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## 7. Satellite systems

The significance of the satellite systems is growing together with the ever larger scale of deployment of the networks and the increasing consumer needs for mobility.

Many are the advantages of the satellite communications. They have a high degree of physical reliability, independence from the terrestrial infrastructure, they provide for distribution of the traffic and solutions with significant volumes of information for large territories.

The satellite systems are most efficient in the following cases:

- The terrestrial infrastructure is damaged, destroyed or overloaded;
- Linking of networks deployed over broad territories;
- They provide compatibility and interoperability between entirely different systems and networks;
- They perform sound and/or television broadcasting over very large territories, such as a country, a region or a hemisphere;
- They provide the “last mile” connection in the cases, where no optical networks for interactive services are available;
- They provide mobile broadband and narrowband communications;
- Natural disaster or terrorist attack, since the optical networks or even terrestrial wireless networks can be destroyed by tsunami, earthquakes, etc.

In 2006 one new operator is licensed under individual license No. 112 to carry out telecommunications through a public telecommunications network in the fixed satellite service – BIKAM EOOD. At the end of the year eight out of eleven licensed operators have declared provision of commercial services.

The services provided by the satellite systems operators can be classified in the following way: transfer of radio and television signals and data transfer (for internet, etc.), where the strongest segment is that of the digital television. Five of the licensed operators offer wholesale services (these are BIKAM Ltd, LYMES CONSULTING Ltd, NETERRA Ltd, TELENOR BULGARIA Ltd and TRANSAT Plc), the remaining three provide services to end users (these are BULSATCOM Plc, INTERACTIVE TECHNOLOGIES Plc and BNT).

The main services of the wholesale market players include satellite distribution of television and radio programs with high signal quality through satellites to the territory of Bulgaria, Central and Eastern Europe, where the operators offer also an option for additional audio and text services, data transfer, provision of backup VSAT connectivity, internet connectivity and others. Apart from the main services, the operators also offer their clients other services such as design and construction of VSAT networks, supply, installation and maintenance of VSAT equipment, etc.

As for the end user services, the dominating segment is that of the satellite distribution of radio and television programs.

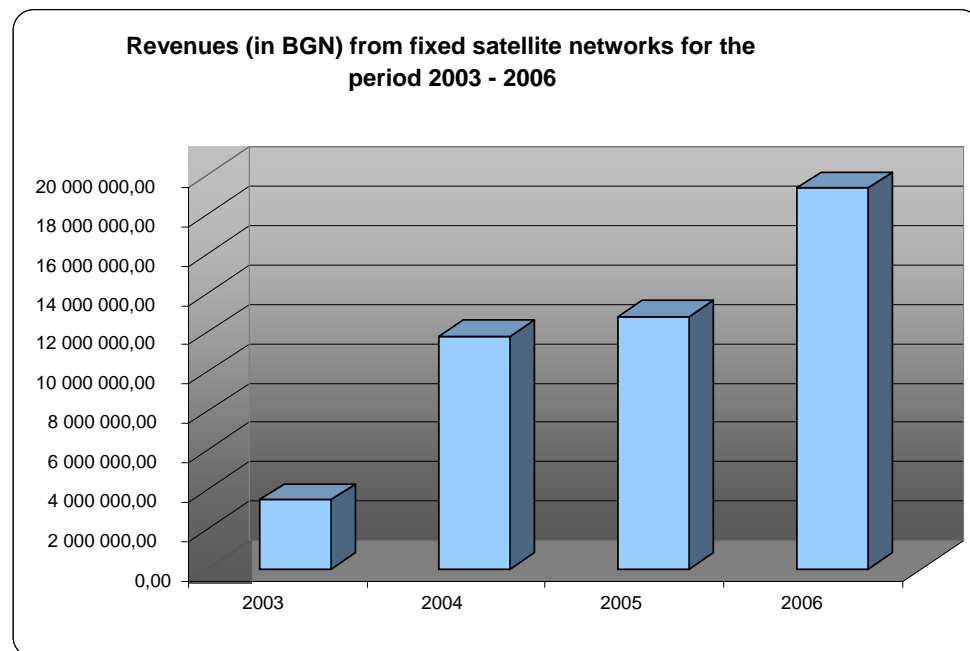
According to the data submitted to CRC the penetration of the service „digital satellite television” in the households is 3%<sup>1</sup>. For comparison, the penetration of the cable television is 41%. Despite the huge difference in the absolute values, the provision of digital television is gaining speed very rapidly – from the start of the service in 2003 until now the operators have doubled their subscribers every year.

The operators providing digital television offer a set of different digital radio and television program packages as well as paid programs and premium channels and also the service Pay Per View, which gives the consumers the possibility to pay via SMS or on-line for the access to certain broadcasts (films and sport events) after a one-time registration. This is the way to pay for certain transmissions which are not included in the subscription packages.

The volume of the market segment „fixed satellite networks” in 2006 amounts to 19,35 million BGN in total and has grown with 50,8% compared to 2005 (fig. 74). The growth is significant (in comparison with that for 2005 compared to 2004) and could be explained with the significantly increased share of the digital television in the segment as a whole<sup>2</sup>.

<sup>1</sup> The number of households, used for the calculation of this indicator, is from the last official census, 2001.

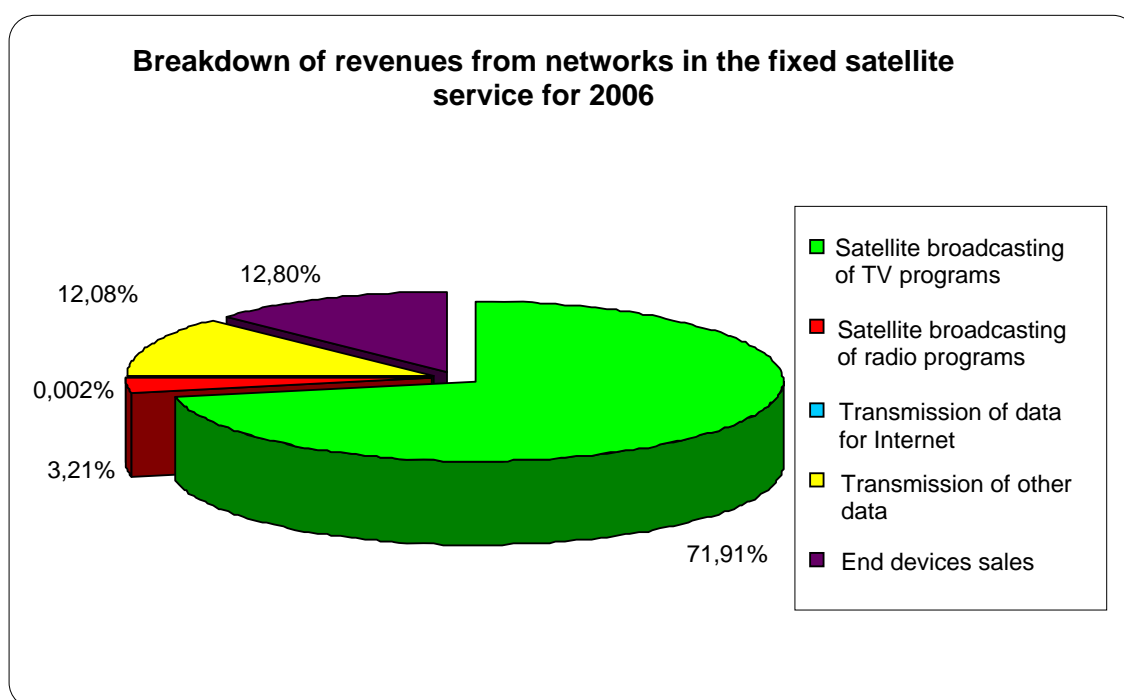
<sup>2</sup> The data for 2005 is corrected



*Source: Data provided to CRC*

**Fig. 74**

The distribution of the revenues according to the type of services provided through the licensed VSAT networks can be seen on the chart below (fig. 75).

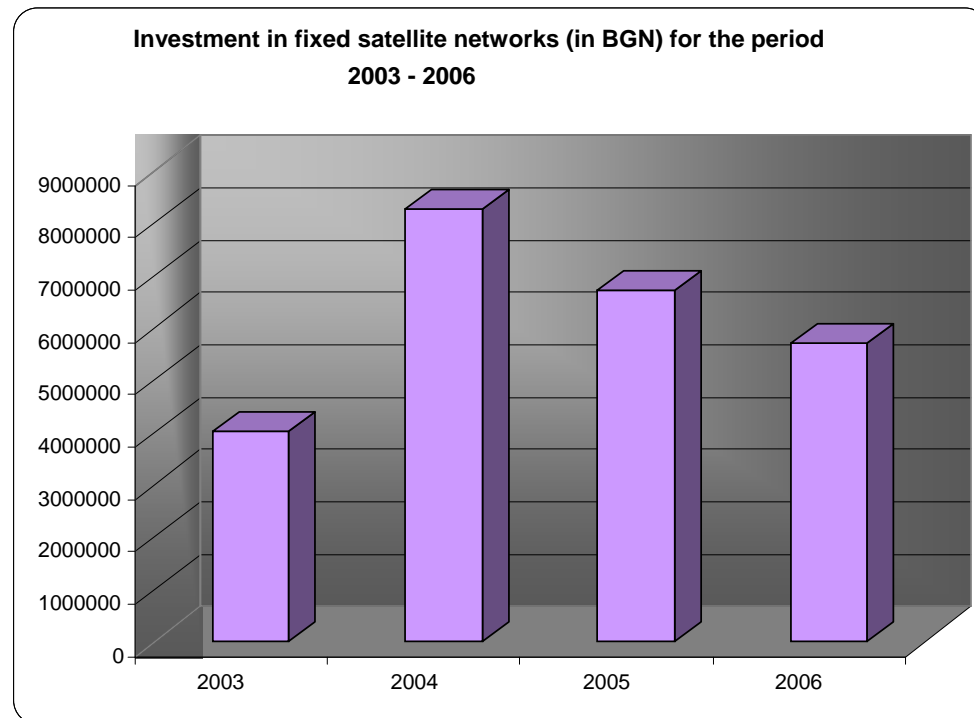


*Source: Data provided to CRC*

**Fig. 75**

The biggest share in the realized revenues is that of the satellite distribution of television programs – nearly 72% from the total revenues. A decrease is observed in the percentage of the revenues from distribution of radio programs - for 2006 it has decreased drastically - from 15% to 3,2%. The revenues from data transfer for internet constitute a negligible share - just 0,01 per cent. More than one eighth of the market revenues is formed by sales of terminal devices for reception of the provided services.

The operators have declared 5,7 million BGN investments in fixed satellite systems, which is 15% less in comparison with the investments for 2005 (fig. 76). The investments envisaged in the segment for the next year maintain their volume from the past year and amount to 5,9 million BGN.



Source: Data submitted to CRC

Fig. 76

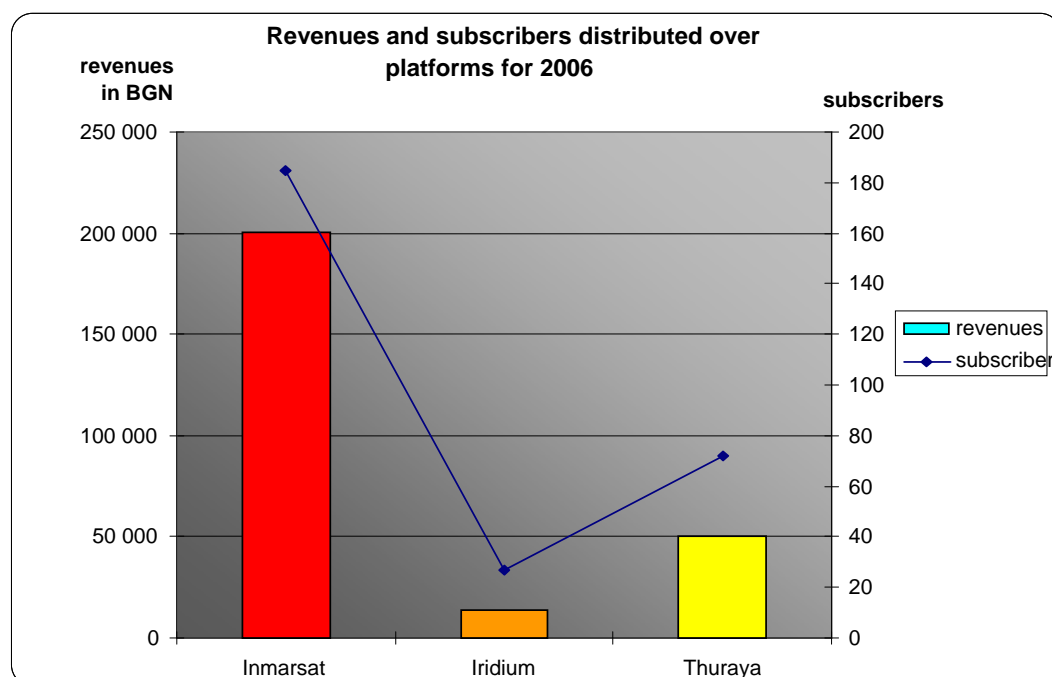
### Access to satellite systems

The satellite systems and networks are used in 4 main directions:

- Radio and television broadcasting of digital content to consumer groups and subgroups;
- Voice transfer - due to the low costs of the VSAT networks and the large capacity of the satellites at certain frequencies, the voice transfer over satellite is the cheapest and quickest way to access distant territories, where terrestrial equipment is missing;
- Data transfer and internet access;
- Mobile and personal communications.

In 2006 CRC has granted two new certificates for registration under General license No. 216 for provision of the telecommunications service access to satellite systems, to FORCE DELTA Ltd and to ELSACOM S.p.A. Plc, respectively. Three out of four registered companies have declared the provision of services under General license No. 216, namely ELSACOM S.p.A. Plc, SCORTEL Ltd and ET SKU-JULIA LAZAROVA but for the past year only SCORTEL Ltd has been a significant player (on a revenue basis) on the specific market segment. The main services provided by the company include supply of services and equipment for mobile satellite communications in the systems Inmarsat, Iridium, Thuraya, GPS management of transport vehicles, system integration of management information systems for the public city transport, etc.

According to the data submitted to CRC, in 2006 over 75% of the revenues in the segment are from provision of communications services for access to “Inmarsat”, about 5% - from provision of communications services via „Iridium”, and the rest – from access to „Thuraya”. The distribution of revenues and subscribers according to satellite systems is depicted on the chart below (fig. 77):



Source: Data submitted to CRC

Fig. 77

The low earth orbit satellite system Iridium provides connectivity on the move: for people, transport vehicles, aircraft, etc. The coverage is ubiquitous – simply line of sight is necessary (the coverage encompasses the oceans as well as the Polar Regions). The inter-satellite links between the separate satellites provide for reliable transfer of voice or data around the globe to an Iridium gateway or Iridium user.

Inmarsat is a project, which ensures global mobile satellite communications and provides full choice of mobile voice services and data transfer to almost each point of the Earth, irrespective whether it is on land, sea or in the air.

During the year Inmarsat strengthened its leading position in the segment of mobile satellite communications by entering the market of portable phones. The service is provided for the time being on the Asian market. It is expected the service to be provided in 2008 on a global scale as a result of the cooperation of Inmarsat with ACeS International Limited.

Thuraya is a geostationary mobile satellite system providing satellite communications services, cellular services (GSM), navigation services (GPS), transfer of voice, data, facsimile and short messages.

Taking into account that Inmarsat-4 and Thuraya are the satellite equivalent of 3G networks, it can be expected in the future the services provided over satellite will gain more and more importance on a global scale considering the intensifying trend for provision of services, irrespective of the location of the users.