■ Mobile Telephone Service (MTS)

This chapter contains the MTS's state at the end of 2007 and describes namely this service's offers, its usage and user's profiles and its evolution during that year.

Below is a summary of the main items of this service's evolution during that year.

Main items of the evolution in 2007

At the end of 2007, MTS's penetration reached 126.7 per 100 inhabitants, one of the highest among the EU countries. MTS's penetration in 2007 is still above the EU average, ranking 7th among the 27 EU countries. However, service penetration growth was below the EU average.

According to the Electronic Communications Consumer Survey of December 2007, about 89.8 per cent of those residing in Portugal were MTS's customers.

In 2007 there was a considerable increase of UMTS users. At the end of the year these users already stood for 23 per cent of the service's overall amount of subscribers, Portugal ranking 2nd in the EU15 countries in UMTS penetration.

The first alternative service provider based on the network of a mobile operator came about in Portugal during the year under review, and the launch of a tender for granting another service provider licence and to grant licenses to mobile trunking service operators, should they request it, were studied. In the meanwhile, this tender was launched in 2008. It may thus be possible to reduce concentration in these markets, which is above the European average, according to the available information.

The voice services' usage level also recorded a larger growth versus the previous year (5.8 per cent in terms of calls and 9.6 per cent in terms of minutes). This is a higher growth than the recorded averages of the latest years, although below that of other EU countries and below the increase recorded in the amount of subscribers in Portugal.

2007 recorded once more a significant increase in the amount of sent text messages. It grew 48.1 per cent since the previous year. This increasing SMS trend, which began in mid-2005, was fostered by the mobile operators' promotional campaigns. It should be mentioned that, according to the available data, Portugal registered one of the highest SMS traffic growth levels.

Operators have launched new services and facilities based on UMTS and on HSPA. MMS and video-telephony had a residual development. Mobile TV, which increased the amount of available channels and the diversity of offerings, and mainly broadband Internet access, which took benefit from the launch of new offerings and of the Government's initiative within the scope of Information Society development - New Opportunities - showed considerable growths. The penetration of broadband Internet access reached 6.2 actual users per 100 inhabitants at the end of 2007.

Customer service's revenues reached 2.4 billion Euros, a figure that is slightly above that of the previous year. The registered growth occurred mainly in data services, particularly Internet and mobile portal access, and on SMS. The service's revenues may have been affected by the drop in international roaming prices, further to the entry into force of the Community Regulation on this matter.

MTS offer

MTS is a public electronic communications switched service that enables signal transmission using terrestrial electronic communications networks. The access network is made up of radio means and the terminal equipment is mobile.

The service is provided by the entities with the corresponding licences, since frequency use depends on the granting of individual rights of use[17].

Below is a detailed description of the services provided and of the entities offering theses services in Portugal.

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17 Cf. no. 3 of article 19 of Law no. 5/2004 of 10 February.

MTS

The first generation (1G) of the mobile service was exclusively designed for voice communications. It used analogue signals and a transmission technique based on Frequency Division Multiple Access (FDMA)[18]. This transmission technique allocates a frequency band to each channel. 1G can thus be identified with the analogue systems; voice was the single service it provided. In Portugal, this service was provided by TMN since 1989 and terminated on 30 October 1999.

The second generation (2G) uses the European Telecommunications Standards Institute's (ETSI) Global System for Mobile Communications / Digital Communications System (GSM/DCS) standards. It operates in the 900 MHz (GSM) and 1800 MHz (DCS) bands, using digital technology and providing access to low rate data services (e.g. fax and e-mail), besides voice. 2G enables the development of data transmission services and uses a more effective technique regarding spectrum use, based on Time Division Multiple Access (TDMA)[19].

GSM, which also made international roaming possible, has had a huge success as a wireless technology and a previously unseen history of international acceptance. GSM networks had a very fast and broad geographical roll-out and are currently in around 218 countries and territories. Currently, GSM technology is used by 1/4 of the world population and stands for about 80 per cent of mobile communications technologies worldwide[20].

Besides voice services, it should be particularly mentioned that GSM made it possible to develop the SMS[21] text messages service, a feature making it possible to send and receive small text messages, with alphanumeric characters, among mobile phones.

The technical specificities of this platform (narrow band) and the limitations of terminals (small screen, keyboard, autonomy, and limited memory and data processing), although they made large scale mobility possible, did not give mobile Internet access the same speed as that of a PC connected to a fixed telephone network. The GSM platform was however perfected and developed to encompass a progressively broader offer of voice and data services.

Within this framework, several manufacturers united their efforts in order to define a protocol that could be used by all mobile communications systems. This protocol, named Wireless Application Protocol (WAP)[22], made a standardised communication between a mobile terminal and a server at the mobile operator network possible. However, this protocol, even if it brought about some improvements to mobile Internet access, did not have a broad market acceptance, per se. Among its main limitations are the slow access to the required information and the need for a very specific and non-diversified content offering.

The limitations of the above-mentioned standards led to the development of the mobile networks' 2+ generation. Thus the introduction and development of GSM-based technologies aimed at supporting data services, such as GPRS[23] and Enhanced Data for GSM Environment (EDGE)[24], which make it possible to provide higher quality mobile data services, both in terms of processing capacity and speeds (from the 9.6 kbps transmission rates, available on GSM networks, to rates as high as 115 kbps, with error protection and 384 kbps), and some multimedia service

Since 2001 and 2002, respectively, within the scope of the service features, mobile operators have offered EMS (Enhanced Messaging Service) and MMS (Multimedia Messaging Service). EMS is an enhancement of SMS, very similar to it regarding use, includes sending and receiving graphic elements/logos or sounds, combines melodies, images, sounds, animations, altered text and regular text in an integrated fashion. MMS, such as the name indicates, is a feature for sending and receiving messages that include text, sounds, image and videos. This is how it became possible to send moving messages and videos.

18 Interference-free access system that grants different frequencies to each user for access.
19 Interference-free access system in which several users simultaneously access a single radio frequency by parting it into channels (time slots). Unlike FDMA, this system multiplies the frequency's capacity by dividing its use in time.
20 According to GSM Association/Wireless Intelligence, there were 2392.76 million connections to GSM networks in the first quarter of 2007 (http://www.gsmworld.com/news/statistics/index.shtml).
21 This service was created during GSM standard's Phase 1.
22 It is a wireless application protocol that uses a specific language and technology, giving mobile telephone users and those of other wireless digital devices the possibility to access Internet contents, exchange e-mail or perform other data transmission operations. It is particularly used in mobile communications networks. Thus, with a micro-browser, it is possible to view pages on the mobile telephone screen that are written in a special language, named WML (Wireless Mark-up Language), more adequate than HTML (Hypertext Mark-up Language, the most common-place computer language on the Internet) to send data to wireless devices.
23 Evolution of the GSM system, based on packet-switching, which makes it possible to reach transfer speeds of up to 115 kbps.
24 Evolution of the GSM system that makes it possible to reach transfer speeds of up to 384 kbps.

GPRS networks also make it possible, in an "always on" mode, to send and receive data at much higher rates than those of the traditional GSM, giving access to the Internet and to search facilities in coloured-screen terminals, with mobile e-mail, visual communications, multimedia messages and location-based services.

Also the fact that data communications is possible with no need for a voice channel makes it possible to set up tariff schemes based on amount of data and no longer on the length of communications.

It should also be mentioned that some important features were also introduced in the MTS, by regulatory means – indirect access (available since 31 March 2000); and operator portability (on 1 January 2002).

The third generation (3G), also digital, was designed for the convergence of fixed and mobile communications, and multimedia, by making mobile networks closer to fixed ones regarding capacity, and giving mobile users access to multimedia services at 384Kbps rates and above, for voice and data services.

Among the third generation mobile telecommunications systems, UMTS (Universal Mobile Telecommunications System) stands out, in the 2GHz band, and is identified as the European standard within the global family of mobile international telecommunications systems standards (IMT2000/UMTS).

The UMTS technology uses the Wideband Code Division Multiple[25] (WCDMA) transmission mode, which is based on a multiple access by code division. Although it is different from those of the GSM/GPRS networks, this technology – which requires the development of complex networks and systems – was designed to be fully GSM compliant. The number of WCDMA subscribers all over the world was supposed to be close to 179 million by the end of 2007, standing for an 82 per cent annual growth[26].

UMTS makes the offer of advanced mobile multimedia services possible, regardless of the user's location, making way for the development of new services and applications: Internet-based services, e-commerce, location-based services, sending photos directly from cameras (using the Bluetooth protocol), live video feeds, remote monitoring of people and vehicles and download of games and music.

Current mobile phones have countless functions: beyond phone calls, they give access to a variety of services that increase the flexibility of mobile communications – call-on-hold, call holding, call re-routing, caller ID and data services standing out. The microelectronics on which the software for these applications is based also makes it possible to include in the mobile phone a digital camera, an FM receiver, and an MP3 music player, amongst others.

During 2004, and further to the delays in connection with the difficulty in stabilising the technology, a set of new 3G mobile services based on IMT2000/UMTS (WCDMA) were introduced.

3G-based commercial services – namely broadband Internet access, video call, multimedia services, etc… – were introduced in January 2004, on an experimental basis, and were commercially launched by TMN, Vodafone and Optimus, respectively, on 21 April 2004, 4 May 2004 and 4 June 2004.

Services based on the HSPA (High Speed Packet Access) standard, often referred to as 3.5 G, started to be introduced after 2006. This is an extension of WCDMA enabling considerably higher speeds. It includes improved modulation schemes enabling a better use of UMTS's bandwidth.

Regarding downlink – HSDPA – services using this standard may theoretically reach maximum rates 14.4 Mbits/s. However, the currently installed systems and terminals can only hold rates up to 1.8 Mbits/s, 3.6 Mbits/s or even 7.2 Mbits/s, while typical rates are in the 0.5 to 1.5 Mbits/s range. For operational reasons, some providers introduce a lower limit that the maximum one that terminals can transfer. Currently, over 70 networks worldwide support HSDPA.

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25 Broadband Access system which access discipline to the various users shares the same frequency band through different codes assigned to each one of them.
26 http://www.gsacom.com/news/statistics.php4.
27 Short range radio technology in the 2.4 GHz frequency band, used to ensure connectivity among devices at the user's facilities, within approximately 10 metres, with a maximum throughput of 1 Mbps. It may evolve, in the future, to 6 to 11 Mbps maximum throughput and a 100-metre range.

On the uplink, HSUPA can hold up to 5.76 Mbits/s and the first commercial networks emerged in 2007. The Finish operator Elisa released HSUPA at 1.4 Mbits/s on major cities and plans to broaden the service to its entire 3G network within a few months. The first development can hold up to 1.5 Mbits/s. The investment needed to develop HSPA networks is mainly made up of low cost software upgrades that can lead to a decrease in the average cost per transferred bit on mobile networks.

In Portugal, offers based on HSDPA were introduced in March 2006 with a 1.8Mbps rate. In September, rates evolved to 3.6Mbps using, besides PCMCIA cards, USB connection modems. In November 2006 there was an evolution towards 7.2Mbps rates. HSUPA-based services were implemented in September 2007, with the offer of cards enabling upload rates up to 1.4Mbps.

MTS providers

The MTS was first marketed in Portugal in 1989 by a consortium made up of CTT - Correios de Portugal S. A. and Telefones de Lisboa e Porto (TLP). Only later, on 22 March 1991, was TMN – Telecomunicações Móveis Nacionais, S.A. set up. The provided services used the analogue C-450 technology.

In March 1991 a public tender to grant an MTS license using GSM technology took place. That license was awarded to Telecel – Comunicações Pessoais, S.A. on 18 October 1991. The service's commercial offer began on 18 October 1992.

On 20 July 2006[28], ICP-ANACOM's Board of Directors decided to issue the renewal of the right of frequency use to Vodafone Portugal, following the corresponding request, in compliance with article 36 of Law no. 5/2004 of 10 February. This title was renewed for 15 years, ending on 19 October 2021.

TMN's operation license was issued on 16 March 1992, with excuse from public tender, in accordance with the exceptional rule of article 19 of Decree-Law no. 346/90 of 3 November, as changed by Decree-Law no. 147/91 of 12 April. TMN began offering its service in October 1992. 15 years after, TMN requested, within the legal deadline, the renewal of the right of frequency use granted for the provision of the Mobile Telephone Service (MTS) according to the GSM 900-1800 technology system. After analyzing TMN's request, ICP-ANACOM's Board of Directors decided on 28 February 2007[29] to renew the right of frequency use granted to TMN for the provision of the MTS according to the GSM 900-1800 system, for 15 years, setting its end on 16 March 2022. General conditions in connection with the service's offer and conditions in connection with the right of frequency use were also established.

On 15 July 1997, Notice No. 3542-A/97 (II Series) was published, for the opening of a new tender to grant a license for the provision of the land mobile service in accordance with the GSM and DCS standards and using the 900 MHz and 1800 MHz frequencies, respectively. Further to that tender, a license was granted to Optimus - Telecomunicações, S.A.. Optimus began its commercial offering in August 1998. It should be mentioned that a determination of 24 October 2007 approved the final decision concerning the authorization request for transmitting the rights of frequency and numbering use granted to OPTIMUS to the ownership of NOVIS[30].

In August 2000, a tender was opened for the granting of four national licenses for the International Mobile Telecommunications Systems (IMT2000/UMTS). In December the results were announced. The four licenses at stake were thus granted to Telecel – Comunicações Pessoais, SA (currently Vodafone), to TMN – Telecomunicações Móveis Nacionais, SA, to OniWay – Infocomunicações, SA and to Optimus – Telecomunicações, SA.

3G commercial offerings were launched in Portugal on 21 April 2004, 4 May 2004 and 4June 2004, respectively by TMN, Vodafone and Optimus.

The fourth operator that was licensed for this system, OniWay, did not begin its mobile telecommunications activity and its license was formally revoked in January 2003 by Order of the Minister of Economy (Order No. 1758/2003 of 29 January). On 4 October 2007, a tender was opened concerning the

28 http://www.anacom.pt/streaming/licenca_vodafone_01_2006.pdf?contentId=384041&field=ATTACHED_FILE.
29 http://www.anacom.pt/streaming/tmn_01_2007.pdf?categoryId=236363&contentId=462322&field=ATTACHED_FILE.
30 http://www.anacom.pt/streaming/decisaofinal24102007.pdf?categoryId=256662&contentId=531021&field=ATTACHED_FILE.

rights of frequency use in the 450-470MHz band, for the provision of publicly available mobile telephone service (MTS). Broadly, the document proposed to grant this right of use to a single entity, to establish a public tender as the procedure for granting this right of frequency use, and to grant individual rights of frequency use in the 450-470MHz band for the provision of publicly available MTS upon request of the mobile trunking service providers, at the end of the mentioned contest. This decision resulted from spectrum availability and aimed at promoting competition.

Mobile Virtual Network Operators (MVNO)

On 9 February 2007, ICP-ANACOM established the MVNO's regulatory framework.

The mobile virtual network operator (MVNO[31]) activity can be framed within the offer of electronic communications networks and services and is subject to the general authorisation regime, and to the terms of the granting of rights of use of numbers. MVNOs do not use rights of use of frequencies and, thus, are not based on their own radio access network infrastructure. They are based on the radio means supplied by network operator(s) which possess their own rights of use. MVNOs have a direct contractual relationship with the end customer, in connection with the provision of the service, and, therefore, are not mere distributors of the service, in which the contractual relationship is kept between the end client and the mobile network operator.

MVNOs thus have direct customers, i.e., they are the exclusive responsible parties for the relationship with the end customers and design and market their own retail offer, which they are free to detach from that of the operator on which they are based, by defining their own marketing strategy.

It should be mentioned that on 20 November 2007, CTT – Correios de Portugal, S.A., began its commercial activity as the first mobile telephone service operator based on the network of a third operator.

Besides CTT, authorization statements were also issued for Companhia Portuguesa de Hipermercados, SA (Auchan) and ACP - Comunicações Electrónicas, Unipessoal, Lda. These entities did not begin their operations during 2007.

Current state

In 2007, besides the three entities that were legally entitled to provide mobile telephone service in Portugal – TMN, Vodafone and Optimus – there was a new entrant in these markets, service operator CTT, as previously mentioned.

MTS providers
Table 30.

		Numbering ranges
Optimus Telecomunicações, S.A.	Network operator	93
TMN – Telecomunicações Móveis Nacionais, S.A.	Network operator	96, 926
Vodafone Portugal – Comunicações Pessoais, S.A.	Network operator	91
CTT – Correios de Portugal, S.A.	Service provider based on TMN's network	922

Source: ICP-ANACOM.

New offerings in which the distribution of the service is made by a third party, different from the operator, were introduced in 2006, namely:

• Talk Talk Mobile marketed by The Phone House with preferential tariffs for numbers within its brand;

• *Rede Bónus* marketed by Worten Mobile, also with preferential tariffs among customers of this network.

All new offerings are based on Optimus' network.

31 Mobile Virtual Network Operator.

Other offerings with the same characteristics were introduced in 2007, connected to sports clubs and associations, namely:
- Benfica Telecom. This traffic scheme was created for Benfica member's using mobiles; it has a single national tariff, equal for all networks, at any hour of the day and at any day of the week, with no mandatory pre-payments.
- Dragão Mobile, aimed at members and sympathizers of FCP. DRAGÃO Mobile provides the essential services for mobile phone, at a single tariff, with no mandatory pre-payments. It also makes it possible to earn 5% of the value of each pre-payment in FC Porto's membership fees.
- Federação Portuguesa de Airsoft / Clube Airsoft da Maia. The 50Call tariff contains a card that makes automatic monthly pre-payments with 50 free minutes to be spent with other 50Call cards.

These offerings are based on TMN's network.

These activities are not MVNO's activities and, therefore, their providers are not MTS providers.
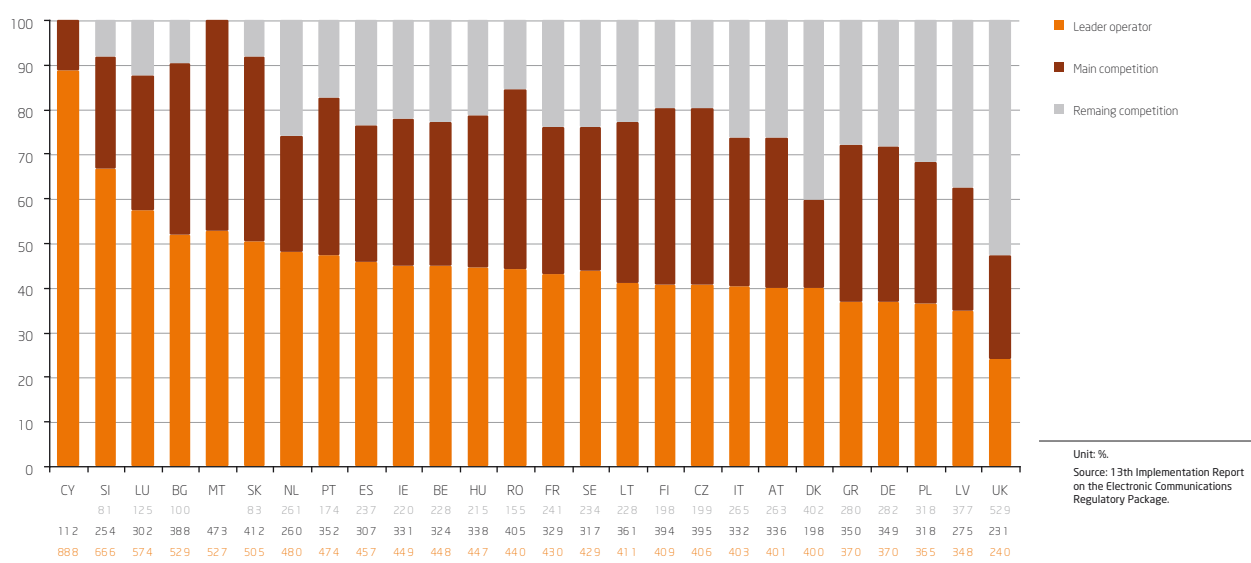
Offer structure

According to data from the 13th Report on the implementation of the electronic communications regulatory package, by the European Commission, most countries have more than three mobile telephone service operators, except Cyprus and Malta, which only have two operators.

There are three network operators in Portugal and, as mentioned, a new service provider emerged in 2007. As previously mentioned, the launch of a public tender to grant licences to mobile trunking operators was considered, should they request it. This took place during 2008.

Concentration in Portugal is relatively high. Even if the market leader holds the 8th lowest market share in the EU, the overall share of the two mains operators is the 8th highest one. Only the countries that have recently joined the E.U. and Luxembourg have higher figures.

Structure of the mobile services market in the EU
Graph 32.

Unit: %.
Source: 13th Implementation Report on the Electronic Communications Regulatory Package.

The concentration level in Portugal may be connected to possible barriers to operator switching. Only 20 per cent of users have switched operators in Portugal.

Operator switching in the mobile network
Table 31.

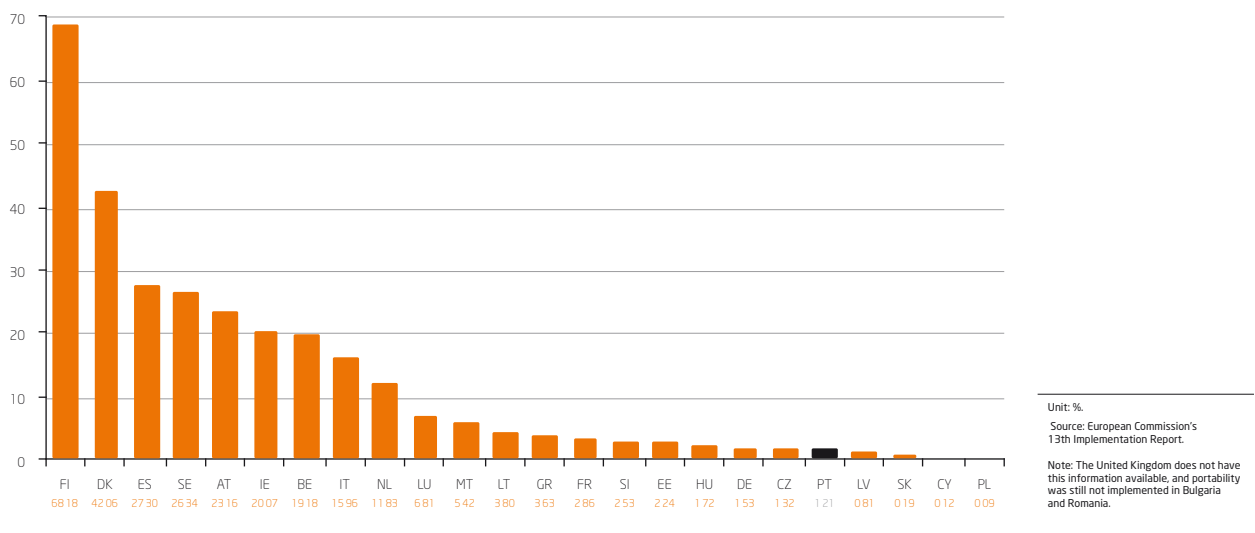|	Dec. 2006	Dec. 2007
Yes	19,9	18,2
No	79,9	81,6

Unit: %.
Source: ICP-ANACOM, Electronic Communications Consumer Survey.

One of the regulatory mechanisms introduced to minimize barriers to operator switching is number portability. Portability allows consumers to switch operator without changing their contact number. However, this feature has not been much used in Portugal.

Ratio of ported number versus total
Graph 33.

FI	DK	ES	SE	AT	IE	BE	IT	NL	LU	MT	LT	GR	FR	SI	EE	HU	DE	CZ	PT	LV	SK	CY	PL
68.18	42.06	27.30	26.34	23.16	20.07	19.18	15.96	11.83	6.81	5.42	3.80	3.63	2.86	2.53	2.24	1.72	1.53	1.32	1.21	0.81	0.19	0.12	0.09

Unit: %.
Source: European Commission's 13th Implementation Report.

Note: The United Kingdom does not have this information available, and portability was still not implemented in Bulgaria and Romania.
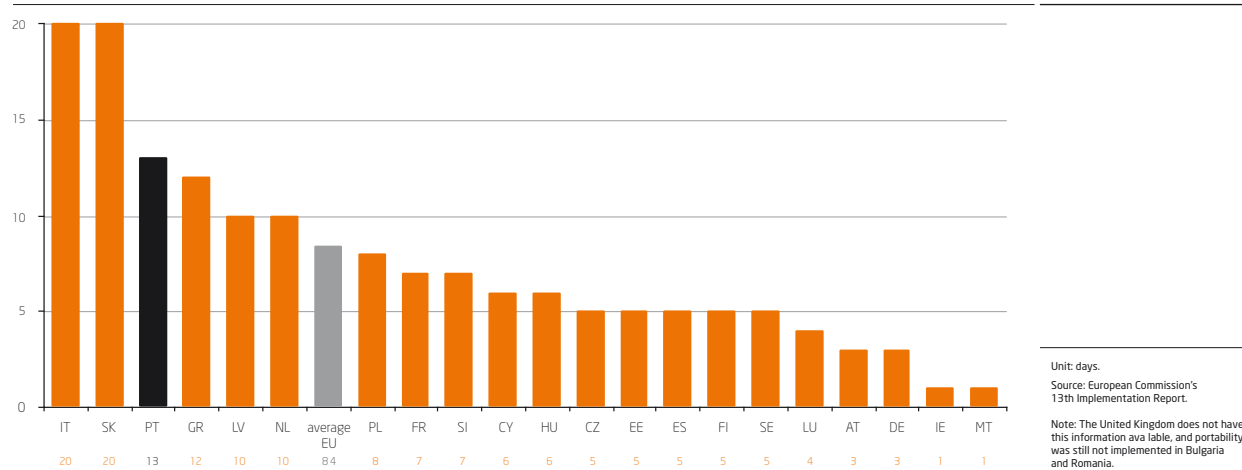
The amount of mobile portations at the end of 2007 was 837,637, which stands for a little over than 1 per cent of all service subscribers.

The time to actual number portation varies between 1 day, in Malta, and 20 days, in Italy and Slovakia. In Portugal, the average is 13 days, the third highest deadline among the considered countries.

Days to provide portability
Graph 34.

	IT	SK	PT	GR	LV	NL	average EU	PL	FR	SI	CY	HU	CZ	EE	ES	FI	SE	LU	AT	DE	IE	MT
	20	20	13	12	10	10	8.4	8	7	7	6	6	5	5	5	5	5	4	3	3	1	1

Unit: days.

Source: European Commission's 13th Implementation Report.

Note: The United Kingdom does not have this information ava lable, and portability was still not implemented in Bulgaria and Romania.

MTS user and usage profile

The following sections characterize the MTS user and this service's usage.

Characteristics of the MTS user

The main reason for subscribing to MTS in Portugal is to be reachable all the time.

Benefits of having a mobile phone
Table 32.

	Portugal	UE25
Reliability when making a call from anywhere, if something goes wrongl	15	37
Possibility of being reachable at any place and at any time	55	33
Freedom to make calls when away	20	18

Unit: %.
Source: Eurobarometer 66.3 (E-Communications Household Survey), European Commission 2008.

According to the data received from the 2004-2007[32,33,34,35,36] Electronic Communications Consumer Surveys, variables age and education level are the ones that mostly separate MTS users from its non-users.

32 Electronic communications consumer survey 2004. The universe defined for this survey was individuals of both genders, aged 15 or over, residing in Mainland Portugal and the Autonomous regions of Madeira and the Azores. The size of the sample was determined for a maximum error of 3 per cent for the main results (assuming a significance degree of 95 per cent) The sample was stratified by region (NUTS ll), habitat/size of households (5 groups), gender, age (3 groups), education (3 groups) and occupation (2 groups), based on the last General Population Census: Census 2001. 1.051 interviews were made. Data collection was made with personal and direct interviews. The field work took place between January and February 2004, by Intercampus.
33 Electronic communications consumer survey 2005. The universe defined for this survey was individuals of both genders, aged 15 or over, residing in Mainland Portugal and the Autonomous regions of Madeira and the Azores. The size of the sample was determined for a maximum error of 2 5 per cent for the main results (assuming a significance degree of 95 per cent). The sample was stratified by gender, age and region, in accordance with the last General Population Census: Census 2001. 2184 interviews were made. Data collection was made with personal and direct interviews. The field work took place between 9 June and 12 June 2005, by Metris GFK.
34 Electronic communications consumer survey Feb. 2006. The universe defined for this survey was individuals of both genders, aged 15 or over, residing in Mainland Portugal and the Autonomous regions of Madeira and the Azores. The size of the sample was determined for a maximum error of 2 5 per cent for the main results (assuming a significance degree of 95 per cent). The sample was stratified by gender, age and region, in accordance with the last General Population Census: Census 2001. 2,020 interviews were made. Data collection was made with personal and direct interviews. The field work took place between 17 January and 22 February 2006, by Marktest.
35 Electronic communications consumer survey Dec. 2006. The universe defined for this survey was individuals of both genders, aged 15 or over, residing in Mainland Portugal and the Autonomous regions of Madeira and the Azores. The sample was selected by quota of sex, age and education and occupation, structured by region and residence. In total 2,519 interviews were carried out. Of these 2,519 interviews, 997 were made by mobile phone and 1,522 by fixed-line. In the cases with Table 1, point 2 and Table 3, a 3.1% margin of error is ensured. In Table 7 a 2.5% margin of error is ensured. In the remaining tables the margin of error is approximately 1.95%. The results were adjusted for the total target population and households according to the weighting calculations of MARKTEST and based on the 2001 Census of INE. For mobile services a weighting was applied to be representative of the Portuguese population of over 15 years of age and residing in Portugal, based on the social-demographic characteristics of the survey. The fieldwork and processing of the information was performed by MARKTEST between 9 November and 29 December 2006.
36 Electronic communications consumer survey 2007. The Universe defined for this survey was made up of users 15 years old or older, living in Mainland Portugal and in the Autonomous Regions of Madeira and the Azores. The sample was made up of 3504 interviews, with a semi-proportional distribution by NUT II region. Households were selected randomly from a stratified matrix including the Region (7 NUT II regions) and the Habitat/Size of the population aggregates (5 groups). Crossing these variables ensured a proportional distribution of the sample by region regarding the Portuguese population in general. Results were later weighted in order to grant each region its real weight within the Portuguese population. Quotas were defined with base on the General Population Census (2001) by Instituto Nacional de Estatística (I.N.E.). Interviewees at each household were selected using the quota method, based on the crossing of variables Sex, Age (3 groups), Education (3 groups: primary education or less, more than primary education and less than higher education, and more than higher education – according to the categorization requested by ICP-ANACOM), and Occupation. Data was collected by telephone interviews, made to fixed network numbers and mobile phone numbers, using the CATI (Computer Assisted Telephone Interview) system. The fieldwork was conducted between 1 November 2007 and 17 December 2007. The fieldwork and handling of data was carried out by company GFK Metris. The results obtained for each of the four services considered (fixed telephone service, mobile telephone service, Internet access service, and paid TV service) have a maximum error of 4 per cent (for a confidence level of 95 per cent)

In fact, there is a negative relationship between age and MTS penetration. The fact that only 61 per cent of the people over 65 years old had a mobile phone by the end of 2007 stands out. In spite of that, this result shows a penetration increase in this group from 2006.

MTS penetration by age group
Table 33.

Age group	Feb. 2004	Jun. 2005	Feb. 2006	Dec. 2006	Dec. 2007
15-24	90,1	96,2	98,4	99,1	99,1
25-34	91,8	92,4	97,1	98,5	98,6
35-44	79,6	86,1	92,9	97,1	95,4
45-54	69,6	75,0	91,3	90,9	92,7
55-64	42,3	69,6	79,8	83,0	85,5
65 and over	19,0	29,0	51,0	58,5	61,0
Total	**66,0**	**74,1**	**84,5**	**87,7**	**89,8**

Unit: %.
Source: ICP-ANACOM, Electronic Communications Consumer Survey.

On the other hand, those in the lower social status levels are the ones among which the MTS penetration is the lowest.

MTS penetration by social status level
Table 34.

Social status	Dec. 2007
High (A)	100,0
Medium high (B)	98,9
Medium (C)	95,8
Medium low (D)	84,4
Low (E)	88,6

Unit: %.
Source: ICP-ANACOM, Electronic Communications Consumer Survey.

All regions, except Madeira, reinforced their service's penetration in 2007. People residing in the Azores and inland are those with less mobile phones.

MTS penetration by NUT II
Table 35.

Region	Feb. 2006	Dec. 2006	Dec. 2007
North	83,0	86,5	91,4
Centr	84,5	84,3	87,8
Lisbon and Tagus Valley	88,8	93,0	95,3
Alentejo	78,3	85,5	91,0
Algarve	84,9	89,3	90,5
Azores	78,9	82,6	82,7
Madeira	85,4	89,9	86,4
Total	**84,2**	**87,7**	**89,8**

Unit: %.
Source: ICP-ANACOM, Electronic Communications Consumer Survey.

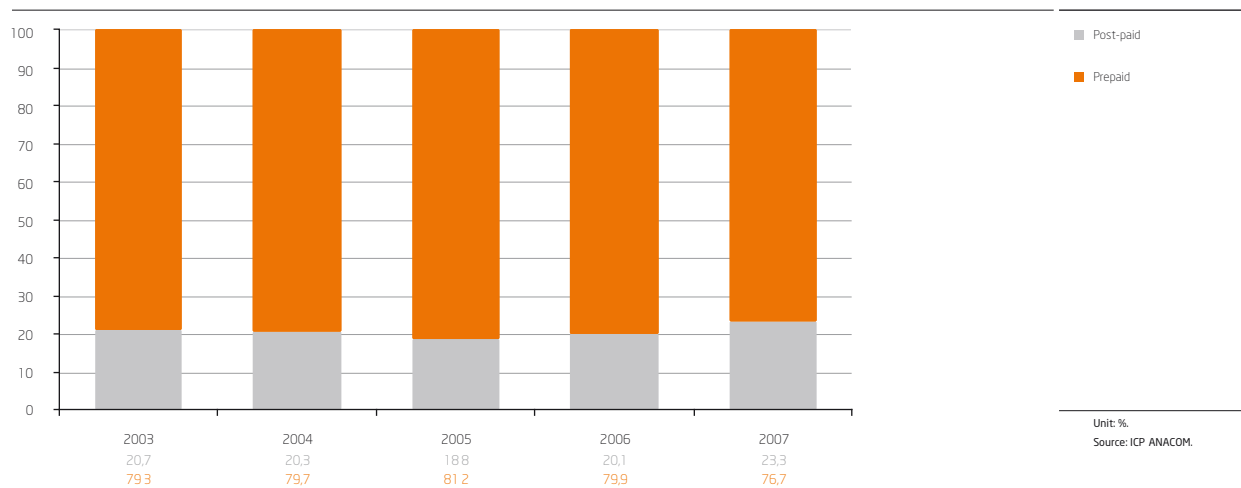## Characteristics of the MTS usage

Below are some items on the use of the MTS, namely used tariff schemes and type of features of the calls made.

Tariff schemes

Regarding tariff schemes used by the MTS subscribers, about 76.7 per cent of all subscribers use prepaid plans.

Distribution of subscribers by type of tariff plan
Graph 35.

	2003	2004	2005	2006	2007
	20,7	20,3	18,8	20,1	23,3
	79,3	79,7	81,2	79,9	76,7

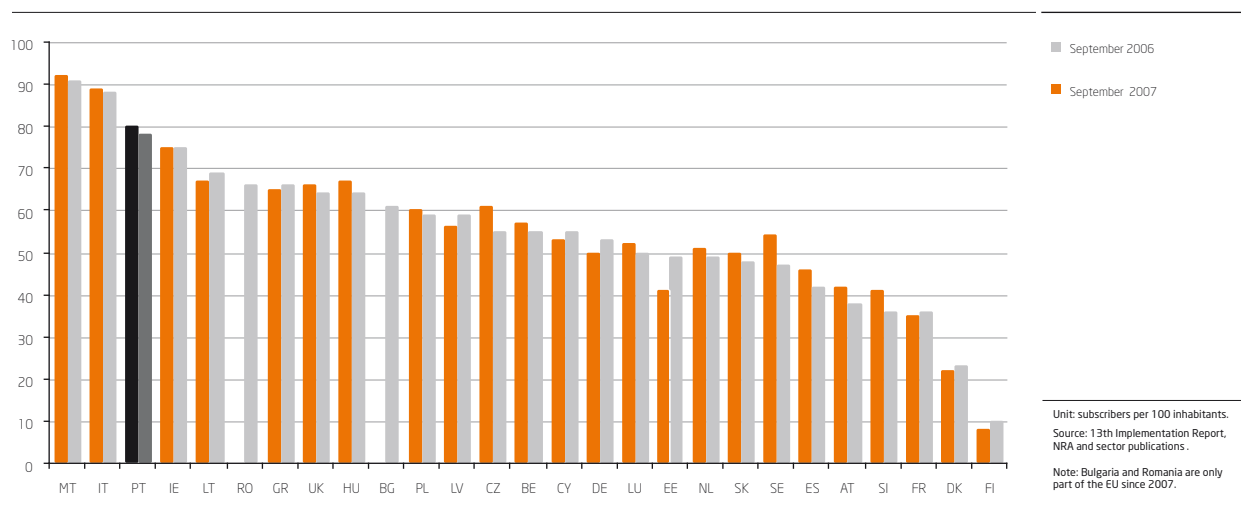Post-paid
Prepaid

Unit: %.
Source: ICP ANACOM.

It should be reminded that Portugal was a pioneer in introducing the prepaid system in the mobile telephone service. TMN launched in 1995 the MIMO product. These products give customers greater control over the service bill and do not require the payment of monthly fees.

The graphic below shows that Portugal is among the countries with the highest shares of prepaid schemes, right after Malta and Italy. Finland and Denmark are the countries with the lowest ratios. In 2007, the average rate of prepaid cards in the EU was at 60.9 per cent.

Weight of prepaid cards in the overall amount of subscribers – Portugal vs. EU
Graph 36.

September 2006
September 2007

Unit: subscribers per 100 inhabitants.
Source: 13th Implementation Report, NRA and sector publications .

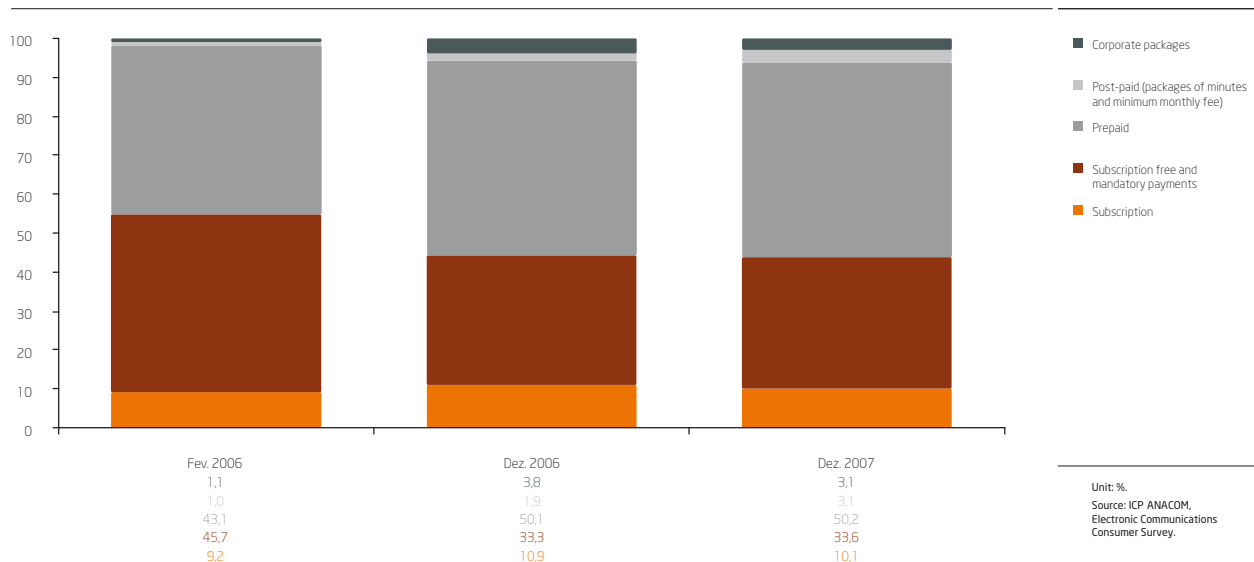Note: Bulgaria and Romania are only part of the EU since 2007.

As service penetration increases, operators are obliged to capture customers from population segments with lower income levels and below the average age. This type of product is particularly targeted at the needs of these population segments. The importance that tariff schemes with no mandatory payments have reached in the lattes years should be highlighted.

Since 2005, however, the rate of prepaid tariff schemes has been decreasing, in some countries, namely in those with higher prepaid rates. This evolution is justified by the operators' commercial policies and by the implementation of new post-paid offers (i.e. minute packs or with traffic included in the monthly fee), and by the development of the 3rd generations services, which are post-paid offerings in many cases.

Type of contract with the mobile operator
Graph 37.

	Fev. 2006	Dez. 2006	Dez. 2007
Corporate packages	1,1	3,8	3,1
Post-paid (packages of minutes and minimum monthly fee)	1,0	1,9	3,1
Prepaid	43,1	50,1	50,2
Subscription free and mandatory payments	45,7	33,3	33,6
Subscription	9,2	10,9	10,1

Unit: %.
Source: ICP ANACOM, Electronic Communications Consumer Survey.

Voice traffic: usage level

As can be seen on the following graphs, MTS traffic tends to grow. The growing traffic trend should be related with the increasing amount of subscribers, the service's massive use and also the decline in the use of the FTS.

On the other hand, seasonal nature increases occurred in each year's 3rd and 4th quarters, in connection with the summer and Christmas holidays.
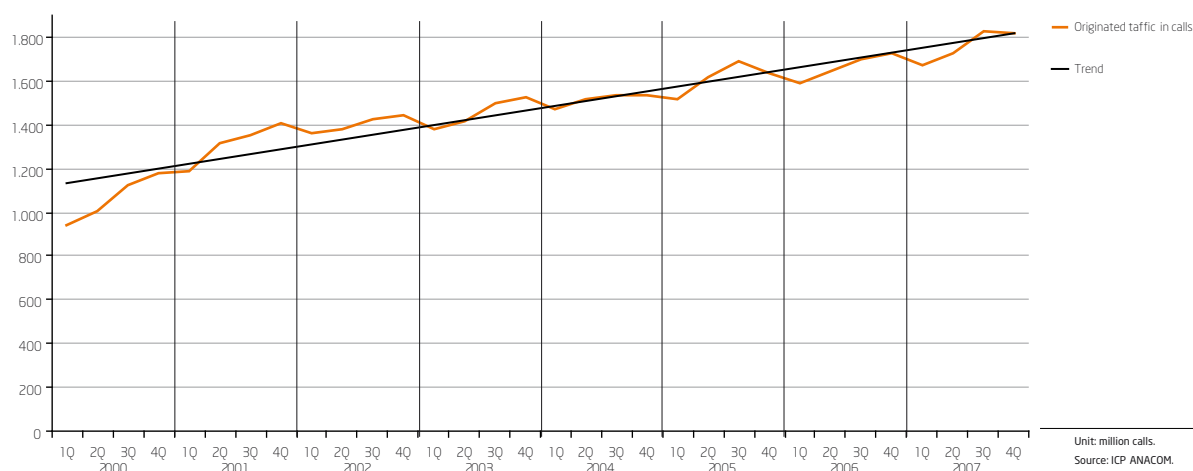
Evolution of the MTS outgoing traffic, trend and seasonal cycles (minutes)
Graph 38.

Legend:
- Originated traffic in minutes
- Trend

Unit: million minutes.
Source: ICP ANACOM.
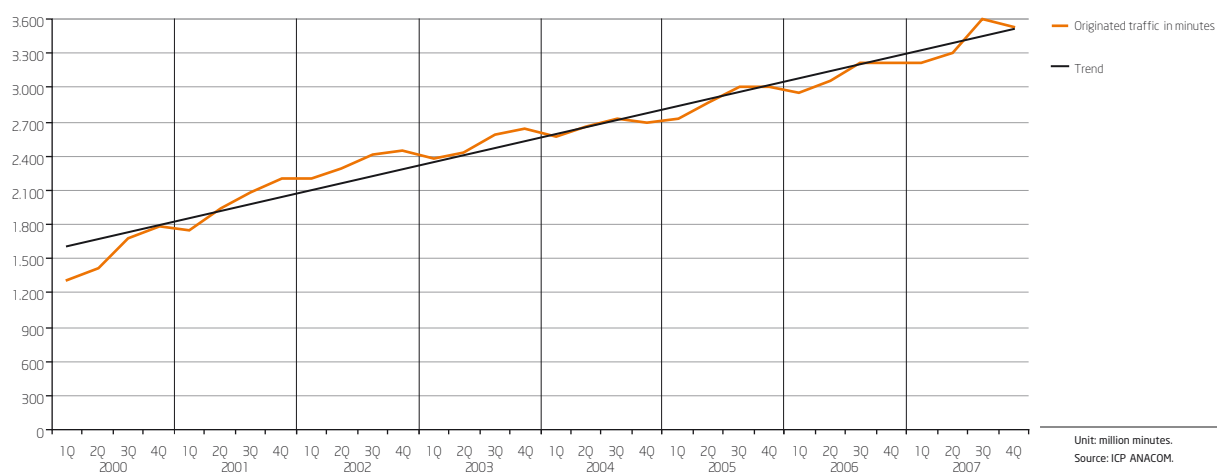
Evolution of the MTS outgoing traffic, trend and seasonal cycles (calls)
Graph 39.


Legend:
- Originated taffic in calls
- Trend

Unit: million calls.
Source: ICP ANACOM.

The average monthly traffic per subscriber is close to 89 minutes and 46 calls. The amount of minutes reaches peaks during the 3rd quarter, for the above-mentioned reasons.

## Traffic evolution per subscriber, in minutes
Graph 40.

Legend:
— Minutes per month and per subscriber
— Trend

Unit: minutes.
Source: ICP ANACOM.
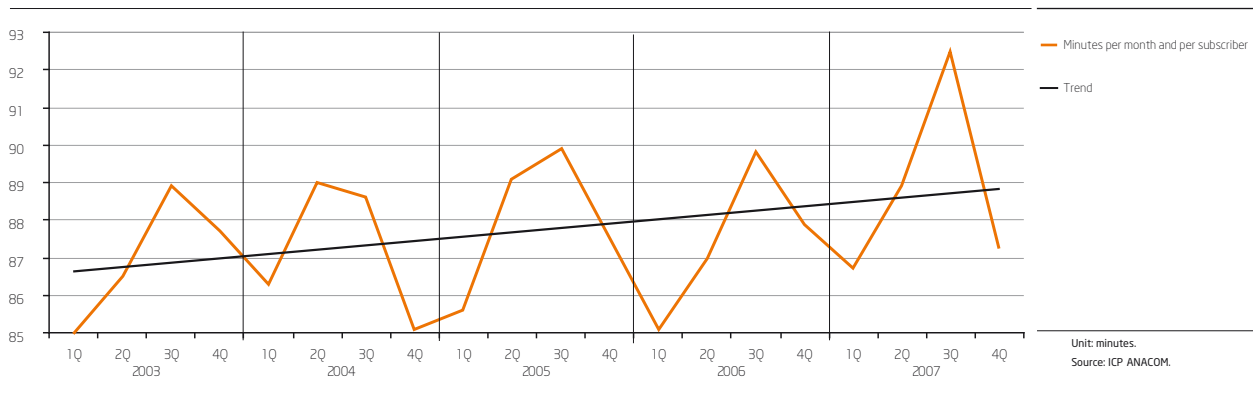
A slight decreasing trend in the amount of calls per subscriber can however be perceived. The average amount of calls per subscriber was close to 44 in the 4th quarter of 2007, less than in that same quarter the previous year.

Traffic evolution per subscriber, in calls
Graph 41.

Legend:
— Calls per month and per subscriber
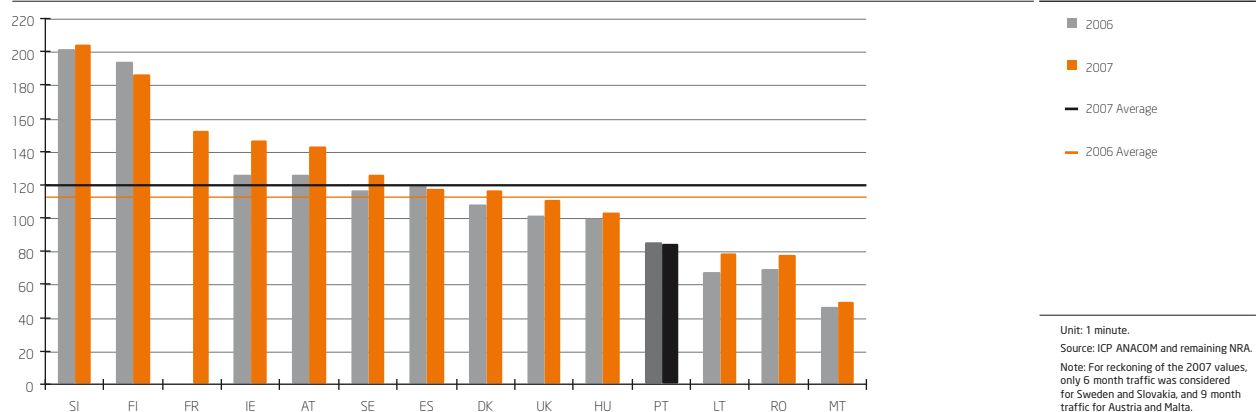— Trend

Unit: calls.
Source: ICP ANACOM.
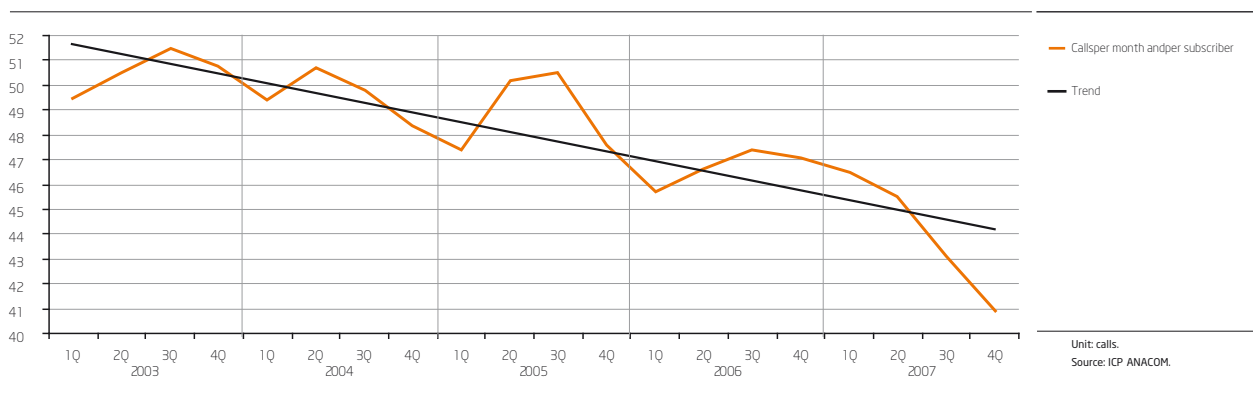
This evolution can be justified by the fact that the new service subscribers have a lower than average income level, or by macroeconomic factors that affected this service's use.

The following graph shows an international comparison of traffic per subscriber. As can be seen, according to the available data, this service's use in Portugal stands below the average of the considered countries.

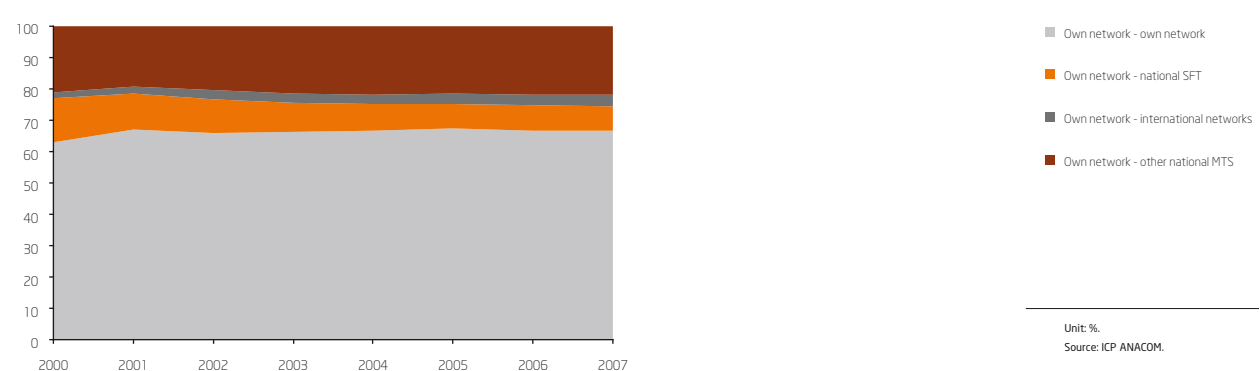## Minutes per month and per subscriber – international comparisons
Graph 42.

Unit: 1 minute.
Source: ICP ANACOM and remaining NRA.
Note: For reckoning of the 2007 values, only 6 month traffic was considered for Sweden and Slovakia, and 9 month traffic for Austria and Malta.

Legend: 2006 · 2007 · 2007 Average · 2006 Average

Voice traffic: type of calls

Regarding the type of calls made, about 2/3 of calls are made to the network where the call has its origin. Other mobile operators' networks are the destination of around 22 per cent of the originated traffic, and the FTS comes next. Regarding incoming traffic, the relative weight of the types of calls does not change significantly.

There is, on the other hand, a progressive decrease in the weight of calls with destination and origin in fixed networks, which should be related with the declining amount of FTS users.

Voice traffic distribution in calls per type of calls
Graph 43.

Own network - own network
Own network - national SFT
Own network - international networks
Own network - other national MTS

Unit: %.
Source: ICP ANACOM.

Voice traffic; average length of calls

The average length of outgoing calls reached 116 seconds. The average length of calls originated and terminated in the mobile networks has been increasing over the latest years. The average length of international calls is the exception, which has remained constant, despite being the longest ones: 150 seconds, when they are originated in the country, and of 180 seconds, when they are terminated in the country. It should be mentioned that the average length of calls in the mobile network is lower than that of the fixed network.

Average length of calls
Table 36.

	2003	2004	2005	2006	2007
Total outgoing traffic	103	106	108	112	116
Own network – own network	104	107	109	115	120
Own network – national FTS	96	96	97	96	101
Own network – international networks	166	156	155	155	155
Own network – other national MTS	97	98	100	103	105
Total incoming traffic	104	107	109	114	118
Own network – own network	104	107	109	115	120
National FTS – own network	107	107	110	113	116
International networks – own network	176	175	174	178	185
Other national MTS – own network	97	98	100	103	105

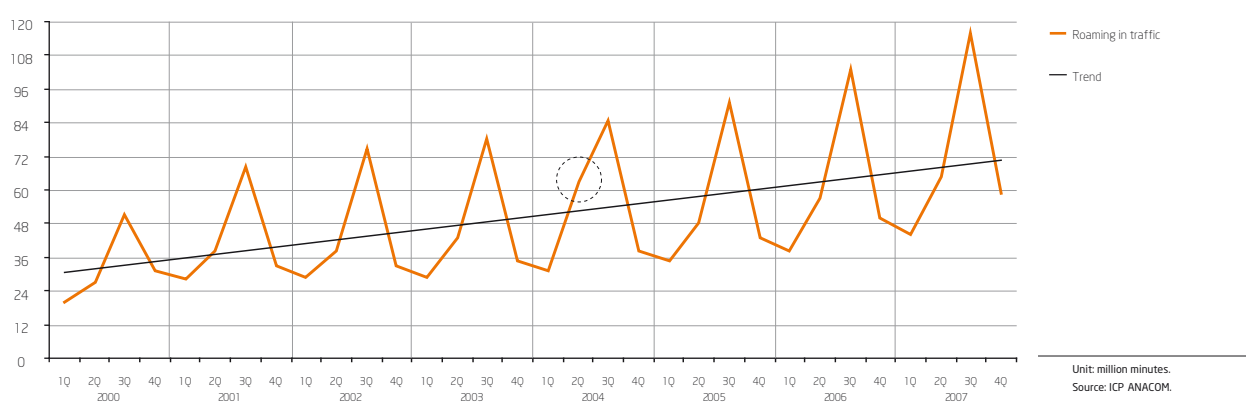Unit: seconds.
Source: ICP-ANACOM.

Roaming traffic: voice and SMS

The roaming traffic is highly seasonal in connection with the summer holiday period.

The following graph shows that the "Euro 2004" phenomenon had some impact on the roaming in[37] traffic (2nd quarter of 2004).

Roaming in traffic evolution and trend
Graph 44.

Unit: million minutes.
Source: ICP ANACOM.

37 Traffic made by foreign operators' subscribers using national networks.

The roaming out[38] traffic is also highly seasonal, due to the same reasons.

Specifically regarding roaming out, there is a growing trend in the use of SMS, which could be related with the price level of this type of calls and with the termination figures in these cases.

Roaming out traffic evolution and trend
**Graph 45.**

Unit: millions minutes.
Source: ICP ANACOM.
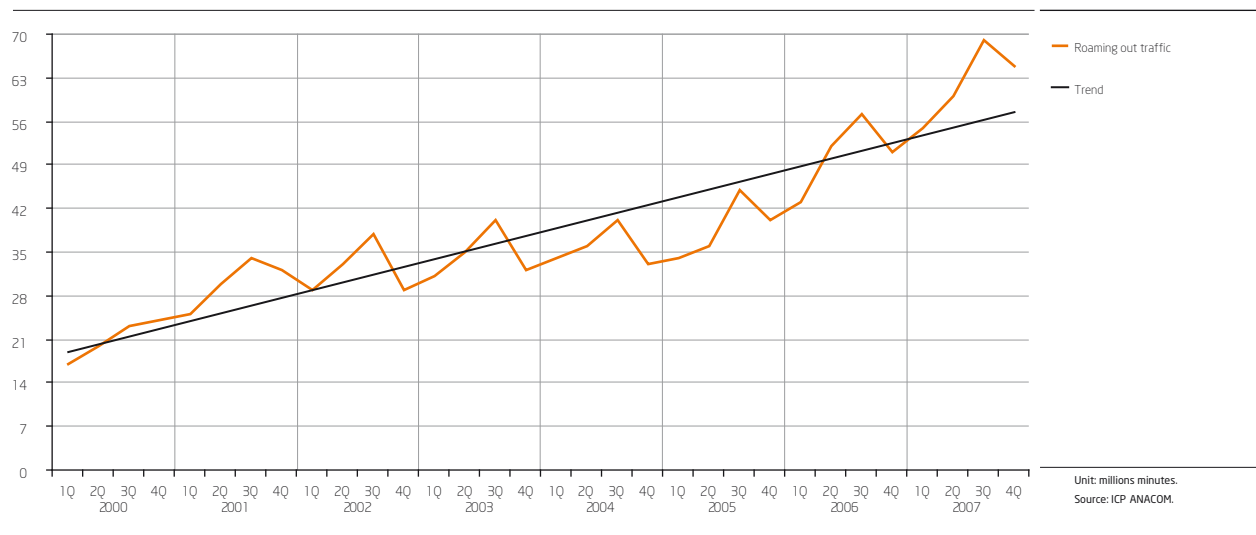
Also, promotional campaigns by operators designed to intensify the use of SMS, considerably add to the amount of roamed-in messages. It should be highlighted that roamed-in messages have no costs to the roamer and receiving a voice call means paying the part of the call in connection with the termination cost of the foreign operator at which the roamer is registered. This, in connection with the aforementioned campaigns, can explain the peaks in the third quarters of 2005, 2006, and 2007, during the holiday seasons.

38 Traffic made outside the country by national operators' subscribers using the networks of foreign operators

Evolution of the roamed-out traffic per type of traffic
Graph 46.

Unit: thousand calls/messages.
Source: ICP ANACOM.
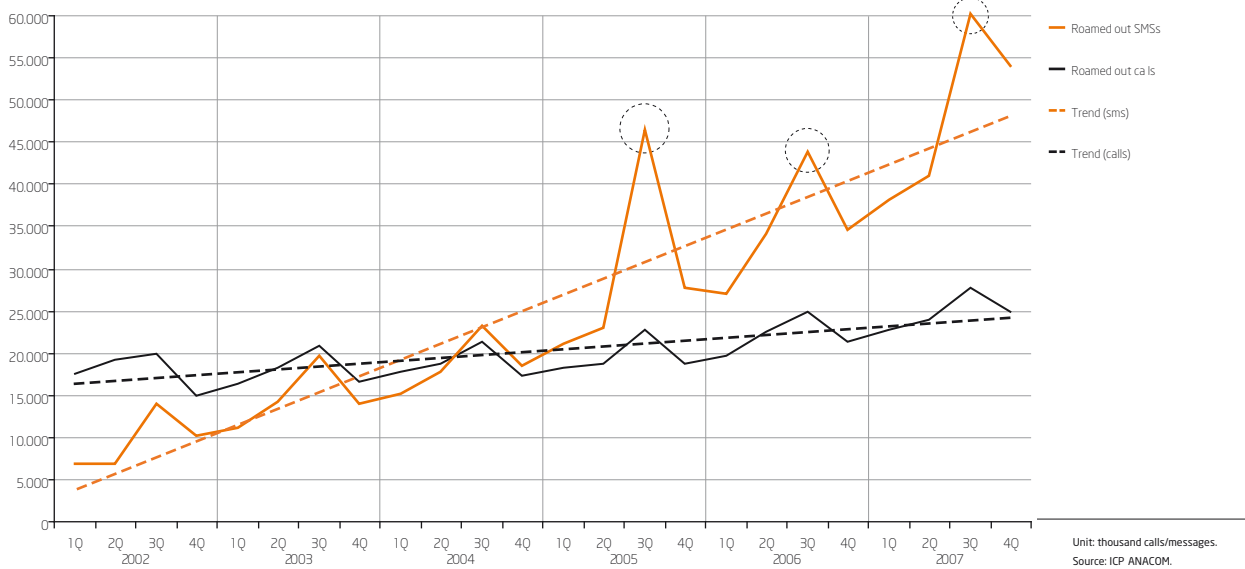
On average, roamed calls are longer than those made within national networks.

SMS

Until the second quarter of 2005, there was a monthly average of about 20 SMS per subscriber. This figure considerably changed after that period, a change that was intensified afterwards.

In 2007 the SMS monthly average surpassed 100 SMS. In the 4th quarter of that year this figure reached 120 SMS per subscriber.

This evolution should have a relation with the new tariff offerings and promotions that the operators launched, as mentioned above.

It should be mentioned that the so-called Premium messages are only 1 per cent of the overall SMS.

Evolution in the amount of SMS per subscriber and per month, trend
Graph 47.

Legend:
- SMS per subscriber and per month
- Trend (sms per subscriber)

Unit: messages.
Source: ICP ANACOM.
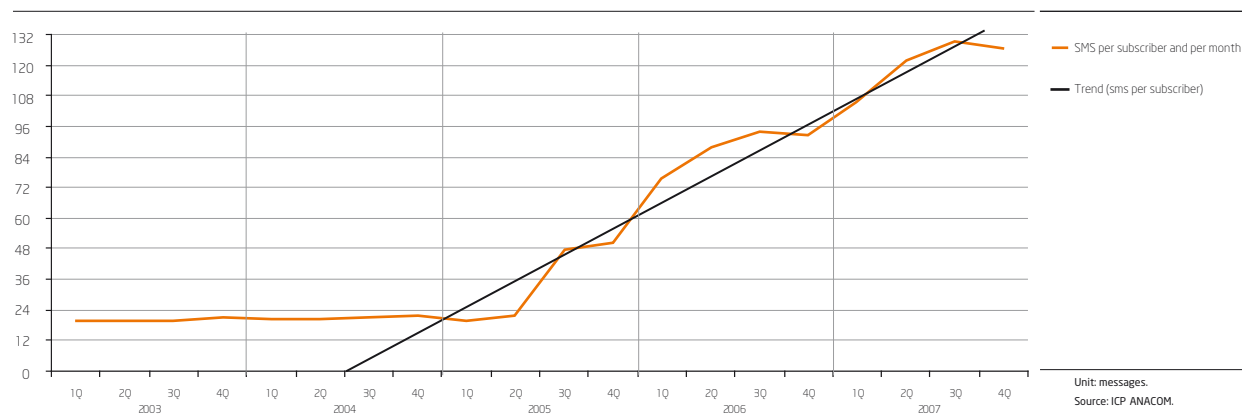
Data services

Sending multimedia messages (MMS) is still the mostly used 3G service, with 28 per cent of all answers. There was a sharp decrease in the use of this service, as well as of the video call service.

It should be noted that the video call service, due to its characteristics, also depends on the available devices, implying that both the sender and the receiver must have device and equipment that is compliable with the service.

Services used with the 3G mobile phone
Table 37.

	Dec. 2006	Dec. 2007
MMS	47,0	28,1
Internet access	29,3	20,2
Video calls	21,7	6,3
E-mail, Messenger or chat	12,9	8,4
Music download	n.d.	10,6
Video download	10,6	4,0
None f the above	31,7	22,4

Unit: %.
Source: ICP-ANACOM, Electronic Communications Consumer Survey.
Note: multiple answers.

Barriers to joining the service

According to the Electronic Communications Consumer Survey, among those that do not have a mobile phone, the main reason for that is "do not need it" (49 per cent).

The service's price levels, which were, in the previous year, the second main barrier to joining the service, are now the third. The ratio of non-users pointing it out decreased 9 per cent. This evolution might have been influenced by the introduction of low-cost or no-frills tariff schemes in 2005.

MTS's evolution in 2007

Below is a set of items on the MTS's performance in 2007: availability, penetration, service usage, prices and quality of service.

The service's geographic availability

MTS is available in the overwhelming majority of the Portuguese territory, and it reaches almost 100 per cent of its population.

Regarding the several MTS access technologies, 3G (WCDMA) currently has a wide coverage in most cities. But regarding major roads, coverage is bad, according to the results of the quality of service assessments carried out by ANACOM[39]. The most recent study carried out in the autonomous regions show that WCDMA coverage in the Azores is poor.

Currently, all operators publicize on their websites their corresponding 3G and 3.5G (HSDPA) network coverage according to the available speed, per municipality and even per village.
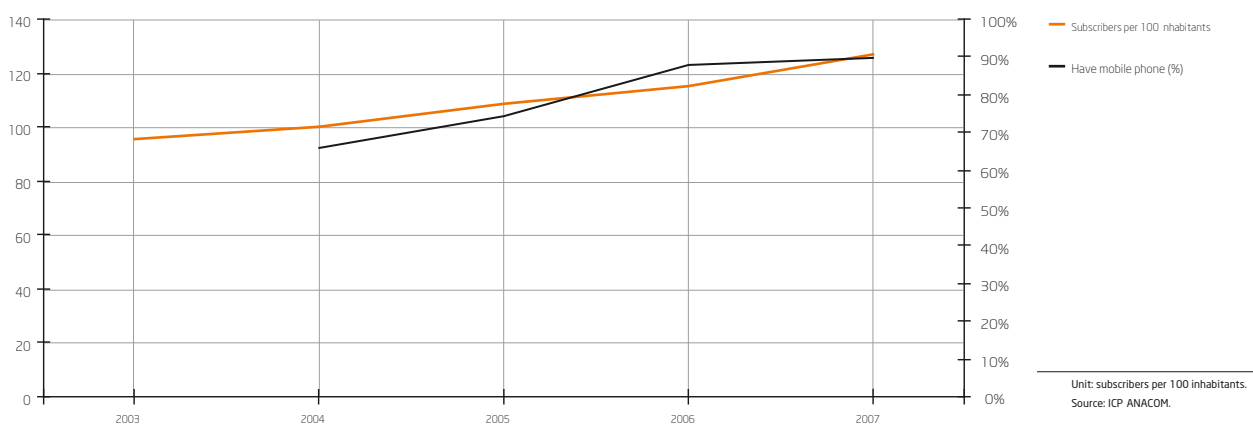
Service penetration

MTS penetration in Portugal reached again very high figures during this year. By the end of 2007, the service's penetration rate reached 126.7.

Mention should be made to the fact that, according to the December 2007 Electronic Communications Consumer Survey, around 89.8 per cent of those residing in Portugal were MTS customers.

MTS penetration in Portugal
Graph 48.

Subscribers per 100 nhabitants
Have mobile phone (%)

Unit: subscribers per 100 inhabitants.
Source: ICP ANACOM.

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39 http://www.anacom.pt/template12.jsp?categoryId=237202 e http://www.anacom.pt/template20.jsp?categoryId=1643&contentId=553755.

The difference between the above-mentioned penetration rate and the answers to the above-mentioned survey are due to various reasons, such as:

• The fact that there are users with more than one active card;

• The activation of new SIM cards for exclusive use by data and Internet access services;

• The fact that there are active cards for use by machines, equipment and vehicles (automatic payment terminals using the mobile network, alarm, security, telemetry and telematic equipment, etc.);

• The fact that there are cards for use by companies.
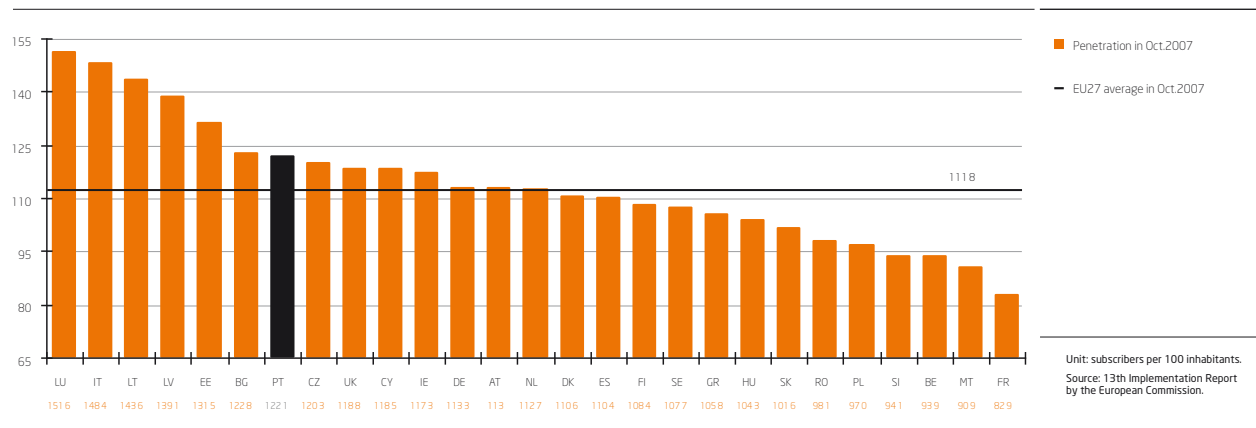
Amount of active cards

Table 38.

	Dec. 2006	Dec. 2007
1 Card	82,6	79,2
2 Cards	14,9	15,5
3 Cards	2,1	2,4
More than 3 cards	0,4	1,9

Unit: %.
Source: ICP-ANACOM.

MTS penetration in 2007 is still above the EU average, ranking 7th among the 27 EU countries.
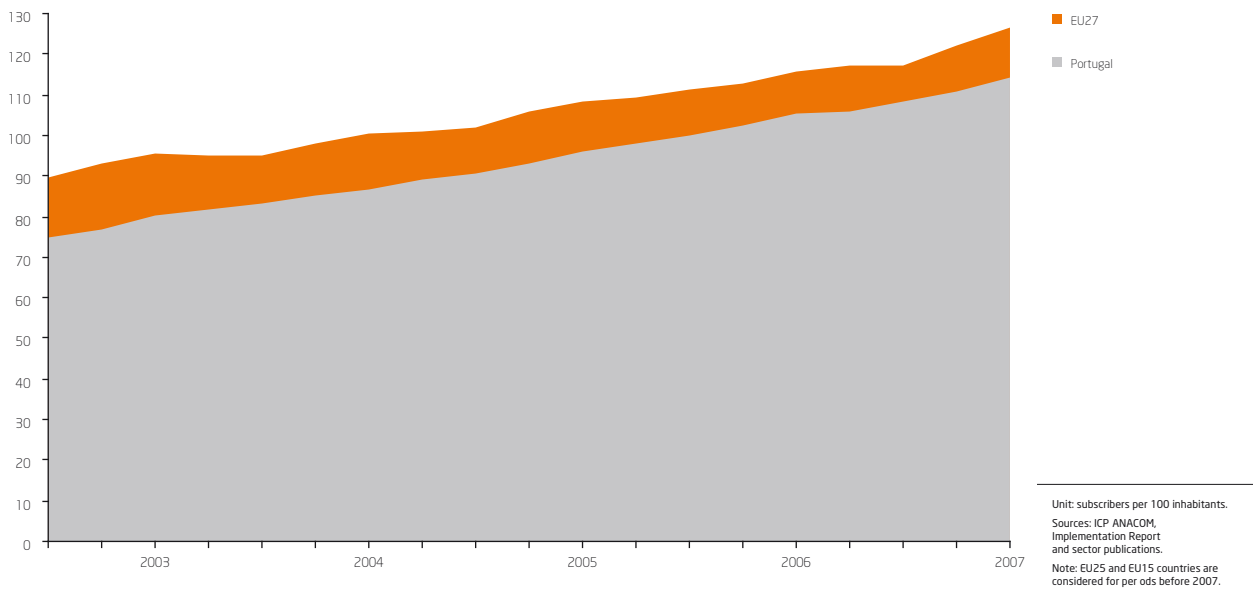
MTS penetration in the EU

Graph 49.

Unit: subscribers per 100 inhabitants.
Source: 13th Implementation Report by the European Commission.

	LU	IT	LT	LV	EE	BG	PT	CZ	UK	CY	IE	DE	AT	NL	DK	ES	FI	SE	GR	HU	SK	RO	PL	SI	BE	MT	FR
	151.6	148.4	143.6	139.1	131.5	122.8	122.1	120.3	118.8	118.5	117.3	113.3	113	112.7	110.6	110.4	108.4	107.7	105.8	104.3	101.6	98.1	97.0	94.1	93.9	90.9	82.9

Legend: Penetration in Oct.2007 — EU27 average in Oct.2007 (111.8)

This is indeed a middle term trend. MTS penetration in Portugal has consistently been above the EU average.

Evolution of the MTS penetration in Portugal and in the EU
Graph 50.

Unit: subscribers per 100 inhabitants.
Sources: ICP ANACOM,
Implementation Report
and sector publications.
Note: EU25 and EU15 countries are
considered for per ods before 2007.

MTS penetration growth and its evolution vis-à-vis the European average should have been influenced, namely, by the fast introduction of GSM services in Portugal, the small penetration of the FTS, the marketing investment and the innovations launched by the market players (namely tariff-related innovations). Particularly, the introduction of prepaid offerings, together with the simplified administrative procedure in connection with the purchase of the service and its activation, led to the mass use of the service and the "democratisation" of the use of the mobile phone, which, from a status symbol, became a regular commodity, available to all.

Evolution of the number of mobile telephone service's subscribers: before and after prepaid
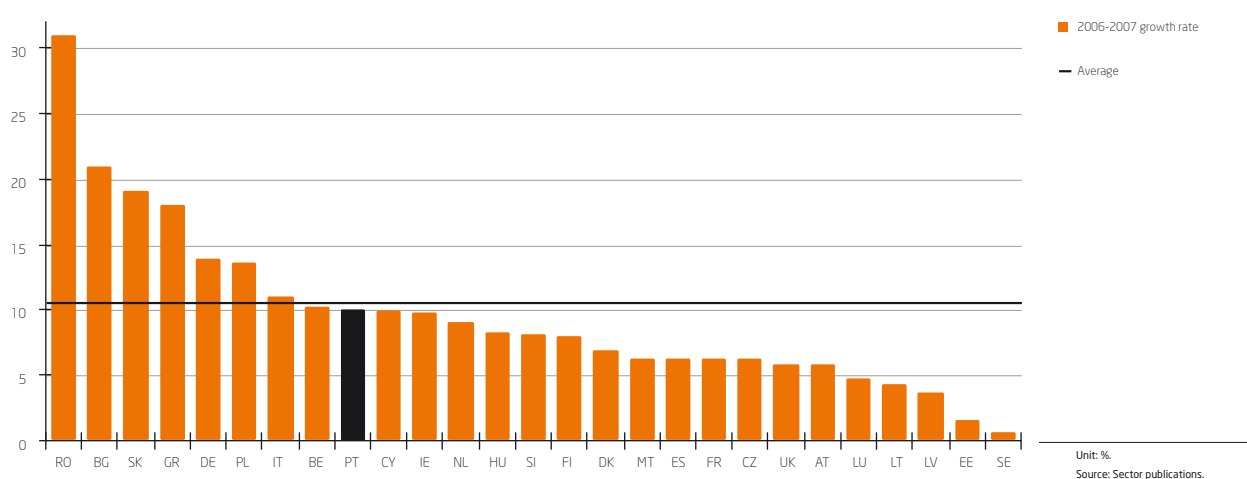**Graph 51.**

Unit: 1 Subscriber.
Source: ICP ANACOM.
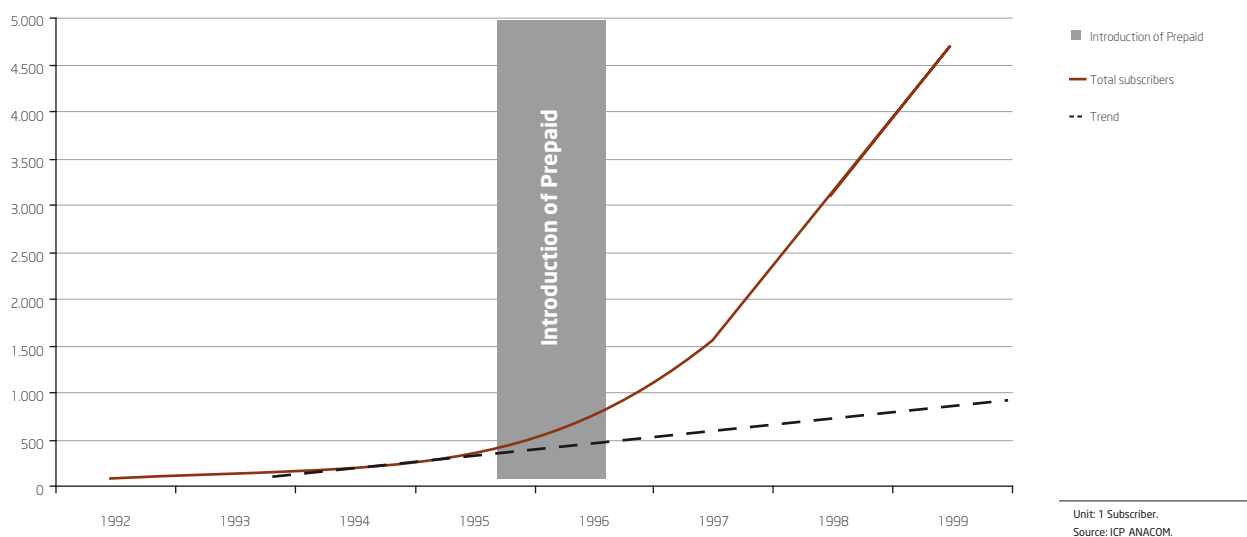
Mention should be made to the fact that, in spite of Portugal's position in the EU ranking, the service's growth has slowed down in 2007. This service is now having a strong development mainly in the Eastern European countries, namely Romania, Bulgaria, Slovakia, Greece and Poland.

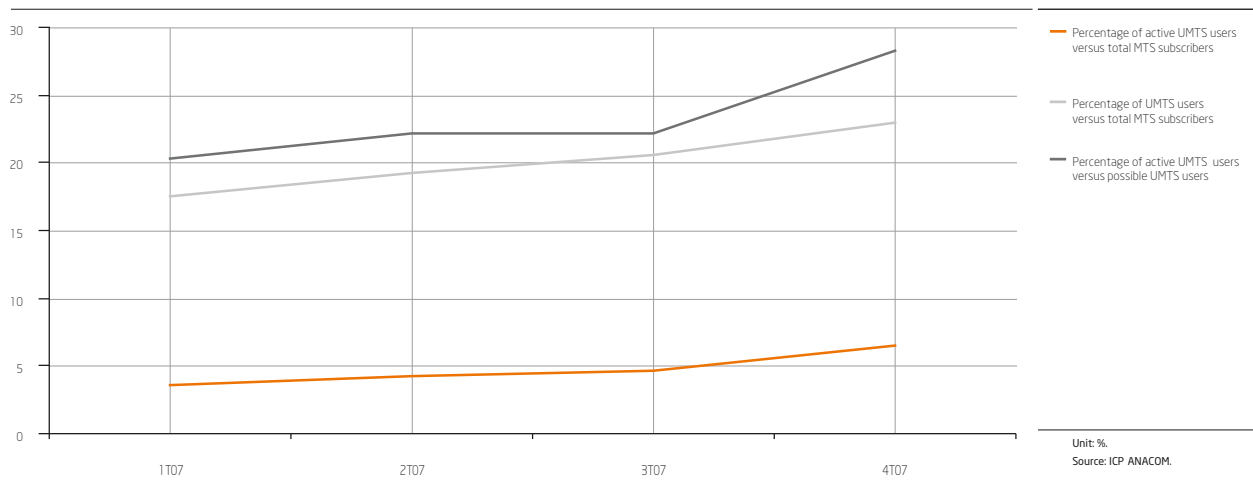## Subscriber growth rates in the EU27 countries - 2006-2007
Graph 52.

Unit: %.
Source: Sector publications.

Regarding UMTS service users in Portugal[40], they stood for about 23 per cent of all MTS subscribers at the end of 2007.

Evolution of UMTS penetration in Portugal
Graph 53.

Percentage of active UMTS users versus total MTS subscribers

Percentage of UMTS users versus total MTS subscribers

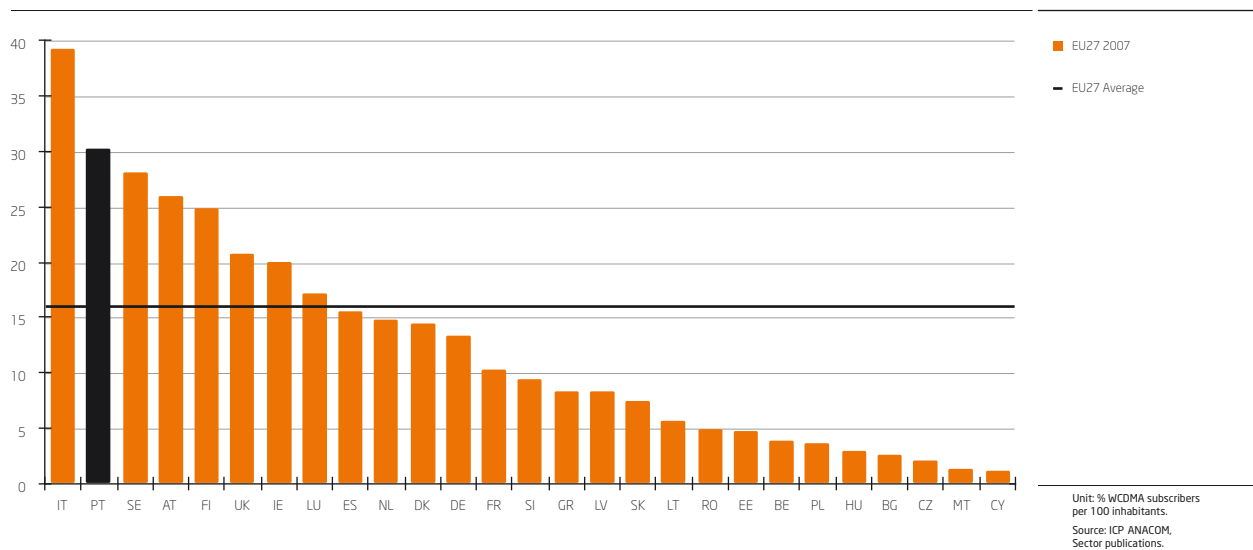Percentage of active UMTS users versus possible UMTS users

Unit: %.
Source: ICP ANACOM.

At the end of 2007, Portugal ranked 2nd among the EU27 countries, right after Italy, in terms of WDCMA user penetration.

UMTS penetration in some EU27 countries
Graph 54.

EU27 2007

EU27 Average

Unit: % WCDMA subscribers per 100 inhabitants.
Source: ICP ANACOM, Sector publications.

40 Number of SIM/USIM (Subscriber Identity Module/Universal Subscriber Identity Module) cards that made at least one authentication and registration on the mobile operator's network, since the launch of the service, enabling it them to use any of typical UMTS network services (i.e. video-telephony or broadband data transmission). Those cards that made at least one authentication and registration on the mobile operator's network during the period under analysis are considered active cards. Card. Cards that were deactivated until the end of the period under analysis were excluded. Migrations from SIM GSM to USIM UMTS should be considered, when it applies.

Number of service subscribers

At the end of 2007, there were 13.4 million subscribers[41] to the MTS, a 10 per cent increase in the total number of subscribers vis-à-vis the previous year, a ratio that is slightly below the 2003/2007 average.
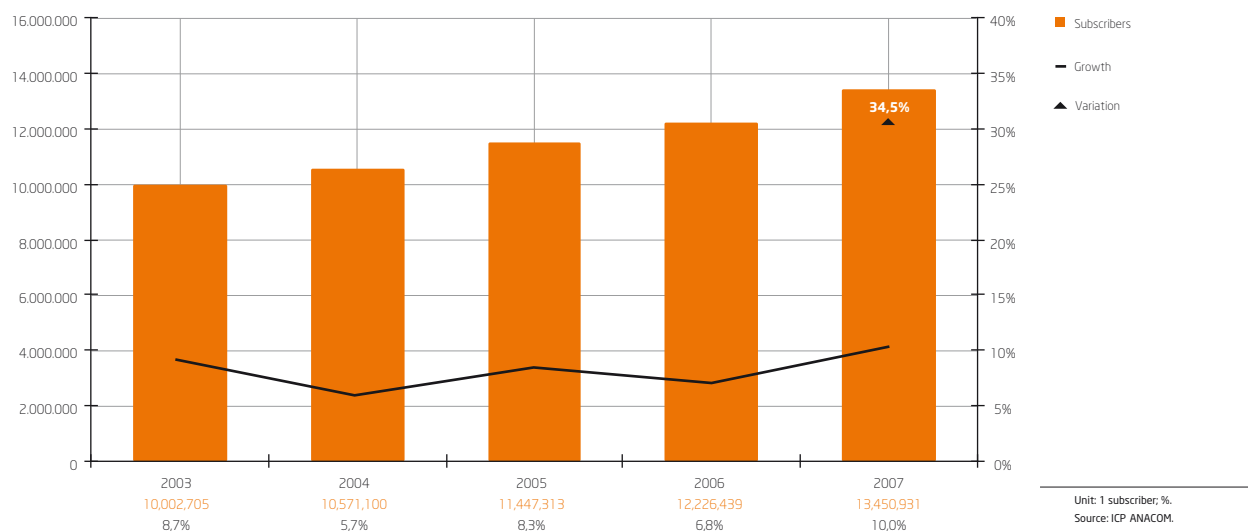
Amount of subscribers

Table 39.

	2006	2007	Var. 2006/2007	2003/2007 Annual average var.	2003/2007 average
Post-paid	2.455.608	3.131.088	27,5%	10,8%	51,0%
Prepaid	9.770.831	10.319.843	5,6%	6,8%	30,2%
Total	**12.226.439**	**13.450.931**	**10,0%**	**7,7%**	**34,5%**

Unit: 1 subscribers; %.
Source: ICP-ANACOM.

Evolution of the amount of subscribers and growth rates

Graph 55.

| 2003	2004	2005	2006	2007
10,002,705	10,571,100	11,447,313	12,226,439	13,450,931
8,7%	5,7%	8,3%	6,8%	10,0%

Unit: 1 subscriber; %.
Source: ICP ANACOM.

41 The definition of subscriber was approved by a determination of ICP-ANACOM's Board of Directors of 07.02.2002. It relates to the number of cards that are under a contractual relationship with one of the national Mobile Telephone Service operators, which were granted the right to originate or receive traffic through their networks..

Evolution of the amount of subscribers by type of tariff scheme
Graph 56.

Unit: thousand subscribers.
Source: ICP ANACOM.
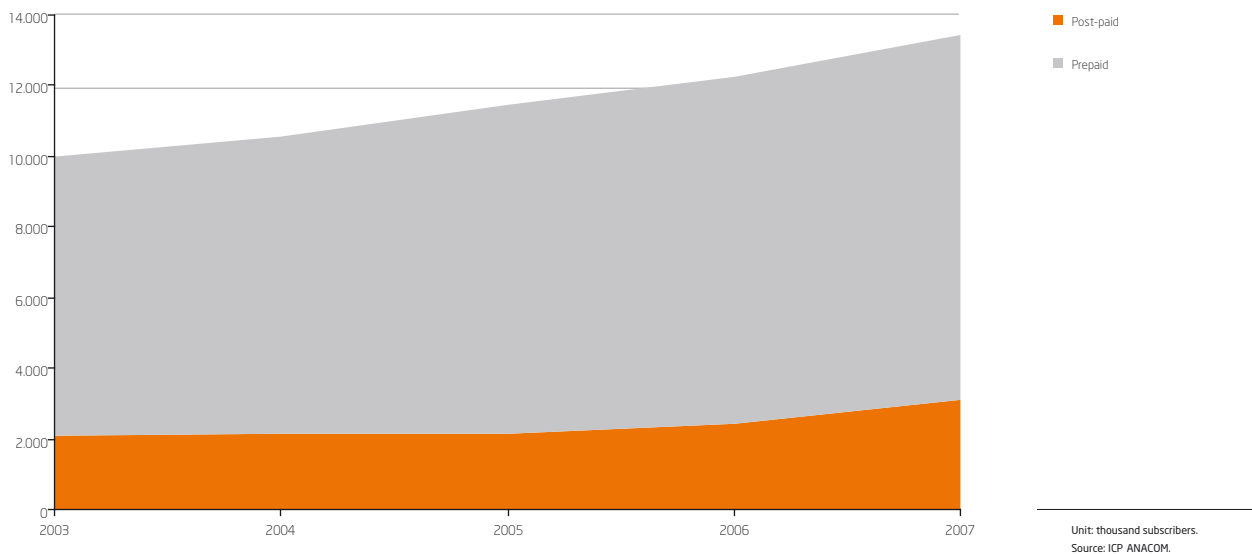
The recent evolution in the amount of subscribers was partly influenced by the following factors:

• The development of 3G services. The amount of 3G/UMTS subscribers in Portugal reached about 3.07 million by the end of 2007.

• The coming about of the discount offerings (Uzo, Rede 4, Vodafone Directo), in 2005.

• The coming about of new mobile broadband Internet access offers.

• The launch of specific offers within the scope of the development of the Information Society (Initiative Novas Oportunidades, e-opportunities, e-schools and e-teachers initiatives).

• The development of new applications for machines, for example.

These factors contributed to sustain the trend of the MTS growing number of subscribers in Portugal.

Evolution of the number of subscribers and growth trend
Graph 57.

Unit: Thousand subscribers.
Source: ICP ANACOM.
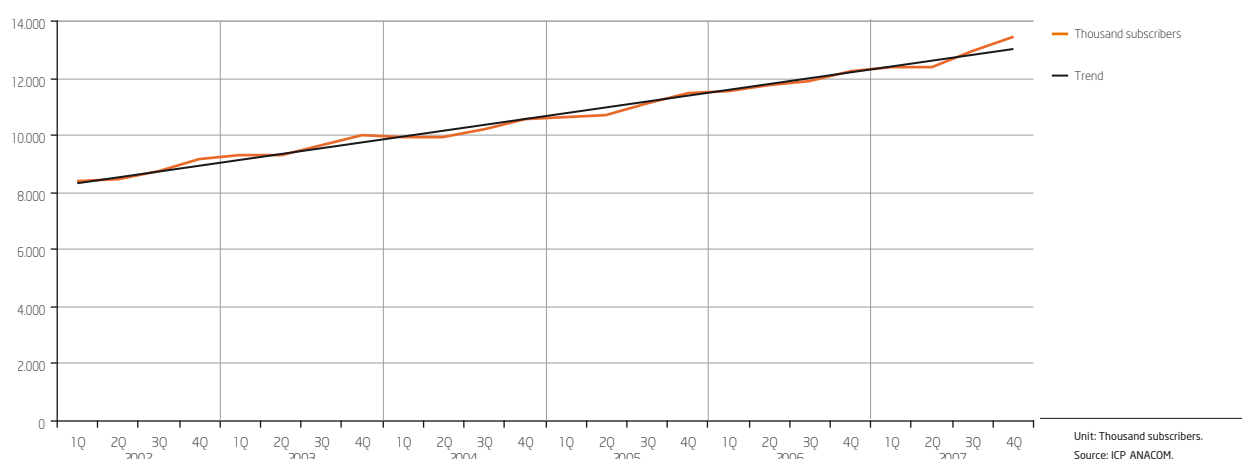
As mentioned above, the growth recorded in the amount of subscribers was below the EU average.

That may be due to the life cycle stage of this service and/or to macroeconomic cyclical factors.

The service's usage level

Below is the evolution of the service's usage level, in terms of voice traffic, SMS, MMS, roaming, data services, video telephony and mobile TV.

Voice traffic in calls
Table 40.

Voice traffic

In 2007, MTS subscribers made more than 7 billion calls, 5.8 per cent more than in the previous year.

In that same period, MTS subscribers received over 7 billion calls, which is 5.5 per cent more than in the previous year.

|	2006	2007	Var. 2006/2007	2003/2007 annual variation	2003/2007 variation
Outgoing traffic	**6.648**	**7.035**	**5,8**	**4,9**	**21,1**
Own network - Own network	4.439	4.693	5,7	5,0	21,7
Own network - national FTS	534	552	3,3	0,5	1,9
Own network - International networks	226	248	9,8	9,4	43,4
Own network - Other national MTS	1.448	1.542	6,4	5,6	24,5
Incoming traffic	**6.693**	**7.064**	**5,5**	**4,5**	**19,1**
Own network - Own network	4.439	4.693	5,7	5,0	21,7
National FTS - Own network	593	610	2,8	-3,1	-11,7
International networks - Own network	206	217	5,4	10,7	50,1
Other national MTS - Own network	1.455	1.544	6,1	5,6	24,5

Units: million calls, %
Source: ICP-ANACOM.

Between 2003 and 2006, outgoing traffic grew about 21.1 per cent and incoming traffic grew around 19 per cent.

These traffic growth rates are below the growth rates for the number of subscribers.

Call volume evolution 2003-2007
Graph 58.

Unit: million calls.
Source: ICP ANACOM.
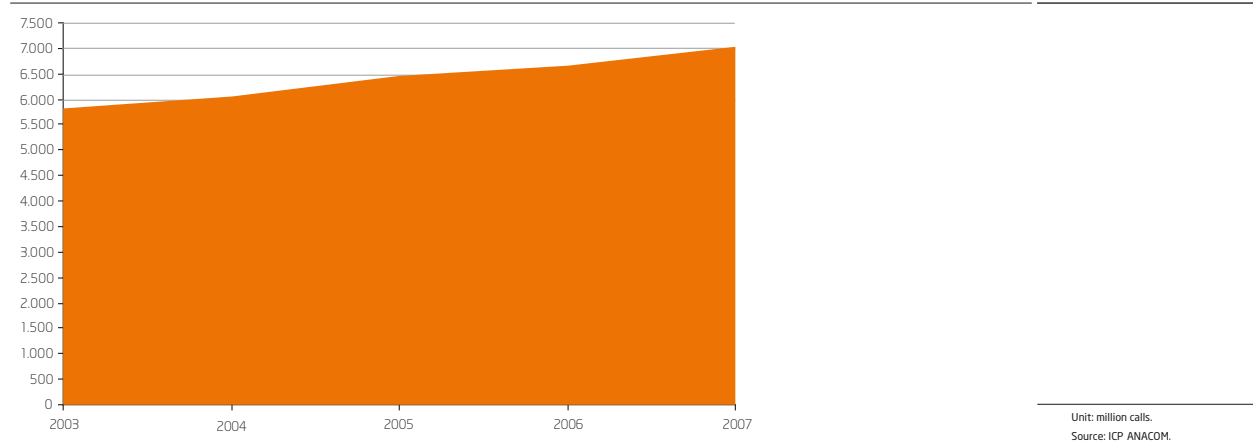
An analysis of the traffic evolution by type of call shows that the weight of intra-network traffic determines the overall traffic evolution. Inter-network and international traffic grew more than the average traffic, while outgoing international traffic was the only item that followed the growth in the number of subscribers.

Regarding fixed-to-mobile an mobile-to-fixed calls, in spite of a positive variation versus the previous year and a growth above their five-year average, this type of calls already stands for less than 9 per cent of all calls with termination in the mobile network.

Weight of fixed-to-mobile traffic in the overall incoming traffic
Graph 59.

■ Fixed-to-mob le traffic
■ Overall incoming traffic

Unit: % of calls.
Source: ICP ANACOM.
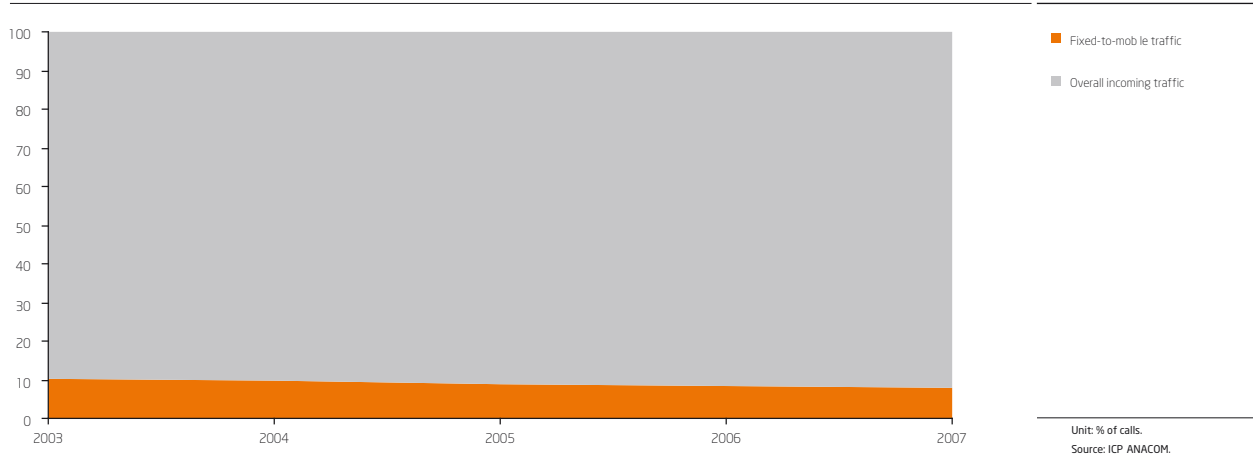
Regarding traffic evolution in minutes, 2007 recorded the highest growth rate in the latest 5 years. The amount of conversation minutes with origin in the mobile networks grew about 9.6 per cent vis-à-vis the previous year, totalling about 13.6 billion minutes.

The amount of minutes ended in mobile networks reached over 13.9 billion minutes, a 9.2 per cent increase from the previous year.

Voice traffic in minutes
Table 41.

|	2006	2007	2006/2007 var.	2003/2007 average annual var.	2003/2007 var.
Outgoing traffic	**12.452**	**13.645**	**9,6**	**8,1**	**36,4**
Own network - Own network	8.520	9.362	9,9	8,9	40,5
Own network – national FTS	858	932	8,6	1,9	7,9
Own network – International networks	583	642	10,2	7,6	34,2
Own network – Other national MTS	2.491	2.709	8,8	7,9	35,6
Incoming traffic	**12.745**	**13.914**	**9,2**	**7,8**	**34,8**
Own network - Own network	8.520	9.362	9,9	8,9	40,5
National FTS - Own network	1.119	1.177	5,2	-1,2	-4,7
International networks - Own network	613	669	9,2	12,0	57,6
Other national MTS - Own network	2.493	2.705	8,5	7,9	35,3

Units: million minutes; %.
Source: ICP-ANACOM.

Between 2003 and 2007, there was a growth of around 36.4 per cent in the outgoing traffic and of around 34.8 per cent in the incoming traffic, growth rates that are similar to those of the number of subscribers.

Evolution of the minute volume 2003-2007
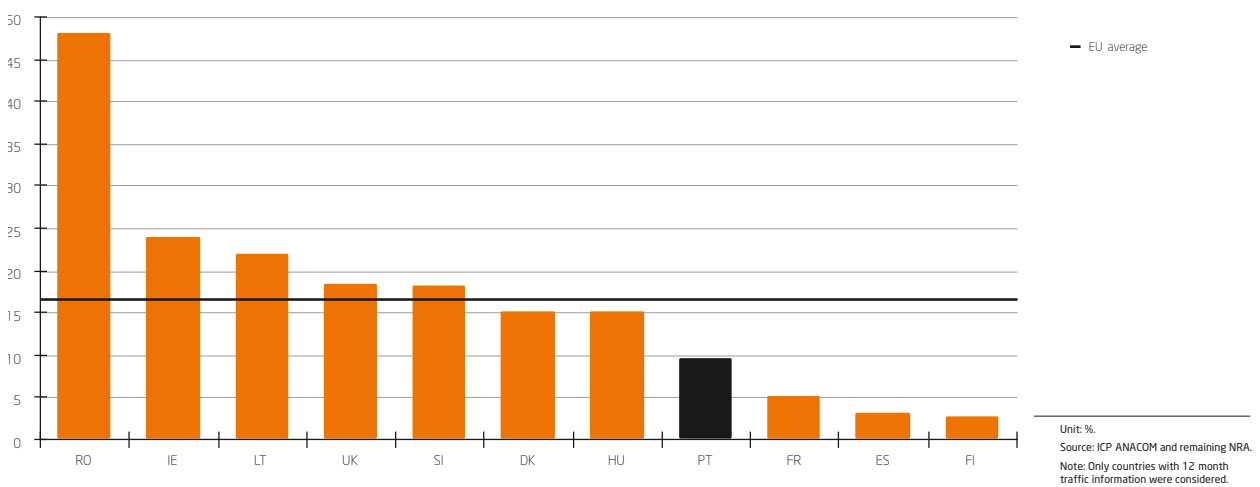**Graph 60.**
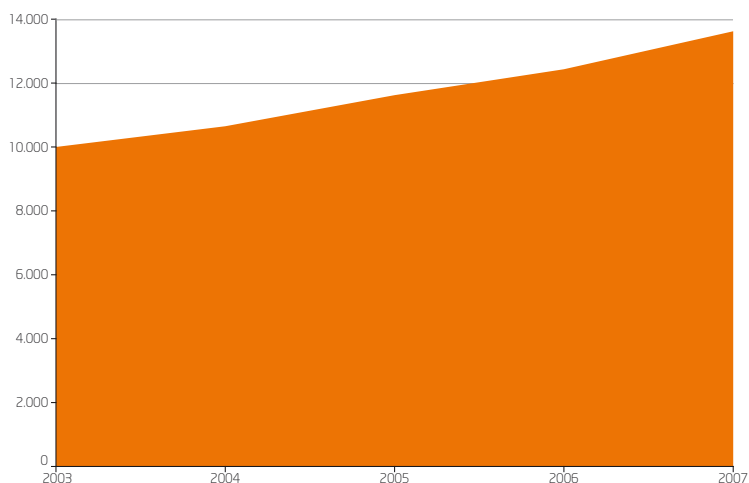
Unit: million minutes.
Source: ICP ANACOM.

On the other hand, traffic growth in mobile networks, in 2007, was below that of other countries.

Traffic growth in minutes, in 2007 – international comparisons
Graph 61.

EU average

Unit: %.
Source: ICP ANACOM and remaining NRA.
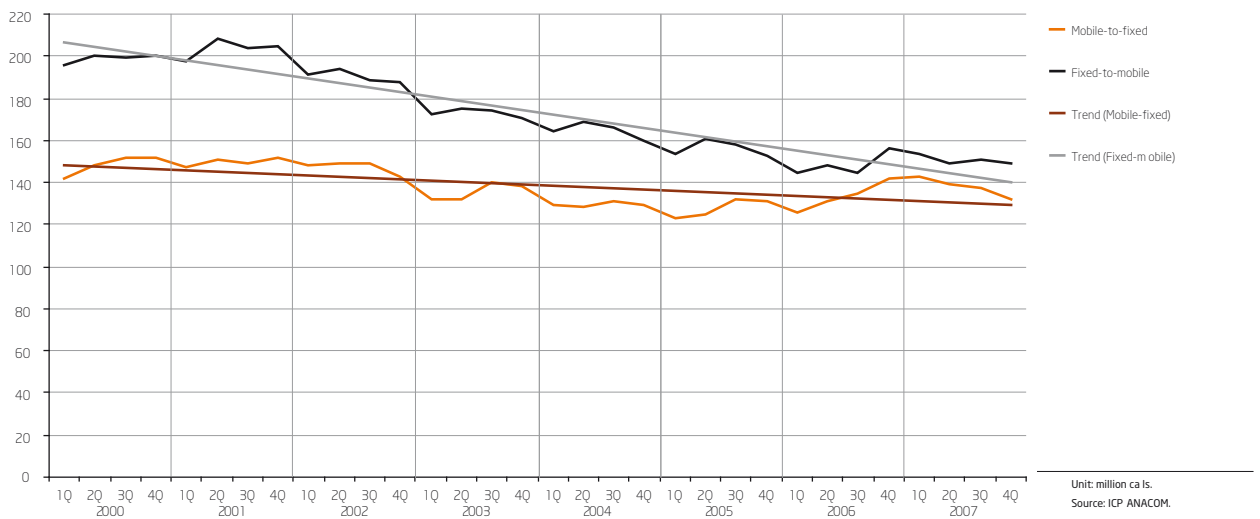Note: Only countries with 12 month traffic information were considered.

Just as with the amount of calls, during 2003-2007 the amount of minutes with origin in the fixed networks and with destination in the mobile networks has lost weight in the overall mobile networks' incoming traffic. In this case there is even a decrease, in absolute terms, of this type of traffic (4.7 per cent). The decreasing mobile-to-fixed and fixed-to-mobile traffic trend is linked to the fixed-by-mobile replacement phenomenon.

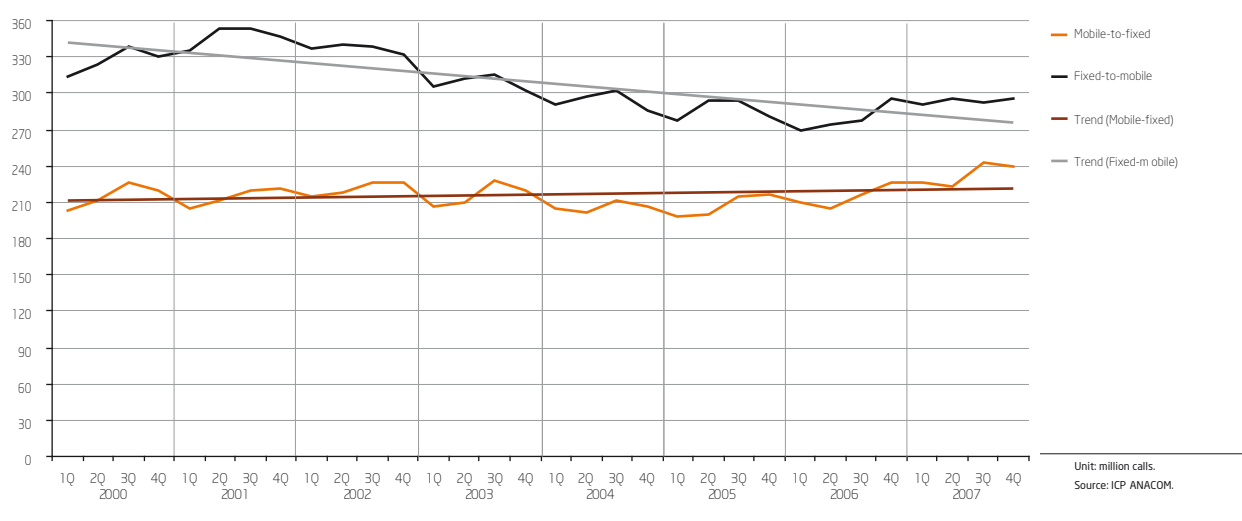## Mobile-to-fixed and fixed-to-mobile call evolution and trend
Graph 62.

Mobile-to-fixed
Fixed-to-mobile
Trend (Mobile-fixed)
Trend (Fixed-mobile)

Unit: million cals.
Source: ICP ANACOM.

Mobile-to-fixed and fixed-to-mobile amount of minutes and trend
Graph 63.

Mobile-to-fixed
Fixed-to-mobile
Trend (Mobile-fixed)
Trend (Fixed-m obile)

Unit: million calls.
Source: ICP ANACOM.

In 2007, however, the amount of fixed-to-mobile minutes grew 5.2 per cent from the previous year. Reducing mobile terminations and the coming about of low-cost tariff schemes, with no price difference per call destination, could have fostered this type of calls.

Weight of incoming fixed-to-mobile traffic (minutes)
Graph 64.

Fixed-mobile traffic
Mobile network incoming traffic

Unit: % of minutes.
Source: ICP ANACOM.
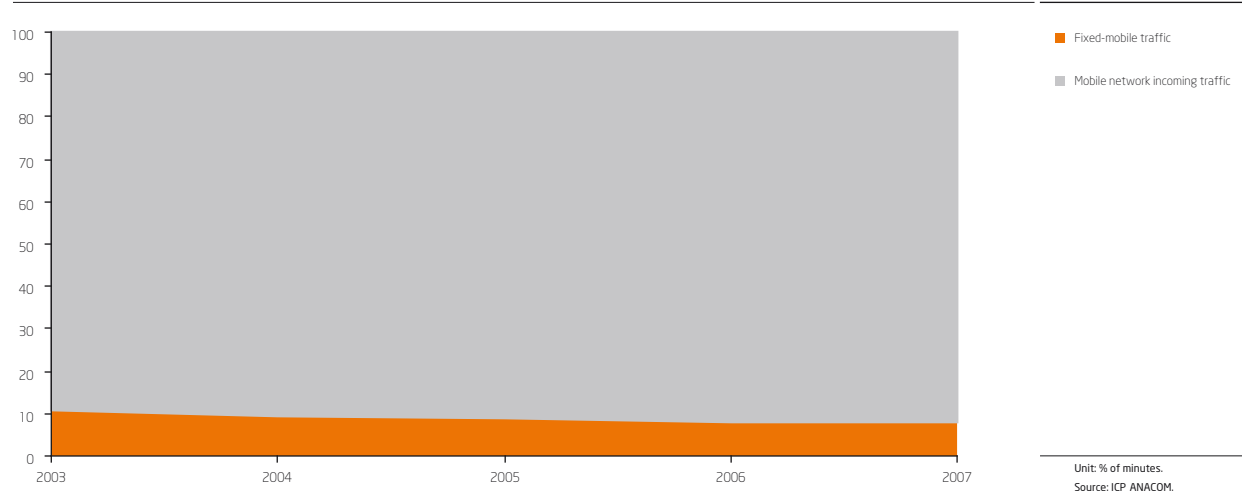
This type of traffic already stands for less than 8.5 per cent of minutes terminated in the mobile network.

It should be mentioned that, even if the amount of traffic originated in the fixed network and terminated in the mobile network is usually higher than the amount of traffic originated in the mobile network and terminated in the fixed network, the latter has grown at a higher rate than the former. Thus, while mobile-to-fixed calls stood for 75 per cent of fixed-to-mobile calls in 2003, this figure was already 92 per cent in 2007. In terms of minutes, during the same period, the rate between both traffic types increase 14 per cent, reaching 79 per cent in 2007.

SMS

2007 recorded again a considerable increase in the amount of sent text messages (48.1 per cent vis-à-vis the previous year).

This was due to promotional campaigns put in place by the mobile operators since early 2005.
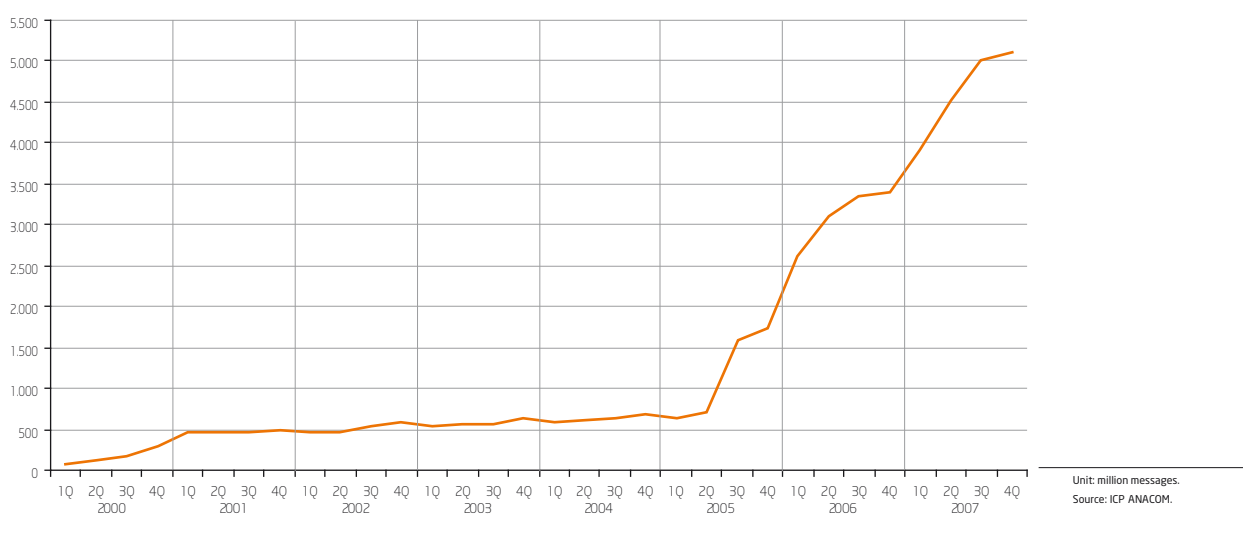
SMS with origin in own network
Table 42.

	2006	2007	Var. 2006/2007	2003/2007 average annual variation	2003/2007 var.
Amount of SMS messages	12.453	18.439	48,1	68,2	700,7

Unit: million messages, %.
Source: ICP-ANACOM.

Evolution in the amount of SMS
Graph 65.

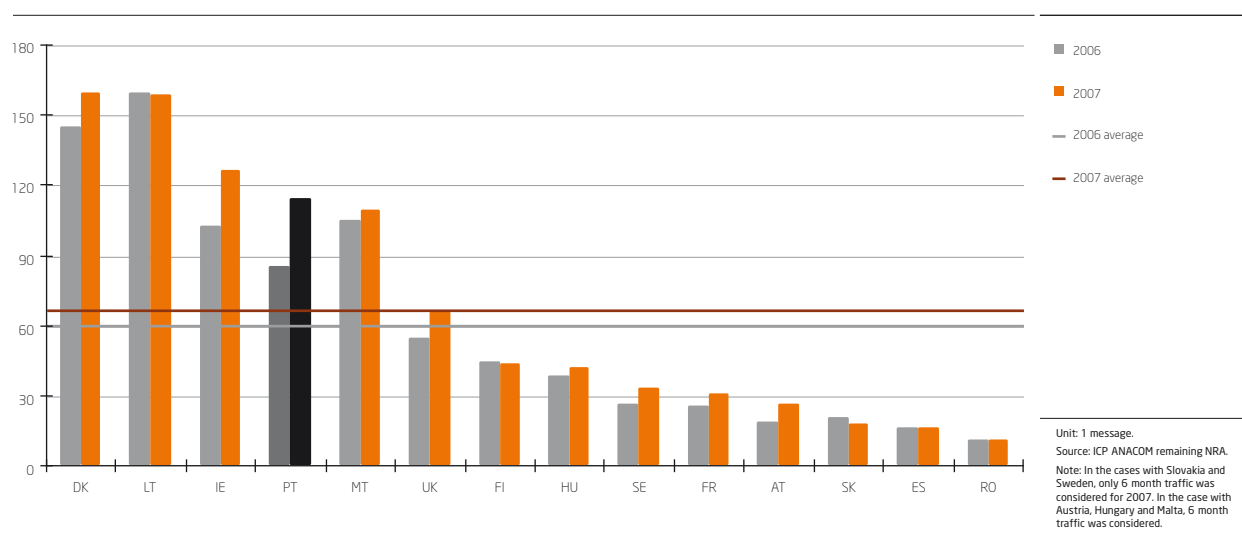Unit: million messages.
Source: ICP ANACOM.

According to the available data, SMS use in Portugal is relatively low in intensity, if compared to other countries, Denmark and Latvia standing out.

There was in general an increase in the use of SMS in the considered countries. It should be highlighted that Portugal has one of the highest growth rates in the amount of SMS, among the considered countries.
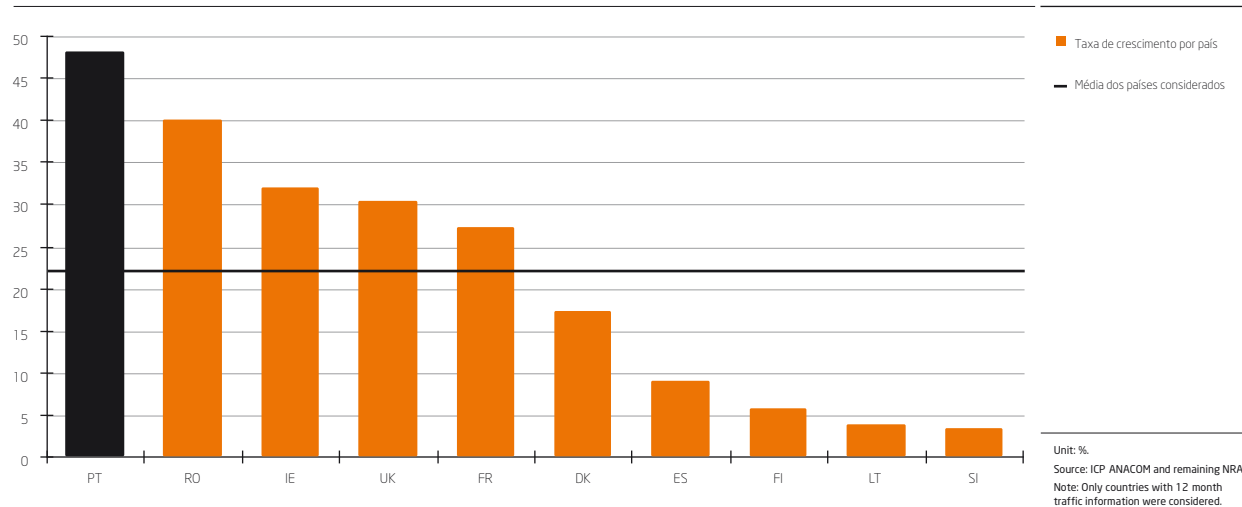
Amount of SMS per subscriber and per month – international comparisons
Graph 66.

Unit: 1 message.
Source: ICP ANACOM remaining NRA.
Note: In the cases with Slovakia and Sweden, only 6 month traffic was considered for 2007. In the case with Austria, Hungary and Malta, 6 month traffic was considered.

SMS message traffic growth – international comparisons
Graph 67.

Unit: %.
Source: ICP ANACOM and remaining NRA.
Note: Only countries with 12 month traffic information were considered.

MMS

Multimedia message traffic, known as MMS, had a considerable decrease in 2007.

It should be mentioned that the use of this service implies the use of terminal equipment that is compatible with it. In the case with the called user it is also possible to refer to the message at the operator's website.
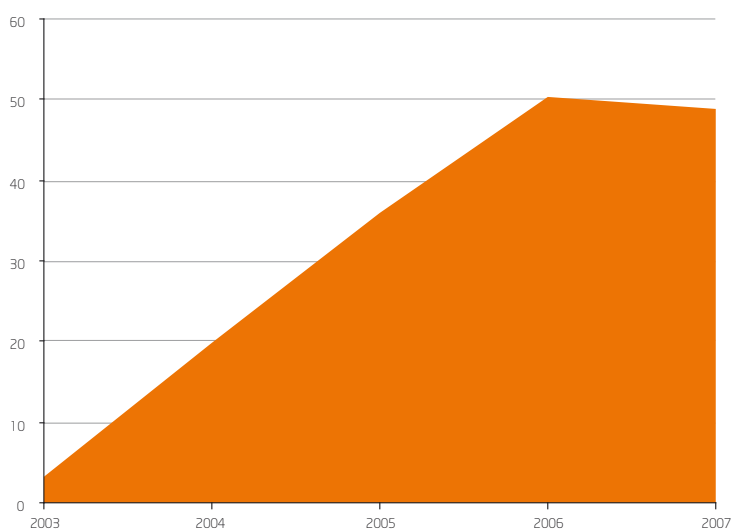
MMS with origin in own network
Table 43.

	2006	2007	Var. 2006/2007	2003/2007 average annual variation	2003/2007 var.
Amount of messages	50.389	48.734	-3,3	97,0	1.406,7

Unit: thousand messages, %.
Source: ICP-ANACOM.

Evolution in the amount of sent MMS
Graph 68.

Unit: million messages.
Source: ICP ANACOM.

In comparison with the amount of SMS, the amount of MMS is relatively small.

Roaming

In 2007, roamed in traffic registered considerable variations, text messages standing out (25.8 per cent).

The average roamed in call length was 123 seconds, 5 seconds above the figure recorded in the previous year.

Roamed-in traffic
Table 44.

	2006	2007	Var. 2006/2007	2003/2007 average annual variation	2003/2007 var.
Roamed voice calls	126.077	138.772	10,1	3,7	15,7
Amount of roamed minutes	248.368	283.593	14,2	11,2	53,2
Roamed text messages	192.438	242.019	25,8	34,7	229,4
Average call length (sec)	118	123	+5 seconds		

Unit: thousand, %, seconds.
Source: ICP-ANACOM.

Evolution in the amount of roamed-in traffic
Graph 69.
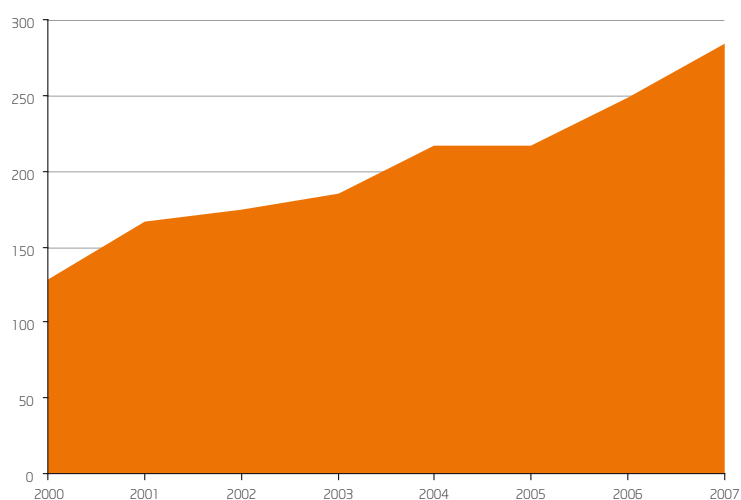
Unit: million of minutes.
Source: ICP ANACOM.

Roamed out traffic also shows considerable growths: around 12.1 per cent in calls, 22.1 per cent in minutes, and 38.5 per cent in text messages.

Roamed-out traffic
Table 45.

|	2006	2007	Var. 2006/2007	2003/2007 average annual variation	2003/2007 var.
Roamed voice calls	88.434	99.140	12,1	8,2	37,1
Amount of roamed minutes	203.864	248.917	22,1	16,0	80,9
Roamed text messages	139.665	193.441	38,5	34,6	228,1
Average call length (sec)	138	151	+13		

Unit: thousand, %, seconds.
Source: ICP-ANACOM.

There is a growing trend in the SMS use, probably fuelled by the price level of this type of calls and the value of the terminations in these cases. It should be underlined that receiving roamed messages has no costs to the roamer, whereas receiving a voice call means paying the part of the call in connection with the termination cost of the foreign operator at which the roamer is registered. This, together with the afore-mentioned campaigns, may explain why using SMS is preferred over voice calls.

Evolution of the amount of roamed-out traffic
Graph 70.

Unit: million minutes.
Source: ICP ANACOM.
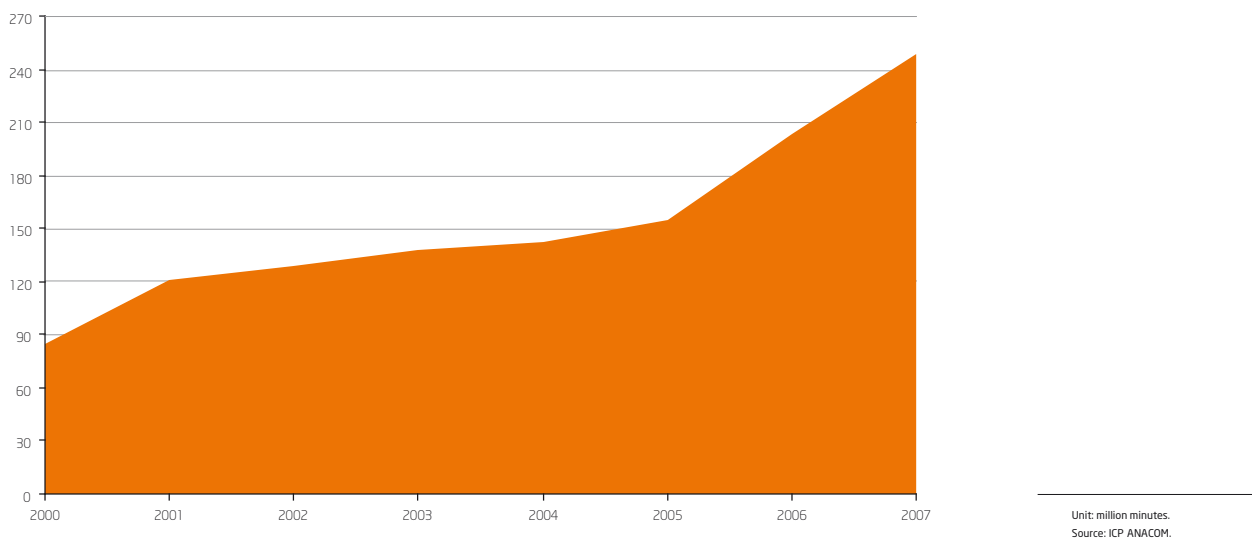
There was a considerable increase in the roamed-out calls' average length, in 2007, from about 138 seconds to 151 seconds per call.

Also in that year, there was an increasing trend towards the re-balancing of roamed-in and roamed-out traffic. Although there is more roamed-in traffic than roamed-out traffic, its relative weight has been dropping.

In terms of minutes, roamed-out traffic stands for 88 per cent of roamed-in traffic, 6 per cent more than in the previous year. The relative weight of the amount of roamed-out messages increased 7 per cent, now standing for 80 per cent of roamed-in messages.

It should be mentioned that the above-mentioned evolution may have been influenced, after the 3rd quarter of 2007, by the entry into force of the International Roaming Regulation, Regulation (CE) no. 717/2007 of the European Parliament and of the Council, of 27 June 2007. Following the implementation of the rules stemming from that Regulation, there was a general trend towards the decrease of the average price per minute of roamed voice communications within the EU/EEA.

Data services traffic

The amount of data service users with the WAP protocol is relatively small. This evolution could be connected with the development of 3G services.

Data service accesses
Table 46.

	2007
APN WAP sessions	130.445
Amount of APN WAP sessions (MB)	15.917
Corporate service sessions	15.452
Amount of corporate service sessions (MB)	13.231

Unit: thousand.
Source: ICP-ANACOM.

The number of subscribers already using 3rd generation mobile services (IMT2000/UMTS) has grown considerably.

Number of UMTS service and data service users
Table 47.

	Jan.2007	Dec.2007	Var. Jan-Dec (%)
1. Total number of possible UMTS service users	1.988	3.074	54,6
Who were active during the period under review	452	869	92,2

Unit: thousand users.
Source: ICP-ANACOM.

The evolution of the number of mobile broadband users was influenced by the changes made by its providers to the offerings of this type of service, and by the implementation of the Government's initiative on New Opportunities (Novas Oportunidades): e-escola (e-school), e-professores (e-teachers) and e-oportunidades (e-opportunities). This initiative makes is possible to buy a laptop PC and to have monthly broadband Internet access fees at reduced prices.

Mention should be made to the fact that all operators have reinforced their mobile broadband offerings and started to provide access to the Internet over High-Speed Downlink Packet Access (HSDPA), and recently with HSUPA, High-Speed Uplink Packet Access.

The offerings' characteristics were also changed. The operators increased the download speeds, changed the terms of the tariffs and introduced a system for connecting to the PC via Universal Series Bus (USB).

However, 2007 also registered the launch of specific "mobile phone Internet" offers, with daily or monthly subscription options.

Specific "mobile phone Internet" offerings - 2007

Table 48.

Optimus	TMN	Vodafone
Tariff scheme: - monthly access: € 7.5 (100MB included) - daily access: € 0.99 per day (10MB included)	Tariff scheme: - monthly: € 7.5 (up to 100MB usage) - daily: € 0.99 per day (0.33€ per each 100kb up to a maximum of 0.99€)).	Tariff scheme **Browsing:** - 0.99€ (access to WEB or WAP site, including Vodafone Live, until 12 pm) **Browsing Additional:** 7.50€ (with unlimited access during 30 days) **Messenger:** 3€ (unlimited instant message sending) Valid during 30 days. **My Mail Light:** 3€ (40 emails included) **My Mail Standard:** 6€ (150 emails included) **Mobile Internet Additional:** 9.99€ month

Source: Operators' websites.

Video-telephony

The video-telephony service has a very small amount of traffic.

In 2007 there was even a considerable decrease in this service's usage level.

Video-call traffic

Table 49.

	2006	2007	Var. 2006/2007
Amount of video-calls	4.206	3.569	-15,1
Video-calling traffic volume	9.743	5.842	-40,0

Unit: thousand calls, thousand minutes, %.
Source: ICP-ANACOM.

Mobile TV

Also in 2006 the mobile TV service was introduced in the market, giving users access to the television service.

This service registered an 86 per cent user increase during the last year, totalling around 190 thousand users at the end of the year

Mobile TV users

Table 50.

	2006	2007	2006/2007 var.
Amount of Mobile TV users	102	190	85,7

Unit: thousand users, %.
Source: ICP-ANACOM.

Currently, Optimus has about 25 available channels, TMN has 29 and Vodafone has 26. Tariff schemes are in several options, as can be seen on the table below.

Mobile TV service

Table 51.

Optimus	TMN	Vodafone
25 channels	29 channels	26 channels
Tariff scheme: : One channel per day - € 1.90 (1h traffic limit) - One channel per month (automatically renewable monthly fee) - € 2.90 (2h* traffic limit) - Pack Plus with 16 channels: (automatically renewable monthly fee) - € 7.50 (4h traffic limit)	Tariff scheme: - monthly: € 7,5 (up to 100MB usage) - daily: € 0.99 per day (€ 0.33 per each 100kb up to a maximum of € 0.99). All options grant access to all available channels except to Playboy and Blue TV channels. Playboy and Blue TV with an € 3.50 additional cost per access/day.	Tariff scheme: **Daily Subscription:** € 0,90 (unlimited access to all channels during 24h, except adult channels); **Weekly Subscription:** € 1.99 (with unlimited access to all channels during 7 days, except adult channels. First 7 days free for new activations; **Monthly Subscription (30 days):** € 7.5 (unlimited access to all channels, except adult channels). First 30 days free for new activations; **Adult Channels:** € 2.5 per two hour periods/each channel

Source: Operators' websites.

The service's revenues and Average revenue per subscriber[42]

Revenues from services to customers reached 2.6 billion Euros, a 5.6 increase from the previous year.

Revenues from service provision to customers
Table 52.

	2006		2007		2006/2007
	Absolute figure	%	Absolute figure	%	Var.
Revenues from monthly fees (monthly fees and supplementary services)	149.095	6,1	161.877	6,2	8,6
Revenues from Voice communications	1.907.472	77,6	1.910.847	73,6	0,2
Of which, Roaming Out	159.023	6,5	158.665	6,1	-0,2
Revenues from Data communications	334.555	13,6	464.495	17,9	38,8
SMS	226.089	9,2	248.266	9,5	9,8%
MMS	12.116	0,5	12.849	0,5	6,0
Video calls	861	0,04	1.569	0,06	82,2
Mobile TV	1.313	0,1	3.175	0,1	141,8
Internet access and mobile portal	79.336	3,2	178.908	6,9	125,5
Other data services	14.840	0,6	19.728	0,8	32,9
Other Revenues	65.905	2,7	58.569	2,3	-11,1
Total revenues with services to customers	**2.457.027**		**2.595.788**		**5,6%**

Unit: thousand Euros, %.
Source: ICP-ANACOM.
Note: Figures presented differ from those previously released due to corrections made by the operators. They do not include revenues from services to operators or from sales of equipment.

Revenue growth was fuelled by data services, particularly by Internet access, mobile portal and SMS.

Data services already stand for 18 per cent of overall revenues, 4.3 per cent more than in the previous year.

The drop in roaming tariffs by community imposition (vide. roaming traffic section) may have affected this traffic's revenues, which decreased 0.2 per cent from the previous year. This occurred in spite of the increase registered in traffic (+10.1 per cent in calls, +14.2 per cent in minutes, and +5.8 per cent in messages).

According to the available data, the average revenue per user is estimated to have declined by about 1.6 per cent in 2007.

Average revenue per subscriber
Table 53.

	2006	2007	Var. 2006/2007
Average monthly revenue per average subscriber	17,30	17,02	-1,6

Unit: Euros, %.
Source: ICP-ANACOM.
Note: Reckoning on the figures: revenues from services to customers and average amount of subscribers in that year.

42 The presented values are reckoned based on data collected at the operators.

Service's price levels

Below is an international price comparison of this service's prices and its price evolution between 2002 and 2007.

MTS international price comparison[43]

According to the available information, Portugal's price level is below the average for prepaid tariff schemes, in 2007. However, regarding post-paid schemes, this scenario changes considerably, for prices in Portugal were above average for medium and high consumption profiles, in 2007.

International price comparisons (November 2007) – deviations from average[43]
### Table 54.

Package	Profile		
	Low consumption	Average consumption	High consumption
Post-paid	-8,1 %	0,6%	5,9%
Prepaid	-21,5%	-45,3%	-44,1%

Unit: %.
Source: Teligen, OCDE, ICP-ANACOM.

Regarding the low consumption profile, the price of the prepaid packages in Portugal is about 21 per cent below the average of the considered countries.

Low consumption profile – prepaid packages (November 2007)
Graph 71.

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.
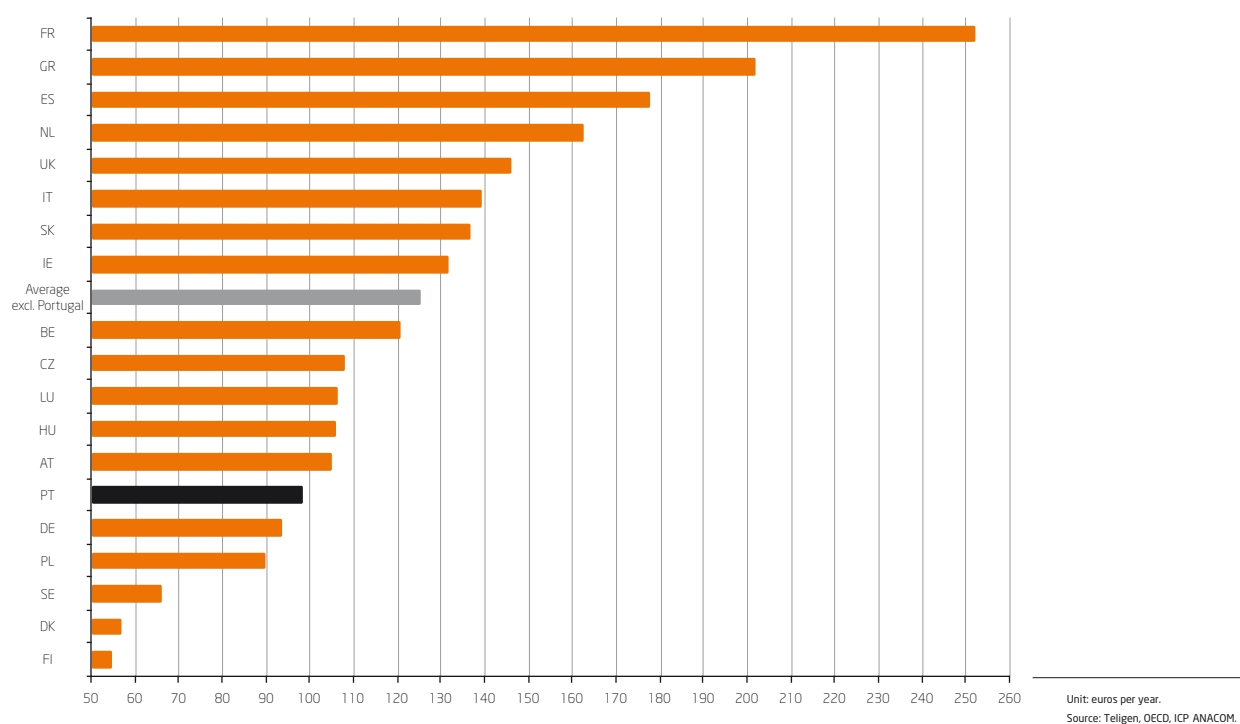
43 Methodology note: The results of the shown baskets were taken from OECD/Teligen database of November 2007 and are in Euros, VAT excluded and without considering PPP (purchasing power parity). From the OECD countries, those that are part of the EU were selected. Taking into account that, by default, OECD/Teligen always produces two results by country (regarding the incumbent operator and the second most representative one), the operator with the lowest tariff plan, regarding the annual invoice for each usage basket and profile, was selected for each country. The shown deviations refer to the average of the selected countries, Portugal excluded. The shown values are those of the new baskets defined in 2006.
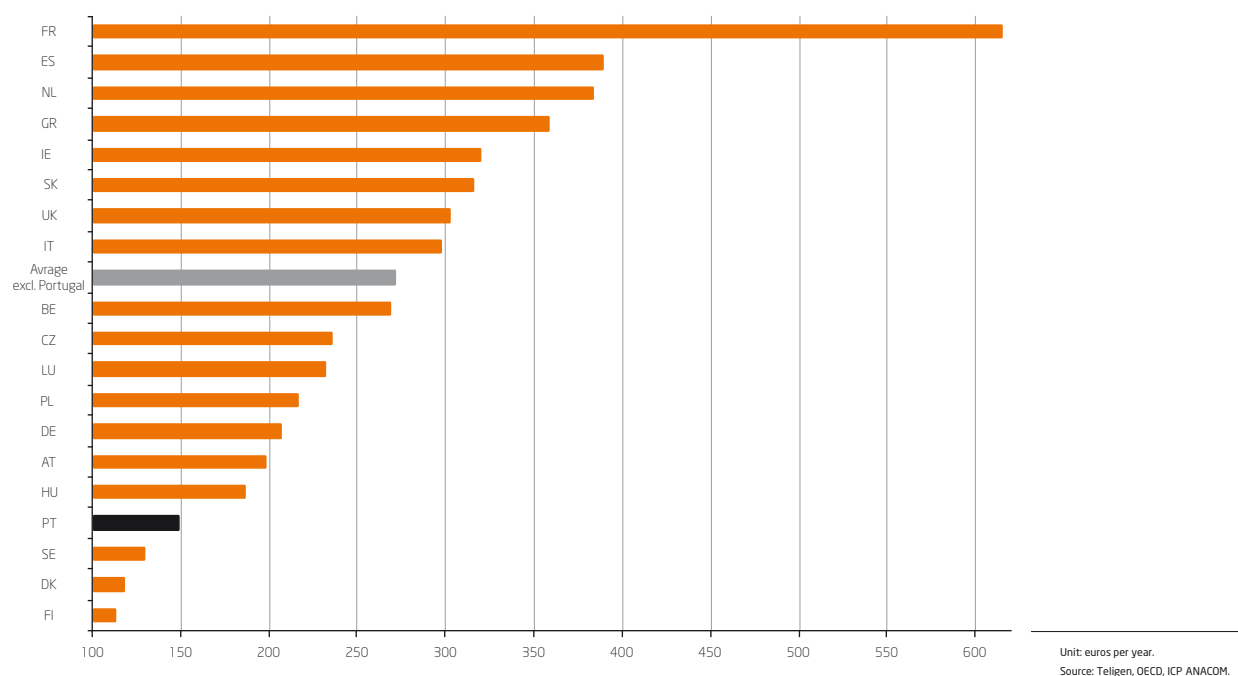
Regarding the medium consumption profile, the prices in Portugal are about 45.3 per cent below the average of the analysed countries, for the prepaid packages.

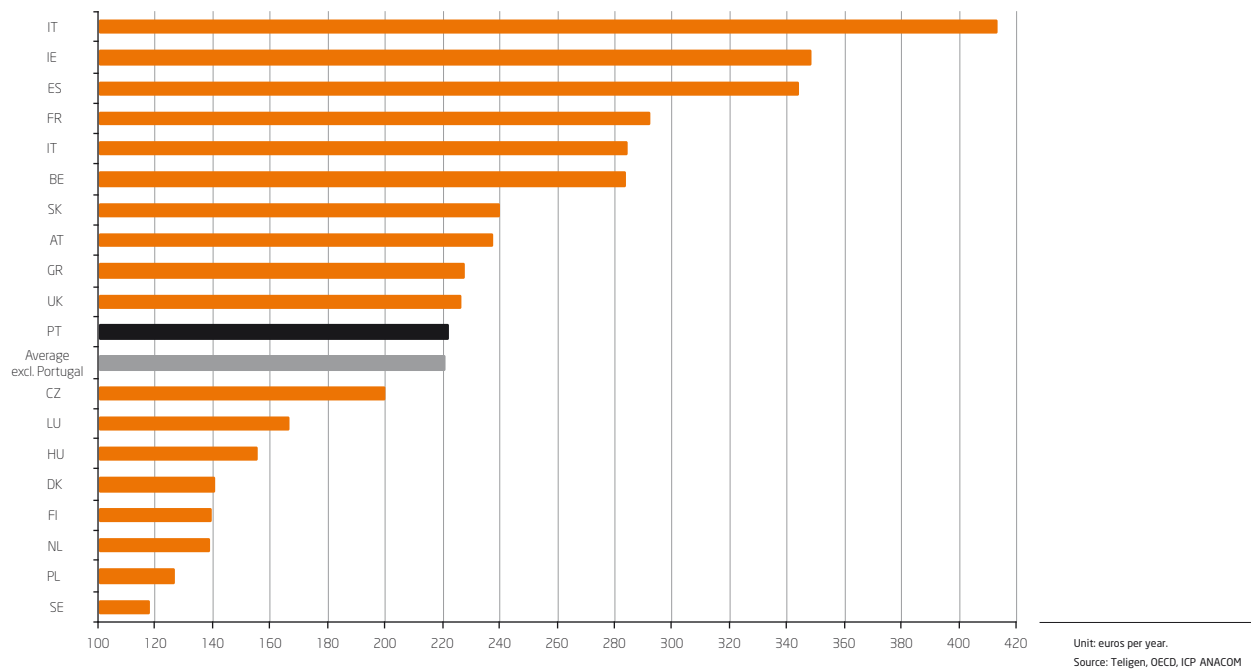## Medium consumption profile – prepaid packages (November 2007)
Graph 72.

Country	Value
FR	
ES	
NL	
GR	
IE	
SK	
UK	
IT	
Avrage excl. Portugal	
BE	
CZ	
LU	
PL	
DE	
AT	
HU	
PT	
SE	
DK	
FI	

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.

Regarding post-paid packages, the prices charged in Portugal
are about 0.6 per cent above average.

Medium consumption profile – prepaid packages (November 2007)
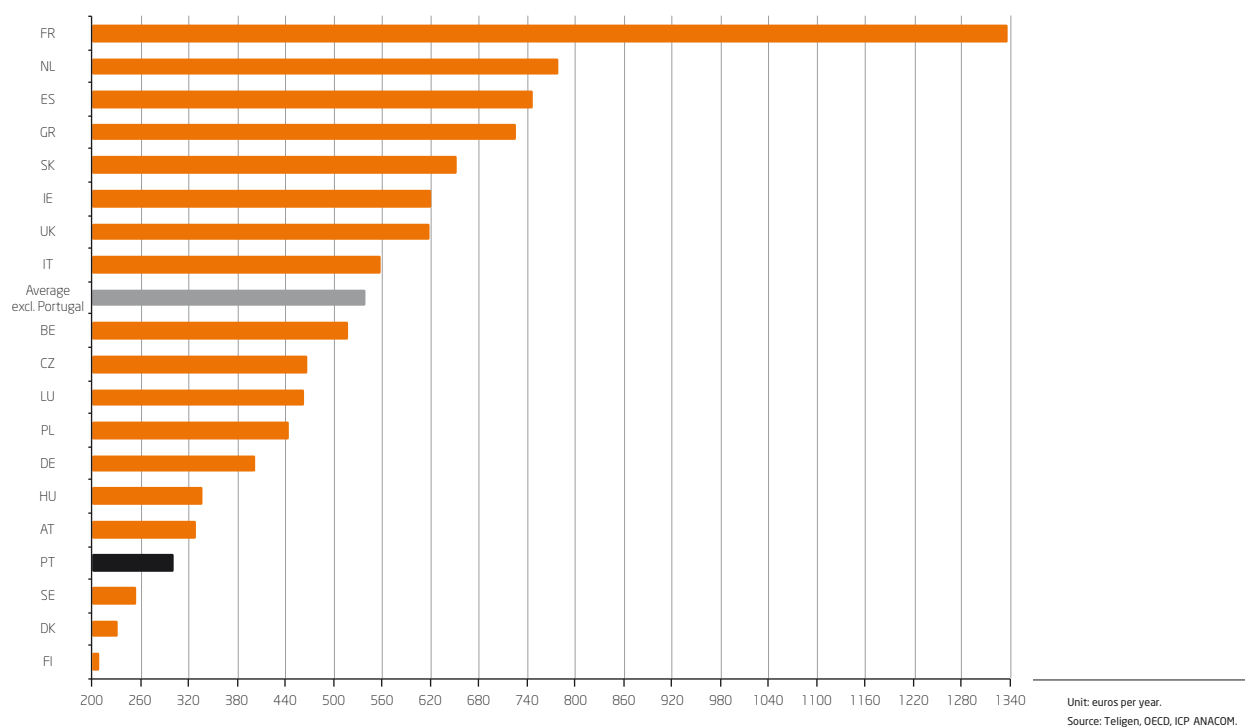**Graph 73.**

Concerning the high consumption profile, prepaid offers in Portugal have a price that is 44.1 per cent below average.

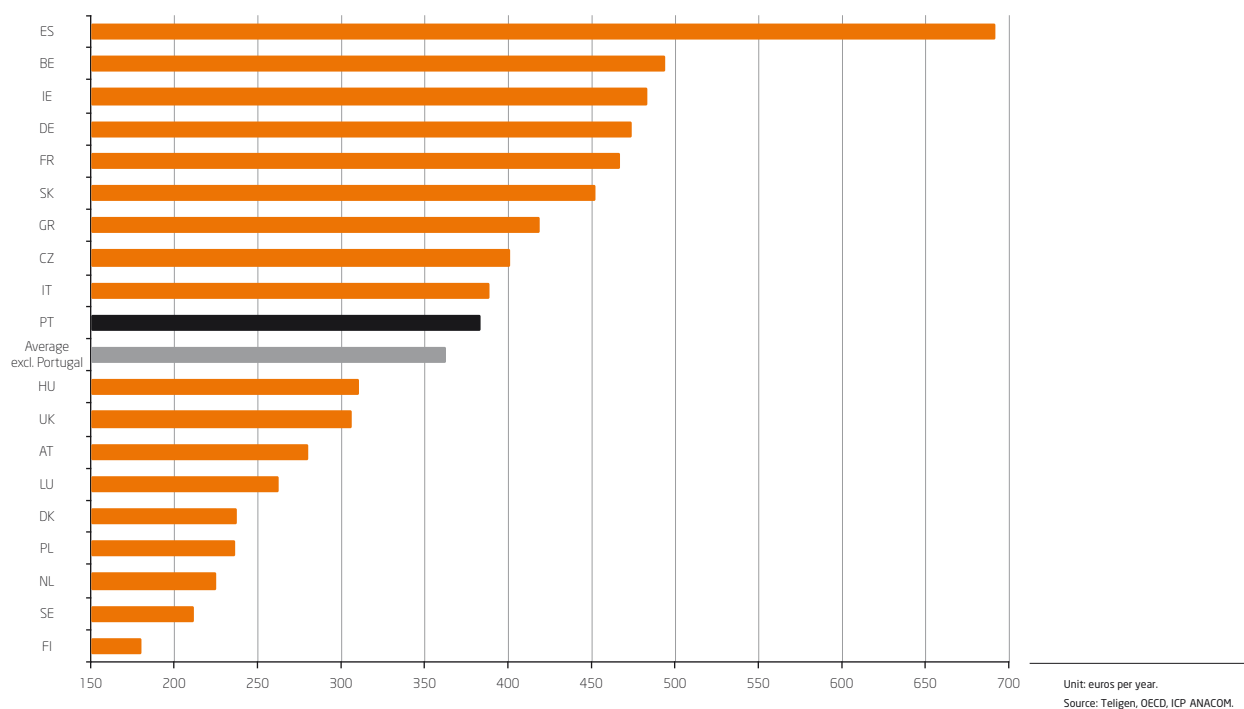**High consumption profile - prepaid packages** (November 2007)
Graph 74.

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.

Regarding post-paid packages, the deviation from the average is about +5.9 per cent.

High consumption profile – post-paid packages (November 2007)
Graph 75.

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.

Evolution of national prices and comparison with the EU (2002/2007)[44]

The graphs below show the main trends regarding the service's price evolution in Portugal.
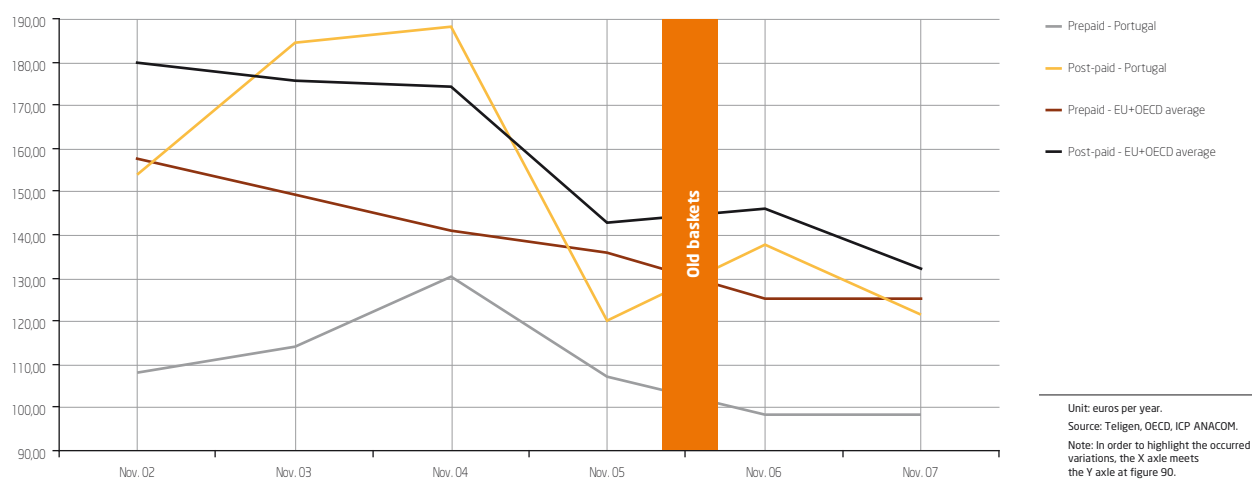
Regarding the low consumption profile, prepaid plans tend to be below average, unlike post-paid plans, which only had values below the average value of the considered countries during the latest years. After the increase recorded in the previous year, the post-paid tariff basket returned to its 2005 figure.

44 Os valores apresentados são calculados com base na informação recolhida junto dos operadores.

Price evolution - low consumption basket
Graph 76.

Legend:
- Prepaid - Portugal
- Post-paid - Portugal
- Prepaid - EU+OECD average
- Post-paid - EU+OECD average

Old baskets

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.
Note: In order to highlight the occurred variations, the X axle meets the Y axle at figure 90.
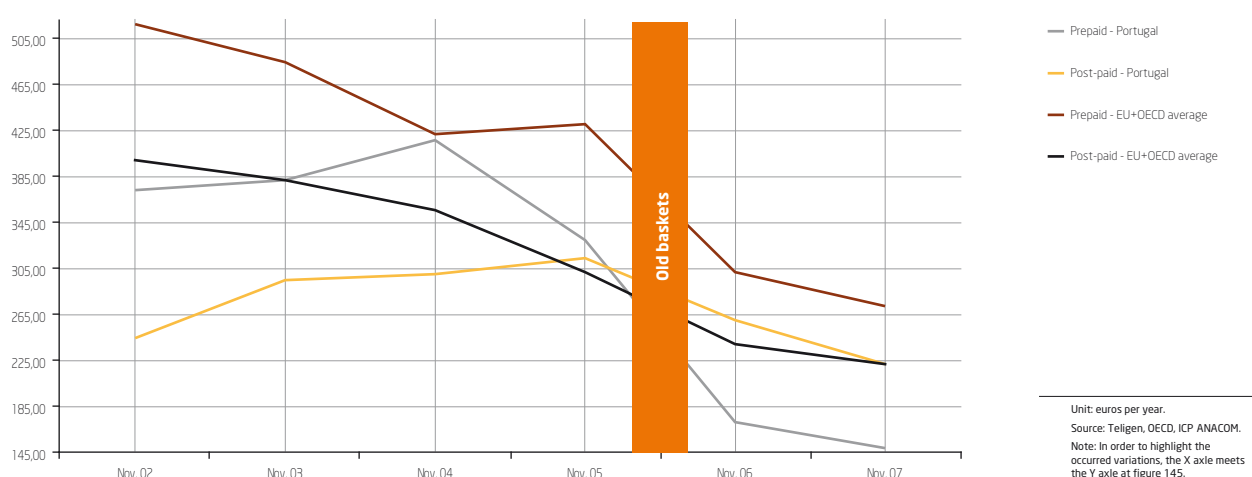
Regarding the medium consumption profile, post-paid plans slightly surpassed the average. Prepaid tariff schemes show a decreasing trend and are quite below the average of the countries under analysis.

Price evolution - low consumption basket
Graph 77.

Legend:
- Prepaid - Portugal
- Post-paid - Portugal
- Prepaid - EU+OECD average
- Post-paid - EU+OECD average

Old baskets

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.
Note: In order to highlight the occurred variations, the X axle meets the Y axle at figure 145.
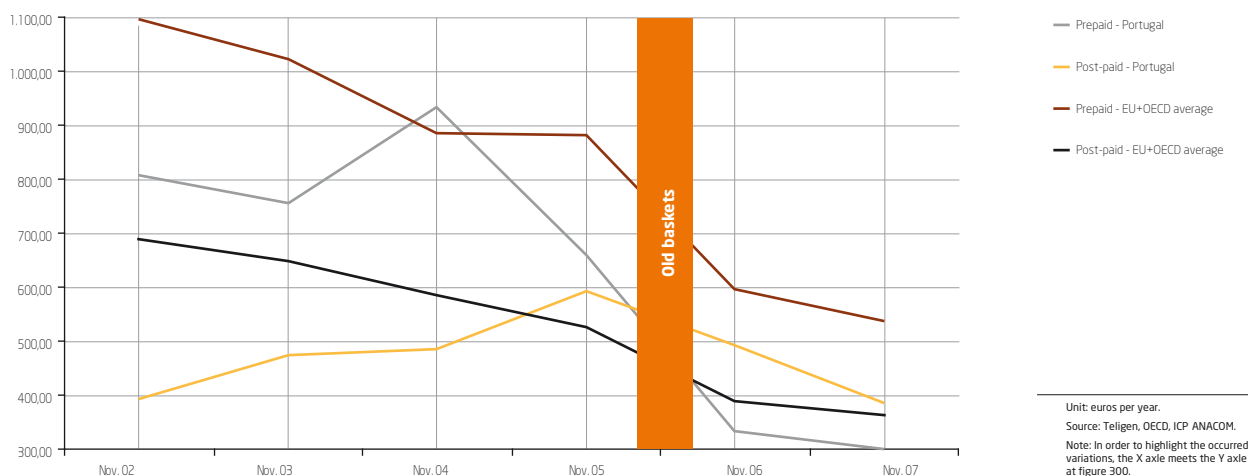
Regarding the high consumption profile, the prepaid plans' price has a decreasing trend and stands below the average figure charged in the remaining countries. As for the post-

paid plan's price, in spite of a small decrease, it is still above average.

Price evolution – high consumption basket
Graph 78.

Prepaid - Portugal
Post-paid - Portugal
Prepaid - EU+OECD average
Post-paid - EU+OECD average

Unit: euros per year.
Source: Teligen, OECD, ICP ANACOM.
Note: In order to highlight the occurred variations, the X axle meets the Y axle at figure 300.

GSM networks' quality of service

ICP-ANACOM has been carrying out study for assessment of the quality of mobile networks in Portugal.

In 2007, it evaluated the quality of mobile voice services (GSM), video telephony (UMTS) and network coverage (GSM and WCDMA) offered by the operators Optimus, TMN and Vodafone in the autonomous regions – in the main urban agglomerations of Ponta Delgada, Angra do Heroísmo and Funchal, and in the major roads of all islands of the Autonomous Regions of Azores and Madeira, by analysing the technical parameters which translate quality perception from the consumer's standpoint[45].

The results registered by the quality of service indicators analyzed in this study show considerable differences among operators.

One of the aspects contributing to the observed differences is the fact that operator OPTIMUS has no WCDMA coverage in the Azores archipelago, and only has GSM coverage in 5 of the 9 islands. Operators TMN and Vodafone also do not have WCDMA coverage in the Flores and Corvo islands.

In general, GSM coverage is wider than WCDMA coverage. However, both technologies still have large areas with little or even no radio coverage, especially on major roads.

Consumers' evaluation

In order to evaluate consumers' perception of the quality of the MTS, below are some items from the Electronic communications consumer survey and on the complaints received at ICP-ANACOM.

In general, MTS customers are satisfied with the service provided by their provider.

45 Cf. http://www.anacom.pt/template12.jsp?categoryId=265182.

Satisfaction level regarding the service provided by their provider
Table 55.

	Dec. 2007
Very Dissatisfied	1,1
Dissatisfied	4,2
Satisfied	71,7
Very satisfied	22,0
N.A.	1,0

Unit: %.
Source: ICP-ANACOM.

For this reasons it is not common for consumers to place complaints at the operators of which they are customers.

Most complaints are related to technical problems and invoicing errors.

Complains at the main operator
Table 56.

	Dec. 2007
Yes	12,5
No	87,3
N.A.	0,2

Unit: %.
Source: ICP-ANACOM.

Type of complaints presented
Table 57.

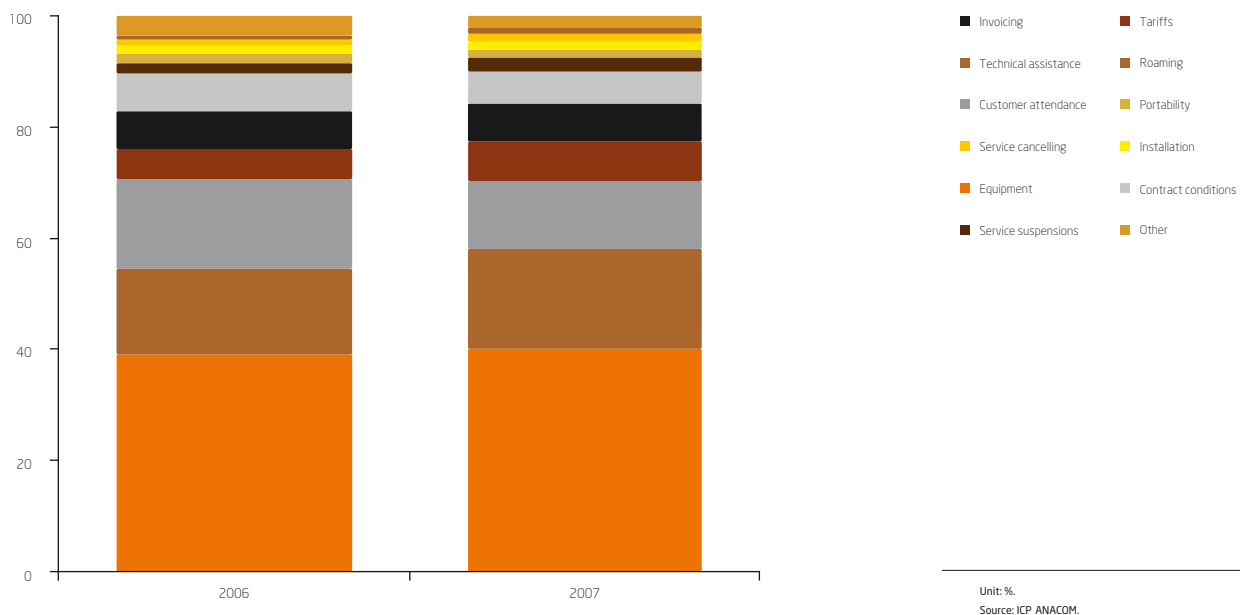|	Dec. 2007
Technical problems (voice mail, unsent messages, etc)	47,5
Invoicing errors	24,9
Network failures	14,6
Contract conditions	9,6
Equipment malfunctions	3,6
Other issues	4,5
N.A.	2,1

Unit: %.
Source: ICP-ANACOM.

During 2007, ICP-ANACOM received around 4,457 complaints concerning the mobile telephone service and its providers. It should be mentioned that MTS stands for around 25.4 per cent of the overall amount of complaints received at ICP-ANACOM regarding electronic communications services[46].

About half of those requests are issues regarding terminal equipment and technical assistance, which is largely out of the service providers' hands. However, the amount of complaints regarding the operators' attendance services has decreased.

Complaints on MTS received at ICP-ANACOM
Graph 79.

Legend:
- Invoicing
- Technical assistance
- Customer attendance
- Service cancelling
- Equipment
- Service suspensions
- Tariffs
- Roaming
- Portability
- Installation
- Contract conditions
- Other

Unit: %.
Source: ICP ANACOM.

46 Includes complaints directly sent to ANACOM and via Complaints Book.