

**Case Study on transition from analogue to digital terrestrial TV
(DTTV) broadcasting in the Republic of Bulgaria
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Policy and regulatory aspects

The following digital terrestrial broadcasting related Laws have been enacted by the Bulgarian Parliament:

- i) The Law for the Radio and Television was enacted on 24 of November 1998 and was amended exactly 25 times thereafter by the Bulgarian Parliament, last amendment of 6 February 2009. The Law defines the programme “content” related issues, defining the scope and tasks of commercial and public broadcasting operators, who are creating relevant programmes as well as their rights, duties and obligations. Chapter Two of this Law defines the composition, tasks and operational arrangements of the Council for Electronic Media (CEM), financing and remuneration inclusive. Chapter Three defines the general provisions, the programmes, the management, and

the financing of both national public service broadcasters the Bulgarian National Radio (BNR) and the Bulgarian National Television (BNT). Of particular interest is to this Case study is Article 44 (1) stipulating that “The Broadcasting of radio and television programmes of BNR and BNT shall be carried out by own electronic communication networks and/or devices for terrestrial analogue broadcasting owned by BNR and BNT or on the basis of a contract with undertaking providing electronic communication services”. Paragraph (4) of the same article stipulates that “The resources for implementation of the activities referred to in paragraph (1) shall be provided from the state budget”. Article 70 paragraph (3) stipulates that the budgets of the BNR and BNT shall be credited with:

1. financing from fund “Radio and Television”;
2. subsidies from the state budget (until year 2010);
3. own income from advertisements, publicity and sponsorship;
4. revenue from additional radio and television related activities; donations and testaments; and
5. interests and other incomes related to radio and television activity

Furthermore Article 70 paragraph (4) stipulates that Chapter Four is dedicated to the commercials, radio and television market and sponsorship. Chapter Five defines the components for financing of the radio and television activities.

Chapter Six defines the provisions for licensing and registration of radio and television broadcasting operators and lastly Chapter Seven deals with the administrative and punitive provisions/fines.

It is to be noted that the last amendment to this Law specifies the composition of the expert commission dealing with the granting the license procedure (three CEM Members and two Communications Regulation Commission’s Members).

ii) The Electronic Communications Law has been enacted by the Parliament on 11 May 2007 and published in State Gazette No. 41 on 22 May 2007 (amended eleven times thereafter, last amendment published in State Gazette No 82 on 16.10..2009) governing the competencies responsibilities and tasks of bodies operating under this Law (The Council of Ministers, The State Agency of Information Technology and Communications, The Council on National Radiofrequency Spectrum), the Communications Regulation Commission (CRC) hereinafter: “the Commission” as an independent regulatory authority). The said Law is governing the issues related to electronic communications; the conditions for the provision of electronic communications networks and electronic communications services; ensuring universal service; management of the radio frequency spectrum.; furthermore is laying down the conditions for restrictions on ownership rights, especially the rights of users; protection of end-users interests and data, the operation of networks and services in emergency situations; the protection of security and confidentiality of electronic communications; the resolution of disputes in the electronic communications market. Same Law defines key definitions such as radio

broadcasting, terrestrial analogue broadcasting, application programme interface (API), conditional access, electronic communications facilities, electronic communications infrastructure, electronic communications network, electronic communications service, electronic communications terminal equipment, electromagnetic compatibility, electronic programme guide (EPG), enhanced digital television equipment, radio equipment, radio service, radio-frequency spectrum, wide screen television service, user, undertaking with significant market power, etc. It governs network facilities, analysis of relevant markets, as well as for determining, maintaining, or revoking obligations of operators with significant market power. The very same Law defines the radio frequency spectrum management. It defines further decisions, administrative procedures, provisions for contests and tenders, reviews and evaluation of contests and tenders, selection of successful applicants/ bidders, content of authorizations granted and their duration of validity, procedures for granting authorizations for use of radio-frequency spectrum and their respective amendments, supplements, termination, withdrawal, suspension or transfers extension on the authorization to use radio-spectrum frequencies, fees for use of radio frequencies, as well as provisions for control and administrative penalties. Of particular interest to this case study however are the recently amended Chapter Four section VI “Cooperation with the Council for Electronic Media in the Field of Digital Radio-broadcasting” and Chapter Ten Section III “Access to and Use of Required Network Facilities and Equipment” governing the provisions for shared use of electronic communications infrastructure.

Older version of this Law incorporating amendments published into State Gazette No 69 of 05.08.2008 and beforehand, is available in English language and is attached to this Case Study for reference. Latest version, incorporating last amendment published in state Gazette No. 82 of 16.10.2009, is available only in Bulgarian language and also attached herein.

iii) The Public Service Broadcasting Law, enacted by the Bulgarian Parliament on 12 May 2009, was published in State Gazette No. 37 on 19 May 2009. Chapter one of this Law governs the provisions for the State participation in the distribution of national public radio and television programmes as well as the State participation in the digital terrestrial broadcasting of the said programmes to the population. Chapter Two stipulates that the State will ensure the availability of relevant radiofrequency spectrum, and that the CRC will grant relevant authorizations for radio frequency use without application of contest or tendering procedures, upon presentation by the newly established National Company “Public Digital Broadcasting” (NCPSB) of relevant documents as required in the Electronic Communications Law. It defines the provisions for operation of the NCPSD as company authorized only to broadcast terrestrially in digital form the national public radio and television programmes as defined by the Law, as well as the NCPSB management, financing, including contributions from the State, revenues and expenditures. Chapter Three of this Law stipulates that the State guarantees for the deployment of new electronic communications network for delivery of radio and television programmes (not only for public service broadcasting programmes) and also that the State ensures the

delivery of the programmes of Bulgarian National Radio and Bulgarian National Television over the said electronic communications network for delivery of radio and television programmes to the above-mentioned NCPSB for their subsequent digital terrestrial broadcasting. Furthermore this Law defines the provisions and obligations to be imposed on the national coverage successful bidder as stipulated in the First Phase of the Plan for Transition to DTTV broadcasting.

This Law is available only in Bulgarian language, but nevertheless is attached to this Case Study for reference.

Multiplexes and planning issues

It should be underlined that the said legislation above did not consider the multiplexing part of the broadcasting chain at all, thus enabling freedom of interpretation. Furthermore the said Laws did not define explicitly the term broadcasting network versus the term delivery network-in other words rebroadcasting branch of transmission network via chain of TV Transposers/Repeaters might be interpreted either as delivery network or as broadcasting network. Such ambiguities might lead to cases to be forwarded to the juridical system for final interpretation and judgement.

The legislation provides for operational playing ground either to produce TV programmes as licensed by the CEM TV operators; to deliver ready-made TV programmes via delivery electronic communications networks based on authorization by the CRC to the authorized by CRC DTTV broadcasters; or alternatively to broadcast those TV programmes terrestrially via DTTV networks to the population, however the said Electronic Communications Law excludes explicitly operating more than one of said three options. *Important Note: By Decision No. 3 of the Constitutional Court on constitutional case No. 3 of 2009, Article 48, paragraph (5) has been declared anti constitutional, namely “that an authorized operator to broadcast digital terrestrial programmes to the population shall not have right to deploy delivery distribution network between the operator/s producing sound and television programmes and the broadcaster/s to the public” and this might have an adverse impact on the current procedures for application contests/tenders and subsequently on rules to grant an authorization .*

Because of the prospect some ambiguous cases to be forwarded to juridical system for interpretation and judgment, the CRC has revised and fine tuned its procedures and rules for granting an authorization for DTTV broadcasting as per the said decision of the Constitutional Court.

Furthermore the programme composition of any multiplex is not defined in the implementation Plan for transition to DTTV broadcasting in this country.

After the telecom liberalization, part of the analogue radio and TV public broadcasting programme delivery for both the radio and the television is still being carried out by a dedicated entity within the telecom operator BTK (National Directorate “Radio and Television Systems”-NDRTS). Over decades the systems used were based on proven mix of microwave networks for delivery of radio and television signals, as well as on well

chosen and carefully planned networks of main and rebroadcast FM and TV transmitters located in strategic points in this country. The assets of this vast company of high value are composed of sophisticated electrical energy supply grids, stand-by electricity generators, roads, water supply, buildings, antenna towers and masts, transmitters and microwave links, experienced and trained staff. The majority of transmitters are already out of date, but anyway they shall be replaced during the transition to digital terrestrial TV broadcasting. The Electronic Communications Law through its Chapter Ten Section III "Access to and Use of Required Network Facilities and Equipment" governing the provisions for shared use of electronic communications infrastructure, practically enables shared use of authorized by CRC broadcasters and delivery network providers. However the recent legislation in force has not allowed that this company applies for an authorization to use spectrum for the purposes of first phase of the DTTV broadcasting Plan, because, in line with granted authorizations, it is operating for decades both the radio and television programme delivery networks (contribution and distribution) and the radio and television broadcasting networks. This case falls into the said anti constitutional category as declared by the Constitutional Court.

The new Law for Public Broadcasting apparently is rejecting this available, efficient and less expensive possibility and directs taxpayers' money to creation of entirely new electronic communications infrastructure, thus duplicating the infrastructure of NDRTS. During the 12 of May 2009 Parliament hearings of the draft of this Law, this issue was submitted for consideration by some Parliamentarians, but with no avail. Time will only tell if the majority of the legislators voting in favour of this Law, was right.

Financing and market share status quo

It was impossible to obtain information on budgets because of legal obligations prohibiting financial disclosure.

Instead of fixed annual subscription fee collected by the post office from every household being obligatory before the entry into force of the Law for Radio and Television, its Article 93 stipulates that, except for industrial purposes, every registered electric energy meter shall be charged also with monthly fee for reception of radio and television programmes of relevant household. Article 94 paragraph (1) stipulates that every registered electric energy meter will be charged with 0,6 % of the minimum monthly salary, which equals currently to an monthly household subscription fee for radio and television programme reception of around 0,78 Euro and that this income, after deduction of collecting charges by the electricity supply provider, will be deposited to fund "Radio and Television". For the total of 2921887 households, registered during the last statistical survey of the year 2004, the annual pure "public fee" income generated should total 25890957 Euro. As stipulated in this Law, in addition to this revenue, the fund "Radio and Television" is accumulating the initial and annual license charges paid by radio and television operators creating programmes, supplemented by interests, donations and testaments, as well as other lawful incomes. This fund alone is the source of financing for the CEM and fraction of it is destined to finance both the national public radio and the national public television. Therefore, it is logical to estimate that the BNT share of the

said pure public fees income would be much less, and that the BNT total share of the said fund “Radio and Television” would be less than half of the revenue generated. The long and winding road of the “public subscription fee” income, before being made available for disposal of national public radio and television, is rather complicated. It is assumed also that the annual total of subscription fees collected from the public is inferior to the financing originating from the Treasury of the State every year (subsidies for content production and resources to finance the expenses for cost of contribution, distribution and broadcasting networks for national public radio and television). This situation is conflicting in substance with the postulate for independence of public broadcasting service and is creating significant interdependence from the state as a key funds provider. For the reasons above the “public service broadcasting” in this country appears like a “state service broadcasting” even to its native citizens.

It is worth recalling similar critical comments made by Dr. Werner Rumphorst, Head of EBU Legal Department during the consideration of the draft law proposals by the Bulgarian Parliamentarians during 1998 when this country was still in very difficult financial situation. Nowadays the country financial environment has evolved in positive direction and perhaps at not too distant occasion, the Bulgarian Parliamentarians might reconsider and rectify this aberration from the usual public service broadcasting practice and respectively amend the Law for Radio and Television.

Furthermore the annual income from publicity, advertisements and sponsorships for the Bulgarian National Television (BNT) alone is estimated roughly at 5 million Euro as important revenue budget line for BNT. For this reason, in discharging public broadcaster duties towards the general public, it is a major challenge to BNT management and creative staff to produce television programme output noticeably different from established nation-wide commercial broadcasters.

Based on information made publicly available, the annual income of the commercial television broadcaster “bTV”, generated from publicity, advertisements and sponsorships, is estimated at 93,4 million Euro and the said income for Nova TV is estimated at 55,4 million Euro. In fact the above-mentioned revenues of both largest commercial national television operators might shape the substance of their budgets and their “raison d’etre” as commercial broadcasters.

It is interesting to note that while the entire value of TV publicity, advertisement and sponsorship market for the month of January 2008 was estimated around 18,3 million Euro, it was, in spite of the economic crisis, around same level at 18,2 million Euro for the month of January 2009.

Cost implications of the transition to digital

The Plan itself is of technical nature and does not consider the cost implications of the transition to digital.

Based on estimates made for the Bulgarian National Television alone, the cost for deployment of transmission network of hundreds of digital terrestrial TV transmitters might be extremely high (of the magnitude of 50 million Euro) and financially be not

bearable. Furthermore the annual cost for one multiplex operation might well exceed that amount. In addition, the BNT shall modernize its programme production infrastructure. Therefore the State Treasury intervention is the only viable option left and it is correctly encapsulated into both the recent Public Service Broadcasting Law and the Law for the Radio and Television in force.

Business model and plan

The Laws for Radio and Television and for Public Broadcasting allow both for state subsidies.

This mission has been informed that social assistance to the population with lowest income is considered to be made available in order to avoid social exclusion of substantial part of the ageing population and the population layers with low income in this country.

Applicable Standards

The Republic of Bulgaria, via the CRC, has decided firmly to use MPEG-4 Part 10 also known as ITU-T Rec. H-264 AVC for advanced video coding.

In spite of initial higher retail price of MPEG-4 Set-Top Boxes (STB), this future-proof strategic decision is taken to use more efficiently the spectrum and provide better technical quality to users without forcing any more the consumer to buy new equipment in another transition (MPEG-2 to MPEG-4). It enhances the digital dividend gains and paves the way to quick introduction of HDTV terrestrial broadcasting, mobile TV, wide band, etc. Prices of STB's are falling in Europe and industrial sources estimate that MPEG-2 STB's might become more expensive than MPEG-4 STB's in a not too-distant future.

TV receivers on sale already are offered with MPEG-4 and HDTV 1080 progressive scan.

Another important strategic decision has been taken to deliver all TV programmes on DVB-T DTTV transmission networks.

Fixed modulation or statistical modulation to be used within any multiplex, haven't been defined neither in the said Laws, nor in the implementation Plan for transition to digital.

Implementation Plan for the DTTV Broadcasting for the Republic of Bulgaria

Discussions with the above-mentioned officials have focused on the "DVB-T Implementation Plan for the Republic of Bulgaria" (hereinafter: The Plan) and on the transition from analogue to digital broadcasting in this country.

Total of 49 pages document of this Plan has been elaborated and approved at Session of the Council of Ministers of 31 January 2008 (reference Protocol No 5, decision on Agenda item 24). This former out-of-date version of this Plan (31.01.2008) is available in English language. However the Plan has been amended in March 2009 to cope with the recently enacted digital broadcasting legislation particularly related to the television. In line with the latest amendments of said Electronic Communications Law, this Plan has been also amended but its final version, incorporating the latest amendments introduced during October 2009, is available only in Bulgarian language. Its main considerations and key aspects are provided herewith.

Both language versions are attached to this case study for reference and wider consultation by ITU Members.

The Plan describes in detail the sound and TV broadcasting status-quo prior to the transition to digital and clearly defines the strategic decisions taken for the entire process of transition from analogue to digital. It incorporates the key aspects of it, inclusive deadlines, coverage and technology issues, etc.

TV Broadcasting delivery and market share of platforms

TV Programme licences

As of January 2008, a total of 203 TV programmes have been licensed for delivery to the population of this country by cable television, terrestrial broadcasting and via satellite.

The terrestrial broadcasting component ensures analogue delivery of the total of seven TV programmes as follows:

- a) Three nation-wide TV programmes, namely:
 - “**Channel 1**” of the Bulgarian National Television (BNT) with population coverage of 98,3% achieved by 677 high power main transmitters, relay transmitters and low power fill-in transmitting stations in Frequency Bands II, III, IV and V;
 - “**bTV**” with population coverage of 97% achieved by 676 high power main transmitters, relay transmitters and low power fill-in stations in Frequency Bands III, IV and V; and
 - “**Nova**” exceeding 70% population coverage achieved by total of 143 transmitters, with comparatively lesser number of high power main transmitters and with a growing network of relay transmitters and low power fill-in transmitting stations, all operating in Frequency Bands IV and V.
- b) In addition there are four regional TV programmes licensed to be on air in the towns of Blagoevgrad, Plovdiv, Russe and Varna.

Remaining 196 licenses are issued for TV programme delivery via cable or satellite.

Public/commercial/temporary licensed operators

Seventeen licenses are issued to public broadcasting operators and 169 licenses to commercial broadcasting operators totaling 186 regular licenses. Furthermore, the said regular licenses are supplemented by additional 42 specific licenses (temporary in nature but still in force) for terrestrial analogue broadcasting. The CRC has started procedure for granting additional terrestrial analogue TV broadcasting authorizations with limited duration.

Cable/Satellite/Terrestrial delivery

It is estimated that more than 70% of the country population is served by cable network delivery, 3% of the population by satellite and less than 30% of the population receives TV programming via terrestrial broadcasting channels. While every country town is served via cable TV network delivery only about 28% of the villages of this country are served by cable TV. It is expected that cable TV network delivery would reach its saturation limit at 75% of the population coverage.

The country population, having access exclusively to terrestrial TV broadcasting only, is estimated to be within 10 to 11% range.

Experimental digital terrestrial TV broadcasting

Only one digital terrestrial TV broadcasting operator (BTK) and in particular its NDRTS Directorate has been licensed on test basis to serve the area of Sofia City since 26.05.2003 via multiplex set-up, offering 6 TV programmes on TV channel 64.

Set Top Boxes Analysis

The Plan concludes that the wide range of STBs could not be a serious obstacle for the introduction of DTTV in this country.

Purpose and mission of the analogue to digital terrestrial TV transition

The said Plan for introduction of digital terrestrial broadcasting aims not only at retaining the number of users who, in spite of having access to cable, terrestrial and satellite delivery, have already chosen to use analogue terrestrial delivery, but also has set the target of increasing the number of digital terrestrial delivery users in nearest future. Indeed the Plan has the objective of creating an enabling competitive environment thus effectively preventing the monopolistic cable and satellite delivery operators' grasp at the market.

Towards this end, the digital terrestrial broadcasting shall be deployed under certain conditions as follows:

- free of charge delivery to users - free to air - (not more than one encrypted programme per multiplex be permitted);
- initial number of programmes delivered shall be not less than 15;
- programmes delivered be composed of an attractive-to-viewers blend of national, regional and local origin;
- better quality and offer of additional/interactive e-services and applications, and
- mobile outdoor reception predominantly for cars and portable reception inside of buildings expected to be used for the purpose of second and third household receivers.

The said Transition Plan has defined the strategic aspects of:

- population coverage objectives and criteria;
- Multiple Frequency Network (MFN) approach dedicated only to nation-wide coverage, while Single Frequency Network (SFN) approach will be applied explicitly to allotment zones;
- initial build-up of SFN network broadcast coverage of densely populated towns and areas (Island Coverage) within any allotment zone followed by further gradual network extension until the entire allotment zone coverage has been achieved;
- optimization of number of multiplexes within allotment zones;
- granting license or temporary permission to any new analogue terrestrial broadcasting operator applicant will be severely restricted;
- parallel broadcasting of both the analogue and the digital (simulcast) being limited to one year duration upon the expiry of which the concerned analogue broadcasting license/s will be terminated. Thus the reuse of liberated spectrum of analogue broadcasting is provided for further build-up of digital terrestrial TV broadcasting networks as per the Plan;
- establishing criteria for switch-off of analogue TV broadcasting, but not later than end 2012;
- nation-wide coverage by digital terrestrial broadcasting to be completed in all zones by end 2015;
- factual digital dividend definition (HDTV, Mobile TV, wireless wide band, etc.); and
- timely supply of Set Top Boxes (STB) to the population at affordable prices and risks involved.

Impact of the digital terrestrial broadcasting Plan of RRC-06 and GE 06 Agreement

RRC-06 and GE 06 Agreement guarantee to the Bulgarian Administration to have at its disposal and use at its discretion 10 nation-wide networks for terrestrial digital TV broadcasting, supplemented by 34 regional networks and by 23 networks dedicated to the regions of Sofia and Varna.

All measures are taken to ensure that this Plan is in full conformity with the GE-06 Plan and under the envelope concept adopted at the RRC-06. Furthermore the CRC, following up the procedures established by RRC-06, has successfully transformed the allotments into frequency assignments.

Transition to digital terrestrial TV broadcasting

The said transition will be executed into two phases as follows:

First phase-start of the transition

Three nation-wide digital terrestrial TV networks

Two nation wide commercial TV broadcasting MFN/SFN networks, all DVB-T, will be licensed to operators for deployment in allotment zones of Blagoevgrad, Burgas, Kardzhali, Pleven, Plovdiv, Ruse, Shumen, Smoljan, Sofia, Stara Zagora, Varna and Vidin by June 2009 (SFN only within any allotment zone)

Licensed operator shall start “Island Coverage” broadcast within allotment zones of Burgas, Plovdiv, Ruse, Sofia, Stara Zagora, Varna and Vidin by December 2009 and by June 2011 the licensed operator must ensure at least 75% population coverage.

Same licensed operator by June 2010 shall start “Island Coverage” broadcasting in Blagoevgrad, Kardzhali, Pleven Smoljan and Shumen and by December 2011 the licensed operator must ensure at least 75 % population coverage.

Furthermore, relevant licensees with authorization granted must ensure at least 95% population coverage of all above-mentioned twelve allotment zones by December 2012.

*In accordance with the modifications and amendments made as of 19.03.2009 to this Plan, the Communications Regulatory Commission has decided (by its decision No 358 of 8 April 2009) to issue an open invitation for tendering procedure for two national **commercial DTTV networks** with deadline for applications 12 May 2009. Six candidates have applied for relevant frequency spectrum usage authorization.*

On 05 June 2009 the CRC has granted authorization for deployment and operation of two national DTTV broadcasting networks of 15 years duration to the contest winner TOWERCOM BULGARIA EAD, however the above-mentioned Decision No. 3 of the Constitutional Court might have an adverse impact on this CRC decision.

The undertaker winning the contest is obliged to:

- *start broadcasting on “island” principle by December 2009 for said seven regions and by June 2010 for remaining five regions;*
- *ensure population coverage of 75% by June 2011 for those seven regions and by December 2011 for remaining five regions; and*

- ensure 95 % population coverage by December 2012 for all the twelve regions where digital terrestrial TV broadcasting service is to be provided.

Furthermore, in accordance with the said modifications and amendments to the Plan and retained in the final October 2009 Plan, it has been decided to grant authorization for use of frequency spectrum dedicated to one national network for **public** radio and TV broadcasting operators (BNR and BNTV) by September 2009.

In accordance with the newly enacted Public Broadcasting Law of 12 May 2009, the Communications Regulation Commission (CRC) should grant an authorization for frequency use to the National Company “Public Digital Broadcasting”, without any contest nor tendering procedure, but upon submission of relevant application documents as required by Electronic Communications Law in order to enable terrestrial digital broadcasting of the programmes of both the Bulgarian National Television and the Bulgarian National Radio. This Company shall:

- start broadcasting on “island” principle by April 2010 for seven regions and by November 2010 for remaining five regions;
- ensure population coverage of 75% by June 2011 for said seven regions and by December 2011 for remaining five regions; and
- ensure at least 95 % population coverage by December 2012 for all twelve regions where the digital terrestrial broadcasting service is to be provided.

Twelve regional commercial digital terrestrial TV networks

Twelve regional SFN networks were to be licensed to operators within allotment zones of Burgas, Plovdiv, Sofia and Varna (three SFN networks each) by June 2008. Licensees were to start “Island Coverage” broadcast within said allotment zones by January 2009 followed by ensuring of full population coverage for the said four allotment zones by January 2010.

In accordance with the modifications and amendments at 19.03.2009 made to the above-mentioned Plan and retained in the final October 2009 Plan it has been decided to grant twelve SFN frequency spectrum use authorizations for regional **commercial** digital terrestrial TV broadcasting networks(three SFN Networks each for Burgas, Varna, Plovdiv and Sofia) by December 2009.

The undertaker winning the contest shall:

- start broadcasting on an “island” principle in the respective areas, where service is to be provided, by June 2010; and
- ensure population coverage of at least 95% for each area, where service is to be provided, by January 2011.

Second phase of the transition

Additional three nation-wide digital terrestrial commercial TV broadcasting networks

Furthermore, in accordance with the former version of the Plan, three nation-wide MFN/SFN networks, two of them DVB-T plus one DVB-H, were to be licensed to operators for deployment in the allotment zones of Burgas, Plovdiv, Ruse, Sofia, Stara Zagora, Varna and Vidin by July 2010.

Licensed operators were to start “Island Coverage” broadcast within said allotment zones as from January 2011 and they must ensure at least 75% population coverage of said allotment zones by December 2013.

Exactly one year later, after the simulcast expiry, new licenses were to be granted to operators by July 2011 with obligations to start “Island Coverage” broadcast within the allotment zones of Blagoevgrad, Kurdzhali, Pleven, Smolyan by January 2012, being followed by obligations to ensure at least 75% population coverage by July 2014.

Furthermore, relevant licensees were obliged to ensure full population coverage inclusively for the above-mentioned twelve allotment zones by July 2015.

*However, in accordance with the said modifications and amendments, made as of 19.03.2009 to this Plan and retained in the final version of the October 2009 Plan, the Communications Regulatory Commission, by its Decision No 360 of 08 April 2009, has issued an open invitation for tendering procedure for three nation-wide **commercial DTTV** broadcasting networks with deadline for applications 27 May 2009. Six candidates have applied for this tender. The CRC has granted authorization for use of frequency spectrum for three nation-wide commercial networks on 22 June 2009 to the successful applicant “HANU PRO BULGARIA EAD”..*

The undertaker winning the contest shall:

- *start broadcasting on “island” principle by June 2011 for said seven regions and by January 2012 for said remaining five regions;*
- *ensure population coverage of 75% by December 2013 for seven regions and by July 2014 for remaining five regions mentioned above; and*
- *ensure at least 95 % population coverage by June 2015 for all twelve above-mentioned regions where DTTV service is to be provided.*

Additional fifteen regional commercial digital terrestrial TV networks

In accordance with the former version of the Plan, fifteen regional SFN networks were to be licensed to operators for deployment in the allotment zones of Blagoevgrad, Burgas, Kardzhali, Pleven, Plovdiv, Ruse, Smolyan, Sofia, Sofia-City, Stara Zagora, Strandzha, Shumen, Varna, Varna-City and Vidin by July 2010.

These licensees would have been obliged to start “Island Coverage” broadcast within said allotment zones as from January 2011 and they would have been required to ensure 90-95% of population coverage in the above-mentioned allotment areas by December 2012.

*In accordance with the modifications and amendments made as of 19.03.2009 to this Plan and retained into the final version October 2009 of the Plan, it has been decided to issue fifteen authorizations for regional **commercial** digital terrestrial TV broadcasting networks. It is expected that relevant authorizations for use of frequency spectrum shall be granted by December 2010:*

The undertakers winning the contest shall:

- *start broadcasting on “island” principle by July 2011 for respective areas where the DTTV service is to be provided, and*
- *ensure population coverage of at least 90 % for respective areas where the DTTV service is to be provided by December 2012.*

The “sliding” approach decided to be applied by this country is based on use of the spectrum for the second phase being liberated by the implementation of the first phase during which national analogue terrestrial TV broadcasting programmes, benefitting from the must-carry obligation, have been already transformed into digital carriage format.

DVB-H versus HDTV

In accordance with the former version of the Plan, subject to license application/s for digital terrestrial HDTV broadcasting network/s being submitted latest by December 2011 to competent regulatory authorities, or upon initiative of competent regulatory authority, license/s may be granted to relevant operator/s for deployment and operation of digital High Definition TV terrestrial broadcasting network/s.

Possibility might exist to restructure SDTV into HDTV DTTV service in all DTTV multiplexes, should the market be ready for it, provided that:

- a) HDTV attractive programme content is in abundance;
- b) HDTV quality receivers with screens bigger than 50 inch at affordable prices are dominating the market;
- c) Terrestrial DHTV delivery still remains more attractive than satellite, cable or IPTV delivery;
- d) Blu-ray recorders and players are widely in use;
- e) Quality of service and robustness of delivery remains outstanding; and
- f) Last but not least the business plans continue to be successful.

In general for entirely HDTV service with performing MPEG-4 encoders it is possible to expect delivery of 7 to 21 HDTV nation-wide programmes within UHF Bands IV and V, but below 790 MHz.

However in the latest version October 2009 Plan the previous provisions for HDTV have been replaced with provisions for DVB-H, namely that subject to license application/s for DVB-H broadcasting networks being submitted beyond December 2012 to competent regulatory authorities, or upon initiative of competent regulatory authority, license/s may be granted to relevant operator/s for deployment and operation of DVB-H broadcasting networks.

Number of European TV Broadcasters are already announcing introduction of HDTV digital terrestrial broadcasting service or making plans to go for it.

The growing size of the Flat Panel Display getting thinner and thinner, constantly improved technical features like better contrast and color rendition, reduced energy consumption with falling prices made available to the consumers, together with the large scale introduction of Blu Ray HDTV video disks, and the growing offer of HDTV over satellite or cable (around 200 HDTV programmes made available to the European viewers from the sky only) would have an impact on every European broadcaster and perhaps the Plan might well be reconsidered again.

The pros and cons of the DVB-H and the HDTV will become apparently more clear for the viewers and the market forces within next three years. Only time will tell which one of them will win.

One Year Simulcast Limitation

The period of parallel broadcasting of both analogue and digital terrestrial TV broadcasting (simulcast) is limited to one year after the start up of digital terrestrial broadcasting within relevant "Island". Upon expiry of this one-year period all analogue terrestrial TV broadcasting transmitters within the "Island" territory coverage will be switched-off in principle, however exceptions may be granted spectrum permitting, in particular for remote rural areas.

Appropriate measures will be taken to ensure adequate spectrum allocation/s in order to guarantee the practical implementation of this key requirement.

"Must carry" obligation

The Electronic Communications Law, October 2009, Article 47 stipulates that it is within the purview of the Council for Electronic Media (CEM), empowered by the Law for Radio and Television, to decide on the programmes allocation within any network, inclusive national public broadcasting TV programme/s of Bulgarian National Television.

Taking into account the existing severe spectrum constraints, the Second Phase of the Transition Plan may be implemented only on condition that relevant spectrum indeed be liberated by the already licensed operators of analogue terrestrial digital TV broadcasting with nation-wide coverage networks. In this regard and in order to ensure that the above-mentioned requirement of the Electronic Communications Law will be met, either the said licensed operators must have new licenses granted for nation-wide network coverage of digital terrestrial TV broadcasting during the First Phase of Transition, or alternatively, in consistency with the decision of the CEM on the network assigned to carry the programme/s of Bulgarian National Television (BNT) a "must carry" obligation

be imposed on relevant operator/s, being licensed as nation-wide digital terrestrial TV Broadcaster during the First Phase of Transition in order to carry the programme/s of Bulgarian National Television and other nation-wide commercial television programmes.

Analogue switch-off

Firm decision has been taken to impose the switch-off of any analogue TV terrestrial broadcasting transmission in this country by December 2012 at the latest.

Digital dividend

The switchover from analogue to digital broadcasting will create new distribution networks and expand the potential for wireless innovation and services. The digital dividend accruing from efficiencies in spectrum usage will allow more channels to be carried with variety of fast data transmission rates and lead to greater convergence of services.

The inherent consistency of data flows over long distances and flexibility offered by digital terrestrial broadcasting will support mobile reception of video, internet and multimedia data, making applications, services and information accessible and usable anywhere and at any time. Along with the introduction of innovations such as Handheld TV Broadcast (DVB-H) and High-Definition Television (HDTV), it will provide greater bandwidth which, in full consistency with “European Parliament resolution Towards a European policy on the radio spectrum” {2006/2212(INI)}, could increase the widespread availability of affordable mobile/wireless broadband, including in rural areas.

After 2012, if there is an interest declared or alternatively by initiative of competent regulatory authority, an authorization might be granted for use of radio frequency spectrum for deployment of DVB-H networks and/or perhaps the HDTV.

Services ancillary to broadcasting (wireless microphones, talk back links), planned on a national basis, could also be extended.

Low Power Devices, Public Protection and Disaster Relief (PPDR), new wireless technologies might also be a potential benefactors of the digital dividend.

Because of the complex and interleaving reasons, associated inter alia with the said purpose and mission of the introduction of digital TV terrestrial broadcasting in this country, it will be very difficult in the mid-term future to quantify the spectrum which will be available for use of services other than broadcasting. Therefore it is foreseen that the factual quantitative balance of the spectrum liberated will be done not earlier than the complete analogue switch-off at the end of 2012 and not later than end 2015, and in full conformity with the decisions taken at the WRC-07.

Brief summary of the transition to DTTV broadcasting

Simulcasting between analogue and digital terrestrial TV broadcasting will be applied but not permitted for more than one year duration, except in remote rural areas.

Two phases of transition to digital TV terrestrial broadcasting will enable gradual transition to digital.

Six nation-wide DVB-T MFN/SFN networks-licensed operators must ensure at least 95% population coverage in all fifteen allotment zones: first three by December 2012, remaining three by June 2015.

Twenty seven regional SFN networks must ensure at least 95% population coverage in all fifteen allotment zones: first twelve SFNs by January 2011, remaining fifteen SFNs must ensure at least 90 % population coverage by December 2012.

License applications for digital terrestrial DVB-H broadcasting may be submitted beyond December 2012 to competent regulatory authorities, or upon initiative of competent regulatory authority, license/s may be granted to relevant operator/s for deployment and operation of DVB-H broadcasting networks..

Interactive services and applications will be encouraged.

Switch-off of all analogue TV terrestrial transmissions will be completed by December 2012.

Transition to digital terrestrial TV Broadcasting shall be terminated by June 2015 and factual digital dividend shall be established.

Allotment zones

The Figure below on next page defines the distribution of allotment zones on the map of Bulgaria as per RRC-06.

FIGURE
Allotment zones for the Republic of Bulgaria defined by RRC-06

