country is affected. In that case bi- or multilateral agreements concluded between Germany and The Netherlands shall be applied.

7. Revision and cancellation

7.1. This Agreement may be revised upon request of any Administration listed in this document.

7.2. Any Administration listed in this document is entitled to withdraw from this Agreement with a notice of at least six months.

8. Entry into force

8.1. This Agreement shall enter into force from the 1. September 2019

8.2. This Agreement has been drawn up in 4 (four) identical copies, one for each Administration.

For the Communication Authority of Denmark

Billund — 12/6 2019

Place — Date

Jeppe Tanderup Kristensen
Senior Adviser

For the Communication Authority of Germany

Mainz — 27/08/2019

Place — Date

Jens Franke
Head of Section of Mobile Services Department

For the Communication Authority of Norway

Oslo — 27.6.2019

Place — Date

John-Eivind Velure
Director of the Spectrum Department

For the Communication Authority of the Netherlands

Place — Date

Groningen — 25-6-2019

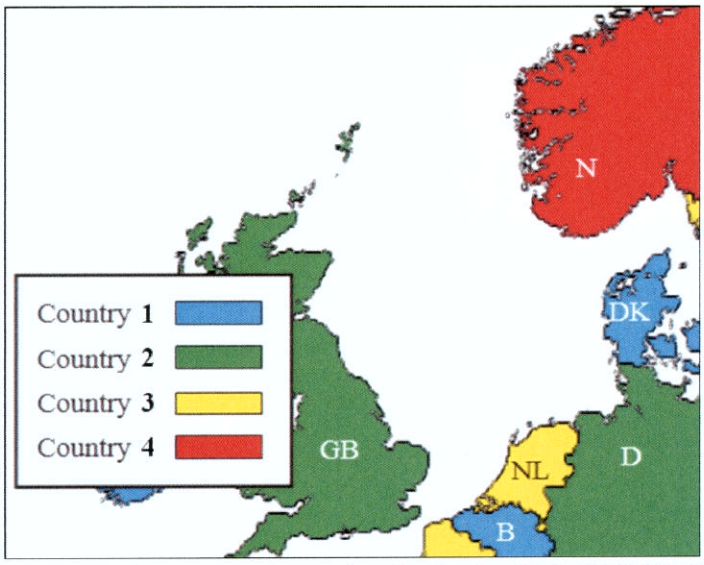
Yvonne Veenstra-Knop
Head of the Networks Department

ANNEX 1 – Preferential PCIs (for LTE and 5G NR) and SCs (for UMTS)

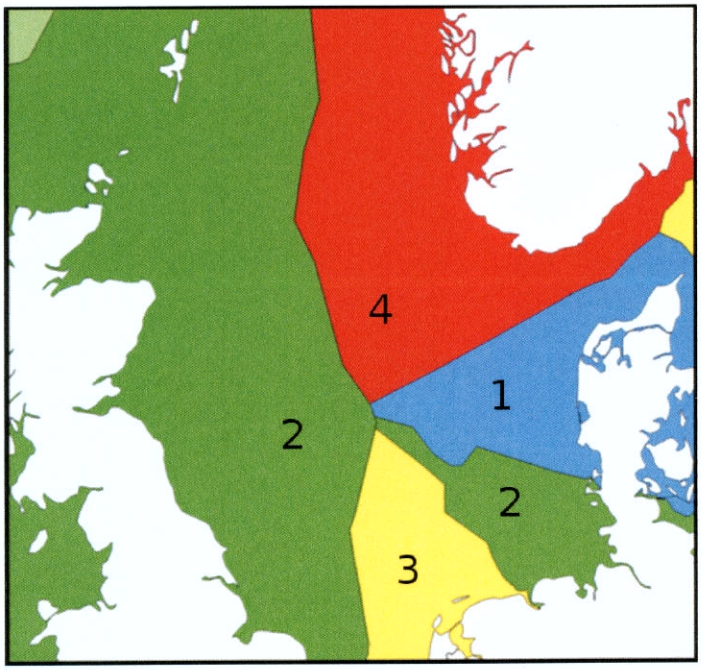
1. Country types

ECC REC(08)02 defines four types of countries for the use of preferential PCIs and SCs on land territory (Picture 1) and respective EEZ (Picture 2):

Type country 1: Denmark
Type country 2: Germany, the United Kingdom
Type country 3: the Netherlands
Type country 4: Norway



Picture 1: Country type map (on the basis of ECC REC(08)02)



Picture 2: EEZ borders

2. PREFERENTIAL PHYSICAL-LAYER CELL IDENTITIES (PCI) FOR LTE and 5G NR

For each type of country, the following tables and figure describe the sharing of the PCI's with its neighbouring countries, with the following conventions of writing:

■	Preferential PCI
	non-preferential PCI

The 504/1008 physical-layer cell-identities should be divided into the following 6 sub-sets when the carrier frequencies are aligned in border areas:

PCI	Set A	Set B	Set C	Set D	Set E	Set F
Country 1	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	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	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	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		■		■		

3. PREFERENTIAL CODES FOR UMTS (UTRA FDD)

For each type of country, the following tables and figure describe the sharing of the codes with its neighbouring countries, with the following conventions of writing:

■	Preferential code
	non-preferential code

For the FDD mode; 3GPP TS 25.213 defines 64 « scrambling code groups » in §5.2.3, numbered {0...63}, hereafter called « code groups ».

	Set A	Set B	Set C	Set D	Set E	Set F
Country 1	0..10	11..20	21-31	32..42	43..52	53..63
Border 1-2	■	■				■
Zone 1-2-3	■	■				
Border 1-3	■	■	■			
Zone 1-2-4	■					■
Border 1-4	■		■			■
Zone 1-3-4	■		■			

	Set A	Set B	Set C	Set D	Set E	Set F
Country 2	0..10	11..20	21..31	32..42	43..52	53..63
Border 2-1			■	■	■	
Zone 2-3-1			■	■		
Border 2-3		■	■	■		
Zone 2-1-4			■	■		
Border 2-4			■	■		■
Zone 2-3-4			■	■		

	Set A	Set B	Set C	Set D	Set E	Set F
Country 3	0..10	11..20	21..31	32..42	43..52	53..63
Border 3-2	■				■	■
Zone 3-1-2					■	■
Border 3-1				■	■	■
Zone 3-1-4					■	■
Border 3-4			■		■	■
Zone 3-2-4					■	■

	Set A	Set B	Set C	Set D	Set E	Set F
Country 4	0..10	11..20	21..31	32..42	43..52	53..63
Border 4-1		■		■	■	
Zone 4-1-2		■			■	
Border 4-2	■	■			■	
Zone 4-2-3	■	■				
Border 4-3	■	■		■		
Zone 4-3-1		■		■		