Bilag 12: Bilaterale aftaler om TV-senderettigheder

De ved udbudstidspunktet indgåede bi- og multilaterale aftaler med relevans for DTT i VHF (174-230 MHz) og UHF (470-694 MHz). Bemærk at Danmark løbende indgår nye bi- og multilaterale aftaler, som kan medføre ændringer, som de berørte tilladelseshavere vil skulle tåle, se bl.a. udbudsmaterialets afsnit 11.1 og underafsnit.

Multilateral aftale med Tyskland, Polen og Sverige

Coordination agreement relating to DTT in the band 470 - 694 MH z in Denmark-Ge:rmany-Poland-Sweden

Warsaw 21 June 2016

Background

Denmark, Germany and Sweden have decided to use the frequency band 694 - 790 MHz for electronic communication services other than broadcasting in the future. While Poland has no such decision at this point in time all four countries subject to this agreement have interest in tinding a solution for the continued service of DTT in the remaining band 470 - 694 MHz. The intention during the negotiations has been to find a common final planning solution enabling up to six layers in each country, depending on chosen SFN-sizes, network structure etc.

Ch amge s to th e GIE06 lP'lliam1

In order to replan the band 470-694 MHz a number of changes have to be done to the existing GE06Plan.

Aclld fiti on s

In the following section all entries having a channel number that is not underline d may be implemented from the day of entry into force of the agreement. Entries having an underlined channel number may only be implemented when agreed amongst the concerned parties (given in paranthesis behind each new, underlined entry).

The following Allotments are accepted by the above mentioned Administrations as additions to the GE06 Plan:

Denmark

TOLNE-NIBE	26	4(;JSJ		
THISTED	27	35	45	
VIDEBAEK	21	23	42	47
VIBORG	27	28	38	47
HADSTEN-AARHUS	29	46 (S)		
HEDENSTED	41	43		
VARDE	23	32	34 (D)	41
AABENRAA	25	30 (D)	40 (D)	
TOMMERUP-SVENDBORG	30iDJ	? (D)	371D1	
VORDINGBORG-NAKSKOV	31	32		
JYDERUP	33 (Sl	34		
KOEBENHAVN	33 (Sl	40 (S.D)	42	48
ROE	33 (Sl	40 (D. POL)	45 (S. POL)	

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Germany

Germany optimized t he structure of all allotment shapes according to the service areas of the main t ransmitt ers within the allotments. Germany will use the same shape structures for all layers. For this reason Germany will withdraw all allotments and assignment s from the GE06 Plan and will add new allotments having these new shapes (annex " New German allotment plan.t xt" of this agreem ent). All changes correspond to t he mutually agreed common final plan.

NEUBRANDENBURG	22	23	29lPO U	36	44(POL)	46(PO L}
ROSTOCK	24	26	29	36	44	46
ROGEN-USEDOM	24(8)	26(8)	29	36	44CPOU	46
SCHWERIN	24	26	29	36	44	46
KIEL	21	27lDNK)	28<DNK)	39	45	47
HAMBURG-LUBECK	23	27(DNK}	28	33	41lDNK)	45
WESTKOSTE	24	26	27(0N K)	f-28<DNK)	31	45
HAMBURG reaional	37	40				
BREMEN reaional	34	46				
AURICH	29	35	42	43	48	
CUXHAVEN	29	35	36	42	48	
BREMEN-UNTERWESER	22	29	30	35	42	48
UELZEN	22	25	32	38	43	48
D ANNENBERG	30	32	35	38	43	48
DEQUEDE	30	32	34	35	45	48
P RIlZWALK	21	27	28	31	35	42
CASEKOW	22	23	25	27	33	40
BERLIN	25	'P	31	33	40	42
BERLIN regional	39	47				
BOOSSEN	25	29lPOU	31	33	40	43

Sweden

HELSINGBORG **sam are!l as S-PT2-20 54**	27	45	47
MALMOE **{same area as S-DT2-20356)**	30	43	
HOERBY **(same area as S:-GT 2-00011)**	27	43	
KARLSHAMN-KARLSKRONA	31{DNK}	41	43
VISLANDA	24	29	44
EMMABODA	26	36	
VISBY	22	31	

Po/and

; **GDANSK**	24 (S)	25	44
PM-2	45 (S)		
LEBORK	44	48	
KOSZALIN	28	35	37 ml
PM-1	48		
ZP-1 (northern **part)**	38		
ZP-1 (southem part)	33		
BIALOGARD	35	37 (D)	47
SWINOUJSCIE	21	37 (Dl	
SZCZECIN	37 (D)		
PILA	35	441D1	
WP-1	31		

The following Assignments are accepted by the above mentioned Administrations as additions to the GE06 Plan:

Denmark

LAESOE	23	33 (S}	**42**
ANHOLT	22	30	43

Germany

PRENZLAU	43

Po/and

KOSZALIN	46

§ ll.Il]Pl]Pllt'le§ § llO illl§

The following Allotments or parts (sub-areas) of allotments are to be considered as treated as deleted. That means they have no implementation rights and no protection rights. Nevertheless the allotments may be kept in the GE06 Plan, but will have to be modified to carry a remark using the t_remarks field saying "D-DNK-POL-S 21-06-2016", as a reference to this agreement.

The date of entry into effect of the deletions is to be agreed upon in connection with the agreements of the underlined entries in the previous chapter to this agreement:

Denmark

THISTED	***4l***	4j
VIDEBAEK	28	40
VIBORG	24	40
HEDENSTED	33	
VARDE	28	46
AABENRAA	41	
T OMMERUP-SV ENDBORG	27	41
ROE	31	

rJu

Germany

Germany will withdraw all allotments and assignments from the GE06 Plan and will substitute the allotments with new allotments having modified shapes (see explanation under section "Additions").

Sweden

HELSINGBORG (area S-DT2-20354)	30			
HELSINGBORG-HOERBY-MALMOE (area S-DT2-20352)	33	43		
KARLSHAMN-KARLSKRONA	24	26		
VISLANDA	40			
EMM ABODA	45			

Poland

GDANSK			
PM-1	23		
KOSZALIN	40		
BIALOGARD	38	45	
PILA	**31**		

The foliowing Assignments are to be deleted from the GE06 Plan (suppressed).

The date of entry into effect of the deletions is to be agreed upon in connection with the agreements of the underlined entries in the previous chapter to this agreement:

Denmark

LAESOE	22			
ANHOLT	25	33	40	46

Poland

SZCZECIN	39

IRe \Vli§i rnrn

Revision to this agreement can only be made if all four parties agree.

IErn.1te ir fill1l1tl{J) fo irce

This agreement will enter into force upon the signatur e of all four parties.

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Place fØ.bæ''' h

Date I ·J ""(t *Lolk.*

For the Danish Energy Agency

Jeppe Tanderup Kristensen

Senior Adviser

Center for Telecoms, ENS

Place *Sr1nA t*

Date (n !l.f:>t,b

For the Swedish Post and Telecom Authority

Head of Section for Spectrum Development

Spectrum Department, PTS

Place /14.,'t.t)...

Date 2o Jw/y .,

For the German Bundesnetzagentur

Dr. Sascha Falahat

Assist ant Head of Section Broadcasting

Place W t.L

Date ÆG t- 2..01b

For the Polish Office of Electronic Communication

Dr. inz. Wiktor **S ga**

Director of Department of Frequency Resources Management

Aftaler med Tyskland

Der er pt. ved at blive indgået en opdateret bilateral aftale vedrørende beskyttelsen mellem DTT og MFCN (LTE700) med Tyskland. Det er planen at denne er indgået og offentliggjort inden for udbudsperioden.

Agreement between Danmark and Germany covering the Digital assignments and allotments included in the Plan at RRC-06

Background and problem:

During the development of the digital Plan agreed in Geneva at the RRC-06 a number of assignments and allotments were included in the Plan using conditional Administrative Declarations.

To enable the implementation of the assignments and allotments contained in the Plan for Denmark and Germany and at the same time ensw-e the future integrity it is necessary to agree on suitable fieldstrength limits.

1. General agreements

- Coordination between the administrations concemed is required, in case the maximum allowable field strength *as* indicated in chapter 2 (for UHF) and chapter 3 (for VHF) is exceeded by the cumulative interfering field strength of a real network implementation. The network implementation comprises all previously notified assignments as well as all newly notified assignments for the corresponding allotment.
- Field strengths are calculated at 10 meters height for 1% time, 50% of locations.
- Tue power sum method is used to calculate the cumulative interference field strength.
- The cumulative interference field strength is calculated at the boundary of the co-channel/co-block allotments.
- For field strength calculation, the propagation model according to the Geneva RRC-06 Agreement (modified ITU-RP. 1546) should be used. The parties noted that there are differences in the implementation of Jand-sea geographical data which could result in discrepancies in the calculated results. Preferably the land-sea data used at the RRC-06 should be used, if available.
- Assignments, that are situated within an allotment area, designated to transmit on the same channel *as* the allotme but not linked to that allotment, will be treated in the implementation exactly like linked assignments in the RRC 06 planning process. Only the allotment area will be protected. The service area of these assignments outside of the allotment area are not protected.

2. UHF agreement

Tue maximum allowable interfering field strength *Emaxint* is defined as

Emaxint **=49+** *fco"* **[dBµV/m]**

where *fcorr* is the frequency correction (in dB), given by 30*log(f/650), fin MHz

Due to the protection ofboth Danish and German other services in channels 61 to 63 and 67 to 69 the implementation of these channels is restricted. Tue parties agreed to seek to find a solution on a case-by-case basis. Nevertheless, it is noted that there is an increased need for using these channels for broadcasting. It is expected that the frequency requirements in this band for other services will decrease.

3. VHF agreement

The maximum allowable interfering field strength Emaxint is defined as follows:

DVB-T interfered by 7 MHz DVB-T:	*Emaxint* =38 d.BµV/m
DVB-T interfered by T-DAB:	Emaxint =33 dBµV/m
T-DAB interfered by T-DAB:	Emaxint = 39 dBµV/m
T-DAB interfered by 7 MHz DVB-T:	Emaxint **=45 dBµV/m**

Two or more neighboring allotments using the same channel/block are treated as one allotment.

Geneva, 8th of June 2006

On behalf of the Administration of

Denmark	Germany
Henning Andersen	Andreas Werner
NITA	Bundesnetzagentur

Additional agreement D-DK 220908_corr with 28 august 2008 DNK proposal

ROENNE & NEKSOE ERP 5kW -> 2kW and AABENRAA ERP reduced by 0,4dB

ch	allotment	affected allotment	proposal*
22	Aabenraa	Bremen	ok as requested now (46 dBW with directional antenna pattern)
54	Koebenhavn	Neubrandenburg	ok with bilateral agreement (network to be adjusted accordingly)
36	Vorpommern	Hedensted	ok with bilateral agreement (network to be adjusted accordingly)
56	Roe	Schwerin	additional 0 dB allowed**, only in this direction, not vice versa
52	Ostfriesland	Videbaek	additional 0 dB allowed**, only in this direction, not vice versa
32	Roe	Schwerin	additional 1 dB allowed**, only in this direction, not vice versa
48	Ostfriesland	Videbaek	additional 1 dB allowed**, only in this direction, not vice versa
39	Roe	Kiel-...	additional 4 dB allowed**, only in this direction
39	Kiel-...	Roe	additional 4 dB allowed**, only in this direction
59	Roe	Kiel-...	additional 3 dB allowed**, only in this direction
59	Kiel-...	Roe	additional 3 dB allowed**, only in this direction
32,50	Aabenraa	Schwerin	additional 4 dB allowed**, only in this direction, not vice versa
24,26	Schwerin, Rostock,..	Hadsten	additional 4 dB allowed**, only in this direction, not vice versa
23	Koebenhavn	Neubrandenburg	additional 3 dB allowed**, only in this direction, not vice versa
23	Hamburg+Luebeck	Koebenhavn-Jyderup	additional 3 dB allowed**, only in this direction, not vice versa

Agreement to solve problems in the UHF-Band for the bilateral area Denmark-Germany

22 May 2014

Background

The above mentioned countries have decided to use the frequency band 790-862 MHz for electronic communication services ether than broadcasting (Digital Dividend) in the future. Beth Administrations have rights for Allotments in the Digital Plan GE06 in this frequency range. The interest of these countries is therefore to find solutions for the continued service of DTT (Digital Terrestrial TV). Initially the interest is to accommodate in the remaining band 470-790 MHz the same number of layers as present in the GE06 Plan for the entire band 470-862 MHz. It turned out that this is impossible. The intention is therefore to ensure that no more than one layerwill be lost in each Allotment area. Such solutions were addressed in the "Agreement to selve problems in the UHF-Band for the multilateral area Denmark-Poland-Sweden-Germany, Warsaw, 16.09.2009". This agreement serves to address some of the remaining issues.

Changes to the GE06 Plan

The following Allotments are accepted by the respective Administrations of Germany and Denmark as additions to the GE06 Plan:

Channel 25: Extension of GE06 Allotment "HANNOVER-BRAUNSCHWEIG" (Admin-Unique-ID "D--NI-O---03-04") with the area of the GE06 Allotment "UELZEN-SOLTAU" (Admin-Unique-ID "D--NI-NOS-05-04") to a common new allotment.

Channel 28: New allotment "PRIGNITZ" as an addition with the same area like channel 66 "PRIGNITZ" (Admin-Unique-ID "D--BB-NW--03-04").

Channel 31: In the "Agreement to selve problems in the UHF-Band for the multilateral area Denmark-Poland-Sweden-Germany, Warsaw, 16.09.2009", it was agreed if Cuxhaven channel 49 is not longer usable because of utilisation of channel 49 in Aabenraa a bilateral solution has to be developed. For this reason the Allotment 'WESTKUESTE" (Admin-Unique-ID "D--SH-WES-01-04") will extend to the area Cuxhaven to a new common allotment 'WESTKUESTE CUXHAVEN".

Channel 35: Extension of GE06 Allotment "UELZEN-SOLTAU" (Admin-Unique-ID "D--NI-NOS-05-04") with the area of the GE06 Allotment "LUENEBURG-WENDLAND" (Admin-Unique-ID "D--NI-NON-05-04") to a common allotment "LUENEBURG-UELZEN" (like channel 63 (D--NI-NO--07-04) or channel 65 (D--NI-NO--03-04)).

Channel 40: Extension af GE06 Allotment "HAMBURG-LUEBECK" (Admin-Unique-lD "D--SH-S---03-04") with the area af GE06 Allotment "KIEL-OSTHOLSTEIN" (Admin-Unique-lD "D--SH-O---05-04} to a common new allotment. CH40 ROSTOCK-STRALSUND (unique admin id: D--MV-----02-11) and its associated assignments can be used until 1 April 2020 as long as it does not hamper the lang term planning af the band 470-694 MHz for DTT. CH40 ROSTOCK-STRALSUND (unique admin id: D--MV-----02-11) shall be SUPPRESSed from the GE06 plan no later than 1 April 2020.

All bilateral and multilateral agreements between both nations are also applicable for the implementation and protection af these above mentioned modifications af the Plan GE06.

Done by correspondence,

For Denmark

L
Jep p Kristensen
Danish Business Authority
Ministry af Business and Growth Denmark

On behalf af the Danish Business Authority

Date af signature:
22/5 2014

For Germany

/J
ef. k %'41 /-
Federal Network Agency far Electricity, Gas, Telecommunications, Post and Railway

On behalf af Federal Network Agency

Date af signature: IL -(:b - 2 0 air

Bilateral additional agreement between Denmark and Germany

Tothe

Coordination agreement relating to DTT in the band 470-694 MHz
in Denmark-Germany-Poland-Sweden (Warsaw 21st June 2016)

Due to the remaining frequency band 470-694 MHz and the intention to find six layers in each country it was necessary to plan additional co-channel relations with suboptimal interfering field strength constellations compared to previous agreements. For this reason the administrations of Danmark and Germany see the need to find . agreements for higher interfering field strengths in specific co-channel relations.

Both administrations agree to additional dB's in relation to maximum interfering field strength of 49 dBµV/m (including frequency correction for RPC2/3) which is allowed to be delivered to a co-channel allotment in the other country following the agreement of the 8th June 2006. The agreed additional dB's and new maximum interfering field strength values are listed in the attached annex.

The co-channel relations listed in the annex of this agreement replace the agreed values from the agreement of 22nd September 2008. Co-channel relations not listed to the annex of this agreement remain valid until 31st December 2020.

This agreement will enter into force upon the signature of both parties.

Berlin, 11th August 2016

For the Danish Energy Agency,
Center for Telecom

Jeppe Tanderup Kristensen

Senior Adviser

For the German Federal
Network Agency

Dr. Sascha Falahat

Assistant Head of Section Broadcasting

Annex to agreement of 11 August 2016, Berlin

Agreed interfering fieldstrength relations between Denmark and Germany for DTT in ch 21 to 48

For all allotment relations which are not listed apply 49 dBµV/m + f_{corr}

Channe!	Interfering Allotment	Wanted Allotment	Additional dB	New threshold fst [dBµV/m]
22	Bremen-Unterweser-Uelzen	Aabenraa-Tommerup-Svendborg	1	46,1
23	Hamburg-Lubeck	Koebenhavn-Jyderup	4	49,3
24	Rostock, Schwerin, Rugen-Usedom	Hadsten-Aarhus	4	49,5
26	Rostock, Schwerin, Rugen-Usedom	Hadsten-Aarhus-Nibe-Tolne	4	49,9
29	Rostock, Schwerin, Rugen-Usedom, Neubrandenburg	Hadsten-Aarhus-Nibe-Tolne	3	49,5
33	Hamburg-Lubeck	Koebenhavn-Jyderup	1	48,3
36	Rostock, Schwerin, Rugen-Usedom, Neubrandenburg	Hadsten-Aarhus-Hedensted	2	49,8
39	Kiel	Roe	3	51,3
42	Aurich, Cuxhaven, Bremen-Unterweser	Videbaek	2	50,8
45	Hamburg-Lubeck, Kiel	Roe	2	51,3
48	Aurich, Cuxhaven, Bremen-Unterweser	Videbaek	1	50,8
21	Videbaek-Viborg-Thisted	Kiel	1	45,9
22	Aabenraa-Tommerup-Svendborg	Bremen-Unterweser-Uelzen	3	48,1
23	Koebenhavn-Jyderup	Neubrandenburg-Casekow	4	49,3
30	Aabenraa-Varde-Tommerup-Svendborg-Hedensted	Bremen-LInterweser	6	52,7
31	Koebenhavn-Jyderup-Vordingborg-Nakskov	Westkuste	6	52,9
34	Videbaek-Varde	Bremen regional	5	52,5
37	Aabenraa-Tommerup-Svendborg	Hamburg regional	1	49,0
39	Roe	Kiel	1	49,3

Aftaler med Sverige

Der er pt. ved at blive indgået en opdateret bilateral aftale med Sverige. Det er planen at denne er indgået og offentliggjort inden for udbudsperioden.

Agreement between the Danish Energy Agency, and the Swedish Post and Telecom Authority concerning the use of the 700 MHz-band (694-790 MHz) for DTT service in Denmark and MFCN service in Sweden

February 2016

Protection of DTT from MFCN and protection of MFCN from DTT

This agreement is valid from 1 April 2017 until a potential change af service away from DTT in the 700 MHz band in Denmark. Denmark will inform Sweden 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, corresponds to the frequencies from 694 MHz to 790 MHz.

1.2. The agreement covers the protection of DTT in accordance with Geneva Agreement 2006 (GE06) from MFCN with the FDD (Frequency Division Duplex) arrangement, including SDL (Supplemental Dawnlink, up to 4x5 MHz in the duplex gap) in accordance with ECC Decision (15)01. The use of other arrangements such as TDD (Time Division Duplex) is not covered in this agreement.

1.3. This agreement also covers the protection of MFCN from new or previously not coordinated DTT allotments/transmitters in the 700 MHz band.

1.4. This agreement covers the coordination of MFCN base stations in relation to DTT. The MFCN user equipment, or terminals, are allowed to be used on a non-interference basis, in accordance with ITU RR 4.4.

1.5. This agreement is based on the concept of field strength levels. The power sum method is used for accumulation.

1.6. 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. DTT transmitters may continue to operate and to be implemented in the 700 MHz band in both Denmark and Sweden as set out in the GE06, as well as in the agreements from 2009[1]

[1] Agreement to selve problems in the UHF-Band for the multilateral area Denmark-Poland-Sweden-Germany, signed 16 September 2009

2011[2] and 2012[3]. MFCN shall not claim protection from DTT services operating according to the GE06 Plan and the bilateral agreement.

2.2. MFCN base stations may be implemented in the 700 MHz band without coordination in relation to DTT as long as the cumulative interfering field strength is below 34 dB{µV/m)/1MHz, calculated for 1% of the time and 50% of the locations, 10 m above ground, at the border of co-channel (overlapping frequencies) DTT allotments which have DTT transmitters in operation.

2.3. In case of using MFCN stations with other channel bandwidths (BW) than 1 MHz, the coordination trigger field strength E shall be adjusted by a factor in comparison with Ea as defined in paragraph 2.2:
E =Ea+ $10 \cdot \log_{10}$(BW/ 1), where BW is measured in MHz

2.4. New DTT services not covered by the provisions of paragraph 2.1may be implemented in Denmark in the 700 MHz band without coordination with Sweden in relation to MFCN as long as the cumulative interfering field strength is below 54 dB(µV/m)/5 MHz, calculated for 10% of the time and 50% of the locations, at a height of 1.5 m above the ground at the Swedish border or beyond.

2.5. New DTT services not covered by the provisions of paragraph 2.1may be implemented in Sweden in the 700 MHz band without coordination with Denmark in relation to MFCN as long as the cumulative interfering field strength is below 54 dB(µV/m)/5 MHz, calculated for 10% of the time and 50% of the locations, at a height of 1.5 m above the ground at the Danish border or beyond.

2.6. GE06 Plan entries which are not implemented and are not in operation do not need to be taken into account when bringing into operation an MFCN base station. Such base stations will become subject to coordination if the GE06 Plan entry is implemented and the coordination trigger given in 2.2 is exceeded. A three month notice will have to be given before implementing and operating a previously not implemented GE06 Plan entry in the band 694 - 790 MHz (CH49-CH60).

3. Coordination procedure

3.1. 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.

3.2. 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.

4. Revision and cancellation

4.1. This agreement may be revised upon mutual agreement of the two administrations.

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

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[2] Coordination agreement relating to DTT services in the UHF-Band in Denmark-Sweden-Norway, signed April 2011

[3] Agreement between Denmark and Sweden concerning the use of the broadcast band planned at the RRC 2006 conference and at the multilateral replanning meetings at Warsaw 16.09.2009 and the trilateral agreement between DNK-5-NOR of April 2011 for the band 470-790 MHz, signed April and May 2012.

4.3. This agreement is valid until a potential change of service in the 700 MHz band in Denmark.

5. Entry into force

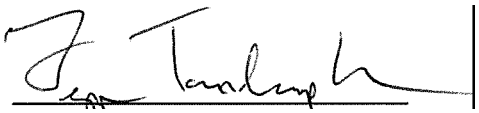
5.1. This agreement shall enter into force 1 April 2017.

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

Place \(\i C-A. h.c-n,'"

Date $l^{l/}t$ 'lo l-b

For the Danish Energy Agency



Jeppe Tanderup Kristensen

Senior Adviser, Center for Telecoms

Place 2-/1-j

Date 2-'3,/2 - /h

For the Swedish Post and Telecom Authority

Jonas Wessel

Director of Spectrum Department

Aftaler med Norge

Coordination agreement relating to DTT in the band 470 - 694 MHz between Norway and Denmark

1. Background

Norway and Denmark have decided to use the frequency band 694 - 790 MHz for electronic communication services other than broadcasting in the future. The intention during the negotiations has been to find a common and final planning solution that enables DTT to continue in each country. The following solution is based on the current network implementation and structure in both countries.

2. Changes to the GE06 Plan and subsequent associated bilateral agreements

In order to replan the use of DTT in the band 470-694 MHz a number of changes have to be done to the existing GE06-plan (BR-IFIC number 2840). The already existing plan entries which are in the GE06 plan and which are continued to be used cf. section 2., will keep its entry as is in the existing GE06-plan. In the following chapter all those changes, which are considered to affect Norway and Denmark, have been adressed. Changes affecting additional countries other than Norway and Denmark will be adressed in other, bi- and multilateral agreements.

The frequency channel plans in this agreement are based on the compatibility between current assignments that already are in operation in the existing networks.

This agreement supersedes the existing DTT bilateral agreement of 22 April 2009.

2.1 Overview of the frequency channel plan

In the following tables (tables 1-2) channels on green background are existing GE06 channels. Channels on white background are new frequency channels and frequency channels on white background without footnote remarks may be implemented from the day of entry into force of this agreement. Frequency channels on white background having a footnote remark cannot be implemented befare June 3rd 2021 unless otherwise agreed between the parties.

An individual frequency channel can be used in a different MUX for the same Allotment/SFN area without notifiying the other party.

Norway

Table 1 gives an overview of the frequency channel plan for Norway. The frequency channels for SFN areas (in table 1) and its subsequent SFN members (ANNEX 1) and stand-alone MFN assignments (ANNEX 1) are accepted by Denmark as part of the GE06 Plan.

Changes to ANNEX 1 are subject to the implementation conditions in ANNEX 3. The belonging assignment characteristics for the main transmitters in each SFN area and MFN assignments are listed in **ANNEX** l.

SFN areas	SFN ID	SFN ID MUXS	MUX1	MUX2	MUX3	MUX4	MUXS
HALOEN	HOY0*	TVH0S	32	45	21	38	47
KONGSVINGER	HOL0*	TVH0S	29	48	43	28	47
TRYVASSHØGDA(OSLO)	TVH0*	TVH0S	33	42	40	30	47
NORDHUE	NRU0*	TVH0S	37	31	45	27	47
GRAN	GNR0*	TVH0S	38	21	22	25	47
BANGSBERGET	BAB0*	TVH0S	34	41	35	44	47
BAGN	KDK0*	TVH0S	32	39	23	26	47
GOL	ESH0*		30	33	40	42	45
FENNEFOSSKNIPA	FEN0*		26	39	31	28	45
RINGERIKE	RIKO*		37	31	43	28	48
GAUSTA	GAU0*	VEL0S	29	27	35	32	36
KONGSBERG	VEL0*	VEL0S	34	41	44	24	36
SKIEN	VEL0*	VEL0S	34	41	44	24	36
HOVDEFJELL	HOF0*	VEL0S	23	33	48	42[A]	36
GREIPSTAD	HEI0*	VEL0S	40[B]	41	44	24	36
LYNGDAL	KAL0*	VELOS	25	28[C]	43[D]	32	36
BJERKREIM	UNP0*		23	26	30	27	34
BOKN	BOK0*		31	40	46	44	35
STORD	KNA0*		32	38	48	47	45
BERGEN	ULR0*	ULR0S	33	41	39	43	29
GULEN	GUT0*	ULR0S	37	42	26	23	29
LØNAHORGI	LHO0*		31	25	44	46	40
FØRDE	HAF0*		35	45	48	22	32
SOGNDAL	SHO0*		21	24	34	38	47
MFN areas			**MUX1**	**MUX2**	**MUX3**	**MUX4**	**MUXS**
SØYLANDSDALEN			22	38	29	47	45

*Table 1: The Norwegian frequency channel plan for DTT. The table shows the SFN areas together with the allocated frequency channels for each mux. The subsequent SFN members belonging to each SFN area and MFN areas are not listed in this table. The asterisk wildcard sign * in column SFN ID represents a number between 1-5*

A Thisted is today working on channel 42 and the date of the change to channel 42 at Hovdefjell needs further coordination

B Videbaek and Viborg is today working on channel 40 and the date of the change to channel 40 at Greipstad needs further coordination

C Videbaek and Varde is today working on channel 28 and the date of the change to channel 28 at Lyngdal needs further coordinat ion

D Thisted is today working on channel 43 and the date of the change to channel 43 at Lyngdal needs further coordination

Denmark

Table 2 gives an overview of the frequency channel plan for Denmark. The frequency channels for Allotments (in table 2) and its subsequent SFN members (ANNEX 2) and stand-alone MFN assignments {ANNEX 2) are accepted by Norway as part of the GE06 Plan.

Changes to ANNEX 2 are subject to the implementation conditions in ANNEX 3. The belonging assignment characteristics for the transmitters are listed in ANNEX 2.

Allotment	MUX1	MUX2	MUX3	MUX4	MUX5	MUX6
TOLNE-NIBE	39	37	35	29	26	45E
THISTED	31	22	35	27	21	45
VIDEBAEK	48	47[F]	23	42	21	34
VIBORG	38	47[F]	28	27	21	45
HADSTEN-AARHUS	24	44	36	29	26	46
HEDENSTED	41	44	36	43	30	46
VARDE	41	33	23	32[G]	30	34
AABENRAA	40	37	22	32	30	25
TOMMERUP-SVENDBORG	35	37	22	43	30	25
VORDINGBORG-NAKSKOV	34	38	48	42	31	32
JYDERUP	34	33	48	42	31	23
KOEBENHAVN	40	33	48	42	31	23
MFN areas	MUX1	MUX2	MUX3	MUX4	MUX5	
Laesoe MFN	34	23	42	33	48	
Anholt MFN	41	27	30	43	22	

Table 2: The Danish frequency channel plan for DTT. The table shows the respective allotments and MFN areas together with the allocated frequency channels for each MUX. The subsequent SFN members belonging to each allotment and MFN area are not listed in this table

E Tryvasshøgda is today working on channel 46 and the date of the change to channel 46 at Tolne-Nibe needs further coordination

F Lyngdal and Greipstad is today working on channel 47 and the date of the change to channel 47 at Videbaek and Viborg needs further coordination

G Lyngdal is today working on channel 32 and the date of the change to channel 32 at Varde needs further coordination

2.2 Suppressions

Channels other than those listed in Annex 1 and 2 will not be protected atter June 3rd 2021. Beside the channels which will not be protected atter June 3rd 2021, there are some channels in border areas that will be transferred from one country to the other (Denmark to Norway or Norway to Denmark). Those channels need to be taken out of operation and be formally suppressed from the GE06 Plan. They are listed in the following two tables.

Norway

The following SFNs are to be Suppressed from the GE06 Plan no later than June 3rd 2021.

SFN areas	Channel
Tryvasshoegda	**46**
Kongsberg	**43**
Greipstad	26,47
Lyngdal	33,46,47

Tabte 3: Suppressed channets in Norway

Denmark

The foliowing Allotments/SFNs are to be Suppressed from the GE06 Plan no later than June 3rd 2021.

Allotment/SFN areas	Channel
THISTED	**42,43**
VIDEBAEK	28,40
VIBORG	**24,40**
TOMMERUP-SVENDBORG	27,41
Laesoe	**22**
Anholt	25,33,40,46

Tabte 4: Suppressed channets in Denmark

3. Revision and cancellation

Revision and denunciation to this agreement can only be made if both parties agree or if the procedures under Article 10 and Article 11 of the GE06 agreement are put in to effect. Any such denunciation and revision to the GE06-agree ment takes precedence to the provisions of this agreement. In case of a need for modification of the frequency plan for Norway or for Denmark (both contained in this agreement) due to circumstances caused by a third party, the party who needs to make an amendment shall inform the other party as soon as possible. The parties agree to convene within a time span of three (3) months, once a party reports a need for amendments.

4. Entry into force

This agreement will enter into force upon the signature of both part ies.

Place /

Date

For the Norwegian Communications Authority

John- Eivind Velure
Director of the Frequency Management Department
Nkom

Place

Date

For the Danish Energy Agency

Jeppe Tanderup Kristensen
Senior Adviser, Center forTelecoms
ENS

ANNEX 1 - Norwegian Assignment Characteristics

Norwegian assignments with technical characteristics according to the electronic files:

- NOR_Assignments_UHF_202X.zip (ZIP format)
  (SHA 2S6: 99 a9 9e 84 e4 9S ba a8 8b 62 e6 a4 97 b3 d2 34 7a 9S 2f OS S6 4b OS b2 bl eb ld es 4S dO d8 bS)

NOR_Assignrrents_UHF_202X.zip

- NOR_Assignments_UHF_202X.txt (TerraSys format)
  (SHA 2S6: 80 76 00 da 3b b2 4e 13 4112 e4 e9 Se 16 2d SS Oe Od 79 70 63 36 le 9S 2f 60 Sa 02 d9 29 00 la)

NOR_Assignrrents_UHF_202X.txt

- NOR_GapTransmitters_UHF_202X. txt (TerraSys format)
  (SHA 2S6: 60 ca co lf 18 0141219044 S3 c2 es Sf **44** as Of es 9d 77 c6 2b ab b3 36 75 22 e9 Se b3 31 19)

NOR_GapTransrritters_UHF_202X txt

- NOR_SFNmembers_UHF_202X.txt (TerraSys format)
  (SHA 256: 9b cf ld 87 d4 42 Of f2 81 83 72 00 fe Oe d6 ed 6d bS fe 46 6a Se 91 Sf ld db 16 a3 as f4 e6 f7)

NOR_SFNrrerrbers_UHF_202X. txt

- NOR_Antennalnformation_UHF_202X.zip (ZIP format)

  (SHA 256: Se 20 2b 64 4a la aO 58 la 4d al e9 16 86 4d df 06 65 e2 10 bO 8d ad ae 64 lb ad ae 57 9e d3 e8)

NOR_Antennalnforrration_UHF_202X. zip

ANN EX 2 - Danish Assignment and Allotment Characteristics

Danish assignments and allotments with technical characteristics according to the electronic files:

- DNK_Asssign ments_UHF_202X.txt (TerraSys format)
  (SHA2S6:e9a04d47de9210S56e1014e2c37a46cceбf074aS4d38120044eae2ed49659)

  [ ]

  DNK_Asssignrrents_UHF_202X. bet

- DNK_Allotments_UHF_202X.txt (TerraSys format)
  (SHA256:865a9a8368b84d86f21bdf74227a74752e573b48b81ac7a51ee03b97adb00)

  [ ]

  DNK_Allotrrents_UHF_202X.txt

- VRP_Danmark5.zip (ZIP format)
  (SHA256:51le46ff4e2d6e65536858b9f9afabOlba414bOfcd3b8aee26fe8bOd7d842fcd)

  VRP_Dan rmr kS.zi p

ANNEX 3 - Implementation conditions

Implementation of allotments/SFNs according to the frequency channel plan of this agreement, using the assignments mentioned in ANNEX 1 and ANNEX 2 respectively, creates a reference interference situation to all other co-channel allotments/SFNs. This reference interference level is by this agreement accepted.

Implementation of allotments/SFNs according to the frequency channel plan of this agreement and modifications to this plan shall be coordinated with the other party if the cumulative interfering field strength from all assignments belonging to the same allotment/SFN exceeds:

1. Either the reference interference level
2. or the value listed below, whichever is the greatest

Based on the boundary of any co -channel allotment or co-channel assignment with characteristics according to ANNEX 1 and ANNEX 2 respectively.

For this field strength calculation, the propagation model ITU-R P.1546-5 should be used. For summation, the power sum method should be used. For assignments the boundary is the calculated noise limited coverage, with the minimum median equivalent field strength corresponding to reference planning configuration 1 (RPC 1) of the GE06 Agreement increased by 3 dB.

Field strength trigger,Er,igge,, values for co-ordination when implementing the allotments/SFNs concerned:

Etrigger = 38 + 20*log(f/650) dBµV/m, fin MHz

Agreement between Norway and Denmark for the frequency band 174-240 MHz

If the cumulative interfering field strength exceeds the values (Emax $_{int}$) listed in the tables below on the boundary of co-channel/co-block allotments or the allotmcnt implementation is not in confonnity, co-ordination with the affected administration is needed.

The propagation model to be used for calculating cumulative interfering field strength is ITU-R 1546 database (l % of time, 50 % of location, fixed receiver antenna height of 10 m); the summation method to be used is the power sum method.

For affected T-DAB it is proposed to use the Emax $_{mt}$ for RPCS and for affected DVB-T it is proposed to use the Emax $_{in1}$ for RPC2.

The agreement is also valid for applications other than T-DAB and DVB-T as long as the applications comply with the agreed Emax $_{int}$ values and the respective spectrum masks.

T-DAB interfered with by T-DAB for 200 MHz

Reference planning configuration	**RPC5**
Location probability	95%
Reference C/N fdB'!	15
Reference (Emedlrer fdBµV/ml	66
CF (correction factor)	14.6
IM (implementation margin)	2.6
Emaxmt [dBµV/m]	**39 (see exceptions in Tabte 2)**

Table 1: $_{Emaxlnt}$ for T-DAB interfered by **T-DAB**

Exceptions for the Nonvegian allotment NOR00018 (OSLO_AKERSHUS_OESTFOLD) and the Danish allotment DNK-NAT-12C-3

he following test points, an increased Em"$_{...inj}$ is accepted.

Testpoint .nbr	**Loneitude**	**Latitude**	Emuint **rdBuV/ml**
5 (Oslo Fjord - NOR00018)	0llE00lS	59N00l5	42,8
6 (Oslo Fjord - NOR00018)	010E5346	59N0407	42,2
7 {Oslo Fjord - NOR00018)	010E4553	59Nl 128	41,2
8 (Oslo Fiord - NOR000 I **8)**	010E3059	59Nl839	40
15 (DNK-NAT-12C-3)	10El4	57N4144	39,7
16 (DNK-NAT-12C-3)	10E25	57N47	42,7
17 {DNK-NAT-12C-3)	10E36	57N46	42,8
18 (DNK-NAT-12C-3)	10E3930	57N2710	40,2
19 (DNK-NAT-12C-3)	I 1El2	57N24	40,2

Table 2: Exceptions to the general values of Table 1

T-DAB interfered with by 7 MHz OVB-T for 200 MHz

Reference planning confi2uration	**RPC5**
Location probability	95%
Protection Ratio ⌜dBl	9
Reference (E.ned)re r [dBµV/ml	66
CF (correction factor)	14.6
IM (implementation margin}	2.6
E max int [dBµV/m]	**45**

Table 3: Emu idt for T-DAB interfered witb by 7 MHz DVB-T

DVB-T interfered with by 7 MHz OVB-T for 200 MHz

Reference planning confi2uration	**RPC2**
Location probability	95%
Protection Ratio [dBl	19
Reference (E.ned) rer [dBµV/m]	67
CF (correction factor)	12.8
1M (implementation margin)	2.8
E max int [dBµV/ml	**38**

Table 4: Emnint for DVB-T interfered with by 7 MHz DVB-T for 200 MHz

OVB-T interfered with by T-DAB for 200 MHz

Reference planning confi2uration	**RPC2**
Location probability	95%
Protection Ratio ⌜dBl	23.6
Reference (E.-i)rer ⌜dBµV/ml	67
CF (correction factor)	12.8
IM (implementation margin)	2.4
E max fo1 [dBµV/m]	**33**

Table 5: Emu ;111 for DVB-T interfered witb by T-DAB

11[1h] May 2010

Flemming Alstrup
NITA, Denmark

John-Eivind Velure
NPT, Norway

Aftaler med Polen

Agreement between Denmark and Poland covering the Digital assignments and allotments included in the Plan at RRC-06

Background and problem:

During the development af the digital Plan agreed in Geneva at the RRC-06 a number af assignments and allotments were included in the Plan using conditional Administrative Declarations.

To enable the implementation af the assignments and allotments contained in the Plan for Denmark and Poland and at the same time ensure the future integrity it is necessary to agree an suitable fieldstrength limits.

1. General agreements

- Coordination between the administrations concemed is required, in case the maximum allowable field strength as indicated in chapter 2 (for UHF) and chapter 3 (for VHF) is exceeded by the cumulative interfering field strength af a real network implementation. The network implementation camprises all previously notified assignments as well as all newly notified assignments for the corresponding allotment.
- Field strengths are calculated at 10 meters height for 1% time, 50% oflocations.
- The power sum method is used to calculate the cumulative interference field strength.
- Tue cumulative interference field strength is calculated at the boundary af the co-channel/co-block allotments.
- For field strength calculation, the propagation model according to the Geneva RRC-06 Agreement (modified ITU-R P. 1546) should be used. The parties noted that there are differences in the implementation af land-sea geographical data which could result in discrepancies in the calculated results. Preferably the land-sea data used at the RRC-06 should be used, if available.
- Assignments, that are situated within an allotment area, designated to transmit an the same channel as the allotment, but not linked to that allotment, will be treated in the implementation exactly like linked assignments in the RRC 06 planning process. Only the allotment area will be protected. The service area af these assignments outside of the allotment area are not protected.

2. UHF agreement

The maximum allowable interfering field strength $_{Emaxint}$ is defined as

$_{Emaxint} = {}_{49} + fcorr$ **[dBµV/m]**

where *horr* is the frequency correction (in dB), given by 30*log(f/650), fin MHz

3. VHF agreement

The maximum allowable interfering field strength $_{Emaxint}$ is defined as follows:

DVB-T interfered by 7 MHz DVB-T: $_{Emaxint}$ **=38 dBµV/m**

DVB-T interfered by T-DAB: $_{Emaxint} = 33$ **dBµV/m**

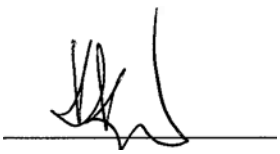
T-DAB interfered by T-DAB: $_{Emaxint} = 39$ dBµV/m

T-DAB interfered by 7 MHz DVB-T: $_{Emaxint} =$ **45 dBµV/m**

Two or more neighboring allotments using the same channel/block are treated as one allotment.

Geneva, 8th of June 2006

On behalf of the Administration of

Denmark	Poland
	
Henning Andersen	Krystyna Kuhn

Aftaler med Holland

Agreement between the Netherlands and Denmark related to administrative declarations and allotments agreed during RRC-06

Background

A number of co-channel exist between the allotments in the Plan for DVB-T and T-DAB in the Netherlands and Denmark. This agreement is covering both VHF band III and UHF band *f.VN* and is valid for conditional Administrative Declarations only.

Tue Agreement is as follows:

The administrations confirm that actual networks may be implemented as long as the cumulative interfering field strength on the boundary of any existing co-channel/co-block allotment does not exceed the maximum allowable interfering field strength $_{Emaxint,}$ as given below:

VHF, DVB-T interfering DVB-T (RPC2):	E_{maxint} = 42 dBµV/m
VHF, DVB-T interfering T-DAB (RPC5)	E_{maxint} = 45 dBµV/m
VHF, single T-DAB block interfering DVB-T (RPC2)	$E_{=xint}$ = 39 dBµV/m
VHF, T-DAB interfering T-DAB (RPC5):	$E_{=xint}$ = 39 dBµV/m
UHF (RPC2/3):	$_{Emaxint}$ =49+ *fcorr* [dBµV/m]

where *fcorr* is the frequency correction (in dB), given by 30*log(f/650), fin MHz. Field strengths are calculated at 10 meters height for 1% time, 50% of locations and the power sum method is used to calculate the cumulative interference field strength

The propagation model to be used is ITU-R. 1546 - RRC06.

Coordination between the administrations concerned is required, in case the maximum allowable field strength as given above is exceeded by the cumulative interfering field strength of a real network implementation.

Geneva, 7th of June 2006

For the Administration of

Denmark Tue Netherlands

Henning Andersen Ben Smith