

Transition to the digital TV broadcasting and the digital dividend II

Dear users of radio spectrum,

Last year we initiated a discussion with the intermediation of CTO information and communication document concerning topical issues of radio spectrum management in connection with digitalization of TV broadcasting and its contributions specified as the digital dividend. In this document we invited the public to participate in the first round of public discussions. This discussion took place in August and its results were recapitulated in a workshop in September. We thank all who contributed to the discussion and thanks to their contributions they became our partners in drawing up the CTO position on both ongoing and future changes in use of the radio spectrum.

Today we can state that as of January 2009, the digitalization of terrestrial television broadcasting is a big step ahead particularly from the point of view of digital signal coverage compared with the situation in late summer, 2008. Nevertheless development has brought some changes in comparison to the original assumptions of the Technical Plan of Transition. Four networks are in operation and two of them cover significant parts of the territory and population. An important change is the inclusion of TV PRIMA into broadcasting in broadcasting network 2. This will probably provide better accessibility for viewers. On the other hand, there was a slow-down in development, in particular of broadcasting network 4. It is not yet known which other programs will be accessible in digital networks. In this context we must ask the question, what is the time horizon and on what scale, or as the case may be, what character the updated needs of television broadcasting will have with respect to the radio spectrum. Neither the process of step-by-step full-area switchover, according to the Technical Plan of Transition, nor the establishment of tertiary networks of additional low-power transmitters in individual networks has started. Therefore we do not know precisely what will be the additional needs of the radio spectrum for securing the fluent transition process.

Both consultations and deliberations of the workshop and the evaluation of standpoints and monitoring of discussions on the digital dividend, in the framework of the EU, confirmed that the use of the released part of 470-862 MHz band is very important for the future development of existing and new mobile services of electronic communications. These facts lead to the conclusion that it is purposeful to follow-up with a second round of consultations that will focus specifically on reaping the full benefits of the digital dividend in this band.

In principle we decided to orient the discussion in this second paper to the use of the digital dividend into four key topics.

From the point of view of the development of electronic communications markets the biggest expectations in all of Europe are connected with the considered utilization of the part of 470-862 MHz band by mobile communication networks. Not only an important economic contribution but, as well, the development of qualitatively new services for customers are expected. Frequently these expectations are also connected with the broadband development problem. This effort is in an outstanding way, accented in the harmonization efforts of the

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European Commission. This trend acquires a new dimension in light of possible infrastructural projects connected with economic revitalization.

There is no doubt that the digitalization of standard terrestrial broadcasting, in progress, is a practically necessary prerequisite for the expected use of high definition television. It is exactly the high definition television that shall bring a new quality to users and is a key manifestation of the development of television broadcasting technology. Currently high definition television successfully develops on other platforms of television broadcasting – in satellite and cable broadcasting and gradually also on the IP TV platform. However, we consider it important to systematically open, and in more detail, the issue of development of high definition television on the terrestrial television broadcasting platform.

Recently the future of mobile television has been a frequent subject of optimistic expectations in the framework of digitalization. However, in the current situation, it is an issue that must be again thoroughly considered taking into account the current development of this problem in other states, vaguely articulated positions of key players, current economic limits and technological development. In parallel with the preparation of the Technical Plan of Transition, CTO carried out preparation of steps to create conditions for the implementation of this service on the territory of the Czech Republic from the point of view of radio spectrum management. It is again necessary, in this new situation, to ask essential questions concerning the actual time framework and market application of this specific service.

Three key subjects mentioned above are in the framework of European discussions concerning the digital dividend taken nearly for classical. In the framework of this second stage of discussion, the CTO also includes the subject of the use of the digital dividend for regional and local television broadcasting. We are convinced that it is convenient to start a systematic discussion in order to clarify conditions, opportunities and limits of the utilization of the gradually released radio spectrum for the enhancement of plurality and diversity of television broadcasting.

The main purpose of the currently submitted material and the opening of the follow-up discussion is exactly the concretization of needs connected with the possible use of the spectrum to be released in the future. Covering needs of the spectrum for future systems of new services of electronic communications is a complicated and complex process that requires professional and broad discussion in order to identify future development. Without any doubt, this discussion will be demanding because it cannot be exhausted with simple television or tabloid headlines, neither will it be finished by the time when selected solutions are successfully implemented in the open market in the framework of the whole EU.

I am personally convinced that this discussion must not forget users / viewers and meet their requirements and needs and their gradually cultivated expectations. Respecting genuine expectations of end users is, without any doubt, a critical point for reaping the full benefits of the digital dividend in the future.

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Therefore the intention of the second round of consultations is to open a discussion on ways and deadlines for implementation of new and innovated services corresponding to specific needs of the market and its key subjects and thus also the necessary regulatory of legislative steps.

It is obvious that in the second round some of the participants will not find “their topics.” An example of temporarily omitted topic is: We have decided not to discuss, for the time being, the use of the radio spectrum in band III – that is to discuss digital radio broadcasting problems. Basically there are two main reasons – it is more or less clear that band III will be used after its release for digital radio and it is not necessary to discuss at great length other modalities of spectrum utilization. Secondly I am convinced that the complex topic of the digital radio development requires an independent elaboration and discussion.

The second round of public discussion, initiated just now, will be again concluded with a workshop under the name „The transition to digital TV broadcasting and the digital dividend II“, held in Prague on 17th and 18th March 2009.

From the point of view of the next specific steps in the creation of attitudes toward the digital dividend, it likely that the next event on the time line will be a 3rd round of discussions concerning the digital dividend, in context of the evaluation of the digital broadcasting transition process. This will follow implementation of the first, more important, steps in switching over analogue television broadcasting and after further development of networks for digital broadcasting over the course of the year. It is obvious that in this period, most probably towards the end of the year 2009, issues concerning content of digital television broadcasting and business models will become more evident. Complying with the Technical Plan of Transition or, as the case may be, with the follow-up specification of releasing frequencies for securing trouble-free transition with the aim of complying with conditions of this plan will subsequently make possible further concretization of necessary steps until the termination of analogue television broadcasting. Nevertheless it is already evident that in this future discussion it will be necessary to open for example issues of optimization of existing digital networks, connected for example with applying the DVB-T2 standard and the number of HDTV programs and the like. Only after this discussion and after the realization of all the steps in switching over analogue television broadcasting pursuant the Technical Plan of Transition will it be possible to carry out specific measures in relation to other networks for digital broadcasting.

To conclude my introduction, allow me to express my wish that this CTO material will initiate a matter-of-fact discussion both concerning the paper and at the planned workshop.

Prague 4 February 2009

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Chairman of the CTO Council

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1. INTRODUCTION

The Czech Telecommunication Office (hereinafter the „Office“ or „CTO“) carried out the first round of public consultation related to the digital dividend during the period from the 8th of August to the 19th of September 2008. The CTO described digital dividend problems in the consultation paper „Digital dividend – information and communication document of CTO“ [1] elaborated for this purpose.

The workshop held on 25 – 26 September 2008, which on the second day dealt with the digital dividend problem in a complex way followed up this consultation. Findings and conclusions from the consultation and the workshop have been recapitulated in Chapter II of this document.

The result of the present discussion I apart from other things the identification of the need to follow up with the next cycle of consultations oriented to the future utilization of the spectral digital dividend in band IV./V. (470–862 MHz), denominated as well as UHF1) band.

Updated information related to the possibility of the utilization of 470–862 MHz band is given in the Chapter III.

In Chapter IV there are issues for public consultation.

After this round of consultations, the CTO workshop 17 – 18 March, 2009 will follow.

You may send your answers – contributions to public consultation – till March 5th 2009. Details are provided in the Chapter 4 Section “Regarding deadlines and conducting discussions”.

¹⁾ UHF is an English abbreviation for ultra-short waves band (the Czech abbreviation is UKV) and in the framework of the discussion of the television broadcasting digitalization and the utilization of the digital dividend it specifies 470-862 MHz band (IV./V. band). However generally the abbreviation UHF / UKV specifies 300-3000 MHz band.

2. FINDINGS FROM THE PREVIOUS PUBLIC CONSULTATION

The Czech Telecommunication Office recapitulated the findings in the final document submitted to the pertinent Ministry of Industry and Trade of the Czech Republic:

2.1 Text of the document:

Findings and conclusions from the course of the public consultation and the workshop organized by the Czech Telecommunication Office on the 25 and 26 September 2008.

1) **Factual connections**

The issue of the future use of the digital dividend is a globally discussed topic. In the broader concept under the digital dividend we understand the comprehensive all-society contribution of digitalization, in narrow sense it is a look on the possible use of the spectrum that becomes accessible if the transition to digital technologies that is more economical concerning the spectrum utilization takes place.

The situation of European countries characterized by language diversity and therefore requirements for television and radio broadcasting in mother tongues of inhabitants is specific. Predominantly high density of population and relatively high number of countries in the limited area limits the accessibility of the spectrum for individual states. Therefore in the years 2004 and 2006 on initiative of European countries the regional radio communications conference of the International Telecommunication Union took place with the objective to create conditions for the transition to the digital radio and television broadcasting, to update the existing frequency plans and thanks to re-planning to create comparable conditions for the access to the spectrum for all the countries in the planning area.

Though the main objective was above all the digitalization of the television broadcasting and the pre-requisite of its further development including the extension of the offer by so called additional services, already during the conference the elements of flexibility were incorporated into its final proceedings that had to enable the utilization of the spectrum for further applications beyond the radio and television broadcasting. Countries that have no problems with the lack of spectrum for the television broadcasting both because of geographic reasons or the development of other distribution platforms other than the use of terrestrial transmitters networks (for example Nordic countries), started to be interested in a different utilization of the spectrum. Above all UHF band (470-862 MHz) would enable the establishment of communication

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networks with relatively big distance from base stations, that is with lower costs and therefore convenient also for scarcely populated areas.

U.S.A. proceeded with the implementation of digitalization with the intention to enhance the competitive environment. Practically monolingual country with limited need of terrestrial broadcasting can release a significant part of UHF band thanks to developed networks of cable television and satellite broadcasting. The decisive part of the spectrum that becomes accessible thanks to the digitalization was made available to business subjects in auctions that took place since the beginning of 2008. .

Such a development accelerated the effort of the European Commission to achieve a similar situation and this way to initiate the development of pan-European networks that should have the character of broadband access networks stimulating the technical and social development.

Technical studies confirm that the one-way distribution of the television signal and the operation of the two-way communication network are not compatible. In particular for the Central and East European countries the creation of frequency block for communication networks means an important limitation of the number of distribution networks that could be possibly created for the digital television broadcasting pursuant to conclusions of the conference in 2006.

In the situation when the process of planned transition to the digital broadcasting through the implementation of the so-called Technical Plan of Transition approved in 5/08 was started in the Czech Republic, it was purposeful to initiate the discussion on issues concerning the current situation of the digitalization and the future utilization of the accessible radio spectrum.

2) Findings arisen from the workshop and from reactions to questions asked to CTO in the public consultation – main conclusions:

a) Priorities of the current process

The time issue is perceived in a realistic way. The realization of the transition to the digital broadcasting set up by the Technical Plan of Transition is unambiguously identified as a priority.

Without any doubt such conclusion is logical. In condition of the Czech Republic the digitalization is a complicated process and its necessity is accepted practically without reservations. The enabling of implementation of networks for spreading 4 multiplexes is the result of a social consensus achieved in the previous period and projected into the Technical Plan of Transition.

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The finalization of the transition will enable to identify the whole scope of the spectrum available for the further utilization. .

b) Fundamental dilemma of the future utilization of the radio spectrum

The future spectrum utilization splits markedly into two basic directions of discussion concerning the utilization of the UHF (470-862 MHz) band – the first one is the further development of the television broadcasting (broadcasting in general) and the second one is the development of mobile broadband communication networks. . The first party points out to the expected arrival of a new quality and scope of service (namely the introduction of high definition systems), the second party brings out mainly the quality jump in mobile communications with allegedly multiple economic benefit.

Really the contradiction of two basic concepts is at issue, because it cannot be assumed that the available spectrum could fully meet requirements of both parties. At the same time other applications that till this time use the band and serve for example to secure the collection of information of reportage nature, such as operational and communication technology for organizing mass sports and cultural undertakings activities and the like are omitted.

Both directions have one thing in common – the immediate necessity of the spectrum is not a question and the time horizon when it happens is not sufficiently indicated. The time course of the transition to the digital broadcasting pursuant to the Technical Plan of Transition is presently not conflictive and is not put in doubt.

c) Further findings

i) Issue of the utilization of so called white spots

The utilization of places where the signal of television broadcasting is not identified designated as white spots has relatively pessimistic response. So far no support or confidence in the future utilization of the spectrum in this way has been identified. The obvious reason for doubts concerning the utilization of white spots is obviously the fact that partly in time of the transition to the digital broadcasting it is still not possible to identify the extent of usable spots, partly technologies are not available. In the future this situation may change after the stabilization of the situation concerning the coverage by the television broadcasting (with the termination of the transition) and technologies using white spots become available. The American regulator FCC approved the usage of such technologies in November 2008.

ii) Issues concerning mobile television perspectives

Opinions concerning this topic were characterised above all by disagreements. There is no conclusive support for prescribing to the spectrum user the usage of

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a specific (DVB-H) technology namely in the situation when available mobile terminals will enable the reception of freely distributed programs by DVB-T networks. Even more important are the doubts about the possibility to create a realistic business model for the given service and the missing demonstrable interest of potential investors.

iii) Issues concerning the digital radio development

There was no active response in the discussion to the digital radio. The reason maybe both the absence of representatives from the area of radio broadcasting in the discussion and the fact that contrary to the television broadcasting the transition to the digital broadcasting in so called FM band (87,5-108 MHz) is not planned in the long-term horizon and therefore it is not necessary to terminate the existing broadcasting. Last but not least the reason is the nature of the transition to the digital radio broadcasting. The increase of transmission capacity when building networks on T-DAB platform that would use frequencies in the band III planned by the regional radio communications conference is so important that they are able to meet with reserve capacity requirements of broadcasters. Given that these networks exist, the background of possible requirements for the spectrum beyond the available frequencies would be above all to seek the competitive advantage. .

iv) Issues concerning the development of further multimedia applications

Similarly as in previous cases no interest was indicated in the discussion to use further applications derived from T-DAB and thus no demand for the spectrum for these applications was identified.

3) Conclusions and recommendations drawn from the above mentioned findings

a) Setting of priorities in the development of the television broadcasting and mobile communications

UHF band has a fundamental importance from the point of view of using the digital dividend. With respect to the lack of the available spectrum and in order to use the digital dividend by the television broadcasting and mobile communication networks it will be necessary by the end of 2010 to adopt a decision on the level of top bodies similarly as in case of the Technical Plan of Transition. From today's point of view the approaching deadline of the end of the transition to the digital broadcasting in the year 2012 requires such a decision concerning „the national plan for the use of the digital dividend“. We may expect that gradually the scope of demand for the terrestrial television broadcasting and needs of broadcasters will be made more accurate on the one hand and business plans concerning mobile networks will become more precise on the other hand. The technical development and the European harmonization,

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particularly measures for the coordinated implementation of broadband networks in Europe may even accelerate the need to adopt decisions on the national level.

b) Issue of the mobile television development continues open for the time being

The mobile television is an application that generally has a potential group of users and therefore it is necessary to monitor the development. The intention is to verify after some lapse of time by way of the public consultation to what extent continues the present situation when the technical solution has not been decided so far and when an adequate business model does not exist and thus investors show no interest.

The consultation should be conducted from broader approach. The need itself of the network designed only for mobile television may be an issue for the discussion taking into account the expected future demand for the spectrum in the UHF band and already available equipment that enables the mobile reception of the transmission of existing DVB-T networks. Or on the contrary which requirements the network should fulfill in order to meet users requirements not limited only to the mobile television.

c) Radio broadcasting and multimedia applications do not generate the increased demand for spectrum

Applications based on T-DAB do not lead to the increase of the demand for the spectrum. The need to converge the assignment of DVB-T in band III to the assignment for T-DAB is not manifested. With regard to the envisaged development in the UHF band the planned assignment of DVB-T band III will be maintained. .

4) Summary

The opening of the public consultation concerning the issues of reaping benefits of the digital dividend contributed to the awareness of both the expert and lay public of the problem complexity. It confirmed the key importance of the future utilization of UHF band and it showed that adoption of top-level decisions will be required. The present situation concerning the demand for the spectrum was identified including the fact that in the second stage of the television broadcasting digitalization important modifications come about step-by-step. The course of digitalization on the national level and both the technical development and political decisions adopted on supranational level have impacts in the social and business field.

Therefore it proves inevitable to monitor the development continuously and to respond to changes in the situation. For this reason it is the intention of the Czech Telecommunication Office to address the public again in the course of the first quarter

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of 2009. The objective is above all to evaluate the course of the digitalization, to identify the development of the demand and possibilities how to cover it in the sphere of the mobile television services, specification of intentions and needs of the present and future users and operators of digital networks in the UHF band.

3. DIGITAL DIVIDEND – CURRENT PROBLEMS

Note: The following text is linked to the information given in the information and consultation document of the first round of the discussion.

3.1 Current progress of the digitalization in the Czech Republic

There was progress in television broadcasting digitalization in the Czech Republic in the period following the workshop which concluded the first round of discussions concerning utilization of the digital dividend. In areas with high population density, namely broadcasting networks 1 and 2, were developed. These networks currently represent all present operators of country-wide analogue television broadcasting. This will positively influence the progress of switching over analogue transmitters and the further course of digitalization. Currently digital broadcasting from these networks is accessible for approximately 50% of the population. The start of the process of switching off transmitters of terrestrial analogue television broadcasting scheduled to begin, in Prague, in April, will be an important milestone for further progress of transition and origin of the digital dividend.

The actual course justifies the assumption that, in compliance with the Technical Plan of Transition and intentions of the European Commission, analogue television broadcasting in the Czech Republic will be terminated in June 2012. By this date the released spectrum – the digital dividend will become available on the territory of the Czech Republic. However its practical utilization will be influenced by progress in switching off analogue broadcasting in neighboring states.

Germany, where building of foundations of digital broadcasting finished and at present coverage is in the process of improvement, has made the greatest progress in digitalization of terrestrial television broadcasting among neighboring countries. As far as we are concerned, there are requirements to coordinate further transmitters above the framework of the Geneva 2006 Agreement. There has been an interesting development in the field of mobile television where the selected operator of the DVB-H network was not directly connected with mobile operators yet started to sell mobile telephones for reception of common DVB-T broadcasting. Subsequently the development of the DVB-H network was been suspended. In Germany there was also an essential modification of VHF band

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utilization that, at present, is in its entirety planned for digital radio broadcasting. Its utilization for television is not envisaged.

There is an important development of digital broadcasting in Austria where high power transmitters were already switched off. Also one broadcasting network of mobile television with DVB-H technology is in operation.

Slovakia prepared its plans for the transition to terrestrial digital broadcasting similarly as its neighboring countries and it envisaged compliance with the 2012 deadline. However the last development due to the cancellation of the selection procedure for broadcasting networks operator organized by the Slovak regulator TÚSR can negatively influence the expected time flow of transition.

Poland presented its plan for transition to digital broadcasting. It notifies that it will not be capable to terminate analogue broadcasting by the deadline proposed by the European Commission. It envisages termination of analogue broadcasting by the year 2013. Selection of the DVB-H network operator in Poland is in progress.

The Office regularly consults with regulators from neighboring countries, both in the framework of European structures and during bilateral and multilateral negotiations. The preparation for utilization of frequencies assigned to individual countries by the Regional Radio Communication Conference of the International Telecommunication Union, Geneva 2006 requires frequency coordination negotiations. The importance of negotiations will continue to grow. They will be required because of the need to reconfigure frequencies after finishing the transition to digital TV broadcasting in order to enable implementation of new services described hereinafter.

3.2 470–862 MHz band and the digital dividend

470–862 MHz band plays a decisive role in the utilization of the digital dividend. At present the activity of EU bodies and CEPT expert groups concentrates on the proposal of conditions for utilization of the band by terrestrial digital broadcasting and its utilization in mobile service. Technical reasons suggest splitting the band into two parts. European countries head for the coordinated utilization of the upper part of the band for mobile networks of electronic communications. The lower part of the band may continue to be used for television (digital) broadcasting. By television broadcasting we mean the provision of services in the wider sense of the word because network digitalization and further development of technologies are not limited only to classical transmission of picture information accompanied by sound.

First the development of television broadcasting is discussed because it determines possibilities for digital dividend utilization by further applications.

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3.2.1 Television broadcasting

Though digitalization is an important change in terrestrial television broadcasting, it is only one part of the process of the permanent development of this way of sharing information. In the process evolving from black-and-white to color broadcasting that continues with the introduction of stereo sound, change of aspect ratio of screens, and transition to digital broadcasting, present digital broadcasting cannot be taken as the last stage of evolution. In connection with the use of the digital dividend it is necessary to discuss the envisaged steps following complete switch-off of analogue broadcasting.

3.2.1.1 HDTV (digital television of superior quality)

The office assumes that the transition to DVB-T technology with MPEG-2 compression must be understood merely as the first step of the digitalization process of terrestrial television broadcasting that in conformity with the Technical Plan of Transition [4] (hereafter „TPT”) should be finished in June 2012. In the course of this transition practically all the available spectrum will be used, in particular in order to ensure the possibility of parallel broadcasting during the stage-by-stage implementation of digitalization and gradual termination of analogue broadcasting in eleven territorial areas specified in the TPT. The Office envisages that the transition stage from digital broadcasting of standard quality to digital broadcasting of high definition will follow either consecutively or after some time lapse after complete termination of analogue broadcasting. This does not exclude earlier implementation of HDTV by some operators.

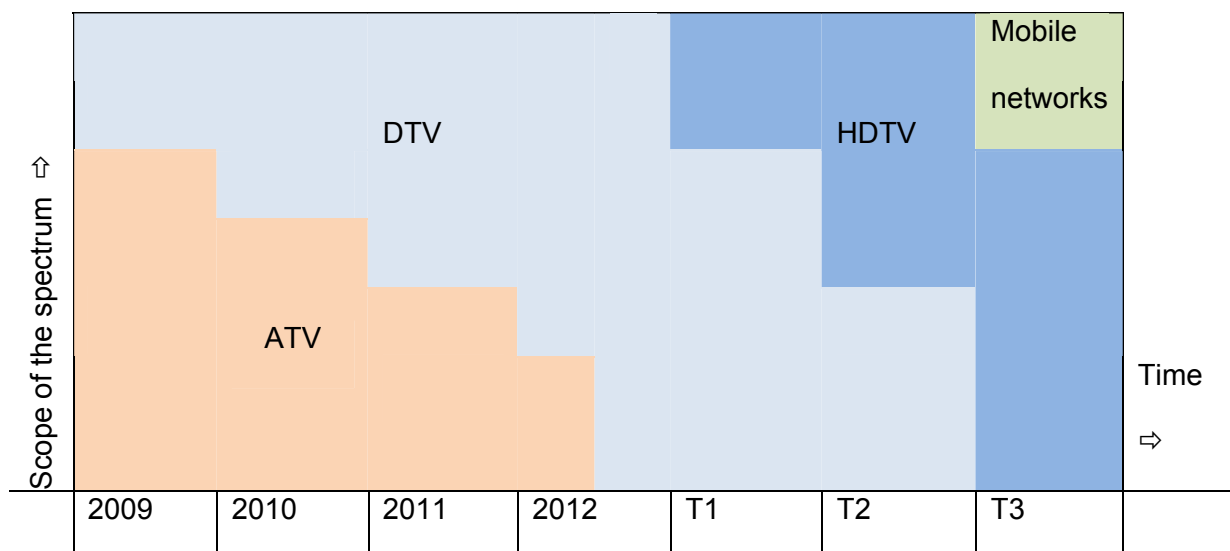


Figure 1

Figure 1 represents one possible scenario – transition to HDTV will begin at time T1 with a lapse after switching off analogue broadcasting, it will proceed step-by-step and only

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after its termination, will the spectrum for the utilization of the digital dividend by other applications be released. So far we do not know times T1 and T2, time T3 is in conformity with the validity of allocation of the 790-862 MHz band to the mobile service according to Radio Communications Regulations envisaged for the year 2015. HDTV represents here television broadcasting of superior quality that does not need to be limited only to higher definition but it will contain also other improvements, for example multi-channel sound. Only future models of the HDTV application on the market will decide the HDTV share in digital broadcasting in the future.

The extent, duration and method of this transition are still open questions, but we may assume that in the end, part of programs, perhaps even the majority of programs, will be broadcasted with high definition because the assumption of higher quality television was one important stimuli for starting the digitalization process. From the public, equipped with *high quality big format displays*, we may, legitimately, expect a requirement that terrestrial television broadcasting ensures pictures with high definition.

Under state-of-the-art technology, creation and processing of content with high definition are not regarded as a problem. However the problem is its distribution to the viewer. In particular cable connections and satellite broadcasting that are currently used for the distribution of programs with high definition. Before it was generally assumed, among other things, that terrestrial broadcasting of HDTV will be provided exclusively by multiplexes with paid content. However this assumption may be taken as outdated. HDTV demand will be without any doubt stimulated by the increasing selection of receivers with large-screen displays capable of high definition display (specified as HD Ready or FULL HD). The progressive increase in the number of households equipped with receivers of this kind and the dissatisfaction of these viewers comparing the quality of the record of DVD or Blue-ray players and the reception of satellite or cable HDTV with reception of terrestrial digital television only with standard definition will very probably mean that competitive reasons leading to the implementation of high definition broadcasting in free-to-air form will apply.

The Office believes that it is not necessary to regulate this transition in any special way and that regulation will be applied by virtue of market principles.

In the course of transition to terrestrial HDTV broadcasting several alternatives with different requirements concerning the spectrum may arise:

- simultaneous transition of all programs
- gradual transition of individual programs over a longer time interval
- transition at the same time as implementation of new technologies (DVB-T2) and compression processes (MPEG4)

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- combination of all things mentioned above and the impact of other still unidentified influences

The transition to HDTV may, but does not have to, impose increased requirements concerning the scope of the radio spectrum for broadcasting depending on technologies available in the future, number and quality (definition) of transmitted programs. The implementation of new, currently known technologies (DVB-T2, MPEG-4) leads to a substantial decrease in the dataflow necessary for transmission of programs. However this decrease has not reached such a level as to make possible the transition of all programs digitally transmitted with current technologies (DVB-T, MPEG-2) to HDTV thanks to the implementation of the new technology while maintaining the same bandwidth. Therefore the use of new technologies by itself does not mean that increases in the necessary spectrum cannot occur. Under certain conditions the lack of spectrum may limit or threaten transition to HDTV; especially in cases where it is carried out assuming parallel transmission of both current and new technologies.

Also the necessity of acquiring a new receiver will play a role in the transition. Availability of equipment that integrates both existing and new technology sufficiently in advance will be critical. The same holds for awareness and acceptance of this quality change by the public. In the past, a similar transition was carried out successfully without need of any parallel broadcasting (the transition from SECAM to the PAL standard). The fundamental factor for the success of this transition was provision of a population of receivers capable of reproducing the new method of broadcasting without any problems. Therefore the availability of information for viewers, manufacturers and broadcasters sufficiently in advance will play a fundamental role.

The Office assumes that the future development of terrestrial television broadcasting will not impose further requirements on further spectrum or more precisely it will lead to an even more efficient use of the allocated spectrum. The Office assumes that other networks put together after the termination of analogue television broadcasting will be probably assigned for the implementation of new technological standards, for example DVB-T2 a HDTV.

From this round of discussion the Office expects information on assumptions and plans of all the subjects involved in any way in terrestrial television broadcasting and quality increase of the whole chain – that is both broadcasting parameters and (recommended) standards of receivers, namely concerning the method, conditions and deadlines for transition to digital broadcasting of a higher quality including the envisaged level of transmission capacity.

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3.2.1.2 Local television broadcasting

Compared with television broadcasting on the whole territory of the state, local terrestrial television broadcasting has a specific application – as a territorially targeted information media. Satellite broadcasting is not a practical variant for such broadcasting and cable networks are not accessible in all municipalities in the broadcaster's service area. On the other hand the internet is taking on a larger and larger role as an information medium and its use expands in all age groups.

The transition to digital broadcasting includes also broadcasters who are holders of (content) licences for broadcasting with territorially limited content specified as local or regional.

In order to enable digital broadcasting of these licence holders, the Office expects, first of all, to use the same frequencies used by these subjects for analogue broadcasting (provided that they are or will be coordinated for digital broadcasting). This among others means the transition to digital broadcasting without parallel broadcasting.

The creation of networks for new local broadcasting does not represent a part of this transition and requirements for the spectrum for it may not be satisfied until finalization of the whole transition to digital broadcasting.

The scope of the spectrum need will determine to what extent it will be necessary to create other local networks; keeping in mind the fact that with the transition of existing local networks to digital broadcasting, their transmission capacity will multiply. However the factor limiting the possible saving of spectrum may be the scope of rights (the territorial scope of broadcasting) specified in their content licences.

The Office takes for its primary task to coordinate the allocation of frequencies to existing broadcasters. Frequencies of so called white spots, coordinated by the Office should serve new local networks. Frequencies of the Geneva Agreement 2006 that should be preferentially kept for full-area networks are not meant for local broadcasting purposes.

The Office expects the involvement of all subjects, taking part in local broadcasting or planning of broadcasting, in the discussion on the future of local broadcasting and its needs.

3.2.2 Mobile communication networks

The availability of radio spectrum which is not interfered with by other users is the most important prerequisite for the implementation of mobile networks.

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3.2.2.1 Utilization of radio channels 61 up to 69 (790–862 MHz)

In the World Radio Communication Conference WRC-07 the existing preferential band allocation was extended to the mobile service except for the mobile air service and identified for IMT (mobile technology of the 3rd and higher generation). The allocation will come in force on 17 June 2015. Therefore at the same time the preferential allocation to radio service continues; both services will have the same rights in the band when respecting Geneva Agreement 2006 provisions. This allocation comprises 72 MHz in total and it does not solve the issue of a protection link between applications in one service and the other one; the solution of this issue is left to the national level, or as the case may be to bilateral and multilateral international coordination.

Pursuant to completed studies, it is obvious that frequency sharing both by mobile networks and television broadcasting is not possible with regard to different operating conditions.

The harmonization within the framework of the EU, in our case particularly the coordination of process with neighboring states is the prerequisite for implementation. In case of an earlier implementation in one state, where analogue television broadcasting remains in operation, mutual interference will be an important obstacle. An uncoordinated process or a process with different timing in individual countries will cause, especially in our region, certain frequencies to be temporarily unavailable.

3.2.2.2 European harmonization

The European Commission envisages the utilization of the 790-862 MHz band by two-way broadband mobile networks. In the future the band will offer new opportunities for providing broadband mobile access at all times and everywhere and it will be one of fundamental contributions of the digital dividend. Contexts, or more precisely conditions of compatibility, are being studied at present by CEPT work groups.

Though at present the majority of member states prefer to decide on the future utilization at the national level and taking into account national conditions, harmonization in the framework of the European Community has indisputable benefits and, among others, which may include:

- the scope of the spectrum, placement of links for uplink and downlink;
- technologies, duplex operation FDD or TDD, minimal technologically necessary size of blocks;
- the type utilization / service provided, in particular with respect to international roaming or, as the case may be, unified conditions for EU
- time availability

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- procedures and conditions for granting of national licences
- centralized allocation at the European level.

European harmonization and within its framework harmonization of utilization of the band with neighboring states will be beneficial for the Czech Republic. It is assumed that broadband mobile access networks services will gradually become the most important electronic communications service with the requirement constant availability and ubiquitous access. From what has been mentioned above, there is the necessity of the same spectrum scope for these networks throughout the whole territory (and with the same protection).

Utilization of mobile service is implemented pursuant to the reduction of spectrum needs for television broadcasting. Along with the further reduction of spectrum needs for television broadcasting is the possibility for future reassessment of the spectrum scope used for mobile service which is released from another spectrum, is not excluded. However this possibility may be in the remote future.

At present technical studies carried out by CEPT on the basis of the 2nd mandate of the European Commission concerning the digital dividend [8] are focused on the 790-862 MHz band. In particular they have the task to specify basic (minimal) technical parameters, design the channel grid and recommend procedures for mutual coordination in spectrum utilization in neighboring countries, etc.

Mobile applications in this band will get access to the spectrum at the expense of television broadcasting. Nevertheless for one part of the population, television broadcasting is an important, and in some cases, the only source of information. Access to information via computers may be difficult for these citizens both with regards to capability to manage the computer and financial costs of its provision and connection. Therefore the implementation of mobile networks may not be limited only to the issue of spectrum configuration. In connection with the „digital divide“ issue, the barrier between citizens dominating modern electronic communications and citizens handicapped from this point of view, it is necessary to connect the implementation of these new networks with the solution of accessibility of services provided to those impacted by the digital divide.

<p>The opinion of the Office is that implementation of mobile broadband access networks in conformity with European harmonization will be the most important benefit of the digital dividend utilization for national users of the radio spectrum.</p>
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The Office expects that requirements concerning the implementation of these networks will be specified during discussions, namely with respect to the time aspect, availability of technologies, protection of utilization, convergence of mobile and fixed access networks, or as the case may be, requirements related to the general concept of broadband access networks and the role of this method of radio spectrum usage in the national economy.

3.2.3 Network for mobile multimedia services (mobile television)

The European Commission believes that the solution of the problem concerning those in the neighborhood of high-power transmitters for television broadcasting and mobile networks lies in a harmonized location of mobile television networks between both applications. Nevertheless this aim may be at variance with technical conditions of utilization of the DVB-H system supported by the European Commission. This system, due to the cooperation with terminals of networks in the 900 MHz band, required utilization of frequencies in a specific frequency range. At present the acceptance of this solution is not indicated from surrounding countries as it is possible to successfully use coordinated allocations pursuant to the Geneva Agreement, 2006.

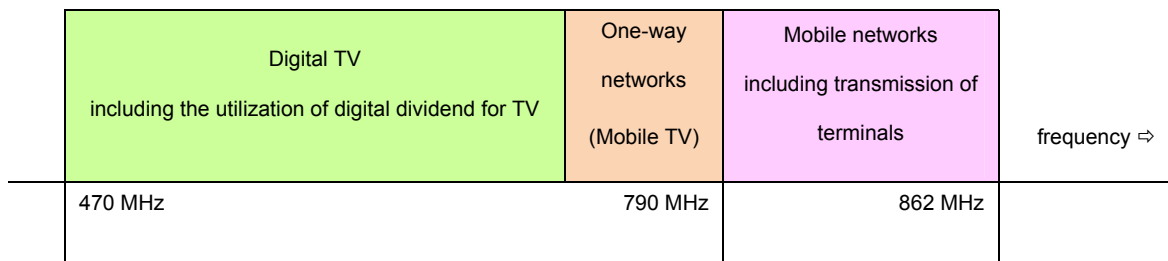


Figure 2 European harmonization aim

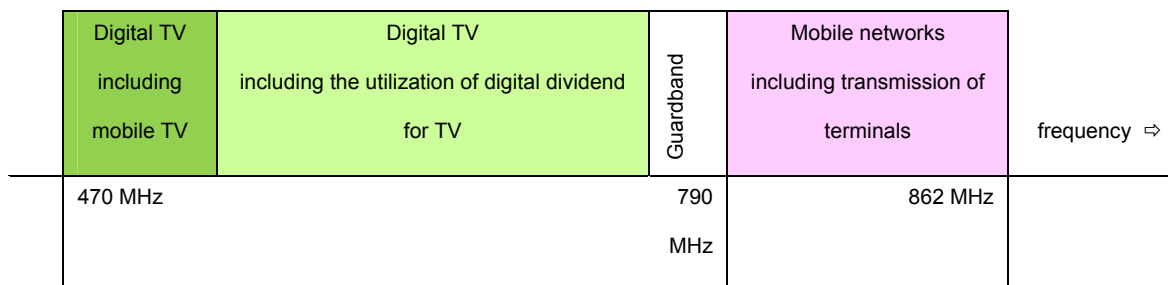


Figure 3 Proposal of the Czech Republic national solution (segments widths are only illustrative)

Figures given above illustrate the location of segments according to the goals of the European Commission and the intention of the national arrangement in the Czech Republic where the allocation of an independent segment is not envisaged but utilization of allocation

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pursuant to the Geneva Agreement, 2006 is expected. Widths of individual segments are only appreciative.

Reception of television broadcasting in motion was one of promised benefits of the transition to digital television broadcasting. So far the expectations have not been met, especially in the case of special networks for mobile television. Their representative should be, in particular, the DVB-H technology. Besides the low level of demand for these services as well as the commonly broadcast DVB-T programs, the reception of which is enabled by several types of mobile telephones and are available as a free-to-air service, become competition.

3.2.3.1 The European Commission call for the development of mobile television DVB-H

The European Commission also responded to the given situation with its call to limit obstacles for the creation of mobile television networks. On 10 December 2008 it issued the Commission Communication KOM (2008) 845 „Legal Framework for Mobile TV Networks and Services: Best Practice for Authorization – The EU model“ [5] This communication follows communication KOM (2007) 409 from the year 2007 „Commission Communication COM (2007) 409 – Strengthening the Internal Market for Mobile TV“ [6] and it recapitulates examples of proven procedures of member states in the regulation of mobile television networks and services.

The Communication states that the Commission has the intention to support the implementation of mobile television in the EU and in the world by issuing instructions for appropriate regulatory measures for licensing these services. The Commission wants to prevent the creation of a legislative vacuum or situation characterized by considerable legal insecurity on the domestic level that would discourage investors and threaten the development of potential mobile television operators in the domestic market.

The Commission states that the integrated approach is the best one of possible regulatory models for mobile television. This model envisages first an agreement among all subjects involved in the operation chain of mobile television networks before submitting an application or granting a licence within the framework of the selection procedure of mobile television network operators. Further the communication states the support for minimization of obligations imposed on participants in the market, however taking into account the need to secure effective use of frequencies. The licensing process should be open for all economic entities capable of meeting minimal requirements.

A clear time schedule is given as an important prerequisite for success.

The communication states that in a majority of member states, only multiplex is envisaged for mobile television (only in France is the possibility of two multiplexes being

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discussed). Because this way there is only one opportunity to select an operator and to start broadcasting, it is necessary to prevent spectrum hoarding, it means formal participation in the procedure and subsequent blocking of allocated frequencies without their actual utilization. That is why the communication proposes a time limit for start-up of operations. If the time limit is not met, the licence should be withdrawn. In connection with the creation of only one mobile television multiplex it is also possible to consider the common utilization of network infrastructure and common location, also on the grounds of protection of the environment (in accordance with the economic competition rules).

The complete interoperability of all networks and operation of user equipment in the whole of Europe (a consequence of using the same technology in all user equipment) is given as an important condition for success of mobile television in Europe. DVB-H technology is mentioned explicitly. In the end DVB-SH technology is mentioned the launching of which the Commission expects this year and which will offer similar services.

3.2.3.2 Current situation in the Czech Republic

On a long term basis the Office prepares the possibility of using the digital dividend by the broadcasting network providing mobile multimedia services. This is also documented by the plan of radio spectrum utilization. On the basis of tests carried out successfully and in conformity with the Commission's opinion, the Office expected an agreement with the parties involved in the process - potential network operators, mobile networks operators and content providers. Unfortunately we must state that this agreement has not been reached and in the meantime mobile telephones that enable reception of common DVB-T broadcasting became available in the market. This, to a certain extent, puts into doubt the need for a specific network. The first round of discussions concerning the digital dividend confirmed this hesitation. The Office assesses this fact as the operation of market mechanisms and has no intention to regulate it in any way. Nevertheless the opinion of the Office is that a specific network for providing mobile multimedia services may have, particularly in case of successful European harmonization, its foundation and advantages. In particular if it offers appropriate, new, attractive content and other applications. Then it may provide additional services to both the services of current television broadcasting and services of mobile communication networks.

However a pressing question is when should the selection process of the operator of this specific network be started? Under the present circumstances it seems to be premature and groundless. Besides the situation on the market, the fact that so far no decision has been reached whether the network should be located in the harmonized sector [9] proposed by the European Commission or if it should be located in already coordinated allocations pursuant the Geneva Agreement 2006 applies. It remains an open question if existing legal

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regulations that exclude from the group of potential networks operators the operators of mobile communication network is justified. If the existing legal regulation is justified regarding conditions of preventing mutual interference with mobile networks and provisional no confirmation of terminal functionality with respect to interactive services.

We have only one opportunity to build a broadcasting network for reception of mobile television and if the planned allocations are used for other applications (for example other DVB-T networks) it will not be possible to coordinate appropriate new allocations (with regard to DVB-H specifications).

The Office intends to keep this specific network in its plan and to elaborate on conditions of granting rights to use frequencies according to further development.

In the framework of the discussion, the Office welcomes opinions of involved entities concerning existing obstacles, possibilities of their elimination and deadlines for building the network.

4. ISSUES FOR DISCUSSION

Before we set down specific steps for radio spectrum management, we have to discuss the following issues:

4.1. HDTV

4.1.1. Do you envisage the creation of paid multiplexes of terrestrial digital television broadcasting? Do you believe that HDTV will be implemented only in these multiplexes? Or do you take the implementation of HDTV is the logical future development of all programs?

4.1.2. How do you envisage the course of HDTV implementation? Do you believe that this change will be available over a longer time horizon and that it will be different for individual multiplexes and programs or that this change will be fast and will take place for all programs or for the majority of programs simultaneously? What time horizon do you forecast for launching the transition to HDTV or more precisely when it will take place?

4.1.3. Do you agree with the opinion that it is necessary to minimize **regulatory** interventions and that the Office should not interfere with the transition to digital broadcasting on higher level (HDTV, DVB-T2)?

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4.1.4. Do you believe that the state with its recommendations should contribute in advance to the orientation of viewers, in particular, concerning the problems of receivers' standards in order to prepare them for transition to HDTV? Or should information and recommendations for viewers arise from commercial entities?

4.2. Local broadcasting

4.2.1. What is the preparedness of current operators of territorially limited television broadcasting for transition to digital broadcasting? What utilization of transmission capacity of local networks multiplexes do you envisage? What is your opinion concerning the integration of more broadcasting networks, the increase in programs of the current broadcaster and offering of capacity to other broadcasters?

4.2.2. Do you believe that the demand for further digital local broadcasting will exceed the framework of current analogue broadcasting?

4.3. Mobile networks

4.3.1. **Creation of networks:** Do you believe that it is necessary to elaborate a conceptual plan for the implementation of mobile networks similar to the way the Technical Plan of Transition was elaborated? Do you believe that it is necessary to ensure the earliest possible accessibility of the band? Give us your opinion concerning the time flow and conditions for implementation of mobile services, the network of development and possible critical points.

4.3.2. Scope of services

a) Should the scope of services provided by new mobile networks (both territorial scope and type of services) be decided exclusively by the market and the only obligation for a newcomer shall be payment for access to the spectrum i.e. a corresponding price deduced for example from the spectrum market value, resulting from the auction, set down on the basis of the cost of releasing the spectrum?

b) Should the state adopt a national concept of digital dividend utilization, in which services of mobile access broadband networks will be equalized with universal service? Should it invite tender for „the state order“ with defined requirements and conditions based on the assumed importance of the band?

c) Should the requirements of certain „offset„ programs, which would compensate the society/population for the reduction of spectrum quantity for the provision of information via TV broadcasting, form part of the selection procedure for allocations? (for example programs for ensuring the accessibility of broadband networks and services provided via internet for those who can't afford computers or are lack the knowledge to use them?)

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4.4. Mobile multimedia

4.4.1. With regard to the fact that allocations for the creation of a country-wide broadcasting network enabling mobile multimedia services / mobile television will be available throughout the whole territory, but only after the switch-off of analogue television broadcasting, give us your opinion whether:

a) The Office should currently prepare a selection procedure for the allocation enabling the creation of such a network on a limited area? Or to do it as soon as it is possible based on the spectrum availability and in at least several centers? Is it convenient to include in the selection procedure conditions, an obligation to continue building on other territories as soon as they become available?

b) The Office should, with respect to the current situation and findings from previous consultations (i.e. the tepid interest of potential network operators, absence of an attractive content, etc.), postpone the selection procedure for the allocation of the network and adapt it to the current situation in the future?

4.4.2. Should special conditions be set down for network creation? What sort of conditions? For example:

a) binding deadlines – for network creation, for launching and provision of services?

b) territorial scope – should rights be granted to one all-areas allocation or to allocations for individual areas?

c) services – should a (minimal) set of services be licensed?

d) others?

Issues mentioned above cannot be taken for a complete enumeration of the problems associated with the digital dividend utilization in the UHF band. If necessary, give other important pieces of information, keeping in mind the Office's scope of responsibility. Please, focus on radio spectrum problems.

Regarding deadlines and conducting discussions

Dear discussion participants if you have decided to contribute your opinion we kindly ask you to draw up your contributions in a matter-of-fact manner, if possible with clear and specific wording and with specific details.

In electronic form you can send them, by 5 March 2009, marked as „Digital Dividend II“ to the address dd@ctu.cz or by the same deadline by mail to the address: Czech Telecommunication Office, Post Box 02, 225 02 Prague 025.

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This consultation is not conducted in the mode pursuant § 130 of the Act on electronic communications, instead it serves primarily as an opinion poll.

The intention of the Office is not to publish these contributions and to provide them without their authors' knowledge to third persons. Findings from consultations will serve as a background for evaluation and setting further rounds of matter-of-fact and specific discussions, for further communication with contributors. Concerning this communication we envisage also working seminars (therefore we ask you to give us your name and your e-mail contact address). For this reason do not give information which you consider to be trade secrets.

The whole process will result in the elaboration of specific drafts of procedures and alternatives for the digital dividend utilization that will be ultimately be submitted to pertinent state authorities as background material for further work. **The primary summary of this discussion will be presented at the CTO workshop on 17 – 18 March this year.**

The Office will also make use of acquired findings in the preparation of documents which are within its authority – for example new wordings of pertinent parts of the plan for radio spectrum utilization or general authorizations – that will be discussed in the framework of pertinent provisions of the Act on electronic communications.

We thank in advance all those who contribute to this matter-of-fact discussion.

Time framework of events

- 17 – 18 March 2009 – 2nd workshop about digitalization of television broadcasting and the digital dividend
- March 2009 – publication of the 2nd CTO Report concerning TPT implementation
- March 2009 – CEPT: proposals for a technical solution for mobile applications in the upper part of band V
- April 2009 – termination of analogue broadcasting from the Praha – Žižkov (Prague) transmitter is scheduled
- June 2009 – discussion of the CEPT report pursuant the Mandate 2 in the RSC
- September 2009 – publication of the 3rd CTO report concerning TPT implementation
- September 2009 – the termination of analogue broadcasting from the Plzeň transmitter is scheduled
- October 2009 – the termination of analogue broadcasting from the Praha – Cukrák (Prague) transmitter is scheduled
- November 2009 – adoption of the RSPG position document concerning the digital dividend

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- [9] Commission Communication COM (2007)700 – Reaping the full benefits of the digital dividend in Europe: A common approach to the use of spectrum released by the digital switchover

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0700:FIN:EN:PDF>

CEPT / ECC; European Radio Communication Office : [HTTP://WWW.ERO.DK](http://www.ero.dk)

- [10] CEPT Report No. 21 – Compatibility issues between “cellular / low power transmitter” networks and “larger coverage / high power / tower” type networks

[HTTP://WWW.ERODOCDB.DK/DOCS/DOC98/OFFICIAL/PDF/CEPTREP021.PDF](http://www.ero.docdb.dk/docs/doc98/official/pdf/ceptrep021.pdf)

- [11] CEPT Report No. 22 – Technical Feasibility of Harmonizing a Sub-band of Bands IV and V for Fixed/Mobile Applications (including uplinks), minimizing the Impact on GE06

[HTTP://WWW.ERODOCDB.DK/DOCS/DOC98/OFFICIAL/PDF/CEPTREP022.PDF](http://www.ero.docdb.dk/docs/doc98/official/pdf/ceptrep022.pdf)

- [12] CEPT Report No. 23 – Technical Options for the Use of a Harmonized Sub-Band in the Band 470 - 862 MHz for Fixed/Mobile Application (including Uplinks)

[HTTP://WWW.ERODOCDB.DK/DOCS/DOC98/OFFICIAL/PDF/CEPTREP023.PDF](http://www.ero.docdb.dk/docs/doc98/official/pdf/ceptrep023.pdf)

- [13] CEPT Report No. 24 – A preliminary assessment of the feasibility of fitting new/future applications/services into non-harmonized spectrum of the digital dividend (namely the so-called “white spaces” between allotments)

[HTTP://WWW.ERODOCDB.DK/DOCS/DOC98/OFFICIAL/PDF/CEPTREP024.PDF](http://www.ero.docdb.dk/docs/doc98/official/pdf/ceptrep024.pdf)

- [14] CEPT Report No. 25 – Technical Roadmap proposing relevant technical options and scenarios to optimize the Digital Dividend, including steps required during the transition period before analogue switch-off

[HTTP://WWW.ERODOCDB.DK/DOCS/DOC98/OFFICIAL/PDF/CEPTREP025.PDF](http://www.ero.docdb.dk/docs/doc98/official/pdf/ceptrep025.pdf)

- [15] CEPT website on Digital Dividend

[CEPT ACTIVITIES ON DIGITAL DIVIDEND \(DD\)](#)