

Case studies on migration from Analogue to DTTB of Hungary

(March 2009)

1. Policy and regulatory aspects

The government program handled the case of the digital switchover in an emphasized mode in 2006. The aim of the program was the acceleration of the digital switchover and creation of a new media environment. The Prime Minister's Office prepared the strategy of the digital switchover, which was accepted by governmental decision in March 2007. The strategy reviews the full market segment including the terrestrial, cable, satellite, IPTV or other solutions and covers the radio and television markets. The strategy is basically communication but predicts that the success of the digital switchover without a new media concept is beyond possibility. What is interesting about the strategy is that the value chain was made on its basis. (Program provision – Broadcasting – End user)

The strategy is available on the website of the Prime Minister's Office (Hungarian and English version):

<http://www.meh.hu/szolgaltatasok/dtv/adas20070426.html>

The main points and statements of it:

- it is necessary to switch off the analogue terrestrial TV broadcast network till 2012,
- digital television service is going to be available for everybody

The strategy is platform- and technology neutral, does not support either of them, therefore:

- it essentially targets all Hungarian households,
- it expands audio-visual services selections,
- it may promote the use of information society services,
- creates significant need for service provider (transmitters, network) and consumer (decoders, digital receivers) investments
- it may result in a rearrangement of analogue market positions and revenue processes in the communications and media sector,
- it speeds up institutional and regulatory convergence processes.

Digital switchover in a value based approach:

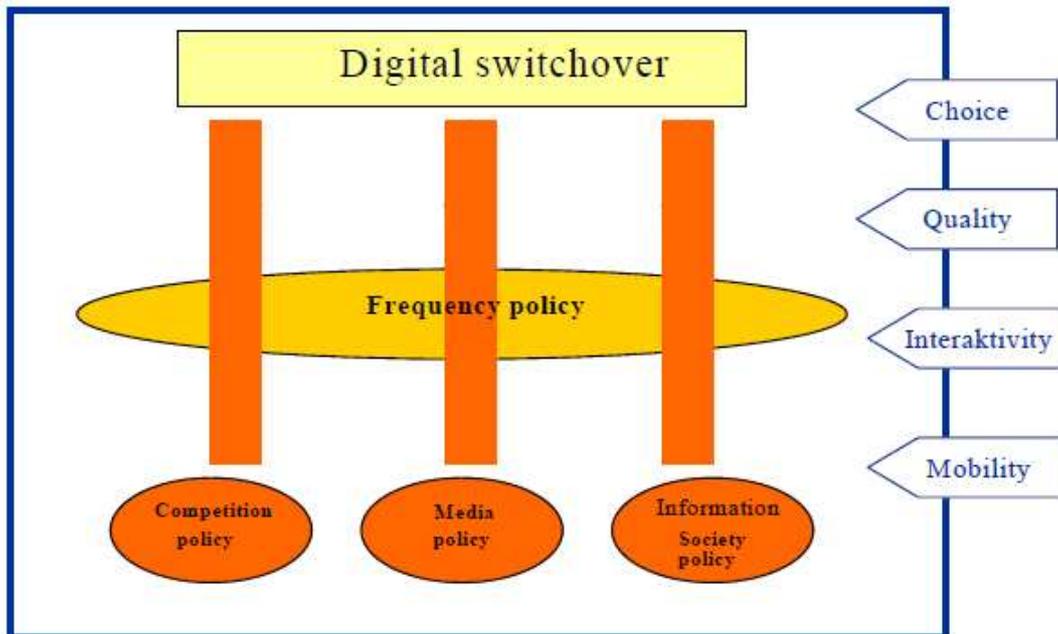


Figure 1. Policies

- The most of the prominent EU initiative regarding digital switchover concerns the Commission's wish to coordinate the switch-off of analogue terrestrial television programming at community level, in order to validate community level spectrum management aspects: the latest date at which member states are allowed to switch off analogue broadcasting services is December 31, 2011. Considering the fact the majority of the neighbouring countries intend to adhere to this deadline, adopting a later target date would give rise to diplomatic difficulties for Hungary from a frequency coordination point of view, as surrounding countries would be unable to fulfill their objectives without Hungary's switching off of analogue terrestrial services.
- The fact is that fewer channels will be available on the DVB-T platform in the simulcast period in Hungary than in the leading countries. This will make digital terrestrial supply significantly less attractive and cast doubt on the viability of a hybrid offer (containing FTA and pay selection) as well.
- As a result of the RRC-06 meeting, the set of frequencies necessary for launching digital transmission will only be available after digital switchover has been fully accomplished (after 2012). Until this is achieved, the frequencies negotiated with the neighbouring countries currently offer three terrestrial digital television networks in the switchover period until 2012.

Table 1. The priorities

<p>“Philosophy” and instruments of the strategy</p>	<p>The overall objective of the strategy is to aid the priorities listed below during the digital switchover with clear regulatory conditions and practice, in accordance with relevant EU directives; confident public policy involvement and a targeted subsidy</p>
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	policy that upholds the principles of technological neutrality.
Priority 1	The reinforcement of media pluralism Digitalization of television and radio archives Spreading of interactive services with high added value
Priority 2	Expedient use of limited resources Establishment of sustainable and effective market competition in digital broadcasting
Priority 3	Improvement of consumer awareness Making basic digital television services accessible to disadvantaged social groups

1.1 Licensing /Authorization schemes

For DTT:

The strategy and the law defined the rules of the implementation and operation of the digital television network. Basically the tender was a beauty contest, but the tender documentation gave some rules how to support the digital switchover by the winner. These rules could be expressed financially (see later). The main goals and rules:

- The following market players were not allowed to apply:
 - Main cable TV or DTH operators who have more than 300,000 subscribers
 - Commercial and public broadcasters
- If the present analogue broadcaster provider applied for this position they had to establish a new company.
- Five of eight multiplexes were open to tender (because the legislators thought about the digital dividend)
- The tender intended to encourage the applicants to choose state-of-the-art technology (MPEG 4 for example) with extra points in tender process.
- It also inspired the applicants to operate DVB-H service on one of the five multiplexes from the beginning. (The frequencies on the second multiplex are suitable for DVB-H service)
- It also brought extra points if the applicant undertook the new commercial broadcaster would be available on the first multiplex.
- The present commercial broadcaster who uses the nationwide analogue terrestrial network was entitled to join digital broadcasting while they had to accept that their analogue license terminated before the deadline (2012). They could choose between two situations:
 - they do not want to give up their analogue license, therefore they will not be available on the digital multiplexes,

- they give up their analogue license before the deadline, therefore they have the right to use the digital multiplex without any tendering
- The public broadcasters are under the rules of must carry. It is a basic right to be on the multiplex without any tendering.
- The authority defined the minimum criteria for coverage and roll out. The applicants could undertake quicker implementation and higher coverage.
- Extra points were also provided for interactive services and campaigns. The campaigns meant the operation of the webpage, distribution of leaflets and advertisement.
- The criteria were that winner should operate a helpdesk and showroom.
- The winner should subsidize the set top boxes for those who live at a low standard of living.

These criteria provide ground to strengthen the competition on electronic communications and audiovisual media fields.

1.2 Spectrum planning

The National Communications Authority is responsible for frequency management (international coordination, new frequency resources for analogue and digital broadcasting). The authority gives the frame regulation and the winner has a right to plan their network. Generally the planning is based on MFN, but if it is necessary the SFN transmitter should be launched. (like a gap filler in the MFN zone)

The present situation in UHF and VHF bands.

The UHF band is used for different services, but basically for TV broadcasting D1 system 8 MHz bandwidth. Some channels are used for military purposes.

The frequencies between 174 – 216 MHz and 470 – 862 MHz are used for secondary services as wireless microphones.

On the basis of the GE06 Agreement, Hungary was allocated seven layers (networks) for digital broadcasting of television programmes in the UHF and one layer (network) in the VHF band.

Hungary was allocated 15 distribution zones in the UHF band. The distribution zones in the UHF band are shown in Figures 2-6. The design of networks for digital broadcasting will be performed on the basis of the final Act of GE06. Multiplex D, E will be available after the ASO.

Multiplex A:

Zones in the multiplex with number of used channels. Available temporary frequencies are indicated in the brackets.

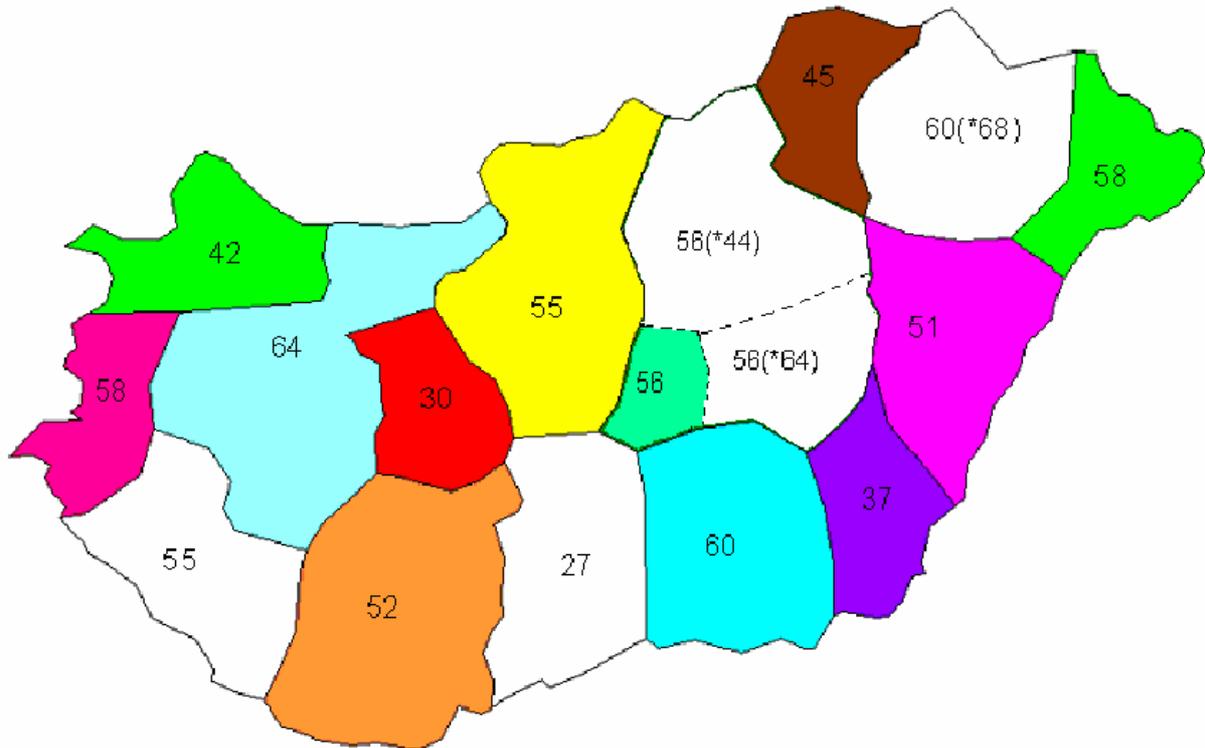


Figure 2. Multiplex A

Multiplex B:

Zones in the multiplex with number of used channels. Available temporary frequencies are indicated in the brackets.

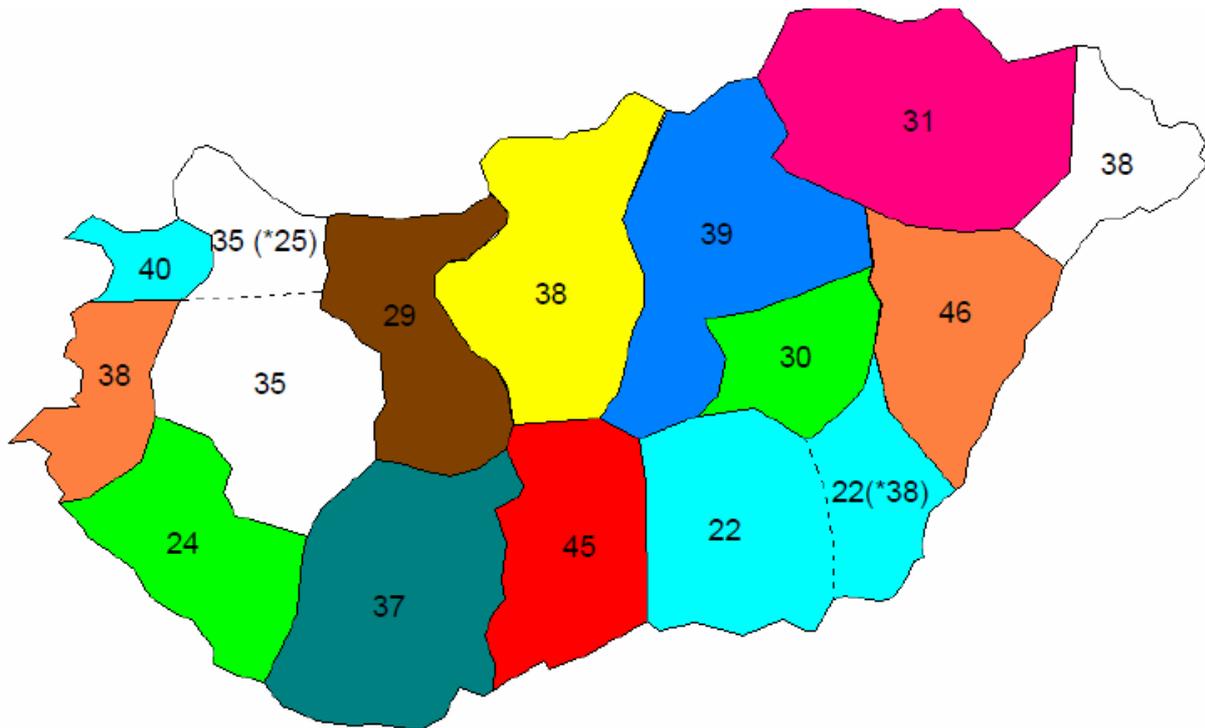


Figure 3. Multiplex B

Multiplex C:
 Zones in the multiplex with number of used channels. Available temporary frequencies are indicated in the brackets.

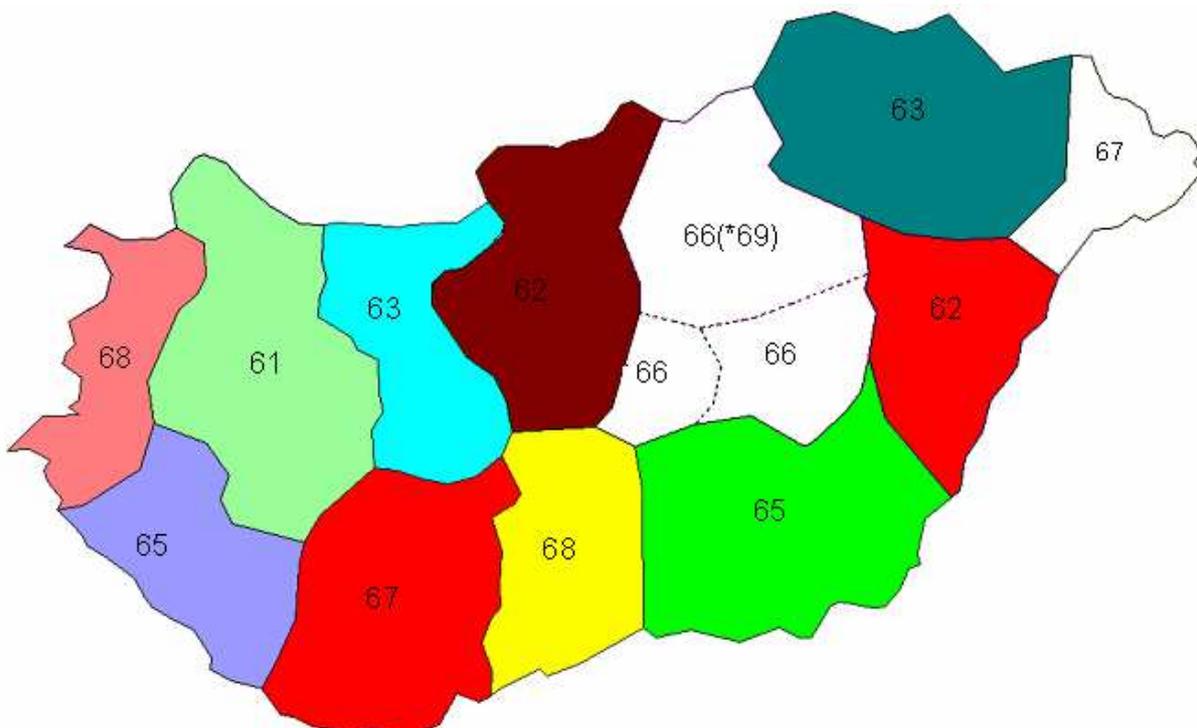


Figure 4. Multiplex C

Multiplex D:
Zones in the multiplex with number of used channels.

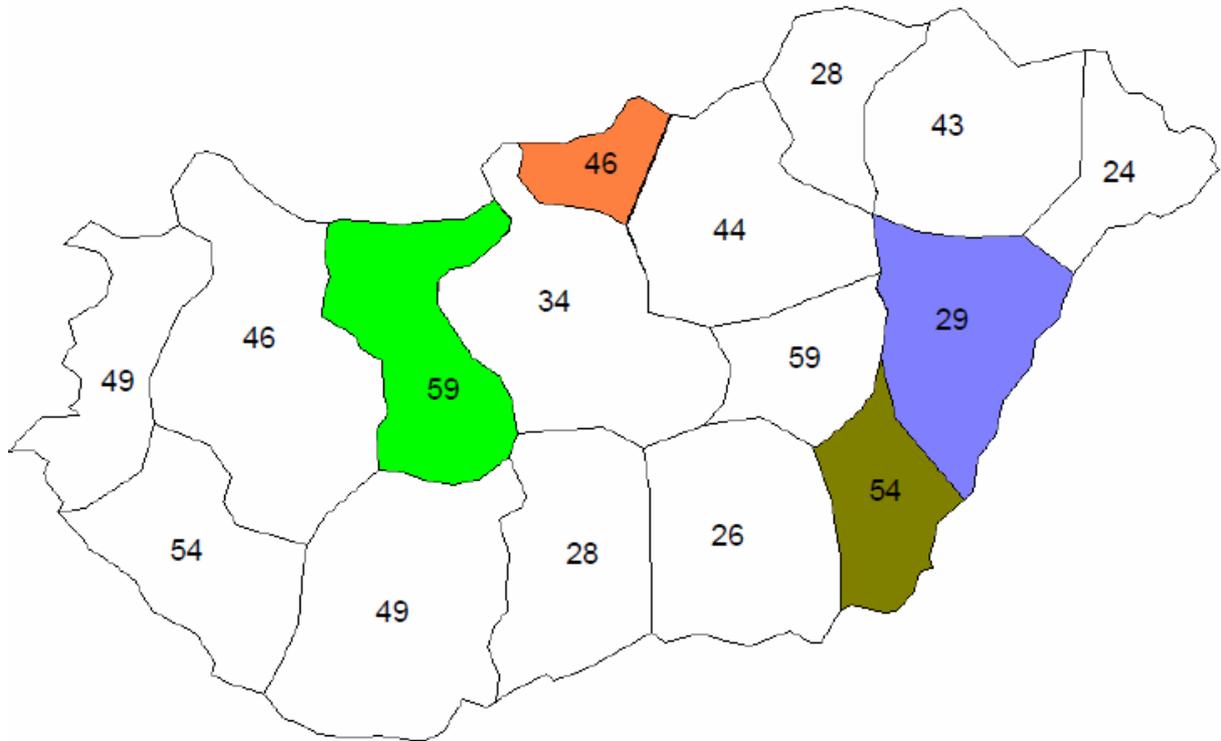


Figure 5. Multiplex D

Multiplex E:
Zones in the multiplex with number of used channels.

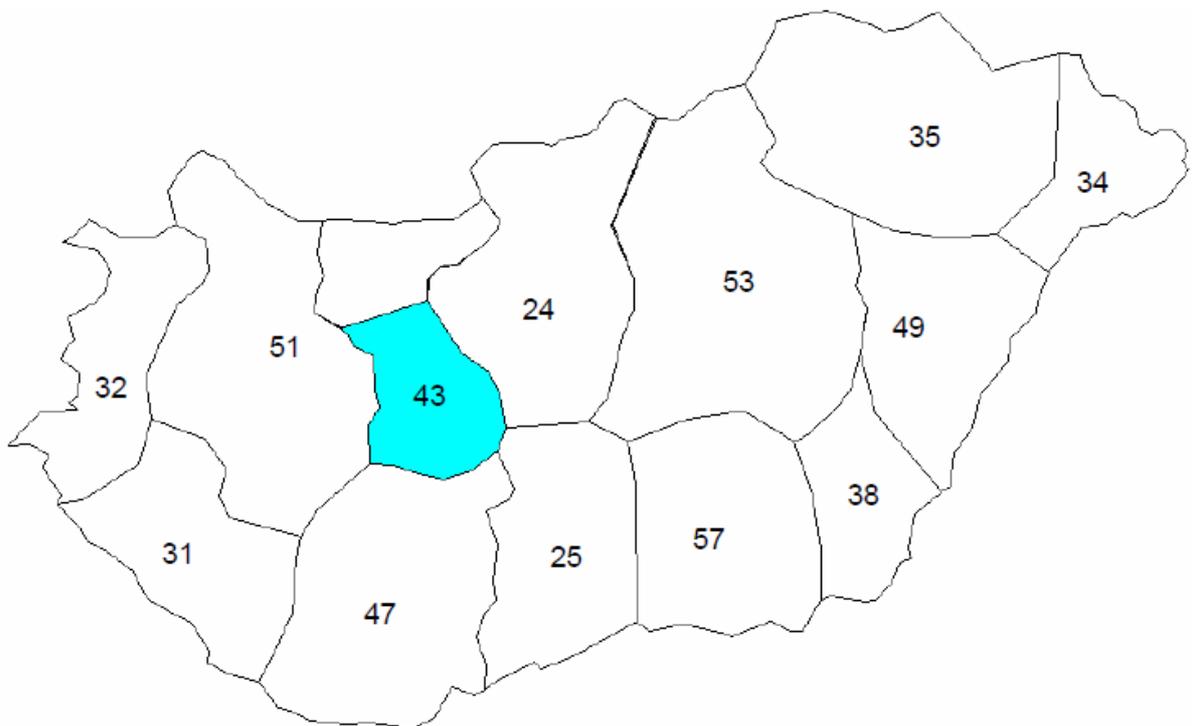


Figure 6. Multiplex E

Digital Dividend

One layer is affected by the digital dividend. Due to the massive analogue use and switchover process the dividend will be available after 2012. It has not yet been decided what access could be possible in the future. It could be a tender or an auction.

1.3 Applicable Standards

DTT is based on DVB-T and Mobile TV is based on DVB-H standards.

The MPEG-4 (AVC/H.264) Audio Musicam or and Dolby Digital Plus (E-AC3) standard was offered by the winner and the service was launched based on it last December.

The standards provide a lot of options for the service provider. There are not any rules about picture quality. It depends only on the market players (broadcaster and multiplex service provider). The players define the capacity which belongs to one SD or HD channel. The National Communications Authority does not have the right to intervene in case of bad quality except the market players do not keep their agreement between each other.

(The trial, which was launched in Budapest and Kabhegy, 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, because it is connected with digitalization. (see rules for operating of the DVB-T multiplex.)

The present analogue situation:

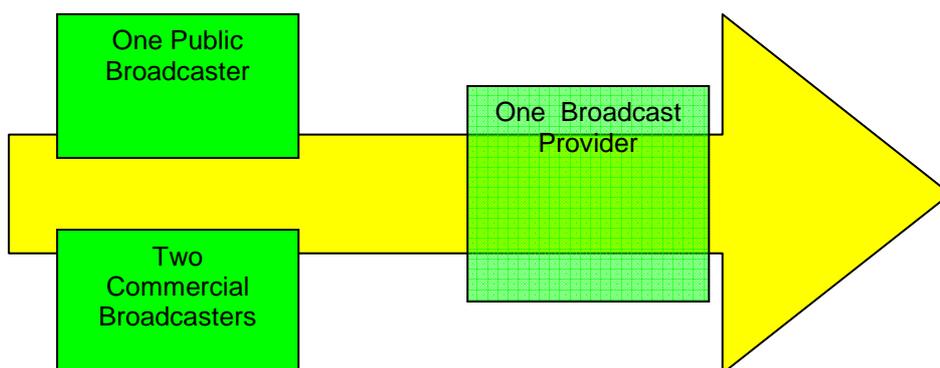


Figure 7. Network structure

The present digital situation:

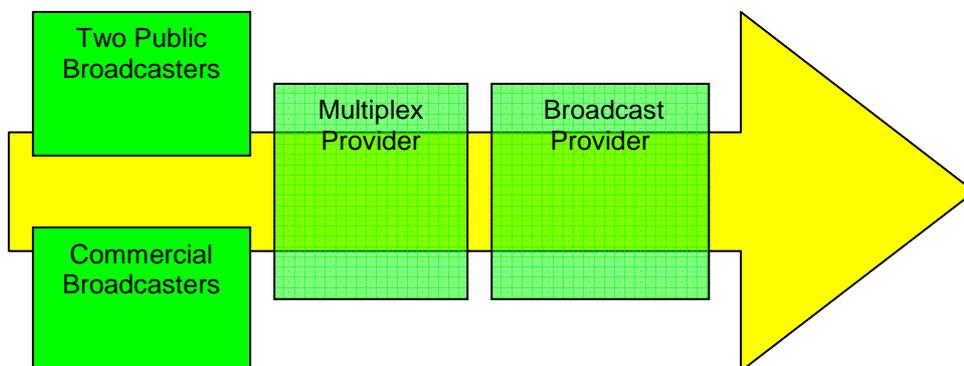


Figure 8. Network structure

One of the public broadcasters is on the satellite because the analogue frequency, which should give nationwide coverage, was not available for them. This public broadcaster with their two channels is available on the DVB-T platform due to the must carry rules. Two commercial broadcasters use the analogue networks and they have a right to be on the multiplexes without any tender.

The former analogue broadcast provider won the right to operate five digital multiplexes therefore this company (Antenna Hungária Zrt.) established the company in compliance with rules. The new company is owned 100 % by Antenna Hungária Zrt. The real service provider is Antenna Hungária Zrt, but authorities have a better opportunity to control this market field. (Two companies means separate accountancy between analogue and digital licence.)

The multiplex provider is based on a strong multiplex model, in the same way as cable television or DTH service providers. Who operates the multiplexes could define the content which will be available for the viewers. (Except the public broadcaster, because they must be on the multiplex and two commercial broadcasters have a right to be on the multiplex due to the legislation.) The multiplex service provider (who is a broadcast provider in this situation in Hungary) has an opportunity to choose the attractive contents for the multiplexes, which could be FTA or Pay TV channels. On the other hand the opportunity means responsibility. It is necessary for the multiplex provider to find the best business model, they have to analyse the audiovisual media and electronic communications field and they have strong competitors (cable TV and DTH provider).

The obligations and opportunities are similar at mobile TV. It is necessary for the multiplex provider to find the best business model with the mobile operators. (See. 1.5 paragraphs)

Table 2. Broadcasters

Name of broadcasters	Coverage	Type	Channels (Terrestrial)	Remarks	Coverage Population %
MTV	Nationwide	Public	M1 M2 (satellite)	M1 (regional in the part of	97 %

				time)	
M-RTL	Nationwide	Commercial	RTL		86 %
MTM-SBS	Nationwide	Commercial	TV2		86 %

Dates of the ending license for analogue commercial broadcaster fall in June 2012.

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

Timeline for introduction of DVB-T and DVB-H:

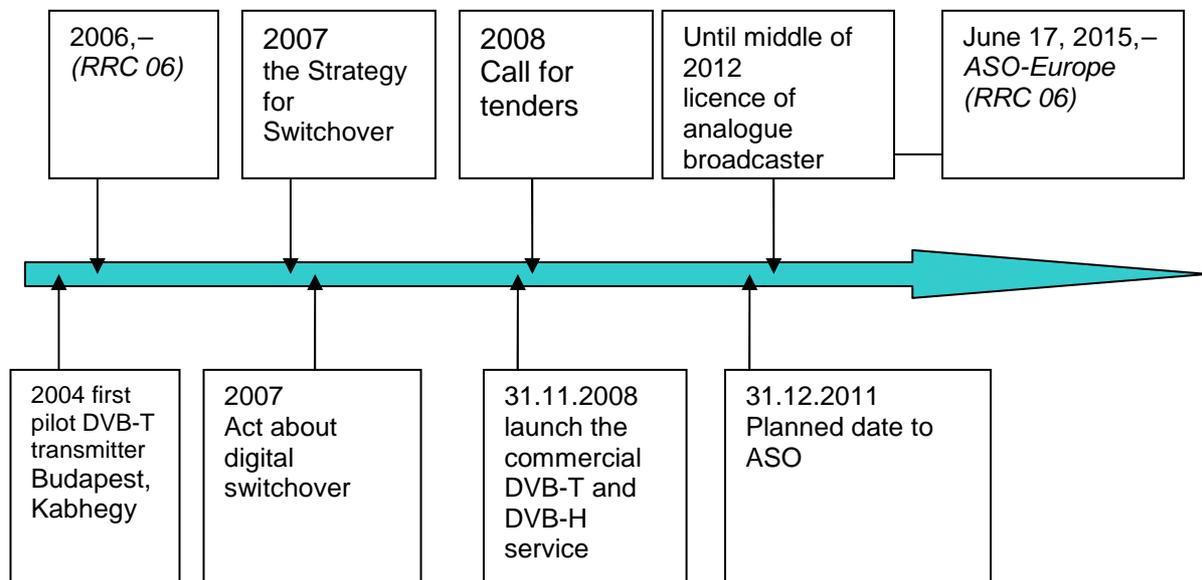


Figure 9. Timeline of DVB-T and DVB-H

At the moment there are three available multiplexes for the simulcast period. Basically pay TV will not be available on the first multiplexes due to the scant capacity of the HD service. It will only be available from the launch of the fourth multiplex. However two news channels are available as pay TV channels from the beginning.

Mobile TV:

Mobile TV means the DVB-H technology in this context. Last year the winner was given the right to choose between DVB-T or DVB-H networks, which will be on the second multiplex. Antenna Hungária Zrt undertook to operate DVB-H network. Antenna Hungária Zrt launched the service FTA mode last December until they agree with mobile operators about the

technical and financial conditions. The service is available in the area of Budapest. /in the Budapest area.

The business model:

The market players involved:

- Public and commercial broadcasters
- Transmission and broadcast provider(s)
- Mobile network operators

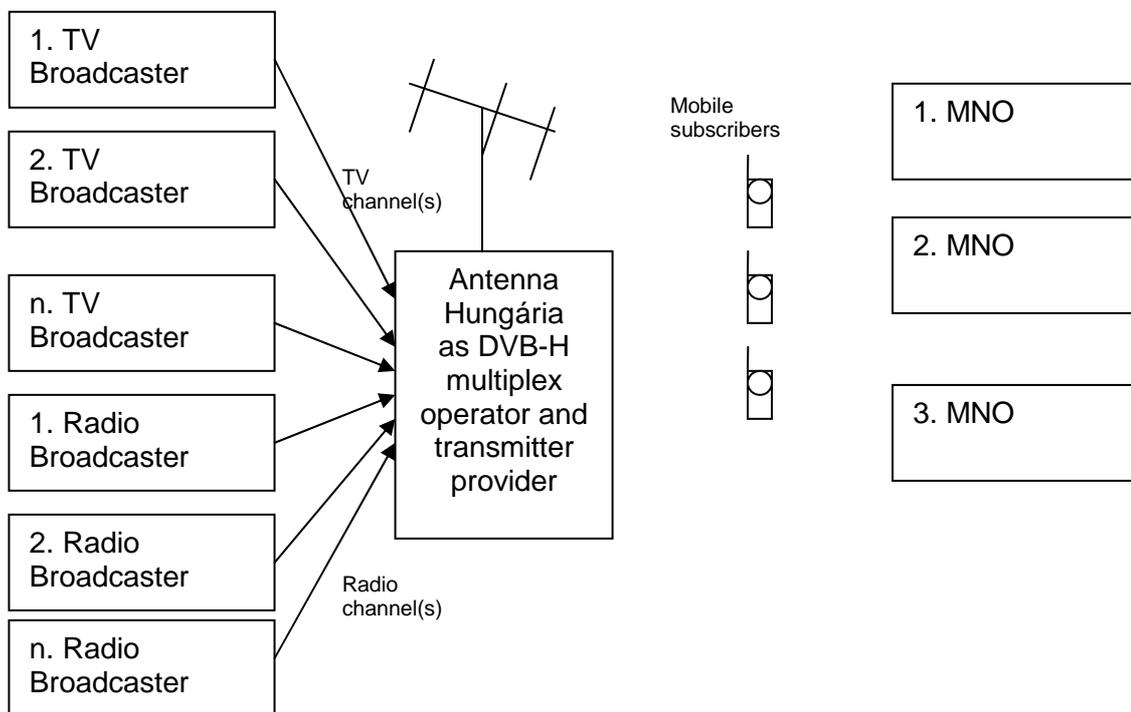


Figure 10. Mobile TV business model

The DVB-H operator provides this service as a wholesale one. They would like to use their own existing infrastructure. If they do not have their own suitable sites (towers), then they will rent them. The operator makes no exception to anybody, they offer the same conditions to the three mobile operators, and do the same towards the content providers. In this case by content providers we mean the TV and radio broadcasters.

The market research constituted as confidential information. So far mobile device availability has not been reported as a problem, but few models are in the mobile network operators' showrooms.

The same content will be available as in the other format (e.g. terrestrial, satellite broadcasting). We have not spoken about the DVB-T service, which should not be

competition to DVB-H service due to the same provider. (If the DVB-T network had offered portable or mobile reception mode and the contents are available free to air it would have been a challenge for DVB-H operator.)

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

Table 3. MNOs in Hungary

Operator	Technology	Subscribers (in millions)	Ownership
T-Mobile	GSM, GPRS, EDGE UMTS, HSDPA, HSUPA	5,2	Deutsche Telekom
Pannon	GSM, GPRS, EDGE UMTS, HSDPA	3,4	Telenor
Vodafone	GSM, GPRS UMTS, HSDPA, HSUPA	2,4	Vodafone

(Data from middle of 2008)

1.6 Measures to promote investment and switchover;

The contract between the multiplex provider and authority defines the rules how to measure the investment and promoting (including the DVB-H service).

Authority check all obligations of multiplex provider which was offer in their tender documentation. It could be measures at the transmitter, could be check all plan, documentation, accountancy data or could be test the shops and receivers.

1.7 Costs and benefits analysis related issues;

The cable television service is a popular reception mode in Hungary, but the market share of the terrestrial is roughly constant. Mention must be made that market share of DTH service has to increase for next years due to the new DTH market player. Not too many programmes are available free due to the legislation. The old-fashioned media act does not allowed nationwide commercial broadcasters - who are use the analogue terrestrial network - to launch second or more channels. The other broadcasters do not have an opportunity to become nationwide FTA broadcasters because their market share is small. 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 4. Market share of platforms

Platform	Market player(s)	Market share (%)
Terrestrial (analogue)	Antenna Hungária Zrt	28
Terrestrial (digital)	Antenna Hungária Zrt	Cannot be measured
Cable (analogue)	UPC, T-kábel, Fibernet, Digi TV	59,5
Cable (digital)	UPC, T-kábel	Cannot be measured
Satellite (DTH)	UPC, T-kábel, Digi TV	12,5
IPTV	T-kábel	Cannot be measured

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

1.8 Convergence and competition policies.

Hungary as member of the EU accepted the directives of the EU and the country put them into practice before the deadlines. The regulatory framework of the EU determines the basic principles for the communications- and audiovisual market. In spite of the fact that the government accepted the new act about the digital switchover, which defines the deadline of ASO and give the rules for call for tenders. After the Parliament accepted the new act started the tender process. When the Parliament accepted it they accepted the Parliament's decision, which said that the new Media Act will be approved until the end of tender. Unfortunately the Parliament has not discussed this act until now. It causes a problem for digital terrestrial broadcasting, because the present content is not enough and not too attractive compared with the multi-channel solution.

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 it should 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 Act about the digital switchover authorized the ministries to write the governmental decisions. One of them will define the fund and rules how to support this process financially. The government has not yet accepted the decision about the fund.

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 providers based on EU legislation.

The subsidizing of the viewers has not been laid down yet from state side. The question is how to promote the viewers and which processes are in compliance with EU rules. It has to

be decided that who could become subsidized and how to define this group. Subsidizing was one of the obligations in the tender documentation. The winner (Antenna Hungária Zrt) offered the set top box with a reasonable price and conditions. It means that they offer the set top box where the monthly instalment is 1 % of minimum wage. (For example price of set top box is 200 EUR the monthly instalment is 2-3 EUR)

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

The business model is not determined due to strategy, but create the frame for it. (strong multiplex model). The winner needs to find the business model (e.g. FTA, Pay TV or mixed, roll out, available content on the multiplexes).

2.2 Market analysis related issues.

There are no analyses for DVB-T or DVB-H services or confidential. The overview of the market predict that market share of digital terrestrial broadcasting will decrease year by year and may stop at 20 % (present value is 28%)

3. Consumer aspects

3.1. Consumer understanding issues

The state and market players are also responsible for the promotional campaign which 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 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.

Market players (cable, IPTV and DTH operators) are active and they promote their service while they educated the viewers. The contract which was established between the provider and state (authority) details that how often and what kind of way (e.g.: brief let, advertisement) necessary to promote the DTT.

3.2. Consumer research issues (trends and appropriate services)

The Prime Minister's Office prepared the strategy based on market analysis (in 2006-2007). No similar general survey has been published since that time. The National Communication Authority published the communications market data last year, which refer to broadcasting field.

Quote from it:

- 99 % of the households have a TV set.
- Average number of the sets in the households: 1,6
- 15 % of households plan to buy a new set in the following 2 years and 4/5 of them would like to by LCD or plasma set.
- 946,000 (23,6 %) households use solely the terrestrial network
- Half of households heard something about the switchover
- The households prefer the better picture quality and PVR service but on the other hand the willingness of payment for these services is low.
- Interest in mobile TV decrease,
- the 10 % of the subscribers who buy the new mobile phone think important that this feature is important

3.3. Consumer support issues

The tender documentation defines the basic rules (later contract between the service provider and authority) how to support the DTT by the operator:

- campaigns
- operation of the webpage,
- distribution of leaflets and advertisement.
- operate a helpdesk and showroom .
- offer the set top box (MPEG4 HD) with a reasonable price and conditions. The monthly instalment is 1 % of the minimum wage.