

# Mobile Telecommunications Landscape in ACC and Western Balkan Countries

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**Abstract**— The last few years the telecommunication market in ACC and Western Balkan (WB) countries has experienced a rapid growth in terms of mobile operators and penetration rates of mobile telephony. An overview on the mobile telecommunications evolution in the emerging markets of the ACC and WB countries in terms of penetration indicators is analyzed in this article.

**Keywords:** *Mobile Communications Indicators, ACC, Western Balkans Countries*

## I. INTRODUCTION

Over the last decade all South Eastern Europe (SEE) countries (Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Former Yugoslavia Republic of Macedonia (FYROM), Greece, Romania, Serbia and Montenegro, Slovenia, Turkey), have started an effort that involves a complete transition of their political, social and economic structures in order to build a democratic political system and a free market economy. More than 130 million residents, with different languages and religious beliefs, populate the SEE region, which is situated at the crossroads of three continents and of numerous cultures and traditions. These transitional efforts being common for all of the countries there exist specific characteristics and particularities for each of them. Some of the countries, as Slovenia and Cyprus have fulfilled the criteria for joining the EU and are official members of it. Others such as Romania and Bulgaria, have achieved to accelerate both their development and their accession process to the European Union lacking though the vitality needed for the new global information economy. Croatia has been recently considered as an Accession country, while Turkey will probably start negotiations with EU on October 2005. Greece, even though geographically is a SEE country, politically and economically has been on a different path as a member of European Union.

Based on IST work program the mentioned countries can be divided in three categories, EU member states (Cyprus and Slovenia), ACC countries (Bulgaria, Romania, Croatia and Turkey) and Western Balkan Countries (Albania, Bosnia &

Herzegovina, FYROM\*, and Serbia & Montenegro). Since the telecommunications market in the countries of the EU member states is well analysed in several studies, this article focuses on the development of mobile communications and the particular characteristics of the mobile market in ACC and WB countries.

The last few years the mobile communications market in the majority of these countries experiences a rapid growth in exception to the other telecommunications infrastructure. This boom is due to the fact that wireless telephony has a cost comparable to the fixed and it is easier to be established in comparison to the fixed. Moreover, these countries hope that through mobile telephony they will be able to catch up the evolution in the telecommunication sector by leapfrogging some stages of development and decreasing in this way the "digital gap" between them and the European Union countries.

Even though there has been significant progress during the last years in ACC and WB countries, telecommunications infrastructure is still lagging in comparison with other developed countries. In addition, the existing regulatory framework is not adequate and in many cases it impedes further investment activity in the sector. The development of the mobile market in developing countries of other regions with monopolistic telecommunication infrastructure has similar characteristics. In one hand the mobile market in these countries includes the first commercial CDMA network in Europe (Zapp Mobile in Romania), but in the other hand it reports the first failure in the European mobile GSM market (Cosmorom in Romania).

Although work on the mobile telecommunication market in ACC and WB is limited, some authors have tried to analyze the telecommunications market environment in these countries. In [1] the Romanian telecommunications institutional reform, fixed and mobile telephony, cable TV and internet are analyzed. The authors in [2] present the status and future development plans for the Serbian telecommunications infrastructure, markets and industry. In addition, [5] summarizes the status and expected near-term developments in

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\* It is an applicant country

the mobile telecommunication industry in Turkey. The IST SIBIS project [6] analysed the ICT environment in New Member States including Bulgaria and Romania. Furthermore, the IST-MENTOR and the TRISTAN-EAST projects [7] presented a generic analysis on the ICT development in these countries. However, these reports do not analyse the particular characteristics of the mobile market in these countries. There is no evidence of articles about the mobile communications market in ACC and WB countries in order to understand the current and the future market development in cellular and fixed networks in these countries.

The remainder of the article is structured as follows. Section II presents the most important of the regional players in the mobile communications market. In Section III the mobile systems are presented while, the growth of the mobile communications in SEE is analysed in terms of penetration indicators in Section IV. A brief overview in the regulatory framework in SEE is given in section V whereas section VI intends to present the road to 3G in some of the SEE countries.

## II. REGIONAL PLAYERS

The constant growth of mobile market in these countries has drawn the interest of foreign telecommunication companies that have proceeded in important investments. Currently, forty-one mobile operators are active in the region. Hellenic Telecommunications Company (OTE) is the most important player of the mobile telephony in SEE as it can be seen from table I that presents the mobile operators in the WB and ACC countries, the mobile systems and the principal shareholders of each operator. OTE controls 100% of the mobile operator in Bulgaria, FYROM and Romania, while it is shareholder of the Albanian AMC and Telecom Serbian operators. Vodafone group is also an important player in this region operating in Greece, Albania and Romania, whereas Telecom Italia operates in Croatia and Deutsche Telecom operates in Croatia and FYROM (MATAV).

It is worth mentioning that in Romania the first failure in the European mobile GSM market is reported. Cosmorom, 100% owned by Rom Telecom (OTE), was the first GSM Romanian commercially launched operator in March 2000. At the end of 2003 Cosmorom had some 84000 subscribers, 11,4% less than a year before. Besides decreasing in subscribers, Cosmorom reported losses and had problems with loan payments.

It has to be noted that Kosovo, part of the Serrbia & Montenegro territory, which is under United Nations supervision, has established an independent regulatory body and it has launched two GSM licenses. Vala-900 is already been commercially operating since 2001. The second licence that was supposed to be given to a consortium of Mobitel from Slovenia and the local Mobikos was cancelled last July.

## III. MOBILE SYSTEMS

GSM (900MHz and 1800MHz) [8] is the most popular mobile system in the region, with over 80% of the subscribers. However, some other analogue systems, NMT450 and NMT900 operate in Bulgaria, Romania and Croatia. Since these systems are known they are not analyzed in this paper.

Early in February 2002 a new mobile service Zapp Mobile[4], based on Code Division Multiple Access (CDMA) 450, was launched in the Romanian market by Telemobil.

TABLE I. MOBILE OPERATORS IN ACC AND WB COUNTRIES

Country	Company Name	Status	System	Partnership
Albania	AMC	Private	GSM 900/1800	Cosmote Greece, Telenor ASA Norway, Government
	Vodafone	Private	GSM 900	Vodafone Group, Vodafone Greece
Bosnia and Herzegovina	BH Telecom	Public	GSM 900	Government
	Mobilna Srpske	Public	GSM 900	
	ERONET	Private	GSM 900	HTd.o.o. Zagreb, Hercegovina Osiguranje d.d. Mostar Insurance Company, Alpina Komerc d.o.o.
Bulgaria	Mobikom	Semi-Public	NMT450	Cable and Wireless, Bulgarian Telecom, Radio Electronic sys.
	Globul	Private	GSM 900/1800	Cosmote (OTE)
	MobiTel AD	Private	GSM 900/1800	Eastern Market Telecom, MCG Holding
Croatia	Vipnet	Private	GSM 900	Mobikom Austria, Vecernji List
	HT	Public	NTM 450, GSM 900	Hrvatske Telekomunikacije
Turkey	Turkcell	Private		
	Telsim	Private		
	Aria	Private		
	Aycell			
FYROM	Cosmofon	Private	GSM	Cosmote (OTE)
	MT	Private	GSM	Stonebridge Com. MATAV, Government, Finance Corporation,
Romania	Mobifon	Private	GSM 900	Vodafone Ltd
	CosmoRom	Private	GSM 1800	RomTelecom(OTE)
	Orange Romania	Private	GSM 900	Orange, AIG, Societe General
	Zapp Mobile	Private	NMT 450, CDMA 200	INAQUAM SA, others with less than 0.3%
Serbia & Montenegro	Telecom Serbia	Public	GSM 900	Government of Serbia, Telecom Italy and OTE Greece
	Mobtel Srebja	Private	GSM 900	BK Trade, Telecom Serbia
	Monet	Public	GSM 900	Government of Montenegro, PTT employees, Private MVP
	Pro Monte	Private	GSM 900	Telenor, other private owners, Government of Montenegro
Kosovo	Val-900	Private	GSM 900	

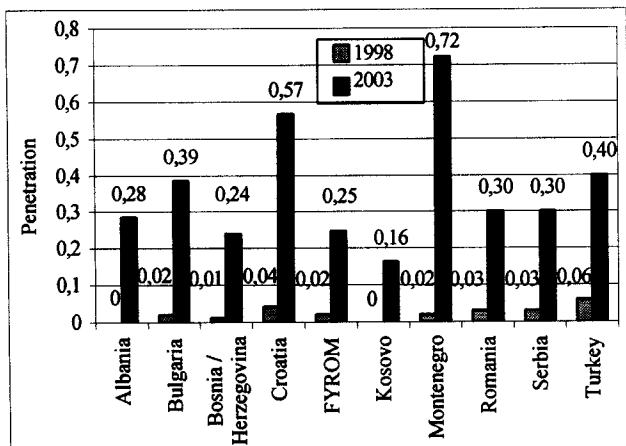


Figure 1 Mobile Communications in ACC and WB countries

approximately 60%, can be seen in FYROM. This is due to

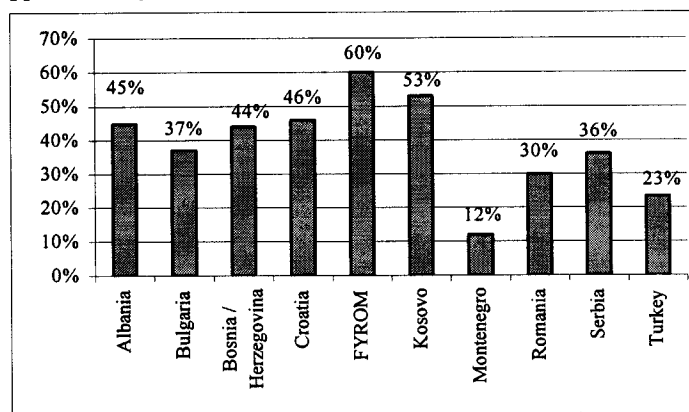


Figure 3 Mobile telephony growth from 2002 to 2003

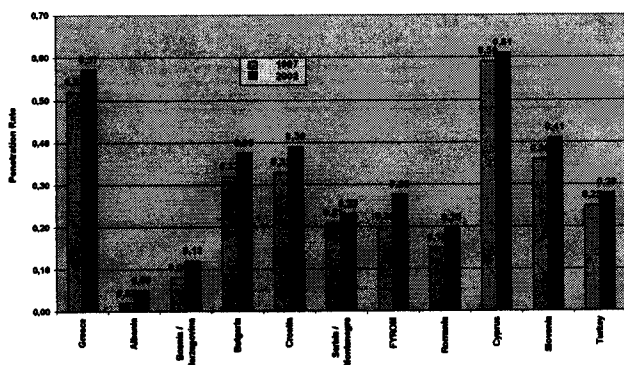


Figure 2 Fixed Communications growth in SEE

This system offers voice and data services up to 154kbps giving solution to the low PCs' penetration and the low development of Internet in Romania. The CDMA 450 implementation requires less investment than a GSM operator for a national coverage (US\$600-700 million for 95 percent of the Romanian population coverage). This fact gives to the Telemobil the opportunity to offer lower prices than the GSM competitors. Even though Telemobil has (at the end of the 2003) less than 3% of the Romanian mobile market. From the total number of clients, more than 80% are companies interested for the wideband facilities that the technology offers. CDMA 450 is currently the only technology providing an opportunity to enter the digital era for NMT operators in Eastern Europe. The Telemobil experiment (and a similar experience from SkyLink in St Petesburg and Eurotel in the Czech Republic) suggests that CDMA could target a niche market not competing directly with GSM addressing mainly corporate clients. The technology, using a low frequency range, is most likely to be deployed in rural areas. For regulators in Eastern Europe there is a field of investigation how to handle CDMA and TETRA.

#### IV. MOBILE TELEPHONY INDICATORS IN ACC AND WB

The rate of growth of mobile telephony in ACC and WB countries during the last five years is indisputable and in terms of figures in some countries like Croatia reflects an evolution from 4% to 57%, in Bulgaria from 2% to 39% and in Montenegro from 2% to 72% [9]. In the same countries the growth of fixed lines does not exceed 3% (Fig.2). The fact that these mobile penetration rates are low compared with rates in Western Europe indicates that the market has not saturated yet. This can be also seen in figure 3, where the growth of the mobile penetration from 2002 to 2003 is depicted. It can be observed that almost all countries have an increase in the mobile penetration higher than 20% in a year. The highest one,

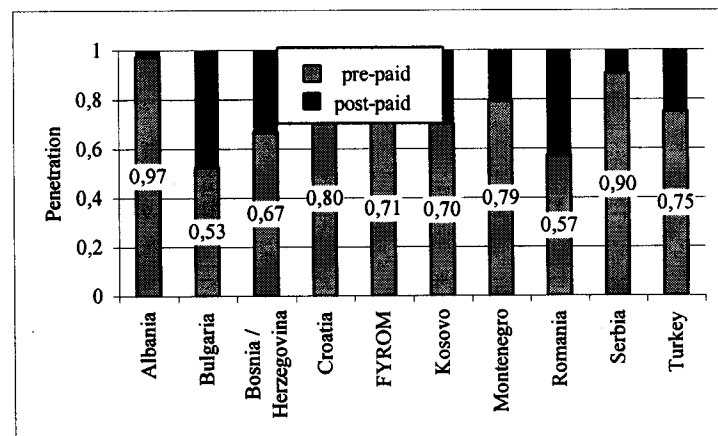


Figure 4 Post pre-paid penetration in ACC and WB countries

the lunch in the market of a second operator, Cosmofon. As a consequence, the competition between both companies has decreased the prices and has increased the offers to the clients. In spite of the low penetration in Kosovo, it seems that the mobile market increases very fast. The low growth in Montenegro's market is basically due to the high mobile penetration in this country and due to the dramatic growth during the last three years. To be more precise, the mobile penetration in this country has grown 36%, 54% and 67% respectively every year in the 2000-2002 time period.

The rationale for the expansion of mobile telephony in SEE countries should be found in the lower penetration of fixed telephony in rural areas, in the long waiting list and waiting time for a fixed line and the very low quality of fixed telephony services. Moreover, mobile technology permits faster rollout, while the cost for a mobile line seems to be cheaper in comparison with that for a fixed.

However a deeper analysis of the mobile market shows that in these countries the increase in the subscriber base is mainly due to prepaid services. All countries tend to have high percentages, more than 53%, of pre-paid telephony with respect to post paid as it can be seen in Fig. 4. That is the case for Albania, Croatia and Serbia/Montenegro where it corresponds at 97% and 80% and 90% of the mobile users respectively. The preference of people in pre-paid telephony, even though there is higher minute price, rises mainly from the better control cost and the high monthly contract fees of post paid telephony.

#### V. REGULATORY ENVIRONMENT

The explosion of the mobile sector in these countries can

easily be interpreted as a result of fast steps towards liberalization that the mobile market has made in contradiction to the fixed where the monopolistic situation still characterizes most of the countries marketplaces or wherever it has taken place is still in an early phase.

Nevertheless the gradual liberalization of these telecom markets should be followed by the establishment of an adequate regulatory environment. In order this to be achieved stimulating policies are being implemented which will foster telecom market. Towards this direction and under the framework of the European telecommunication Directive the majority of the SEE countries have proceeded in the creation of Independent Regulative Authorities like Albania, Turkey, Romania, and Telecommunication Councils like Croatia. The Bodies role, along with the relevant Ministry of the country, is to implement the best policy practices and support the development of a credible regulatory regime, which will boost investments in the telecommunications sector and promote public confidence in the telecommunication market through transparent regulatory and licensing processes. Serbia and Montenegro is an interesting case, as independent regulators exist in Montenegro (AGENTEL) and Kosovo (Telecommunication Regulatory Authority (ART)) but not in Serbia.

One of the most important aspects that the regulation authorities have to be looked at seriously even the fully liberalization of the market is the tariff and pricing policies. In some countries like Albania and FYROM whose price for mobile communication is high, the regulators have to revise them to make it more competitive. The other major challenges the Regulators Bodies in the region are currently facing reside in denoting the significant Market Players in the mobile market and reinforcing Universal Service Obligation.

#### VI. THE ROAD TO 3G AND THE FUTURE

At a European level, the Universal Mobile Telecommunications Systems (UMTS) are continuing their development, but the initial enthusiasm has subsided. This is most obvious during the conduct of tenders for licensing operators of third-generation mobile services. The tender prices that the telecommunications operators are inclined to pay are much less than those paid in 2000.

Although no UMTS licenses have been granted so far in Romania, the current trend in the market is to encourage a range of 3G technologies. The Romanian government plans to sell four 3G licenses, for which it intended to organize an international tender. The licenses will be valid until 2019. Each franchise will cost around USD 35 million for the freeing of the frequency spectrum. Spectrum allotted to 3G communications will be in the range of 1900-1980 MHz (currently owned by the Ministry of National Defence) and in the range of 2110-2170 MHz.

In Bulgaria, no UMTS license has been granted so far. The core frequency bands for UMTS (a total of 230MHz) are still occupied, so it is too early to plan releasing the additional frequency bands (another 160MHz). A schedule for a phased release of UMTS frequency bands is currently being prepared. As a first priority, frequency blocks of a minimum of 2x10 MHz in the frequency bands 1920-1980 MHz and 2110-2170 MHz should be available by mid-2003. Licenses for 3G operators are expected to be awarded by mid-2005.

Croatian Government is planning to launch UMTS in the mobile market after the award of the third GSM license. Croatia gave its first UMTS/3G licence to the third GSM operator for a total fee of 30,7 million Euro late in 2004. The

rationale was that the third operator would be reluctant to pay for another (3G) license in such a short period, as it might prove financially unfeasible.

Turkish authority does not yet have a concrete plan for licensing 3G. Although licences are expected to be granted in 2005-2006. However, a new National UMTS Co-ordination Committee was created in 2002 in order to prepare Turkey's mobile market for the introduction of 3G. For the future the main competition to 3G, but to GSM as well, is expected to come from WiFi & WiMAX technologies. Hybrid solutions of Satellite and IEEE 802.11x including VoIp will challenge the dominance of GSM/UMTS. The battle in ACC and WB will be played under different rules compared to the EU. It will be an interesting show.

#### VII. CONCLUSIONS

This article has highlighted the mobile communications situation in emerging markets like ACC and WB countries. It can be easily seen from the presented article that the mobile market in these countries has grown dramatically in the past five years. However the mobile market has not yet saturated, this means that more investments can be foreseen in the mentioned countries. As far as the future is concerned the constant upgrade of services that mobile telephony offers allow to think that its growth in the ACC and WB countries will keep up and the competition with the fixed one will be harder. The introduction, that has already started, of innovative services in mobile phones such as video and internet will bring big changes in consumer's everyday life.

#### REFERENCES

- [1] N. Oacă, "Mobile Telephony : The main Driver of Romanian Telecommunications" IEEE Communicaitons Magazine, Vol. 38, No. 8, pp.98-104, August 2000.
- [2] N. Gospic, M. Jankovic, and B. Odadzic, "Yugoslav Telecommunicaitons Markets: Vision and Potential", IEEE Communicaitons Magazine, Vol. 38, No. 8, pp.112-116, August 2000.
- [3] N. Oacă "A Wireless Balkan" Global Communicaitons Newsletter, August 2001.
- [4] N. Oacă "CDMA450-An alternative to UMTS in Central and Eastern Europe", Global Communications Newsletter, November 2002.
- [5] C. Evci, K. Ciliz, E. Anarim, B. Sankur "Wireless Networks in Turkey: A jewel in the crowd" Alcatel Telecommunications Review, 3<sup>rd</sup> Quarter 2004.
- [6] Statistical Indicators Benchmarking the Information Society (SIBIS)
- [7] Mentoring of IST Multipliers in the Newly Associated States (NAS) (IST-MENTOR) - Training of IST multipliers and Awareness Nurturing in the 3<sup>rd</sup> Countries of EAST and South East Europe (NIS) (TRISTAN-EAST-IST).
- [8] S.M.Redl, M.K.Weber, M.W.Oliphant, An introduction to GSM, Artech House Publishers, 1995.
- [9] International Telecommunications Union (ITU) Indicators: [www.itu.int](http://www.itu.int)