

## **Table of Contents**

1. INTRODUCTION
2. TELECOMMUNICATIONS SERVICES OVER THE FIXED NETWORK
  - 2.1. Infrastructure of the fixed network
  - 2.2. Telephone services provided by BTC
  - 2.3. Universal Service
  - 2.4. Provision of leased lines
  - 2.5. Tariffs and tariff policy of BTC
3. MOBILE TELEPHONY SERVICES
  - 3.1. Market Participants and competition
  - 3.2. Mobile networks infrastructure
  - 3.3. Development of the market for mobile telephony services
  - 3.4. Quality of service
  - 3.5. Tariffs
4. NETWORKS INTERCONNECTION
5. PUBLIC TELECOMMUNICATION NETWORKS FOR PAGING
6. SATELLITE SYSTEMS
7. VHF radio broadcasting
8. TELEVISION BROADCASTING
9. CABLE TELECOMMUNICATIONS NETWORKS FOR RADIO AND TELEVISION SIGNALS
10. INTERNET
  - 10.1. Development of the market for Internet services
  - 10.2. Internet service providers (ISP)
  - 10.3. Quality and prices for Internet services
  - 10.4. Restructuring of the Internet market. Investments.

## 1. INTRODUCTION

The “Sector Policy of the Republic of Bulgaria in Telecommunications”, endorsed by Decision No. 570 of the Council of Ministers from 29 October 1998, outlines **the strategic priorities in the field of telecommunications in respect of the provision of a modern, efficient and highest quality range of telecommunications services**. For that purpose, the sector policy highlights the provision of telecommunications services in the conditions of a free and competitive market and ensures equitable access of every user to those services at economically justified and affordable prices. With regard to this, the fundamental principles of the sector policy have been defined – **de-monopolization, liberalization, competition and conditions for attraction of foreign investments**. In practice these principles are implemented by the creation of a regulatory framework, harmonized with European legislation, developed with the joint efforts of all participants on the telecommunications market – state authorities, operators and users.

The main objectives in the field of telecommunications set in accordance with the sector policy, are:

- elaboration and adoption of an overall regulatory framework, rules and procedures, harmonized with the European *acquis communautaire*, in place to ensure meeting the requirements of the new environment;
- liberalization of the telecommunications market through abandon of the monopoly on telecommunications services;
- ensuring fairness and equal treatment of all players on the market of telecommunications services and implementation of relevant structures and code of conduct for ensuring loyal competition.

The practical implementation of the above cornerstone objectives is tailored to achievement of the following results:

- rapid development and modernization of the existing telecommunications infrastructure, considerable increase in the quality of telecommunications services and establishing Bulgaria as an international traffic center;
- attraction of foreign investments and active involvement of domestic capital;
- introduction of new, modern services for the population and business;
- priority satisfaction of the telecommunications needs of the government, national security and defense;
- provision of the necessary infrastructure for telecommunications activities in force majeure and emergency conditions – major industrial failures, natural disasters, calamities etc, and dealing with their consequences;
- development of the telecommunications sector according to the European standards in view of the future integration in the European Union (EU);
- transition to cost-oriented pricing of all telecommunications services and non-admission of unfair competition;
- transition from liberalization to total de-monopolization of the market after 31.12.2002;
- a pace forward towards the information society and development of multi-media services for exchange of data, text, sound and image.

On the grounds of art.18, p.4 of the Constitution of the Republic of Bulgaria, and art.10, p.1 of the Transitional and Final Provisions of the Telecommunications Act (TA), a state monopoly has been established on:

- a) provision of the fixed voice service (local, long distance, international and transit) between terminal points of the fixed telephone network, until 31 December 2002;
- b) provision of leased lines under publicly announced conditions, until 31 December 2002.

On the grounds of the Telecommunications Act, the performance of these activities has been assigned to the Bulgarian Telecommunications Company (BTC) by an individual licence granted by the State Telecommunications Commission (STC), based on a decision by the Council of Ministers (CoM).

No companies on the domestic market are yet capable to provide competitive services on equal basis with the monopoly holder BTC. According to art.11, p.2 from the Telecommunications Act, the public telecommunications operators are obliged to construct their networks using leased lines. The right to construct their own lines is acknowledged, subject to permission by the State Telecommunications Commission (STC), to telecommunications operators only following receipt of a refusal from BTC to provide leased lines (art.11, p.4 of the Telecommunications Act).

The year 2000 saw over 700 operators performing telecommunications activities, such as radio and TV broadcasting services (including using cable networks), paging services, mobile voice services, data transmission services (including Internet), satellite and terrestrial transmission services, etc. Most of the providers on the market are dependent upon the exclusive rights of the BTC over the leased lines, for provision of their related scope of services.

The analysis of the telecommunications market stems from the information, collected by the State Telecommunications Commission (STC) and contributed by the operators, as well as on studies carried out by independent Bulgarian and foreign agencies. The sources of all data have been named.

## **2. TELECOMMUNICATIONS SERVICES OVER THE FIXED NETWORK**

### **2.1. Infrastructure of the fixed network**

The existence of a modern and efficient telecommunications infrastructure is acknowledged to be one of the most vital factors for development of a market economy in Bulgaria, facilitating our integration in the EU.

Fig.1 shows the fixed digital network in the Republic of Bulgaria in the year 2000.

Until 1994 the fixed network of BTC was entirely constructed of analogue equipment with extended automation of the connections, estimated at around 95%.

The digitalization of the network started with the construction of a digital overlay backbone network foreseen under the DON project, financed from a loan to the amount of around \$150 million, and funded by the World Bank (WB), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB). The main objectives set in this project are:

- implementation of a digital overlay backbone network;
- digitalization of the international network;
- automation of long distance and international dialing.

With the implementation of the DON project in 1994 – 1999 the backbone of the digital telecommunications infrastructure in our country was constructed: over 2,300 km fiber-optic cable lines, over 2,000 km digital microwave network, 2 satellite earth stations, total of 35 digital exchanges at all levels of the telecommunications network. The installed subscriber capacity is already over 380,000 digital lines. A highly reliable international connectivity was ensured on the basis of SDH technology via digital microwave lines, fiber-optic terrestrial and submarine cable systems. The digitalization of junction networks in the big cities started.

The backbone of the national digital transit network consists of two fiber-optic cable rings (Western and Eastern) in the figure – of - eight, each of them consisting of 24 and 12 fibers, respectively, and covering a total length of about 1,800 km.

The layout of the fiber-optic cable interloops 21 of the previous 27 regional centers and some other towns. The other 6 regional centers and some of the big cities in the peripheral and mountainous regions are connected to DON via digital microwave lines with a total length of about 1,700 km.

The digital multiplex and transmission equipment for the fiber-optic cable and digital microwave links are built using SDH technology. In that way Bulgaria ranked among one of the first countries in the world to construct the backbone of its national transit network based on this technology.

Until the end of the year 2000 the investments of BTC gained priority in the following directions:

- implementation of an access network (n x 64 Kb/s) for business services (including Internet);
- construction of a National Network Management Center and Intranet and implementation of a Financial Management System (FMS);
- further digitalization of the transit level of the national network – construction of new digital long distance exchanges with combined functions (including provision of ISDN services) and interregional fiber-optic rings.
- further digitalization of the local level of the network – construction of local digital exchanges in regions with high density of the active subscribers, in the most famous resorts in Bulgaria and in other strategic locations.
- extension of the existing long distance and local digital exchanges and of the capacity of the transmission network via SDH technology.



**Legend:**

- Optical cable in operation
- - - Optical cable in construction
- DRN in operation
- DLTE in operation
- ▲ DLE in operation
- Terrestrial Satellite Station AOR, IOR

Fig. 1 Fixed Digital Network - 2000

In the year 2000, the results from digitalization and infrastructural development of the fixed network were, as follows:

The Black Sea Fiber-Optic Cable System (BSFOCS) connecting Varna with Odessa (Ukraine) and Novorosiisk (Russia) was constructed. It is equipped with STM-16 multiplex equipment on the basis of DWDM technology. BSFOCS is the implementation of an international project financed by BTC, Ukrtelecom (Ukraine), Vestelecom (Russia), OTE Ltd. (Greece) and some smaller companies.

- New fiber-optic lines on the basis of SDH technology with a total length of 124 km were constructed along the following routes:
  - ❖ Petrich - Macedonian border (STM-4) - 22 km;
  - ❖ Sofia - Plana Earth Station Complex (PESC) (STM-4) - 40 km;
  - ❖ Kneja - Kozloduy (STM-1) - 62 km.
- The transit fiber-optic transmission network was extended by installation of new multiplex equipment and constructing a second STM-16 system on national level on the basis of the fiber-optic ring structure and a second STM-16 system on the territory of Sofia. That has opened the option for connection of new network capacities and provision of leased lines.
- Harmonization of the national telecommunications network was performed, which included expansion of all existing digital exchanges and increase in the number of long distance trunk lines and ISDN subscriber lines of primary and basic access. The installed subscriber capacity in the country is over 380 00 digital lines.
- In order to improve the centralized management of the digital exchanges, a "Node Commander" system for centralized management of all EWSD exchanges and a SS7 monitoring and control system were placed into operation in BTC's network.
- In year 2000 four automatic telephone exchanges have been put into operation in BTC's network throughout the big cities. Three of them are digital. In the same period, thirteen telephone exchanges have been stopped from operation - nine A 29 type, one KRS type and three were transformed into RSU. In this way the digitalisation of the cities was increased, thus resulting in increase of the quality of service.
- The capacity of the ATM network was increased, so that the capacity of the trunk connection routes Sofia – Plovdiv and Sofia – Varna went up to 6 Mb/s. In this particular part of the backbone fixed network, a high speed broadband technology for integrated transmission of voice, data, video and multimedia applications via asynchronous transfer mode (ATM) is used. The ATM network infrastructure development will facilitate the overall development of telecommunications in our country and the integration of our infrastructure in the European highways, as well as into the regional networks of our neighboring countries.
- The digitalization of the telex network was completed. Now in the country an AXB-20 Erickson telegraph exchange is in operation, performing the functions of an international, long distance and local exchange. The business services Network (n x 64) envelops in a star-connection 39 telegraph multiplexors MVX-238 Erickson, connecting them to AXB-20 and serving all subscribers in

the country. The access network for business services is separate network incorporated in the fixed telecommunications network of BTC. It consists of 82 nodes and covers all regional centers. Junction networks have also been constructed in Sofia, Plovdiv, Varna, Bourgas and Rousse. The “star” type network architecture incorporates a central control node in Sofia; several transit sub-nodes, and 64 terminal remote access locations. BTC provides to its customers basic services, namely provision of 64 Kb/s to 2 Mb/s digital leased lines and Frame Relay.

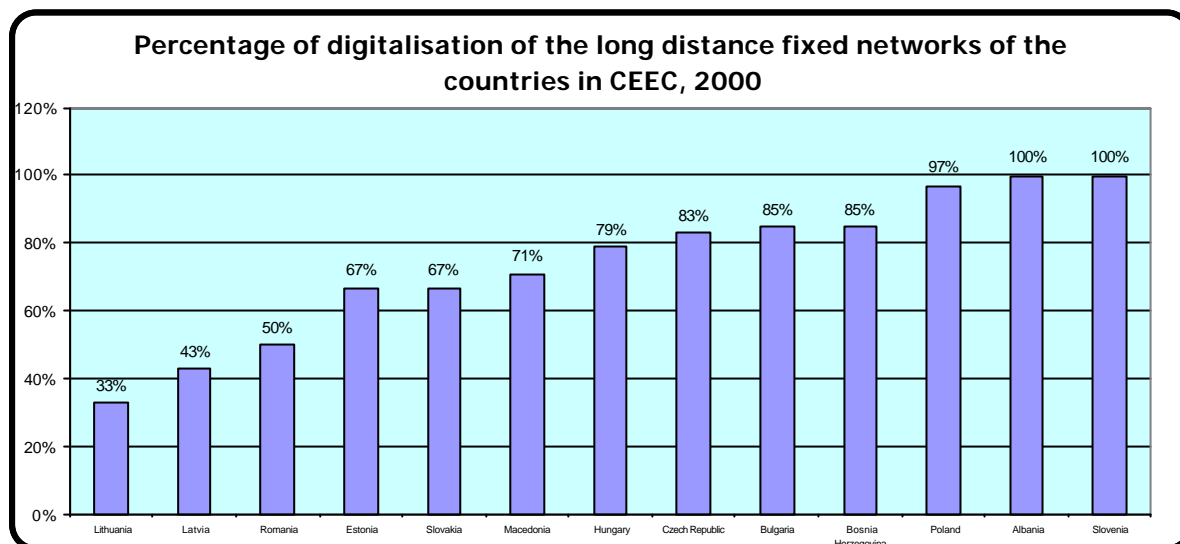
The main characteristics of the fixed network in Bulgaria are described in Table 1.

**Table 1. Main Characteristics of the Fixed Network**

<b>Indicators towards:</b>	<b>31.12.1997</b>	<b>31.12.1998</b>	<b>31.12.1999</b>	<b>31.12.2000</b>
1. Telephone exchanges – total number, incl.:	2 445	2 443	2 434	2 408
1.1. Local telephone exchanges	2 398	2 396	2 387	2 367
1.2. Long distance telephone exchanges, total number, incl.:	45	45	45	39
1.2.1. LDE, Servicing the national automated telephone network, incl.:	19	20	24	26
1.2.1.1. Digital	12	13	17	19
1.2.1.2. Analogue	7	7	7	7
1.2.2. LDE, Servicing regional telephone networks	26	25	21	13
1.3. International telephone exchanges	2	2	2	2
2. Long distance telephone cable lines, incl.:	39 930 km	41 390 km	41 485 km	41 395 km
2.1. Trunk	14 519 km	14 528 km	14 826 km	no data
2.2. Regional	25 411 km	26 862 km	26 352 km	no data
2.3. Fiber-optic	no data	no data	no data	2 483 km
2.4. Copper	no data	no data	no data	38 912 km
3. Long distance telephone connections, total number, incl.:	71 387	84 514	92 270	91 299
3.1. Analogue	51 036	50 024	48 263	43 503
3.2. Digital	20 351	34 490	44 007	47 796

Source: Published reports of BTC and data provided to STC

Bulgaria shares the fourth – fifth place, together with Bosnia – Herzegovina, (fig. 2) in respect of network digitalization among the countries in Central and Eastern Europe (CEEC).



Source: ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>)

**Fig. 2**

Despite the implementation of digital technologies and fiber-optic cables, there is a problem for all fixed telephone networks, not only in Bulgaria, but worldwide. The problem is related to access networks, i.e. the lines connecting the subscriber premises to the switching equipment in the exchange of the telephone network operator or the data transmission network operator. One common feature of these lines still is the copper cabling (there are over 750 mill. copper telephone lines worldwide), and it would be unreasonable to expect that this cabling is replaced by fiber-optic medium in the near future, especially in the economically weaker countries. New technologies for integrated transmission of voice, data and video, which are gaining importance at an increasing pace – ISDN and xDSL, are being introduced. In Bulgaria ISDN is provided by BTC as an alternative to analogue modems.

The contemporary high quality requirements for high-speed and integrated transmission over the existing copper cables of voice, fax, data and video images were challenged by BTC with the introduction of HDSL and ISDN services. HDSL provides for speeds of up to 128 Kb/s via the Access network for business services. Starting 1999, a step by step introduction of ISDN switching access – basic and primary, has been set out.

The construction of the digital transit network paved the preconditions for participation of BTC in several international projects of regional impact.

The modern telecommunications infrastructure and the strategic geographic location of Bulgaria on the Balkan Peninsula act as an important factor in attracting international transit traffic. BTC participates in the implementation of the following major international projects:



- Trans European Line (TEL). It begins in Frankfurt (Germany), passes through Central and Eastern Europe and reaches Sofia. It is based on fiber-optic technology.
- Trans European Network (TEON). It connects Brno (Czech Republic) to Yeroskipos (Cyprus) via terrestrial and submarine fiber-optic cable systems and digital microwave lines.
- Trans Balkan Line (TBL). It is a digital cable highway with a total length of 1,600 km, connecting Istanbul (Turkey), Sofia (Bulgaria), Skopje (Macedonia), Tirana (Albania) and Bari (Italy). It is constructed of fiber-optic terrestrial and submarine cables and digital microwave lines.
- Submarine Cable System in the Black Sea (CAFOS). It connects Turkey, Romania and Bulgaria with the landing points of Istanbul, Varna and Mangalia.
- Black Sea Submarine Fiber-Optic Cable System (BSFOCS). It connects Bulgaria, Ukraine and Russia and will serve transit traffic to all interested operators. The system connects Varna, Odessa and Novorosiisk over two-pair fiber-optic cable. The most contemporary transmission SDH technology is used. The extension of the system to Georgia is expected to provide a modern route connecting Europe to Central Asia and the Far East.

The digital connectivity between all neighboring countries is provided on the basis of fiber optic cables laid, supported by digital transmission SDH systems installed at the Serbian, Romanian, Macedonian and Turkish borders. The digital connection to Greece is performed using a digital microwave system, PDH technology based.

The routes of the connections are:

- with Greece: Sofia – Petrich – Greek border, and Haskovo – Kurdjali – Greek border (the project is financed under the PHARE Program– cross-border cooperation);
- with Macedonia: Sofia – Macedonian border, and Petrich – Macedonian border;
- with Romania: Rousse - Romanian border, and Varna - Mangalia (part of CAFOS project);
- with Turkey: Haskovo - Turkish border, and Varna - Istanbul (part of the CAFOS project);
- with Yugoslavia: Sofia – Yugoslavian border.

The network of BTC directly connects to over 45 foreign telecommunications operators including such in 29 European countries. The connectivity is carried out using digital transmission systems, operated basically over fiber-optic cables. For distant countries, such as Japan, USA, Canada, China, India, RSA and other, connectivity is carried out using INTELSAT and INTERSPUTNIK international satellite systems.

The strategy developed by BTC foresees in the long term that the digital transit network covers:

- 4 first level transit exchanges (in Sofia, Veliko Turnovo, Stara Zagora and Varna) and 23 secondary transit exchanges, located in the centers of the

existing regional networks serving one and the same service area, and constructed on the principle of mesh connected network;

- fiber-optic cable rings using STM-16;
- fiber-optic cable rings or segments of digital microwave lines based on SDH transmission systems for connecting the remaining long distance digital exchanges.

The local digital networks will form the lowest (tertiary) level of the national network. Around 120 local digital exchanges will be connected. Each local digital exchange with its remote subscriber units shall service a specified number of towns and villages (subscriber concentrations).

The digital automatic telephone exchange will be connected to the respective long distance automatic exchanges via fiber-optic rings and digital microwave segments, based on SDH transmission systems.

The mid-term priorities set out by BTC for the period until the year 2002 in the field of technological innovation of the telecommunications network are:

- completion of the digital transit network using new remote digital switching nodes in the 13 regional centers and the respective inter-regional transmission networks (over 2,200 km) using fiber-optic cable lines and digital microwave lines on the basis of SDH technology;
- further digitalization of the local network through accelerated digitalization of the junction networks and installation of digital capacities in the regions with high concentration of active subscribers, in resort places and other strategic locations all over the country;
- accelerated implementation of enhanced telecommunications and information technologies and services, including ISDN of primary and basic access;
- construction of an intelligent network, creating possibilities for provision of modern enhanced services;
- integration of the transmission networks of BTC on the basis of an ATM platform, seen as a prerequisite for future convergence between the telecommunications and information infrastructures;
- implementation of centralized management, operation and control of BTC network;
- accelerated extension of the local loops and delivery of services for broadband access.

The layout of the recently constructed modern infrastructure allows provision of a wide range of modern telecommunications services, highlighted as a strategic goal in the Sector policy. In the future special attention will be paid to elaboration of an architectural network model, based on separation of infrastructure from services and an open interface connection between the two. In that way infrastructure will become "transparent" for services and will ensure the independence of services from the characteristics of the network medium. The separation of services from infrastructure will allow for their diversification, which will be technology neutral, and at the same time new technologies will be introduced to support the services already provided. To a large extent this can be achieved if the latest IP, ATM and WDM technologies are introduced in an environment of assured interoperability, together with SDH.

## 2.2. Telephone services provided by BTC

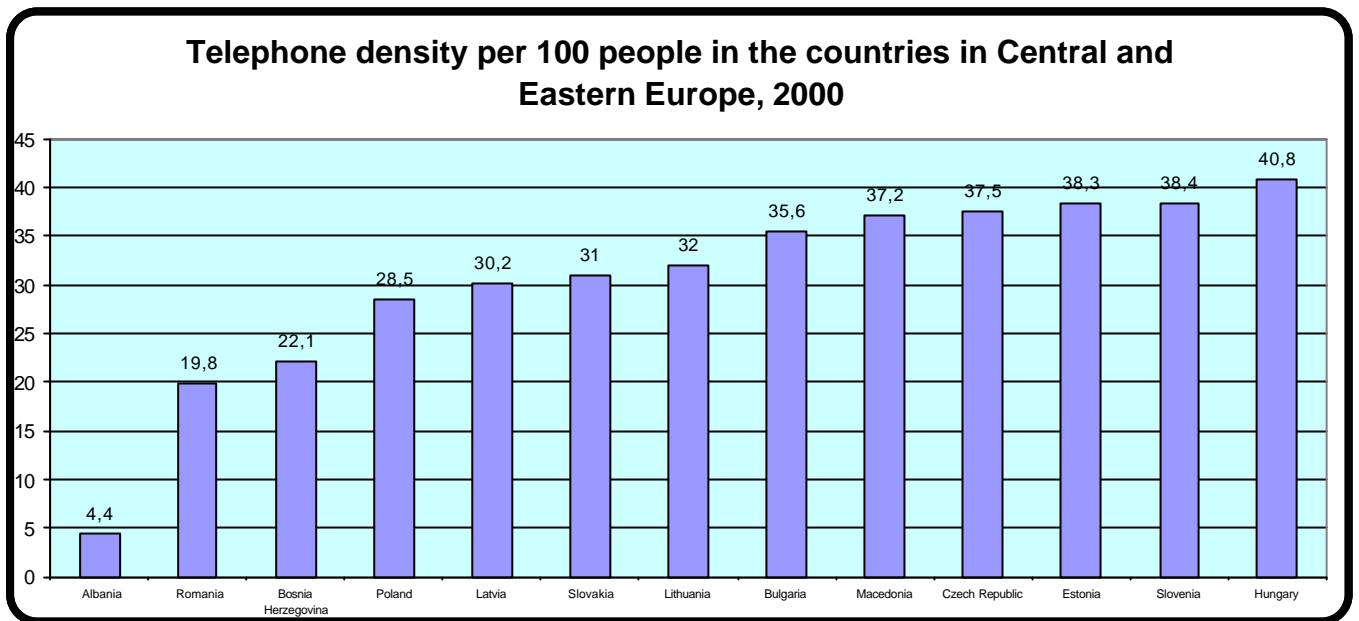
The ordinary telephone service provided via the fixed network, posts the highest relative share in the overall income of BTC. The incumbent operator holds monopoly over its provision until the end of the year 2002.

The distribution of subscriber lines, the number of contracts signed for subscription and the percentage of occupation of the installed capacity are shown in Table 2. It can be noticed immediately that there is a high percentage of unoccupied capacity of subscriber lines – around 12%. Taking into consideration that two-party lines are also included in the subscription figures percentage of non-occupation is inexplicable in parallel with a waiting list of 245,414 applications.

**Table 2. Subscriber lines, Subscribers, and occupation of the installed capacity**

<b>Indicators towards:</b>		<b>31.12.1997</b>	<b>31.12.1998</b>	<b>31.12.1999</b>	<b>31.12.2000</b>
1.	Subscriber lines, total number, incl.:	2,681,074	2,757,990	2,833,395	2,881,786
1.1.	Digital subscriber lines, total number, incl.:	no data	230,000	342,000	380,000
1.1.1.	ISDN lines with primary access	0	0	7,041	11,732
1.1.2.	ISDN lines with basic access	0	0	254	559
1.2.	Analogue	no data	2,527,990	2,491,395	2,501,617
2.	Subscribers, total number, incl.:	2,383,000	2,457,000	2,507,000	2,558,982
2.1.	Residential	2,239,000	2,327,000	2,382,000	2,421,159
2.2.	Business, incl.:	144,000	130,000	125,000	137,823
2.2.1.	For primary ISDN access	0	0	1,146	3,764
2.2.2.	For basic ISDN access	0	0	140	280
3.	Percentage of occupation of the installed capacity	no data	92.71%	88.41%	87.94%

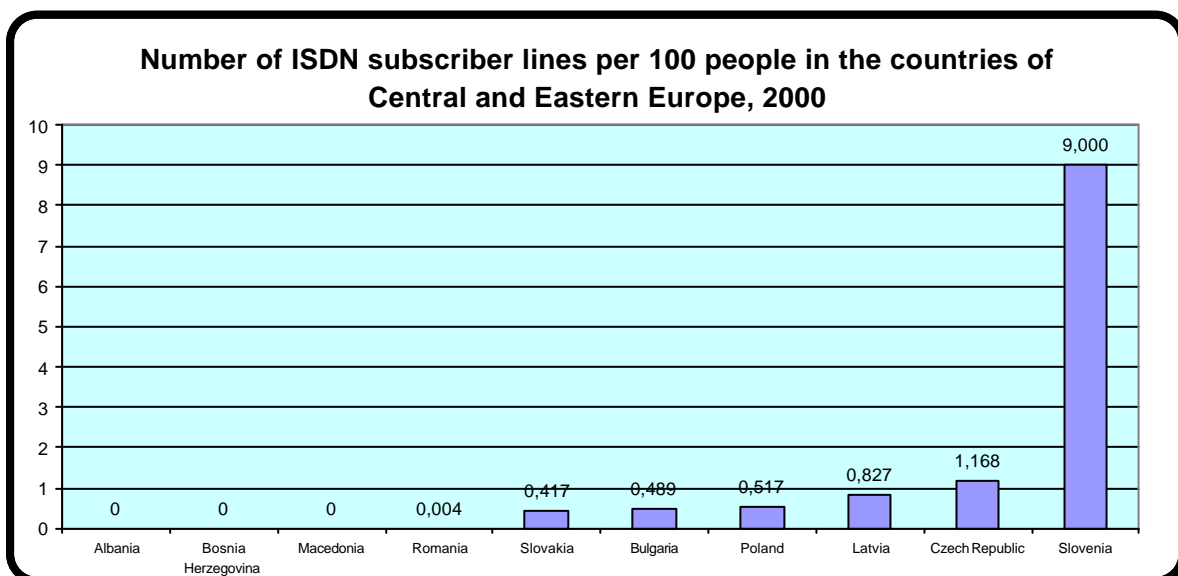
In comparison to the other Central and Eastern European countries, Bulgaria has a good percentage of penetration of telephone services, provided via the fixed network. With a telephone density of 35,6% per 100 inhabitants (Fig. 3), Bulgaria ranks 6<sup>th</sup>, where the achieved telephone density is above the average figure for the countries from Central and Eastern Europe – 27,5%.



Source: ESIS Knowledge Base  
<http://www.eu-esis.org/esis2basic/esis2basic.htm>

**Fig. 3**

With the exception of Slovenia, a low percentage of penetration of ISDN services is typical for all countries in Central and Eastern Europe – average figure of 0.5 subscriber lines per 100 inhabitants (Fig. 4). To this indicator Bulgaria ranks 5<sup>th</sup> among the ten countries, for which data exists. Estonia, Lithuania and Hungary are not present in the analysis, because the regulatory bodies of these countries have not provided the necessary information.

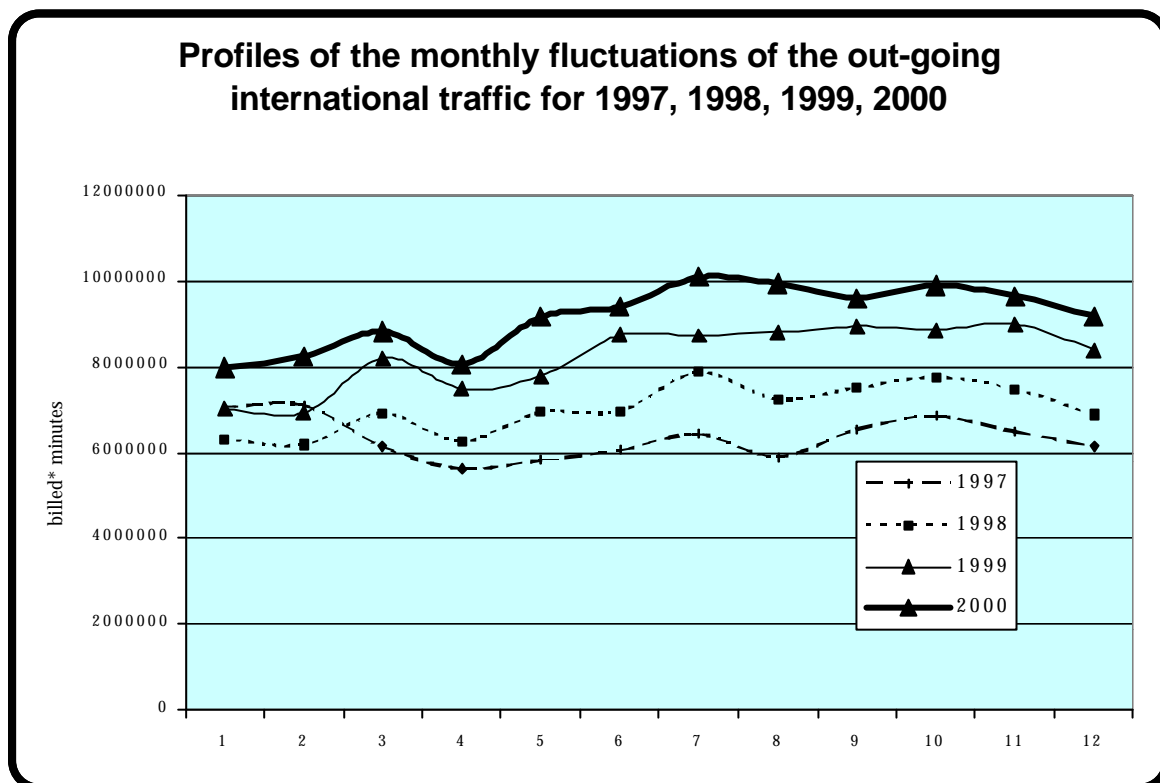


Source: ESIS Knowledge Base

<http://www.eu-esis.org/esis2basic/esis2basic.htm>

**Fig. 4**

The data for structural distribution of the international traffic, presented on (Fig. 5), is derived on the basis of traffic measurements of the national network and is based on the volume of paid minutes to outgoing international directions. A tendency is seen towards increase of the traffic flow for the period under review (1997 - 2000 ã.), with distinct peak values in the month of July and a decrease in April.



Source: Traffic data of BTC, provided to STC

Fig. 5

The results from the incoming international traffic for the year 2000 shall be presented in June 2001, because there is a delay from foreign administrations in providing the data.

### 2.3. Universal Service

One of the main tasks in the transition to full liberalization of the telecommunications market is the provision of the universal service. According to the effective Telecommunications Act universal service means service with determined quality providing access by any user, regardless of the geographical location, and offered at an affordable price. The universal service is an ordinary telephone service, provided over the fixed telecommunications network. As it was mentioned above, on the ground of the established state monopoly over the provision of the ordinary

telephone service, BTC is the only operator, providing the universal service via its telecommunications network.

In the year 2000 a positive change is observed in some parameters of the provision of the universal service. The affordability of the services is guaranteed by the development of the infrastructure of the network of BTC. The increase of the telephone density is due to a number of measures, which BTC undertook for the development of its network (in comparison to 1999), as well as to the technical maintenance of the exchanges. The number of subscribers was increased due to the greater installed capacity.

In the last year an improvement of the commercial quality of the service was observed (Table 3).

**Table 3. Indicators for commercial quality of service**

<b>Indicators towards</b>	<b>31.12.1997ã.</b>	<b>31.12.1998ã.</b>	<b>31.12.1999ã.</b>	<b>31.12.2000ã.</b>
Waiting list of applications for new telephone lines	450,000	416,000	331,785	245,414
Reported failures per 100 telephone lines per month (average)	4.8	4.6	4.2	4.04
Average number of failures, fixed within 24 hours	83.4%	83.9%	87.4%	89,91%
Average number of complaints about the quality of connections per 1000 subscribers	1.4	1.1	0.2	0.13
Average number of complaints about the amount of the monthly bills per 1000 subscribers	1.3	1.15	1.01	0.63

The average waiting time for connection in the network of BTC towards 31 December 2000 is 1 year and 8 months, a month less than the waiting time towards 31 December 1999. The argument behind this small decrease is that in year 2000 the increase in the number of the telephone lines is not very high– 48,391.

The decrease in the monthly average number of reported failures per 100 telephone lines is due to the better organization of the work of “Failures” service, as well as to the great number of failures, repaired in shorter terms. This fact corresponds directly to the compensations paid in favor of the telephone subscribers, stated in “General Conditions of the Contract between BTC and the telephone subscribers” of 1 June 1998.

The decrease in the monthly average number of complaints per 1000 subscribers about the amounts of the monthly bills is due to the newly opened digital exchanges, as well as to the systematic implementation of itemised billing equipment in the analogue exchanges.

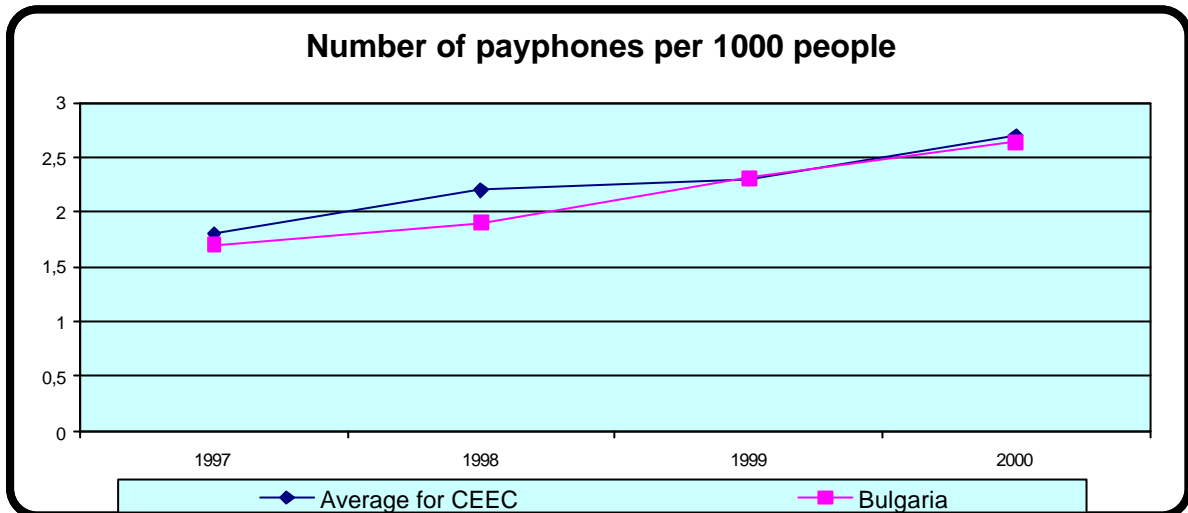
An important aspect of the universal service is the public access to the ordinary telephone service using public phones (payphones), scattered on the entire territory of the country and installed in suitable locations, which provide access to the national emergency services free of charge (Table 4).

Individual licences for installment and operation of “System of Payphones for Public Use” have been granted to the “Radio Telecommunications Company” (RTC) and to “Bulphon” AD. The public pay phones of RTC (Mobika) and of “Bulphon” use phone cards with an integrated microchip and these of BTC– tokens. In the month of August 2000 “Mobika” installed combined pay phones and pay phones with coins as well.

**Table 4. Payphones for public use**

<b>Payphones towards:</b>	<b>31.12.1997ā.</b>	<b>31.12.1998ā.</b>	<b>31.12.1999ā.</b>	<b>31.12.2000ā.</b>
Total number, incl.:	14 453	15 669	19 031	21 619
Payphones for local dialing – token payphones of BTC	8 847	8 227	7 846	7 929
Payphones for combined dialing – phone card payphones of RTC (“Mobika”)	5 606	7 472	5 085	6 078
Pay phones for combined dialing – phone card payphones of “Bulphon”			6 100	7 612

The number of payphones per 1000 people (Fig.6) is an important indicator. The average number for the countries in Central and Eastern Europe in the year 2000 is 2.7. Bulgaria is in the group of countries (Latvia, Slovenia, Poland, Lithuania and the Czech Republic) with a penetration of payphones around the average figure.



Source: *ESIS Knowledge Base*  
(<http://www.eu-esis.org/esis2basic/esis2basic.htm>)

**Fig. 6**

A key factor for protection of customer interests is document outlining the “General Conditions of the contract between the telecommunications operators and the users”, which determine the relations between them. The licensed operators shall draft and agree with the State Telecommunications Commission, in compliance with the Telecommunications Act, and the licences awarded to them general conditions of the contract with the users. The State Telecommunications Commission, in the course of approval of these General Conditions, shall conform to the following basic requirements for:

- provision of information to customers;
- non-discrimination;
- quality of service;
- use of customers’ information;
- complaints procedures;
- behavior in case of failure in service provision;
- privacy of telecommunications;
- compensations for non-compliance with the contract conditions.

In the short term special attention shall be paid to the approval of the General Conditions of operators with monopoly or dominant market position aiming at preventing from abusive behavior of the operator which might have an adverse effect on the customers.

Access to the universal service with appropriate quality and under conditions of full non-discrimination of customers and clearly determined rights and obligations of the parties should be guaranteed.

On 27 November 2000, by Decision No 1237, the State Telecommunications Commission (STC) approved the “General Conditions of the contract between BTC and the subscribers of the fixed telephone network”.



In the process of adoption of these General Conditions STC's objective was to define precise rights and obligations of the parties in their relations, in order to protect in a better way the interests of all customers of the universal service and to improve the quality of service. In connection to this several new conditions were imposed:

- transparency of the process of connection to telephone lines;
- specified terms for repair of failures;
- changes in some of the conditions for payment of the monthly bills.

Technical level and the technological characteristics of the network of BTC have been taken into consideration in the course of approval of the General Conditions, thus reflecting real conditions of implementation.

The adoption of General Conditions for contracting between BTC and the customers for provision of leased lines is expected in the shortest term. That way transparency of the provision and non-discrimination of operators in the construction of their networks shall be achieved. In the short term it's necessary to increase the possibility for contracting of additional clauses, which are not contrary to the General Conditions for provision of telecommunications services.

The clauses for settlement of disputes in the General Conditions are also important. In Bulgaria there is a regulatory framework, dealing with these problems, as well as, a special Law on Proposals, Complaints and Requests. According to this law disputes are settled in the court. According to the Law on Customer Protection and the commercial rules there is a possibility for settlement of disputes by a reconciliation commission. In the telecommunications sector the participation of the regulatory body is also a possible means for direct or indirect intervention in the disputes between the customer and the operator, without excluding the possibility for appeal in front of the court, if an agreement is not achieved.

At the moment, in the EU, a new directive is discussed, proposing much simpler, and not that expensive, procedures for settlement of the disputes. The Directive can operate in parallel to the national judicial system. A decision is forthcoming, whether the settlement of disputes shall be specific for the different sectors, and shall be carried out by, the regulatory body, for example or, in general, by arbitration.

The harmonization of our legislation with *acquis communautaire* necessitates the extension the scope of the universal service. In the shortest terms, the scope will be extended by adding directory service for subscriber telephone numbers, emergency call services, specialized services, allowing access to services by the handicapped and access to voice service, using payphones for public use.

Before the full liberalization of the telecommunications market, it's very important to define, in a legislative act, the scope of the universal service, specific requirements for quality and acceptable prices, special tariff schemes and preferential tariffs, introduction of itemised billing and other additional services, pursuant to Directive 95/62/ÅÑ, rider Directive 98/10/ÅÑ.

The operators, who shall be licensed in the future for provision of universal service, shall assume obligations, related to its quality and affordable prices. In many occasions these obligations shall result in financial losses for the operators. In this relation, in the shortest term, it is necessary to adopt a legislative act for the conditions, which should be met by the operators, providing universal service, and for the conditions and manner for their compensations. It is necessary to create a favorable environment for the operators for the provision of this package of services.

The rapid development of the technology in the sector, and the reduction of prices of the services shall provide a possibility, in the longer term, to extend the scope of the universal service. As a first step in this direction an obligatory access to Internet in schools shall be introduced. In the next stage this service should become accessible to each household. In this relation it is possible to distribute the services in the package to different operators.

#### 2.4. Provision of leased lines

The provision of leased lines – national and international, with fixed quality parameters and for a specified period – is an exclusive right of BTC till the end of the year 2002. Re-leasing of lines is not allowed. In the event, where BTC is unable to provide leased lines with the required parameters and in the requested time frame, the operators may apply for a licence for construction of the necessary trunk lines.

In Table 5 comparative data are presented, about the major market segments – local, long-distance and international leased lines, and their market share as a percentage of the total number.

**Table 5. Leased lines, provided by BTC, 1999 – 2000**

Types leased lines	Analogue lines				Digital lines			
	Number		Change	% of the total number	Number		Change	% of the total number
	1999	2000	2000	2000	1999	2000	2000	2000
Local	16,600	16,007	-3.57%	78.70%	724	1,341	85.22%	6.59%
Long-distance	2,600	2,425	-6.73%	11.92%	339	509	50.15%	2.50%
International	32	33	3.13%	0.16%	21	24	14.29%	0.12%
Total	19,232	18,465	-3.99%	90.79%	1,084	1,874	72.88%	9.21%

In the year 2000 the number of leased analogue lines also prevails. But a re-orientation of companies and operators towards leasing digital lines, especially for the local lines, is noticeable.

The increase of about 73% for the year 2000 is due to the improved quality and the greater capacity, provided by the digital lines.

## **2.5. Tariffs and tariff policy of BTC**

### **I.2.5.1. Ordinary telephone service**

During the year 2000, prices for provision of ordinary telephone service approved by the State Telecommunications Commission (STC) according to the "Methodology for determination of the prices of the ordinary telephone service and leased lines" were the same as these which were in effect since 1 April, 1999. By Decision No 1260 of 30 November 2000, the Commission approved a change in the prices of the main types of services of BTC, using for a second time the abovementioned methodology. The proposal by the operator for a change of these prices is related to the changes in the regulatory and economic environment, which occurred since 1 April 1999, and is a step for achievement of a balanced price structure, where the prices of the individual services are cost-oriented. The principle, of universal access to the network is observed, so that the price changes were consistent with the living standard in Bulgaria.

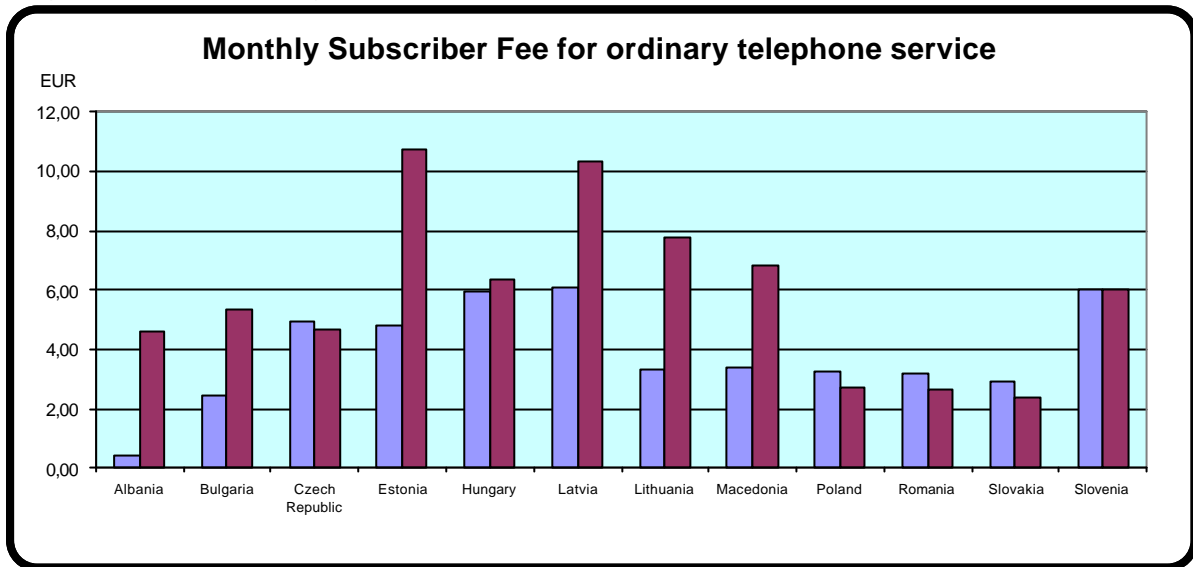
The change of prices is aimed at:

- continuation of the tariff rebalancing for reaching of cost-oriented prices of the major types of services and restriction of the cross-subsidisation between them;
- reaching of price levels, which shall not hinder the entrance on this market of other operators, after expiration of BTC monopoly period;
- maximum approximation of the price levels and ratios to these currently in force in the European countries with developed competition in this sector;
- determination of such price levels for the ordinary telephone service, that will allow the introduction of new telecommunications services and their adequate positioning in the "portfolio" of the services of the company.

The prices of the ordinary telephone service were raised by an average of 8,21%. The monthly average subscriber fee was raised by 52%, the average price per 1 min. duration of a local call – by 11.26%, and the price per 1 min. duration of an international call was decreased by 15%. The other tariffs keep the previous levels.

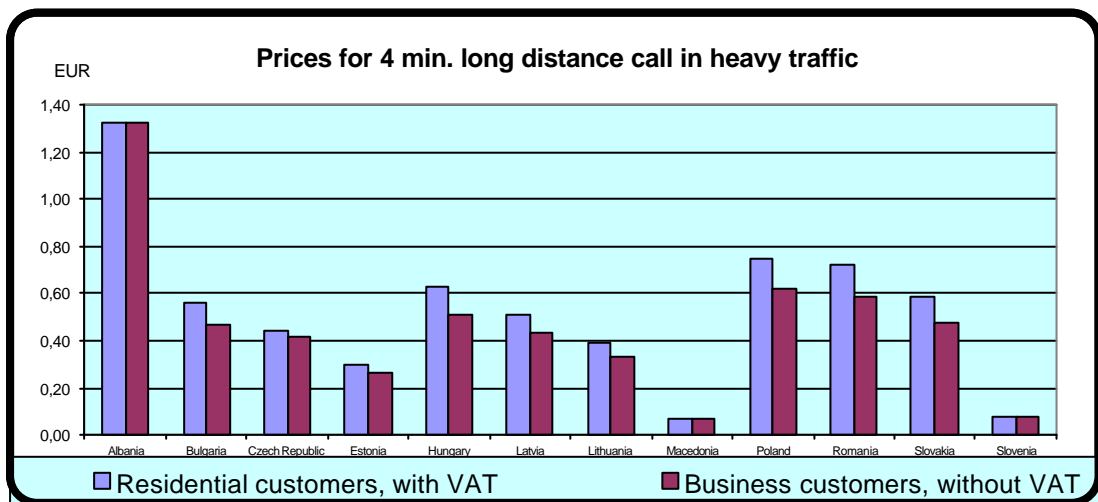
The comparative analysis, presented below, is based on data from a project for telecommunications tariffs in Phare Multi Country Program for Telecommunications and Posts (Phare MPTP) for the countries of Central and Eastern Europe, where the adopted changes in the prices of BTC are included. The

monthly subscriber fee (Fig. 7a), and consumption (Fig.7 b) for 4 min. duration of a local call in the busy hours (for residential and business customers), as well as for long distance calls (Fig.7c) for the most distant zone, are considered.



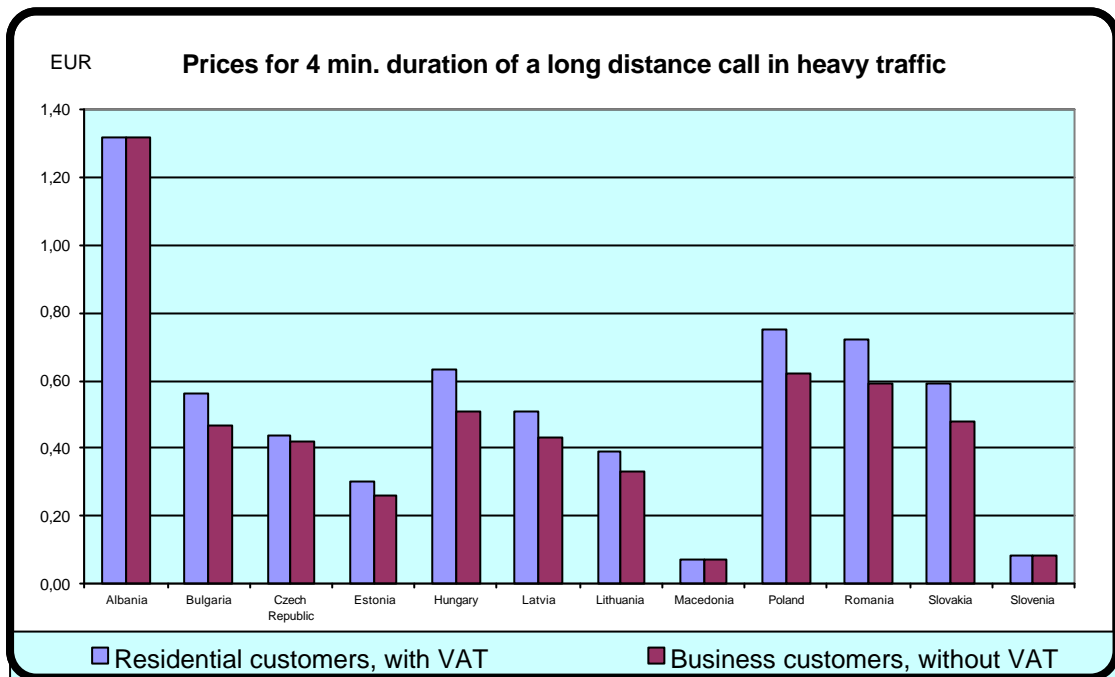
Source: Project for Telecommunication Tariffs in Phare MPTP:  
Project ZZ 97.28-01-01

Fig. 7a



Source: Project for Telecommunication Tariffs in Phare MPTP:  
Project ZZ 97.28-01-01

Fig. 7b



Source: Project for Telecommunication Tariffs in Phare MPTP:  
Project ZZ 97.28-01-01

Fig. 7c

The comparison of the presented prices shows that the monthly subscription fee of BTC for residential subscribers is lowest (after the subscription fee of the Albanian national telecommunications operator “Albtelecom”). The tariffs for 4 min. duration of the local calls for both groups of subscribers are also among the lowest – only the Macedonian operator – MT has lower tariffs for these services. Regarding the prices for long distance calls for the most distant zone BTC ranks 7<sup>th</sup> among the represented countries in CEE.

In Table 6 a matrix of the prices (VAT excluded) for 4 min. duration of an international call in the countries in CEE and in Greece is presented.

Table 6. Matrix of the prices for a 4 min. international call in countries, comparable with Bulgaria

Country	Albania	Bulgaria	Estonia	Hungary	Latvia	Lithuania	Poland	Romania
Albania		2,32	2,70	2,32	2,70	2,70	2,70	2,70
Bulgaria	2,82		2,82	2,82	2,82	2,82	2,82	1,41
Estonia	3,06	1,98		1,98		1,75	1,98	1,98
Hungary	1,75	1,75	1,75		1,75	1,75	1,75	1,75

<b>Latvia</b>	3,35	3,35	1,43	3,35		1,43	2,39	3,35
<b>Lithuania</b>	3,29	2,82	1,32	2,82	1,32		2,82	2,82
<b>Poland</b>	1,78	1,33	1,61	1,61	1,61	1,33		1,33
<b>Romania</b>	1,84	1,84	1,84	1,84	1,84	1,84	1,84	
<b>Slovakia</b>	1,63	1,63	1,63	1,63	1,63	1,63	1,63	1,63
<b>Slovakia</b>	1,53	1,53	1,96	1,72	1,96	1,96	1,72	1,72

Notes: 1. The prices in the horizontal lines are for the outgoing traffic from the respective country to the others

2. The prices in the vertical columns are for the incoming traffic to the respective country from the others

Source: Project for Telecommunication Tariffs in Phare  
MPTP:Project ZZ 97.28-01-01

The analysis shows that the subscription fees and the prices for local calls of BTC are among the lowest in the countries in CEE. The prices of the outgoing international calls from Bulgaria to the countries in the region are higher than those in the opposite direction - incoming calls, with the exception of Romania, Greece and Latvia, although, the costs in both directions are similar. The price is the same with that in Lithuania.

The conclusion is that the tariff rebalancing for provision of ordinary telephone service by BTC should continue in the same direction – increase in the prices for the local calls, and decrease for the international calls. The objective is to reach an acceptable rate of return for all services of the consumer basket, in order to avoid cross - subsidisation, where the changes of the economic situation in the country (inflation rate, economic growth) are taken into account. The lack of balance between the tariffs and costs results in distortion of the demand and supply ratio, which would reflect the investment policy of the operator. At the same time the regulatory framework should be developed for the scope and the parameters of the universal service as well as the mechanism for compensation to the operators with USO.

### **I.2.5.2. Leased Lines**

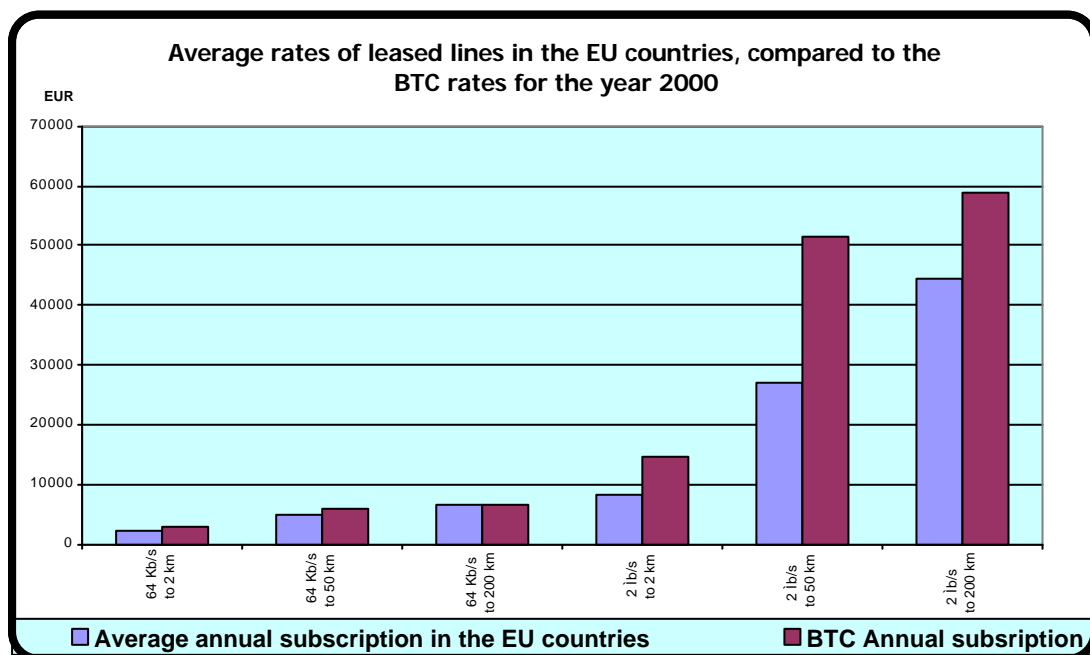
On November 30, 2000 by Decision No. 1260 the State Telecommunications Commission approved new tariffs for provision of leased lines by the BTC. This change introduced an increase in the monthly subscription fee for analogue lines (by an average of 35%), and a reduction in the monthly subscription fee for digital lines (by an average of 22%). The tariff change conforms to the “Methodology for Determination of Tariffs for the Ordinary Telephony Service, provided via the fixed telephone network of BTC and of the provision of leased lines”. Thus, the tariff structure for the various leased lines types was approximated to the balance in the EU countries. The structure of income was preserved, with the biggest share allotted to long-distance lines.

Indisputably, these changes will stimulate operators to use digital lines in the construction of their telecommunication networks, with the effect of an enhanced quality of the service provided to users.

In view of the significant number of licences for telecommunication networks and activities issued during the year 2000, and moreover, the entry of a second GSM-operator as a major client, it may well be expected that throughout the year 2001 the trend for increase in the number of digital lines instead of analogue ones will continue, leading to enhanced quality of telecommunications services.

In the short-term prospective, an Ordinance for the Provision of Leased Lines is expected to fill a gap in acting legislation. Such an Ordinance will regulate the obligations of the incumbent operator in the provision of leased lines by fixing the minimum leased lines package and mandatory quality parameters.

Systematic data for comparative analysis of the leased lines tariffs in the Central and Eastern European Countries (CEEC) could not be found in publicly available information. In the year 2000 a significant reduction in the annual subscription fees for leased lines was witnessed in the EU member states and, despite the great difference in the fees among the different countries, the average tariff rates for the zone, presented in Fig. 8, were reached. The BTC annual subscription fees for the respective leased lines, approved towards November 30, 2000, are presented for comparison. For calculation purposes grouping of local and long distance lines has been done, as mentioned in the notes under the figure, in order to achieve comparability with the terminology accepted in the EU for national leased line - connection "point to point" between two terminal subscriber points. The interbank rates on 31 December 2000 is used for currency exchange into EUR



Source: Commission of the European Communities, Sixth Report on the Implementation of Telecommunications Regulatory Package ([http://europa.eu.int/comm/information\\_society/policy/telecom/6threport/pdf/com2000814\\_en.pdf](http://europa.eu.int/comm/information_society/policy/telecom/6threport/pdf/com2000814_en.pdf))

Fig. 8

### 3. MOBILE TELEPHONY SERVICES

#### 3.1. Market Participants and competition

As per December 31, 2000 two mobile operators with licences for construction, operation and maintenance of mobile cellular networks with a national coverage and provision of services, via these networks – “RadioTelecommunication Company” (RTC), with commercial name “Mobicom”, and “Mobiltel” operated in Bulgaria. These two operators are using different standards: analogue NMT 450 – operated by RTC, and digital GSM 900 – operated by Mobiltel.

In the year 2001 the competition in the field of mobile telephony services will intensify because of the presence on the market of the third national operator – OTE, which has won the tender for the second GSM licence.

The entry of other competitors subject to the state policy objectives in the sector, the availability of scarce resource - radio frequency spectrum and national numbering capacity, as well as the legal framework for licensing.

The BTC monopoly position till December 31, 2002 additionally restricts the mobile operators in relation to:

- the construction of the trunk lines of their networks, because according to Art.11, p.2 of the Transitional and Final Provisions of the Telecommunications Act, the public telecommunications operators are obliged to construct their networks using leased lines, the provision of which is an exclusive right of the BTC;
- the international traffic from and to mobile operators, which is carried out using the BTC networks, according to the licences issued to them;
- the pricing of the provided services, due to the above mentioned restrictions, render mobile operators dependent on the BTC tariff policy, and on the rates of the BTC monopoly services, approved by the regulator, respectively.

#### 3.2. Mobile networks infrastructure

The main indicators for mobile networks development in our country in the year 2000 are presented in Table 7.

**Table 7. Mobile networks, 2000**

Mobile operator	RTC		Mobiltel	
	31.12.1999	31.12.2000	31.12.1999	31.12.2000
Indicators				
Territorial coverage	85%	85%	72,7%	76,5%
Population Coverage	96%	96%	84,6%	89,5%



Base stations – number and increase in %	235	319 36%	288	519 80%
Cells in operation - number and increase in %	385	469 22%	702	1196 70%

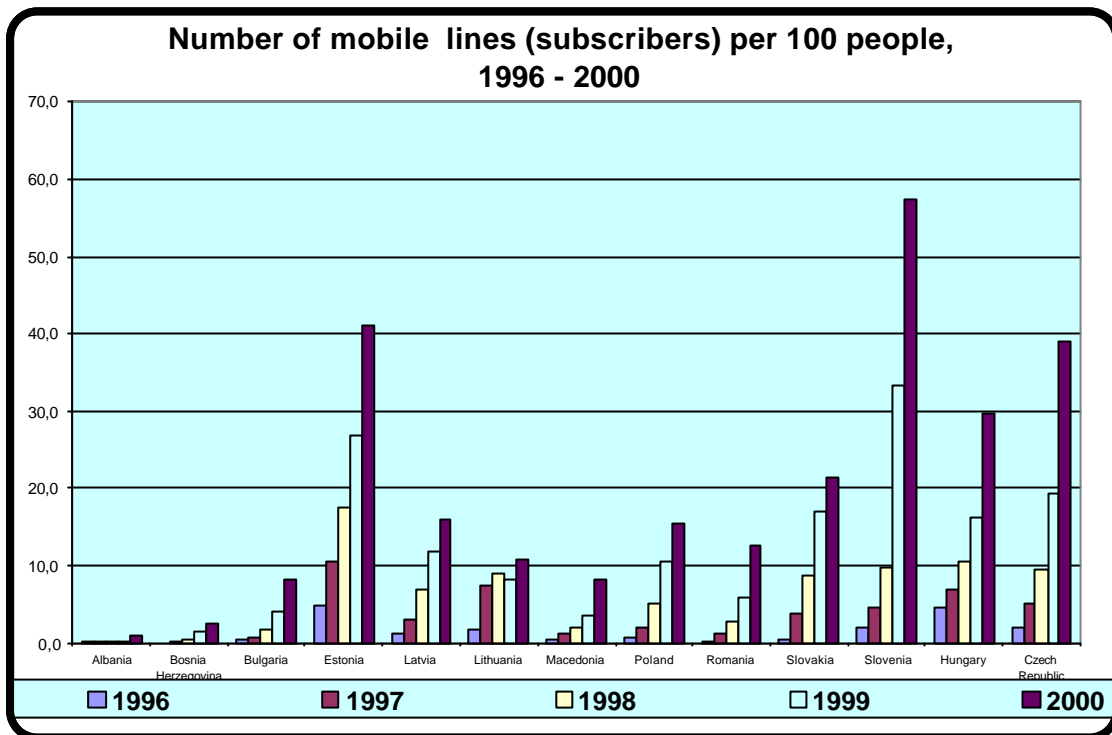
A major advantage of RTC, valid also for the year 2000, is the better coverage of its network both by territory and population.

The coverage of the RTC network by territory has increased insignificantly as per the end of the year 2000 and includes 21 towns and villages. A re-allocation of channels from base stations with lower traffic to stations with higher traffic has been carried out in order to improve the quality and increase the efficiency of the operation of the available equipment. For Mobiltel there is a 3.8% increase of the territorial coverage, where 2,611 towns and villages are included, compared to 2,536 at the end of the year 1999.

In the end of the year 2000 Mobiltel has commercial roaming agreements with 201 GSM operators from 91 countries on six continents and with two satellite operators, and contracts for international roaming have been signed with 24 more GSM operators from 22 countries. RTC offers roaming services in 8 European countries on the basis of signed contracts with 9 foreign operators.

### **3.3. Development of the market for mobile telephony services**

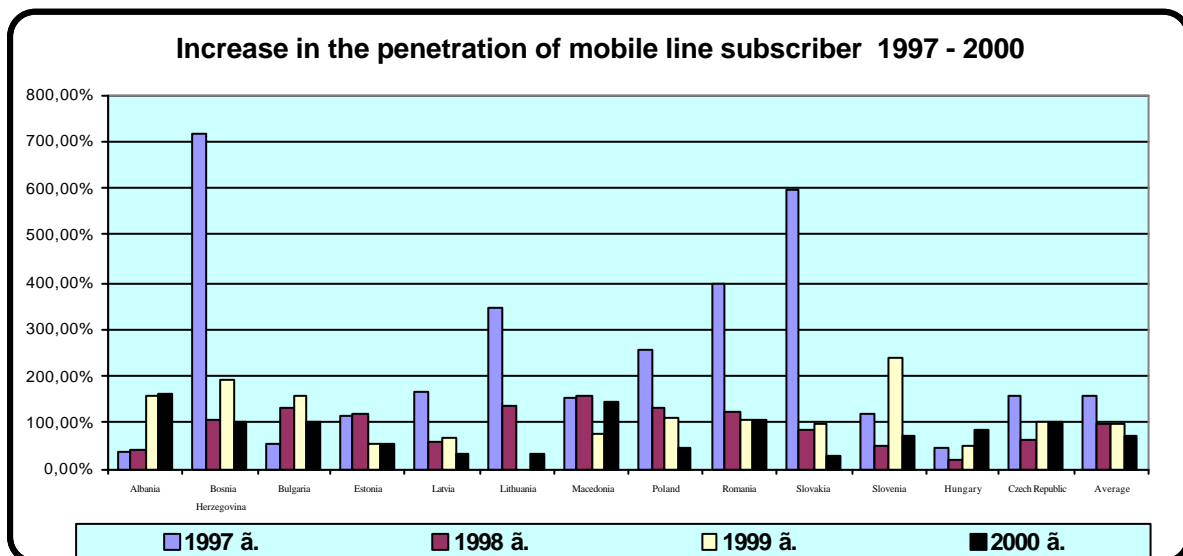
The market for mobile telephony services in Bulgaria is the least developed compared to the CEEC. As regards the penetration (mobile lines per 100 inhabitants) our country ranks 10<sup>th</sup> among the 13 countries of the former eastern block, presented on Fig. 9. The value of this indicator for Bulgaria in August 2000 is 8.2, and for the CEEC – an average of 17. The main reason for the low penetration of mobile telephone services in Bulgaria is their high price due to the insufficient competition in the sector.



Source: ESIS Knowledge Base: ESIS II Report Information Society Indicators in the CEEC countries (<http://europa.eu.int/ISPO/esis/default.htm>)

Fig. 9

As regards the pace of development in the year 2000 the Bulgarian market for mobile telephone services ranks fifth among the CEEC (Fig.10). The penetration of mobile subscriber lines has increased by 102.15%, whereas the average rate is 69.89%.



Source: ESIS Knowledge Base: ESIS II Report Information Society Indicators in the CEEC countries (<http://europa.eu.int/ISPO/esis/default.htm>)

Fig. 10

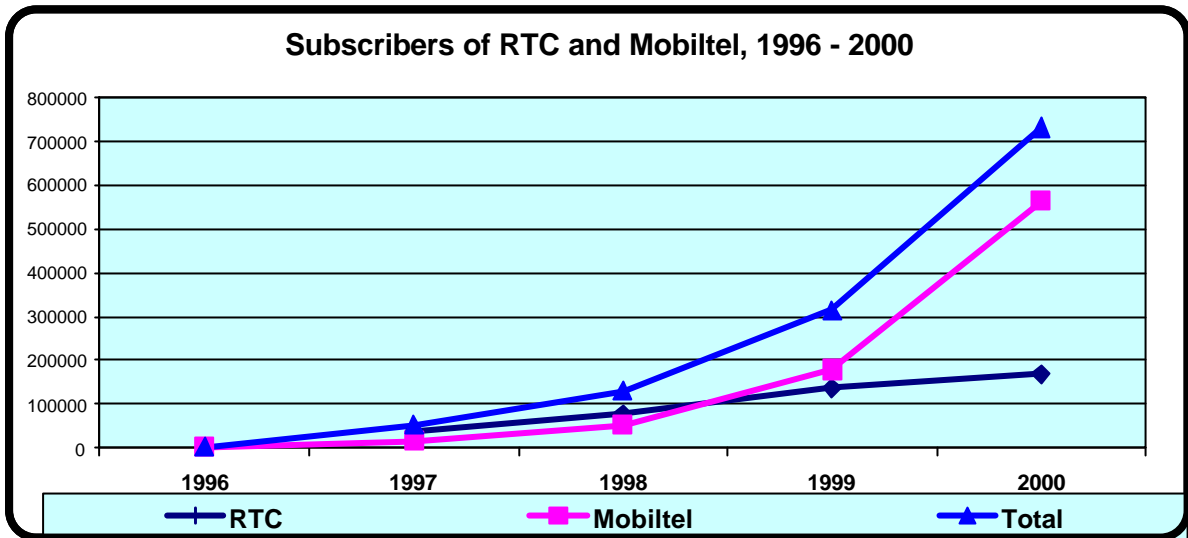
The average rate of increase, of the penetration of mobile telephone services in the EU member states for the year 2000 (Table 8) is 63%, i.e. lower than the indicator for the CEEC, although the rate of services penetration for the latter is significantly higher.

**Table. 8. Data for the development of the market of mobile telephony services in the EU member states, 2000**

Country	Mobile subscriber lines (subscribers), mill.	Mobile subscriber lines (subscribers) per 100 people
Belgium	4.0	39
Denmark	3.2	61
Germany	36.2	44
Greece	5.1	49
Spain	20.8	53
France	25.1	43
Ireland	1.6	51
Italy	36.2	63
Luxemburg	0.25	59
Netherlands	9.0	57
Austria	5.3	66
Portugal	5.3	54
Finland	3.6	70
Sweden	5.9	66
United Kingdom	31.8	54
<b>Total: 194</b>		<b>Average: 55</b>

Source: Commission of the European Communities, Sixth Report on the Implementation of Telecommunications Regulatory Package ([http://europa.eu.int/comm/information\\_society/policy/telecom/6threport/pdf/com2000814\\_en.pdf](http://europa.eu.int/comm/information_society/policy/telecom/6threport/pdf/com2000814_en.pdf))

The market share of RTC and Mobitel, calculated on the basis of number of subscribers per 100 inhabitants in the end of the year 2000, is respectively 2.5 and 7.4. A reduction trend in the rate of increase of the subscriber number of RTC is seen, whereas the number of subscribers of Mobitel in the last four years steadily grows with over 200% (Fig.11). The greater market share of Mobitel may be explained with greater possibilities provided by the digital GSM-system to subscribers in comparison to the analogue NMT and with the network development, where the coverage approximates the coverage of RTC network. According to a Wall Street Journal edition in 2000, the company ranks seventh by income rate in Central Europe, and second – among the operators in the region.



Source: Data of RTC and Mobitel

Fig. 11

Fig. 12 presents the market shares of Mobitel and RTC on the basis of number of subscribers, towards 31 December 1999 and 31 December 2000 respectively.

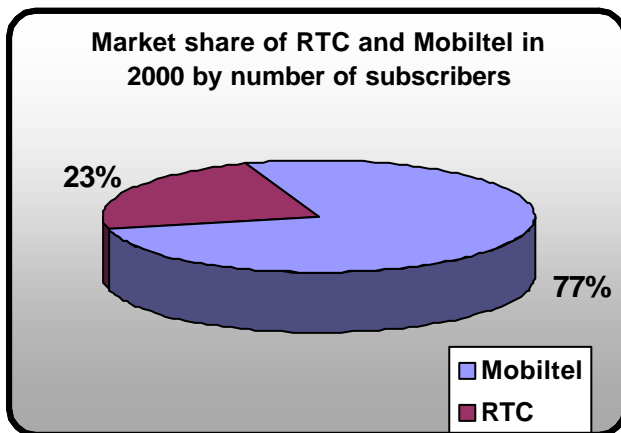
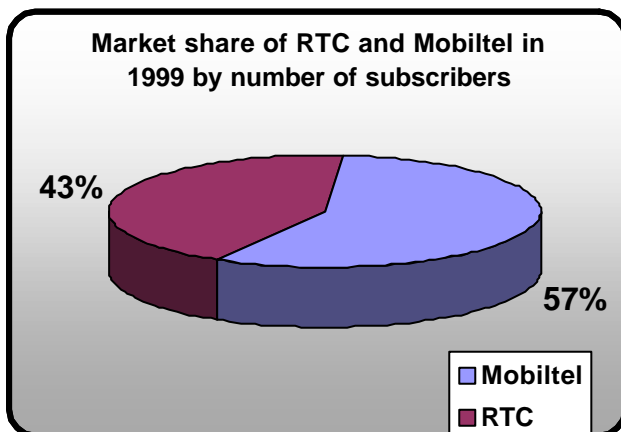


Fig. 12

The trends will be maintained in future – as a whole the number of subscribers of mobile services will grow, and the gap between the number of subscribers of the analogue and digital networks will widen in favour of the GSM networks. Since the licence of a second GSM operator was issued, the market share of Mobitel will probably continue to grow, but with slower rates, and GSM II will occupy a market niche mostly in the bigger cities.

In the EU member states the competition in the provision of digital mobile services is significantly higher, than that in the CEEC (Table 9). In the EU market 10 analogue network operators and 54 second generation digital network operators operate. Till November 35 licences for UMTS digital networks were issued, where it is expected the licensed operators to offer services at the beginning of the year 2002.

**Table 9. Operators and providers of analogue and digital mobile services in the EU member states data, 2000**

Country	Operators of analogue mobile telephone networks	Operators of second generation digital mobile telephone networks	Providers of mobile telephone services	UMTS licences, issued towards November, 2000
Belgium		3		
Denmark	1	4	1	
Germany	1	4	9	6
Greece		3		
Spain	1	3		4
France		3		
Ireland	1	3		
Italy	1	4		5
Luxemburg		2	2	
Netherlands		5		5
Austria	1	4		6
Portugal		3		
Finland	1	4	6	4
Sweden	1	4	3	
United Kingdom	2	4	47	5
Total	10	54	68	35

Source: Commission of the European Communities, *Sixth Report on the Implementation of Telecommunications Regulatory Package* ([http://europa.eu.int/comm/information\\_society/policy/telecom/6threport/pdf/com2000814\\_en.pdf](http://europa.eu.int/comm/information_society/policy/telecom/6threport/pdf/com2000814_en.pdf))

### 3.4. Quality of service

According to the General Conditions for work with subscribers, mobile operators are obliged in a one-month period to handle the submitted complaints and

proposals and to take measures respectively. Complaints and proposals may also be submitted by subscribers directly to the regulatory body – the State Telecommunications Commission (STC).

Mobilitel performs its commercial activity entirely through its subsidiary company M-Tel Trading, which offers different types of services, manages the payments of subscribers and registers new subscribers. Mobilitel offers its subscribers, free of charge, a possibility for emergency calls to medical aid, the fire brigade, road traffic control, police and an additional international GSM number 112, for emergencies, where access to that number is also possible without a SIM card. The company provides a priority access to the network to I and II Group handicapped people and delivers the radio telephones and SIM cards to their homes. A possibility is provided, free of charge, for calls with a duration up to 20 minutes per month during busy hours on the territory of the country. Mobilitel offers its customers information services on subscription fees, inquiries on tariffs, due payments, zones, etc.

RTC was awarded a certificate for development and implementation of a quality system for certification to the International Standardisation Organisation ISO 9002 standard. The standard sets the criteria for a quality system, related to the production, installation and servicing of the equipment and network.

### **3.5. Tariffs**

The two operators of mobile telephony networks RTC and Mobilitel determine their tariffs and tariff policy independently. The State Telecommunications Commission (STC) intervenes in case of signals for violations or in case of non-observance of the principles for fair competition or subscriber rights, regulated in the Law for Protection of Competition, the Customer Protection Law and the commercial legislation.

The levels of charges collected by the two mobile operators are similar as well as their pricing rules. They are determined on the basis of three basic elements: installation charge, monthly subscription fee and charge per 1 minute call. The RTC tariff packages and the Mobilitel subscription plans are formed using different combinations of the three basic elements and are directed towards different market segments, covering subscribers with different income level. RTC offers its subscribers four tariff packages (Gold, Platinum, Silver and Bronze), and Mobilitel – five subscription plans (Basic, Business, Universal, Economic and Limited).

The price discounts are a key policy tool for the promotion of the services on the market: campaigns are organised for advertising different prices discounts for the telephone sets and the initial subscription fee, reduced monthly subscription fee for the different group types, promotional package prices of telephone sets and subscription and discounts for prepaid subscription. These price strategies have a proven effect for the attraction of new subscribers during holiday periods.

A trend is seen towards reduction of the tariff levels of the mobile telephony services, particularly for the monthly subscription fee. It is expected that this trend will continue in the future due to the increase in competition after the entry of the second GSM operator, the market development and the subscriber demand increase.

#### 4. NETWORKS INTERCONNECTION

The networks interconnection is a requirement of the EU Framework Directive for Open network Provision (ONP) and efficient access to networks, and operation of the existing and newly constructed networks by the new operators of services as well as by customers, in observance of the principles of equity, transparency and publicity.

During the past year a great development was seen in the interconnection of telecommunication networks. There is no change in the legal framework on these matters. The increased number of additional agreements, reflected in Table 10, is due to changes in the operators prices to users. The agreements signed by BTC for interconnection on international level are not presented.

**Table 10. Agreements for interconnection of public telecommunication networks**

Agreements	Date of signing	Additional agreements, number	Signed in 2000
1. Agreement for interconnection of public telecommunication networks between BTC and RTC	30.06.1993ã.	15	1
2. Agreement for interconnection of public telecommunication networks between BTC and Mobiltel	20.03.1995ã.	16	5
3. Agreement for connection of public use telephones between BTC and Bulfon	12.03.1996ã.	5	1
4. Agreement for connection of public use telephones between BTC and BETCOM	01.08.1997ã.	4	1
5. Agreement for interconnection of public telecommunication networks between BTC and GOCIS	05.01.1998ã.	5	0
6. Agreement for interconnection of public telecommunication networks between RTC and Mobiltel	01.07.1999ã.	0	0

The expected entry of a second GSM-operator and the licensing of other networks for data transmission will impose new challenges to the regulatory body.

A problem needing to be solved, is, on one side, not to allow abuse of the BTC monopoly position and rights, and on the other side, not to create conditions for restriction of the operators initiatives. The practice of European countries shows that even after the full liberalization, for some period of time, incumbent monopoly operators still play an important role in the market. In order to develop competition, the European approach suggests that regulatory measures are included in the licence of the monopoly operator, in order to impose certain obligations related to the provision of the universal service, the provision of leased lines, the ONP requirement and the interconnection. These requirements of the EU will be appropriately reflected in updates of the Sector Policy, changes in the legal framework of the sector and in the secondary legislation in the context of the full liberalization.

The practice in Bulgaria is that the tariffs for traffic exchange between interconnected networks are determined as fixed settlements between operators. The EU approach allows negotiation between operators as well as determination of the interconnection tariffs by the regulatory body. By Recommendation No 263/2000 of the European Commission the following maximum tariffs for traffic from fixed to fixed and from mobile to fixed network are determined as “best practice” for 2000:

- ❖ from 0.5 to 0.9 cents per minute for interconnection of local networks;
- ❖ from 0.5 to 1.5 cents per minute for interconnection with unidirectional transit;
- ❖ from 1.5 to 1.8 cents per minute for mutual connection with bi-directional transit.

In the year 2000 the average interconnection tariffs to the fixed networks in the EU are, as follows:

- ❖ for interconnection of local networks – 0.97 cents per minute;
- ❖ for interconnection with unidirectional transit – 0.97 cents per minute;
- ❖ for interconnection with bi-directional transit – 1.98 cents per minute.

The average interconnection tariffs for traffic from fixed to mobile networks in the EU in the year 2000 is 20.98 cents per minute.

In relation to the policy for development of information society in the EU and extension of access to Internet services, the European Commission has issued Recommendation No 3863/24.11.1999 for the maximum recommended monthly subscription fees for provision of leased lines, between two interconnected networks of public operators, as follows:

- ❖ 350 EUR per month for a 2 Mb/s leased line with a length of up to 5 km between connection points;
- ❖ 1800 EUR per month for a 34 Mb/s leased line with a length of up to 2 km between the connection points;
- ❖ 2600 EUR per month for a 34 Mb/s leased line with a length of up to 5 km between the connection points.

The recommendation is based on the understanding that the fees for provision of leased lines in case of interconnection should be considered as wholesale prices and should be lower than the fees for leased lines, provided to an end user (retail prices).

## **5. PUBLIC TELECOMMUNICATION NETWORKS FOR PAGING**

In the year 2000 the State Telecommunications Commission (STC) issued three licences to operators of private paging networks for own needs. In the beginning of next year, the re-licensing of the paging operators, carrying their activities on the basis of licences issued by the Committee of Posts and Telecommunications is forthcoming. The networks of two of those operators – Mobipage and Link page, are with a national coverage, and of the other two –



Scortel and Di-Va, are with a local coverage (for Sofia). These operators are operating using POCSAG - the most popular standard in Europe.

The data for last year show that the interest in this kind of telecommunications activity is decreasing. A part of the operators licensed, by the Committee of Posts and Telecommunications (CPT), have ceased functioning and have not submitted an application for re-licensing to the State Telecommunications Commission (STC). To a certain extent this is due to the replacement of the "paging" service by the SMS service, provided by the cellular GSM network.

Mobipage is the leading operator in Bulgaria. Its market share, calculated on the basis of number of subscribers, is around 83% towards the end of the year 2000, and its territorial coverage is around 65%, which covers all major cities, transport network and resorts in our country. In order to keep its subscribers, whose number is comparatively stable this year, on 15 April 2000 Mobipage reduced by around 30% the service prices and organized promotions for public offer of different pager models on preferential prices. To the same purpose, Mobipage introduced a new service "e-mail to pager", which allows sending messages to a pager in the form of an e-mail.

The other operator with a national coverage of the network is Link Paging. It is the first national paging operator in Bulgaria and has been functioning since 1993. In addition to individual subscribers, Link Paging provides services to governmental bodies and corporate clients – the Ministry of Defense, the Ministry of the Interior, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Health, the National Electricity Company (NEC), Central Department Customs etc. Its network covers 90% of the territory of the country. Despite that, Link Paging market share, calculated on the basis of subscriber number, is estimated at about 14%.

Activities for the construction, maintenance, operation and development of a paging network and for provision of services over that network are included in BTC licence, but only via use of RDS technology. To that purpose the company uses as carrier signal the VHF frequency range of "Horizont" radio program. The achieved territorial coverage is almost 90%. BTC uses the RDS paging system also for company purposes. During the previous year the number of subscribers has dropped down by 30%, which once again outlined the notably decreasing trend in the interest to those services.

## **6. SATELLITE SYSTEMS**

The construction, maintenance and operation of VSAT networks, with hub stations on Bulgarian territory, of terrestrial fixed satellite stations, of satellite terrestrial terminal devices (INMARSAT-B, EMS-PRODAT, EMS-MSSAT) and of access to global satellite communications, as well as the provision of public services, using them, are subject to individual licensing by the State Telecommunications Commission (STC). The satellite stations may be used for broadcasting of radio - and television programs, data transmission, including teletext in digital format, and for voice telephony services.

In the year 2000 a total of 15 licences were issued for terrestrial fixed satellite stations (all for own needs) and one individual licence – to "Teleport Bulgaria" for the

construction, maintenance and operation of a private VSAT network with a hub station on Bulgarian territory for provision of telecommunications services to a closed group of subscribers. Teleport Bulgaria is a trading company, established by Mobiltel and BMW. The scope of activity of the company covers construction, maintenance and operation of satellite telecommunications networks and computer devices, systems and networks in Bulgaria and abroad, as well as provision of services – unidirectional and bi-directional digital information transmission – on the basis of modern VSAT technologies.

In the beginning of the year 2001 the re-licensing of four stations for radio- and TV signal transmission, covering, respectively, Sofia and the territory of the entire country, is forthcoming.

It is obvious, that towards the end of the year this type of telecommunications activity is carried out by the operators exclusively for own needs. To that purpose it cannot be said that there is a specialized market for services via satellite systems.

The activities for construction, maintenance, operation and development of satellite telecommunications networks and of satellite terrestrial stations for use of satellite telecommunications are included in the scope of the licence of BTC. The company provides satellite services using leased capacity of the international systems INTERSPUTNIK, INTELSAT and EUTELSAT, where it is a share holder.

The terrestrial satellite station, equipped with 12- and 18 meters antennas, are located in the Plana Earth Station Complex (PESC) near Sofia. The complex has digital connection to Sofia – to the TV tower and to Sofia STTS, respectively using a 40 km fiber-optic line (STM 4) and digital microwave line (STM 1). A control station for a “LMI-1” satellite is constructed in the PESC.

A possibility for telephone connections with the countries in the region of the Atlantic Ocean is provided via the used channels of the satellite system INTERSPUTNIK. The “Shipka” satellite station is also equipped for transmission of a package of digital television and radio programs. Since the beginning of the year BTC carries out trial broadcasting of television programs via the newest geostationary satellite International Orbital Space Station INTERSPUTNIK – “Express – 3A”. They can be received by a 2.4 m antennas on frequency 3984 MHz. In the initial stages of provision of the service up to 6 programs will be broadcasted with a speed of 3.5 Mb/s and up to 12 stereo radio programs. Each of the television programs will be individually processed and encrypted. The service covers the activities for MPEG compressing, encrypting and dynamic multiplexing, which will be carried out in the TV tower in Sofia. The transmission of the television programs and the radio programs from the tower to the PESC will be carried over a digital microwave line with a stand-by fiber-optic cable. It is expected that the service will be introduced in the beginning of the year 2001. In the future it is envisaged that the broadcasted digital platform will be extended to ensure transmission of up to 14 television programs, 28 stereo radio programs and data. Upon customer request, BTC may provide “point-to-point” combined service, i.e. transmission over terrestrial routes of television and radio programs from a given point in the country, designated by the customer, to the Sofia TV tower and their receiving by a satellite at another point. In the event of technical feasibility, the service may include broadcasting. The company will offer free of charge to its customers a one-month period of transmission – for tuning and organization of the receiver network.

The station INTELSAT standard A (AOR), oriented to a satellite above the Atlantic ocean, has functioned since 1994, and offers exchange of television programs and direct telephone connections to the countries in the region. Since the end of 1998, a second terrestrial station, oriented to the region of the Indian ocean (IOR) is operating. The station provides exchange of television programs with the countries in the region. It is additionally equipped with DAMA technology for telephony transmission using organization of direct digital channels.

Using the INTELSAT system, BTC also offers organization of private leased VSAT channels to the countries in the region of the Atlantic and Pacific Oceans for corporate data transmission, including Internet access, with a capacity from 64Kb/s to 8 Mb/s. Upon a customer's application BTC carries out under its licence, in its capacity of an authorized signatory, installation and maintenance of VSAT stations, as well as leasing and provision of a satellite channel. In the year 2000 BTC has 21 subscribers for those services.

In the year 2000 a terrestrial station for provision of satellite broadcasting of radio- and television programs via the EUTELSAT system, which services the Bulgarian National Television, was constructed.

Due to its multiple advantages, the VSAT technology has exceptional potential for future development:

- wide range of the offered services – voice, video and data transmission, Internet, LAN at comparatively low costs;
- a possibility for connection of geographically remote sites and servicing of entire countries, regions and markets;
- independence and total control of the telecommunications system by the end user;
- flexibility of the network – a possibility for simple management, change of location, removal and addition of stations;
- high speed and quality of the transmitted data.

The VSAT market is rapidly developing worldwide. At the moment there are over 1 million stations installed in more than 120 countries. It is envisaged that in the end of the year 2004 the income from these services will be \$ 13.8 billion. At that time a ten fold increase of the business subscribers of the global satellite system (in comparison to 2000) is forecasted and it is expected that they will reach almost 3 million, and the number of residential subscribers will be around 14 million.

In the year 2001 is forthcoming the licensing of networks for access to global mobile satellite communications.

## **7. VHF radio broadcasting**

Since in the beginning of the year 2000 the State Telecommunications Commission (STC) issued licences for local VHF radio broadcasting pursuant to Art. 14 of the Telecommunications Act and as a result of the competitions held for the regions of Sofia, Plovdiv, Varna, Bourgas, Stara Zagora, Veliko Turnovo, Russe and

Blagoevgrad, the signal of the local radio stations reached 40% of the population of the country. Over half of those are concentrated in Sofia, Plovdiv, Varna and Bourgas.

The statistics show that only 15% of the licensed operators for local radio broadcasting have preferred smaller towns. Due to that in the new Tariff on Fees the State Telecommunications Commission (STC) reduced the licence and some other fees for radio broadcasting in the rural regions of the country, in order to increase the interest of the operators and to assure access to this type of telecommunications service.

In the competition for radio broadcasting with a local coverage in the eight regions all participants declared their intention and readiness to provide the "Additional information - RDS" service. Most operators also declared technical capacity for direct broadcasting from news locations (using vehicles for reporting purposes) and international exchange (transmission of the program on the Internet).

All licensed operators broadcast their own program, consistent with the requirements of the Radio and Television Act (RTA), and some – also programs of other operators.

In some of the radio stations the transmission of the programs from the studio to the transmitters is carried out via transmission equipment of the BTC, in compliance with the provisions of Art. 11 of the Transitional and Final Provision of the Telecommunications Act. A great part of the operators have constructed, for that purpose, their own microwave lines.

In the year 2000 most of the licensed operators use modern digital technology in their studios, and the rest intend to introduce it. In order to improve the quality of the services and to optimize the scarce frequency resource, the introduction of new technologies in the operation of the networks, as well as their total digitalization is envisaged.

## **8. TELEVISION BROADCASTING**

The television broadcasting with a local or national coverage is subject to individual licensing by the State Telecommunication Commission (STC) for carrying out of the Telecommunications Act activity, and for the program activity – by the National Council on Radio and Television (NCRT).

In the year 2000 the market of television media went through a dynamic development. The number of television operators (broadcasting and cable) on a local and national level increased, which increased the competition among them.

Since bTV, the second national broadcasting television station was awarded its licence in April 2000, it has already started broadcasting. It has a coverage of around 80%.

"Channel 1" of the Bulgarian National Television (BNT) broadcasts to the entire population of the country.

“New Television – First Private Channel” won the tender for third national television station with a proposed strategy for development of the network and services, planned investment and program scheme. Its entry to the market will create prerequisites for growing competition in the market environment.

Regional television broadcasting stations are still few in number – 12 were licensed till the end of the year 2000. Half of the issued licences are for Sofia and other big cities – Bourgas, Dobrich, Pleven. The coverage of the regional television broadcasting stations is not the same for the different places – around 90% of the potential customers live in Sofia and the big cities, while over the entire country around 25% of the population is covered.

In some places the television broadcasting stations are subject to great competition from the cable operators. In the future it is envisaged that the number of the television broadcasting stations will increase.

### 9. CABLE TELECOMMUNICATIONS NETWORKS FOR RADIO AND TELEVISION SIGNALS

With the active assistance of the State Telecommunications Commission (STC), towards the end of the year 2000 more than 650 licensed cable telecommunication networks functioned in Bulgaria and approximately 80 percent of the population had access to the services delivered over those networks.

As shown in the diagrams on fig. 13, almost half of the population (46 percent) having access to licensed cable telecommunication networks is concentrated in Sofia and the cities with a population of over 100,000 people. A comparatively high percentage share falls to towns with a population varying from 1,000 – 5,000 people, and the number of licences issued in those populated areas rank highest. In contrast to the substantial number of licences issued in the scarcely populated areas, the percentage of overall coverage there according to the same criteria is rather small – indicating a mere 2 percent of the population.

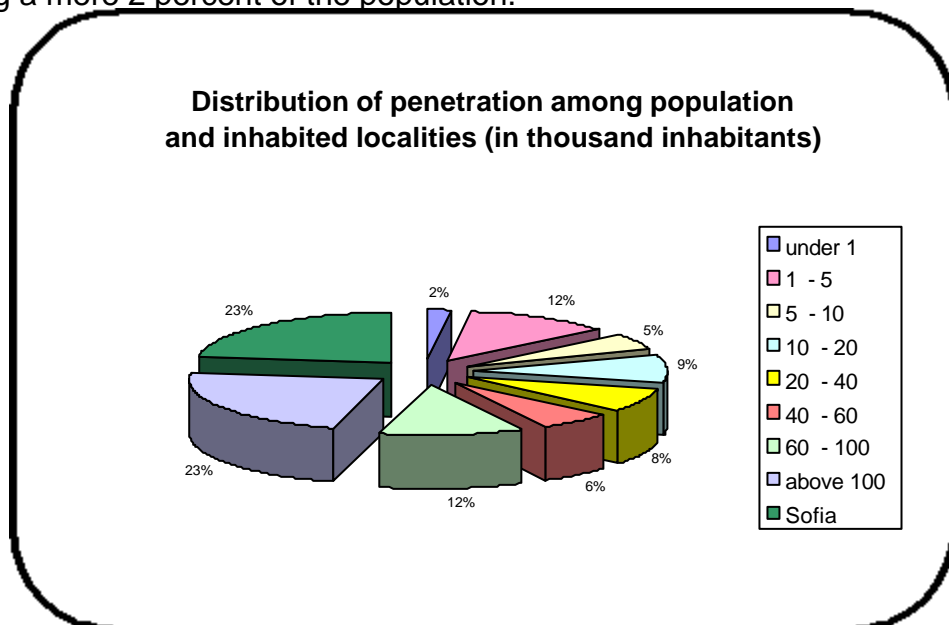


Fig. 13à

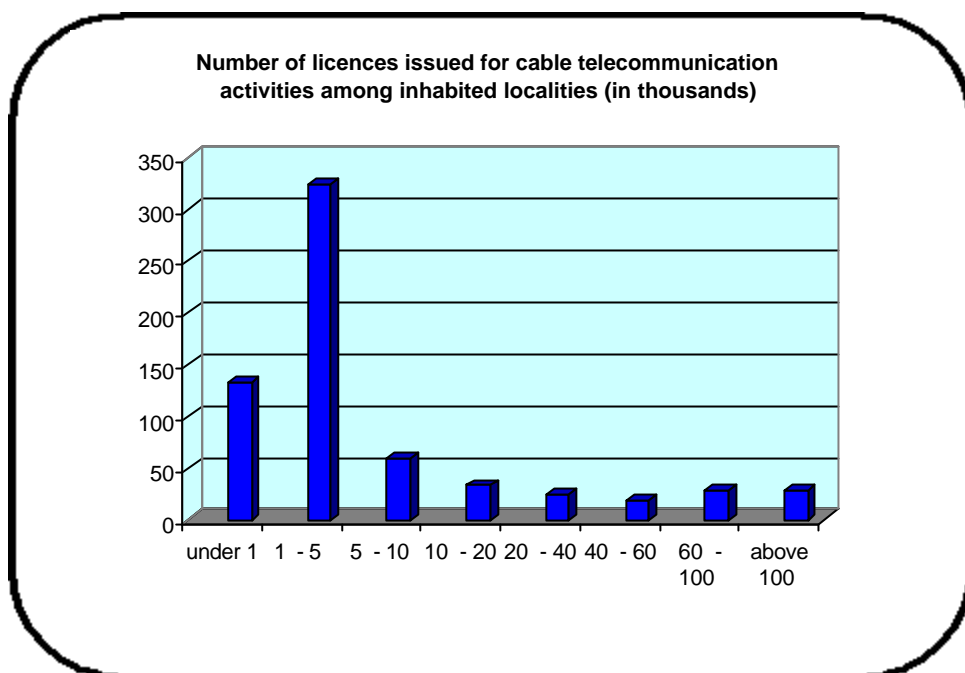


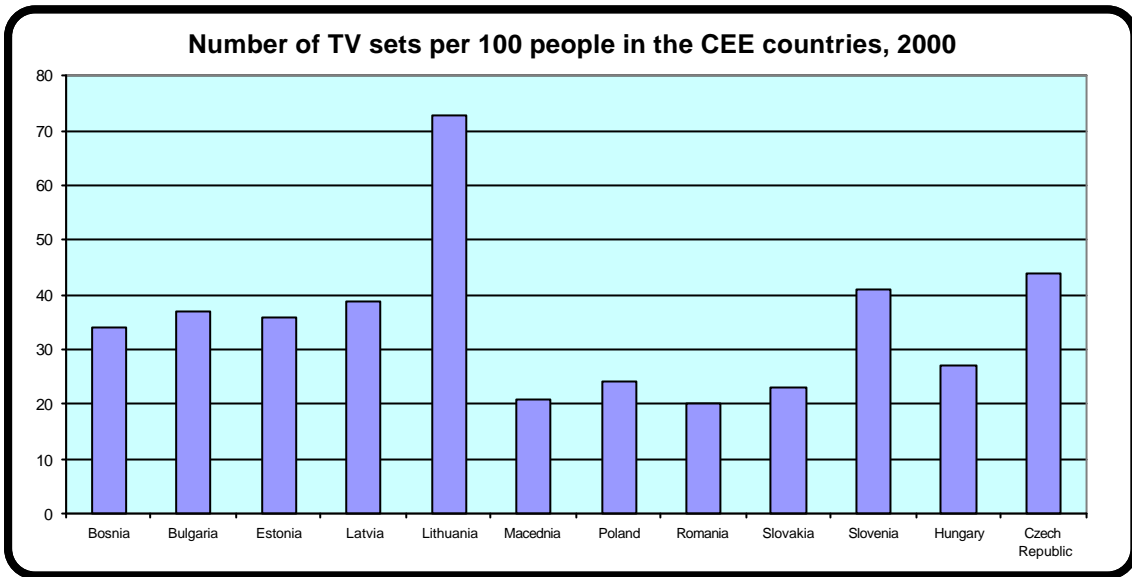
Fig. 13b

The policy of the State Telecommunications Commission, in its capacity of a regulatory body, focuses on encouraging cable operators and further enhancement of their activity in the medium to large populated areas of the country. The weak interest demonstrated until recently has been due to the extremely high licence fees which, when compared to the limited number of potential users, account for the low profitability of these services. The new Tariff on Fees, collected by the STC, envisages a considerable reduction on licence and other fees, payable for the construction of cable telecommunication networks in those regions of the country (with a population of 30,000 – 100,000 people).

Due to the very high number of cable operators, despite the energetic licensing activity of the State Telecommunications Commission throughout the year, many applicant companies failed to acquire licences for telecommunications activity. During 2001 the process for company licensing will continue in the same intensive pattern.

The main activity performed by the cable operators encompasses provision of radio and television programs and additional information in the context of the Radio and Television Act. All licensed operators broadcast programs sourcing from other operators, in addition to their own.

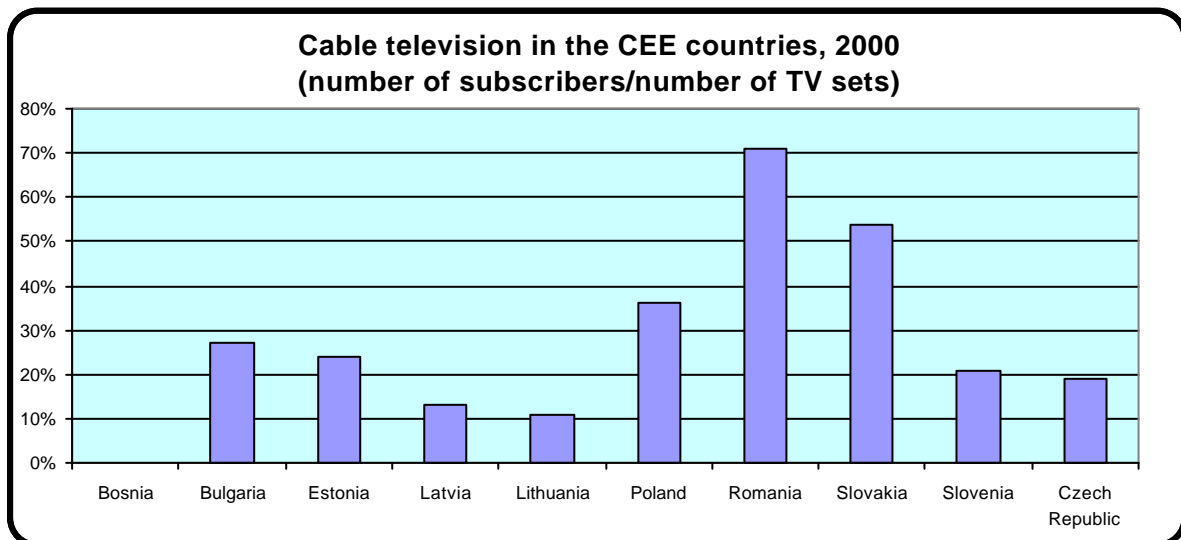
A prerequisite for the introduction of cable services is the availability of television sets in almost all Bulgarian households. Bulgaria occupies fifth place (fig. 14) among the CEE countries by number of TV sets per 100 inhabitants - 37, on an average indicator of 25.2 for those countries.



Source: *ESIS Knowledge Base: ESIS II Report Information Society Indicators in the CEEC countries* (<http://www.eu-esis.org/esis2basic/esis2basic.htm>)

Fig. 14

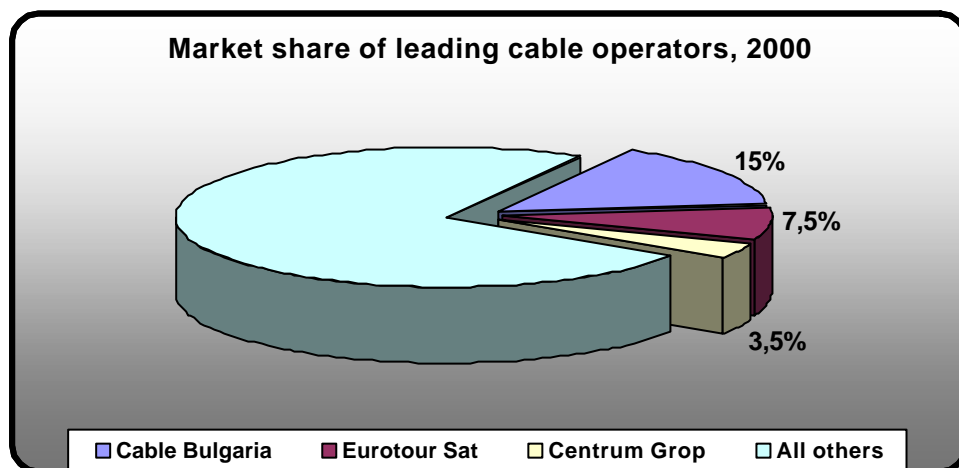
The total number of subscribers for cable television services in Bulgaria amounts to 800,000. Bulgaria ranks fourth among the other CEE countries by use of cable television (the ratio between the number of subscribers and number of television sets in the country expressed in percentage) – 27 percent. That indicator is higher only for Romania, Slovakia and Poland.



Source: *ESIS Knowledge Base: ESIS II Report Information Society Indicators in the CEEC countries* (<http://www.eu-esis.org/esis2basic/esis2basic.htm>)

Fig. 15

Despite the presence of many licensed cable operators, the domestic market was dominated by 3 leading companies (fig. 16) with the highest user aggregate concentration - Cable Bulgaria (120,000 subscribers), Eurotour Sat TV (60,000) and Centrum Group (28,000). Cable Bulgaria represents American and Canadian investment capital and has been operating as a cable operator on the Bulgarian market since the beginning of the year 2000, following the acquisition of 3 other cable operators – Union TV, Globo TV and Varna Kabel. The company has made public its intentions to install in the near future a fiber-optic cable network covering the entire country, investing a total of US dollars 40 to 50 million in the development of network infrastructure, and will offer services such as digital television, interactive television, video on demand and Internet services.



Source: Central and Eastern Europe Business Information Center  
 (<http://www.mac.doc.gov/eebic/countryr/bulgaria/market/bgvatelecom.htm>)

Fig. 16

The process of restructuring is still underway on the Bulgarian market for cable and television services. The foreseeable future development will be concentration of capital and merger of trading companies, thus creating opportunities for the operators to impose cheaper services and expand their investment potential.

From the value-added service package, the domestic market offers as yet only cable Internet – and that offer is very limited. This reason accounts for the fact that at present cable operators are not regarded as competitors to Internet providers. However, the situation will change in the future, since cable operators have the right and a sufficient technical back-up to use their networks for telecommunication activities under free regime. The digital television, interactive television and video on demand have gained publicity as services but are not yet offered on the domestic market.

After the expiry of the monopoly period of the Bulgarian Telecommunications Company (BTC), cable telecommunication networks will pose a real alternative for delivery of the voice telephony service.

Some of the best known companies in the television industry, such as Time Warner, United Pan European Communications è TCI have declared their



willingness to enter the Bulgarian market by acquiring viable cable television operators.

## 10. INTERNET

### 10.1. Development of the market for Internet services

The definition of a user, i.e. a person having access to the Internet network from his or her home, a workplace or an educational establishment, may be interpreted in a number of ways. Some market research agencies count as users also the persons who incidentally surf through Internet, for example from Internet clubs and cafes. A diverse user evaluation basis is proffered – the overall population, a particular age group, the labour active population, etc.

As shown in table 11, the figure for web users in Bulgaria totals 390,000 people, while residential users over switch-line access do not exceed 100,000.

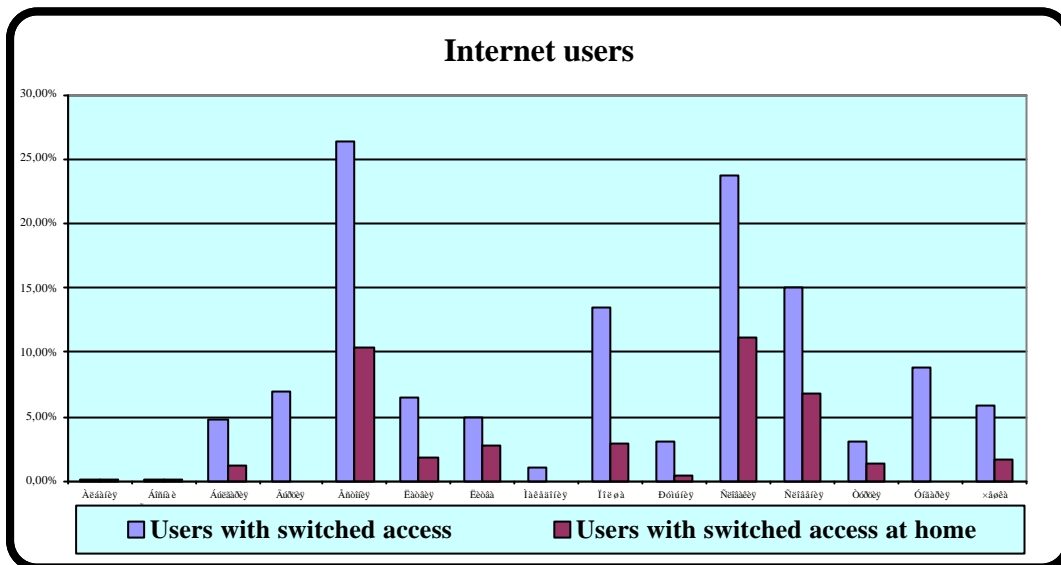
Around 137,000 people use Internet access from their workplace. The biggest share of business users sources from the large regional city centers – 46,5 percent in total, followed by Sofia – 36,3 percent. From the operating 361,400 computer systems in the country, 59,7% have network connection.

**Table 11. Data for the Internet users by country**

Country	Users with switched access	Users with switched access at home	Population	Users per 100 inhabitants	Home users per 100 inhabitants
Albania	5,500	2,500	3,370,000	0.16%	0.07%
Bosnia Herzegovina	6,000	4,000	3,840,000	0.16%	0.10%
Bulgaria	386,400	96,600	8,175,000	4.73%	1.18%
Greece	737,310	0	10,601,527	6.95%	0.00%
Estonia	380,000	150,000	1,440,000	26.39%	10.42%
Latvia	155,000	45,000	2,370,000	6.54%	1.90%
Lithuania	180 000	100 000	3 620 000	4.97%	2.76%
Macedonia	20 000	0	2 042 000	0.98%	0.00%
Poland	5 200 000	1 100 000	38 650 000	13.45%	2.85%
Romania	690 000	90 000	22 400 000	3.08%	0.40%
Slovakia	1 281 500	600 000	5 398 000	23.74%	11.12%
Slovenia	300 000	136 000	1 990 000	15.08%	6.83%
Turkey	2 000 000	880 000	65 300 000	3.06%	1.35%
Hungary	890 680	0	10 043 000	8.87%	0.00%
Czech Republic	600 000	180 000	10 272 000	5.84%	1.75%

The graphics on fig. 17 gives an overview for the number of Internet users in countries comparable to Bulgaria, situated in the same geographic region or undergoing a process of transition to a free market economy. By around 5 users per

100 inhabitants from its overall population, Bulgaria occupies 10<sup>th</sup> place among the fifteen presented countries. For EU member countries this indicator is 36 percent, varying to under 10 percent (Greece) to over 55 percent (Denmark and Sweden).



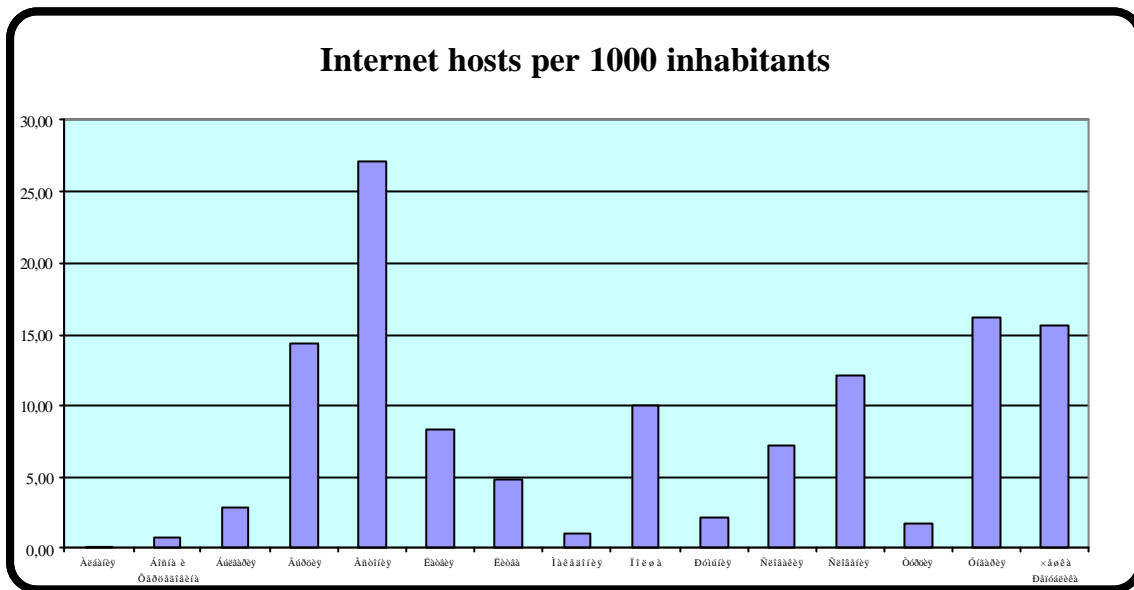
**Sources:**

**For Bulgaria:** *BBSS Gallup International Securities - Bulgaria,; © 2000. CBN. ChronoAnalysys: Annual Business Analysis of the IT Market in Bulgaria , IV edition.*

**For the remaining countries:** *ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>), (<http://www.netsizer.com>)*

Fig. 17

The number of Internet hosts per 1,000 inhabitants is another indicator for the penetration of Internet services. On an average it posts 53,8 for the EU. The respective data for Bulgaria, the CEEC and other countries are shown on fig. 18.



**Sources:**

**Hosts by Countries towards end 2000 - Internet Software Consortium**  
<http://www.isc.org>

**Population by Countries towards July, 2000 ã.** <http://www.geographic.org>

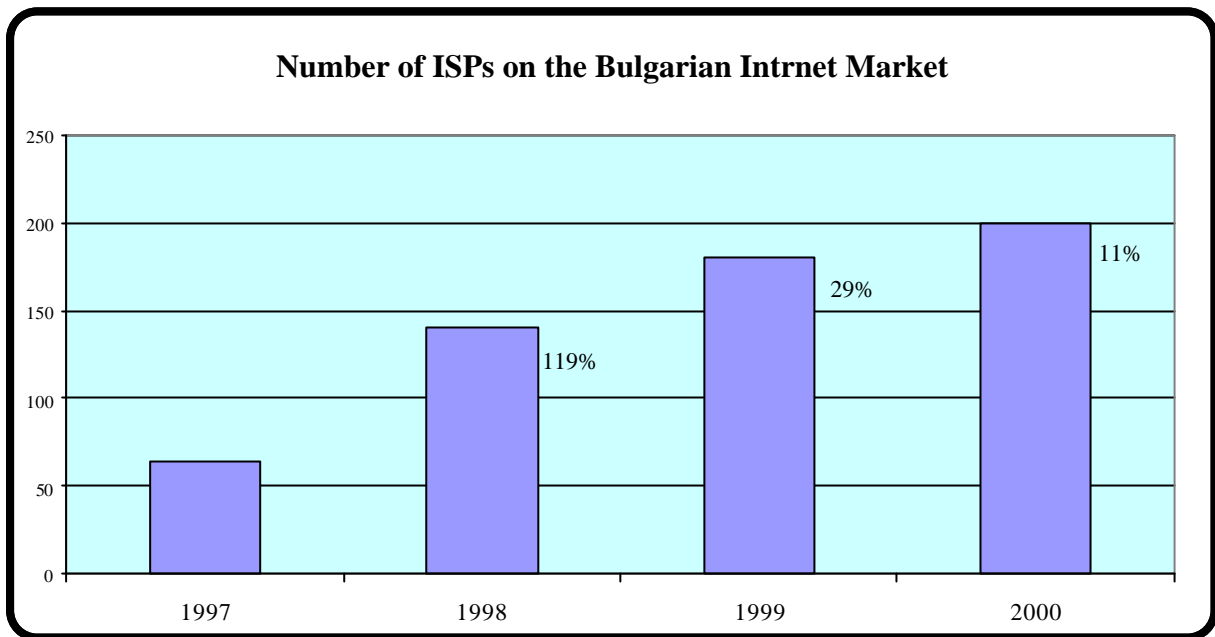
Fig. 18

It can be seen that Bulgaria is among the countries with relatively low penetration of Internet services, both as regards the number of users and the host number indicator per 1,000 inhabitants of the population.



**10.2. Internet service providers (ISP)**

During 2000 around 200 companies on the domestic market offered Internet access services. Thus, the slow upward trend for 1999 was maintained, posting just a slight increase in the number of ISPs (fig. 19).



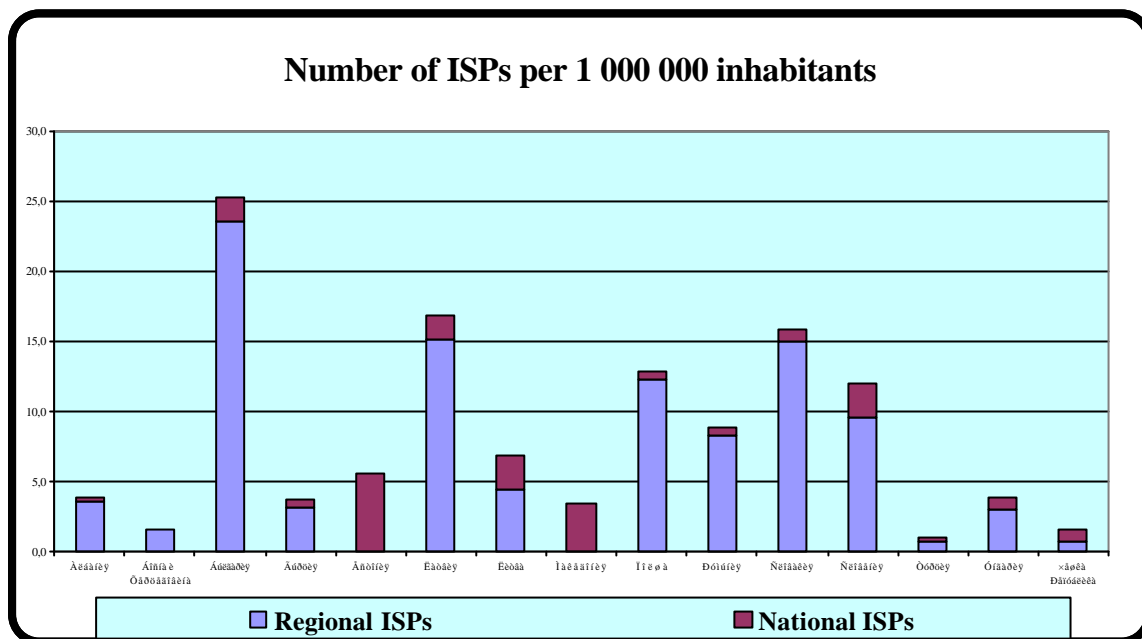
**Sources:**

© 2000. CBN. *ChronoAnalysis: Annual Business Analysis of the IT market in Bulgaria, IV edition*; *ESIS Knowledge Base* (<http://www.eu-esis.org/esis2basic/esis2basic.htm>)

Fig. 19

Around 48 percent from all ISPs are located in Sofia. With the exception of the major regional cities – Varna, Plovdiv, Burgas and Russe, the presence of ISPs in populated areas varies between 0,5 and 2,5 percent from the total number of ISPs, or between 1 to 5 companies.

The development of the market for Internet services can also be evaluated employing an indicator for the ISP number per 1 million people from the population (fig. 20).



**Sources:**

**ESIS Knowledge Base** (<http://www.eu-esis.org/esis2basic/esis2basic.htm>), **RIPE** (<http://www.ripe.net>)

Fig. 20

By over 25 ISP per 1 million people of the overall population, Bulgaria tops the list among all represented countries. The relatively high value for this indicator, when compared to the low percentage ratio for the user figure, comes to pinpoint the fact that the Internet services market in Bulgaria has not yet been structured. In a national scale, the following ISPs are operating actively on the domestic market:

- |  |                                |
|--|--------------------------------|
| 1. Global One Communication and Information Services (GOCIS) | 8. Specter Net                 |
| 2. The Bulgarian Telecommunications Company (BTC) Plc.       | 9. NetIsSat                    |
| 3. Mobiltel  | 10. Digital Systems - Varna    |
| 4. RTC Ltd.  | 11. Bank Service               |
| 5. Orbitel   | 12. Bulgarian Economic Chamber |
| 6. ProLink   | 13. ITD Network                |
| 7. Lirex (Naturella Agency)                                  | 14. Internet Bulgaria          |

They have been selected based on the following criteria:

- Availability of direct external channels to international Internet providers;
- Well developed sub-provider network and/or entry point throughout the country;
- Income from their ISP activity;
- Number of subscribers via switch-line and leased line access.

The remaining ISPs in Bulgaria operate in a regional scope, and for the majority the provision of Internet services is an additional parallel activity.

The capacity of international connectivity of the Bulgarian Internet for the year 2000 was in the range of 110 Mb/s, out of which 44 Mb/s – via terrestrial symmetrical lines owned by BTC. Throughout the year round, the capacity of the Bulgarian links connecting to the international network has grown by more than 100 percent. Over 90 percent from the traffic passes through the 11 ISPs, which have their own channels to external providers. The best quality of direct linking to the international network is within the prerogative of BTC – via three terrestrial symmetrical lines, with a total capacity of 44 Mb/s.

Towards the end of 1998 a tie lines system (SIX) was contracted, serving as a basis for the national connectivity of Internet providers. Co-founders of this co-operation initiative were Global One Communication and Information Services (GOCIS), Naturella Agency (Lirex), Specter Net, Pro Link and Orbitel. Later on RTC Ltd., Internet Bulgaria, NetIsSat and ITD Network joined. At present, 14 from the leading Bulgarian providers participate in the national peering system, which incorporates also their sub-provider networks. According to the contractual agreement, each participant disposes of at least 2 internal connections constructed and maintained to loop in at least 2 other participants from SIX, where each internal link is of a capacity at least 128 Kb/s. The ultimate aim behind the construction of this system was to scoop the domestic Internet traffic from within the country. As a result, it may be assumed that Bulgaria presently has its own creation of a domestic Internet medium, allowing user communications at a comparatively high speed.

The ISPs who have the best developed network Internet infrastructure are BTC, Global One Communication and Information Services (GOCIS), the Bulgarian Economic Chamber, Bank Service and Digital Systems – Varna.

One other form for establishing Internet connectivity presents itself in the creation of sub-provider networks. The best positive development in this respect was demonstrated by Global One Communication and Information Services (GOCIS), Specter Net, NetIsSat and Orbitel

The provision of Internet access as an economic activity is governed by the commercial, taxation and fiscal legislation and other related secondary acts but is not subject to regulation – registration, licensing and control, pursuant to the Telecommunications Act.

All providers offering Internet access – via switch or leased lines, over the public switching telephone network – use services from BTC, holder of the state monopoly on the ordinary telephone service and the provision of leased lines until the end of 2002, in accordance with § 10, p. 2 from the Transitional and Final Provisions laid down in the Telecommunications Act. Access billing and charging, separate of Internet service charges, is done by the telecommunications providers.

### **10.3. Quality and prices for Internet services**

The provision of Internet access services in its two major forms – switched and leased line access - will be of primary focus on the Internet market during the

year 2000. Value-added services (information and directory services, electronic commerce and payments, Internet marketing and advertising) are as yet relatively underdeveloped and of limited offering. In the opinion of sector specialists, the main factors impeding wider entry of the e-commerce are, as follows:

- lack of stimuli for investment in value-added services, owing to the yet rather small number of Internet users;
- absence of an established credit system for electronic payments (the now existing electronic payment systems - ePay and BgP@y operate with debit accounts);
- nonavailability of specialized courier companies for delivery of the services.

Towards the end of the year, subscribers to switched Internet access will be able to use over 11,000 Internet access points on the territory of the country. This number has marked a jump by over 100 percent, when compared to the middle of 1999. BTC also offers 2 uniform telephone numbers for access from any chosen point on the territory of the country - 0134100 and 0134200, used at the charge of an ordinary local telephone call. The second telephone number ensures free pulse access at the charge of an Internet service, according to the pricing rate for 1 pulse. More than 20 ISPs started to provide digital ISDN switched access. RTC Ltd. and Mobiltel offer mobile Internet access to their subscribers. Broad practice gained the purchase of Internet access using prepaid cards. By unofficial data, an estimated 15 percent of all households use this kind of service. In billing switched access, monitoring focuses primarily on the duration of time consumption. Only single ISPs practice the application of traffic tariffs. A growth trend is noticeable in the offer of unlimited, in terms of time and traffic Internet access of unguaranteed quality to residential subscribers. The market saw the first provider offering free night access – Multicom, Sofia.

The marketed broad palette of subscriber schemes gives opportunity to the client for a choice of provider and subscription, which best fit his or her personal model. If he or she surfs often in Internet, it would be reasonable to select a subscription with a high installation fee but low usage charge. Users who access Internet incidentally may prefer a subscription without an installation fee and usage charges which are higher to a measured degree.

From the point of view of speed, stability, security and service level, the quality of Internet services is not yet a competitive parameter. Users rarely can obtain information for the ratio “number of subscribers versus installed modem ports”, channel capacity to ISP from a higher level, capacity of internal and external links, statistics of system access failures, etc. On the other hand, severe competition exists with regard to pricing and types of subscription. The users of Internet services have no choice of a telecommunications provider due to the monopoly status of BTC until the end of 2002. The tariffs for telephone services over the fixed network are subject to approval by the Minister of Transport and Communications and as yet, these do not incorporate discounts for bulk volumes consumption.

All national and the majority of regional ISPs offer access to Internet over leased lines. The normal practice is that the user leases a line directly from the BTC. Services are offered with a varying degree of guarantee for line capacity, mainly in the form of a monthly subscription. Traffic pricing is still offered only by a few

providers. Over 10 companies provide one-way or two-way satellite access to the web. The majority of ISPs prefer to market the leased-line Internet access by agreement and withhold from making public their tariffs and the quality of offered services. Thus, conditions for unfair competition between providers are created.

During 2000 persisted the trend for decrease in the average market price for switched Internet access (table 12).

**Table 12. Average market price for switched Internet access**

Period	Average market price (BGN)
1998 ã.	1,80
1999 ã.	1,50
I quarter, 2000	1,20
II quarter, 2000	1,07
III quarter, 2000	1,05
IV quarter, 2000	0,80

Note: The average market price is calculated approximately based on the tariffs for analog switched access for residential subscribers (VAT excluded) in a sample of 30 leading providers in Bulgaria. The wide introduction of access via Internet cards into the market accounts for the relatively sharp price decline during the fourth quarter. The average weighted price per hour for this service is around BGN 0,40.

The price reduction can be explained with the strong competition between Internet providers, coupled with the growing diversification in specialized offer packages, targeted at different subscriber groups. As yet, no discount for bulk consumption is offered on the market. Where adopted for practice by the ISPs, discounts are made for prepayment of services. It is expected that competition on the telecommunications market will influence positively the Internet access in Bulgaria, despite restructuring of the tariff rates for telephone calls and the price increase per 1 pulse for local access.

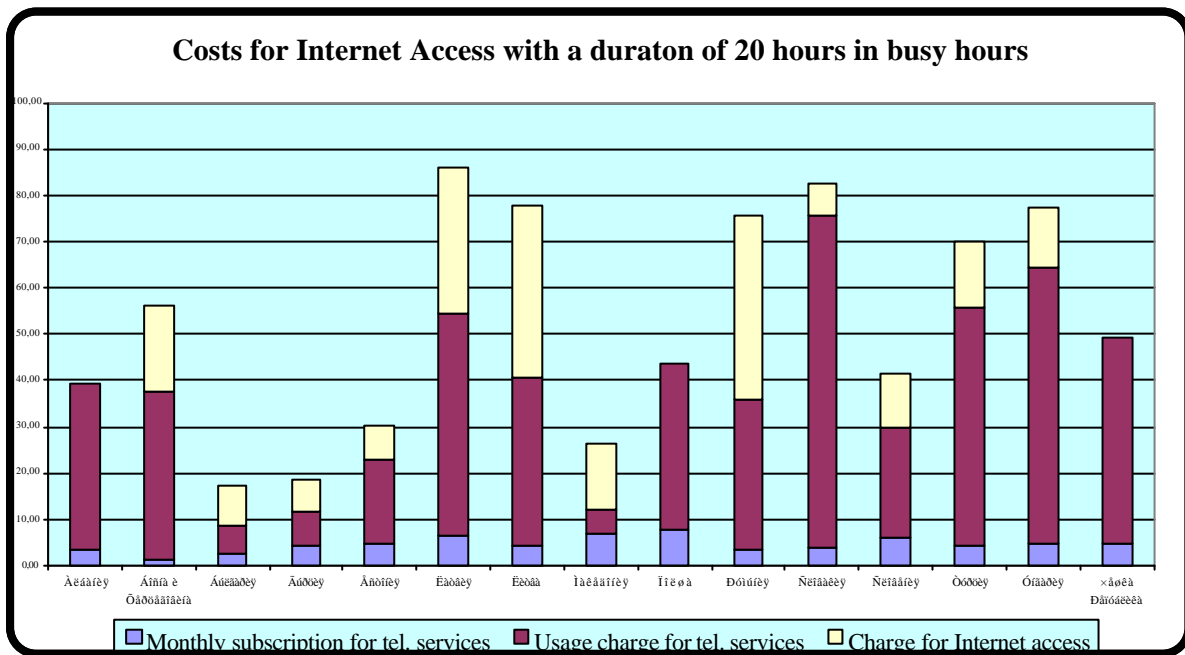
In accordance with the methodology entailing the consumer basket for residential subscribers, developed by the Organization for Economic Co-operation and Development (OECD), the factors which influence price formation and expenditures for Internet consumption, include:

- a fixed charge : a monthly subscription for telephone services for residential subscribers;
- a usage fee: the charge per local telephone call for connection to the ISP for residential subscribers;
- Internet access fee: the access charge by tariff of the incumbent national telecommunications operator, operating as an ISP, for the duration of the service under consideration (20 or 40 hour connection);



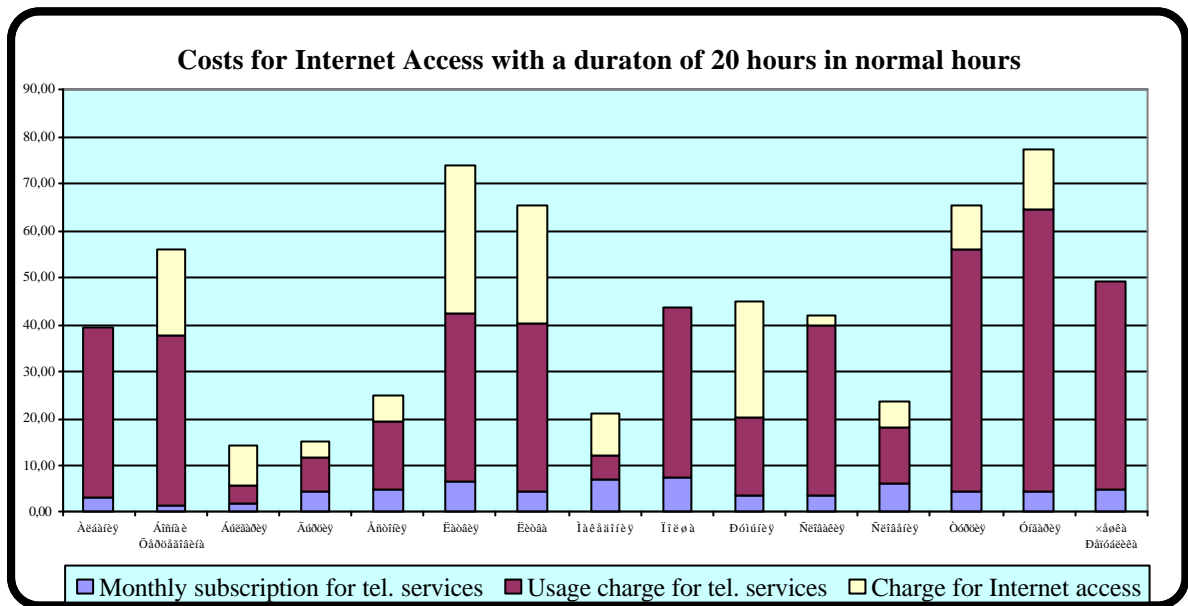
- discount schemes: the offered scheme for each of the selected consumer baskets;
- taxation levy: VAT.

Internet consumption has been framed out in time blocks, each consisting of 20 hours (fig. 21) and 40 hours (fig. 22). The usage charges are calculated for the peak traffic hours (fig. 21a and fig. 22a) and the normal hours (fig. 21b and fig. 22b), in accordance with the following rating: peak hour consumption is charged at the rate of 1 local telephone call at 11:00 h local time for all working days, while normal hour consumption is charged as a local telephone call made at 20:00 h local time, for all working days.



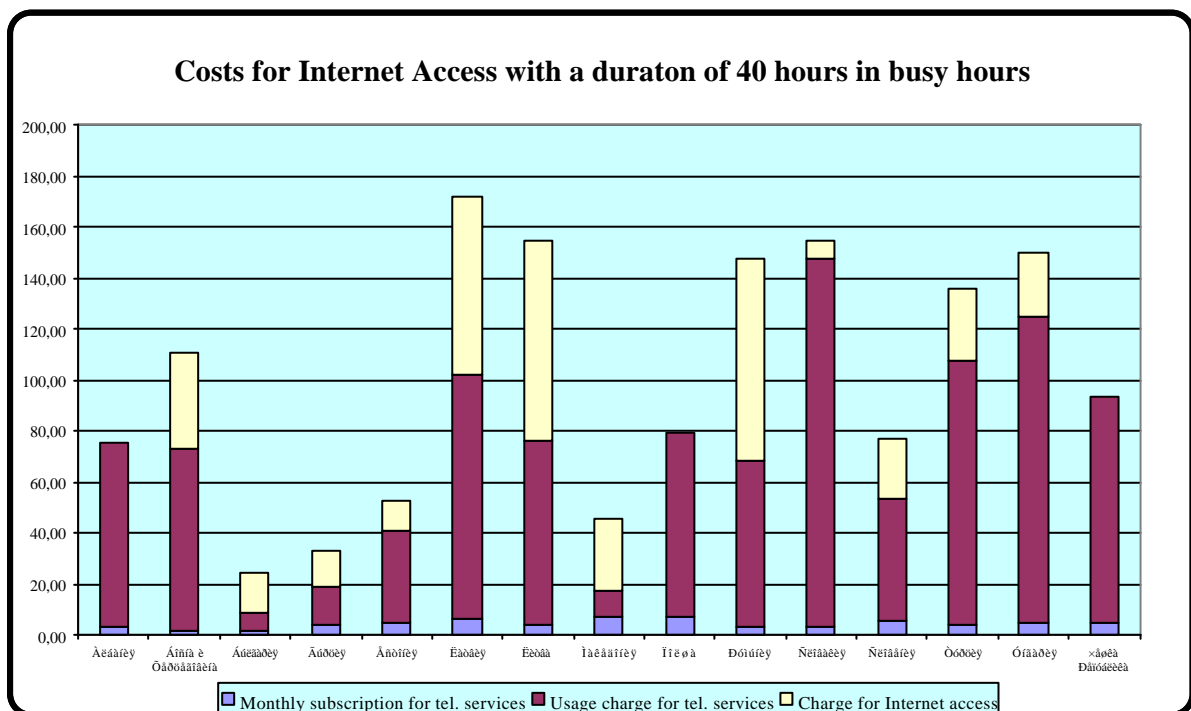
Sources: ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>), Internet Software Consortium (<http://www.isc.org>)

Fig. 21a



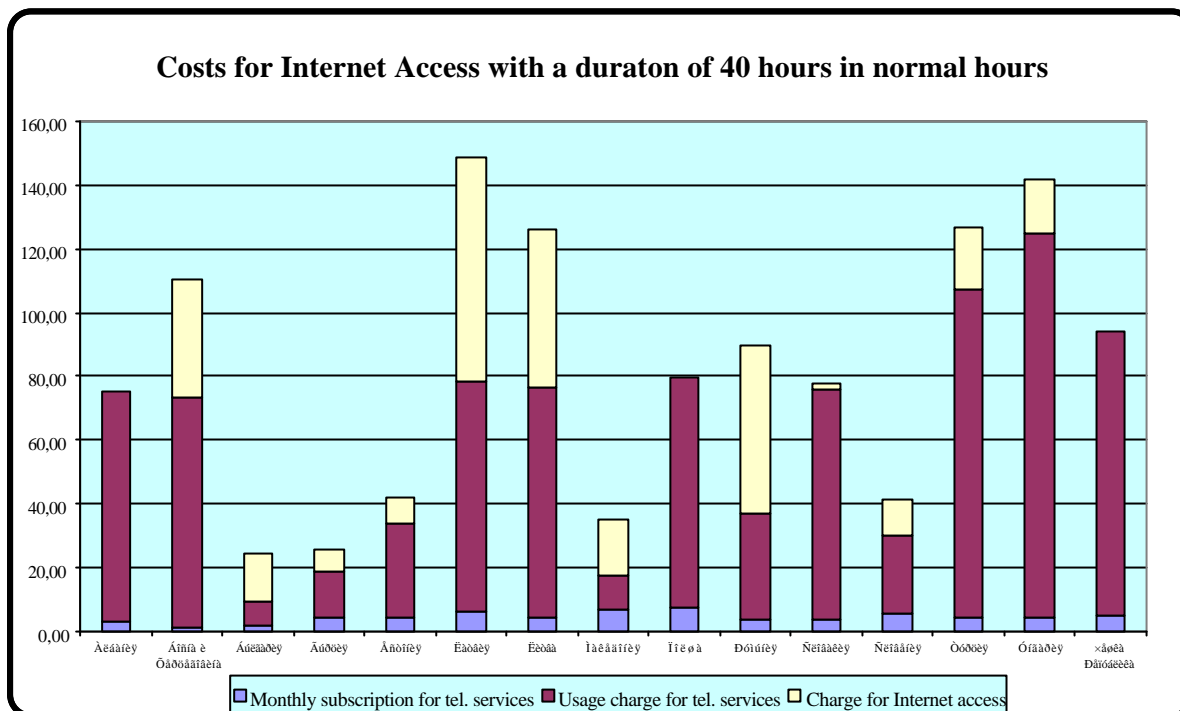
Sources: ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>),  
Internet Software Consortium (<http://www.isc.org>)

Fig. 21b



Sources: ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>),  
Internet Software Consortium (<http://www.isc.org>)

Fig. 22a



Sources: ESIS Knowledge Base (<http://www.eu-esis.org/esis2basic/esis2basic.htm>),  
 Internet Software Consortium (<http://www.isc.org>)

Fig. 22b

As can be seen, the costs for Internet access calculated on the basis of the OECD methodology, are lowest for Bulgaria. That may be interpreted as a good potential for future expansion of the market and a more accelerated introduction of value-added services.

#### 10.4. Restructuring of the Internet market. Investments.

In the year 2000 a process started for market restructuring and consolidation of providers. An influx of foreign investment already marks its presence on the Bulgarian market. The IBRD invested USD 1 million in Orbitel. The Austrian company Europronet became the owner of Specter Net, investing around USD 5 million. The company bought out the Internet business of Busoft-Burgas and Assi Company-Sofia and intends a merger with some of the smaller and viable providers. Foreign companies are holding negotiations for the purchase of shares in other Bulgarian ISPs – Lirex, ProLink, BOL. BG. In the sector of telecommunications emerged a new and powerful company – Cable-Bulgaria. Its owners are the investment companies Ganley Group – Ireland and the American Catamount Partners. The first owns 37.5% from Broadnet, one of the largest European wireless operators, and is founder of the most authoritative site for e-commerce with jewellery - adornis.com. Behind Catamount Partners stands Commodities Corporation, operating an investment capital of USD 4 billion and, in its turn, owned by Goldman Sachs, a leading bank institution (market capitalization estimated at USD 50 billion). Following acquisition of Union Television and Globo, Cable-Bulgaria became owner of the regional cable networks in 22 towns (125,000 households). The company

intends to invest around USD 50 million and take the lead in provision of high quality cable television services, including video on demand, digital television, multimedia, and quick cable access to Internet.

