

Case Study on transition from analogue to digital terrestrial TV (DTTV) broadcasting in the Republic of Slovenia (April 2009)

Officials met

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Policy and regulatory aspects

Discussions with the above-mentioned officials have focused on the Strategy for transition from analogue to digital broadcasting in the Republic of Slovenia.

Total of 64 pages document with same name as above has been approved on 16 February 2009 by the Slovenian Government (hereinafter: The Strategy). Indeed it defines the overall concept of transition from analogue to digital sound and television broadcasting in this country, but is available in Slovenian language only. Nevertheless it merits to be attached to this Case Study and as soon as translated in English to be made available for wider consultation by ITU Members.

The Strategy 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 every key aspect of it, inclusive deadlines, coverage and technology issues, etc.

In accordance with the deadlines set by this strategic document, the following digital terrestrial broadcasting related Acts have been enacted by Slovenian Parliament:

- i) Act for Radio and TV Slovenia (ZRTVS), on 25 Oct 2005, defining public service broadcasting, inclusive “programme”/content related issues;
- ii) Media Act (ZMed), on 29 Sept 2006, defining commercial broadcasting, inclusive “programme”/content related issues; and
- iii) Digital Broadcasting Act (ZDRad), on 02 November 2007, defining digital broadcasting specifics for licensing regimes, multiplexes, networks, frequencies, technological choices, analogue switch-off and operations.

All the three Acts are available only in Slovenian language, but nevertheless are attached to this Case Study for reference.

- iv) Furthermore an Electronic Communications Act (ZEKom-UPB1) has been enacted by the Parliament on 01 February 2007, governing the conditions for the provision of electronic communications networks and electronic communications services, ensuring universal service, management of the radio frequency spectrum, furthermore laying down the conditions for restrictions on ownership rights, especially the rights of users, governing the operation of networks and services in emergency situations, the protection of secrecy and confidentiality of electronic communications, governing the resolution of disputes among subjects in the electronic communication market, governing the responsibilities and tasks of the Postal and Electronic Communication Agency (APEK) (hereinafter: the Agency) as an independent regulatory authority, as well as the competencies of other bodies operating under this Act, and it shall govern the issues related to electronic communications. Same Act defines key definitions such as broadcasting, conditional access, electronic communications equipment, electronic communications service, electronic communications network, enhanced digital television equipment (incorporating the set-top boxes and integrated digital television sets), harmful interference, operator, radiofrequency protection ratio, radio communications, radio frequency, wide screen television service, user, 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 Act defines the radio frequency spectrum management, radio frequency band allocation, radio frequency allotment plan, assignment of radio frequencies, decisions, administrative procedure, special provisions for opening of tenders, reviews and evaluation of tenders, selection of bidders, content of the decision and duration of validity/extension on the assignment of radio frequencies, conditions for use/ transfer of rights to use radio frequencies, payment for use of radio frequencies, conditions for digital broadcasting radio frequencies, as well as supervision and construction of control and management systems.

Of particular interest is Chapter XI of this Act “DIGITAL RADIO AND TELEVISION BROADCASTING” Article 113 (digital radio and television broadcasting) stipulating that:

- (1) Public communications networks intended for the distribution of digital television service must be planned so as to be appropriate for the distribution of wide-screen television services and programmes.
- (2) Operators providing public communications networks from the previous paragraph shall be obliged in the receipt and redistribution of wide-screen television services or programmes to maintain their high-definition format.
- (3) The Agency may by decision require operators providing electronic communications networks from the first paragraph of this Article to ensure access to application

programme interfaces or electronic programme guides under fair, reasonable and non-discriminatory conditions.

(4) The Agency shall by general act prescribe the conditions for interoperability of digital interactive television services and digital television equipment used by consumers.

(5) The Agency shall supervise the implementation of provisions on digital radio and television broadcasting.

Both Slovenian and English versions of this Act (ZEKom-UPB1) are also attached to this Case Study for reference.

In summary it is important to distinguish the main differences between the pair of Acts (ZRTVS & ZMed) governing programme content issues, while the second pair of Acts (ZDRad & ZEKom-UPB1) are governing multiplexes and broadcasting network issues. The above-mentioned national legislation is so concise and clear cut that it allows for long-term plans and relevant strategic decisions.

Broadcasting delivery

At the time of approval of The Strategy there were registered 70 TV and 113 sound broadcasting (radio) media, out of which 22 TV and 83 radio programmes were broadcasted terrestrially in analogue format. Furthermore nineteen (19) TV programmes and two (2) radio programmes were delivered via dedicated cable TV networks or Internet.

Five (5) national coverage TV programmes were broadcasted to the public. Another thirteen (13) TV programmes were defined with Special Importance Status.

Satellite broadcasting service via Eutelsat Hot Bird 13°E DVB-S delivers three TV and six radio national programmes. Direct to Home Satellite Broadcasting service is available for commercial broadcasting programmes via Eutelsat W.

Furthermore cable digital Point to Multipoint service already was available using DVB-C and DVB-T in some cases with return channel offering triple play services system of delivery under the trade name Lastovka, provided by cable operator in Ljubljana and other operators in Maribor and at the Slovenian coast. It delivered national radio and TV programmes, supplemented by foreign programmes.

IP TV is also quite developed – total of 145 000 households are subscribed to IPTV service as per April 2009.

Market share of platforms

In accordance with latest information provided around 40 % of the population receives analogue terrestrial TV broadcasting, while close to 60 % are cable TV networks subscribers. Total of 70% of cable TV subscribers have the TV programmes delivered to their household via DVB-C standard (digital packages). TV Satellite TV Broadcasting service is not for free (conditional access only) and practically not used by the population. IPTV has modest market share of 17% of the population.

The Republic of Slovenia has total of 750000 households as per Year Book 2007 and there is an obligation for every household to pay subscription fee of 11 Euro per month for the public service radio and TV programmes only. Annual subscription fee income for sound and TV public broadcasting service (PBS) is estimated at 99 million Euro.

In addition, PBS can generate substantial income from advertisements, sponsorship and publicity.

It is also possible for regional PBS televisions to apply occasionally for grants by local public service authorities for production of special programmes, but this income, generated by short-term contracts, is not of regular nature.

Commercial broadcasters operate based on revenue generated by advertisements, sponsorship and publicity only.

Market study in the Republic of Slovenia has revealed that the total market value of TV publicity sponsorship and advertisements for the year 2008 is of 160 million Euro with the following market share distribution between the main two TV programmes in this country:

TV Programme	Service	Population Coverage	Market Share
<i>RTV Slovenija</i>	Public	95%	73%
<i>Pro plus (Pop TV Kanal A)</i>	Commercial	85%	26%

Therefore, while the Public Service Broadcaster RTV Slovenija has generated an income of 116,8 million Euro from TV publicity, sponsorship and advertisements, the Commercial Broadcaster PRO PLUS has generated an income of 41,6 million Euro from TV publicity, sponsorship and advertisements.

Analogue Switch-Off

Although the Republic of Slovenia has joined the European Union Members' decision at the RRC-06 to switch-off the analogue TV broadcasting by the year 2012, this strategy and the Law of this country stipulates that the Analogue Switch-Off (ASO) of the terrestrial TV broadcasting shall be done latest by the end of 2010. The Law also stipulates that the ASO is possible even before this deadline in a response to strong demands to shorten simulcast period because of its double cost implications.

Chapter 4 of this strategic document summarizes the key aspects of analogue to DTTV transition plans of every neighbouring country (DVB-H inclusive) plus relevant ASO deadlines. This Administration believes that such delicate and complex process could be successful if properly coordinated in detail not only with neighbouring countries, but also with any other country concerned. It has been reported that practical results have been already achieved towards this end.

Licensing/Authorization schemes

The Regulatory Agency APEK has issued a license to the RTV Slovenia (itself a PBS solely operator having available at its disposal a nation-wide country coverage transmission analogue network) to start deploying of Multiplex A (MUX A) with corresponding DTTV transmission network. Digital Broadcasting Act (ZDRad) stipulates obligation for RTV Slovenija to achieve population coverage of 95 % 6 months before the Analogue Switch-Off.

The Agency has issued a call for tenders for second Multiplex B (MUX B) with nation-wide coverage for TV commercial broadcasters and corresponding transmission network but requesting explicitly business plan here-in for population coverage of 90% for the purposes of transparency, equal treatment and evaluation of bids submitted. It was possible however, after the announcement of successful bidder in December 2008, to clarify mutually agreed percentage of actual coverage and issue corresponding license to the successful bidder.

Broadcasting network structure (ownership of multiplex, transmission network)

It is to be noted that the Regulatory Agency APEK, based on enacted national legislation, has imposed on RTV Slovenia to provide its infrastructure to its competitor for side by side deployment of its MUX B plus corresponding DTTV broadcasting transmission network and this decision was included in the call for tenders documentation.

Multiplexes and planning issues

Currently the public broadcasting service Multiplex A (MUX A) with corresponding DTTV transmission network is operated by RTV Slovenia with coverage estimated at 85%.

The total operational data rate for MUX A is defined at 19, 69 Mbits/s and plans are in place for 7 to 8 SDTV programmes on this multiplex. (Network type: SFN - currently with some MFN exceptions). The bit rate budget of the MUX A could be seen instantly and in detail at <http://funa.si/dvb-t/slovenia/multiplex-a-transport-stream-analysis>

There is a fixed net video data rate for every one of the three currently broadcasted programmes at 2,39 Mbits/s.

The following programmes are transmitted to the population via MUX A:

Three public national and two public regional TV programmes. Three commercial programmes (Pop TV, Kanal A and TV Pika) ended broadcasting in MUX A due to price dispute.

Multiplex B (MUX B) is dedicated to Commercial Broadcasting Service, and together with corresponding DTTV network is to be operated by NORKRING with planned coverage estimated at 90 % (70% on 1 September 2009, 85% on 1 September 2010).

MUX B, not yet operational, is defined to ensure data rate capacity not less than 22 Mbits/s and it is left to the operator to choose the appropriate version of

modulation/constellation, code rate and guard interval as long as the overall multiplex data capacity is not less than 22 Mbits/s.

This key requirement will ensure that licenses granted for broadcasting of 8 SDTV commercial programmes will be supported by relevant reliability and quality of broadcasting operation. The operator is obliged to ensure that the picture quality should not be degrading more than half grade as per ITU-R Rec. BT-500-11.

The following commercial TV broadcasting programmes will be transmitted to the population via MUX B:

- a) seven national programmes, namely, POP TV, KANAL A, TV 3, TV PIKA, I- TV, ŠPORT 2, and RTS+.
- b) three regional programmes (one in each allotment), namely, TV Primorka, Vaš kanal and RTS.

In accordance with the Strategy both Multiplexes A and B will deliver the above-mentioned TV programmes to the population of this country by the ASO date latest at the end of the year 2010.

Applicable Standards

The Republic of Slovenia 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 higher retail price of MPEG-4 Set-Top Boxes (STB) - around 150 Euro in this country, - 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. Prices of STB's are falling in Europe and industrial sources estimate that MPEG-2 STB's might be more expensive than MPEG-4 STB's in a not too-distant future.

Another important strategic decision has been taken to deliver all TV programmes on DVB-T DTTV transmission networks. Currently fixed modulation is used within any multiplex, but it is envisaged to introduce statistical modulation at later stage.

Licensing Procedures

The potential of vast choice of enhanced programme offer from new comers might tighten the competition and change radically the status-quo. By the Law, the APEK is mandated to make sure that the fair competition market continues to prevail in the Republic of Slovenia.

The liberation of radiofrequency spectrum used for simulcast broadcasting of analogue TV terrestrial transmissions will enable the start up of the process for media registration certificates with the Ministry of culture, relevant license programme applications followed by their evaluation by Broadcasting Council. Relevant programme

license/certificate grants will be issued by the APEK in accordance with the Broadcasting Council's decision.

The Regulatory Agency APEK will appoint tender evaluation commission for issuing bids for tenders for corresponding applications for frequency, multiplexes and networks and apply the Laws of this country until the deployment of digital terrestrial TV service.

If a new applicant shows up he will be required to do the following:

- 1) to register as Media Company with the data register of the Ministry of Culture and he will obtain relevant registration certificate;
- 2) to apply for content certificate to the Broadcasting Council with The Post and Electronic Communications Agency (APEK) of the Republic of Slovenia providing required information for the nature, format of TV programme and other required information and thus the license issued by APEK will enable him legally to become a TV programme channel within a cable TV network;
- 3) file application for analogue frequency and by application of "beauty contest" principle he might become a winner and obtain a license for use of such frequency thus becoming terrestrial analogue broadcaster (only until the end of 2010);
- 4) however he must file application for multiplex and corresponding SFN or MFN or mix of both and based on beauty contest principle he might have the honour to become DTTV Multiplex and Network Provider. According to the Digital Broadcasting Law in this country there will be just DTTV Multiplex Operator/s - Network Operator/s for DTTV is not defined as such by the Law.

The Regulatory Agency APEK is mandated by the Law to be the ultimate decision maker.

Longer-term Multiplex Planning

The Strategy stipulates that the total number of "layers"/ multiplexes will be seven (7). Between 4 and 5 multiplexes will be dedicated to SDTV and HDTV DTTV by the summer of 2011, the remaining part of the Digital Dividend will be allocated to Mobile TV and Broadband within same deadline.

Spectrum Planning

All measures are taken to ensure that this Strategy is in full conformity with the GE-06 Plan and under the envelope concept adopted at the RRC-06.

Third MUX C and corresponding network is foreseen for HDTV as longer-term objective after the ASO date. It may be practically impossible as for many other European countries to launch a HDTV offering on the terrestrial platform until they and their neighbours have completed the Analogue Switch-Off.

Possibility exists 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.

Cost implications of the transition to digital

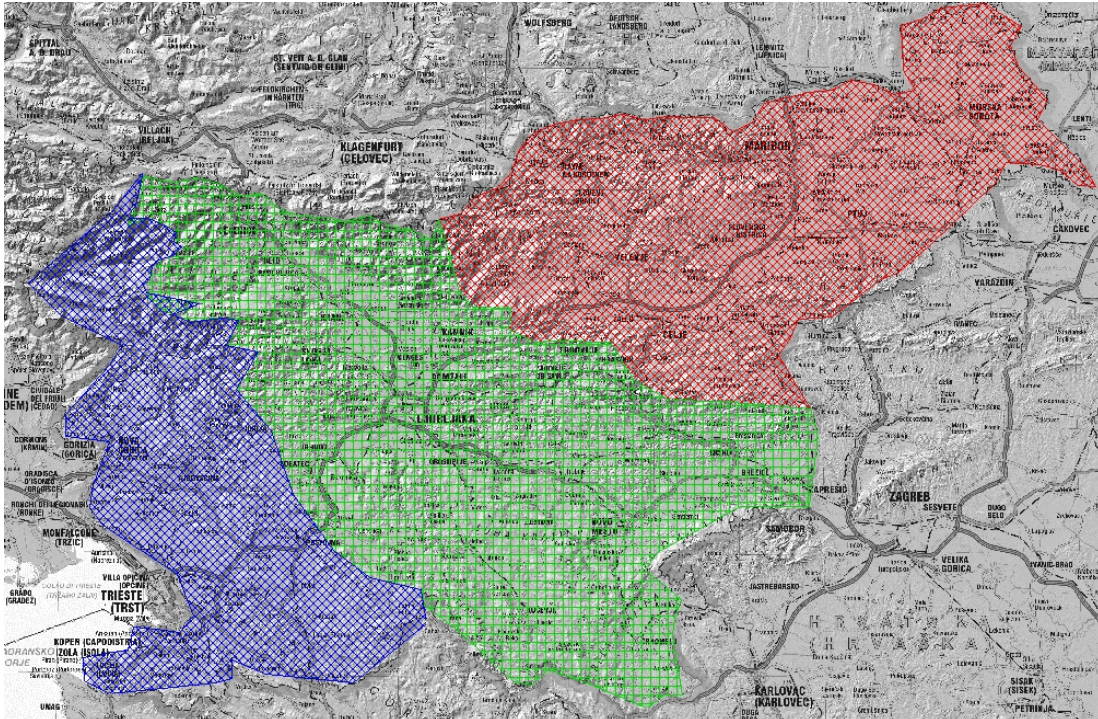
The Strategy considers in detail the necessary modifications and cost implications of the transition to digital. The estimated cost of deployment of multiplex with transmission network of 10 transmitters of 2 kW and of 200 gap fillers of 200 W each, plus the distribution network, would roughly amount to 1200000 Euro. The overall investment cost has been estimated at 8,5 to 10,5 million EUR. Even 1 million Euro have been estimated for large scale order of STB's in order to drop down significantly their retail cost.

Regional DTTV broadcasting

Three regional SFN allotments as indicated below will be the basis for regional DTTV broadcasting service for the Eastern, Central and Western Regions with both MUX A and MUX B with SFN channel allocation as follows:

GEOGRAPHIC AREA (ALLOTMENT)	CHANNEL	STATUS
WEST	51	MUX1
CENTER	45	MUX1
EAST	66	MUX1

GEOGRAPHIC AREA (ALLOTMENT)	CHANNEL	STATUS
WEST	66	MUX2
CENTER	64	MUX2
EAST	67	MUX2



Additional benefits from the transition to digital

The Strategy defines the additional benefits to be derived from the transition to digital such as enhanced additional services and applications as well as the interactivity applications to be embedded into the DTTV platform.

Consumer issues

A public preparedness campaign is also defined. The Directorate for Electronic Communications has made an agreement with all TV broadcasters to broadcast spots of 20-30 seconds duration for free in order to prepare the public in advance of the ASO date. The Law stipulates that broadcasters shall assist in informing the public for such change to DTTV broadcasting.

The Administration is in final preparations to mandate competent testing entity to verify the STB's to check whether equipment on sale for consumers is suitable for MPEG-4, statistical multiplexing, subtitling etc. Although not mandatory such validation tests will be highly appreciated by consumers.

The ZEKom-UPB1 Act stipulates that appropriate measures are to be taken to assist disabled users. The Agency and the Administration are also paying due attention as how best to assist viewers with impairments of vision or hearing thus enabling them as well to benefit from the transition from analogue to DTTV broadcasting.

Business model and plan

The Law does not allow for subsidies neither to TV Broadcasters, Multiplex Operators nor to the consumers for purchase of STB's or Integrated TV Receivers. However the Law stipulates that social assistance to the population with lowest income should be provided and this possibility will be used to provide this part of the population with relevant STB's.