An overview of digital television in Poland[3]

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1. Introduction of the paper: an outline of the situation in Poland

The main aim of this paper is to present the development of digital television in Poland. As a member of the European Union, Poland is obliged to prepare for the switchover that will include replacing the old, analogue television signal with the digital standard. In order to make the paper complete, it was necessary to write not only about the current situation of DVB in Poland, but also mention the characteristics of this country, current analogue and digital television offer, history of the DVB trial projects and first stages of the switchover process, the biggest players on the Polish DVB market and TV providers, along with the activity of the government and the attitude of Polish society towards the implementation of the new television standard in Poland.

1.1. Background information about Poland

Poland is a country situated in Central Europe. It has 38,1 million inhabitants and a total area of 312,679 square kilometres, which makes it both the sixth largest and most populous country in the European Union. Poland is divided into provinces (Polish: *województwa*) which are based on the country's historic regions. They are subdivided into counties and these are further divided into communes. Poland currently has 16 provinces, 379 counties and 2,478 communes (Kupiec, 2008).

The demographic structure of Poland is very homogeneous. More than 96% of the population consider themselves Polish while only 3% declare another or no

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nationality whatsoever (Kupiec, 2008). The currency in Poland is the Polish Zloty (PLN; the currency exchange rate of PLN against Euro on November 29th was 4,53 : 1).

1.2. Television in Poland: TV channels

1.2.1. Public broadcasting companies.

There is only one national public broadcasting company in Poland, Telewizja Polska SA, which has two nationwide channels, TVP1 and TVP2. It also owns many niche channels like TVP Historia, TVP Polonia, TVP Sport and TVP Kultura, TVP Seriale, TVP HD and 16 regional branches – TVP INFO. TVP1 and TVP2 are accessible for more than 99% of the inhabitants and TVP INFO for 95,2% (Nielsen Audience Measurement). Audience measurement conducted in 2011 shows that main public channels (TVP1 and TVP2) are threatened by the growing popularity of niche channels. Their share has been decreasing for many months as the former TVP viewers seem to have found niche channels' offer more attractive. What is important, the share of TVP niche channels is growing very dynamically. This situation may attest both to the evolution of Polish TV viewers who are aware of the changing trends and new possibilities offered by thematic channels and to easier access to other channels caused by the digitization process.

1.2.2. Licensed television

In Poland there are also some private broadcasting companies with their own TV channels offer – Telewizja Polsat, TVN, TV4, Telewizja PULS, Cyfra Plus, Polsat Cyfrowy and n.

Before the beginning of the switchover process in 2010, POLSAT was technically accessible for 94,8% of residents, TVN – 89,5%, TV4 – 76,4% and PULS - 74% (Nielsen Audience Measurement).

The mentioned channels were, however, accessible for owners of satellite digital platforms – Cyfra Plus, POLSAT CYFROWY and n. Owners of cable television (both analogue and digital) had access to these channels as well.

The statistics refer to the period before September 2010 and have changed since the beginning of digitization process. As MUX2 includes all the mentioned channels – they are technically accessible for 87% of Polish population (EmiTel, 2011).

1.3. Television in Poland: statistics

In 2010, 96,6% of Polish households were equipped with a TV set (Millward Brown SMG/KRC TGI, 2011). 33,2% of them already had at least one flat screen in the household (10,6% more than in 2009) (GUS, 2011). 31% of Poles still watch analogue terrestrial television. 35% own a cable television and 33,1% have a satellite dish and only 4,2% use DVB-T. 70% of Poles have access to digital or cable television (CBM INDICATOR, PBS DGA, 2011). And, what is important, the number of Polish households with two or more TV sets is growing very dynamically. 38% of Polish households have at least two TV sets (TGI MillwarbBrown SMG/KRC, 2011). Poles seem to need access to a TV set not only in the living room, but also in the bedroom or the kitchen, and the growing income makes it possible.

The average monthly payment for using TV in Poland amounts to 45 PLN. As far as only the owners of cable television, digital and satellite users are considered, the average monthly payment is higher (CBM INDICATOR, PBS DGA, 2011).

72,1% of the inhabitants are satisfied with the services of their TV providers (CBM INDICATOR, PBS DGA, 2011).

The average viewing time in Poland in 2010 was 245 (240 in 2009) minutes a day (Nielsen Audience Measurement). However, the share of main channels viewing in this estimate has been decreasing steadily for the last few years. This situation is caused both by the growing number of profiled niche channels that are accessible for the Polish TV viewers, and the commercial TV providers whose offer includes a growing number of the mentioned niche channels.

2. DVB introduction

2.1. Current situation in Poland

After joining the European Union in 2004, Poland has committed itself to implement the DVB-T. However, the process of putting it into practice turned out not to be that simple. There have been many delays that caused further problems with replacing the test stage with the definite switchover process. According to the final plan of the Department of the Infrastructure, the process began on September 29th, 2010.

At this moment in Poland, we are dealing not only with the DVB-S and DVB-C standard, offered by the commercial broadcasters, but also with DVB-T, which is no longer in testing stage, and with IPTV. The channels issued by satellite reach the inhabitants via individual satellite decoders and analogue or digital cable networks. However, more than 90% of the Polish digital subscribers use the signal broadcasted via satellite or cable (CBM INDICATOR, PBS DGA, 2011).

The choice of the DVB-S and DVB-C standard by commercial broadcasters was motivated by many factors. First of all, by its operating costs, which are much lower in comparison with the terrestrial broadcasting stations, and also the low price of purchasing licenses. The choice of this form of broadcasting was also influenced by easy access to satellite channels and their favorable capacity.

IPTV is also offered in Poland, but – so far – it is not as popular as DVB-S and DVB-C.

Even though there are so many ways of receiving digital signal, more than 30% of Polish population still watches analogue terrestrial television (CBM INDICATOR, PBS DGA, 2011).

2.2. Digital conversion in Poland

The development of digital television in Poland was initiated in 1998 by broadcasters issuing Polish channels from abroad, via satellite. Also the Polish broadcasters started digital broadcast of their channels via satellite. Most of these channels were widespread by terrestrial analogue networks, but some of them were created for the digital platforms.

The digital conversion in Poland already took place before the year 2010, amongst the subscribers of the commercial satellite digital platforms and a few thousand households that had purchased set-top-boxes to receive the terrestrial digital signals activated by TVP SA in Sucha Góra, by TP Emitel in Warsaw and Wrocław and by INFO-TV-FM in Leżajsk Giedlarowa. A few thousand inhabitants also have access to Leszno TV – a regional digital television station in Wielkopolskie Province. However, as the DVB-T will be implemented in MPEG-4/AVC/H.264 standard, the above households will be forced to purchase new set-top-boxes in the future.

2.3. Test trials of DVB-T in Poland

Terrestrial digital television in Poland was first introduced in 2001 during the Telestrada, the travelling exhibition arranged by an organizing unit of Telekomunikacja Polska SA. Since 2002, this unit has been known as TP EmiTel.

TP EmiTel activated the first digital multiplex and the first terrestrial DVB station in Warsaw on November 9th, 2001. The multiplex included 4 TV channels – TVP1, TVP2, Polsat and TVN – , the most popular channels in Poland. This station's work had been subject of many tests, conducted by the Research and Development Centre of TP SA. The tests involved the range measurement of various modulation modes.

In March 2003, EmiTel began test trials in Lodz (which were finished in March 2004) and by June 2003, in Wroclaw. The multiplex signal was also created in Warsaw.

Another trial project took place in the first half of the year 2004, in Podkarpackie Province. The signal of the new transmitter covered almost the whole area of that province.

Since the beginning of the year 2005, DVB-T tests have only been conducted in cooperation with TVP SA and Polskie Radio SA, as Polsat and TVN gave up on their joint/common tests.

In October 2005, in cooperation with Polskie Radio SA, the DVB-T multiplex was provided with three nationwide radio channels. At the same time, the transmitter in Wroclaw was provided with a TV regional channel, TVP3 and radio channel, Radio RAM.

Another three test trials took place in May 2007. EmiTel activated an experimental broadcast in MPEG-4 standard in RTCN Poznan/Srem. At the same time POT (Polish TV Operator – a company belonging to both Polsat and TVN) started the DVB-T tests in RTCN Poznan/Srem and in Warsaw/PKiN.

On February 7th, 2008, another experimental DVB-T broadcast in Krakow/Krzemionki was activated, and on April 8th another broadcast from the transmitters located in RTCN Zielona Gora/Jemiolow was activated (EmiTel, 2008).

In October 2011, EmiTel activated another experimental broadcast from the transmitters located in RTCN Kraków/Chorągwica and in RTCN Katowice/Kosztowy (EmiTel, 2011).

2.4 Beginning of the digital switchover

According to the final plan of the Department of Infrastructure, the switchover process should have begun in September 2009. However, due to some formal circumstances, it was not possible, and digital broadcasting only began one year later, in September 2010 (EmiTel, 2011).

The plan assumes creating three basic multiplexes that will cover the whole country with digital signal. The first two of them should be available until the end of the year 2013 and the third one in April 2014. Each of them is supposed to contain (more or less) seven Standard Definition channels. Other multiplexes will be probably destined for mobile television and the Internet.

At first, the plan assumed three stages of launching DVB-T and six for the analogue switch-off.

The first multiplex (MUX1) was supposed to contain channels available free to air via analogue signal (TVP1, TVP2, TVP Info, Polsat, TVN, TV4, TV PULS).
The plan also assumed that channels in the second multiplex (MUX2) should be chosen by tender (EmiTel, 2011).

The third and last multiplex (MUX3) was supposed to be comprised of TVP channels only.

At the beginning of 2010, a new plan on introducing DVB-T in Poland was presented. It changed the previous assignment of the multiplexes. And in June 2010, another change in the assignment was made. The current plan that is being put into practice assumes the following channel split:

- MUX1: will consist of seven Standard Definition channels (three TVP channels: TVP1, TVP2 and TVP Info) and four channels chosen by tender. On April 26th

2011, KRRiTV decided that these would be Kino Polska Nostalgia, Eska TV, ATM Rozrywka TV and U-TV. The first stage of launching MUX1 is planned for December 14th, 2011. On that day the signal of the first multiplex will cover about 15% of the country. The second stage is supposed to take place until the end of May 2012. After that date, 92% of Poles should be able to watch channels contained by MUX1 via DVB-T. The process should end in September 2012, when by that time the digital signal will be available for 95% of Polish population (EmiTel, 2011).

- MUX2: in case of the second multiplex, the plan assumes six implementation stages. MUX2 will contain eight Standard Definition channels (Polsat, TVN, TV4, TV PULS, TVN7, PULS2 which is supposed to be replaced by PULS Kids, TV6 and Polsat Sport News). MUX2 was the first officially launched digital multiplex in Poland. The broadcasting was started on September 29th, 2010, and covered about 15% of the country. Ten months later, in July 2011, MUX2 achieved a nationwide range, covering about 87% of the country. The final sixth stage is planned for December 2013. Until the end of that year, 95% of Poles should have access to the channels contained in MUX2 via DVB-T (EmiTel, 2011).

- MUX3: the third digital multiplex will consist of Public Television (TVP) channels: TVP1 (until MUX1 signal covers the whole country), TVP2 HD (launching in June 2012), TVP Info (just like in case of TVP1 and TVP2 HD, when MUX1 is nationwide accessible these three channels will be transferred to the first multiplex), TVP Kultura and TVP Historia. The plan assumes four stages of launching MUX3. The first one started on October 27th, 2010. A year later, after the third stage, MUX3 turned accessible for 48% of Polish population. The final stage is planned for April 2014 (EmiTel, 2011).

After some formal complications between 2009 and 2010, the final plan of launching DVB-T in Poland was finally introduced and put into practice. Considering its pace and the fact that it is following the outlined schedule, it seems to be very realistic that no other complications will appear in the nearest future.

3. DVB status overview

3.1 DVB offer

There are many ways to receive digital TV signal in Poland. The technologies currently available in the country are DVB-T, DVB-S, DVB-C and IPTV.

Currently, the most widespread system of digital broadcasting in Poland is DVB-S, which is the most popular amongst digital television subscribers (CBM INDICATOR, PBS DGA, 2011). The number of Poles who receive digital TV signal via cable is growing. However, most of them are subscribers who simply replace analogue cable TV with DVB-C and do not change the provider. The number of IPTV subscribers is also growing, but, so far, IPTV is no competition for DVB-S and DVB-C commercial providers.

The table below summarizes the services of the three top DVB providers in Poland: Cyfra Plus, Cyfrowy Polsat and n. All of them use the DVB-S standard. Cable providers have also recently introduced their digital offer (DVB-C). However, the number of their subscribers is, so far, too low to be considered serious competitors for the major three DVB-S providers which are described below:

Cyfra Plus	Cyfrowy Polsat	N
HD set-topbox available since December 2006 **Channels:** - Digital channel offer (all analogue available channels) - Thematic channels - Movie channels (Canal+, Cinemax) - Football - Some channels in HD standard (31 in total)	**HD set-topbox available since October 2007** **Channels:** - Digital channel offer (all analogue available channels) - Thematic channels - Some channels in HD standard (23 in total)	**HD set-topbox available since October 2006** **Channels:** - Digital channel offer (almost all analogue available channels) - Thematic channels - Movie channels - HD channels (34 in total) - nRadio -nPortal (additional internet services on the TV screen)

Electronic Program Guide (EPG) **On-demand offer:** - Video on demand **Personal video recorder (PVR)**	**Electronic Program Guide (EPG)** **On-demand offer:** - Video on demand **Personal video recorder (PVR)**	**Electronic Program Guide (EPG)** **On-demand offer:** - Video on demand **Personal video recorder (PVR)** - Recording (nbox HDTV recorder) - possibility of USB recording

Source: www.n.pl, www.cyfrowypolsat.pl, www.cyfraplus.pl

3.1.1 High Definition channels in Poland

At the moment, there are 58 High Definition channels in Poland. Even though their number is still growing, it is pretty low in comparison with High Definition Channels available in other European Union countries.

The greatest number of High Definition channels is available in n, Neostrada TP (TP SA) and Cyfra+ offers. However, despite the fact that all of these providers use DVB-S, the number of High Definition channels available in the offers of all DVB-C providers is higher than in case of DVB-S (Szewczyk, 2010).

3.2 DVB subscriptions

First of all, it is necessary to distinguish two groups that are able to receive digital signal in Poland. The first one consists of people who are able to receive a free DVB-T signal in the areas already covered by the digital terrestrial signal. The other group consists of subscribers of the commercial DVB providers who decided to receive the digital signal before starting the digitization of TV signal in Poland. They prefer to pay higher fee and have access to channel offer of DVB-S or DVB-C providers that is richer than in case of the traditional terrestrial television.

3.2.1 DVB-T

It is hard to estimate the number of Poles who watch television relying only on the free-to-air digital signal. At the end of 2010, only 4,2% of Polish households declared using the DVB-T standard, as more than 30% were still using analogue terrestrial television (CBM Indicator, PBS DGA, 2011). This has definitely changed during the last year as the range of two digital multiplexes (MUX2 and MUX3) is now much broader than in 2010. Some of them declare using DVB-T as an alternative for the primary DVB-C or DVB-S TV-set. Even though the analogue switch-off is planned for July 2013, there are still many households in Poland that will have to choose an alternative way to receive the TV signal.

3.2.2 DVB-S

The past year was a great success for the satellite providers in Poland. The number of customers of three of the biggest commercial DVB-S providers has risen by about 0,33 million in comparison with the year 2009 (Lemańska, 2011).

The total number of subscribers of the three major DVB-S providers is about 5,8 million. If we also take TP SA into consideration, the number will grow up to 6,2 million. The biggest player in this share of the market is Cyfrowy Polsat, with 3,43 million subscribers. They are followed by Cyfra Plus and n. In 2011, the number of Cyfra Plus customers reached 1,55 million and the youngest player among the Top DVB-S Three – n – had 0,8 million subscribers (rp.pl, 2011). The fourth force in the DVB-S market is TP SA, the major provider of telecommunication services in Poland. In case of television signal, it focuses both on IPTV and DVB-S. In 2011, on TP SA the number of DVB-S subscribers reached 0,4 million. What is worth mentioning is that TP SA started to cooperate with n. As a result, its subscribers have access to n channels and n can also include Internet in its digital offer (Lemańska, 2011).

The offer of DVB-S providers is very impressive in comparison with the options of standard television. Services as EPG, VoD, PVR and a very high number of High Definition and thematic channels are omnipresent in the offer of DVB-S commercial providers. More importantly, they still tend to improve their services (n, for example, started to offer free access to dedicated Internet services). Advanced technology, dynamic growth, easy access and competitive prices are factors that make the DVB-S standard a very attractive option for potential digital television subscribers.

3.2.3 DVB-C

During the last three years, DVB-C providers have become a serious competition for the satellite ones. In 2008, the number of Polish households using DVB-C was below 200.000. In 2011, their number reached 20 million and is still growing as more cable television subscribers decide to replace the analogue signal with DVB-C. This process is very often initiated by cable television providers, who are aware of the fact that, if they want to keep their subscribers, they will have to offer them access to the DVB-C signal before the analogue switch-off (Szewczyk, 2010).

DVB-C offer contains many channels that used to be available only for DVB-S subscribers (nSport, Canal+). Digital cable television users have also access to services such as VoD, EPG, PPV, PVR and many High Definition channels. It is also important that DVB-C is often offered by the same company that provides a household with telephone service and Internet, and it is cheaper than DVB-S. However, DVB-C needs cable infrastructure available only in bigger cities - that is not necessary in case of broadcasting via satellite.

The first cable provider that implemented the DVB-C standard was ASTER, in 2005. The other cable providers have also spread their digital offer. It is worth adding that implementing the DVB-C among the cable providers has been a very dynamic and well organized process.

Provider	Number of digital TV subscribers 1Q 2011	Number of digital TV subscribers 4Q 2010	Dynamics
UPC Polska	408 100	370 700	+ 37 400
Vectra	331 200	313 300	+ 17 900
Multimedia Polska	155 000	142 000	+ 13 000
ASTER	100 000	100 000	0
INEA	71 500	70 000	+ 1 500
TOYA	41 000	39 000	+ 2000
Stream Communications	27 390	116 500	+ 10 890
Promax	11 000	10 000	+ 1000
Petrus	8 000	7 400	+ 600
Sat Film	2 300	2 300	0

Source: www.media2.pl

The situation of cable providers described in the previous table seems to be very optimistic. However, the situation on the Polish DVB-C market is very specific. Most of the providers are not present in the whole country. Multimedia and Toya, for example, are not active in Warsaw, but focus on smaller cities, while UPC focuses not only on the capital of Poland, but also on other areas.

The major cable player, UPC, had about 0,4 million customers of digital television services in the first quarter of the year 2011 (media2, 2011). UPC will certainly remain the leader of the DVB-C market due to their taking over ASTER by the end of 2011. It also seems that Vectra and Multimedia Polska will remain the strongest market followers. The fast development of cable providers can result in their becoming great competitors for the three major Polish DVB-S providers in the nearest future.

3.2.4 IPTV

IPTV is also accessible in Poland, but it is not as popular as DVB-S and DVB-C. However, this situation may change in the future, as it is a very attractive alternative for smaller TV providers. In 2008, there were only 54 thousand IPTV subscribers in Poland. In 2011, this number grew up to about 200 thousand subscribers. The market leader is TP SA (with about 110 thousand customers), followed by Telefonia Dialog (40 thousand subscribers). IPTV is also included in offers of Netia, Multimedia Polska and smaller providers (Inotel, Play 5, Telpol). According to the research of Point-Topic, the number of IPTV subscribers can reach up to 700 thousands by the end of 2020 (Dec, 2011).

3.3. DTV costs

The traditional, public analogue TV is relatively inexpensive. The license fee for using radio and TV in Poland is only 17 PLN/month. It is obligatory for every Polish household. However, a very poor channel offer induces Poles to get a cable or satellite TV. The average cable/satellite fee in Poland is about 45 PLN per month (as an addition to the 17 PLN of obligatory license fee).

3.3.1. Requirements

There are some infrastructural requirements that must be met in order to receive digital signal. They may be considered expensive, as the GDP per capita in Poland is still much lower than in countries of the old European Union. Furthermore, there are some surcharges for the additional applications of the DVB.

In order to receive digital signal, subscribers have to purchase (or rent – in case of commercial providers) a set-top box. It is enough for the DVB-C and DVB-T standard. Subscribers of the DVB-S providers have to purchase not only a set-top box, but also a satellite dish with LNB, and an antenna cable.

3.3.2. Prices

Prices of set-top boxes have recently become relatively low because of the great number of promotions, which are a result of growing competition on the Polish digital television market. The standard price (if bought in a normal RTV shop) of the HD set-top boxes available in offers of commercial providers is obviously much higher.

Cyfra Plus	Cyfrowy Polsat	N
- Set-top box: 49 PLN to 99 PLN (depends on the fee) - HD set-top box: 0 PLN per month (In case of more expensive options) - subscriber must purchase a satellite dish on his own	- Set-top box: 10 PLN per month - HD set-top box: 25 PLN per month	- nbox HDTV – 0 PLN in promotion - nbox HDTV recorder – 0 PLN in promotion - subscriber must purchase a satellite dish on his own
Fee: depending on the number of channels, set-top box and other options: <19 – 78 PLN>/month	Fee: depending on the number of channels: <at least 37,90 PLN/month	Fee: depending on the number of channels: <39; 149PLN> /month

Source: www.n.pl; www.cyfrowypolsat.pl; www.cyfraplus.pl; www.satkurier.pl; www.media2.pl

The VOD offer in Poland is very specific. At first, it was developed mostly in n: in offers "nSeriale" and "Picture Box" (movies) – by 30 PLN each (or 40 PLN if bought together), "funVoD" (programmes for adults) for 15 PLN and nFilm HD. Having paid an additional fee, a subscriber may watch their selected series* or movies as many times as they wish. n offers also an additional possibility to watch the greatest cinema movies that are not included in the above mentioned offers – by approximately 11 PLN each.

Cyfra Plus offers VOD as an additional option to its traditional offer. VoD is available for those subscribers who rent a PVR HD set-top box (usually the more expensive options). The average price for a movie is 9 PLN.

Cyfrowy Polsat started to offer VoD later than their DVB-S competitors. The most attractive movies in their offer cost 11 PLN and the cheapest ones only 3,7 PLN.

The average price of a VOD in offer of DVB-C providers is similar to the offer of their DVB-S competitors and varies from 7 PLN to 13 PLN for a movie.

4. Policy

4.1. Activity of the government

After many delays, the process of implementing the DVB in Poland has finally been initiated. According to the new plan of the Department of Infrastructure, it should end on June, 2013.

The Polish government was highly involved in the DVB trial projects. Almost every test trial was supported by the government. The departments that were mostly involved in the process of testing DVB-T in Poland are KRRiT (Krajowa Rada Radiofonii I Telewizji – National Broadcasting Council), UKE (Urząd Komunikacji Elektronicznej – Electronic Communications Department) and URTiP (Urząd Regulacji Telekomunikacji I Poczty – Telecommunications and Post Regulations Department).

In January 2004, the Polish Prime Minister brought into life an interdepartmental unit, responsible for the implementation of digital TV and radio in Poland. Its basic task was to prepare a strategy concerning the dissemination of the digital TV and radio in Polish conditions – the economic, market and social ones.

Another initiative of the Polish government was to join the Digital Innovation through Cooperation in Europe program (DICE). Now, after the election in October 2011, the Polish Prime Minister is determined to create a separate digitization department.

The analogue terrestrial switchover is planned for July 31st, 2013.

The two main sins of the Polish government in this matter are: no information campaign about the implementation of DVB-T in Poland until July 2011 (commercial broadcasters do not seem to be interested in informing the society about the digital revolution as they use DVB-S or DVB-C standard), and no specific regulations concerning subsidizing of the DVB-T set-top boxes, so the society does hardly know anything about the expected financial support.

According to the act about digitization from June 30th 2011, broadcasters present in MUX1, MUX2 and MUX3 are obliged to broadcast information about the upcoming digital revolution and analogue switch-off (Dziennik Ustaw nr 153).

A television campaign was initiated in July 2011, and generated 789 GRP until the end of October (among All 4+ population). However, it was based on TVN Group channels, which are not accessible for people who are not aware of the process (especially those living in the country). (Nielsen Audience Measurement, 2011).

The second problem – subsidizing set-top boxes- is expected to cost about 340 million PLN. However, it is necessary in order to avoid digital exclusion of about 1,35 million of the poorest Polish households (PBS DGA, 2010).

4.2. Awareness and expectations of Polish society towards the implementation of the terrestrial DVB (DVB-T) in Poland

As no campaign informing the society about the changes in broadcasting has been conducted until July 2011, many Poles are still unaware of the digital revolution. In 2008, merely 23% of Poles knew about the switchover, planned for the year 2013 (On Board PR/PBS DGA, 2008).

Based on the results of a survey conducted on that year, almost 70% of the respondents declared willingness to purchase new set-top-boxes if it is necessary for the reception of the signal. On the other hand, as much as 25% of the interviewed declared no intention to do so. It means that a quarter of the society may become cut off from the most important medium. Readiness to buy a new set-top-box was also diversified by income of the residents. While more than 86% of respondents with a household income of more than 2500 PLN were ready to purchase a new set-top box, only 54% of the interviewed with a household income of less than 1100 PLN declared to do so. It means that not even the dissemination of the information about the planned switchover will induce the poor to purchase a new set-top-box, because they simply cannot afford it (On Board PR/PBS DGA, 2008).

Only 18% of the respondents thought that the benefits connected with the implementation of DVB in Poland definitely justified expenses for the set-top-boxes, which are necessary to use this technology. 41% of the interviewed shared this opinion to a smaller extent and as much as 40% of them were of a different opinion or none whatsoever. This shows that the announcement of benefits connected with DVB in Poland should be the most important part of the information campaign (On Board PR/PBS DGA, 2008).

Another problem is the lack of specific regulations concerning subsidy of the DVB-T set-top-boxes in Poland. 75% of the respondents shared the opinion that purchase of DVB-T decoders should be subsidized. Only 16% of Poles thought that subsidizing was not necessary and 10% had no opinion about it (On Board PR/PBS DGA, 2008).

Almost 50% of the interviewed shared the opinion that the purchase of the set-top-boxes should be subsidized by national budget. Referring to the opinion of 32% of Poles, it should be sponsored by private companies, and only 17% of the society thought that the main sponsor should be the national budget (On Board PR/PBS DGA, 2008).

Results of the survey conducted one year later were more optimistic. In 2009, 52% of Polish population declared that they knew about the upcoming digital switchover (On Board PR/PBS DGA, 2009). Even though this still represented only half of the society knowing about digitization, the growth in number of people who are aware of this process is impressive (especially if we consider the fact that no campaign informing the society about the upcoming changes had been conducted until July 2011). Most of them are people who live in big cities, educated and using the Internet where they can read a great number of articles dealing with the digitization process. This is why information campaigns in mass media (especially TV) is so important. 54% of Poles who live in the country are not aware of the upcoming revolution (On Board PR/PBS DGA, 2009).

However, almost 60% of people who know about the digitization process still have not started to prepare for it (On Board PR/PBS DGA, 2009).

According to the results of the new survey conducted in 2010, only 19% of the society was going to start using digital television in the near future, 34% was already using DVB and 44% was not intending to do so. It only showed that the strong information campaign about the digitization was vital (On Board PR/PBS DGA, 2010).

4.3. The parameters of DVB-T set-top-boxes in Poland – na początek

An open session of KIGEiT (a unit of the Polish Economic Council responsible for the electronics and telecommunication) took place on March 26th, 2008. Its main goal was to set the parameters of the DVB-T set-top-boxes that will be implemented in Poland. An update of the document was released in 2009.

Below are the most important details from the session (Kupiec, 2011):

1. Format and display provided for TV in terrestrial broadcast:
- 702x576 (SD 576i) at present
- 1280x720 (HD 720p) or 1920x1080 (HD 1080i) in future

2. Display of a 16:9 image on a 4:3 screen
- keeping the anamorphic video

3. Assuming that every user will be able to change the settings, an Automatic Format Descriptor will be used for the comfort of the audience

4. TV signal coding standard
- H.264/AVC only
  - MP@L3 for SD
  - HP@L4 for HD

5. The broadcast of teletext will be kept (Level 1.5). DVB subtitles are also a subject of the plan.

6. The pay-on-demand services are being planned but have not been specified yet.

7. Interactive services are not being planned at the moment.

8. Every TV set should receive the channels in HD standard and be able to send the signal (also in this standard)

- using HDMI for steering HD Ready display;
- using the SCART/Euro-connector in SD standard for the analogue TV set.

9. The 'HD Ready' iDVB sets should be equipped with the HD TV tuner compatible with the above-mentioned requirements and the S/PDIF outlet.

10. The set-top boxes should be compatible with DVB-MHP 1.2.

11. The set-top box should enable blocking the access to various programmes or programme categories, if parental rating descriptor appears in the stream.

5. Conclusions

The situation of Polish digital television market seems to improve every year. As Poles tend to watch TV more often than the inhabitants of the old EU countries, they pay more attention to the quality of television, channel offer and comfort (for example VOD). The competition on Polish digital television market also seems to increase as more and more cable providers implement the digital standard and competitive services such as VoD, EPG and PVR in their offer. However, DVB-S providers are still the greatest part of the digital television market. The main problem is still the fact that many Poles are not aware of the planned switchover. The government finally conducted an information campaign this year, generating almost 800 GRP in four months. Its results should be noticeable in further research. Another issue is the price of DVB. Many people find set-top boxes too expensive. Most of them share the opinion that purchasing should be subsidized by the European Union and the government. It is almost certain that politicians will spend about 340 million PLN in subsidizing DVB-T set-top boxes for poor families.

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