

# Case studies on migration from Analogue to DTTB of Serbia

(March 2009)

## 1. Policy and regulatory aspects

The Ministry for Telecommunications and Information Society published the “Basic Principles of the Strategy for Switchover from Analogue to Digital Broadcasting of Radio and Television Programmes in the Republic of Serbia” in January 2009.

(Strategy for Switchover from Analogue to Digital Programme Broadcasting hereinafter Strategy.)

The general aspects that the digitalization will provide:

- better quality of sound and picture,
- greater variety of contents,
- more radio and television programmes,
- new services for users with disabilities and for senior citizens,
- enhanced additional services,
- portable and mobile programme reception.

Benefits for the service providers:

- options for adjusting content to the needs of different target groups,
- interactivity,
- potential to provide services on demand,
- lower broadcasting costs
- convergence of services.

The benefits for the state are:

- more efficient utilization of radio frequency spectrum,
- exploitation of the newly freed part of the spectrum for implementing new services,
- promotion of technology development
- new jobs,
- improved competition
- more opportunities for enhanced creativity and preservation of cultural identity.

The strategy is categorized in three basic sectors:

- content producers,
- network operators
- users

All of them are equally important and play a key role as components in the value chain. The detailed value chain:

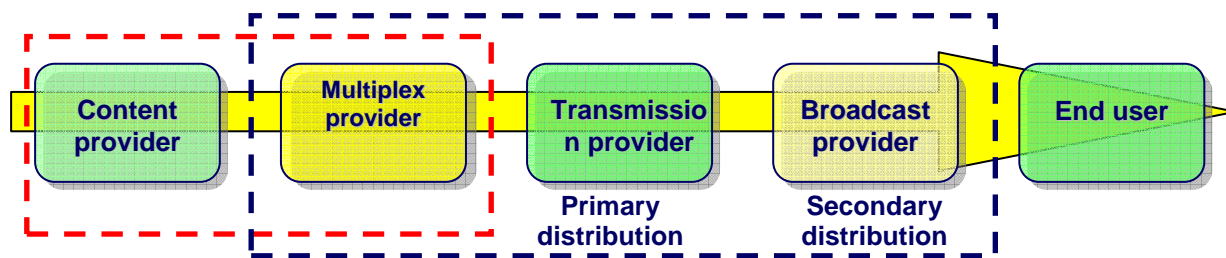


Figure 1. Value chain (DTT)

Regulatory Priorities:

- The means and procedure for selection of network operators (who and in what way can be issued a licence for operating a digital broadcasting network),
- The means and procedure for multiplex managing,
- The means and procedure of issuing licences for different programme contents,
- The programme broadcasting fees.

### 1.1 Licensing /Authorization schemes

It has not been decided. The regulatory priorities define the basic aspect, which will be shaped by public discussions.

### 1.2 Spectrum planning

On the basis of the GE06 Agreement, Serbia was allocated seven layers (networks) for digital broadcasting of television programme in the UHF and one layer (network) in the VHF band. Additional channels were also allocated in the wider territory of the City of Belgrade and in the Southeast part of Serbia, as shown in the Table 1.

Table 1. The overview of the distribution zones with allocated channels for DVB-T (Source: RATEL)

Band	Number of distribution zones	Number of channels per zone	Possible number of networks
VHF band	9	one channel	1
	The City of Belgrade zone	1 additional channel	1
UHF band	15 (Deli Jovan, Tupiznica, Kopaonik, Jastrebac and Besna Kobila)	7 channels (2 additional channels)	7
	The City of Belgrade Zone	6 additional channels	

In the Figure 2, distribution zones for DVB-T with allocated channels in VHF band are presented.

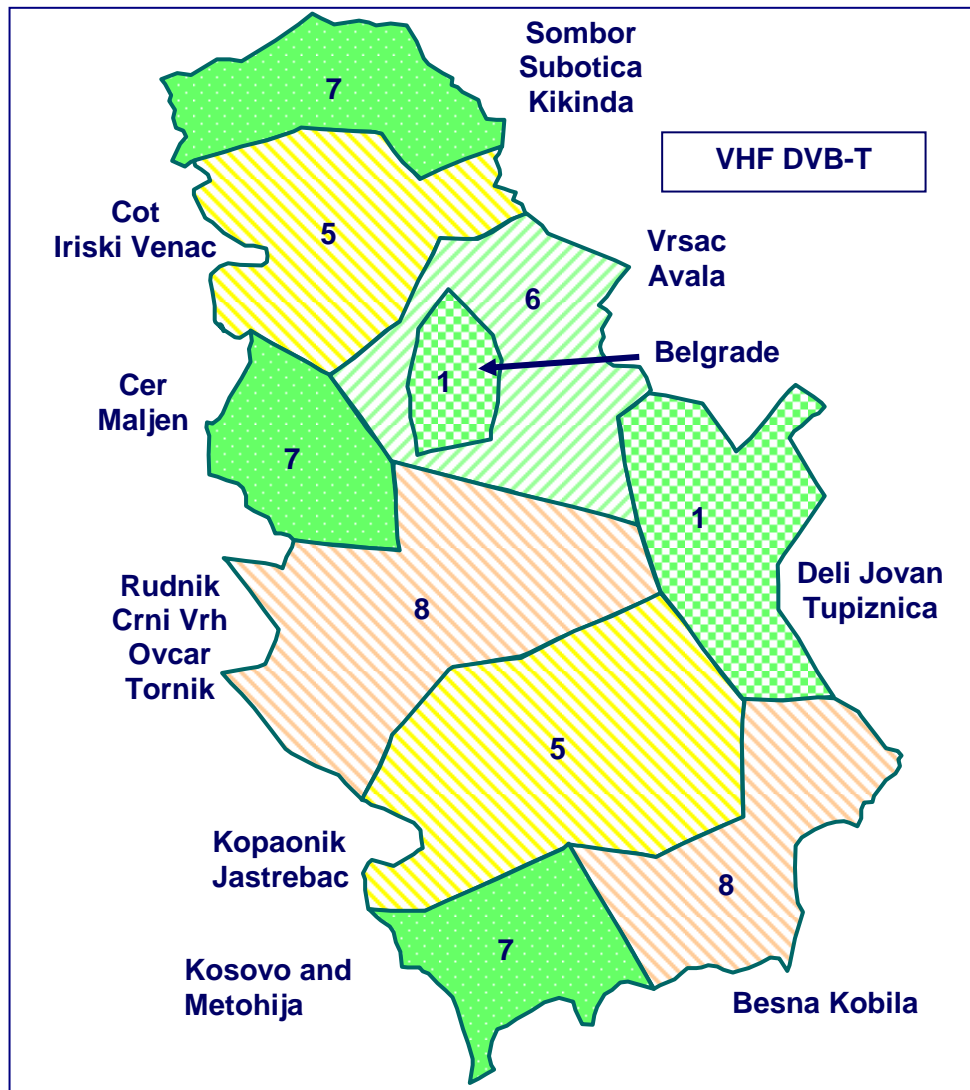


Figure 2. Distribution zones with allocated channels for DVB-T in the VHF band (Source: RATEL)

Serbia was allocated fifteen distribution zones in the UHF band for its entire territory, while the distribution zone for the wider territory of the City of Belgrade was allocated six additional channels. The distribution zones with the allocated channels for DVB-T in the UHF band are presented in Table 2. and shown in Figure 3.

The design of networks for digital broadcasting will be performed on the basis of the final Act of GE06, and in line with the Action Plan document, which will be adopted by the Government of the Republic of Serbia, as an integral part of this Strategy.

Table 2. Distribution zones with allocated channels for DVB-T in the UHF band (Source: RATEL)

Serial number	Distribution zone	Channels
1.	Avala	22,28,33,45,57,62,64
2.	Belgrade	43,50,51,53,59,68
3.	Besna Kobilica	35,39,43,49,54,59,62,63,69
4.	Vrsac	25,31,37,39,42,56,60
5.	Deli Jovan	23,24,41,43,52,59,63,66,68
6.	Jastrebac	27,33,38,42,45,55,57,60,64
7.	Kikinda	29,32,51,55,59,63,69
8.	Kopaonik	22,24,28,32,34,41,51,61,66
9.	Kosovo and Metohija	21,31,44,46,48,58,67
10.	Tornik-Ovcar	23,36,39,50,56,59,63
11.	Rudnik-Crni Vrh Jagodina	26,29,35,40,46,67,69
12.	Sombor	34,39,40,43,58,62,64
13.	Subotica	29,40,43,55,58,59,6
14.	Tupiznica	22,25,28,31,37,44,50,58,65
15.	Cer-Maljen	32,34,37,42,47,49,52
16.	Cot-Venac	24,30,41,48,54,61,66

The yellow colour shows which zones (frequencies) are affected by the digital dividend. The broadcasting may lose 19.8% of the available frequencies.

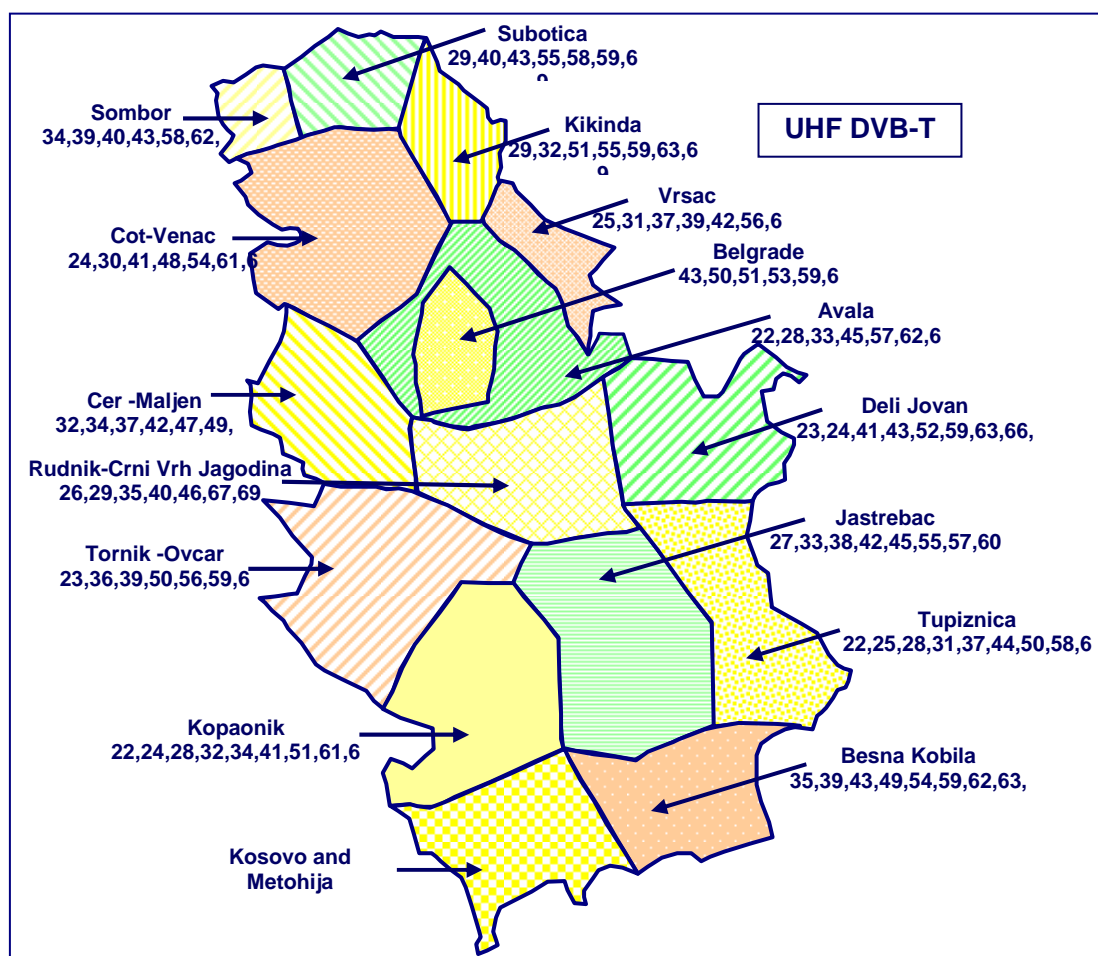


Figure 3. Distribution zones with allocated channels for the DVB-T in the UHF band (Source: RATEL)

The frequency planning is fundamentally based on MFN with SFN based allotments

### 1.3 Applicable Standards

They have not been decided yet. DTT is based on DVB-T2 standard published last year, which enables 30 to 50 percents bitrate increase, as compared to the first generation standards.

At the moment, there are very good results on DVB-T2 experiments in England and Italy with 5-6 modulator/demodulators. Multiplex with 45 Mbps is already in use in Italy. At the moment of implementation of the DVB-T2 in Serbia, there will be available devices from different manufactures. According to the plans, Serbia will have ASO in 2012 and it is expected that the launch of DVB-T2 would be facilitated. In the meantime, few European countries will switch its multiplexes to DVB-T2 (2009.).

Mobile TV will be based on DVB-H standards.

The MPEG-4 standard part 10 (version 10) may further the fast switchover in consideration of the circumstances. The disadvantage of this solution is the price of the set top box, which decreases year by year. On the other hand it will support the initiation of the high resolution High Definition Television (HDTV) after the analogue switch-off.

The standards provide a lot of options for the service provider. It is necessary to notice that it establishes a claim to regulation in the interest of the picture quality. It is necessary to define the bitrate of SD and HD format.

(The trial, which was launched In Beograd and Novi Sad by RTS, is based on the MPEG-2 standard.)

### 1.4 Broadcasting network structure (ownership of multiplex, transmission network);

This document is not focused on the analogue transmission, but it is necessary to mention it. The Broadcasting Act, which was accepted in 2006, determinates the rules for television services. The present situation:

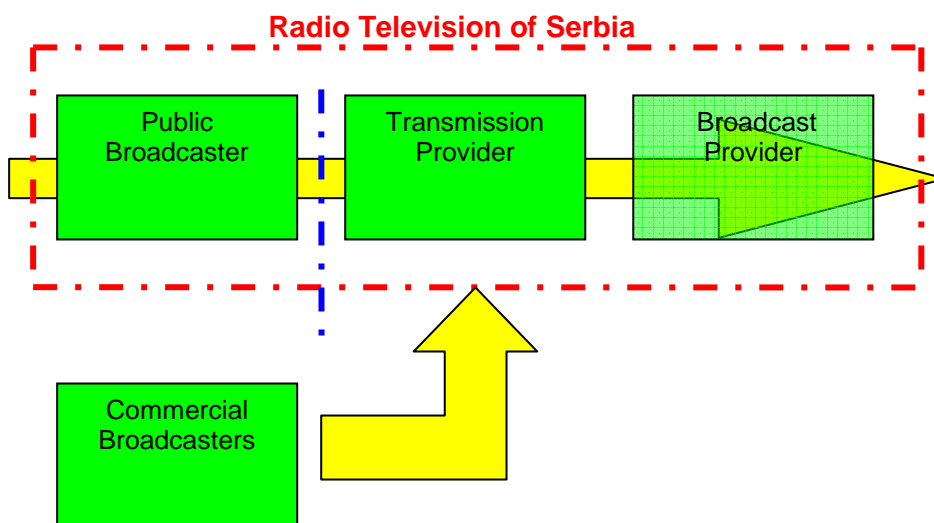


Figure 4. Network structure

The Radio Television of Serbia (RTS) is a state owned company. RTS is the public content provider and it has an infrastructure for nationwide broadcasting. Other market players rent the infrastructure from RTS.

An important step made in the process of digitalization is a Conclusion adopted by the Government of the Republic of Serbia on December 25<sup>th</sup> 2008, about the separation of broadcasting technology from Public Service Broadcasting (RTS). The Republic of Serbia is now in the phase of forming an independent body that will control broadcasting technology and its use on the territory of the country. This step may ensure the transparency on the market.

We should not forget that one of the key drivers may be the public broadcaster for the digital switchover. The opportunity of regional broadcasting generally belongs to the public broadcaster. By using other technology (cable, satellite, etc.) the full population cannot be reached. Therefore it is important, that the claims of the public broadcaster should be taken into consideration for long-term under the mentioned process.

The Serbian public broadcaster RTS will need the state's help to make the digital switchover, a project whose costs are estimated at between €20 million and €50 million by estimate of Telecommunications and information society minister, Jasna Matic.

Generally two public and five commercial channels are available with nationwide coverage. They have a right to use the analogue network till 2014.

Table 3. Nationwide terrestrial broadcasters

<b>Name of channel</b>	<b>Type</b>
RTS 1	Public
RTS 2	Public
RTV Pink	Commercial
B92	Commercial
Happy TV, Kosava	Commercial

The RTS Culture and Arts (or RTS Digital) channel began broadcasting on November 26, 2008. The network airs classical and jazz performances and will broadcast various concerts as well as ballet performances. It is available to citizens in Belgrade and Novi Sad having a DVB-T receiver and through cable television.

Regarding analogue broadcasting, the Broadcasting Development Strategy has stipulated up to 5 commercial television broadcasters with national coverage, up to 40 regional and up to 160 local television broadcasters.

Strategy for the switchover from analogue to digital broadcasting of television programmes in the Republic of Serbia is to be adopted in a situation where a large number of broadcasting licences were issued for analogue broadcasting, with only a small number of free channels remaining on some locations.

## 1.5 Strategies and process of transition to DTTV and introduction of MTV;

The Ministry of Telecommunications and Information Society issued the draft strategy for discussion.

Timeline for introduction of DVB-T:

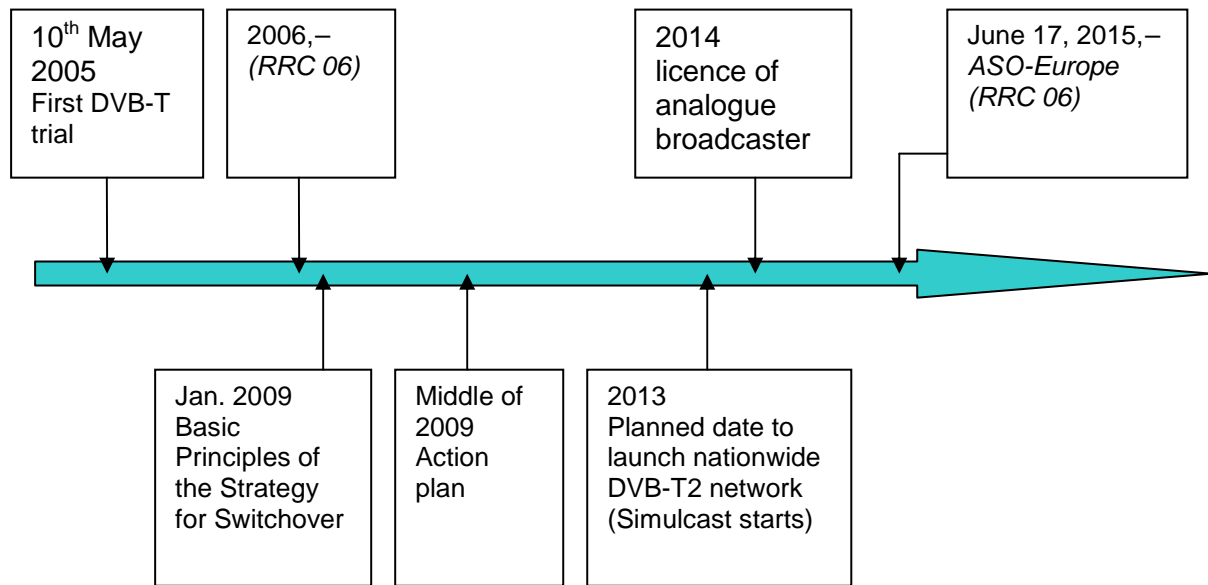


Figure 5. Timeline of DVB-T

At the moment there is no decision made when the simulcast period will start and the available number of multiplexes for simulcast period has not been defined yet either. 10-11 SD programs are planned for the transition period, Pay TV won't be available on the first multiplexes, due to the scant capacity the HD service will be available only from launch of the third multiplex.

Mobile TV:

The Ministry of Telecommunications and Information Society is examining the existing business models for mobile television (discrete, converged, principal, bypassed), as which would be possible to be introduced in Serbia. Mobile TV means the DVB-H technology in this context.

The market players involved:

- Public and commercial broadcasters

- Transmission and broadcast provider(s)
- Mobile network operators

The last group, compare to the DVB-T appears as a new player on the market. Their role and economic size could be similar in the implementation of mobile TV.

DVB-H has been introduced in few countries because currently there is not much experience and best practise in this field.

At the moments there are three mobile network operators in the country:

Table 4. MNOs in Serbia

Operator	Technology	Subscribers (in millions)	Ownership
mt:s	GSM, GPRS, UMTS, HSDPA	5.55	Telekom Srbija (80% Pošta Srbije, 20% OTE)
Telenor	GSM, GPRS, EDGE UMTS, HSDPA	3.04	Telenor
Vip	GSM, GPRS, EDGE UMTS	1	Mobilkom Austria

(Data from middle of 2008)

### **1.6 Measures to promote investment and switchover;**

After the RRC 06 the next milestone was that the Ministry of Telecommunications and Information Society published the Strategy this year. The strategy formulates many open questions, but responding to them may happen to the withdrawal of the concerned participants, market players solely. The ministry starts the open discussion for the sake of the cause. The processing of the received opinions is currently underway.

Depending on the result there may be need for the fine-tuning of the legal environment. Following the finalization of the strategy the action plan will get the acceptance, which specifies the tasks, orders the responsibility and deadlines. The call for tender will be released probably in 2011.

It is necessary to manage to reach some kind of agreement with the present broadcasters that they support the digitalization and, will become the role players while the state has respect for their analogue license. In order to achieve this both parties have to be open to compromise.

An inter-departmental Workgroup is established for the switchover to coordinate the work of all the participants in this process in October 9<sup>th</sup> 2008 who are the principal holders of the promotional campaign and their key partners, in order to successfully carry out all the information and educational activities set up by the Strategy.

### **1.7 Costs and benefits analysis related issues;**

There are no such things in this phase. Analogue terrestrial broadcasting is a popular reception mode in Serbia. Relatively many programmes are available due to the



Broadcasters and they can be reached free (FTA). The cable television providers offer their services mainly in the big cities DVB-C, and IPTV appeared on the market, but their share is negligible. The present market overview:

Table 5. Market share of platforms

Platform	Market player(s)	Market share (%)
Terrestrial (analogue)	RTS	Estimated 70-80
Terrestrial (digital)	RTS	Cannot be measured (trial)
Cable (analogue)	SBB, PTT and Ikom the biggest ones from 58 operators	10,7
Cable (digital)	There is no data	Cannot be measured
Satellite (DTH)	SBB, TotalTV, DigiTV	Estimated 10-20
IPTV	Telekom Srbija (from 15 October 2008)	Cannot be measured

The digitalization is generally a market-oriented process except the terrestrial platform. The frequency is a state resource therefore the state has to take part in the process actively.

### 1.8 Convergence and competition policies.

The Telecommunications Act and the Broadcast Act determine the basic principles for the communications and audiovisual market.

Principles on which the regulation of business relationships among players in the telecommunications sector are based have also been defined, and these principles are as follows:

- Provision of conditions for development of telecommunications in the Republic of Serbia;
- Protection of interests of the users of telecommunication services;
- Creating conditions to meet the users' needs for telecommunication services;
- Encouraging competition, economical and efficient behaviours in business operations within the telecommunications sector;
- Ensuring the maximum quality of telecommunication services;
- Providing interconnection of telecommunications networks, that is, of telecommunications operators under the non-discriminatory and mutually acceptable conditions;
- Providing rational and economical utilization of the radio frequency spectrum; and
- Harmonization of operations in the telecommunications sector with the international standards, practices and technical norms.

Regulatory framework in the broadcasting sector has been based upon the following principles:

- Freedom, professionalism and independence of public broadcasters, as a guarantee for the overall development of democracy and social harmony;

- Reasonable and efficient utilization of the broadcasting spectrum as a limited natural resource;
- Prohibition of any kind of censorship and/or influence on the work of public broadcasters, which guarantees their independence, independence of their editorial boards and of their journalists;
- Complete affirmation of citizens' rights and freedoms, and especially of the freedom to speech and pluralism of thoughts;
- Application of internationally recognized norms and principles related to the broadcasting sector, and especially those that pertain to the respect of human rights in this sector;
- Objectivity, non-discrimination and free availability of the broadcasting licence issuing procedure;
- Encouraging the development of broadcasting and creativity in radio and television sector in the Republic of Serbia.

Additionally, it has been stipulated that the principal stakeholders in the public broadcasting sector are obliged to provide for the utilization and development of modern technical and technological standards in programme production and broadcasting and also to prepare and implement, within a designated timeframe, all the plans for the switchover to the new digital technologies.

The state laid clear basic principles down in the laws. They cannot easily be implemented in practice. Let us think about the number of the available multiplexes, which can be used in the transitional period, which are technically one unit in this sense and they cannot be create the competition within the platform. The terrestrial broadcasting is obviously in a competition on the market. (e.g. cable, satellite)

Other activities:

The GSM association has started a strong lobby activity that the digital dividend should be available for the Mobile Network Operators as soon as possible and let it be supported by the given country.

## **2. Economic aspects**

The planning of funds and monitoring of expenses over the period of transition are important and serve the interest of a successful switchover.

The Strategy and its implementation must take into consideration the advantages and drawbacks for all participants and interested parties involved in the transition process, and also define the packages to be provided by means of the new services.

The switchover in television broadcasting has been planned as a market oriented process, based on the principles of transparency, non-discrimination, market subsidiarity and technical neutrality, with clearly defined objectives and procedures for the existing broadcasters and broadcast provider.

Digitalization will contribute to the better (more profitable) utilization of the broadcasting frequencies which are limited public resource, on the other hand provides a larger number of different television programmes, and the availability of interactive services for the users.

The switchover of terrestrial television broadcasting, cannot be implemented successfully without precise identification of the necessary financial means and sources of funds for these purposes.

Several aspects must be considered:

The Strategy will be used to establish the costs of the process of introducing digital broadcasting of television programmes, derived from the following:

- Necessary technical, financial and other means, needed for realizing the network of digital broadcasting systems, and the entire investment implementation dynamics, with due diligence to the chosen standard for compression and transmission of television signals;
- The scope, criteria and costs of subsidizing the acquisition of digital receivers (that is, of STBs) for end users, in order to ensure the inclusion of all social groups in the process of switchover to digital broadcasting of radio and television programmes;
- The promotion plan aimed at informing the general public and preparing the general public for digital broadcasting, including adequate training courses for the use of digital equipment and new services, in cooperation with broadcasters.
- Instruments for managing and implementing this Strategy document (analyses, opinions, public perception polls, etc.).

Economic impacts and effects are especially important for individual participants and stakeholders in the digitalization process, above all for the producers of programme contents, network operators, equipment manufacturers and state institutions.

The Strategy and the Action Plan for its implementation will propose a method and dynamics for the switchover process, bearing in mind the interdependency of technical, regulatory, social and economic elements, as well as the interdependency between the programme contents and the bringing of the digitalization process closer to the citizens.

#### Question of infrastructure

Unfortunately the consistence of the communications infrastructure has deteriorated in the past years. The economic and financial circumstances have not provided an opportunity for development. What should be reconsidered in the course of the digitalisation is that the existing infrastructure would be made suitable for digital broadcasting, or a new one should be built up, which makes the conditions of the digital broadcasting better.

## 2.1. Business model and plan(including potential services, cost and funding);

The business model has not been determined yet. It does depend on market players (including broadcasters, the transmitter provider, etc.) and technical possibilities like available multiplexes in the transition period. The main problem is how they can make the service attractive to viewers until all the channels are transmitted digitally they have to provide something “extra” to appeal to the public.

No economic analysis has been made because of the lack of a business model. We have already mentioned the problem of infrastructure, which would require a relatively substantial investment. This is a basic question how the state will be able to finance the new network, with or without the commercial providers. The present economic crisis compounds the situation for both parties. Due to the financial crisis the implementation will probably take more time.

## 2.2. Market analysis related issues.

There has been no market analysis made so far. The above-mentioned circumstances limit the market opportunities. The viewers' needs must be taken into consideration for a successful launch since viewers watch the programmes on cable, satellite and via other transmission modes as well.

## 3. Consumer aspects

### 3.1. Consumer understanding issues

Since the digital broadcasting is still in its early days the viewers are not familiar with it. (Except for the people involved in the trial) During the introduction it is of high importance the public should be properly informed in due time and in the right form. Digital broadcasting is a new technology and opportunity for the viewers, but on the other hand they are going to lose the possibility of the reception of former analogue broadcasting. (They might feel that the state deprived them of something they used to have.)

### 3.2. Consumer research issues (trends and appropriate services)

No needs analysis has been performed to date. It is desirable that the quality of the digital terrestrial broadcasting should exceed the quality of the analogue service. (e.g. picture quality, reception mode)

### 3.3. Consumer support issues.

The success of the switchover largely depends on the general public participation in the digitalization process, that is, on a comprehensive promotional campaign that will be primarily directed towards the general public, with the aim to:

- Inform the citizens about the definition and nature of digital television and about the reasons for the switchover from analogue to digital broadcasting of television programmes;

- Educate the citizens about the benefits of digital television and potential ways of using new possibilities offered by new technologies;
- Provide all citizens of the Republic of Serbia with the right to information on the dynamics and other details of the switchover from analogue to digital broadcasting of television programmes, and to offer assistance to citizens in the process of the digital switchover.

Promotional activities will include the organization of informative meetings with key participants in this process, press conferences, public discussions, round tables and symposia, radio and TV programme production, publishing of articles in newspapers, and also informational Web site setup and Internet promotion, printing of brochures and promotions on billboard advertisements, establishing of a call centre that will provide information for citizens, and so forth.