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Mexican Spectrum Auctions: Obligations, Commitments, and Promises

By C. Hirsch, Mexico

Since 1996 Mexico has implemented by law auctions as the only mechanism to assign spectrum even for private microwave links. Licenses are granted for 20 years, with the option of renewal for another 20-year period.

In May 1998, the wireless local loop (WLL) (3.4 GHz) and personal communications services (PCS) (1.9 GHz) auctions ended with eight winners bidding more than US$1 billion. The winners were required to pay 100 percent of their bids in September 1998. Six carriers met their commitments, but two failed, representing more than 40 percent of the auction results. These two companies received a six-month waiver and were still unable to pay; they received another extension until June 15, 1999. In the first half of 1999 one of them paid and the other failed. The company that had not paid yet (Midicel) committed to install two million fixed wireless lines in five years.

Why are we talking about this old story? Because the company that bid US$120 million and could not pay is still fighting in Mexican courts and trying to recover its frequencies. The Communications Ministry has a difficult decision, to strictly follow the rules or to continue giving credit to Midicel's promises, waiting for those huge investments that can boost teledensity. In Spanish there is a saying: "Promising does not impoverish you."

The Mexican fixed local market is still heavily concentrated, with Telmex having 12 million lines, and the WLL and wireline CLECs having altogether less than one million. On the other hand, competition in mobile services is healthy, with three cellular companies: Telcel with 11.8 million customers, Iusacell with 1.8 million, and Telefonica with 1.1 million; and two PCS companies: Pegaso with 650,000 and Unefon with 400,000. Today there are 15.6 million mobile subscribers compared to 12 million fixed line customers. In coming years all future growth and local competition will be based on mobile technologies, and fixed telephony will be used specially for broadband and business customers.

What is happening in Mexico is very similar to what is going on in other countries. Authorities have to choose between auctions or beauty contests. In the latter, the selection of winners is based on obligations, commitments, and promises. In fact, once the license is granted it is a very tough process to cancel it even if the operator has not accomplished what it promised. At this moment, everybody is talking about market forces, but falling into the temptation of ease and quick solutions based on false promises.

On one hand, there is general economic agreement on the regulatory beauty of the auction with no conditions. The company has to commit itself and risk its money, and in order to win frequencies they have to pay more than anyone else. After that, it is in the best interest of that company to make the most of its investment; and if there is enough competition in the country, this is exactly what will benefit the most consumers and society as a whole.

On the other hand, when a beauty contest is used, the evaluation is typically based on promises: "Tell me what you will do and I will choose the best offer." The main problem with this approach is that after two or three years, marketing conditions will change and it will be impossible to evaluate the results. The regulator will be in a difficult position to force the commitments or cancel the license.

The recommendation to regulators who grant spectrum concessions could be a simple rule: "Do not tell me what you will do; risk your money and try to make the most out of it."

In the July issue of the Global Communications Newsletter the author of the article entitled "APCC2000 (Asia Pacific Conference on Communications)" was incorrectly listed as Tomo Taniguchi of Japan. The author of that article was Hongbeom Jeon, Korea.

Dr. Paul E. Green Recognized by the Russian Popov Society

By Henrich S. Lantsberg, Russia

The Executive Board of the Russian Popov Society for Radioengineering,Electronics and Communications, a Sister Society of IEEE ComSoc, at its Meeting on April 4, 2001 in Moscow, Russia, elected Dr. Paul E. Green (recently retired from Tellabs and IBM Research) an Honorary Member of the Russian Popov Society with the following citation: "For great contribution to information theory,radioastronomy, communications and to the longterm beneficial cooperation between the IEEE and the Russian Popov Society."

It is a visible recognition of his election to the highest grade of membership in the Popov Society. Dr. Paul.Green,Past President of ComSoc in 1992–1993, has been well known in Russia since the mid-'60s for his pioneer radar investigations of planets carried out jointly by scientists of the MIT Lincoln Laboratory and scientists of the Institute of Radioengineering & Electronics of the USSR (now Russian) Academy of Sciences headed by Prof. Vladimir A. Kotelnikov, IEEE Life Fellow and winner of the IEEE 2000 prestigous Alexander G. Bell Award. Dr. Green is also known in Russia for his fundamental monograph on fiber optics.

Dr. Paul Green's Russian friends and colleagues send him their most sincere and friendly congratulations on this important achievement.

Mobile Communications Development in Central and Eastern European Countries

By Arturas Medeisis, Lithuania

Central and Eastern European (CEE) countries (Fig. 1) today present an interesting example of social, economic, and technical development. Developing for a long time behind the Iron Curtain of the Communist era, many CEE countries achieved significant levels of welfare in many sectors.

Unfortunately, these developments were based on apparently unhealthy economic principles, so after abolition of Communist rule the CEE countries were thrown back in their socio-economic development and faced a hard struggle on their way to liberal market economies, confronted by many transitional difficulties. All these processes also had a heavy technology impact since many old systems had to be replaced or renovated to comply with Western standards.

In particular, mobile communications were reserved by Communist regimes exclusively for military use, governmental offices, emergency services, and certain kinds of state-owned companies like railways and utilities.

Therefore, the few mobile systems existing in CEE were designed to cope with limited traffic and had no important functions such as airtime accounting, all of which made their later commercialization impossible.

Today, when most CEE economies are growing at an impressive rate, with annual GDP increases of around 5 percent on average and even up to 10 percent in some countries, this dynamically developing marketplace has become an excellent ground for telecommunication developments. Mobile systems, thanks to their quick deployment capabilities and advanced services, were the first new development in this yet-to-be-explored market.

Figure 1. *The Central and Eastern European region: A-Albania; BH-Bosnia-Herzegovina; CZ-Czech Republic; EE-Estonia; HR-Croatia; LT-Lithuania; LV-Latvia; M-Moldova; MC-Macedonia; SK-Slovakia; SL-Slovenia; YU-Yugoslavia.*

First Steps for Public Mobile Telephony in CEE

Liberalization of the CEE countries at the beginning of the '90s opened all roads for development of communications. Mobile systems were seen as a competitor even to fixed networks because of the relatively low teledensity in CEE (between 5 and 30 percent in different CEE countries).

But the early '90s were exactly the time when mobile technologies in Europe were moving from the first to the second generation (1G to 2G). So, having to make a selection for urgent deployment, CEE countries chose to initially install 1G networks, which at that time where already well established, cheap, and easily compatible with the analog public switched telephone networks (PSTNs) then prevailing in CEE.

In most CEE countries it turned out to be the Scandinavian NMT-450 system, with usually one nationwide mobile network installed in every country between 1991 and 1993.

However, those initial NMT-450 networks were not given a real chance to develop to a mature stage, because the Global System for Mobile Communications (GSM) standard was quickly gaining wider acceptance throughout Europe. So with a few exceptions (big countries like Poland, Russia), in most CEE countries NMT networks never managed to enroll more than a few tens of thousands of subscribers.

All this led to a situation where the newly established 1G networks, after two or three years, were quickly overridden by their mighty 2G digital counterparts. However, most of the early NMT networks still exist and are operational, although serving largely the old customer base or remote, scarcely populated areas where NMT-450 sometimes provides more cost-effective coverage. In some other cases NMT-450 networks were converted to serve different purposes (e.g., as a WLL solution for fixed subscribers in rural areas).

Country	GSM-900/1800 operators	GSM subscribers (February 2001)	Total GSM penetration (%)
Albania	1	30,000	1.0
Bulgaria	2	570,000	7.1
Croatia	2	915,000	19.0
Czech Republic	3	4,260,000	41.6
Estonia	3	545,040	38.9
Hungary	3	3,000,000	30.0
Latvia	2	382,500	14.8
Lithuania	3	470,000	12.7
Poland	3	6,795,300	17.5
Romania	3	2,430,000	10.7
Russia	Regional licences	2,235,000	1.6
Slovakia	2	1,293,700	24.3
Slovenia	3	1,155,200	57.8
Ukraine	4	210 000	0.5

Table 1. *GSM operators and subscribers in CEE countries (Source: European Radiocommunications Office).*

Mobile Communications Development in Central and Eastern European Countries

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Public Mobile Telephony Systems Today

Experience with the NMT networks taught CEE administrations one early lesson, which was that considerable advantage might be gained by allowing truly trouble-free roaming between many neighboring countries. So, in their selection of 2G technology, all CEE countries unanimously opted for the GSM standard.

Installation of GSM-900 networks in CEE started around 1995, and very soon GSM dominated the landscape of public mobile telephony.

An important element for successful development was the early introduction of wide competition. Competition increased even further with the licensing of the GSM-1800 systems.

In many CEE countries the licensing of GSM-1800 was arranged in such a way that licences were given to existing GSM-900 operators plus one or two newcomers. Table 1 shows the number of operators of either GSM-900 or GSM-1800 or both in different CEE countries, together with their subscriber numbers and total penetration statistics.

Today many GSM-900/1800 operators strive to further improve their networks and services, regarding both commercial aspects (new services, variety of tariff schemes, etc.) and technical elements (better QoS, coverage, etc.). However, the most important developments in 2G networks today concern the introduction of new communication protocols and platforms, allowing increased transmission speed and new operation modes, thus paving the way to 2.5G and 3G services.

.C.ountry	IT investments per capita (US$)	PC penetration rate (%)	Internet penetration (%)
Slovenia	165	25.0	13.0
Czech Republic	152	10.7	8.0
Hungary	120	n.a.	11.0
Poland	61	13.7	6.0
Estonia	n.a.	6.9*	13.0
Latvia	n.a.	9.1	4.4
Lithuania	63	5.9	3.0
Slovakia	74	n.a.	4.0
Russia	17	n.a.	0.4
Bulgaria	22	3.7	2.5*
Romania	11	2.8	2.8
Western Europe	549	27.7	21 (UK only)

*Residential users only

Table 2. *Investment and penetration statistics of the IT market in CEE countries in 1999 (Source: Prime Investment/IDC, 2000)*

Here the similarities stop, since different operators select different technologies, notably either high-speed circuit-switched data (HSCSD) or its packet-switched rival, General Packet Radio Service (GPRS). Although trials and implementation of these technologies started by the end of 1999 or the beginning of 2000, up to now there have been no reports of their being a big commercial success, and users so far seem to limit their mobile use to voice and short messaging service (SMS).

At the same time, some operators have claimed that both HSCSD and GPRS appear to be tough to implement, even causing operational disruptions in networks. Apparently, introduction of the new data transmission technologies would require major reconfiguration of the networks, and hence much more time would be needed to begin successful commercial use. However, the market itself seems not quite ready to accommodate the new services yet.

3G Developments in CEE

Fast development of GSM networks attracted much attention to the mobile telephony market in CEE. Now everyone appears confident that multimedia capabilities of 3G networks would bring even more benefits and further boost the mobile penetration as well as the overall IT market (Table 2).

CEE countries have already confirmed their commitment to the implementation of the harmonized European standard for 3G, known as the Universal Mobile Telecommunication System (UMTS). However, how to award UMTS licences appears to be less than clear to administrations of CEE, and little harmonization is likely to be achieved in this field.

Until very recently, most CEE countries issued mobile licences by means of the so-called beauty contest procedure. Only Slovakia and Slovenia have so far used some form of auction to licence mobile spectrum. However, this peaceful scenery was spoiled by news from the famous UMTS auction in the United Kingdom, echoed by the also quite successful German auction. This gave rise to a new way of thinking, and many CEE finance ministers hooked onto the bright idea of improving their less than plentiful state budgets.

Today many CEE administrations are considering the possibilities of selling 3G spectrum in their countries by means of auctions. One of the most interesting examples could be the initiative discussed initially between the three Baltic states (Estonia, Latvia, and Lithuania) to issue UMTS licenses in a combined regional auction, thus increasing the size of the potential market and provoking higher license prices.

However, all this talk about money seems to fade away slowly as less optimistic news has now started flooding in about the latest UMTS licensing failures (e.g., in Italy and France) and the financial troubles of operators that have paid huge amounts of money for UMTS licences in the United Kingdom and elsewhere.

A similar failure with 3G auctioning in CEE happened in Poland, where five UMTS licences had to be issued by the end of 2000 in a combined beauty contest/auction arrangement. However, by the prescribed deadline only three existing Polish mobile operators had registered and were given licenses at a fixed price of around $575 million each, payable over a few years.

Probably with this example in mind, the Czech Administration recently recommended to its government the issuing of three UMTS licences to incumbent mobile operators at a fixed price of $135 million. The Czech government still hopes to sell one additional UMTS licence through open auction, with the same initial price tag of $135 million. But even this seemingly moderate approach has been challenged by incumbent mobile operators, who claim that the price is too high,

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Mobile Communications Development in Central and Eastern European Countries

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and that the issue of an additional licence should be delayed at least until 2004–2005 to give existing operators more time to develop their networks.

The Russian Scenario

The Russian Federation is obviously a market in itself and therefore probably deserves a few separate words.

The situation in the mobile market in Russia today is very controversial and differs significantly from that in the majority of CEE countries. Right after liberalization, Russia took a twofold approach to standardization of mobile technologies. Some systems were given federal standard status, which allows unlimited licensing and deployment anywhere in the Russian Federation. These federal standards include European standards NMT-450 and GSM-900/1800.

On the other hand, the Russian administration decided to allow other mobile communication technologies, coming from different regions of the world, by giving them regional standard status. Among these could be mentioned such technologies as AMPS, D-AMPS, and even CDMA (IS-95). The conditions of their use are such that operators of AMPS/D-AMPS are given licences to operate their networks only in a particular region, and no automatic interregional roaming is allowed.

CDMA systems are officially allowed on a regional basis and only for provision of WLL services to fixed subscribers. However, because of the inherent mobility features of their systems, CDMA operators reportedly allow mobile users into their systems, thus raising many a hot debate over illegal competition. Anyway, CDMA users today account for a negligible fraction of the Russian mobile market, which was reported to have reached 3.4 million subscribers by the beginning of 2001 (source: Sotovik.ru).

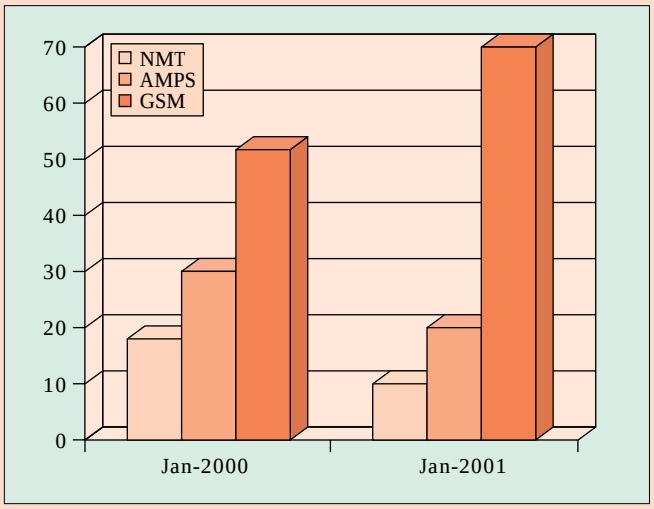

Figure 2. *The splitup of the Russian mobile market into different standards (source: Sotovik.ru).*

Regardless of this mixup with standards and many regional operating companies, the Russian mobile market shows constant growth (more than 152 percent over the last year) and also a certain preference for GSM technology. So while at the beginning of 2000 GSM subscribers accounted for 52 percent of the total number of mobile users, by the beginning of 2001 GSM already occupied 70 percent of the Russian mobile market (Fig. 2). The last important market statistic to mention is that the Moscow metropolitan area alone accounts for around 60 percent of all mobile users in Russia.

Conclusions

The CEE market today is little explored by outsiders, probably because of inertia caused by its long isolation and the currently poor performance of its national economies.

However, the well-developed education system, good record of engineering achievements, and skilled human resources provide this market with a significant potential in technological areas, which is yet to be unleashed to its full extent in coming years.

Within the area of mobile communications CEE countries have taken one good approach in the general adoption of harmonized European standards for their networks, which made it possible to overcome the many difficulties of small fragmented markets. Today mobile communications in CEE countries are keeping truly abreast with the latest developments in the rest of Europe, showing impressive mobile penetration figures.

The only difficulty that telecommunications professionals in the CEE could not possibly have foreseen was that the national economies unfortunately could not restructure and develop as quickly as they can develop their networks.

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