Georgia's Digital Switchover Strategy

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1. Definition of Terms

2. **Analog broadcasting** -broadcasting of terrestrial radio and television implemented by processing of analog signals.
3. **Free-to-air broadcasting (FTA)** – broadcast allowing any person with the appropriate receiving equipment to receive the signal without any payment;
4. **Compatibility**- a function of devices and equipment to share information and talk to each other on the basis of the software application despite their producers;
5. **Video-on-demand**–an individual system that allows to broadcast TV programs and movies to users via different technological platforms. The service is provided upon demand of a user.
6. **Application program interface(API)**–a key application component of digital receiver that allows to interact with operational software of a receiver. As API is software necessary to interact with a receiver, it can be also used to impose certain restrictions in that regard. APIs and the relevant digital receivers should be connected in a way that allows interaction with the consequent device;
7. **Receiver**- a technical device to receive signal of broadcast programs;
8. **Spectrum**-a set of radio frequencies that may be used as radio signal to transmit information and image;
9. **Standard**- compatibility of a set of requirements with DTV receivers that is a device to receive, process, and transmit the audiovisual signal sent;
10. **Digital dividend**- free radiofrequencies resulted from switchover from analog broadcasting to digital broadcasting;
11. **Electronic program guide(EPG)** –associated program based on associated programming interface of a DTV receiver. The program should be compatible with associated programming interface to operate. Electronic program guide consists of scheduling information for current and upcoming broadcast programs. A user is able to request much more information via electronic program guide.

2. Introduction Strategy Basics

Taking into consideration national interests of the country in terms of development of both digital broadcasting and telecommunication and broadcasting spheres, the Government of Georgia shall develop guidelines, strategic objectives and tasks for Georgia's Digital Switchover.

The Georgian Constitution, the international legal acts, and the Georgian law on Broadcasting determine the basics of media pluralism and principles of public and commercial broadcasting that, inter alia, ensure freedom of expression and protect cultural diversity as well as equal development opportunities for commercial broadcasters.

One of the objectives of Georgia's Digital Switchover Strategy is to establish terrestrial digital broadcasting as an alternative platform to the existing broadcasting, digital, and analog transit technologies that service users in big cities and regions of Georgia.

In addition to the better quality broadcasting programs that would be possible after implementation of the strategy presented by the Government of Georgia, the digital broadcasting users will have an opportunity to receive interactive services of the new generation, educational or other types of information services or other products that cannot be provided via analog broadcasting network (teletext, EPG, and SDTV and HDTV channels and similar). The Digital Switchover will create preconditions for diversity of TV programs, audiovisual media, and IT providers and speed up convergence in case of the proper technological decisions.

The strategic objective considers a possibility for a supply of services based on the additional and digital broadcasting network of a new generation by the end of switchover period; more details will be provided int he relevant tender conditions and broadcasting network licenses. Provision of these services may be restricted in a switchover period and they will be provided in parallel to transmission of broadcasting content in line with the certain priorities.

The terrestrial digital broadcasting creates opportunities not only for the existing broadcasters. At the stage following formation of the digital broadcasting network, after requirements of the all existing analog broadcasting license holders are met, the cable and IP network transmitted broadcasters may be granted access to the remaining free channels of the multiplex. The digital broadcasting platform creates technological opportunities for openness of market and facilitates development of free media market where additional and special types of broadcasting of new generation will be presented in addition to main broadcasting services. The above service can be provided by broadcasters and broadcasting operators as well as persons specialized in this service.

The capacities of existing analog television broadcasting are restricted in the Digital Switchover period due to a scarce of frequency resources. The digital broadcasting provides a possibility to increase a number of channels by 15 by application of the same resources, whilst one analog channel provides an opportunity to transmit one channel.

The present strategy determines which segment of the broadcasting network should be regulated in the transition and subsequent periods, policy to be applied in regards to the content production and license policy of network operators as well as regulation policy of competition between the digital broadcasting platforms.

The strategy aims at establishment of recommended quality parameters for the digital technological platforms (for cable and satellite network operators) of the digital broadcasting technology content at the further regulation stage to develop maximally replacement services.

This strategy provides a vision to improve a role of the public broadcasters in the Georgian broadcasting sphere at the Digital Switchover and subsequent stages.

The digital broadcasting process does not imply changes only to the television content provision technology countrywide. The main objective of the Digital Switchover is to create and sustain the favorable conditions for investments to the broadcasting and telecommunications market to ensure provision of new and better quality services, to improve conditions for the Georgian media, to guarantee competition, and to ensure a minimum state financial participation in the process.

The national and regional broadcasters operating in Georgia as well as content producers should have an opportunity to transmit their programs via a high-capacity, reliable and secure broadcasting network at transparent, non-discriminatory, and cost-effective tariffs. The viewer should have an opportunity to have access to quality and diversified programs.

The following stages should be carried out for a successful implementation of the strategy:

- Proper planning of a process;
- Information campaign accessible to all constituents of the society;
- Development and preparation of the legal base;
- Selection and license to multiplex operator;
- Subsidizing-funding of necessary directions of the process;
- Control over proper implementation of the digital television system and necessary adjustments at each stage.

Interests of all parties engaged in the switchover process (when the analog and digital broadcasting television signals are transmitted in a parallel regime) and subsequent stage (after a full switch off of the analog television broadcasting) are protected by the strategy of the Government of Georgia.

In the framework of the strategy it is necessary to establish additional conditions and criteria for priorities related to placement of programs in the digital terrestrial television network in a transition and subsequent periods and to define stages and deadlines for implementation process.

The presented strategy defines parameters of a legal regime for the commercial broadcasting access in case of restricted resources of the multiplex.

The policy document defines the relevant standards related to effective use of spectrum, protection of consumer rights, optimization of costs, and influence on competition and investments. The document also determines how consumers will be migrated to the digital broadcasting and what assistance the state plans to provide the end users in addition to the financial support. This strategy response to challenges faced both by consumers and suppliers.

The presented Digital Switchover policy is based on the following principles:

- Protection of consumer rights;
- Facilitation of information society development in Georgia;
- Freedom of expression and media pluralism;
- Facilitation of media freedom;
- Facilitation of development of competitive markets;

- Effective use of exhaustible frequency resources;
- Compliance with the international standards;
- Implementation of obligations undertaken at international level.

One of the most important actions defined by the strategy is actions related to information of the general public on the digital terrestrial broadcasting. The information campaign includes a dynamic and well-planned process to timely and properly inform the Georgian population. The campaign should showcase positive aspects of the switchover process, distribution of correct and necessary information on the operational and technical rules, provision of information on necessary equipment and devices, accessibility on data on new services and opportunities, etc.

After preparation of the Digital Switchover state policy document in accordance with the established procedure, the relevant action plan should be developed; its implementation will start after its approval. The process shall be coordinated by **the Georgian Ministry of Economic and Sustainable Development** and **Georgian Digital Switchover Government Commission** accountable to the Government of Georgia and Parliament as well as interested parties and general public.

The Government of Georgia determines that the strategic objective of the country is to switch off the analog broadcasting by June 17, 2015; the Digital Switchover plan should be implemented by that time.[1]This date is defined by the ITU. The above means that the existing analog television stations will not be legally protected from interference from the stations of the neighboring countries.

3. Directions of Strategy and Performance Evaluation Criteria

One of the objectives of this strategy is determination of universal guiding principles that are acceptable for all groups of the society. These guiding principles should cover the following directions:

1. Digital broadcasting of all TV programs via the Georgian over-the-air network by June 17, 2015;
2. Establishment of conditions and ensuring dissemination of free, universal public broadcasting programs as well as programs of national, regional, and local commercial broadcasters;
3. Ensuring the relevant pre-conditions for effective management of spectrum via optimization of capacity of broadcasting in accordance with the public needs and interests;
4. Ensuring competitive conditions for independent broadcasters to get access to digital over-the-air television network as well as promotion of openness of broadcasting market and diversity of television content;
5. Ensuring realization of Georgia's diversified culture via digital dissemination of television programs by the over-the-air broadcasting network as well as establishment of improved media sector that is one of the most important factor for development of democracy in terms of provision of diversified and different competitive free content to Georgian citizens;

[1]Notes: Due to the known reasons it is impossible to plan this process in Abkhazia and Ossetia regions, therefore, the deadline to introduce the digital broadcasting in these regions should be 2020.

6. Achievement of maximum accessibility to the equipment of the digital over-the-air signal of the relevant standards by end users using analog broadcasting via provision of subsides, promotion and support in the process of formation of low consumer prices at retail market.

The switchover from analog to digital broadcasting shall not have any negative impact on end users and broadcasters and worsen the current situation in any manner.

The below listed criteria shall not be used for evaluation of performance in terms of this objective:

- ✓ Accessibility to the digital signal as compared to the analog signal[2];
- ✓ Possibility to receive the public broadcasting programs via the digital television network.

4. Technical and Technological Directions of Digital Switchover Policy

From technical and technological standpoint of Digital Switchover, the task of the Government of Georgia is to plan the Georgian digital terrestrial broadcasting networks so that they are in conformity with short term and long term requirements of digital terrestrial television program broadcasting, opportunity of additional and related electronic services supply is ensured, some 85% of population are provided with universal broadcasting services to satisfy public interest and protected and sustainable networks are developed using the best available resources.

To determine technical and technological aspects of Digital Switchover policy, it is necessary to correctly set a technical problem, to ensure transparency of information on the existing infrastructure, and to properly and rationally plan the network.

The following aspects are to be taken into consideration in planning of the Georgian digital over-the-air:

- **Selection of technology**;
- **Number of multiplex operators and networks in a transitional and analog broadcasting switch- off period;**
- **Percentage rate of population coverage**;
- **Necessity to plan new stations and opportunity to use the existing infrastructure, equipment, and transmitters;**
- **Addition/expansion of number of new stations to ensure optimal coverage[3];**
- **Selection of single or multiple frequency network or a hybrid model;**
- **Issues related to avoiding of duplication of existing infrastructure or unreasonable use of a network;**
- **Issues related to safety of the universal broadcasting service network.**

4.1.Technology and Standards

[2]The digital broadcasting services should be accessible to at leaast 85 % of the Georgian population.

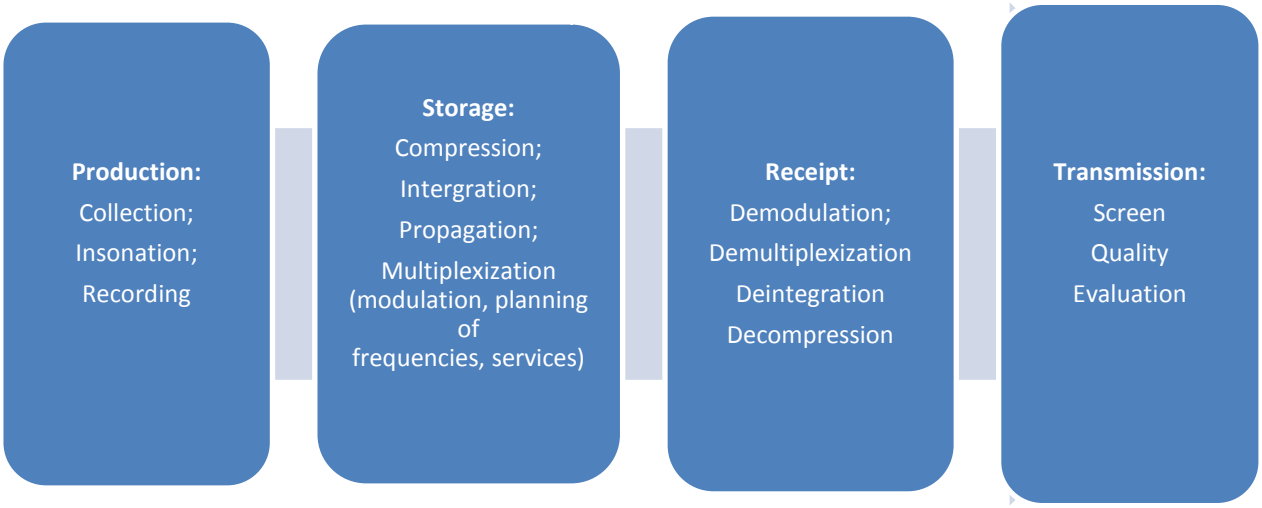
[3]Note: ,,if during a planning of additional infrastructure,it will appear that a 95% of universal coverage and a number of infrastructure do not significantly increases costs, then the universal coverage percentage indicator may increase from85 % to 95 %

The digital broadcasting standards were developed in line with the **EU regulations on Broadcasting and Telecommunications**. The purpose of determination of standards for the digital broadcasting services is to ensure countrywide compatibility, cost-effectiveness, and universal broadcasting accessibility to the so-called universal and other broadcasting services.

The network planning, technology, standards, network setting-up, applications to be used and other important and functionally interrelated issues[4] should be covered by licenses. The objective of technical aspects of the strategy is to identify the optimal decision between quality of image and sound, quality of coverage, and signal propagation price.

A number of issues related to the selection of technologies, planning of frequencies and network should be in conformity with authority and possibilities of the Georgian Communications National Commission and infrastructure status of network providers operating in Georgia.[5]

The broadcasting process may be breakdown into the following phases:



This section of the strategy presents key data and guiding principles on provision of standards of digital broadcasting and associated systems.

4.1.1. SDTV or HDTV

The **SDTV** and **HDTV** television presentation formats are directly connected to the receipt of broadcasting signals and capacity of network despite of being programs production process. The above issue is of the utmost importance to end-users.

[4] Report ITU-R BT.2140 Transition from analogue to digital terrestrial broadcasting; Part 1, section 1.8, The digital broadcasting chain. http://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2140-2008-PDF-E.pdf

[5] Guidelines for the transition from analogue to digital broadcasting, ITU 2010. http://www.itu.int/dms_pub/itu-d/opb/hdb/D-HDB-GUIDELINES.01-2010-R1-PDF-E.pdf

The HDTV services for users of technological platforms have been widely introduced in Georgia. The concentration of the relevant TV sets has been also increasing. The HD television services have become step-by-step becoming norms for broadcasting[6].

The selection of television content presentation formats (SDTV, HDTV), standard, compression systems, conditional access systems, and systems to provide additional services[7]are to be determined in the strategy as well as the relevant legal norms and license terms.

For the SDTV transmission 625 band and 4:3 or 16:9 image format is used. 1080ior720p is used in provision of high definition television services. The wide television screens that have a possibility to receive HDTV quality programs are usually located in big rooms (as a rule, in case of apartments/houses, in living rooms). The European Broadcasting Union (EBU) states that concentration of HD TV sets will increase in the near future and accordingly, demand for HD quality. In the opinion of the above organization, a complex of concrete diversified programs would be interesting for users if it includes 20 - 25 HD programs.[8]

In selection of speed for transmission of data of SDTV and HDTV services for video services it is necessary to identify a compromise between image quality and capacity of multiplex channel during the transition period. It is necessary to evaluate the following issues to achieve the high quality of image:

- High demand of flat-screen TVs in terms of speed for data transmission;[9]
- Quality of signal compression and codification indicator;
- Use of statistical multiplexes;
- The users' demands in terms of quality depend and are compared to the quality of the digital cable or satellite services, or the so-called Blue ray disks and not to the quality of analog broadcasting.

The parameters of digital broadcasting network should be sufficient to "carry" a requested number of services at a speed necessary for data transmission that depends on transmitters, modulation, code rate and guard interval as well as number of services to be transmitted via the multiplex network.

It is necessary to identify a compromise between the image quality and multiplex capacity when selecting the optimal volume of video signal of SDTV and HDTV services. The compromise may be identified at the network and multiplex planning stage, though it is necessary to consider the following parameters to ensure the required image quality:

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[6]An overview of the issues surrounding the delivery of HD services on the digital terrestrial television platform is given in DigiTAG report, HD on DTT, key issues for broadcasters, regulators and viewers (2007).

[7]Note: The transmission of the above services in a transition period should be restricted, though their prior determination is necessary as connected to the multiplex capacity.

[8]Note: When buying a new TV the users select maximally big flat screen TVs and because of screen deffeciencies are seen at small distance during the standard definiiton content transmission, requirement of viewers towards image quality increases.

[9]Note: The flat screen TVs are sensitive and require a double data transmission speed for image as compared to telescope screens (Cathode Ray Tubes (CRT);

Video Transmission Strength Demands

Format	Type of Screen	Compression	Average Speed	Notes
SDTV	CRT[10]	MPEG2	≥3 Mbit/s	
SDTV	Flat screen	MPEG2	≥6 Mbit/s	
SDTV	Flat screen	MPEG4	≥4 Mbit/s	
HDTV720p	Flat screen	MPEG4	≥10Mbit/s	If MPEG4 technology is developed, ≥ 8 Mbit/s presumably should be enough
HDTV1080i	Flat screen	MPEG4	≥12Mbit/s	It depends on content and application of horizontal sub sampling.

It is necessary to consider the following parameters in terms of sound quality:

- Stereo audio signals: 192 kbit/s
- Multichannel sound signals: 0.5- 1 Mbit/s.

Although, it is necessary to take into consideration that upon completion of multiplex development and transmission of services, the image quality may be improved due to the increased capacity at the expense of freed channels or services, higher order modulation), higher code rate or smaller guard interval;[11]

The MPEG2 or MPEG4 standards should be selected for the compression standard. It is anticipated that standardization of more effective systems will take place in the future.[12]

The MPEG4 standard should be considered as the only acceptable standard for this period as prices of receivers are almost the same on the market (especially, for low-priced equipment), and maximization of channels (volume) of multiplex, minimization of costs, effective use of frequency and other issues are very important.

In a transition period, a higher level of state integration is required in licensing of the first two national multiplex operators[13]. After a full switch-off of analog broadcasting, it is necessary to apply a more liberal approach to ensure competition, to introduce new services, and to facilitate internal competition among platforms; this should also apply to a change from the mandatory standards determined for the transition period to recommended standards, in particular in 2015-2017.[14]

[10]Telescope type of screens.

[11]REPORT ITU-R BT.2035-2 Guidelines and techniques for the evaluation of digital terrestrial television broadcasting systems including assessment of their coverage areas. http://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2035-2-2008-PDF-E.pdf

[12]Note: Change of compression will cause of change of all receivers and devices integrated to TVs.

[13]Note: The aim of integration is to ensure universal accessibility to optimaze network and transport network related costs.

[14]Note: Upon completion of a transition period it is necessary to define standards that will settle intercompatability and annul risks related to introduction of improper standards and facilitation of introduction of innovations on the market.

Before selection of concrete digital standard, it is necessary to evaluate advantages of each standard, in particular, capacities are evaluated that are necessary to cover the digital broadcasting zone at defined data transmission speed. The capacity should be identified in line with short-term and long-term needs of Georgian digital broadcasting market and existing landscape factors (fixed or mobile receipt, broadcasting in cities with multistoried buildings, necessity to operate by single frequency network (SFN), etc.).

The world digital broadcasting standards:

Standard	Modulation	Description in ReportITU-RBT.2140[15]	Recommendation ITU-RBT.1306[16]	Applicable standards
ATSC	Single carrier 8-VSB	Brief:part1 section2.6.2.1 Detailed:part2,section1.5	System A; annex1table1a	A/52,A/53,A/65,A/153
DTMB(the so-called Chinese standard)	Multicarrier OFDM	Brief:part1,section2.6.2.2 Detailed:-	-	GB20600-2006
DVB-T	Multicarrier OFDM	Brief:part1,section2.6.2.4 Detailed:part2,section1.6	System B; annex1table1b	EN300744
ISDB-T	Multicarrier Segmented OFDM	Brief:part1,section2.6.2.5 Detailed:part2,section1.8	System C; annex1table1c	ARIBSTD-B31 ABNTNBR15601

The DVB-T2 standard is 30% - 50% more effective compared to the DVB-T standard and properly operates in single frequency network (SFN) conditions. When analyzing experience of other countries, it is important to consider that the DVB-T2 standard service transmission started in the end of 2009.

The DVB-T system[17]depends on the complete digital technology approved by ITU[18]as a system for digital terrestrial broadcasting. The DVB platform was developed in line with market demands and cost-effectiveness. The above standard is associated with MPEG[19] video and audio compression standard.

The DVB system standardized by ETSI[20]includes a set of the DVB standards that defines European standards for DVB-T system as well as other standards, for example, for cable digital broadcasting

[15]Report ITU-R BT.2140 Transition from analogue to digital terrestrial broadcasting.
[16]Recommendation ITU-R BT.1306 Error correction, data framing, modulation and emission methods for digital terrestrial television broadcasting.
[17]"Digital Video Broadcasting for Terrestrial Television Transmissions"
[18]International Telecommunications Union.
[19]Moving Picture Experts Group. http://mpeg.chiariglione.org/
[20]The European Telecommunications Standards Institute.http://www.etsi.org/

(DVB-C), satellite broadcasting (DVB-S), point-multiple point video distribution (DVB-MS and DVB-MC, accordingly close to frequency 10 GHZ) and other types of services.

The set of the DVB standards also includes a number of associated standards for additional and associated services: teletexts (DVB-TXT); sub-titles (DVB-SUB); server information (DVB-SI); conditional access (DVB-CS and DVB-SIM); common interface for the above access and other DVB programs (DVB-CI), data transmission (DVB-Data), interactive services (DVB-I) and other standards.

The set of the DVB standards are based on the full digital technology and is fully compatible with other specific applications such as internet access and electronic selection of programs according to the thematic menu (EPG[21]-Electronic Program Guide). The EPG makes possible to search, to page, to select, and to record programs and associated services.

The DVB-T2 standard specifics as compared to the DVB-T standard make possible to further refine modulation and reduce network mistakes that results in increase of speed and credibility of programs. The DVB-T2 standard network capacity has increased by 30 % based on the theoretical indicator as compared to DVB-T, though it is 65% according to the real test indicator.[22]

The European and world experience (including neighboring countries) states that the television signal transmission standard DVB-T2 is considered to be the only acceptable standard due to many circumstances(services, frequencies, competition) from the viewpoint of optimization of network costs as well as of users' interests. The above is determined by a possibility to transmit competitive, paid interactive broadcasting services. The introduction of this standard in a transition period is optimal for long-term perspective development, competition and facilitation of entry of interactive service providers on the market. ***The introduction of DVB-T2 standard is optimal*** if we take into consideration the average European broadcasting dependent indicator.

In a transitional period, it is necessary to determine the following to issue national terrestrial broadcasting network licenses:

- **Television broadcasting format – SDTV**
- **Program standard: DVB-T2**
- **Compression standard: MPEG4**

Stages	Television Broadcasting Format	Program Standard	Compression Technology

[21] Electronic programme guide.http://www.freeview.com.au/epg/
[22]Understanding DVB-T2. Digital Terrestrial Television Action Group. 2009. http://www.digitag.org/DTTResources/DVBT2_Handbook.pdf

Stages	Television Broadcasting Format	Program Standard	Compression Technology
Parallel broadcasting	SDTV	Mandatory DVBT2	Mandatory MPEG4
Analog Television Switch-off Post Period	Neutral SDTV or HDTV	Mandatory DVBT2	Mandatory MPEG4

The recommended standards are listed in Annex N1.

At the initial stage of digital broadcasting, the minimum quality parameters of network should be determined and controlled to ensure the internal competition of platforms and protect users' interests.[23] **The above ensures** provision of quality service by broadcasting network and increase of network bandwidth.[24]

4.1.2. Encryption System

The encryption system that is mostly used for transmission of conditional access to subscribers enables a subscriber to receive paid services and service operators to protect its content from unauthorized use. The access conditions might be paid or depend on citizenship (in this case, the program access right might be restricted by geographical indicator). In most cases, access is provided by the so-called smart card. If a subscriber is willing to get access (and has a possibility to do so), the authorization signal is transmitted and if confirmed, he/she is provided access to service.

The encryption of television signal is an approved practice for satellite broadcasting services. It shall be noted that the Subscriber Management System (SMS) is necessary to activate a service. The SMS manages a billing process and grants authorization.

Several versions of Conditional Access Systems (CAS) are available on the world market. In most cases, they have been developed for satellite broadcasting, though they are also used for digital terrestrial broadcasting. The selection of the optimal version of Conditional Access System should be based on its price and security parameters (protection from blocking break).

In selection of the Conditional Access Systems (CAS) it is necessary to consider their ability to work together (multi-script) if different access systems operate in a country or are expected to operate in the future.

[23]Note: For example the so-called jetter should controlled in MPEG encoders and etc.

[24]Note : It is advisable to determine antenna cable parameters and to control similar to UK practice (e.g.: Cable Type 100: CAI Benchmark Specification).
http://www.thenbs.com/PublicationIndex/DocumentSummary.aspx?PubID=1237&DocID=296818

The system may be as follows:

- ✓ The so-called loaded version (a cheaper version but at the same less flexible one); or
- ✓ Common Interface (CI) [25](a more expensive application that "exempts" a receiver from influence of providers[26]and is more flexible).[27]

4.1.3. Additional Services

In addition to the television digital signals, many other services are provided by digital broadcasting platform that are either linked to television content or are independent. These services may include the following:

- Radio services;
- Service information (SI) that will be head end[28]and includes information on the existing and future programs;
- EPG (a receiver generates EPG that is based on SI and requires less channel bandwidth). The EPG is provided by service provider and therefore, it makes programs dependable on service providers but requires more capacity and the relevant Application Program Interface (API) for a receiver);
- Teletext (vertical blanking interval (VBI), two data strips per each picture require a speed of at least 37.6 kbits/ (DVB Teletext); speed may often increase to 0,3 Mbit/s);
- System Software Update (SSU) provided by update and fixation of receivers;[29]
- Access services for users with visual or auditory disabilities.

Capacities necessary for Access Services

Access Services	Provision	Examples
Sub-titles	DVB teletext DVBsub-titles*	>38kbit/s ≤10kbit/s
Auditory sub-titles	DVB premixed extra audio channel DVBreceivermixedaudio*	>64kbit/s 64kbit/s
Audio services	Premixed Receiver mixed* Other means (e.g.AM radio, Internet radio)	192kbit/s 64kbit/s -
*Recommended by EBU		

[25]enhanced common interface "CI Plus" has been developed by a number of manufactures in order to provide improved copy protection functionality. CI Plus is expected to become the de facto norm in all television receivers by 2011 (source: DigiTAG).

[26]For the purpose of intercompatibility, the state may determine a necessity to store the service information in receivers (for example as this happens in a number of countries), though this is in the service provider's interests when a consumer is restricted during a service replacement.

[27]Thegeneralinterface may have other funcitions as well.

[28]EBU Report – TECH 3316. Monitoring of Access Services, Requirements, Developments and Recommendations, Geneva, February 2006

[29]DigiTAG report DVB-SSU, implementing system software updates on the terrestrial platform (2007).

In practice, additional services may require 4% - 20% of multiplex capacity. As the multiplex capacity is restricted, it is necessary to select an application based on minimum capacity requirements as well as application that won't cause any duplication of data and unnecessary network load.

The broadcaster and multiplex operator need to define legal aspects of relations between these services and providers to better consider viewers' interests. The services may be offered only after broadcasting programs of main broadcasting content producers are posted (in accordance with standard decipher).

4.2.Radio Frequency Plan

The digital broadcasting plan of Georgia is based on the plan to grant international radio frequencies to radio and television programs of digital terrestrial broadcasting network- ITU Geneva 2006 (GE06) that was adopted by International Telecommunications Union (ITU) in June, 2006 at RRC-06 as a technological change instead of analog frequency distribution.[30]**In accordance with the above Geneva agreement, the digital broadcasting plan GE06 will be fully implemented after 2015 providing Georgia harmonizes and coordinates frequencies with its neighboring countries on a constant basis up to that date.**

The data on frequency channels accessible at the digital broadcasting transition stage as provided by the Georgian Communications National Commission can be seen in Annex 2. **According to 10 Digital Regions.**

The digital dividends may be used to/for:

- ✓ Facilitate making up of additional national digital broadcasting network (according to other standards or mixed standards);
- ✓ Increase volume of digital programs at regional and local levels;
- ✓ Mobile television services (DVB-H) or other video and multimedia services;
- ✓ Introduce mobile communications as the fourth generation services;
- ✓ Provide wideband communications services without cable;
- ✓ Support local services;
- ✓ Short-term applications without cable such as access to houses without cable;
- ✓ Security (different state or private security systems).

The digital network provides different opportunities to transmit services of new generation that may be breakdown into 3 groups:

1. Communication services (**main communication services,** new public communication services, mobile television services);

[30]Stockholm Agreement in 1961 – ST61

2. Information services – (ensuring of new information services by television broadcasters via digital broadcasting platform; information services of new generation for end user; maintenance/ installation of PEGs, technical services);
3. Interactive services (online banking services, interactive games and quizzes, services of certain categories, etc.).

4.3.Technical Aspects of Implementation of Digital Terrestrial Broadcasting

To determine a position in terms of the DVB-T2 standard technological aspects, it is necessary to answer the following questions:

- **What is the most acceptable standard for planning of the DVB-T networks (MFN, SFN[31]or mixed), operating regime and receipt?;**
- **What is the perspective of development of digital terrestrial broadcasting compared to other platforms (digital, cable, satellite)?; the following factors should be considered in evaluation of this question: transmission related technologies, value of networks; their management and maintenance, prices of receivers;**
- **Whether or not the presented model will create any barriers for new operators to enter market?;**
- **What will be the status of interactive services?;**

In a switchover period, it is necessary to determine only minimal conditions to receive signals in a fixed regime.

For determination of the state policy it is very important to identify the optimal model from the point of view of making up infrastructure (networks), associated costs, and quality.

The network making up speed, price and quality (as a rule, reflected in the territory/population coverage indicator, digital signal accessibility indicator, number of multiplexes) are indicators that are to be balanced in accordance to all geographical areas of the country and a concrete solution should be identified based on optimization of these indicators. For this purpose, please see below a table offered by the **ITU**:

Network Elements	Influence	Introduction Speed	Low Price of Network	High Quality of Network

[31]Single-frequency network, Multi Frequency Network.

Use of existing sites	The sites are accessible at a fixed price; it is possible to have restrictions for access to additional services in a transition period.	Positive	Positive	Negative/ Neutral
Use of new, additional sites	Additional time for purchase and installation	Negative	Negative	Positive
Qualified human resources	If this problem does not exist, additional human resources should be available for project planning, supervision, and installation works.	Positive	Negative	Neutral
Temporary transmitters for transition period	Better coverage	Negative	Negative	Positive
Use of frequencies according to GE06	Lack of time for time-consuming international negotiations with neighboring countries and ITU.	Positive	Neutral	Positive/Neutral

In the selection of a comprised version, it is necessary to apply a different approach and technical solution at different stages and geographical areas (e.g., regions with low population concentration, difficult landscape, and environmental conditions). The above issues should be considered at a long-term perspective in a network planning process.

It is important to retain analog broadcasting in the Abkhazia Autonomous Republic till 2020, whilst coverage of Gali region should happen from territory adjacent to the de-facto border in a regular regime.[32]

[32]In accordance with Georgian Association of RegionalBoradcasters as of today it is possible to receive channels broadcasted from Zugdidi to Gali territory and therefore it is important to retain accessibility for population of that region. In our opinion, it will be difficult to provide Gali population with receivers (esp., in a transition period), therefore, it may be possible to retain local analog broadcasting in Zugdidi (in parallel broadcasting rregime) and this should be supported by the state (that this liability should not become a burden for commercial broadcasters).

In determination of technical and technological aspects, it is important to analyze a financial part of the switchover as this process requires big investments at all stages of service supply chain. Due to the small size of the market this issue should be well explored and planned at the implementation stage.[33]

4.4. Principles of Digital Broadcasting Network Planning & Network Architecture

The strategy should include the following aspects at the planning stage:

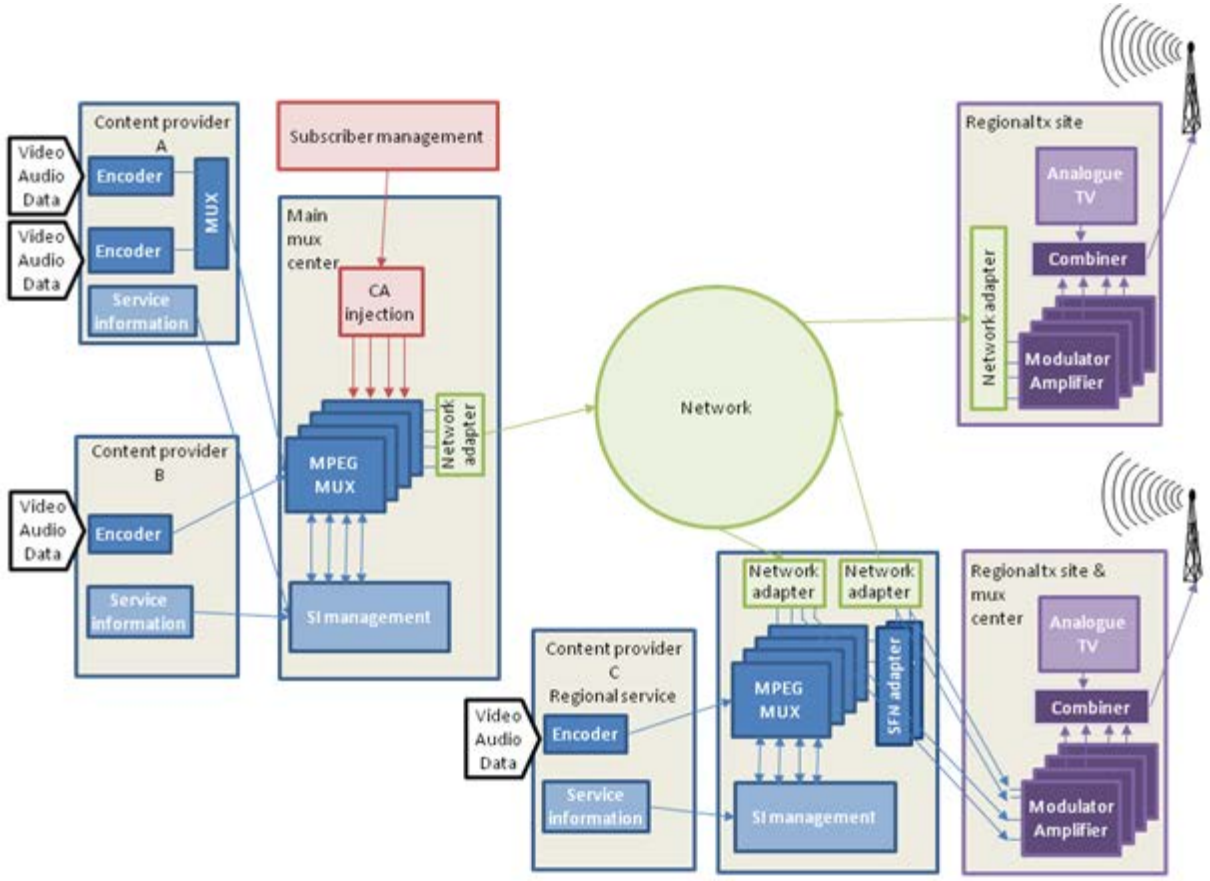
- Selection of the optimal model taking into consideration speed of making up a network, its value, and quality;
- Determination of national, regional, and local coverage services;
- Frequency plan and network topology;
- Head- end configuration;
- Equipment reservation planning;
- Types of distribution networks.

It is very important to properly define general principles of making up a network and network planning as well as technological choice for business planning and regulation.

The DTTB networks include one or more head end, distribution channels, and transmission sites.[34]

[33] CONFERENCE ON DIGITAL TERRESTRIAL TELEVISION (DVB-T). ANACOM WORKING DOCUMENT. Lisbon, 17-18th of February, 2000.

[34] CoE/ARB Workshop On "Transition from Analog to Digital (Digital Terrestrial Television: Trends, Implementation & Opportunities) Tunisia – Tunis , 12 – 15 March 2012 Session 3 : Radio wave propagation and Planning http://www.itu.int/ITUD/arb/COE/2012/DTV/documents/doc3.pdf



The network making up speed, value, and quality depends on a business model and license terms. The head end is a part of the network when video and audio signals from studios are compressed (via use of MPEG2 or MPEG4). The compressed signals and accompanied DATA signals are combined (multiplexing) in the MPEG Transport Stream (TS). The data signal may include different Service Information), Teletext, and Internet Protocol Data Cast (IPDC). The MPEG Transport Stream is transmitted till a site via a distribution channel.

It is also possible to transmit two independent Transport Stream to a transmitter and to use the hierarchical modulation. The first stream may be modulated as a low priority for roof-fixed antennas, whilst the second, as a high priority, for outside receipt. The signal of this category may be transmitted by the DVB-H standard for mobile television services.

As in Georgia it is necessary to transmit regional or local services, these services should be encrypted at the regional sites and added via re-multiplexing to the MPEG Transport Stream for broadcasting in the regional or local zones. The above model mostly depends on price of the distribution networks (and other factors) and a different technical solution may be identified.

At the transmission site, in each MPEG Transport Stream, a modulation happens in a transmitter to transmit a concrete OFDM signal by the relevant system version (e.g.: 64-QAM modulation, code rate 2/3, protection interval indicator 1/32) and is transformed into a required channel. All radio frequency signals or their part and transmitters are combined at one transmission antenna. In some

cases, more than transmission antenna is used, for example, in case when signal of different coverage are transmitted.

The frequencies should be used in accordance with the 2006 Geneva Agreement (GE06) and be compatible with the existing anal television services. For the purpose of protection of the analog television services, in a switchover period from analog to digital broadcasting, it may become necessary to transmit the digital signal at a restricted capacity or by use of temporary frequencies. In addition, for practical purpose (for example, because of insufficient relevant co-location area or lack of the relevant free space at the channel) it may be necessary to operate digital television at a temporary restricted mode.
The criteria to balance technical solution and costs:

High Speed for Network Making	Low Network Costs	High Quality Network
· Use of existing sites · Relevant human resources · Use of frequencies according to GE06	· Use of existing sites · Receipt at roof	· Use of new sites · Mobile receipt · Regional/local services · Reservation devices · Additional transmitters High coverage indicator · Temporary transmitters necessary for transition period

The **network quality** is very important during a selection of the concrete technical solution that is crucial at the planning stage; if the network quality will be low at the Digital Switchover period, it may be difficult to establish is as a competitive platform.

4.4.1. Main Receiving Regimes and Determination of Receiving Installations

The digital signal receiving installations include set top box or integrated digital TV set, antenna cables and antenna. The receiver shall be equipped with the possibility to receive the existing standard, the relevant compression standard and if necessary, conditional access system.

The GE06 Agreement defined the following three receiving regimes[35]:

- ✓ Fixed receipt;
- ✓ Indoor and outdoor receipt;
- ✓ Mobile receipt.

[35]GE06 Agreement, Chapter 1 to Annex 2, articles 1.3.11 (fixedreception), 1.3.12 (portable reception) and 1.3.13 (mobile reception).

During the planning of the broadcasting services it is important to determine the small-scale, the so-called test zones (for example, 10 test zones in each digital zone) in which it will be possible to receive services via the digital signal receiving installations).[36]It is necessary to achieve a determined percentage coverage indicator for each zone. In the analog broadcasting in which an intensity of the signal is less than the required indicator, an image is still seen on a screen, though the quality is poor and noise is increasing. In case of the digital broadcasting, if this indicator is less than a minimum indicator it is possible to receive services. To ensure a quality broadcasting coverage, it is necessary to maintain a quality receiving indicator in the above small-scale zones.

The minimum median field strength values (Emed) for a fixed and mobile receipt is presented in the GE06 agreement [37] and based on the 95% coverage. [38] The Reference Planning Configurations (RPC)[39]also determines the 95% coverage (for a fixed service). It should be noted that RPC 2 defines the low coverage quality requirements for a service to be received in a mobile regime.

The public broadcasting services often should be distributed under the universal coverage liabilities that envisage a full coverage for the population. According to the world practice, in most countries the liability of universal coverage applies only to the fixed coverage.

The outside mobile receipt for most part of the population is not the key purpose in a transition period. In a case when the digital broadcasting platform has to compete with the cable TV or IPTV platforms, a receipt of services in a mobile regime will create a certain advantage compared to these platforms that is a positive indicator for the replacement.

It is necessary to define the following to determine specifications of receivers:

- Transmission system
- Compression system
- Conditional access system
- Used frequency band
- Radio frequency rates

The DVB-T2 broadcasting costs include the following aspects:

- **Development of content and transmission of programs** (e.g.: adaption of studios for compatibility with the digital norms 16:9 and HD quality content).
- **Multiplex and associated services***(this direction includes funding of all measures necessary to post programs, including associated infrastructure, conditional access services, PEG, interactive and other telecommunication services).*

[36]GE06 Agreement, Annex 2, first part, article1.2.2.
[37]The field intensity mimimum average indicator (Emed) for 200 MHz and 500 MHz frequencies for all DVB-T versions are presented in the GE06 agreement (table A.3.2.-2 of Appendix 3.2 of Chapter 3 to Annex 2).
[38]Annex 2 of Part 3 of the GE06 agreement (3.2.1.4 and 3.2.2.4), depdends on receipt of services in fixed and outside regimes.
[39]Reference Planning Configurations (RPC) GE06 agreement, Part 3.

- **Transport and transmitters network** (direction of the digital network of the transport network from a multiplex to transmitters and from transmitters to terminal device of end users).
- **Costs related to subscribers' devices and analog broadcasting.**

In the investment process it is important not to fund a direction that will cause unnecessary and unreasonable duplication of the existing network and an increase of network capital costs that will have a negative impact on the access fee to the relevant resources.[40]

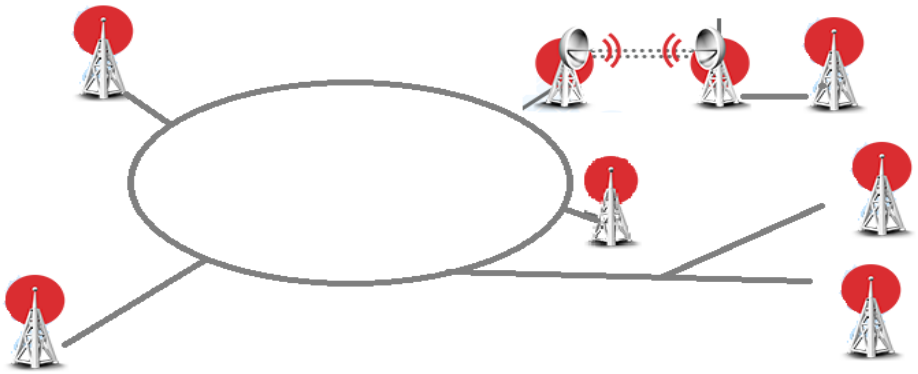
In a medium and long-term periods, the correct and technologically high transmissible solution for a network in terms of signal transportation area should be based on technological solutions of networks of a new generation. The fiber-optic network is the only acceptable solution.[41] In geographically problematic zones, a signal will be best transmitted via radio relay on the maximally short distances (a hybrid model of these two technologies[42]), whilst the network is to be backed up via satellite connection.[43]It is important to state that the western European countries has been working on the development of wideband and new generation networks for years as opposed to Georgia and this, in most cases, solves the problem related to the transportation network for digital broadcasting network.

The Georgian wideband network is well developed, especially at highway levels despite of a lack of coordination and common policy and therefore, it is necessary to use it to ensure network credibility and high ability to transmit as well as to develop a market for provision of high quality broadcasting services.

[40]Note: This problem is more actual in a transition period and will be a unjustified burden to broadcasters.
[41]Transmission Network Fundamentals, From Microwave Transmission Networks: Planning, Design, and Deployment. http://www.globalspec.com/reference/70793/203279/chapter-1-transmission-network-fundamentals
[42]Note: The above model is the only one due to Georgi'as lanscape and the proposed relay solution should be replaced by hybrid model;
[43]DTT NETWORK STRUCTURES AND TECHNICAL INNOVATIONS. A. Morello, Co-authors: G. Alberico, P. Forni, V. Mignone, S. Ripamonti, B. Sacco, V. Sardella, M. Visintin, RAI – Centro Ricerche e Innovazione Tecnologica - Turin – ITALY.
http://www.broadcastpapers.com/whitepapers/IBCRAIDTTNetworkStructures.pdf?CFID=25285954&CFTOKEN=21e39f995340d0c0-BADBEE76-E0E4-FA18-A861E52B5536C939

In case of requirement for the HD of a new generation and other services, a network provider will face problems related to the network transmissibility and quality[44]that will not depend on the external conditions (frequency-based transport network problem). The fiber-optic platform network is the best solution to prevent these risks.

For example, in our opinion, we present Georgia with specific best solution in regard to this issue.[45]



[44]One hundred percent quality of Service. Net Insight. 2011. http://www.netinsight.net/Global/Documents/Company/NetInsight_CompanyBrochure_2011.pdf

[45]Digital Terrestrial TV and Mobile TV Networks. © 2013 Net Insight. http://www.netinsight.net/Solutions/DTT-networks/

The network technical solution presented in the figure above has the following advantages:

- **Fast making-up of a network, at the expense of the existing network**;
- **Effective use of capacities of transmission links;**
- **Network credibility and high transmissibility;**
- **Effective use of radio frequencies.**

4.4.2. Service for National, Regional, and Local Coverage

A zone of the requested services for their multiplexing needs to be exactly defined. In general, a service may cover national, regional, and local zones. If a service includes both national and regional or local programs (even for a certain period of time, e.g. local news or ads), a multiplex should be regarded as a regional or local since a part of services are to be included in the re-multiplexed regional and local services.

The next step is to determine a location of decipher and re-multiplexing equipment (a concrete location should be determined). The above equipment should be located together. The national transmission services are multiplexed in a central point. The regional services are posted one of the sites and form a regional network; the re-multiplexing takes place at this point. In accordance to other solution, all services are transmitted to a center of the central multiplex (including regional and local) in the MPEG transport stream, out of which a local content is selected and transmitted.

Multiplex Operating Aspects

Operating Aspects	**Multiplex Location**
Low price of equipment	Central
Easy management and service	Central
Low price of receipt of uncompressed signals of regional studios	Regional
Network credibility (a restricted number of operational transmitters in case of malfunction)	Regional

The service zones for national, regional, and local services should be defined by the current status. The large number of regional and local zones will increase costs related to making up a network at the expense of increased number of re-multiplexing and access points. It is recommended to restrict a number of such points in regions and of local zones.

The selection of location of re-multiplexes depends on operational instructions and price of multiplex devices. It is possible to apply a different approach in different parts of the country (for example, the east and west zones).

Location of decipher and re-multiplexing equipment should be close to studios to maximally decrease a distance of transmission of compressed signals.[46]

It is obvious that the relevant infrastructure should be jointly used to ensure maximally low costs of the transport and transmission networks. By this approach it will be possible to form a low price of access to the multiplex operator that will enable broadcasters to transmit signals at a low price. This will stimulate a competition within the platform[47], though planning of low - cost network solutions in the long perspective will have a negative impact on a transmissibility of broadcasting network that is connected to the service receiving installations of a new generation that depend on the high quality.

4.5. Frequency Plan and Network Topology

In general, the existing analog broadcasting sites may be used for the digital broadcasting, though it may be necessary to construct additional infrastructure (additional stations) in cases when:

- The analog television networks do not cover the necessary transmission area to ensure the universal coverage;
- The receipt of services in the outside and mobile regimes should a priority for the country;
- It is necessary to achieve a high coverage indicator and it is planned to make up a single frequency network;
- The existing sites are planned for receipt of the roof-located antennas and remote from the settlements.

The experience shows that the existence of additional transmitters is necessary for the digital network that is different from the analog broadcasting. The digital broadcasting network and technical conditions of stations should be in compliance with the GE06 agreement.

4.5.1. Network Planning

It is necessary to achieve a consensus (optimal balance) between the network costs, service quality, and coverage quality. Most part of the network costs depend on a number of sites and transmitters and antennas related investments, therefore, it's important to effectively plan and select an optimal coverage model.

The below scheme shows the elements that's should be considered in a selection of the optimal model:

[46]Guidelines for the Transition from Analogue to Digital Broadcasting guidelines for the Transition from Analogue to Digital Broadcasting. ITU 2010.
[47]NATIONAL ROLL OUT OF DIGITAL TERRESTRIAL TELEVISION. Suruhanjaya Komunikasi dan Multimedia Malaysia. May, 2012.

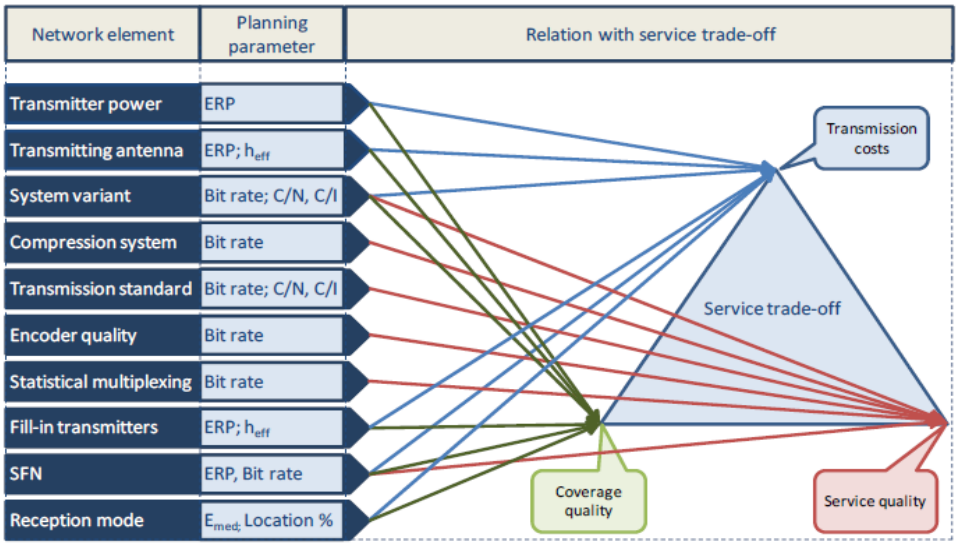


Figure 4.3.2 Service trade-off

The transmission costs depend on a number of transmission stations and ray indicator. The volume of multiplex depends on the compression technology, transmission standard, encoder equipment, and type of the system (transmission modulation, encoder speed, and security mode).

The coverage quality depends on a service receipt regime (fixed, outside or mobile). The defined standard applies to receipt of services in the fixed and outside regimes according to the GE06 agreement (95%).[48]It should be noted that quality of the first two multiplexes should be high as the liability related to the universal coverage will be mostly imposed to the first national multiplex. Therefore, it should cover the whole populated areas of the country with maximally high quality.

4.5.2. SFN or MFN

The ITU GE06 agreement envisages an existence of MF, SFN, and mixed model within a concrete broadcasting zone.[49]The existing analog network infrastructure in multi-frequency, will mostly depends on that what reduce the network related costs. Therefore, the access price to resources of multiplex operators will be less for broadcasters. The infrastructure of users will be useful; though it is important to introduce the DVB-T2 standard network in Georgia which technical specifications differ from the DVB-T standard parameters.

The network making up model should be selected on the basis on analysis of frequencies in use and free frequencies existing within the concrete geographical area as well as geographical specifications of the digital zone which should be provided in the auction conditions as one of the criteria for evaluation of an applicant. Under the existing restricted resources of frequencies it is very important

[48]Note: In practice, for receipt of service in outside regime, a low percentage indicator may be established.

[49] DTV Frequency planning MFN and SFN (Role of DVB-T2 to improve SFNs). Mats Ek http://www.itu.int/ITU-D/arb/COE/2012/DTV/documents/doc6.pdf

and in some cases, absolutely necessary to make up a single frequency network (SFN) for population in high concentrated digital zones that are characterized by less difficult landscape[50].

Optimization of frequencies does not depend only on the existing resources as in accordance with the ITU recommendation, maximally low frequency should be used for digital broadcasting network.

The DVB-T2 standard dependable network provides maximum capacity under topology based approach applied to making up SFN. The new standard provides more capacities for SFN as opposed to the DVB-T standard.

In case of selection of the proper model, the DVB-T2 based single frequency network provides more capacities compared to the DVB-T standard analog broadcasting. The above approach applied for making up a SFN ensures maximum effectiveness of use of spectrum, though it restricts regional and local services.[51]

4.5.3. Head- end Configuration

The multiplexing center includes interfaces, encoder equipment, statistical multiplex, and monitoring and control devices. To establish a flexible network it is necessary to install a Reutter that will connect television signals with encoder equipment. In case of SFN, to operate properly the multiplexing center should include the following devices:

- ✓ SFN adapter to adjust different transport delays in the transport network;[52]
- ✓ Internal clock for synchronization, for example, by GPS;
- ✓ Network Time Protocol (NTP) server for synchronization of all transmitters and multiplex;
- ✓ UPS.

The wide use of statistical multiplex. In a statistical multiplex a speed of data transmission is dynamically distributed in accordance with different services, depends on the program content,[53]that maximizes effectiveness of the multiplex (compared to the service guaranteed data transmission speed model) and quality image will not be decreased during this period.

The examples of multiplex configuration are provided in the EBU reports. The below diagram shows distribution of the data transmission speed in accordance with main and non-main services.

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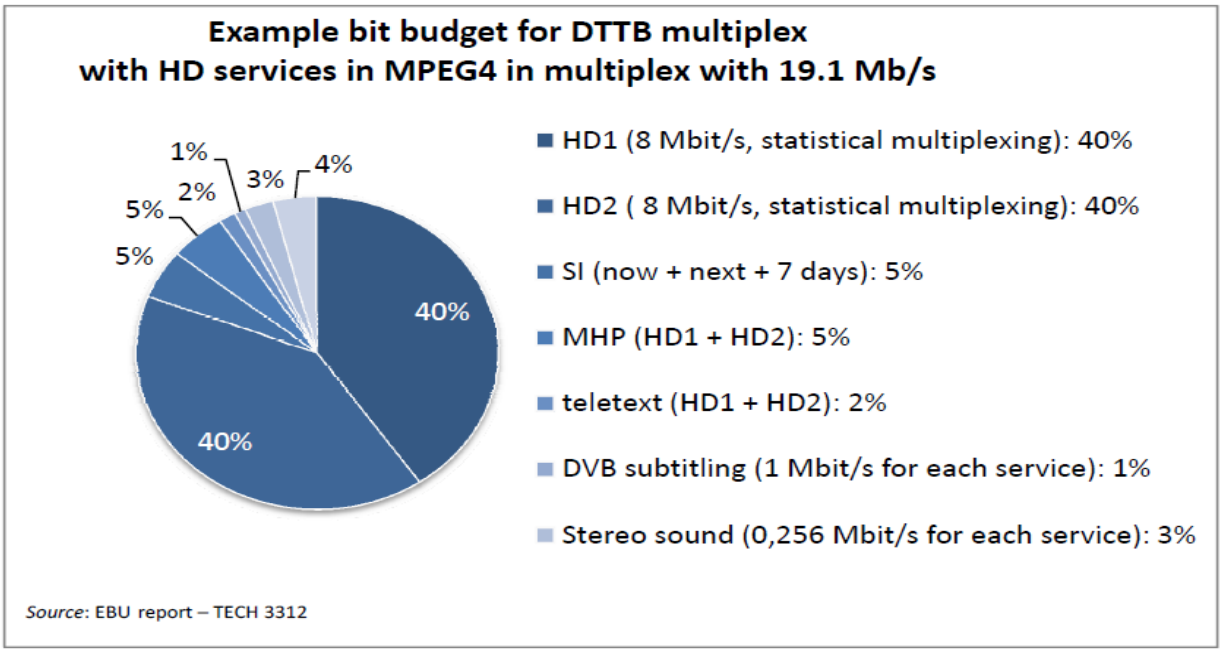
[50]EBU BPN 066 Guide on SFN Frequency Planning and Network Implementation with regard to T-DAB and DVB-T, July 2005.

[51]Key technical, business,& regulatory implicationsUnderstanding DVB-T2. © copyright 2009 DigiTAG

[52]ETSI TR 101 190 Digital Video Broadcasting (DVB) Implementation guidelines for DVB terrestrial services; Transmission; Section 8.5 The Megaframe Solution.

[53]EBU report BPN37 Final report on statistical multiplexing gives by means of questions and answers more information on statistical multiplexing.



The following issues should be considered in determination of the data transmission speed parameters:[54]

- The maximum indicator of data transmission speed should be determined by lower parameters of the digital broadcasting transport network to avoid overload of the network;
- It is necessary to define separate requirements for teletext in terms of the data transmission speed that will depend on a number of teletext pages;
- Transmission of associated program services should be implemented by restricted speed, especially prior to completion of a transition period.

4.5.4. Reservation of Devices

As a rule, the multiplex access contract covers conditions related to distribution and accessibility of its signal from point of view of territory or population.

The service distribution data may change in accordance with period of time or programs. To avoid any long-term deficiencies of services, malfunction of devices or technical service discrepancies, the critical parts of transmission chain elements should have certain resources, for example, passive reserve of encoder device with n+1 configuration or active reserve principle. The advantage of passive reservation model is a high transmissibility that is most optimal in case of improper operations, though it is relatively more expensive. Synchronization of the SFN transmitters is very important as

[54]EBU report EBU – TECH 3312 Digital Terrestrial HDTV Broadcasting in Europe. The data rate capacity needed (and available) for HDTV, Geneva, February 2006; Section 3 terrestrial option for HDTV broadcasting.

in case of malfunction of a synchronization system, the transmitters will interfere with each other, therefore, reservation in these networks and within this direction will be necessary.

4.6 Business Model

During the transition stage the broadcasting content should be provided free of charge. The business model of paid broadcasting services should be acceptable after completion of a transition period on the Georgian market and beginning of operations of the third multiplex that will have a right to offer the mixed service model to end users. The possibility to offer the above services depends on conditions of the television service market.

For a success of the Digital Switchover project it is necessary to maximally cover the territory and quality accessibility of signal, simplification of installation of receivers, their affordable price as well as proper information of end users and balanced advertising market on which freely transmitted platforms depend financially.

There exist several models of the public broadcasting content distribution, though in our opinion, the multiplex management function (that will be consolidated with liability to transfer/distribution of broadcasting signal) should be provided to a commercial legal person that will be granted all relevant rights and imposed the relevant liabilities (MUX1), including a requirement in terms of the public broadcasting content transmission as a must carry requirement on the basis of common authorization and digital broadcasting signal transmission license. Issue of the licenses for these liabilities as in case of MUX2 should be carried out on the basis of a competition, whilst licenses for further multiplexes should be issued on the basis on a two-stage auction (at the first stage- general competition conditions used as criteria, at the second stage- price).

The below provided model should be selected taking into consideration the Georgian broadcasting market conditions, whilst an issue of frequency for a new multiplex upon completion of a transition period should be carried out on the basis of request or announcement of auction by the commission if such a necessity exists based on conditions of the terrestrial broadcasting network or interests of consumers as well as the relevant resources.[55]

The following number of channels should be stored by the multiplex operator in a transition period:

- Multiplex A **(national commercial multiplex)**– 15 Standard Definition TV services (SDTV) by MPEG 4 compression standard;
- Multiplex B – **(commercial multiplex)**-15 Standard Definition TV services (SDTV) by MPEG 4 compression standard.

[55] http://www.digitag.org/Guide_to_Digital_Switchover_v1.0.pdf

The competition for the first and second multiplex operator should be announced within a short interval of time or simultaneously. The person (including affiliated persons) should be prohibited to own one national or one regional digital broadcasting network license at the same time.

The first multiplex operator (of the national broadcasting network) at the commencement of the broadcasting services and upon completion of a transition period as well as the second multiplex operator established in this period and a new multiplex operator established upon completion of a transition period should be granted a right to offer paid service in accordance with the HDTV standard as well as to provide additional and associated services in agreement with the Georgian Communications National Commission. Upon completion of the above stage,the compression technology should be open, whilst access to the types of the associated services should be carried out in accordance with the European Union framework directive, Access Directive and general rules of the Georgian law on Electronic Communications.[56]

The access point to the multiplex resource (access or connect) should be determined in such a way to ensure its accessibility for the interested operator. The access should be carried out in line with the rule defined by the Georgian law on Electronic Communications.

It is necessary to ensure access of the regional broadcasting in the Digital Switchover and subsequent periods in the relevant existing digital transmission zone.

The switchover period for each region includes the following two actions:

1. Start of switchover in a concrete digital zone (sub-zone);
2. Completion of switchover and testing that means transmission of signal of regional broadcasters in all national and concrete broadcasting zones by local transmitters as well as a possibility to provide additional services (in case of free capacities).

In accordance with data of the Communications National Commission,[57]**in Georgia 34 broadcasters transmit television programs by use of frequency spectrum as of today, out of which 27 are regional broadcasters, and 7- national broadcasters. The area of the analog broadcasting is determined in accordance with the 25 broadcasting zones.** In agreement with ITU, Georgia will be divided into 10 digital broadcasting zones as opposed to 25 zones of the analog broadcasting that will enlarge the analog zones and coincide with the administrative division of the country used as a basis for the analog broadcasting. This will have an essential influence on the broadcasters in terms of programs and distribution system.

It is possible to review the following model of the digital distribution system for the content of regional channels at a transition period:

[56]Note: if there will not be a necessity for close regulation of competition.
[57]http://www.gncc.ge/files/2101_113188_153584_GNCC%20-%20digital_broadcusting%20final.pdf

The regional channels are transmitted in a parallel format by use of free frequencies via operational broadcasting network. They are transmitted in accordance with enlarged digital zone. In this case it is necessary to consider that inter-coverage of regional channels will take place, for example: as of today, the current channels existing on the territories of Tsalenjikha, Senaki, and Zugdidi will be broadcasted on the whole territory of Samegrelo region.[58] The selection of the above model will increase competition among channels in one digital broadcasting zone, though a small size of advertising market may make it impossible for small channels to cover enlarged zones and may cause of closedown of channels.

The transmission of the digital broadcasting signal in broadcasting zones (the so-called digital sub-zones) defined by the existing (analog) licenses may be regarded as an alternative model. The above model increases resources for parallel transmission and decreases costs in a transition period. At the same time, selection of this model may stimulate cooperation between the channels operating in one zone to develop a joint program network and to joint cover the broadcasting zone. Existence of at least one network in the regions is necessary for the content transmission by this system.

Upon commencement of operations of the first national multiplex operator, the regional channels may be distributed in a transition period by use of their own frequencies, without the parallel broadcasting. If this approach is selected, the regional channels will not depend on other multiplex operators and will develop a network by use of the existing resources and infrastructure that facilitates competition already at a transition period. Such form of the switchover may be selected by all or several regional channels, though it is necessary to have at least one channel connected to such network in one digital zone.[59]

5. Issues Related to Licenses and Authorization in Broadcasting Sphere

In accordance with the legislation in force, the general and specialized broadcasting is implemented by terrestrial and orbit stations of television or radio broadcasting satellite systems[60], or terrestrial broadcasting transmitters by sue of frequency spectrum.

In accordance with the European best practices EU Framework Directive, and regulations recommended for the broadcasting sector, the approach to be used in terms of different types of broadcasters should become identical for ensure a technological neutrality principle. It is necessary to separately regulate a rule to issue a right for the content development (by the Georgian law on Broadcasting) as well as issue of right to operate a network by frequency spectrum. The main part of regulation norms of the above regime have been reflected in the Georgian law on Electronic Communications since 2008, whilst the Georgian law on Broadcasting requires amendments.

[58]Note: This model may be critically perceived by local channels that paid much more amount for licenses to broadcast in big cities as compared to broadcasters operating in smaller settlements. In case of selection of this model, the state should make the relevant compensation to equalize license feee for broadcasters operating in one zone.

[59]Note: If this model will be selected there exist financial and other risks that small and medium broadcasters will face that should be prevented by the state assistance program.

[60]Note: Part of cable broadcasting is considered as contradicting to the constituion in accordance with the 11 April 2012 decision of the Constitutional Court.

For the regulation purposes (especially licensing) the radio frequency network should be reviewed as one of the platforms similarly to other platforms that are different to other distribution platforms but used for "transportation of identical content for users". A separation between a right to develop the content and issue of a frequency will ensure higher level of transparency and introduction of technical neutrality principle.
The following three rights should be consolidated during an issue of the broadcasting network licenses:

- **Right to use spectrum** covers a right to use region frequency spectrum in a defined geographical area for a certain period of time, the so-called roll-out obligations in a certain short period of time, and service level obligations that include broadcasting standards, geographical/population coverage indicator, accessibility of services/network and etc. ;
- **Right to distribute broadcasting** covers a permit to broadcast television content by a platform determined by the relevant license conditions, in a determined geographical area, for a certain period of time. The above right should include also the following obligations:
  a) The obligation to transmit certain television programs (inter alia mandatory transit obligation);
  b)Obligation to distribute the public broadcasting (there exists the state interest and an obligation to transmit this content should be determined by a license, or to distribute the content actual for the public together with the commercial programs(e.g. distribution of news) ;
  c) Obligation to ensure service quality that includes broadcasting standards, geographical/population coverage indicator, accessibility of service/network, in accordance with distributed frequency band/capacities of multiplex operator and etc.);
- **Right to operate,** that enables an operator to develop (with access) and operate with infrastructure in a concrete geographical area and certain period of time with protection of the relevant aspects such regulation of impact on environment and of danger to health. The above right should include an obligation to share infrastructure, in particular, sites (a network operator or infrastructure owner rents antenna resources in accordance with the certain commercial conditions) as well as obligation to jointly use antennas (a network operator is imposed an obligation to ensure access to the broadcasting antenna if technically feasible).

The multiplex operator plays an important function in the broadcasting transmission consistent supply chain. In addition to the mandatory transmissible content, the first multiplex operator (that should be selected together with the second multiplex operator on the basis of competition) should have a right to provide access to the person willing to have the broadcasting access independently, transparently and in a non-discriminatory manner, in line with the previously defined criteria (in the first place, price) and conditions (or on the basis on a competition, or the first applicants). The state should get involved in the content storage in terms of making decisions related to mandatory transit as well as transmission of commercial content. The national broadcasting network, i.e. national multiplex operator (MUX1) should be required to implement the above obligations by a license (that

should re-state competition conditions and the relevant stages) and decision of the prior regulation of competition in accordance with the Georgian law on Electronic Communications.

To successfully implement the digital broadcasting, the state should get involved in the following directions:

- Operations of associated service providers:
- Operations of content distributers;
- Operations of suppliers of necessary equipment to end users[61]

The broadcasting zones are as follows:[62]

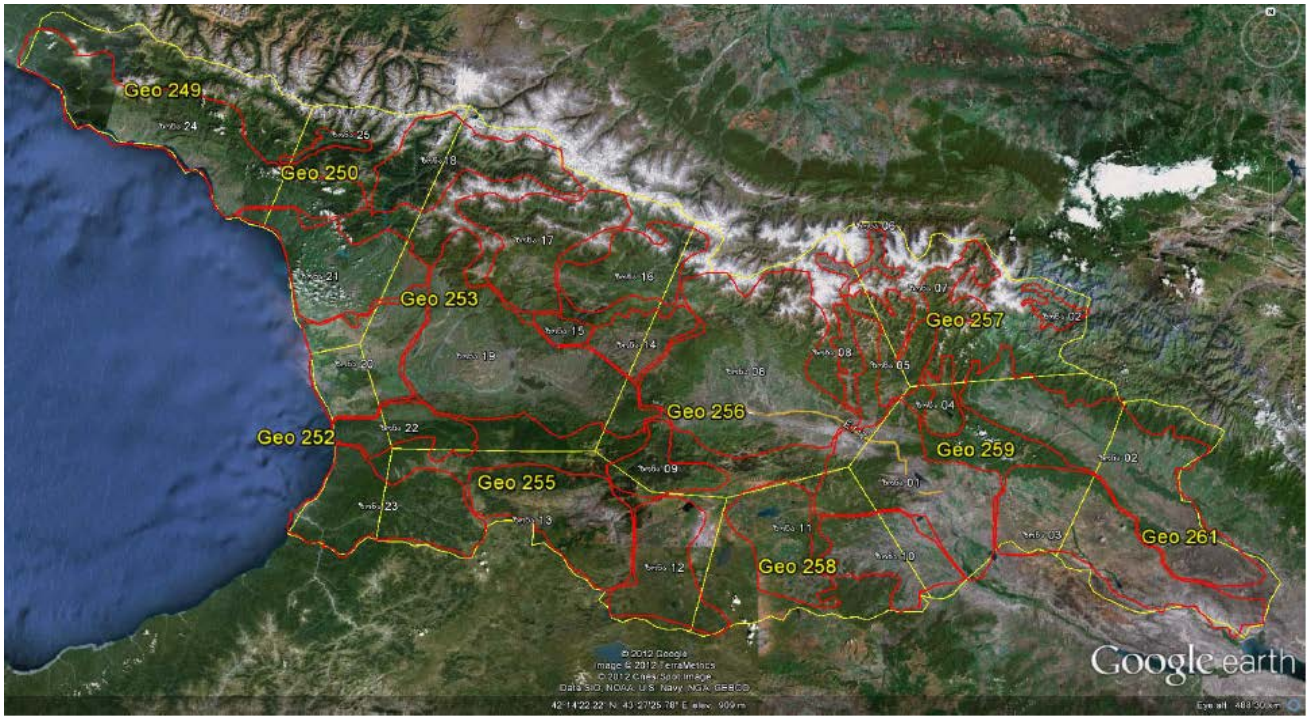
- The broadcasting zone Geo 249 (in accordance with the former 21st broadcasting zone (Zugdidi) due to occupation of the former 24th(Sokhumi) broadcasting zone and former 25th (Chxalta) broadcasting zone);
- The broadcasting zone Geo 250 (mostly covers the 21st (Zugdidi) broadcasting zone and partially, the former 18th (Mestia) broadcasting zone and former 20th (Poti) broadcasting zone);
- The broadcasting zone Geo 252 (mostly covers the former 23 (Batumi) broadcasting zone; partially, the former 20th (Poti) broadcasting zone and former 22nd (Ozurgeti) broadcasting zone);
- The broadcasting zone Geo 253 (mostly covers the former 19th (Kutaisi) broadcasting zone, fully covers the former 15th (Tkibuli) broadcasting zone and former 17th (Tsageri) broadcasting zone and partially, former 14th (Chiatura) broadcasting zone, former 16th (Oni) broadcasting zone, former 18th (Mestia) broadcasting zone, former 20th (Poti) broadcasting zone, former 21st (Zugdidi) and former 22nd (Ozurgeti) broadcasting zone;
- The broadcasting zone Geo 255 (mostly and fully covers the former 13rd (Akhaltsikhe) broadcasting zone and most part of the former 12th (Akhalkalaki) broadcasting zone, partially, former 9th (Borjomi) broadcasting zone, former 22nd (Ozurgeti) broadcasting zone, and former 23rd (Batumi) broadcasting zone);
- The broadcasting zone Geo 256 (mostly and fully covers former 8th (Gori) broadcasting zone and most part of former 9th (Borjomi) broadcasting zone, partially, former first (Tbilisi) broadcasting zone, former 5th (Dusheti) broadcasting zone, former 6th (Stepantsminda) broadcasting zone, former 14th (Chiatura) broadcasting zone, former 16th (Oni) broadcasting zone, and former 19th (Kutaisi) broadcasting zone);
- The broadcasting zone Geo 257 (mostly includes former 5th (Dusheti) broadcasting zone, fully, 7th (Barisakho) broadcasting zone and partially, former 6th (Stepantsminda) broadcasting zone, former 2nd (Kvareli) broadcasting zone, former 4th (Tianeti) broadcasting zone);
- The broadcasting zone Geo 258 (mostly covers former 11th (Dmanisi) broadcasting zone, most part of former 10th (Bolnisi) broadcasting zone and partially, former first (Tbilisi) broadcasting

[61]Note: Only in a transition and subsequent stage and only for equipment related to digital broadcasting

[62]The 2011 Report of the Georgian Communications National Commission.

zone and former 12th (Akhalalaki) broadcasting zone as well as Rustavi, Marneuli, and Gardabani;

- The broadcasting zone Geo 259 (mostly covers former first (Tbilisi) broadcasting zone and most part of former 4th (Tianeti) broadcasting zone, partially, former 2nd (Kvareli)broadcasting zone, former 3rd (Sagarejo) broadcasting zone, and former 10th (Bolnisi) broadcasting zone[63]).
- The broadcasting zone Geo 261 (mostly covers former 2nd (Kvareli) broadcasting zone and most part of former 3rd (Sagarejo) broadcasting zone).



It should be mentioned that the digital zones do not depend or are based on the territorial division of the country and in some cases; it divides several regions in equal parts. The territorial division is closely connected to the editorial policy of local broadcasters. Therefore, in the Digital Switchover process it is important for the Communications National Commission to consider legitimate interests of local broadcasters related to accessibility of their programs for the existing broadcasting zones (that are based on the territorial division of the country) and easy access of these channels to the neighboring broadcasting zones. It is also possible the broadcasters to make their own choice in terms of digital transmission zone.

The local license zones should be adjusted in accordance with landscape specifications of Georgia within the digital zones (division by sub-zones); the digital zones located in the south of Georgia may be changed after adjustments made together with the neighboring countries. In our opinion, small broadcasters may be not required by the Communications National Commission to make a percentage coverage of the new broadcasting zone in the internal zones (not border zones)[64]. In addition, if in

[63]Note: Rustavi zone and Gardabani and Marneuli regions are included in this zone.

[64]Note: In addition tolicenses of the 1st and 2nd national multiplexes, the liability to percentage coverage of population should not be defined by additional national and local licenses.

the internal zones a small local broadcaster is not able to switch to the digital broadcasting till 2015;it should be able to retain a right to the analog broadcasting for a certain period of time[65].

6. Procedures to Grant Rights

During the digital broadcasting transition and analog broadcasting switch-off period, the multiplexing license should be granted by public competition that provides an opportunity to essential evaluate how reasonably an applicant determined the network solutions, use of frequency spectrum, access tariffs, guarantees of making up a network, and other important issues and whether or not they are in line with the competition terms defined by the National Commission in the framework of public administrative procedures.

The above competition terms should be accessible to all interested persons in an e-format (posted on the webpage of the Georgian Communications National Commission) at each stage of the public administrative procedures. The representatives of the Georgian Ministry of Economic and Sustainable Development and Georgian Communications National Commission should provide special explanations, advice, and consultations to all interested parties, media and NGO sector prior to the above competition.

It is necessary to define the minimum quality parameters for the digital television services to be transmitted to the end users in the competitions conditions that are to be implemented by competition winners. In addition to the liability to transmit the public broadcasting content and must carry requirements, the firsts license should include conditions to enforce competition and to secure information accessibility and transparency.

It is necessary to select a multiplex operator that will be able to provide access services while operating of a multiplex in the most efficient manner (high quality and low access price) in line with the established quality parameters. A number of broadcasting channels and period of time necessary to make up a network should be important selection criteria. The above multiplex operator will be factually granted a function to transmit the so-called universal broadcasting.

The effective use of spectrum is one of the most important issues. In other words, the most effective and minimal use of frequency spectrum to achieve an objective that is defined by the license conditions are defined similarly a technical solution of the network making-up.

The above issue should be evaluated from the point of view of economic effectiveness, in particular, the proposed economic model should provide an opportunity to solve the task by the minimal possible costs and in the first place, this should happen by low access tariffs.

[65]Note: The above approach is similar to US practice, though this action may suspend the switchover process.

7. Georgia's Digital Switchover Process State Subsidy Policy

The state subsidy policy in terms of switchover to the digital broadcasting covers actions in two main directions[66]: the end users who need the state assistance due to their social and physical conditions (funding of special or adapted equipment, information support, assistance in installation/setup works, etc.) and service providers as well as equipment importers (broadcasters and network providers that are to transmit the digital broadcasting signal, network setup/re-equipment, equipment importers and/or retailers, etc.).

To ensure an effective switchover to the digital broadcasting, it is important to consider needs and problems [67]of all groups of the society and to guarantee their access to the digital broadcasting network in the framework of the strategy, without which a switch off of the analog broadcasting will cause isolation of certain group of the population[68]. The weakness of end users may be caused by a lack of necessary skills and information in addition to financial and physical reasons.

The market will not be able to self-regulate the above process without the state support and involvement[69]. As a result a low-income user may stay without access to broadcasting and in low-income regions, freely transmitted broadcasters that get some funds from funding of freely transmitted total advertisements- without a special support; they may also stay without a cable transmission alternative or concentration and/or in the worst scenario, may face bankruptcy despite of the high public interests for this content. The above issue is problematic considering that the public broadcasting content should be transmitted in the frame of either the universal broadcasting service [70] or mandatory transit (mandatory transmission) that is funded by taxpayers, whilst commercial broadcasters are funded by advertising or other activities. The advertising market income is polarized and spread among several national broadcasters.

The infrastructure of the terrestrial broadcasting network provider should ensure a proper receipt of diversified programs and other associated services at the end user level. The end user should receive the service of the quality that will be defined by a technical section of the policy document and be determined as an acceptable quality for the digital broadcasting[71].

The majority of Georgian households will incur some expenses at the Digital Switchover initial period; though, in the long-term perspective, it will be possible to receive a high quality digital broadcasting service by several TVs available at a household. Due to an increase of competition

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[66]Guide to the Digital Switchover. OSCE 2010

[67] The prospects for e-government on digital television. Barrie Gunter, 2004 http://www.emeraldinsight.com/journals.htm?articleid=864024&show=abstract

[68] Supporting the most vulnerable consumers through digital switchover. Ofcom 2004

[69]Accessibility to broadcasting servicesfor persons with disabilitiesBT SeriesBroadcasting service(television). Report ITU-R BT.2207-1(05/2011)http://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2207-1-2011-PDF-E.pdf

[70] Guidelines for thetransition from analogueto digital broadcasting. Itu 2012. http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbasiapacific/Digital-Migration-Guidelines_EV6.pdf

[71]Note: The determination of mimimal quality parameters will enable the state to control implementation of license condtions by the digital broadcasters at the end user level.

between services provided by different platforms the cable and satellite service operators will have to review a service fee and improve quality and conditions of the services provided.

The subsidy state program of digital broadcasting signal receiving installations-receivers (special digital device to receive a digital signal and to process/transform it to the analog signal[72]) will support not only terrestrial broadcasting, but all directions of the digital broadcasting. To ensure a competition between the different technological platforms, the receivers subject to financing should be neutral in terms of platforms and inter-compatible[73]and in addition to a free digital terrestrial broadcasting signal, they should be able to join cable and satellite network (technologically neutral approach)[74].

The state policy to assist the parties interested in the digital broadcasting includes actions to encourage end users with the high purchasing capacity to buy the relevant equipment at the early stage of the Digital Switchover process. In addition to the vulnerable population, the state should manage to assist other population as well because there exists a risk of their isolation from this process due to a high price of the digital broadcasting signal receiving installations.

7.1. The End User Subsidy Policy

The state funding should cover the following directions to support the Digital Switchover process:

- Subsidy to the vulnerable end user and end user equal to this category to buy installations (to subsidize and/or provide other assistance methods to purchase digital terrestrial signal receiving installation (receiver);
- Actions aimed at financial stimulation of higher income end users who may become receivers of the digital broadcasting services at the initial stage of the Digital Switchover process (Encouragement of persons with 70 001-200 000 scores from the unified database of socially unprotected households of the Georgian Social Service Agency);
- Funding of public information campaign to ensure a successful switchover to digital broadcasting (funding of information campaign and other activities);
- Subsidy to disabled persons and single pensioners to buy and install receivers as well as provide the relevant instructions[75].

[72] Digital Television Glossary. European Audiovisual Observatory. Strasbourg, December 2003. http://www.obs.coe.int/oea_publ/iris_special/glossardetails.pdf.en

[73]European Union State Aid, public subsidies and analogue switch-off/digital switchover. Mark Wheelers. International Journal of Digital Televison, February 2012

[74]*Idema E.* European Commission: Communication on the Transition from Analogue to Digital Broadcasting // IRIS 2003-10:4/5. See: http://merlin.obs.coe.int/iris/2004/1/article7.en.html

[75]Note: In accordance with import data, installation service at the residential address of user should not exceed GEL 30, though it should be considered installation costs in Tbilisi and other big cities.

7.2. Actions to Assist End Users

One of the major problems related to the Digital Switchover is economic conditions of the population. The user has to buy the relevant device and equipment (TV) that is compatible with the digital broadcasting network or special equipment to receive the digital signal.

The subsidies to buy the digital broadcasting receiving installations can be provided to the vulnerable population and equalized category in the following ways:

- Long-term (at least one year) targeted interest-free loans to end users that should be used to buy technically neutral receivers (compatible with all main technological platforms) or integrated TVs;
- Targeted loans to the private sector that will be guaranteed by the state[76] to subsidize receivers for persons with below 200 000 scores;
- Registered vouchers to certain categories of households based on database of the Georgian Social Security Agency[77].

The starting point for the funding schemes of end users should be the following:

- To ensure switchover of the population to the digital broadcasting at the early stage, in short period of time, to consolidate the so-called critical mass;
- To provide a real opportunity to the vulnerable and low-income population to buy receivers or get co-funding to buy the relevant category of TVs;
- The price of the digital broadcasting devices (receivers) decreases but they are still expensive for most population. It is anticipated that most end users will need to update the receiving antennas and connected cables that is also requires some expenses.

In accordance with the 2012 data of the Georgian Statistics National Agency – Sakstat[78], out of 4.5mln. persons, 2.4 mln. live in cities and 2.1 mln.- in villages. In accordance with the 2012 date of a legal person of public law Social Service Agency[79], 9.2% of the whole population is regarded as the vulnerable population and 394,000 persons get subsistence pension. In addition, some material and non-material assistance may be needed to the disabled persons and old age pensioners at the switchover period. A number of factors are not reflected in the data of the Georgian Statistics Agency due to the objective and subjective circumstances that makes us believe that a percentage of the

[76]"Analogue to Digital Television Broadcasting Switchover Strategy for the Republic of Croatia" http://www.itu.int/ITU-D/tech/OLD_TND_WEBSITE/digital-broadcasting_OLD/Bulgaria_Assistance_Transition/Croatia/Strategija-DTV-ENG-final.pdf

[77]Note: The above approach is regarded as the best practice in accordance with European practice and recommendations of EBRD experts, though due to the existing conditions non-interest loans offered by importers will stimulate terminal integration process .

[78]Sakstat datahttp://www.geostat.ge/?action=page&p_id=151&lang=geo

[79]Note: The legal person of public law – data of official webpage of Social Service Agency (www.ssa.gov.ge) are a bot different from data provided to IDFI- by the Georgian Ministry of Health and Social Security in February.

vulnerable population is higher than 9,2 %; therefore it is necessary to double-check the above data when planning the assistance[80].

7.3. Number of Users Depending on Broadcasting

In accordance with the 2011 Report of the Georgian Communications National Commission, a number of subscribers of transit broadcasting operators (cable platform) are 171,641 as of 2011, an increase rate is more than 20%. In case of increase rate fixed in the first quarter is retained, by 2013 a number of subscribers may increase to 260,000; due to the service specifications this number may be regarded as a number of households. In accordance with the network ecosystem development[81], this service is mostly provided to the urban population that amounts to 600,000 households. In cities, the cable broadcasting concentration of households is approximately 43%.
In accordance with the data analysis of the vulnerable population, a percentage indicator of satellite concentration for households with 200 000 scores are as follows:

Score	Total Number of Households	Number of Satellites	Concentration Indicator
Up to 57 000	180 000	13 000	7%
57 001-70 000	61 000	8 000	13%
70 001-100 000	156 000	22 000	14%
100 001 - 200 000	116 000	16 000	13%
200 001and more	13 000	1 800	13%
Kvemo Kartli	46 000	10 000	21%
Ajara region	43 000	14 000	32%
Tbilisi	95 000	2 000	2%
TOTAL	529 000	62 000	11%

A number of satellites in some regions significantly exceed a number of TVs as a number of socially unprotected households may own two or more satellite plates[82]. In the Georgian regions concentration of satellite broadcasting service users is high due to non-existence of other technological platforms.

Based on the above data, a number of satellite plates countrywide is high. In accordance with the 2012 data of the Georgian Statistics National Agency, out of 4.5 mln. persons, 2.4 mln. (approximately 600,000 households) live in cities and 2.1 mln. (approximately 525,000 households) - in villages. In the below tables, a concentration indicator of households receiving the satellite

[80]Note: There may be many households that despite their difficult social conditions are not included in the assistance pprogram.

[81]Electronic Communication Sector, Comparative Assessment. EBRD 2012
http://www.ebrd.com/downloads/legal/telecomms/georgia-2012.pdf

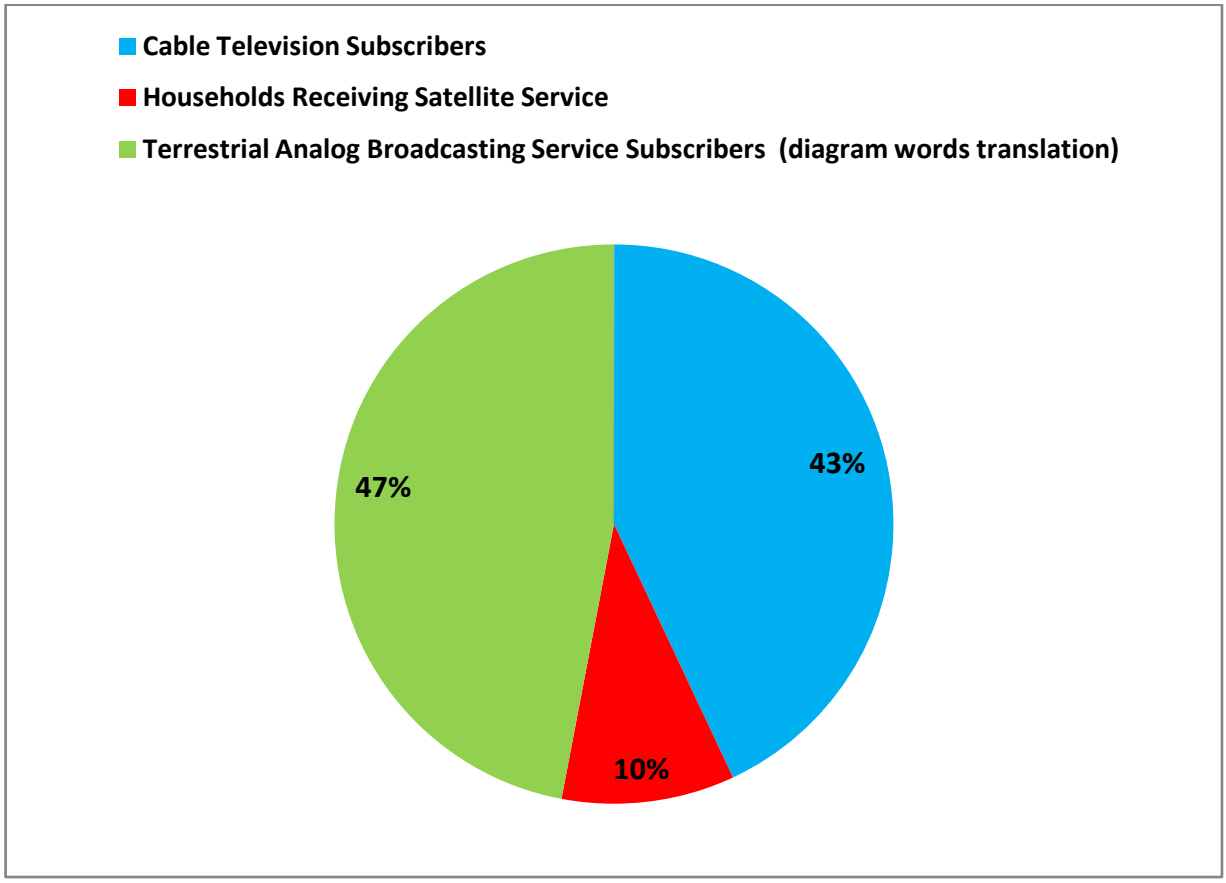
[82]Note: The above data raises many questions in terms of credibility of data. The TV concentration indicator may be much higher.

broadcasting in cities is 10%, therefore we can say that in cities there are approximately 60,000 households that receive the satellite broadcasting service. In the regions, this indicator is 25-30%, i.e. a number of households is about 150 000-[83].

The action plan to ensure a competition is presented in Annex 3.

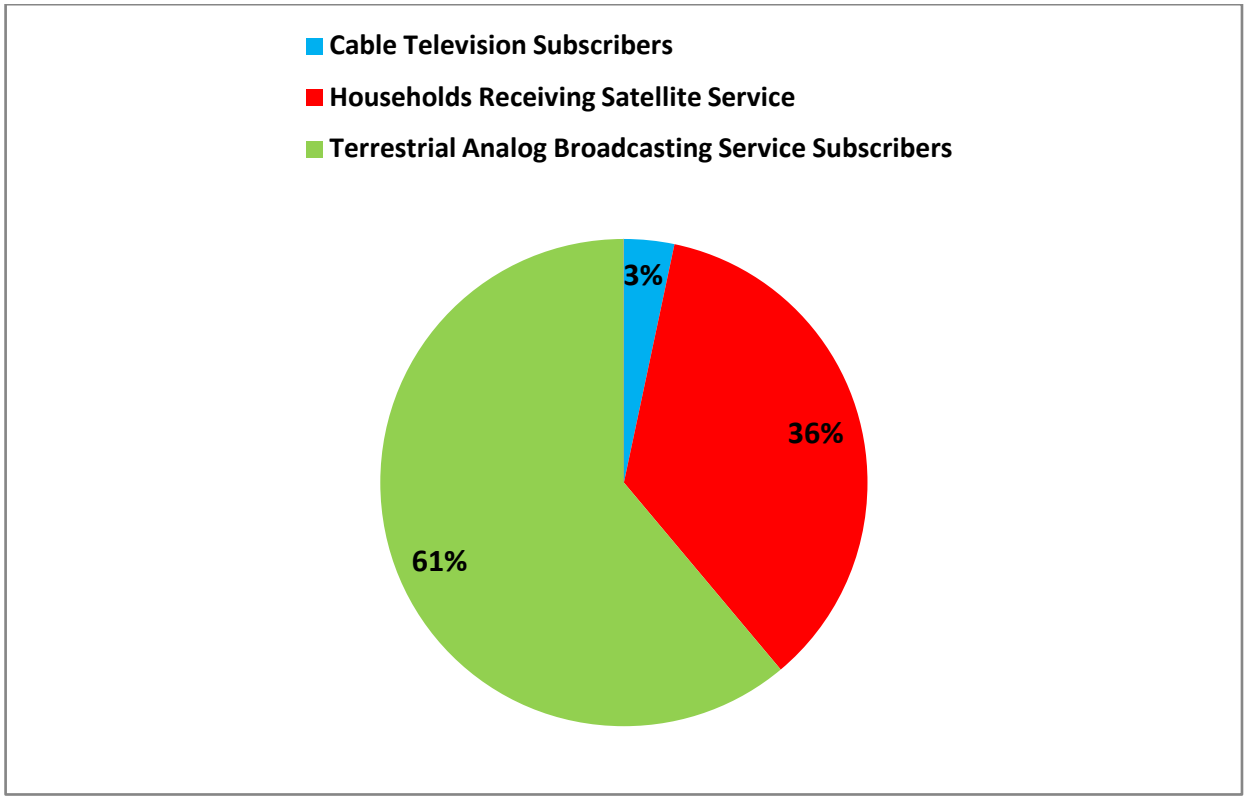
An approximate concentration of households receiving television service by the broadcasting network platform is as follows:

Diagram1. Concentration of Broadcasting Users in Cities



[83]Note: The datum should be checked as sale of satellites was artificially restricted during pre-election period. It may be much higher, approximately 250, 000.

Diagram 2. Concentration of Broadcasting Users in Regions



The above approximate data clearly shows that most population of Georgian cities and regions depends on the analog broadcasting[84]. A high price of cable television service and a poorly developed regional network as well as restricted programmatic resources offered by the satellite broadcasting and initial costs are factors that may influence a choice of the user for the free Terrestrial broadcasting service (especially, with the alternative of free digital broadcasting service by the second and more TVs existing in the households)[85].

7.4. Direct Financing Model of Population and Anticipated Volume

In accordance with the January 2013 data provided by the Georgian Ministry of Health and Social Security, a number of households with scores below 57 000 that are registered in the database of the Target Social Assistance Program is 180 000, out of which about 90 000 are single pensioners.

[84] In April, 2013 NDI submitted more accurate data according to which a number of population that depends on the analog broadcasting is a bit higher;

[85] Digital Switchover in Broadcasting A BIPE Consulting Study for the European Commission (Directorate General Information Society)Final Report April 12, 2002

Region	Scores: Up to 57 000			
	Households	Single Pensioners	No. of Households with TV sets	No. of Households with Satellite Plate
Tbilisi	30 683	14 507	2 586	271
Guria	6 689	3 339	1 256	306
Racha-Lechkhumi and Kvemo Svaneti	7 659	5 116	1 536	1 535
Kakheti	22 902	12 086	4 009	1 319
Imereti	38 375	19 920	4 150	1 770
Mtskheta-Mtianeti	8 352	5 372	1 278	973
Samegrelo-Zemo Svaneti	18 237	6 884	2 261	698
Samtskhe-Javakheti	4 015	2 551	815	825
Kvemo Kartli	10 716	5 380	1 495	1 386
Shida Kartli	23 000	11 293	4 543	984
Autonomous Republic of Ajara	9 782	2 865	1 065	2 959
Zemo Abkhazeti	177	82	85	-
TOTAL	180 587	89 395	25 079	13 026

In accordance with the above table, a TV concentration indicator of the vulnerable population is rather low: Tbilisi (8.4%), Guria (20%), Racha-Lechkhumi and Kvemo Svaneti (20%), Kakheti (17.4%), Imereti (10.8%), Mtskheta-Mtianeti (15.5%), Samegrelo-Zemo Svaneti (12%), Samtskhe-Javakheti (20%), Kvemo Kartli (13%), Shida Kartli (19%), Ajara (10%). Due to this low indicator and low income of this group of the population, financing of receivers only will not have any sense.

The persons of this category having TVs but not receivers should be fully funded by the state, i.e. receivers and other services should be transferred to them without any loan, whilst that category of population that does not TVs should buy TVs by interest-free loans. It is necessary to partially finance small screen TVs integrated with the digital broadcasting network by vouchers for receivers[86].

The same approach should be applied to households with 57001-70 001 and single pensioners (accordingly, 61 405 and 25 126)

[86] *Note: The problem of this category is rather important and should have an alternative to use a voucher to buy receivers or small screen integrated TVs, in the framework of 0% installment one-or two-year system; the issue should be reviewed by the state policy document.*

Region	Scores: 57001-70000			
	Households	Single Pensioners	No. of Households with TV sets	No. of Households with Satellite Plate
Tbilisi	11 355	3 538	1 522	259
Guria	2 910	1 288	513	297
Racha-Lechkhumi and Kvemo Svaneti	1 378	853	136	455
Kakheti	7 097	3 358	1 058	794
Imereti	12 264	6 096	2 161	943
Mtskheta-Mtianeti	2 161	1 100	399	484
Samegrelo-Zemo Svaneti	6 463	2 270	734	423
Samtskhe-Javakheti	1 885	1 155	286	669
Kvemo Kartli	4 051	1 815	338	1 190
Shida Kartli	6 664	2 609	1 255	613
Autonomous Republic of Ajara	5 168	1 044	434	2 044
Zemo Abkhazeti	9	-	9	-
TOTAL	61 405	25 126	8 845	8 171

The households with 70 001 – 200 000 scores, number of which is approximately 339 000, (that does not differ greatly from households with scores below 70 000) should be included in a low interest rate assistance group, (50% subsidy for receivers) due to their income and material conditions [87].

Scores: 70001-100000			
Number of Households	Single Pensioners	Number of Households with TV sets	Number of Households with Satellite Plate
23 996	6 182	9 038	556
8 266	2 709	2 877	872
2 083	783	511	788
17 931	6 407	7 580	2 143
28 243	10 830	9 101	2 686
4 445	1 360	1 607	980
19 289	6 181	6 418	1 408
8 761	3 941	4 464	2 298
16 500	5 282	6 360	4 249

[87] Note: The households of single pensioners are also considered in this category.

12 244	2 922	4 030	1 384
15 185	2 247	4 040	5 308
5	-	4	-
156 948	48 844	56 030	22 672
Scores: 100001-200000			
Number of Households	Single Pensioners	Number of Households with TV sets	Number of Households with Satellite Plate
23 571	3 307	14 918	584
4 798	665	2 272	696
1 052	128	440	370
11 868	1 758	7 533	1 342
18 604	3 123	8 964	2 188
2 627	333	1 344	643
12 965	2 494	4 969	1 684
8 975	1 173	5 987	2 068
13 619	1 852	7 551	3 051
7 103	754	3 874	778
11 391	998	4 441	3 471
2	-	2	-
116 575	16 585	62 295	16 875

The DVB-T2 standard receivers of different quality and prices are available at the world market (the so-called set-top-boxes), the cheapest price being 10-30 USD[88]. The price depends on the order volume, though taking into consideration the current tendencies funding of about GEL 30 (for 100% category) should be sufficient for funding this direction (this issue should be finally confirmed after consultations are held with equipment importers).

Score	Households	Total assistance in GEL/Mln.[89]
0-70 000	241 000	7 230 000
70 001-200 000	272 000	4 080 000
Total		11 310 000

To stimulate the digital broadcasting process, the broadcasting terminals and receiving installations should not be included in the non-agriculture property category to rate the vulnerable population in 2013 as a determinant for funding score[90].

[88]Note: The information requested by IDFI from a Chinese manufacturer reveals that prices vary from 14 UDS to 17 USD as of 2013, though it necessary to consider their quality and how compatible they are with the government specifications

[89]Note: The amount necessary to fund receivers is conditional and depends on the market price of receivers in the first half of 2014.

It is also important to consider interests of those persons in the Digital Switchover process whose integration is complicated due to the non-economic purposes. The problems of the above persons are determined by different purposes (physical, sensor, perception, and other problems).It is necessary to breakdown them according to age, adequate perception, language barriers, geographical remoteness and other factors[91].

The assistance program for single pensioners should cover funding of installation works in addition to provision of subsidies for equipment as presented in the below table[92]:

Single Pensioners	Price of Installation Works/GEL	Total Volume of Assistance/GEL
179 950	30	5 398 500

The special attention should be paid to ethnic minorities at the planning and implementation stages of the information campaign[93], which may be isolated from the process if not well-informed.

7.5. Provision of Subsidies to End Users via Vouchers

It is important to ensure that Georgian population understands advantages of the digital broadcasting compared to other technological platforms (taking into consideration price, quality, simplicity, and other factors) that will determine their choice in favor of this technological platform.

The norms of subsidizing procedures should be clearly determined, easy to understand and transparent. The government shall approve the relevant procedures to grant free equipment or to buy them by the state assistance. All terminals should be equipped by the relevant markers and instructions in the Georgian or other languages.

For the purposes of simple administration, easiness of receipt of equipment by the population, and consideration of interests of equipment retailers, the assistance should be provided in accordance with the households via registered vouchers.

The following data should be accessible by the end users upon distribution of vouchers:

- Information on free and paid digital broadcasting and timing planned for a switch-off of the analog broadcasting;

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[90]Note: In our opinion, the above factor will impede the digital switchover pricess to a certain extent.

[91] DIGITAL TERRESTRIAL TELEVISION (DTT) ACCESSIBILITY RECOMMENDATIONS. Instituto Nacional de Tecnologías de la Comunicación. 2009. www.inteco.es/file/snb-6ZR2I2DaXKiMJlkT_g

[92]Note: Amount necessary to install receivers is conditional. In accordance with one improter, installation fee in Tbilisi may be GEL 50;

[93]Guidelines for Digital TV equipment and services. http://www.universaldesign.ie/useandapply/ict/irishnationalitaccessibilityguidelines/digitaltvequipmentandservices/guidelinesfordigitaltvequipmentandservices

- Information on receivers and TVs to receive the digital broadcasting services as well as information on receiving antennas and parameters and data of the associated cables;
- Information on special actions aimed at provision of assistance to the vulnerable and disabled persons in the installation works.

The following requirements are established for subsidizing the end users:

- The subsidizing policy should be technologically neutral and restrict any competition;
- The receivers should be compatible with the MPEG4 and DVB-T2 standards.

The basis for provision of subsidies should be only social condition of a person[94];

Funding should be provided only for purchase of receivers that are open, maximally inter-operating and interactive[95].

The Georgia's Digital Switchover policy document should determine a body responsible for distribution of vouchers. Only receivers with free software application may be subject to subsidies. After receipt of a voucher, within 6 months after granting the right (deadline to cash a voucher)[96]the authorized person of a household is required to visit a recommended[97]retailer to buy a receiver determined for him and request a transfer of the terminal in the amount of the subsidy provided and provision of certain services at his/her place of residence[98] (with 100% or 50% funding).

Only the broadcasting receiver's purchases on the territory of Georgia should be funded.

The subsidy voucher should be registered and it cannot be transferred to another person. The voucher should include name, surname, address, personal identification number, and its expiration date. The above vouchers should be submitted to single pensioners in accordance with their residential address by the company selected by the state or a local company selling receivers.

Following publication of a list of households subject to subsidizing by the Georgian Ministry of Health and Social Security, that may be submitted to persons registered in this list and persons added to the list at a request of the concrete person.

[94]S. Santamato and M. Salto (DG Competition) "State aid to digital decoders: proportionality is needed to meet common interest" Competition Policy Newsletter, 2006, European Commission.
[95]Note: Parameters of receivers do not restrict consumers from possibilities of other broadcasting network services.
[96]Note: The period to issue receivers depends on the Digital Switchover plan. It may be possible to use vouchers within 3 months after a switch-off of the analog broadcasting.
[97]Note: To facilitate the end users, these data should be posted on information webpage, updated and provided in the faremwork of telephone consultations.
[98]Note: In case of single pensioners, provision of receivers and installation service should be carried out at the residential address..

The Georgian Ministry of Finance (or special fund) is required to transfer the relevant amount of money to the account of a retailer selling equipment after receipt of a document confirming a transfer of a digital equipment by the beneficiary and a voucher as well as a request to transfer the amount.

The subsidized equipment standards should be open and interactive to receive services of other operators. The period of use of the voucher should be short due to the digital broadcasting short-term switchover period. The selected multiplex operator should be also included in the information campaign that will submit additional information on its network operating or planned parameters and the Digital Switchover plan to the end users.

Upon completion of current planning works by technical services it is necessary to define the so-called white, i.e. uncovered zones (remaining 5%), where end users should be ensured by satellite terminal devices that is important to ensure universal access to broadcasting services and programs subject to mandatory transit[99].

7.6. Subsidy of Supply Party

The state should understand an importance of the regional and local media in the development of a democratic society, their role to ensure media pluralism, and importance of distribution of information by the regional and local broadcasters and therefore, implement the below provided regulations.

The subsidizing policy of the supply party, in the first place, should mean assistance to broadcasters. To facilitate the Digital Switchover period, it is important to provide the relevant assistance to the broadcasting network operators and equipment importers/retailers.

It is important to ensure that the Digital Switchover state policy and the relevant actions do not strengthen status of monopolists operating on the market. It is important and necessary to consider the relevant EU regulations in the state policy document and Georgian legislation.

To facilitate the Digital Switchover process, the operation period of the analog broadcasting should be restricted by June, 2015, after which the existing broadcasters should be required to switch off their analog transmitters.

The introduction and proper implementation of an assistance model to the regional and local broadcasters should be considered by the state as one of the important factors for facilitation of pluralism of the regional media. The access conditions to regional terminal components of the

[99]The coverage of the so-called wthie zones should be carried out bt=y satellite technology that should be funded after 2015 ,i.e.e a full swtitch-off of analog broadcasting.

network of digital broadcasting multiplex operator and the associated tariffs should be regulated by article 19.3 of the Georgian law on Electronic Communications[100].

The broadcasting televisions incur certain costs to transmit the analog signal, maintain infrastructure, and transmitters (some of them own antennas); in the long perspective these costs are not economically profitable compared to costs related to access to the regional multiplex. During the Digital Switchover process the state should assist such broadcasters, introduce certain benefits in case of a parallel transmission and offer reasonable conditions for the content transmission. The above broadcasters should have an opportunity for further development; they should not be transferred into a cable network, a concentration should not take place[101]or they should not become bankrupt.

7.7. Assistance to Regional Broadcasters

In terms of financing of broadcasters and digital broadcasting network operators, EU Council of Ministers recommends to the member countries to consider economic and legal issues in their regulations to ensure media pluralism. These issues will also facilitate access of the population to the high quality programs available on the media market[102]. The state should defend and if necessary, to take special measures to ensure media pluralism. In a context of new technologies, the Digital Switchover process will impeded without the relevant and credible financial regulation. In the context of new challenges, the states should ensure an optimal financial support of the public broadcasters to support them in addressing their objectives.

In the Digital Switchover period, one of tools to encourage the regional and local broadcasters is introduction of beneficial or zero-rate regulation fee in terms of income earned by transmission of signal in the zone of operation of their licenses. It is also possible to exempt them from taxes in case of the parallel broadcasting and in the Digital Switchover period that will be a compensation for termination of their licenses after June, 2015. Instead of the analog licenses it is possible to sign a concession agreement[103]between the state and a license holder.

The close regulation [104] of regional access conditions (in the first place, tariffs) to the digital broadcasting network is another, very important action that can be implemented by the state to support regional broadcasters, whilst transparency, minimization of costs, and access liabilities should be determined at the regional and local levels as regulation of access to the relevant resources and

[100]Note: By application of minimum interference principle in the market, at the intial stage of the digital switchover stage it is necessary to allow market players to determine access tariffs on their own, though in accordance with the model defined by the Commission;

[101]A MAPPING STUDY OF MEDIA CONCENTRATION AND OWNERSHIP IN TEN EUROPEAN COUNTRIES, 2004. David Ward, Oliver Carsten Fueg. http://www.mediamonitor.nl/dsresource?objectid=435&type=org

[102]Recommendation R (2003)9 of the Committee of Ministers to Member States on measures to promote the democratic and social contribution of digital broadcasting.

[103]Ict regulation toolkit. 7.1.1 Concessions and License Agreements http://www.ictregulationtoolkit.org/en/Section.691.html

[104] PUBLIC CONSULTATION DOCUMENT ON ESTABLISHMENT OF COST BASED TRANSMISSION FEE FOR DIGITAL TERRESTRIAL TELEVISION (DTT) CHARGED BY MULTIPLEX OPERATORS TO CONTENT SERVICE PROVIDERS. 2012. http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf

components of the broadcasting network is one of important issues at the Digital Switchover stage[105]. The access of the regional and local broadcasters should take place at a regional access points that should be arranged by competition organized by the operator selected by the Communications National Commission. A geographical location of regional access points to the relevant elements of the multiplex operator network should be determined on the basis of the request and not the digital zones, according to choice of a network operator.

The Digital Switchover process requires certain costs from the digital broadcasting network operators. Taking into consideration market conditions, it is necessary to implement additional incentives to ensure affordability of tariffs of accessibility to multiplex by the regional and local private broadcasters. The direct subsidizing system may be introduced for purchase of certain transmitting equipment. It is also possible to reduce or annul the broadcasting license fee of the broadcasting network operator (only in a transition period). These actions will speed and make cheaper the Digital Switchover process.

The so-called DVB-T decision of European Commission[106]defines a list of actions that are acceptable for the digital broadcasting migration. The support to content producers and network operators should be provided in a way not to cause a violation of the technological neutrality or restrict any competition (that can be acceptable only in case of necessity). To provide support to the broadcasters/ broadcasting providers, it is necessary to implement the following actions:

- Funding of researches of the digital broadcasting technologies and interactive programs as well as infrastructure design projects;
- Introduction of subsidies for broadcasters to compensate additional costs in the Digital Switchover period;
- Funding of construction of transmission networks in zones where it will not be possible to achieve a proper digital coverage according to the initial and further analyses ;
- Financial support to the broadcasters that are to suspend their licenses till their expiration due to some objective circumstances.

In Finland a three-stage approach[107] was applied to ease the so-called investment burden for the relevant broadcasters. In the first place, a license fee war decreased by 50% for the analog commercial broadcasters, whilst the digital broadcasters were authorized not to pay this fee by September 1, 2010 (the digital broadcasting was introduced in 2001; the analog broadcasting was switched off in 2007). It should be noted that the state increased a license fee payable by subscribers (13%) starting 2004[108] that was gradually increasing in the Digital Switchover-parallel broadcasting period (till 2007). The same model was also introduced in Austria to consolidate funds for the Digital Switchover fund that was financing other directions as well.

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[105]Digital terrestrial television-commercial issues of multiplex operation. 1995. Gee, A.B. Thorp, J.P.

[106] Commission rules subsidy for digital terrestrial television (DVB-T)in Berlin-Brandenburg illegal. Christof SCHOSER. 2006. http://ec.europa.eu/competition/publications/cpn/2006_1_93.pdf

[107]IDFI recommendations "Determination of Digital Broadcasting State Assistance Strategy", January, 2013

[108] Österlund-Karinkanta M. Finland: Higher Television License Fees in Finland as of 1 January 2005 http://merlin.obs.coe.int/iris/2004/9/article18.en.html

The European Commission analyzed the December 2004 UK regulation [109] when the analog broadcasting licenses were replaced by the digital broadcasting licenses. The European Commission considered the above action was as a necessary measure for a license process.The above was aimed at harmonization of a license fee with the market price of frequencies and not exemption from license fee.

In accordance with the Georgian law on Free Trade and Competition, the state support is an individual decision made in regards to some economic agent that may include exemption from taxes, reduction or postponement of taxes, write-off or restructuring of loans, issuing loans at beneficial rate, transfer of operating assets, monetary assistance, guarantee of profit and granting other exclusive rights. The same article states that the state support does not imply issuance of licenses and/or permits. In accordance with the above legislation the state support provider may be state body, a body of autonomous republic or of local authorities, a non-entrepreneurial (non-commercial) legal person, a legal person of public law, an enterprise with more than 50% of the state ownership, or an economic intermediary agent acting on behalf of the state that directly or indirectly uses authority to issue the state assistance.

In agreement with the Competition and Procurement Agencies a special form of the state assistance may be allowable that does not significantly restrict competition or create any risk for significant restriction of competition and that is issued for the following purpose: a) to develop a certain economic activity; b) to develop a certain economic sector.

The following is acceptable and does not requires any agreement with the above agencies: social assistance that is issued to an individual (a subsidy to buy a receiver); the state assistance related to the regional development; in case of reduction of restructuring of taxes if a decision is made by the Government of Georgia; suspension of actions to ensure payment of outstanding tax liabilities and write-off of outstanding tax liabilities.[110]

7.8. Criteria for Support to Regional Televisions

The criteria defined by the relevant EU directive should be applied to the regional broadcasters in the Digital Switchover period.

The application should be submitted on the basis of following criteria:

- **Regional status** – a broadcaster operates in the digital zone or its part that is granted a regional status and concentrated on production of the regional content (for example, regional news, current news, cultural and other events).
- **Viable enterprise** – funding should be provided only to sustain a viability of current operations. The regional broadcasters should be required to submit a detailed financial report

[109] A Guide to Digital Television and Digital Switchover", 1 October 2004 edition, Ofcom (UK)
[110] Georgian law on free Trade and Competition.

and arguments that the last two data reflect the above problems. The business plan for the next two years should be presented upon submission of the application.

- **Technical expediency** – the regional broadcasters should provide arguments that the technical direction submitted for funding is viable for transmission of a digital signal and the associated costs are cost-effective and properly planned.
- **Time Period for Funding**-funding should be accessible only in 2014-2015, before completion of the digital broadcasting full switchover, i.e. before the first possibility of alternative access in a concrete region. This period of time should be provided for the regional broadcasters to get assistance in accordance with their broadcasting zone (in accordance with the digital broadcasting technical-pilot plan).
- **Signal Transmission Costs** – a funding should cover either construction of its own transmitter (if the relevant license regime is applied, although the earlier issues licenses applied to less area compared to the digital 10 zones), or transmission costs by the national network in its operating zone (that should be defined in the framework of the license issued).
- **Free Access** – The signals of these broadcasters should be accessible by free and open receivers. In case they present access to frequencies of certain antenna, transmitters, funding project, and the united transmission network, their signals should be freely accessible in a list of programs.

The assistance threshold for the regional broadcasters depends on the parallel broadcasting costs.[111]The assistance may include capital costs and certain operations costs necessary for the Digital Switchover (inter alia, transmitters, associated equipment, any installation and additional equipment). The funding should be accessible till 2015 (though may be extended till the end of a year due to the market conditions). The funding should not cover costs related to internal studios, personnel of stations, administration, and overhead costs.

The assistance related to funding of wideband network may be implemented in case if they are necessary to connect with the digital terrestrial transmission network and transmission of a signal. The above includes both costs related connection and software application. The regional broadcasters should present the relevant arguments on their necessity and size of audience.

7.9. Recommendations

1. To stimulate the Digital Switchover period it may be possible to decrease the regulation fee, whilst the companies providing analog and digital broadcasting at the same time should be exempt from the above fee. The VAT payable by the regional and local broadcasters should be either decreased or annulled at the Digital Switchover stage;
2. The additional costs incurred by the broadcasters should be compensated –the aim of this funding is compensation of additional costs incurred by broadcasters in the digital

[111]Note: The funding amount depends on costs of the concrete regional and local broadcasters or network provider.

broadcasting migration process, ina transition period. The broadcasting operating costs are not subject to funding. The short-term period are used in the Digital Switchover funding concept (6-12 months for each region), relatively, the whole funding period is restricted in accordance with this period. The state may issue subsidies for the state and commercial broadcasters to compensate additional costs that they have to incur in the analog broadcasting period. The assistance may be issued by evaluation and summarization of the objective criteria; similarly, the reasonable reimbursement should be provided for those broadcasters that terminate their frequency licenses before their expiration time for the purpose of the Digital Switchover period;

3. The network development subsidies –It is important to provide a support to broadcasters and network operators in countries where the existing infrastructure is not well-developed or is overloaded. The support to broadcasters and network operators is very important in those countries where the existing infrastructure is underdeveloped or overloaded. At the same time the public broadcasters and network providers do not have possibilities and funds to make important investments, especially in a transition period when the costs are doubled. In the framework of the universal broadcasting fund, the state may consider funding of infrastructure construction (transport network) in those regions with the improper transmission of television signal;
4. The assistance should be provided in a transparent manner, in case of necessity and in accordance with the principle of proportionality: no priority should be assigned to a certain technology in terms of the state assistance. It is necessary to have a parallel review of cable and satellite platforms (if a decision is not made to subsidize some concrete direction that should be well-founded);
5. The assistance should be provided to address temporary problems incurred in a switchover process;
6. The beneficiaries should be selected according to the previously defined criteria;
7. The beneficiary should confirm that there exists a necessity for co-funding.

7.10. Concession and License Agreements

In most cases, the concession agreements were used in sectors characterized by high political risks of regulation. The concession agreement shall be regarded as an incentive and alternative option for the analog broadcast license holder to the digital broadcasting in the switchover period providing their interests are taken into consideration. The conditions shall be defined in a way not to damage interests of license holders and protect them from any government influences.

The certain frequencies or frequency may be allocated for the holders of existing analog licenses that will be granted instead of the existing licensed frequencies that will be “exchanged” by the Government for digital frequencies for a joint use after 2015. Before the provision of the relevant frequency, it is necessary to provide all the documents in the framework of the concession agreement (project, plan, deadlines, and coverage area), inter alia, the project implementation budget that realistically reflects costs necessary for making up a network and transmission.

In the framework of the concession agreement, the state should offer a license holder to transmit their programs via the public broadcasting content multiplex operator network on the operating territory by payment of compensation or offering of compensation.

The issues may be also regulated in the license agreements in accordance with the Georgian law on Broadcasting and the Georgian law on Electronic Communications. The licenses to use frequency spectrum state that a number of license conditions may be reviewed under certain circumstances. The approach to be applied by a license holder is to hold negotiations not with Communications National Commission but the Georgian Ministry of Economic and Sustainable Development. If a license holder does not agree with the alternative version, he/she will have to switch off the analog transmitter on June, 2015. This direction may be considered in the financial part as a category of the state assistance.

7.11. Assistance to Importers

Temporary exemption of import of the relevant equipment and TV sets from customs duty and VAT in a transition period may be considered as one of the measures to facilitate a switchover process.

In exceptional cases, the Telecommunications National Commission or the Georgian Ministry of Economy and Sustainable Development (or Georgian Ministry of Finance) may issue the state guarantee to importers of equipment for funds necessary to subsidize terminals of end users.

8. Competition regulation policy of Georgia during and after the switchover to digital broadcasting

8.1. Introduction

The present policy document represents IDFI vision on fulfilling the international liabilities Georgia has including the guarantee for every citizen to receive digital broadcasting free or at affordable prices. Digital broadcasting shall be provided to the end customer through digital network operators and broadcasters operating on the competitive market.

Unlike analogous broadcasting business model where each broadcaster manages its network, regulation of competition-related issues become more pressing along with the introduction of digital broadcasting since if the problems of accessibility, transparency and others are not addressed, there will be the risks of limiting competition that may create threats to the process of digital broadcasting and media pluralism.

It is important to note that regulation of competition in broadcasting sphere is different from that in telecommunication as there is a big public and state interest to the broadcasted content and,

respectively, competition in the sector should be regulated prudently and transparently, especially during the process of switchover to digital platform.

Due to scarce frequency resources and other objective factors at the initial stage of switchover process, the companies having significant market power and advantages will be represented in the broadcasting service market, and Georgian National Communications Commission should carry out precise regulation in different directions.

When defining the state policy, within the frames of preparatory works for the switchover to digital broadcasting, the market segments where the state should interfere should be identified in advance. However, despite advance regulations, at the stage of digital terrestrial broadcasting, Georgian National Communications Commission and the Ministry of Economy should conduct regular control in this direction.

The existing network of analogous broadcasting being the property of the company that has been created by 100% state participation is of no less importance[112]. The above fact represents certain risks in terms of competition limitation[113] for local and regional TV companies with smaller budgets, first of all.

8.2. Ensuring competition within the broadcasting platform

At the transitional stage of switchover process, the number of terrestrial broadcasting networks will be limited due to scarce frequency resources. Based on the data of Georgian National Communications Commission the existing frequency resources enable organization of two digital broadcasting networks.

The competitions for awarding the right of use of the frequency band should be held in two stages:

- Licenses for free digital broadcasting networks for transitional period (MUX1 and MUX2) should be issued before analogue broadcasting switch-off; its set-up should also be finalized within the above frames.
- Competitions for digital free broadcasting networks (MUX3[2]and MUX4) for the period following the transitional period, the license for which should be issued before comprehensive start-up of digital broadcasting and should not be burdened with the liability of free broadcasting.

The frame of the rights to use the band and possibility to update the rights should be specified under the terms and conditions of the competition for multiplexor operator. Taking into consideration technological and market development factors, it would be expedient to limit the provision of payable and additional services through digital broadcasting networks[114].

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[112] Guide to Digital Switchover, OSCE, Vienna 2010

[113] If additional resources are found for Tbilisi digital zone, local license for MUX3 multiplexor should be issued in the transitional period, before switching off analogous broadcasting.

[114]After solving the key tasks for the transitional period and achieving standard definition of broadcasting, in case of sufficient capacities, the decision may be made on rendering additional services during the transitional period.

8.3. Objectives of competition regulation

Correct and efficient regulation of the competition should:

- Attract investments and allow for **minimal state participation** during and after switchover period;
- Reduce systemic and non-systemic barriers for entering the market[115];
- Ensure financial and network sustainability of the business system of digital broadcasting;
- Ensure introduction of innovations in the sector;
- Ensure efficient use of limited resources.

Georgian National Communications Commission should ensure that a big number of customers have the possibility to make their choices between the services provided at least by two platforms.

Implementation of the following measures is necessary in order to achieve the above goals:

- Timely[116] identification of the issues important for preliminary and later-period regulation of the market as well as timely and adequate regulation[117] that should be applied in relation to the providers of those network services that have significant market power.
- Regulation of preliminary compulsory transit that can be achieved through obliging the competitive rival technological platforms to disseminate content through particular, and mainly public service channels that is important in terms of media policy.
- Regulation of "Must offer" liability that should be based on the study carried out by the National Communications Commission of Georgia "the aim of which should be identification of the channels that are in great demand at the national and regional levels.

It is important not to create the threat of competition limitation as a result of the state regulation.

At the transitional stage, there will be one national and one regional operator disseminating the broadcasting signals that may create close and exclusive model within the terrestrial platforms. In order to avoid the above conditions, preventive measures should be planned and competition should be regulated.

8.4. Regulation of competition in the network access market

[115]Non-systemic barriers mean unreasonable access tariffs and non-cost orientation

[116]Delayed interference of the Commission in preliminary regulation may cause irrevocable damage to the concerned parties.

[117]M. Arino "Digital war and peace: Regulation and Competition in European Digital Broadcasting" *European Public Law* 2004.

Competition regulation in regard to dominant platforms should be carried out in parallel (satellite and cable broadcasting).

It would be reasonable to survey the segments of the market by the National Commission that are related to the operation of digital terrestrial broadcasting network in order to ensure timely and effective access to passive and active network infrastructure that is under the management of digital terrestrial network operator. The survey results should be public.

Presently, there are network monopolies on the market the number of segments of which has not been regulated; in some cases the regulation was fragmented and took place several years ago.[118]The above situation creates hard conditions for investors due to lack or absence of information.

Correct policy of competition regulation as well as well-planned and timely measures should ensure maximum transparency of the access conditions, non-discrimination and access to all elements of the network at prudent tariffs oriented on cost minimization. The above conditions create fair and competitive conditions for terrestrial network operators and broadcasters that will develop market and ensure a wide choice of services provided to the final customer.
The switchover process includes certain risks unlike the reality existing under analogous broadcasting. It is significant to point out two directions:

1. Regulation of the conditions related to providing access to digital networks;
2. Regulation of the market segment of access to the resources those are necessary for the digital broadcasting operators for informing their networks (elements and capacity of wire and fiber backbone network, telephone guidance channels, towers and co-location spaces, etc.).

Based on the 2003 EU regulations,[119] the EU member countries were recommended, among them for the purpose of developing digital broadcasting, to study the segments of the wholesale market of broadcasting service, within the frames of preliminary regulation that would create conditions for the market entry for the companies that would like offer broadcasting services. In addition, the recommendations envisage allowing the companies that would like to provide services within the digital broadcasting platforms to do so through providing additional services. The segments[120] of the so called primary market (management of digital broadcasting network) and the secondary market (market of access to the network elements) should be separated from the so called market N18 and be regulated.

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[118] Note: after 2007, despite significant changes on the market, the market of access to the resources of wire communication systems has not been surveyed; no analysis or studies of the market of access to the resources of wire inter-zonal or internal zonal backbone communications system have been conducted.

[119][119]EUROPEAN COMMISSION RECOMMENDATION on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services. 2003/11/02. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:114:0045:0045:EN:PDF

[120] Response to Consultation: Market Analysis - Wholesale Broadcasting Transmission Services . COMREG. 2004http://www.cullen-international.com/cullen/exdocs/xd7140.pdf

The goal of the National Communications Commission is not only pre-regulation of the segments of primary market, but regulation of the secondary market segment since its transparency and cost-orientation represents the guarantee for timely and smooth[121] integration of digital broadcasting networks. The above conditions are related to the tariffs for the access to the multiplex capacities and the time of the network set-up.

The EU Access Directive[122] as well as the Law of Georgia on Electronic Communications provide sufficient legal basis for efficient regulation. In order to create fair and competitive conditions for the access to network communications, transparency should be guaranteed in terms of prices and conditions set for the use of the network (providing transparency liability of the so called invitation to offer or "exemplary offer). However, the operators identified at the switchover initial stage as the ones having significant market power should be given the opportunity to set relevant and cost-oriented prices; transparency and non-discrimination conditions should be regulated in accordance with paragraph 3 of article 19 of the Georgian Law on Electronic Communications[123] within the frames of preliminary regulation. The conditions of transferring the broadcasting signals to the broadcasting network should be regulated similar to telephone interconnection regulation while the regulation of prices and access should be carried out only in case when the market cannot solve the problems despite the established conditions.
Despite high importance of competition regulation, the Commission should use the principle of minimal interference and define which market should be interfered and at what level. However, it is important, and especially at the transitional and after digital switchover stages, to carry out permanent control in order to ensure timely interference.

In case if based on the state digital switchover policy operation of a vertically integrated operator is considered permissible on the digital broadcasting market, the operator should be imposed a specific liability of separate accounting of expenses. At the next stage of regulation, if the applied measures are not sufficient, the vertically integrated operator may be imposed some other and more severe liabilities. The above conditions of competition regulation should be defined not only by the law; they should also be detailed in the bidding conditions and licenses that authorize the right of carrying out digital broadcasting activities.

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[121]Regulating the Digital Television Infrastructure in the EU. Room for Citizenship Interests?
Eliza Varney, 2006 , http://www.law.ed.ac.uk/ahrc/script-ed/vol3-3/varney.asp

[122] DIRECTIVE 2002/19/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 March 2002
on access to, and interconnection of, electronic communications networks and associated facilities
(Access Directive). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0007:0007:EN:PDF

[123]Note: in accordance with the noted paragraph, the operator of electronic communications network that renders services to the final customer within local services zone using cost-oriented tariffs relevant to the elements of their own networks and indiscriminate access should ensure direct or indirect interconnection of operators expressing their desire or the owners of electronic communications departmental networks. Termination of interconnection operating among the operators of communications network is inadmissible. In case if failure to observe the provisions specified in the interconnection agreement by operators, the other party of the agreement shall be authorized, in order to ensure the fulfillment of the conditions, to suspend the functioning interconnection only at the consent of the Commission and based on the terms and conditions defined by the Commission.

It is important to ensure maximum transparency of elements and conditions of access of broadcasting network operator to multiplexor capacities for all operators looking for such access. Network operators should ensure unlimited access to their resources and especially if such operator or an affiliated legal person renders service and is involved in inter-platform competition because in such case the threat of competition limitation increases by limiting the access to network resources.

One of the main objectives of the state is to ensure fair and equal access conditions to the passive elements of digital broadcasting network and related services.
The problems may arise at the level of content providers. However, at the transitional stage it is more important to regulate competition at the level of transmission and management of broadcasting signals. The National Communications Commission should identify, in a straightforward and detailed form, the rule and criteria of broadcasters' access to multiplexor capacity. For the transitional period the National Communications Commission can develop the list of terms and conditions of the agreement on the access to multiplexors' capacity and/or recommended sample[124] of such agreement.
In case of selection of one operator, the real threat of competition limitation exists. Hence, under the conditions of limited frequency band and in order to ensure the internal competition within the platform a competition should be held to select two broadcasting network management operators.

A rather short switchover period and an amount of necessary regulatory works will increase the workload of Georgian Communications Commission that should also be taken into consideration.
If the broadcasters do not have access to infrastructure designed for dissemination of digital signals, the risks of digital switchover will increase and not decrease. The Commission should eradicate systemic and non-systemic barriers related to the market entry at all stages of switchover process.

8.5. Regulation of concentration

In accordance with article 60 of Georgian Law on Broadcasting, a person shall have the right to own no more than one general TV broadcasting and one general radio broadcasting license in one service zone independently or collectively together with the interconnected people. It is doubtless, that the license on setting up a frequency network and developing content should be issued separately. The above approach of Georgian Law on Broadcasting should stay the same in relation to multiplexor operator. However, the limitation should be changed in terms of the content developer since what is interesting is the size of the market share and not the number of channels owned by a particular broadcaster.

Regulation of merging of broadcasters at the stage of switchover is of no less importance. In some cases the above may be conditioned by objective factors (especially in case of regional and/or local broadcasters). When making decision on merging of the licensed entities/individuals the National Communications Commission should evaluate each single case.
Generally, only several transmission networks are formed due to the value of transmission network and difficulties related to their setting-up. Setting-up of additional broadcasting network may be

[124] Note: in order to simplify the process and protect the interests of broadcasters and multiplex operators, the Communications Commission can develop a legal act of the access regulation.

encouraged by norms regulating concentration prohibition the main goal of which is maintenance of diversified local programs.
When developing the state policy on concentration, we take into consideration the threats that are generated as a result of concentration, on the one hand, and huge infrastructure costs, on the other hand, since many small companies may get bankrupt in case of prohibition of concentration.

In the process of switchover to digital broadcasting, some smaller broadcasters may not be protected against bankruptcy due to unstable financial conditions, lack of resources, human or other issues. Respectively, in order to avoid the broadcaster concentration, we need to identify the ways of assisting them.
In this context, spreading the regime in terms of digital network operators that is specified in paragraph 2 of article 37[125] of Georgian Law on Broadcasting is important.

When regulating the competition conditions at the transitional and post-transitional digital switchover period:

- The rights of developing content and setting-up and operating transmission network should be regulated separately;
- The issue of the access to infrastructure should be addressed within the frames of preliminary regulation; otherwise they may have problems related to the access to specific resources;
- Within the frames of preliminary regulation, the Commission should regulate the so called market 18 by defining special liabilities for the individuals having significant market power on the market of providing broadcasting service to the end customer. Special liabilities of transparency, no-discrimination, tariff regulation and accounting should be identified for the operators identified as the ones having significant market power. Access liability for the transitional period should be detailed similar to the one specified in part 3 of article 19 of Georgian Law on Electronic Communications (the norm should be valid until compete liberalization the market).
- Within the frames of preliminary regulation, competition should be defined for each market segment that should be used by broadcasting signals disseminating provider including access to towers and co-location space.
- For the purpose of ensuring competition at the regional level, the state should provide relevant conditions for regional and municipal (local) broadcasters in order to save the resources in the process of receiving the digital broadcasting service and increase competitiveness.
- Competition on the market segment of managing the transmission of TV signals should be regulated.
- In order to ensure efficient competition and effective regulation, the regulations for joint construction and use of physical infrastructure should be introduced in conformity with the EU recommendations.

[125] Note: the license owner in the sphere of broadcasting cannot be a legal entity registered in off-shore zone or the one whose shares are directly or indirectly owned by a company registered in the off-shore zone.

- The National Communications Commission should be empowered to hear the dispute between a broadcaster and network operator; the timeframe set for the dispute resolution should be as short as possible (especially at the transitional stage).[126]
- The right to annul the access agreement, similar to telephone interconnection, should be done at the consent and with the permission of the National Communications Commission.
- In order to protect the interests of all existing broadcasters at the initial and post switchover stages, the liability of transmitting the signals of standard quality should be defined. After freeing the existing analogues frequencies, capacity increase and/or setting-up alternative broadcasting network, the Commission should issue its consent on the provision of HD channels and payable TV service. For issuing the permits on rendering new services, the Commission should hold discussions taking into consideration the interests of the broadcasters and existing market conditions.
- The principle of access to multiplex capacity, "First come-first served" should be limited by the Commission at the transitional stage. When evaluating the issue of access, the Commission should take into consideration the criteria specified in the law (see below) and the conditions to be identified as a result of survey on broadcasting priorities[127].
- If a broadcaster at the same time owns the digital network license (if we consider it permissible), at the transitional stage it should have the liability of separate accounting of income and costs. If the danger of competition limitation increases, it should be imposed the separation liability within the frames of special liabilities[128].
- Must Carry and Must Offer liabilities should be regulated within the frames of the Law on Electronic Communications at the transitional stage.
- In order to maintain low prices on receivers, the state should ensure competition on the retail market of the imported equipment and guarantee complete interchangeability of the imported receivers and their compliance with other networks.

A network operator, the winner of the competition for recommended multiplex model, should completely use the resources of all possible channels at the volume defined by the National Commission based on the principles of the present strategy (quotation method of the first and second multiplexor). Digital network service provider concludes an agreement with the program provider/broadcaster. The key conditions shall be specified in the Law on Electronic Communications and detailed in the respective by-law.

8.6. Rights and responsibilities to be defined within the frames of the terms and conditions of the competition

[126] Note: We think it reasonable to set a one-month period similar to the disputes related to interconnection

[127] In case of similar conditions, access to multiplex should receive the broadcaster that applied the first

[128] The risks of competition limitation increase when a network provider and broadcaster are one and the same or affiliated persons or represent vertically integrated provider on the market of broadcasting signal dissemination. In order to ensure competition, at the initial stage national broadcaster or a group of broadcasters should not have the right to participate in the competition for disseminating broadcasting signals.

The license holder selected in the transitional period shall have the following rights:

- The right to use the frequency allocated by the National Commission of Communications (MUX 1, MUX 2)
- The use of the frequencies allocated for analogous broadcasting before such was switched off
- Adding channels at the decision of the operator and under the supervision of the Commission during the transitional period
- The right to set-up another network using another frequencies after analogous broadcasting switch-off in 2015
- The use of the unused segment of the network for data transmission capacity.

The license holder selected in the transitional period shall have the following obligations:

- The obligation of free dissemination of the channels that fall under a special category (public broadcaster content and/or must-carry programs) as well as the obligation of ensuring free access by population under the conditions defined by the license.
- The obligation of unlimited dissemination of the programs of public radio.
- Development of broadcasting network (by itself or sub-contractor) in conformity with the competition terms, attachments and the contract.
- Ensure MPEG4 compression and observation of other technical conditions;
- Substitute the frequencies used by the broadcasting network if that is necessary for further development of the network and services.
- Involvement in marketing and providing information to customers about digital broadcasting and switchover process.
- Involvement in the switchover process, technical and communications management (permanent responsibility of providing information about network construction or observance of the recommended schedule)
- Coverage obligation
- Access obligation;
- Tariff, non-discrimination and transparency obligation.

8.7. EU recommendations

Due to concentration and globalization, the world media market is changing rapidly that may create some threats to the media market of small countries, decrease the number of Georgian channels, news and debates. With this in mind, during the transitional period the priority of dissemination of locally-produced content should be identified.

The state policy and media should be separated to the extent possible (that might be possible in terms of dissemination of public content, but the situation gets aggravated when the digital terrestrial

broadcasting operator is the company under the state ownership or when the network mainly depends on such company).[129]

The EU Treaty on the Functioning[130] sets the key conditions in case of existence of which the state assistance is not compatible with the internal market principles of the country. Any kind of assistance of the state that limits competition or creates the threat of such limitation, if there are no exceptions, shall be considered incompatible with the EU internal market principles and the international trade rules. Limitation of competition is exercised by creating relatively favorable conditions for particular entrepreneurs or products. State assistance should not cause limitation of competition or create threat of such limitation. Respectively, each activity planned by the state should be in conformity with the principle[131].

8.8. Must carry and Must Offer regulation

As provided by Must Carry obligations, the state can impose the liability on the operators to provide the programs of the public or other broadcasters to the end customer. The programs that have news and discussions and are watched by 20% of a specific city or digital region should be considered as the private content to be much in demand.

(The focus should also be made on the compatibility of state interests in the sphere of broadcasting). The Must Carry criteria should be defined in the legal part of the Strategy.

Must carry regulation for digital broadcasting operators is reasonable to be performed as the EU countries that have broadcasting market conditions similar[132] to those of Georgia do.

Georgian National Communications Commission should specify in details Must Carry obligations for all platforms used for broadcasting purposes (whatever is identified as a result of studies and analysis).

Must Carry obligations specified under general conditions should be applied to all licensed multiplex operators functioning at the transitional stage, while after the transitional stage – to all authorized persons identified as a result of market survey as having significant market power.

Georgian legislation regulates the rule of transit carriage that ensures the carriage of the programs f broadcasters through the networks of cable providers during election period only; however, within the frames of specific access liabilities the relevant multiplexor operator should also be imposed the above liability. Special legislation in the sphere of telecommunications and broadcasting should ensure the carriage of the programs of the public broadcaster of Georgia through other digital platforms if such demand exists.

In case of need to increase intra-platform competition, the National Commission, based on relevant legislation, should have the authority of imposing the Must Offer liability on content providers to

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[129]Guide to the Digital Switchover, OSCE, Vienna 2010.

[130] CONSOLIDATED VERSION OF THE TREATY ON THE FUNCTIONING OF THE EUROPEAN UNION. 2010. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0047:0200:EN:PDF

[131] The topic is widely discussed in IDFI recommendations on Defining the State Strategy for Rendering Assistance to Digital Broadcasting, January, 2013, http://www.idfi.ge/uploadedFiles/files/IDFI-%20Recommendations%20for%20State%20Aid%20Strategy%20of%20Digital%20Switchover.pdf

[132] Carriage obligations for broadcasting platforms, Cullen international SA.http://www.cullen-international.com/cullen/cipublic/studies/broadcast/tables/table15%20.htm

allow the platform operator to disseminate the content interesting for the audience through its network.

Within the frames of the Must Offer liabilities that are imposed on program provider-broadcaster, the program provider should not have the right to say no to the digital network provider. This approach is the simplest way for the National Commission to strengthen the positions of digital broadcasting and other platforms and protect them from the willfulness of the broadcasters. Within the frames of the present strategy, the above liability should be defined in Georgian Law on Broadcasting; its realization can be achieved through further regulation of competition in case if a concrete dispute arises.

8.9. Regulation of channels in the multiplexor operators' network

Introduction of controlling mechanisms that would ensure the placement of programs in digital broadcasting network without discrimination, serve public and state interests and observe the principles of competition on the market[133] is not of less importance.

The above is especially true about the regulation of foreign content and broadcasting of the content disseminated by cable network. During the transitional period as well as during two years after the switch-off of the analogous broadcasting, the owner of a multiplexor should not be authorized to disseminate payable programs, additional programme services and the other non-broadcasting content without the consent of the National Commission.

The Commission should define how the placement of such services in the multiplexor will limit the interests of other broadcasters having access to the resources and deteriorate the quality of broadcasting.

The above prohibition should be applied to the public broadcaster as well (for example, public broadcaster may request the consent of the National Commission on the additional programs of public service or other services such as the so called "video order", or it may request dissemination of the service with better quality").

It is important that the Commission, based on the relevant legal act, decides the conditions of access to the multiplexor capacities. It should be pointed out that during the transitional period and later, the person authorized by the state should evaluate the access priorities based on the following criteria:

- The broadcasters that had licenses before the switch-off of analogous broadcasting[134] should have priority access;
- When placing channels in the first two multiplexors, the priority should be given to non-commercial broadcasters, local and free channels;
- Priority should be given to the broadcasters that should rebroadcast the prioritized content.

[133] Recommendation of the Committee of Ministers to member states on measures to promote the democratic and social contribution of digital broadcasting COUNCIL OF EUROPE COMMITTEE OF MINISTERS Rec(2003)9. https://wcd.coe.int/ViewDoc.jsp?Ref=Rec(2003)9&Language=lanEnglish

[134] If there is a possibility of issuing local broadcasting license, the state may put into operation the so called moratorium principle to prevent the issuance of such frequencies.

In this direction and under the conditions of business models planned in Georgia, the model applied in Italy could be considered the best one. Based on the model, 40% quota of the multiplexor's capacity is allocated for private broadcasters; it also lists the principles that should be observed by the broadcaster. In order to place a channel in the multiplexor, at least two criteria should be met at a time:

- Development of news and debates programs;
- Entertainment – live sports, cultural, etc.
- Informative-educational – historic, cultural, scientific, musical, etc.
- Artistic programs, films and programs for adults.

Priority should be given to the broadcaster the programs of which meet the above criteria to the extent maximum. Based on article 4 of Georgian Law on Broadcasting (Plan and priorities of broadcasting frequencies) envisages the liability of the National Commission that means that in accordance with International Radio Regulations, the priority of TV and radio broadcasting defined as a result of polling held once in two years should be published. We think that the practice existing in relation to the above subject is not satisfactory and the law norms are very general. This should be detailed using the criteria that will be specified in the law; additional criteria should be established based on the polling results.

8.10. Regulation policy of the services related to broadcasting

Regulation of competition related to access to services is of no less importance. The Law on Electronic Communications includes some elements of such regulation such as access transparency, existence of open program interface, etc. However, the above spheres should be detailed at the next stage of regulation.

One of the key goals of the state is the regulation of conditional access systems (key directions: API and EPG) the general norms of which are specified in the Law on Electronic Communications. Regulation of the above systems is necessary since it has a very significant function in developing horizontal competitiveness in the digital broadcasting market where the program developers and providers of intermediate programs and equipment should cooperate closely. Correction and coordination of final directions of this sphere should be done within the frames of license conditions and should be imposed on the provider owning the digital network multiplexor license.

Operators should publish the complete prices of the offered services (including signal scrambling, open conditional access (EPG), etc.

9. Concept of information campaign and its funding

The goal of the information campaign is to inform all interested groups about the pending changes and timeframes. Information about the advantages of digital terrestrial broadcasting in a simple and understandable manner should be provided within the frames of information campaign, and it should take into consideration the interests of all distinguished groups including ethnic ones.

The success of digital switchover process, especially at the regional level, depends on correctly focused and planned information campaign that should be implemented by entities defined by the switchover policy document. All information related to the process should be provided to the public broadcaster by the Ministry of Economy that is responsible for the process on the whole territory of Georgia. The task of the Ministry is to plan, develop and implement all procedures and activities together with all interested parties.
The following activities should be carried out in order to achieve the goal:

- Informing public about the preparatory stage for the process of switching-off analogous broadcasting and switchover to digital broadcasting, including timeframes.
- Informing public about the advantages of digital broadcasting compared to analogous broadcasting.
- Presenting information on the content of the planned subsidies, beneficiaries, the rule of receiving subsidy including timeframes and place. The public should receive all information that might be important for the end customer during the switchover process (information about consultative web-page, free hot-line, development of flyers and film loops).

Equipment importers should be actively involved in the process.

9.1. Peculiarities of information campaign

The following activities should be funded within the frames of information campaign:

- Development of easy-to-remember digital broadcasting brand involving celebrities;
- Development of a multi-language commercial;
- Development of internet web-page;
- Articles in electronic newspapers and journals; dissemination of information using radio and billboards;
- Registration and putting into operation of Digital.ge domain;
- Development of a film loop that will be broadcasted in the networks of retail traders and internal networks of subway, etc.
- Develop film loops and booklets adapted to the needs of the disabled; the information material should be designed by age-groups;
- Organize a special space at the most popular forum;
- Develop budget for advertising campaign and relevant services;
- Develop, advertise and fund installation and maintenance services;
- Develop monthly reports on the sold digital TV sets;
- Control of perception of information campaign and relevant corrections;
- Provision of information to the end customers about the procedures of testing and marking of receivers;
- Information on increasing the electricity bill (if a receiver is used);
- Control lists should be published at least two months prior to funding;

- Develop and provide to retail traders comprehensive guidelines for salespersons and customers;
- Involvement of local self-governments at the regional level;
- Organize hot-line and use the resources of the public broadcaster;
- Shadow zones should be funded on a pro-rata basis of the income of network broadcasters to fund satellite broadcasting;
- Develop information about antennas;
- The rule for receiver classification and certification;
- Provision of data to libraries;
- Regulation for transferring receivers to the third person;

In order to implement the above activities, the Government of Georgia should identify precise assignments to ensure horizontal and vertical coordination of information campaign. Information campaigns should be correctly-planned and focused on all social groups that are defined by the present strategy (#4). All the parties taking involved in the process should be asked for intensive and ongoing cooperation with all concerned subjects including the Government of Georgia, the Ministry of Economy, National Commission of Communications, public and private broadcasters, authorized entities)network providers), equipment importers, and NGOs.

Information campaign should cover the following spheres:

- Provision of information about free and payable digital broadcasting and the time of switch-off of analogous broadcasting;
- Information about the parameters of receivers and TV sets needed to receive digital broadcasting as well as information on the parameters of receiving antennas and their feeding cables;
- Information on funding the demands of vulnerable and disabled persons as well as assistance and special measures during information and installation processes;

Intensive information campaign should be directed to the population of the geographic zone where, based on the switchover plan, the signals will be transmitted through digital platform in the first place (switchover plan by regions).

Information about the Digital Switchover for the end customer should be free. During the funding process, the Government should take into consideration the special needs of those having language problems.
The Ministry of Economy and Sustainable Development together with the National Communications Commission, in parallel with information campaign, should define the content of information and terms and conditions to be provided to the equipment importers.

10. Funding and Price Regulation

All activities planned during the transition stage of digital broadcasting must be market-oriented and must be defined in consideration and on the basis of transparency, non-discrimination and technological neutrality principles.

Interference from the side of the State must be moderate and minimum.

Terrestrial television represents unalterable method for the majority of customers to receive the terrestrial service. They are provided with the public broadcaster content "free of charge" together with other content for the population of regions and cities of Georgia and therefore it is necessary to allow the state competent bodies to intervene and provide necessary funding (as well as funding for support) from the state funds or other funds.

When funding the digital broadcasting transition process, the following important issues shall be considered:

- funding of digital terrestrial receivers subsidizing and installation costs in a technologically neutral way, through issuing vouchers to physical entities (families);
- funding of advertising/informational campaign costs for the purpose of public awareness;
- strategy implementation management costs (analysis, gathering opinions, public surveys, etc.).

Taking into account the relevant legislation of the European Union, the state subsidies are not encouraged for legal entities. Additional costs as a rule (directly or indirectly) shall be covered by this sector. After completion of digital transition, costs for broadcasting shall be much lower than costs for equivalent broadcasting incurred by the sector.

The state shall ensure that during implementation period of this strategy there is not a single group of population which for the reason of social vulnerability or any other reason will not be able to receive digital television service.

In addition to the direct funding from the state budget it is possible to create so-called "**Transition Fund**", which shall be filled in with macroeconomic transfers. In particular, it means those companies which benefit by switching off analogue broadcasting (terrestrial broadcasting market participants, other users of the spectrum, license fees and etc.).

Money accumulated in the fund shall be spent for funding of the activities which will encourage and expedite the process. As an example the practice of the fund (the fund for encouraging the process of transition to digital broadcasting) created in Austria may be considered as the most acceptable model.

Exemption of importers from customs duty and VAT temporarily may be considered as the subsidy alternative during the transition period, only in case of equipment needed for digital broadcasting

(required equipment and TV). It may be considered as the advantage of this solution that it will encourage increase of equipment concentration, formation of competitive prices and fast digital migration as the customer will save a small part of costs which may be used to purchase the equipment.

0.5% of the regulation amount from the sector as well as up to one percent from network providers (telecommunication party) is "withdrawn", where from the part of additional costs of the national commission of communications instead of funding (which is the subject of the separate research) may be directed at the subsidy fund.

Only those digital terrestrial receivers shall be funded, which would be purchased on the territory of Georgia. Common procurement of receivers shall not be made by the state in order to distribute them as there is a high risk of corruption and it will prevent the technical equipment market to determine competitive prices on these products.

If public channels would be distributed by private multiplexers, the budget will save the costs of building multiplexers, but technical costs needed for public TV broadcasting today would be directed at funding of service for providing universal service.

For the project implementation funding shall be provided from the following three sources:

- from the state budget;
- from collected or/and increased regulation fee by the regulatory body for broadcasters and partially for network service operators;
- from resources which would be received from distribution of multiplexers licenses in the transition and further period.

In special cases National Communications Commission or Ministry of Economy and Sustainable Development shall be the guarantor of state subsidies (for the importers as well as investors), settlement of which may start after switching off the analogue broadcasting from funding reserved from the technical direction of the Public Broadcaster. The public broadcaster shall give up its analogue frequency resource in favor of broadcasters in compensation of their expenses.

Admissibility to issue state subsidies in Georgia in terms of influence on competition shall be assessed by the Competition and Procurement Agency. However it is to be decided whether the electronic communications sector belongs to broadcasters' subsidy or receivers' subsidy. The aforementioned council (or commission) shall define that receivers' funding creates the opportunity for the sector to be more effectively enforced and to successfully implement digital terrestrial broadcasting in order to enable the opportunity for a large number of end users to deliver these services. Because of the competition risk based on interests of the end user it may negatively affect only the competition between analogue and digital broadcasters at the transition phase, as well as the competition between those digital broadcasters which are allowed in the transitional period because of superior importance.

It is necessary to maintain the technological neutrality as the aforementioned funding will not infringe the competition between platforms and will not give the priority to only the terrestrial platform.

Use of resources of digital broadcasting transition fund shall be defined purposefully in advance. The fund shall be established by the Ministry of Communications and Ministry of Economy and Sustainable Development which shall be replenished from abovementioned sources. Only those companies operating on the electronic media market may apply to the digital broadcasting transition fund (broadcasting network operators, broadcasters and etc.). The appeal for funding shall be accompanied by projects in compliance with main principles of this fund.

Maximum involvement of the fund in relation with the presented business plan shall be 50% towards regional development.

The commission at its discretion and by the recommendation of the Ministry of Economy and Sustainable Development of Georgia takes a decision for issuing the grant.

Funds of the digital broadcasting transition fund may be used only for the following purposes:

- to finance technical and economic researches and analysis programs, which are oriented on the end user;
- pilot programs and research funding;
- projects related to television programs and other related additional services development, including EPGs, interactive and mobile applications, which are oriented on delivery of additional broadcasting services using digital terrestrial platform and exceed standard broadcasting services;
- activities which may be used as the means of information for the public at large during digital broadcasting;
- digital terrestrial transmitters, network infrastructure planning and installation funding taking into consideration regions coverage and signal access indicators optimization;
- funding shall be directed towards encourage of the equipment to be installed and purchased at the end user's side;
- funding which helps broadcasters to properly understand the digital broadcasting transition process;
- measures directed to financial promotion of users, which may receive digital terrestrial service at the initial stage of the digital broadcasting (e.g. 10% promotion);
- funding of regulatory bodies or other groups for monitoring of digital broadcasting transitions implementation.

At the transition phase in order to speed up the broadcasting process it is likely to give the priority to national digital terrestrial network funding by the State (Russia model). State company – "Alfacom" (previously "Radio Broadcasting center") may be directly defined by the State as the first multiplex

and broadcasting networks' transmitting national operator and the liability to distribute the public content at the national level and partially other national coverage content distribution liability may be imposed on it. **To our view this model is not acceptable for the State because of the lack of target and need.**

In terms of commercial broadcasting costs (only regional broadcasting), it is reasonable during parallel broadcasting to exempt existing commercial broadcasters from the liability to make the payment of the signal distribution or access rate through the first national multiplexor network (MUXI) on the territory for which the broadcasting permission was issued by the National Communications Commission for analogue terrestrial transmitters. The aforementioned access service costs shall be covered using the state and other financial mechanisms.

10.1 definition of the rates for access to digital terrestrial broadcasting network multiplexor

In the process of transition to digital broadcasting of Georgia, main participants of the legal relation at the service delivery side are digital broadcasting terrestrial network multiplex operators and broadcasters. Similar to telecommunication market wholesale segments the main problem at digital terrestrial broadcasters' transition and its further phases is **regulation of issues of access to multiplexor resources,** which may be done by restricting the access terms [135]. Measures taken timely for competition regulation shall ensure maximum transparency of the access terms, nondiscrimination of the access and unrestricted access to all needed elements of the network.

Regulation of the access terms shall be carried out by defining the specific liability of transparency; however the most problematic may become the issue related to defining the access rates to multiplexor resources, as rates not reasonable and not oriented on costs may cause isolation from the low budget local and regional broadcasters' process[136] and later on their bankruptcy/merger.

Within the ongoing process we consider important to develop the guidance document for defining the service rate of access to digital network. In the process of the guidance document development, we apply examples from international practice. Examples about digital terrestrial broadcasting transition process will be provided from **recommendation documents developed for regulatory bodies of Finland, Ireland and Tanzania**. At the same time we consider it important to develop such guidance document which would consider digital terrestrial broadcasting network specificity and highlight costs related to the service rate of the access to the terrestrial digital network. It is reasonable that this guidance document to be used by "Multiplex Operator" (hereinafter – "Operator") during the period of transition to digital broadcasting and its further period.

[135]Natali Helberger, „Some critical reflections about access obligations under the European Communications Framework", Institute for Information Law (IViR), University of Amsterdam, 2005 http://www.ivir.nl/publications/helberger/communications_and_strategies.pdf

[136]Plum Consulting, "Practical recommendations for digital broadcasting over Supporting information to ITU's guidelines for the transition from analogue to digital broadcasting", 2013 http://www.gsma.com/spectrum/wp-content/uploads/2013/02/Digital_Switch-Over_Guide_Plum.pdf

10.2 Business-model for one vs. several operators

Our target is to offer to the National Communications Commission of Georgia the guidance document to define the multiplexor resources' access rate as a recommendation within the scope of the research.

Therefore, the reasons for which at this stage it is not reasonable to define the common (marginal) rate as a recommendation shall be determined in the first place.

First of all by the existing condition the State did not make the final determination of market conditions in which the operator (or operators) will be granted the access to market. This circumstance enforces us to give several different accesses and thus different guidance models generation for definition of rates.

In general, at the aforementioned stage the state gives the priority to the business model of granting the market access to one enterprise owned by the State[137], which would offer individually to broadcasters the digital terrestrial network program distribution service[138].

Hence within the scope of the research first of all we consider necessary to determine the influence which the circumstance that only one state enterprise will be presented on the market at the initial stage would make on the rate; recommended guidance document format encourages us to offer the business-model prioritized by us and the rate determination method preferred by us within this business-model to the National Commission of the Ministry of Economy and Sustainable Development. Within the scope of the research considering all existing factors and interests it is possible make comparative analysis of two different scenarios.

During determination process of the alternative recommendation model of the rate several important accesses were made; aforementioned accesses are related to our organization vision, particularly which risks are seen in the process of providing the service by the operator and how to minimize these risks. The primary access applies to orientation on the component of necessary costs incurred within delivery of the service provided by the rate determination model (cost-based approach). Also it is important that the rate have nondiscriminatory character as the broadcaster and end users, as well as for private operators interested to enter the market.[139]

[137] Presentation of the Ministry of Economy and Sustainable Development of Georgia, dated 7 March of 2013 http://www.government.gov.ge/index.php?lang_id=GEO&sec_id=269&info_id=36256

[138]Company will build one digital broadcasting network building, which will use two double frequencies, or will build two independent networks with regional and national access regimes.

[139]http://www.ficora.fi/attachments/suomiry/1156442723276/Report_for_publication.pdf page 38-39.

10.3 Options for calculation and evaluation of costs

When discussing the issue of calculation, estimate and evaluation of costs within the scope of the rate determination, there are two basic questions to be answered in the rate determination process. On the one hand exactly what expenses shall be considered within the scope of the rate determination; otherwise whether the methodological rules ("methodological rules for separate distribution of costs estimate and expenses by authorized persons"[140], approved by the resolution No 5 of 2006, hereinafter called – "methodological rules") adopted by the National Communications Commission be determinant in the rate determination process by so called "multiplex operator" (even for the transition period or after the effective date of so called "MUX3");

It is the issue of separate discussion how the operator will be technically equipped. It will be impossible to determine the exact rate without considering this factor as before setting in details the requirements (so called „engineering requirements") by the National Communications Commission for network technical equipment, the operator has the opportunity to calculate dozen different rates[141].

10.4 Proposed business-model analysis from the point of view of license rate

In this part of the research we would like to discuss the business-model[142] preferred by the State and compatibility of methodological rules[143]for definition of the rate by the National Communications Commission.

As already mentioned the business-model proposed by the State means delivery of the program distribution service though digital terrestrial network for broadcasters from one state enterprise.

Therefore within the framework of the business-model we get monopolist state company on the non-competitive market.

As authorized person, this company will be automatically liable to use methodological rules established by the National Communications Commission as a guide within the scope of calculation of the determined service rate.

Taking into consideration that according to the existing strategy main activity of the enterprise established by the State will be to sell program distribution service license through digital terrestrial network, it is easy to imagine that expenses considered later in the licensing rate calculation process

[140]Presentation of the Ministry of Economy and Sustainable Development.
[141]http://www.gncc.ge/index.php?lang_id=GEO&sec_id=7060&info_id=3958
[142] Presentation of the Ministry of Economy and Sustainable Development.
[143]http://www.gncc.ge/index.php?lang_id=GEO&sec_id=7060&info_id=3958

of the activity carried out by similar authorized person, include all infrastructural expenses incurred in the process of purchase and installation of new multiplex, network and transmitters. Taking into consideration that while determining the rate we only think that so called „bottom up cost modeling" model is optimal[144], as a minimum, in the rate determination process expenses made for operation of only really loaded capacities shall be considered.

In addition to the abovementioned objective circumstance that the state company in contrast to e.g. the vertically integrated operator, would have to consider total infrastructural expenses incurred during determination of the service rate, a serious problem occurs for this company when using so called capital cost determination rules[145]. Especially taking into consideration that even a small change in the capital cost makes a serious impact on the final rate volume.

We would like to briefly discuss the calculation method. According to methodological rules in force calculation of the annual average weighted rate of the capital cost is made according to the following formula:

$$WACC = r_{EQ} \cdot \frac{EQ}{EQ + D} + r \cdot (1 - t) \cdot \frac{D}{EQ + D}$$

Where:

"*WACC*" - annual average weighted rate of the capital cost;
"r_{EQ}" - annual rate of personal capital profitability;
"*r*" - annual average weighted rate of the loan capital;
"*EQ*" - amount of personal capital;
"*D*" - amount of loan capital;
"*t*" - profit tax rate.

Annual rate of personal capital profitability is calculated according to the following formula:

$$r_{EQ} = i_{rf} + (r_M - i_{rf}) \cdot \beta$$

where

"r_{EQ}" - annual rate of personal capital profitability;
„i_{rf}" - risk-free rate of profitability on the financial market;
„r_M" – "the average amount of the annual rate of personal capital profitability of authorized persons acting in electronic communications sector, which is calculated by the commission based on the data provided by authorized persons carrying out the activity"[146];
"β" - so-called "Beta" factor;

Below we would like to introduce a brief list of problems seen by us:

[144] http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf page 12.
[145] Methodological rules, article 21.
[146] Methodological rules, article 21.

1. First of all we can assume that in case of the state company invested funds will be introduced mainly by personal capital allocated by the state. In such case, on the one hand, annual rate of personal capital profitability will increase more in the process of the capital cost determination, but on the other hand, this circumstance will probably cause the rate increase, because as a rule the personal capital cost is always higher than the loan capital amount, especially in developing countries.[147]

2. We face the following problems in the determination process of the annual rate (r_{EQ}) of personal capital profitability:

   - National Communications Commission has offered ($\mathbf{i_{rf}}$) six-month "average amount of average weighted annual rate fixed on auctions held during last six months from the first placement of deposit certificates of the National Bank" as a risk-free rate of profitability ($\mathbf{i_{rf}}$) on the financial market[148].We think that it will be more adequate to use the interest rate of treasury bonds of five-year maturity period of the Ministry of Finance of Georgia as a risk-free rate of profitability[149]. This **ceteris paribus** would have encouraged the rate reduction and what is more important that five-year maturity period will more adequately include the risks related to the capital cost in the formula.

   - To define the risk-premium ("$\mathbf{r_M - i_{rf}}$") it is necessary to determine the annual rate („ $\mathbf{r_M}$ ") of the sector profitability. Taking into consideration the new type of monopolist business-activity on the market, it would be under question whether it will be reasonable to take the profitability rate as a benchmark in the existing electronic communications sector (for example, authorized persons ("Silknet", "Caucasus online") have indicated 11,7% as the sector profitability rate within the expanded interconnection service expenses calculation)[150], according to the article 21 of methodological rules[151]. Especially taking into consideration that the National Communications Commission is suspicious of the calculation methodologies of different rates by existing authorized persons[152].

   - The fact that profitability factor of such business-activity (program distribution service through digital terrestrial network) does not exist, as minimum at the first stage it is impossible to calculate so-called "Beta"- factor („β") using the proposed model.

[147] http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf Page 16.
[148] Methodological rules, article 21 III.
[149] http://www.treasury.gov.ge/news/?91 ; http://www.nbg.gov.ge/index.php?m=611
[150] Presentation related to expanded interconnection service costs calculation in the National Communications Commission.
[151] http://www.gncc.ge/index.php?lang_id=GEO&sec_id=7060&info_id=3958
[152] Oral hearing sessions of December 14, 2012 and January 22, 2013 of the National Communications Commission of Georgia

This brief list of problems makes clear that business-model preferred by the State and as a result of combination of the existing method for capital cost determination, theoretically we will get the indicator higher than the realistic cost of the personal capital which in turn will be crowned with existence of the high rate of the network program distribution service; and what is more important, unity of the business-model and methodological rules leads to inaccurate and unreliable calculation model.

10.5 An alternative guidance model for the license rate determination

Circumstances mentioned in the previous paragraph, are one-of the major reasons for us within the scope of vision to give priority to the **competitive business-model.** In this case there will be several players presented on the access market to digital broadcasting network multiplexor, but the National Communications Commission shall define in details the appropriate component calculation criteria for the rate determination.

Before starting to describe the scenario, we consider necessary to list the problems related to several operators' activity. For example in case of providing the market access to several operators, such a fact may unintentionally occur, that part of them may be the subject of the state but the other part subject of the private law; also it is to be considered that some suppliers will be limited only by so-called "multiplex operator" activities, while some – a wider range of service delivery. In this case in the rate determination process it should be explained that how it will be possible to separate DTTV (digital terrestrial television), the supplier of diversified portfolio represented on the market and expenses and revenues related to it from expenses and revenues received from other services.

In order to determine the access rate to multiplexor resources it is necessary to consider the models examples used by different countries. This international experience analysis will give us the opportunity to define the framework in which the rate determined by any "multiplex operator" operating in Georgia will be included. At the same time this international experience will help us to adjust from the one hand economic and from the other hand political components included in the rate model to developing countries like Georgia.

*First of all, we want to present the general tariff determination model. According to our model, the primary means which are connected by digital terrestrial network program distribution services shall be defined at the first stage (capital base). After that it is necessary to define the recommendation method for expenses classification (cost methodology), which will practically help us to separate expenses related to DTTV from expenses received from other services of the enterprise. Then, the average weighted annual rate of so-called Cost of capital and the annuity principle shall be determined in order to calculate the return on investment expenses and depreciation. Finally, the Operating (**multiplex-specific operational costs**), and manufacturing overhead costs (**overheads**) pre-determined percentage will be added to the amount received. **The amount received will be distributed in case of one multiplex to 15 digital broadcasters and the final rate will be determined.***

As already mentioned above, for the rate determination we consider so-called "Bottom up cost modeling", the model of modeling optimally emergency costs[153].[19]In case of using this method of costs modeling, the necessary infrastructure, network design and pre-calculation of the plan for its implementation shall be made by the companies wishing to get the market access.

With regards to the recommendation method for expenses classification the priority will be given to so-called **„LRIC+" method (Forward looking Long Run Incremental Costs (LRIC) + pre-determined percentage of manufacturing overhead costs(percentage of common costs)**. To our view, this model is best suitable for separation of direct and operating costs made by the operator for providing services on the competitive market in the communications sector, also to consider partially manufacturing overhead costs in the rate determination process and separation of expenses and revenues only practically related to DTTV and expenses and revenues obtained from other services in the rate determination process.

Certainly, the biggest problem in the rate determination process is determination of the calculation methodology of so-called WACC-rate (average weighted annual rate of the capital cost). In this case we give priority to international benchmark when selecting WACC-rate components.

First of all calculation method of annual profitability rate (**r_{EQ}**) of personal capital shall be paid due attention:

Even in our case this model[21] developed based on so-called **CAPM[154]**will be:

$$r_{EQ} = \mathbf{i_{rf}} + \cdot\ \beta * (\textit{mature equity risk premium} + \text{country risk premium}^{155})$$

The difference against the model established by the National Communications Commission is also expressed in the calculation rule of separate components of the model. For example the rate of treasury bonds of five-year maturity period of the Ministry of Finance of Georgia is considered as a risk-free rate of profitability (**$\mathbf{i_{rf}}$**) is considered as optimal risk-free rate of profitability[156].

Calculation of so-called "Beta"- factor („**β**") may be made by the Competition Economic Group (CEG) for the communications sector according to the established factor which is equal to 1,2[157].[24]

Calculation of average weighted annual rate of the capital cost will be made using so-called WACC formula.

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[153] ?????

[154]Sharpe, William F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk, Journal of Finance, 19 (3), 425-442.

[155] as of January 2013 so-called „*country risk premium*" for Georgia is 4,88%;(http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

[156]http://www.treasury.gov.ge/news/?91 ; http://www.nbg.gov.ge/index.php?m=611

[157]http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf Page 16.

$$WACC = r_{EQ} \cdot \frac{EQ}{EQ + D} + r \cdot (1 - t) \cdot \frac{D}{EQ + D}$$

In case of **WACC** calculation the following problematic issues will remain to be discussed:

- As known in case of using WACC it is necessary to pre-determine the optimal structure for providing the enterprise with capital. In this case we will rely on our international practice[15825] and support the following structure for developing countries like Georgia; **personal capital – 60%, loan capital – 40%.**

- Also, there is a problem related to average weighted annual rate of the loan capital (**r**); while e.g. "Silknet" has 13% average weighted annual rate of the loan capital within costs calculation of expanded interconnection service, but "Caucasus Online" – 15,25% [159], in 2011 World Bank in Georgia designated 25,9% as so-called "lending interest rate" indicator[160].More surprising is the paradoxical circumstance that annual profitability rate of the personal capital of enterprises is less than the average weighted annual rate of the loan capital in the abovementioned presentation (with regards to the aforementioned, our recommendation will be to develop the methodology and at the next stage to conduct the research which using historical data will define the reliable indicator of so-called "corporate lending rate" in Georgia).

After WACC (i) is defined the assets' annual annuity calculation shall be made; as a result depreciation cost and return on investments will be calculated simultaneously. In this case we give the priority to so-called "**simple annuity approach**" (simple annuity principle). According to this principle purchase cost of assets remain unchanged during their total service period[161].Simple annuity principle is used according to the following formula:

$$simple\ anuity = Assets\ cost \cdot \frac{i(1+i)^n}{(1+i)^n - 1}$$

At the next stage operational costs will be defined. For that it is acceptable to use the principle defined in the article 20of methodological rules for defining operational expenses. After the so-called operational expenses will be added to the annual annuity received as a result of calculation of depreciation cost and return on investment and the amount received will be distributed in case of one multiplex to 15 digital broadcasters, pre-determined interest rate of overhead expenses of manufacturing will be added to the amount received (in case of us, considering international

[158]http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf page 16.
[159]Presentation related to expanded interconnection service costs calculation in the National Communications Commission of Georgia
[160]http://data.worldbank.org/indicator/FR.INR.LEND
[161]http://www.ficora.fi/attachments/suomiry/1156442723276/Report_for_publication.pdf page 28.

experience, 10% shall be added to the established rate[162]) and as a result the final rate determination will be possible.

10.6 Recommendations

- *It is necessary to conduct permanent monitoring by the market players in order to correctly use the rule for costs classification and capital cost determination. So-called network external monitoring mechanism (especially in case of one supplier) shall become important instrument in the process of determination of the operator efficiency and establishment of appropriate sanctions by the National Communications Commission as required[163].*

- *in case of signs of oligopoly deal to be made on the market, National Communications Commission may define so-called "price cap" as an extreme measure, when it defines the marginal rate for operators according to the existing manual[164].*

11. Management and Supervision of the Strategy Implementation

One of the government goals to ensure the strategy implementation monitoring and process coordination system, also public awareness liabilities

Strategy for switching to the digital broadcasting for Georgia shall be approved by the Government of Georgia. Strategy goals shall be defined for all digital terrestrial television users – for citizens of the country and business sector.

The aforementioned strategy precisely defines goals and activities for all interested persons in the process of switching from analogue broadcasting to digital terrestrial broadcasting, as well as the final date for switching. Procedures are explained in **the action plan for switching from analogue to digital switching (Annex No 6),** including switching of the digital terrestrial television broadcasting in "the action plan of the digital broadcasting information company" **(Annex No4).**

Process monitoring system shall include two levels:

[162] http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf page 19.
[163] http://www.ficora.fi/attachments/suomiry/1156442723276/Report_for_publication.pdf page 41; http://www.comreg.ie/_fileupload/publications/ComReg0790.pdf page 3; http://www.comreg.ie/_fileupload/publications/ComReg0765.pdf page 12.
[164] http://www.tcra.go.tz/consultative_docs/pcd_mux_cbf_2012.pdf

1. **Separate measures and activities which shall be carried out by particular responsible authorities;**
2. **Joint measures and activities.**

Measures and activities shall be controlled and coordinated by the Ministry of Economy Sustainable Development together with the National Communications Commission.

Strategy implementation monitoring system shall include the following activities:

1. Submission of reports to the government and general public of Georgia during all transition period by the Ministry and National Communications Commission according to the steps of the strategy implementation set according to this strategy;
2. Quarter reports shall be prepared.

12. Institutional-Legal Basis

One of the goals of the Country government is to define basic tasks/goals and liabilities for all interested parties involved in the process of switching from analogue to digital broadcasting and to analyze all related laws and acts subject to law for their compliance with this policy and correction.

12.1. Institutional Basis

Main interested parties in the process of transition to digital broadcasting form the analogue are:

- ✓ Government of Georgia and those authorities, which are responsible for implementation of the strategy;
- ✓ National Communications Commission of Georgia;
- ✓ Public broadcaster;
- ✓ Private broadcasters;
- ✓ Network operators;
- ✓ Receivers/integrated TV manufacturers and retail dealers;
- ✓ customers' rights protection organizations;
- ✓ antennas and cable systems installation companies and service personnel;

Government of Georgia and Ministries, which are responsible for implementation of the strategy shall ensure within the scope of this strategy:

- ➢ To complete the digital television switching process before June 17, 2015 according to ITU Geneva plan of 2006;

- Universal access to public broadcasters' channels using different available platforms;
- Appropriate regulation of all legal acts related to the process (law and subject to the law);
- Radio frequency spectrum, which will be free after switching off the analogue broadcasting, or use of digital dividend to receive maximum benefit for the public through providing new generation services, to create new jobs and achieve economic development (frequency of changes in the national distribution plan);
- Coordinated work for effectiveness of the digital broadcasting transition process;
- To provide (FTA) broadcasting services free of charge, at least for all families receiving existing analogue broadcasting services;
- Maximum consideration of the population interests within the scope of the assistance program in the process of transition to the digital broadcasting, which will be available for all customers, according to the program about digital awareness of customers;
- Not to cause loss to any group of population in the process of transition to the digital broadcasting;
- To consider necessary subsidies for purchase of receivers for those physical entities who are subject to subsidies;
- To find and allocate funds for carrying on the advertising campaign.

National Communications Commission of Georgia shall ensure:

- Timely regulation of radiofrequency spectrum management issues which are related to digital broadcasting transition and its further period, not to give the spectrum required for digital broadcasting before the process starts;
- To fulfill the agreement of the public and private broadcasters and network/multiplex operators with the State and to ensure that changes in the transfer agreement are prepared in time, if such required;
- To provide recommendations for the Government of Georgia and other authorized authorities which shall be fulfilled in a short period and/or if required in the regulatory legislation to prevent obstructions for transition to digital broadcasting;
- To ensure that electronic communications sector of Georgia operates publicly and based on effective competition and elimination of any system and nonsystematic barriers for transition to digital broadcasting;
- To ensure compliance of new services such as programs electronic guidance (EPG), conditional access subscriber services (conditional access) and other modern services with digital broadcasting standards and to reflect the right of use of such in appropriate standards.

Public broadcaster shall ensure:

- First of all to take all measures for availability of the public content and for not blocking transition to digital broadcasting;
- To provide additional services which were not available during analogue platform broadcasting;
- To provide innovative programs which depend on high quality of digital broadcasting;
- To provide new services for persons with disabilities and elderly audience;

- Additional services for the audience with eyesight and hearing problems;
- Multilanguage broadcasting for ethnic minorities living in Georgia;
- Active participation in the provision of information to the audience to be aware of digital broadcasting, switching, hardware, installation process.

Private terrestrial broadcasting shall ensure:

- To promote end user awareness program about digital broadcasting;
- After the completion of the transition process to deliver high-resolution programs, which will cause the high-interest of users (sports, entertainment, education and other programs);
- Distribution of additional services, that was not available during analogue broadcasting.

Network operators shall ensure:

- To make initial investments in building of digital terrestrial broadcasting network at construction, national, regional and local levels;
- Appropriate conductivity distribution channels for all the necessary DVB-T2 transmitter for the distribution of public and private broadcasters' programs;
- Collaboration with other interested persons in the process of digital switchover and consulting technical details and other technologies;
- To support broadcasters in implementation of new technologies (interactive and other new generation services).

Equipment operators shall ensure:

- To import digital receivers compatible with multiplex operators' digital network.
- To give advices to customers relating to issues which refer to digital receivers eligibility and network compatibility, as well as their technical details, price, usage guidelines, and other similar matters;
- To provide timely, adequate and complete information to customers about receivers and other related equipment by their personnel;
- To provide with timely, complete and accurate information to customers about the timing of the shutdown of analogue broadcasting.

Consumers' rights organizations must ensure that:

- To inform end users with maximum about the process of digital switchover;
- To consult end users about their rights;
- To inform vulnerable people for age and other causes timely, adequately and comprehensively about digital terrestrial broadcasting goods and necessary measures for receiving it.

Antennas and cable systems sales and installation companies shall ensure:

- Installation, maintenance of common antennas systems and cabling connections / input devices and associated works;
- To deliver timely, adequate and complete information to end-users and to provide services affordable prices.

12.2 Legal Basis

According to the aforementioned paragraph changes should be made in accordance with the legislation, the process of transition from analogue to digital broadcasting:

- Law of Georgia "About Electronic Communications";
- Law of Georgia "About Broadcasting";
- About Copyright and Related Rights;
- National Plan for the distribution of radio-frequency spectrum;
- Rule for auctions;
- About certification and issue of permits.

Notes and additions to the laws of Georgia "About Electronic Communications" and "About Broadcasting" are included in the Appendix N5.

Annex No1

Digital Terrestrial Broadcasting Standards (DVB Standards)

http://dvb.org/technology/standards/
http://www.etsi.org/technologies-clusters

ETSI Publications

ES - ETSI Specification: a document approved by the entire ETSI membership, not just the Technical Committee proposing it. It is a more stable document, than either a TR or a TS.
EN - European Standard: the highest ranking ETSI publication approved by the national standards organizations of Europe. An EN is a publication which can be and often is included in European and national legislation.

EN 302 307 V1.2.1 (08/09)	Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications (DVB-S2)

EN 302 769 V1.2.1	Frame structure channel coding and modulation for a second generation digital transmission system for cable systems (DVB-C2)

(04/11)	

DVB CS

EN 300 473 V1.1.2 (08/97)	DVB Satellite Master Antenna Television (SMATV) distribution systems

DVB T2

EN 302 755 V1.3.1 (04/12)	Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)

DVB H

EN 302 304 V1.1.1 (11/04)	Transmission system for handheld terminals

DVB MDS

EN 300 748 V1.1.2 (08/97)	Multipoint Video Distribution Systems (MVDS) at 10 GHz and above
EN 300 749 V1.1.2 (08/97)	Framing structure, channel coding and modulation for MMDS systems below 10 GHz
EN 301 701 V1.1.1 (08/00)	OFDM modulation for microwave digital terrestrial television

DVB DSNG

EN 301 210 V1.1.1 (02/99)	Framing structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite

DVB SI

EN 300 468 V1.13.1 (08/12)	Specification for Service Information (SI) in DVB systems
EN 300 472 V1.3.1 (05/03)	Specification for conveying ITU-R System B Teletext in DVB bit-streams

EN 301 775 V1.2.1 (05/03)	Standard for conveying VBI data in DVB bit-streams

EN 301 192 V1.4.2 (04/08)	Specification for data broadcasting

EN 300 743 V1.4.1 (10/11)	DVB Subtitling systems

ETS 300 802 V1 (11/97)	Network-independent protocols for DVB interactive services

ES 200 800 V1.3.1 (11/01)	Interaction channel for Cable TV distribution systems (CATV)

ETS 300 801 V1 (08/97)	Interaction channel through Public Switched Telecommunications Network (PSTN)/ Integrated Services Digital Networks (ISDN)

EN 301 193 V1.1.1 (07/98)	Interaction channel through the Digital Enhanced Cordless Telecommunications (DECT)

EN 301 199 V1.2.1 (06/99)	Interaction channel for Local Multipoint Distribution System (LMDS) distribution systems

EN 301 195 V1.1.1 (02/99)	Interaction channel through the Global System for Mobile Communications (GSM)

EN 301 790 V1.5.1 (05/09)	Interaction channel for Satellite Distribution Systems

DVB RCS2

EN 301 545-2 V1.1.1 (01/12)	DVB-RCS2 Lower Layer Satellite Specification

DVB RCT

EN 301 958 V1.1.1 (03/02)	Digital Video Broadcasting (DVB); Specification of interaction channel for digital terrestrial TV including multiple access OFDM

DVB PDH

ETS 300 813 V1 (12/97)	DVB Interfaces to Ple-sinchronous Digital Hierarchy (PDH) networks

DVB SDH

ETS 300 814 V1 (03/98)	Interfaces to Synchronous Digital Hierarchy (SDH) networks

DVB CI

EN 50221 V1 (02/97)	Common Interface Specification for Conditional Access and other Digital Video Broadcasting Decoder Applications

DVB PI

EN 50083-9 (2002)	Interfaces for CATV/SMATV Head-ends and similar Professional Equipment

DAB

http://www.worlddab.org/introduction_to_digital_broadcasting/standards_specs

http://www.etsi.org/technologies-clusters

Standards

ETSI		
EN 300 401 1.4.1 (2006-06)	**Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers** The present document establishes a broadcasting standard for the Digital Audio Broadcasting (DAB) system designed for delivery of high-quality digital audio programme and data services for mobile, portable and fixed reception from terrestrial or satellite	ETSI
EN 300 797 1.2.1	**Digital Audio Broadcasting (DAB); Distribution interfaces; Service Transport Interface (STI)** Specifies an interface which allows broadcasters, who are producing a DAB	ETSI

(2005-05)	programme or data service component, to transmit this DAB component to the multiplex operator responsible for building the full signal.	
EN 300 798 1.1.1 (1998-03)	**Digital Audio Broadcasting (DAB); Distribution interfaces; Digital baseband In-phase and Quadrature (DIQ) interface** Specifies an interface which allows digital processing equipment for DAB to be connected to RF modulation equipment at DAB transmitter sites.	ETSI
EN 301 234 2.1.1 (2006-06)	**Digital Audio Broadcasting (DAB); Multimedia Object Transfer (MOT) protocol** Specification of the DAB Multimedia Object Transfer (MOT) protocol.	ETSI
EN 301 700 1.1.1 (2000-03)	**Digital Audio Broadcasting (DAB); VHF/FM Broadcasting: cross-referencing to simulcast DAB services by RDS-ODA 147** To produce an EN for the definition and use of a Radio Data System Open Data Application (RDS-ODA) for the cross referencing of audio services from FM-RDS to DAB. Supporters: Eureka 147 project member companies.	ETSI
EN 302 077-1 1.1.1 (2005-01)	**Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 1: Technical characteristics and test methods** of Application To develop an EN for Terrestrial Digital Audio Broadcast (TDAB) equipment used in the sound broadcasting service, based on existing ITU, EBU, CEPT technical specifications where appropriate.	ETSI
EN 302 077-2 1.1.1 (2005-01)	**Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Terrestrial - Digital Audio Broadcasting (T-DAB) service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive** To develop an Harmonized EN for Terrestrial Digital Audio Broadcast (TDAB) equipment used in the sound broadcasting service, based on existing ITU, EBU, CEPT technical specifications where appropriate.	ETSI
ES 201 735 1.1.1 (2000-09)	**Digital Audio Broadcasting (DAB); Internet Protocol (IP) datagram tunneling** To describe how to transport Internet Protocol (IP) data grams in a Digital Audio Broadcasting (DAB) packet mode service component, a technique further on referred to as IP tunneling. TS also to be published while the ES is in the Members' Vote procedure.	ETSI
ES 201 736 1.1.1 (2000-09)	**Digital Audio Broadcasting (DAB); Network Independent Protocols for Interactive Services** This specifies the protocol stacks to be used for the different types of services that are defined, as local interactive, one-way interactive and two-	ETSI

	way interactive service. It also defines a protocol PSSC (Personal DAB Service Session Control) which allows the setup of personal DAB service sessions and functionalities like handover between DAB cells, etc. It also defines the message format to be used and allows for further future extensions.	
ES 201 737 1.1.1 (2000-04)	**Digital Audio Broadcasting (DAB); Interaction channel through Global System for Mobile communications (GSM) the Public switched Telecommunications System (PSTN); Integrated Services Digital Network (ISDN) and Digital Enhanced Cordless Telecommunications (** This specifies the DAB Interaction Channel through GSM/PSTN/ISDN/DECT and handles low level network questions. it is basically a document with references to relevant telecommunications standards where you will find how to implement the low level interaction part. Supporting ETSI member Organizations; Eureka 147 Project i.e., BBC, Bosch, IRT, Teracom.	ETSI
ETS 300 799 1 (1997-09)	**Digital Audio Broadcasting (DAB); Distribution interfaces;** Ensemble **Transport Interface (ETI)** Specifies an interface which allows broadcasters or multiplex operators, who are generating a complete DAB ensemble, to transport the ensemble data between the DAB ensemble multiplexer and the transmitter network.	ETSI
ETSI TS 102 980 V1.1.1 ((2008-09))	**Digital Audio Broadcasting (DAB); Dynamic Label Plus (DL Plus); Application specification** Digital Audio Broadcasting (DAB); Dynamic Label Plus (DL Plus); Application specification	ETSI
CENELEC		
EN 50248	**Characteristics of DAB receivers**	CENELEC
EN 50255	**Digital Audio Broadcasting system - Specification of the Receiver Data Interface (RDI)** The Eureka 147 Digital Audio Broadcasting System is able to transmit data rates of up 1.8432 Mbit/s. This data rate occurs if an EEP with a code rate of 0.8 is selected. Audio receivers generally will be capable to decode one or several MSC Sub channels, but will not contain decoders for all possible data services. Therefore, the source for the data to be carried on the Receiver Data Interface (RDI) is the output bit stream of the channel decoder of a DAB receiver. Dedicated decoders for data applications, computers, etc., but also devices for audio post processing and recording can be connected to the DAB receiver through this interface	CENELEC

EN 50320	Digital audio broadcasting system - Specification of the DAB command set for receivers (DCSR)	CENELEC

Annex No 2

Data available about frequency channels presented by the Georgian National Communications Commission of digital frequency channels at the transition stage by 10 regions.

Zone	Regional broadcasters	National broadcasters	Channels available for the transition period
GEO249 part of the ex-broadcasting zone 21 (Zugdidi), ex-broadcasting zone 24 (Sukhumi) and ex-broadcasting zone 25	0	7	Planning Impossible
GEO250 Mainly covers the ex-broadcasting zone 21 (Zugdidi), ex-broadcasting zone 18 (Mestia) and ex-broadcasting zone 20 (Poti)	3	7	7 23, 26, 30, 40 51 52 59 60
GEO252 Mainly covers the ex-broadcasting zone 23 (Batumi), ex-broadcasting zone 20 (Poti) and ex-broadcasting zone 22 (Ozurgeti)	4	7	26, 43, 48, 58, 59, 60
GEO253 Mainly covers the ex-broadcasting zone 19 (Kutaisi), ex-broadcasting zone 15 (Tkibuli) and partially ex-broadcasting zone 14 (Chiatura), ex-broadcasting zone 16 (Oni), ex-broadcasting zone 18 (Mestia), ex-	11	7	34, 41, 46, 49, 50, 53, 56, 58

broadcasting zone 20 (Poti), ex-broadcasting zone 21 (Zugdidi) and ex-broadcasting zone 22 (Ozurgeti)			
GEO255 Mainly and completely covers the ex-broadcasting zone 13 (Akhaltsikhe), major part of ex-broadcasting zone 12 (Akhalkalaki) and partially ex-broadcasting zone 9 (Borjomi), ex-broadcasting zone 22 (Ozurgeti) and ex-broadcasting zone 23 (Batumi)	**2**	**7**	**25, 32, 40, 41, 43, 47 53**
GEO256 Mainly and completely covers the ex-broadcasting zone 8 (Gori), major part of ex-broadcasting zone 9 (Borjomi) and partially ex-broadcasting zone 1 (Tbilisi), ex-broadcasting zone 5 (Dusheti), ex-broadcasting zone 14 (Chiatura), ex-broadcasting zone 16 (Oni), ex-broadcasting zone 19 (Kutaisi)	**5**	**7**	**23, 26, 29, 30, 34, 40, 43, 46, 47, 50, 53, 56, 57, 58 60**
GEO257 Mainly covers the ex-broadcasting zone 5 (Dusheti), ex-broadcasting zone 7 (Barisakho) completely and partially ex-broadcasting zone 6 (Stephantsminda), ex-broadcasting zone 2 (Khvareli), ex-broadcasting zone 4 (Tianeti)	**0**	**7**	**27,31,32,33,35,36,39 , 41,44, 59,**
GEO258 Mainly covers the ex-broadcasting zone 11 (Dmanisi), ex-broadcasting zone 10 (Bolnisi) completely and partially ex-broadcasting zone 1 (Tbilisi), ex-broadcasting zone 12 (Akhalkalaki), also Rustavi, Marneuli, Gardabani.	**4**	**7**	**31, 35,36, 41,44,59**

GEO259 Mainly covers the ex-broadcasting zone 1 (Tbilisi), major part of ex-broadcasting zone 4 (Tianeti) and partially ex-broadcasting zone 2 (Khvareli), ex-broadcasting zone 3 (Sagarejo) and ex-broadcasting zone 10 (Bolnisi)[165].32	**10**	**7**	**46, 50, 56, 58, 60**
GEO261 Mainly covers the ex-broadcasting zone 2 (Khvareli) and major part of ex-broadcasting zone 3 (Sagarejo).	**2**	**7**	**23, 28, 52 57**

Annex No 3

Action plan for Digital Switchover

Activity	Responsible authority	Deadline
Changes in Laws		
Changes in the Law of Georgia " About Electronic Communications"	Ministry of Economy and Sustainable Development	1 July 2013
Changes in the Law of Georgia "About Broadcasting"	Ministry of Economy and Sustainable Development	1 June 2014
Pre-Regulation of the Market		

[165] Note: Rustavi zone and Marneuli as well as Gardabani districts are included in this zone.

to make research and analysis of market segments closely related to the "market of digital terrestrial television service of the end user"	National Communications Commission of Georgia	I July 2013
Changes in the Act subject to the Law		
Changes in Annex No 2 "addition of the service of digital television for the end user"	National Communications Commission of Georgia	1 January 2014

Annex No 4

Action plan of media - advertising campaign in order to keep the population informed

Activity	Responsible authority	Deadline
Providing information by TV		
Preparation of promotional video and broadcast (it is important to create easily perceivable logo and slogan - Develop)	Ministry of Economy and Sustainable Development (content of video) public broadcaster (preparation and distribution)	1 July 2013
To sign the promotional video distribution agreement and financing	Ministry of Economy and Sustainable Development	1 January 2014
To prepare/broadcast additional small size videos prepared in response to the Internet and telephone inquiries received as a result of Promotional video broadcast	Ministry of Economy and Sustainable Development (Information analysis) Public broadcaster (preparation and distribution)	1 September 2014
Informing the public		
To organize informational brochure preparation, printing and distribution process	Ministry of Economy and Sustainable Development	1 January 2014
Organizing meetings with the regional population	Ministry of Economy and Sustainable Development	1 January 2014

Creation of Informational Web Site		
Accessible to the general public for the Web - Site Creation – Presentation	Ministry of Economy and Sustainable Development	1 September 2013
To provide space in the form of forum, its management and analysis	Ministry of Economy and Sustainable Development	1 September 2013
To present documents and other visual materials, response analysis and periodic updates based on well-founded Comments	Ministry of Economy and Sustainable Development	1 January 2015
To organize call-center		
To create Information Center, its completing to determine the information number	Ministry of Economy and Sustainable Development	1 January 2014

Annex No 5

Legislative changes related to digital terrestrial broadcasting

The law of Georgia "about electronic communications" is in line with the EU's the telecommunications regulatory framework directive, although it is recommended to make amendments to the following articles:

a) In the article 2 (terms definitions) (“b”, “v”, “r”, “kh”, “h[36]”, “h[41]”, “h[45]”); in the article 49 (license, term of license);
b) According to the directive No 140 of 2009 of the European Union and European Council, so-called Collocation has expanded as well as so-called "joint-use" part of it (Article 12 – collocation and electronic communications network elements and common use of associated elements);
   Where according to the applicable law, electronic communications service provider companies have the right to take to locate-install their devices in private and / or public property, or to force the use of his property, the national regulators, in accordance with co-

sizing and proportionality principle, are entitled to impose the responsibility upon such companies to share such operating assets.
According to the Part II of the article Member States are entitled to impose the responsibility upon owners defined by the first article to share their property and means of communications (including physically compatible building), or to instruct the parties to ensure cooperation and coordination when carrying out the public work (to take measures to protect the environment, urban planning and health and other purposes respectively). Regulation is likely to refer to passive or active infrastructure construction and planning, as well as to definition of its subsequent joint operation regulations;

c) The obligation of so-called "Operator licensed for Multiplexing" shall be added to the Article 19 of the Law, to provide unlimited access to the person wishing to access the capacity using cost-oriented rates non-discriminatory terms. Termination of access should be allowed only with the consent of the Commission, in case if appropriate preconditions exist. In order to ensure transparency, it is recommended that the operator to publicly publish so-called "Reference offer";

d) Radio frequency spectrum licenses should be issued for the construction of digital TV signals distribution network based on competition;

e) Article 56 (widescreen digital television broadcasting service), minimum qualitative parameters of FTA digital terrestrial broadcasting shall be defined in the second paragraph of the same Article;
Minimum standards for digital terrestrial television service provided to the end-user shall be included in this Article or in the paragraph about customers/users which shall be defined as follows:

1. The standard resolution TV signal;
2. DVB-T2 transmission standard
3. Signal compression standard MPEG4.

f) Terms and conditions of use of individual access systems shall be amended also in terms of transparency, copyright and other fields), as well as in case of API and EPG.

Changes in the Law of Georgia "About Broadcasting"

a) Article 2 shall be replaced by "R", "T", "W", Article 4, Paragraph 3 of Article 5 shall be amended (only definition of the license conditions shall remain, issue of licenses, in general, it is to be clarified whether the right to create broadcasting content will be assigned through authorization or licensing); Article 12, Article 17 (Article should be included in the Law of Georgia "About Electronic Communications", if decided that the public broadcaster should have its own network, through which it will carry out commercial activities, in particular it will rent out and receive the income from economic activities), Articles 36 and 37; article 37_1,

part of the Paragraph No 4 shall be removed, the part shall be specified more precisely by the selected model;

b) Paragraph No 10 shall be removed, but the paragraph No 11 are to be amended according to the selected economic model.

Annex No6

Analog broadcast shutdown plan

Zone	Analogue broadcasting test broadcasting start date
GEO249 Main part of the ex-broadcasting zone 21 (Zugdidi), ex-broadcasting zone 24 (Sukhumi), broadcasting zone and ex-broadcasting zone 25 (Chkhalta).	**2020**
GEO250 Mainly covers the ex-broadcasting zone 21 (Zugdidi) and partially ex-broadcasting zone 18 (Mestia), ex-broadcasting zone 20 (Poti).	**01/05/2014**
GEO252 Mainly covers the ex-broadcasting zone 23 (Batumi) and partially ex-broadcasting zone 20 (Poti), ex-broadcasting zone 22 (Ozurgeti).	**01/04/2014**
GEO253 Mainly covers the ex-broadcasting zone 19 (Kutaisi), completely ex-broadcasting zone 15 (Tkibuli), ex-broadcasting zone 17 (Tsageri) and partially the ex-broadcasting zone 14 (Chiatura) and partially ex-broadcasting zone 16 (Oni), ex-broadcasting zone 18 (Mestia), the ex-broadcasting zone 20 (Poti) and ex-broadcasting zone 21 (Zugdidi), ex-broadcasting zone 22 (Ozurgeti).	**01/06/2014**

GEO255 Mainly covers the ex-broadcasting zone 13 (Akhaltsikhe) and major part of the ex-broadcasting zone 12 (Akhalkalaki), partially ex-broadcasting zone 9 (Borjomi), ex-broadcasting zone 22 (Ozurgeti) and ex-broadcasting zone 23 (Batumi).	**01/03/2015**
GEO256 Mainly and completely covers the ex-broadcasting zone 8 (Gori) and major part of the ex-broadcasting zone 9 (Borjomi), partially ex-broadcasting zone 1 (Tbilisi), the ex-broadcasting zone 5 (Dusheti), ex-broadcasting zone 6 (Stephantsminda) and the ex-broadcasting zone 14 (Chiatura) and ex-broadcasting zone 16 (Oni), partially ex-broadcasting zone 19 (Kutaisi).	**01/11/2014**
GEO257 Mainly covers the ex-broadcasting zone 5 (Dusheti) and ex-broadcasting zone 7 (Barisakho) completely, partially ex-broadcasting zone 6 (Stephantsminda), the ex-broadcasting zone 2 (Khvareli) and ex-broadcasting zone 4 (Tianeti).	**01/08/2014**
GEO258 Mainly covers the ex-broadcasting zone 11 (Dmanisi) and major part of the ex-broadcasting zone 10 (Bolnisi), partially ex-broadcasting zone 1 (Tbilisi), the ex-broadcasting zone 12 (Akhalkalaki), as well as Rustavi, Marneuli, Gardabani.33	**01/03/2015**
GEO259 Mainly covers the ex-broadcasting zone 1 (Tbilisi) and ex-broadcasting zone 4 (Tianeti), partially ex-broadcasting zone 2 (Khvareli), the ex-broadcasting zone 3 (Sagarejo) and ex-broadcasting zone 10	**01/03/2014**

(Bolnisi)[166].33	

[166]Note: Rustavi zone and Marneuli as well as Gardabani districts are included in this zone.