Mobile 2007

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Introduction

With total revenues estimated at 616 billion USD in 2006, mobile services have generated the bulk of the increase in the telecom services market.

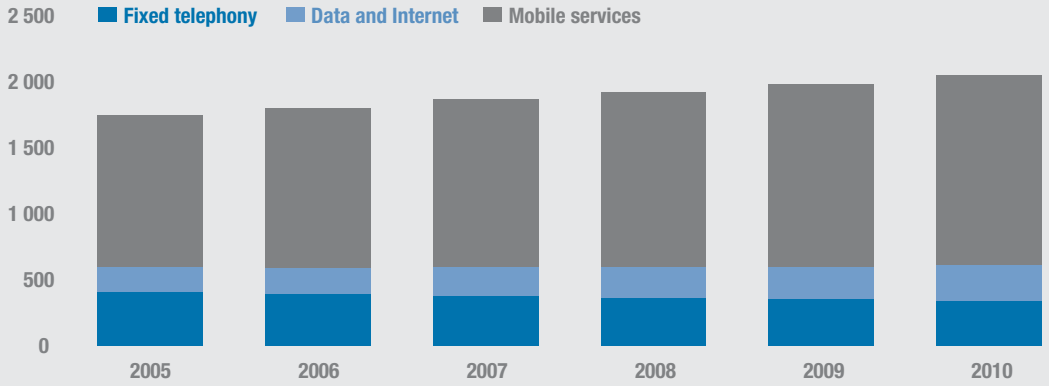
Growth in the mobile sector comes from enlargement of the customer base. Having passed the 2 billion mark in 2005, the number of mobile customers throughout the world reached **2.6 billion** by the end of 2006. At the same time, however, the ARPU has declined (down 10% in 2005 and 2006).

In Western Europe, cuts in the rates for fixed-to-mobile call termination charges have largely contributed to the fall, but are not the sole explanation. The increasing numbers of cut-price services being offered by MVNOs in Northern Europe, the arrival of "3G" in several markets, and growing competition in general have had a heavy impact on tariff rates. Although most operators have rolled out 3G services, migration towards these services has been relatively slow (9% of mobile customers possessed a 3G handset in mid-2006) and is not having much of an impact on operators' revenues.

The year 2006 was marked by a certain number of achievements:

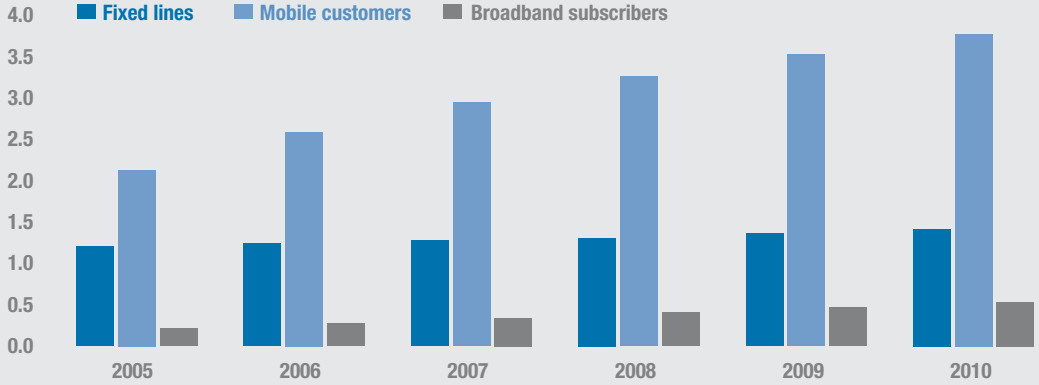
- Significant 3G take-off, with 100 million UMTS customers worldwide at the end of the year
- First commercial HSDPA mobile broadband
- Introduction of Fixed-Mobile convergence offers in Europe

Figure 1. Telecom services around the world
2005-2010, billions USD



Source: **IDATE**

Figure 2. Forecasts for fixed, mobile and broadband customer bases
2005-2010, billions



Source: **IDATE**

Telecom Services & Mobile Trends

The growth in telecom services is still fuelled by mobile

The slowdown in growth in the telecom services market experienced in 2004 continued into 2005 and 2006. Our estimates put total world revenue in 2005 at 1.150 billion USD, up 5.6% on the previous year. Growth in 2006 can be expected to be slightly lower at 5.2%.

While the upswing in Internet services is offsetting the decline in telephony in the fixed sector, growth in the overall telecom services sector is largely accounted for by mobile services. It is also being strongly driven by the expansion of telecom services in developing countries.

With total revenues estimated at 556 billion USD in 2005 and 616 billion USD in 2006, mobile services have generated the bulk of the increase in the telecom services market.
In terms of value, by 2003 they had already exceeded fixed-line services. Estimated at 51% in 2006, their share of the telecom services market in general displays continuous growth.

Table 1. Key data on the world telecom services market
2005-2006

	2005	2006
Market value	1 150 billion USD	1 200 billion USD
Annual growth rate	5.6%	5.2%
Share of mobile services	48.4%	51.0%
Share of developing countries	26.7%	29.1%
Fixed lines	1.21 billion	1.24 billion
Fixed penetration (% of population)	19.5%	19.7%
Mobile customers	2.14 billion	2.60 billion
Mobile penetration (% of population)	34.3%	41.3%
Broadband subscribers	215 million	277 million
Broadband penetration (% of population)	3.4%	4.4%

Source: IDATE

Figure 3. Customer bases around the globe
2002-2006, millions

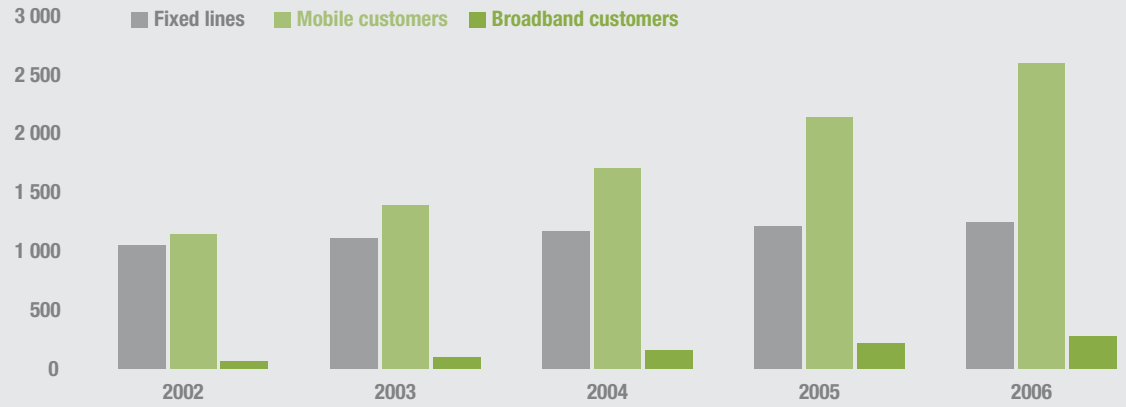
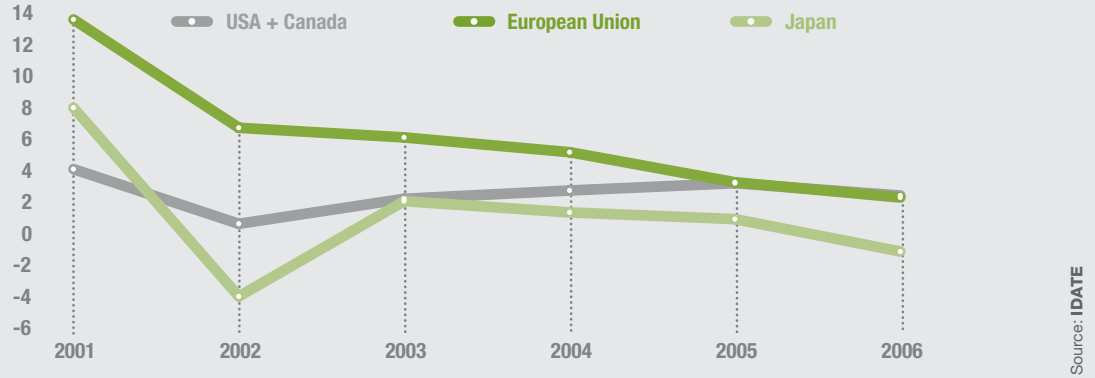


Figure 4. Telecom services market
2001-2005, annual growth rate (%)



Growth in the mobile sector comes from enlargement of the customer base. Having passed the 2-billion mark in 2005, the number of mobile customers throughout the world reached 2.6 billion by the end of 2006. At the same time, however, the ARPU has declined (down 10% in 2005 and 2006).

Fixed telephony continues along the downward trend that started in 2002. In 2005, there was a decrease of 2.1% in value terms in the world market as a whole, resulting from a nominal effect (annual fall in average revenue per line of 6-7% since 2004) and a real effect (weak growth in the number of lines – less than 4% in 2005 and below 3% in 2006). The value of the market shrank further in 2006, with an estimated fall of 3.8%. Fixed telephony's share in terms of value of the total world market for telecom services fell from 48% in 2001 to 35% in 2005 and can be expected to fall still more in 2006 to 32%.

As a driver of worldwide growth in telecom services, data and Internet access services are playing an increasingly important role. In 2005, they generated additional revenues of 14 billion USD in relation to 2004. The growth rate has been maintained in 2006. Their share of telecom services in general has enjoyed steady growth, increasing from 15% in 2001 to nearly 17% in 2006.

Table 2. Customer bases - Industrialised countries vs. developing countries
2001-2006, millions

		2001	2002	2003	2004	2005	2006
FIXED LINES	Industrialised countries	537	533	525	516	502	488
	Developing countries	471	518	583	654	711	756
MOBILE CUSTOMERS	Industrialised countries	576	625	682	748	821	886
	Developing countries	369	521	705	955	1 320	1 716
BROADBAND SUBSCRIBERS	Industrialised countries	34	58	86	120	155	186
	Developing countries	2	5	16	36	60	91

Source: IDATE

Table 3. Telecom services deployment - Industrialised countries vs. developing countries
2001-2006, number of customers / lines per 100 inhabitants

		2001	2002	2003	2004	2005	2006
FIXED DENSITY	Industrialised countries	56.8	56.1	55.1	53.9	52.2	50.6
	Developing countries	9.4	10.2	11.3	12.6	13.5	14.2
MOBILE DENSITY	Industrialised countries	60.9	65.8	71.6	78.2	85.5	91.8
	Developing countries	7.4	10.3	13.7	18.3	25.0	32.1
BROADBAND DENSITY	Industrialised countries	3.6	6.1	9.0	12.5	16.1	19.3
	Developing countries	0.0	0.1	0.3	0.7	1.1	1.7

Source: IDATE

Trends by activity segment

Mobile services

General evolution of the market

The world market for mobile telecom services in 2005 amounted to 556 billion USD. This meant an 11.1% increase, lower than the 13.7% growth achieved in 2004. With the exception of Africa and the Middle East, there was a decline in growth in all geographical regions. 2006 could see the same downward trend because of the slowdown in the industrialised countries, but it should nevertheless remain above the 10% mark at an estimated 10.5%. Growth has been far stronger in the developing countries (23% in 2005, 25% in 2006) than in the industrialised (7.1% in 2005, 5.3% in 2006). Expressed in value terms, the former countries are now accounting for an ever-larger share of the world total. At 28% in 2005 compared with 20% in 2002, their share can be expected to exceed 32% in 2006.

Four main factors have marked recent developments in the mobile services market:

- the enlargement of customer bases in the developing economies, particularly in the major emerging markets but also in the industrialised countries, despite already high penetration rates
- the growing importance of data services
- the fall in ARPU in most countries
- market consolidation

Customer base growth around the world

During the period 2002-2004; mobile customer bases expanded at an annual rate of 20-21%. In 2005, the number of customers rose to 26% to pass the 2-billion mark (2.14 billion at year-end 2005). IDATE estimates indicate only a slight slowdown in customer base growth in 2006, winding up at 22%. By the end of 2006, mobile customers around the world should number 2.6 billion. A large part of the increase in the customer base is fuelled by the developing countries. By the end of 2006, two-thirds of the world's mobile customers will be found in a developing country, compared with 50% at year-end 2003. In 2005-2006, these countries

Figure 5. Regional mobile density
2002 / 2006, number of mobile customers per 100 inhabitants at year end

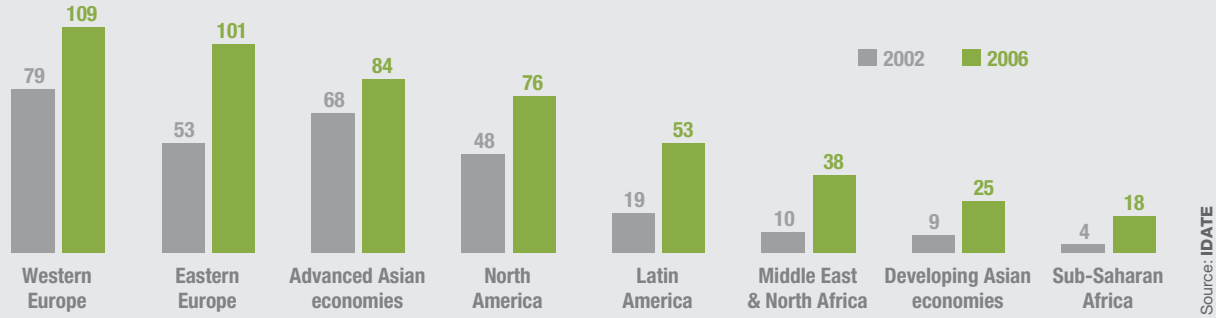
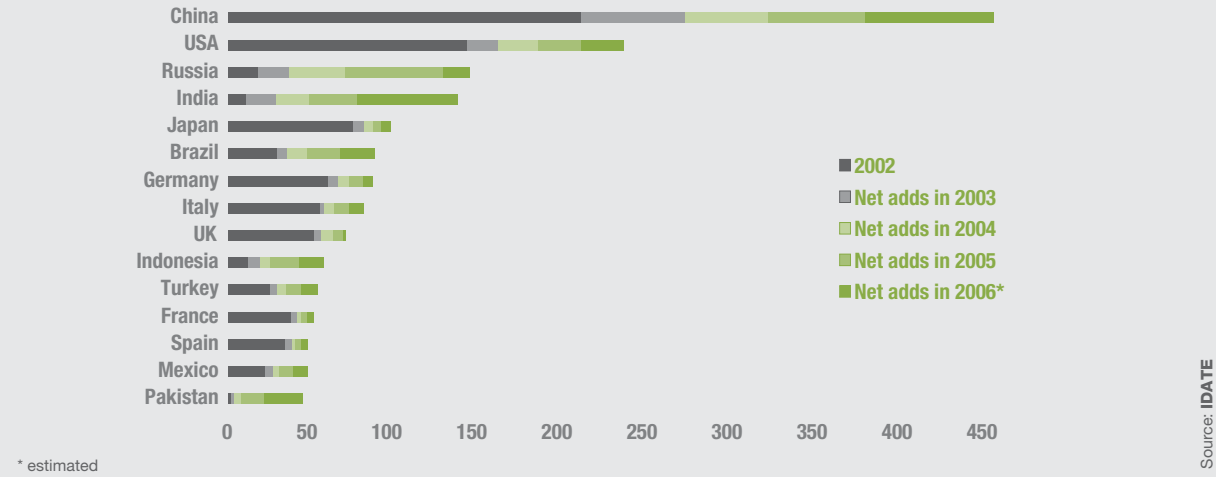


Figure 6. Leading mobile markets, in number of customers
End 2006, millions



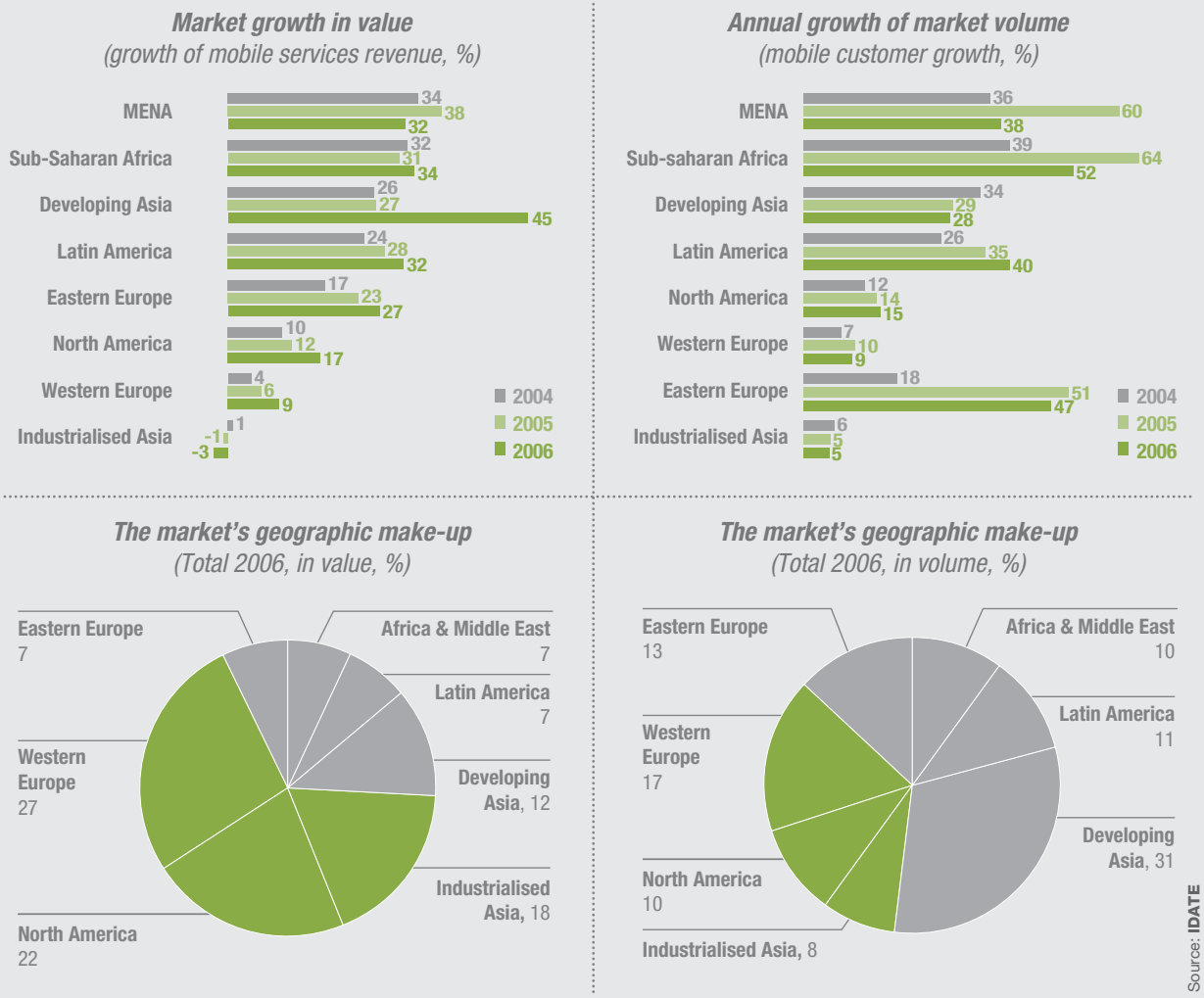
* estimated

generated around 85% of the net increase in the worldwide customer base. Taking all developing countries into account, the customer base grew by almost 40% in 2005 and 30% in 2006. Particularly strong growth is displayed by the major emerging economies of Asia (China, India, Indonesia, Pakistan), Latin America (Brazil, Colombia) Europe (Russia, Ukraine, Turkey) and Africa (South Africa, Algeria, Nigeria). Customer bases in the industrialised nations continued to grow steadily (nearly 10% in 2005 and 8% in 2006), despite an already high penetration rate (86% on average at year-end 2005). In the USA and Canada, where the mobile market is still less developed than in Europe, customer bases were up 14% and 12% respectively in 2005. Growth is also above 10% in Italy, where penetration exceeds 100%. Weak growth can nevertheless be found in some markets in the Asia-Pacific region (Taiwan, Hong Kong, Singapore) and in Europe (Denmark, Sweden, Norway).

Among the industrialised countries, the gap between the USA (estimated penetration of 70% at end 2005) and the EU (100%) remains, partly reflecting the wider use of prepaid services in Europe. EU countries continue to display some of the world's highest penetration rates with several countries exceeding the 100% mark (e.g. Italy, the UK, Sweden and the Czech Republic).

Average penetration in the developing economies continues to rise – from 10% at the end of 2002 to 25% at the end of 2005, and it is likely to reach 32% by the end of 2006. Lying behind this average are quite varying situations. East European countries display rates comparable with those in Western Europe. The lowest in the region at the end of 2005 was recorded in Romania (60%). Several countries outside the continent of Europe display penetration rates of over 40%. These include countries in the Persian Gulf, Africa (Algeria, Tunisia, South Africa), Asia (Malaysia, Thailand, the Philippines) and Latin America (Chile, Argentina, Brazil, Colombia, Mexico, Venezuela). The period 2004-2005 also witnessed the emergence of a number of new major markets such as Bangladesh, India, Pakistan, Indonesia, Vietnam and Nigeria. Penetration in these countries is still below 15% but the market is expanding rapidly ■

Figure 7. Mobile services market growth and geographic make-up



Mobile Equipment Dynamics

Mobile Terminals

Market development in volume

IDATE now expects the global mobile terminal market size for 2006 at 977 million units up from 836 million units in 2005, i.e. more than 17% growth.

In the long term, the mobile terminal market is now forecasted at 1,350 million units in 2010, i.e. a CAGR of 8.42% from 2006.

Market development in value

The global mobile terminal market revenues for 2006 expected to reach USD 117.0 billions up from 110 billions in 2005, i.e. +6%, due to a decrease in the ASP driven by stronger than expected market growth in the emerging markets and significant competition on high-end handsets.

In the long term, the mobile terminal market is forecasted at USD 128 billions in 2010, i.e. a CAGR of 2.4% from 2006.

3G market

For 2006, IDATE forecasts the 3G market at 78 M units, i.e. 8% of the total mobile terminal market. By 2010, the 3G market will account for 259.1 M units, i.e. 19.2% of the total market volume

Mobile terminal market shares

In Q3 2006, the largest vendor Nokia continued to grab market share in volume significantly thanks to outstanding performance. Motorola's market share decreased to 21.9% but remains out of reach: Samsung's market share increased to 12.5%. Sony Ericsson reinforced its #4 position. LG is now the last actor of the top 5 with stable market share. Finally, other vendors' market share drop bellow 15%.

Figure 8. Global Mobile Terminal Market
2004-2010, in M units

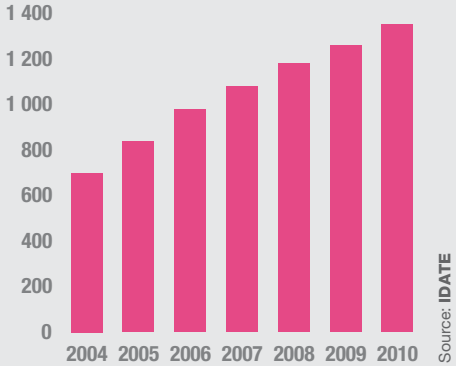


Table 4. Mobile Terminal market, shares of region
2004-2009, volume in M units

	2004	2005	2006(e)	2007(f)	2008(f)	2009(f)	2010(f)
North America	108.7	133.0	136.0	137.5	140.0	142.0	143.0
Asia Pacific	291.4	344.0	427.6	490.2	550.5	597.5	649.4
Western Europe	129.7	141.6	148.0	151.5	154.5	155.5	157.0
Latin America	52.0	63.9	89.0	110.0	130.0	145.0	163.6
Eastern Europe	71.0	93.5	102.4	106.8	110.0	115.0	125.0
Middle East & Africa	46.0	60.0	74.0	84.0	95.0	105.0	112.0
TOTAL WORLDWIDE	**698.8**	**836.0**	**977.0**	**1 080.0**	**1 180.0**	**1 260.0**	**1 350.0**

Source: IDATE

Figure 9. Global Mobile Terminal Market
2004-2010, in B USD

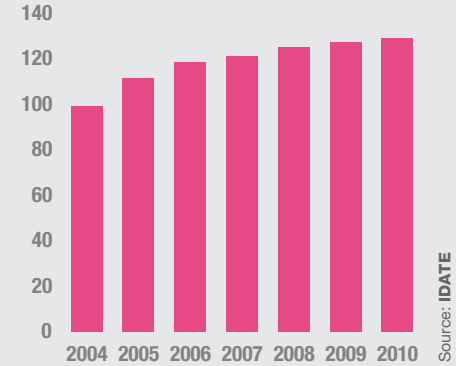


Table 5. Global Mobile Terminal shares
2004-2009, % (unit based)

	2005				2006		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3(e)
Nokia	30.2	32.0	31.0	33.2	33.8	34.1	36.1
Motorola	16.1	17.8	18.0	17.7	20.8	22.6	21.9
Samsung	13.8	12.8	12.5	10.8	13.1	11.4	12.5
LG	6.2	6.4	7.2	6.4	7.0	6.7	6.7
Sony	5.3	6.2	6.4	6.4	6.0	6.8	8.1
Others	28.4	24.7	24.9	25.6	19.3	18.4	14.6

Source: IDATE

Mobile Infrastructure

The market for mobile access infrastructure includes base stations for access to mobile networks (BTS for GSM/GPRS/EDGE networks and CDMA and Nodes B for UMTS networks), their related equipment (base station controllers, GGSN, SGSN) as well as base stations for access to public WLAN networks (P-WLAN) also called hotspots.

Market trends by technology

GSM/GPRS/EDGE

GSM technology and its associated 2.5G technologies (GPRS and EDGE) have confirmed their strong dominance in the mobile access segment worldwide (85% of 2G and 2.5G customers), with a growth of 30% (growth equal to that of 2004) to reach more than 1.6 billion customers at the end of 2005.

This growth in absolute value was based essentially on emerging regions (Latin America, Central and Eastern Europe, Africa and the Middle East), which collectively represented 55% of worldwide growth in 2005, and by the Asia/Pacific region with generated 31% of the worldwide growth during the year, especially driven by China and India which together generated 20% of the worldwide growth in the GSM customer base.

CDMA IS/95 and 1x 2000

CDMA IS/95 and 1x 2000 saw the growth of its worldwide customer base accelerate in 2005 (+22% compared to +18% in 2004), even though this does not match the growth of the GSM market. Almost 50% of this growth came from Asia/Pacific, especially India (14% of worldwide growth), China (10%) and other countries such as Malaysia and Indonesia. Latin American also contributed to the momentum of the CDMA 2/2.5G market, while the North American market remained a significant outlet even though less dynamic (+12% growth in 2005) based on migration to CDMA EV-DO by Verizon and Sprint.

Table 6. Mobile infrastructure revenues of major equipment manufacturers worldwide
2003-2005, million USD

	Total revenues (million USD)			2005 vs. 2004 (%)
	2003	2004	2005	
Ericsson	14 541	16 265	18 283	12.4
Nokia	6 989	7 918	8 153	3.0
Siemens	6 064	6 499	7 173	10.4
Alcatel	4 359	4 062	5 086	25.2
Lucent	3 946	5 108	5 967	16.8
Nortel	4 389	4 817	5 306	9.7
Motorola	4 417	5 457	5 112	-6.3
NEC	2 885	3 520	3 168	-10.0
Huawei	641	910	1 419	56.0
ZTE	651	1 165	1 079	- 7.4
Samsung	n.a.	1 162	1 025	-11.8
LG	2 226	1 111	996	-10.4
Others (Fujitsu, UTStarcom…)	n.a.	1 822	1 380	-24.3
TOTAL	**51 108**	**59 838**	**64 148**	**7.2**

Source: **IDATE**

UMTS

As far as 3G, 2005 was a decisive year in large scale commercialisation of UTMS technology. The UMTS customer base grew more than 170% to reach more than 45 million customers by the end of December 2006 should see this trend confirmed with expected customer base growth of more than 130%. If the Japanese market is by far the market of reference, strong development in the Italian and English markets make Europe the largest 3G region in the world.

CDMA EV-DO

CDMA EV-DO, a 3G technology from the CDMA world, is also developing at a sustained rate even though less than UMTS. The net slowdown in the growth of the primary market for this technology, South Korea, poses real questions as to this technology's prospects. In effect, the two leading South Korean operators (KTF and SK Telecom) have decided to gradually migrate to HSDPA. However, the selection by KDDI in Japan and Verizon and (to a lesser degree) Sprint in the United States in favour of this technology seems to strengthen it ■

Table 7. Mobile access infrastructure market by technology
2005-2010, million USD

	2005	2006	2007	2008	2009	2010
Cellular	**31 904**	**33 116**	**28 757**	**29 912**	**29 564**	**28 078**
GSM/GPRS/EDGE	17 994	18 034	11 486	8 060	6 000	3 911
CDMA One/2000 1x	4 132	3 628	1 668	1 776	191	76
WCDMA/HSDPA	7 228	8 637	15 603	20 076	23 373	24 091
CDMA EV-DO	2 550	2 817	5 030	6 727	7 219	7 195
Carrier Wi-Fi/WiMAX/Wibro	**3 383**	**4 253**	**4 978**	**5 641**	**6 003**	**6 359**
TOTAL	**35 287**	**37 369**	**33 735**	**35 553**	**35 567**	**34 437**

Source: **IDATE**

3G Economics

3G services

Asia heads the market, take-off in Europe

Between June 2005 and June 2006, the number of 3G customers doubled to over 100 million, corresponding to roughly 5% of the total mobile customer base. For the moment, 3G is limited to the industrialised countries. .

The Asia-Pacific region accounts for 50% of the world's 3G customers. The number stands at 54 million, of which 29 million in Japan and 11 million in South Korea. Japan also leads in the spread of 3G services, with 43% of the country's mobile customers possessing a 3G handset.

In Western Europe, most operators have rolled out 3G services. There are 38 million customers, i.e. 9% of the total mobile customer base. The number of 3G customers rose 29 million over a period of twelve months. Italy and the United Kingdom lead the field with 56% of the European total. 3G customers in Italy accounted for 18% of mobile customers in June 2006, a far higher proportion than in other countries of Europe. Also in Eastern Europe, operators in several countries have launched 3G services (namely Hungary, Romania, Slovenia and Slovakia).

In the USA, the number of 3G customers is estimated at 5% of the total mobile customer base.

Figure 10. 3G customers by geographical region
June 2006, % (ranked by n° of 3G customers)

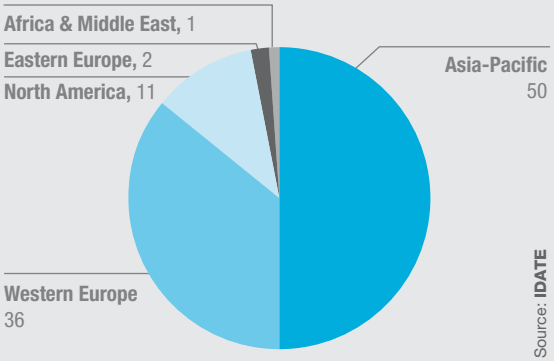


Table 8. Main 3G customer bases

		3G customers (thousands)			% mobile customers
		12/2004	12/2005	6/2006	6/2006
NORTH AMERICA	USA	125	1 000	10 900	5.0
ASIA-PACIFIC	Australia	413	736	1 732	8.9
	China Hong Kong	210	577	820	10.6
	Japan	10 898	29 197	39 392	43.0
	Korea	9 539	12 518	13 961	35.4
	Singapore	2	107	287	6.8
	Taiwan	0	147	408	2.0
EUROPE	Austria	225	535	845	9.5
	France	26	1 590	2 700	6.5
	Germany	195	2 072	3 955	4.8
	Italy	2 615	10 303	13 942	18.5
	Netherlands	12	230	820	5.0
	Spain	68	854	1 868	4.1
	Sweden	279	522	1 010	10.1
	UK	2 832	7 352	7 607	10.9
ME & AFRICA	Israel	12	230	385	4.8
	South Africa	1	216	349	1.1

Source: IDATE

Data services used chiefly in Europe and industrialised Asian countries

Mobile data services have displayed strong growth in recent years. The main categories comprise: messaging, transaction, information, entertainment, marketing, man-machine communication and security services. The growing importance of data services in the mobile service sector is leading to a major transformation of the industry, as an increasing proportion of revenues accruing to mobile operators is now shared with third parties, i.e. service and content providers.

In value terms, the market is dominated by the industrialised countries, which account for around 85% of the total figure. Two major regions stand out clearly in this context: Europe (mainly West European countries) and the Asia-Pacific region (industrialised countries), both far ahead of North America.

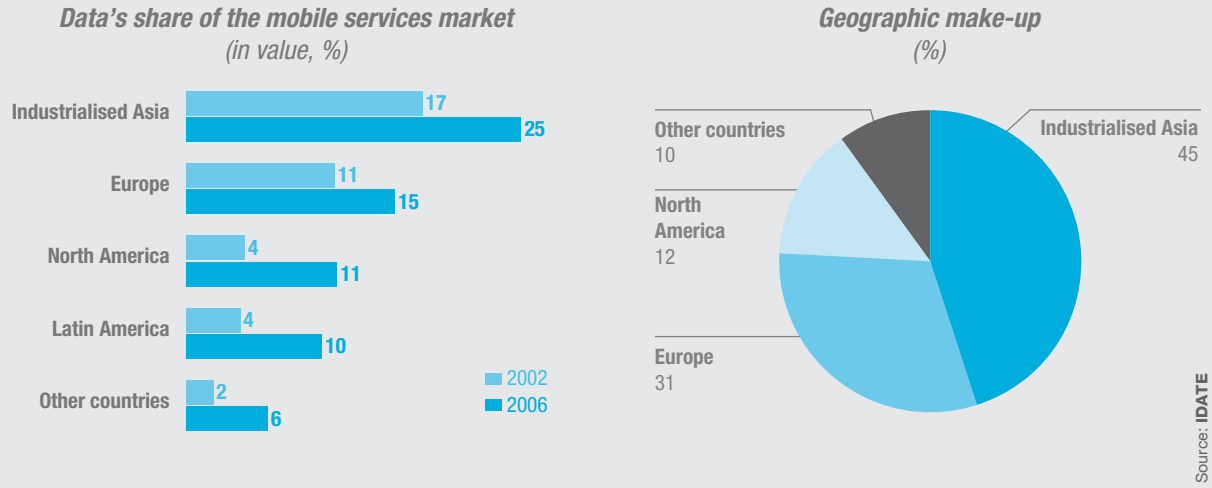
- European countries account for over 30% of the world market for mobile services. SMS continue to dominate but their share is shrinking.
- The industrialised nations of the Asia-Pacific region account for 45% of the world market for mobile data services (19% for Japan alone). It is these countries, too, that display the widest use of 3G services.
- With only 14% of the total, North America lags behind. Data services there account for only 11% of revenues from mobile services in general, compared with an average 15% in Europe and 25% in the advanced economies of the Asia-Pacific region.

Average revenue per user (ARPU)

Heavy fall in ARPU levels

ARPU levels differ widely not only from one region to another but also within the group itself of industrialised countries. In Western Europe, the level is still well below that found in North America and the industrialised Asian countries, which reflects the comparatively high proportion of prepaid customers in Europe.

Figure 11. Mobile data services market in 2006



In the period 2005-2006, ARPU levels have fallen in all the regional markets. Voice services have been specially affected because of the cuts in tariff rates (particularly via flat-rate options) and the voice-data substitution trend.

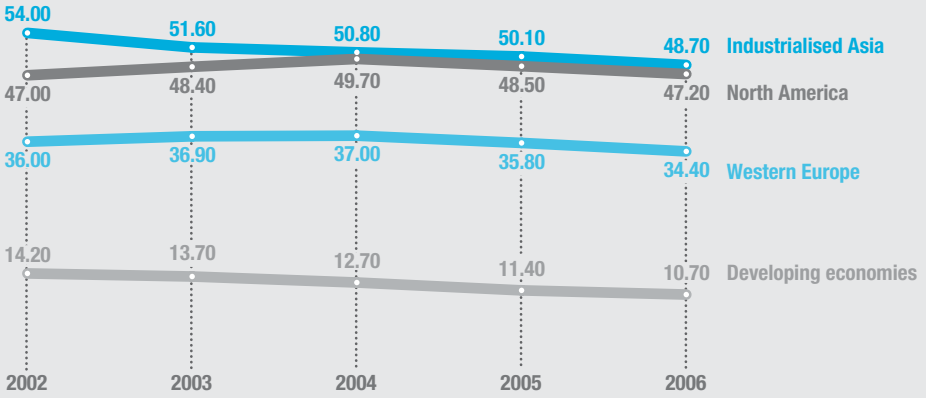
In Japan, the mobile ARPU fell from 80 USD in 2002 to 68 USD in 2006. Although the gap in relation to other countries has narrowed, Japan still has the highest mobile ARPU level of all the industrialised countries. The fall has been particularly pronounced in voice services, while in the data sector, it tends to remain unchanged.

In the USA, on the other hand, overall ARPU levels have tended to remain steady, thanks to the increased use of data services that has offset the fall in the ARPU in the voice sector.

In Western Europe, the fall in ARPU levels varies from one country to the other. The rise in the ARPU from mobile data services is not high enough to offset the decline in voice ARPU. The fall can be explained mainly by the reduction in fixed-to-mobile call termination charges. In the saturated mobile markets, however, tariff rates have also been heavil affected by the development of discount or no-frill offers by MVNOs in Northern Europe and, in the case of Italy, Sweden and the United Kingdom, the arrival of “3”.

In the developing countries, the strong growth in customer bases has led to a significant fall in ARPU levels, which vary according to country. The level stands at 5 USD per month in Pakistan, 7 USD per month in India and Indonesia, 9 USD per month in China, 10 USD in Senegal, 12 USD in Brazil, 13 USD in Algeria, 17 USD in Nigeria and 20 USD per month in South Africa. In a great many African countries, the ARPU remains comparatively high, despite heavy price cuts. It stands at a little over 12 USD per month in the sub-Saharan countries (excluding South Africa), compared with 8 USD in the developing countries of Asia. Monthly mobile services ARPU in 2005

Figure 12. Monthly ARPU of mobile services by geographical region
2002-2006, USD per month



Source: IDATE

Table 9. Mobile voice and data ARPU in Japan, Western Europe and the USA
2002-2006, USD per month

		2002	2003	2004	2005	2006
USA	Voice ARPU	45.5	46.3	47.2	44.6	41.9
	Data ARPU	1.9	2.4	2.7	3.9	5.2
	Total mobile ARPU	47.4	48.8	49.9	48.5	47.1
Japan	Voice ARPU	63.8	58.6	55.4	52.7	49.0
	Data ARPU	16.1	18.4	18.5	18.5	18.6
	Total mobile ARPU	79.9	76.9	73.9	71.2	67.6
Western Europe	Voice ARPU	32.4	32.4	32.1	30.5	29.0
	Data ARPU	3.7	4.5	4.9	5.3	5.4
	Total mobile ARPU	36.0	36.9	37.0	35.8	34.4

Source: IDATE

Mobile Hot Topics

MVNO: the new deal

The term MVNO defines a company that offers mobile services without actually possessing any frequency allocation and which is financially very dependent on its host MNO.

The financial stability of an MVNO naturally depends on the financial conditions surrounding the wholesale purchase of minutes from its MNO. MVNO sources of revenue are the same as for traditional mobile operators (except for wholesale revenues). The extent of the operating costs that weigh heavily on MVNOs depend on the particular activity. The costs required to enter the market are still relatively high and about two years of margins are normally needed for a company to be profitable. The financial compensation paid to MNOs depends on an MVNO's negotiating power. The average reduction granted for wholesale prices is about 30% in Western European countries, except in specific cases (Virgin Mobile UK).

MVNO growth

By mid-2006, MVNOs are becoming established in both Europe and North America, and in some mobile markets in Asia. They are responding to a logic of finer segmentation in what is now a mature market (about 30 million customers), i.e. a 60% rise in two years.

The main vehicles of MVNO growth are the market situation, technology and the regulatory framework.

MVNO development is also linked to the need to seek out new growth outlets in markets that are either saturated or are nearing saturation, as is the case in West-

Table 10. Growth factors and potential of the MVNO phenomenon, by geographical zone

	Western Europe	North America	Japan, South Korea
	• A favourable regulatory environment • Situation controlled by mobile operators (masters of the game and of costs) • Moderate potential for 5 years	• A neutral regulatory environment • Market led by FMC and FMS • Market led by the media • Situation controlled by mobile and cable operators • High potential for 5 years	• A neutral regulatory environment • Very (too) competitive markets • High access costs • Limited potential for 5 years
Network construction cost (*)	+++	++	+++
Quadruple play	++	+++	++
Fixed-mobile convergence	++	+++	++
Telecoms-media convergence	++	+++	++
Fixed-mobile substitution	+++	+++	+++
Regulation	++ to +++ (**)	++	+
Situation of the rise in mobile data traffic	++	++	+++
Cellular customer voice traffic levels	+	+++	++
ARPU	++	+	+++
Cellular penetration rate	+++	++	+

Source: **MVNO Executive summary**

(*) Frequencies + infrastructure
(**) Non-uniform transposition of EU Directives

ern Europe and North America, where there is still substantial room for conquering customers.

The MVNO phenomenon is also unfolding against a background of network convergence and the adoption of added-value services.

Regulation is a main factor in the explosion of MVNOs in Europe. As a means for remedy, regulators can, in fact, impose MVNO agreements in the market. This may explain the contrasting degrees of development among different MVNOs in the European Union

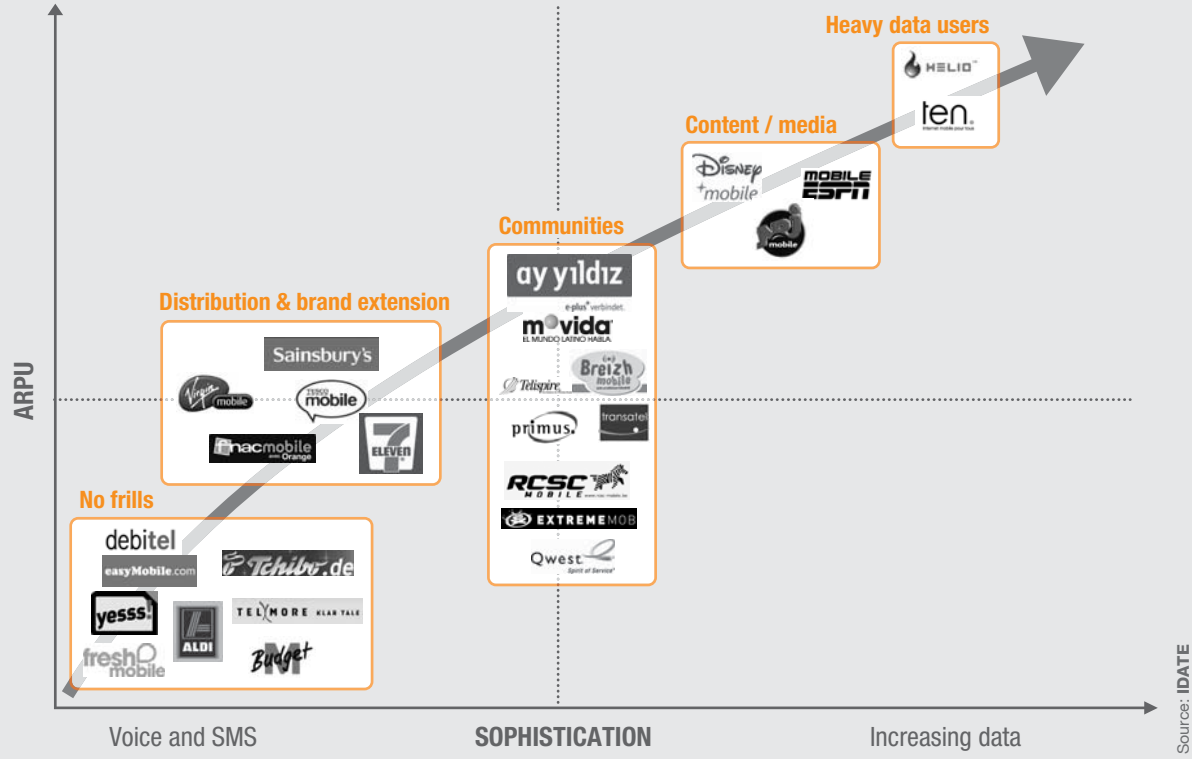
Weight and scope of the MVNO phenomenon

By mid-2006, the MVNO phenomenon that emerged in Northern Europe in 1998 has spread to Western Europe and North America, while its development in Asia is more measured. The number of MVNOs is highest in Europe although the United States is the country where they are most numerous (more than sixty virtual operators). MVNO growth in Asia is mixed.

The situation in Western Europe also shows sharp contrasts. The phenomenon taps into more and more markets; Southern countries are facing monthly launches announcements.

Early MVNOs brought about serious upheavals in the mobile markets of some countries. A few MVNOs managed to seriously threaten MNOs with a significant share of the market, especially in Northern Europe, where they hold most of the market in terms of volume. The arrival of MVNOs also led to considerable erosion in retail prices and a fall in ARPU, mainly at the bottom end of the market.

Figure 13. Towards higher sophistication, customization and ARPU



Fixed-Mobile Convergence

As part of their ongoing quest to differentiate themselves from the competition, wireline telcos are now adding mobile services to the mix, in view of rolling out quadruple play bundles. If integrated operators can rely on their mobile subsidiaries, the remaining landline telcos are achieving their expansion through either MVNO agreements (US cablecos) or co-branding (Vodafone-FastWeb, UPC-One), while a handful among them have become integrated operators via strategic acquisitions (Softbank, Orange in Spain) or investments in unbundling (Mobistar).

And we are seeing a growing number of convergent device initiatives (UMA, SIP) which take advantage of Wi-Fi with home zone offers (reduced rates for calls from home over Wi-Fi). But the vast majority of players are focused on fixed-mobile bundles and, without going all the way to the quadruple play (except for cablecos), they are concentrating their efforts on fixed-mobile voice offers, benefiting from network synergies (termination), and more and more on a combination of fixed internet access, in some cases with naked DSL, and mobile telephony.

A number of cellular only telcos are working to encourage users to switch from landline to all mobile by offering large volume formulas (3 in the UK), in some cases unmetered (Bouygues Telecom), or very appealing tariffs for certain calls (same network, same community, etc.). And some have successfully reproduced home zone formulas, without the technological component, such as O2's Genion. Most, however (Vodafone, O2), are now making the move to fixed-mobile bundles acting as an FVNO.

All operators have set their sights beyond fixed-mobile access, working to develop convergent communication (IM) and entertainment (access to content) services as a means of distinguishing themselves from the pack and, if possible, of generating added revenue thanks to increased data traffic and paid services, and possibly advertising. But some services will not be able to be implemented at a reasonable cost without deploying new technologies, hence certain players' growing interest in NGN and IMS.

Table 11. Example of integrated operators in Europe

COMPANY	Country	Fixed network	Wireless network
Iliad	France	Free	Altitude Telecom (WiMax)
Softbank	Japan	Yahoo! BB	Vodafone KK
TeliaSonera	Denmark	Telia Networks	Telia Mobile (ex Orange Danemark)
Telenor	Denmark	Cibercity	Sonofon
Telenor	Sweden	B2, Glocalnet	Telenor Mobile, Vodafone Sweden
France Telecom	Belgium	Mobistar (unbundling)	Mobistar
France Telecom	Spain	Orange (ex Wanadoo)	Amena
Telefonica	United Kingdom	Be	O2
Telefonica	Germany	Telefonica Deutschland	O2
Deutsche Telekom	Austria	Tele.ring	T-Mobile

Source: **IDATE**

Table 12. Main players involved in FMC

COUNTRY	Integrated operators*	Ops. with fixed-mobile offerings	Ops. with plans of FMC offerings
Austria	Telekom Austria, DT	One, UPC, Tele2	
Belgium	Belgacom, Mobistar	Telenet, Tele2	
Denmark	TDC, TeliaSonera, Telenor		
Finland	TeliaSonera, Elisa, Finnet	Tele2	
France	France Telecom	Neuf	SFR, Free, Noos Numericable
Germany	DT, Vodafone, Telefonica/O2	Freenet	
Italy	Telecom Italia, Wind	Fastweb, Vodafone	
Japan	NTT, KDDI, Softbank		eAccess
Netherlands	KPN, Orange	Tele2 (Versatel), UPC, T-Mobile	
Norway	Telenor, TeliaSonera	Tele2	
South Korea	KT		
Spain	Telefonica, Orange		Jazztel, ONO, DT
Sweden	TeliaSonera, Telenor, Tele2		
Switzerland	Swisscom, TDC		
United Kingdom	Orange, Telefonica/O2	BT, NTL, Vodafone (from Jan. 2007)	T-Mobile, Carphone Warehouse
United States	AT&T, Verizon		Comcast, Cox, Sprint (through WiMAX)

Source: **IDATE**

* Through MVNO or FVNO or partnerships

Mobile Video and TV

What course will mobile television and video offers take?

Three main courses can be identified in terms of the distribution of mobile TV and video services.

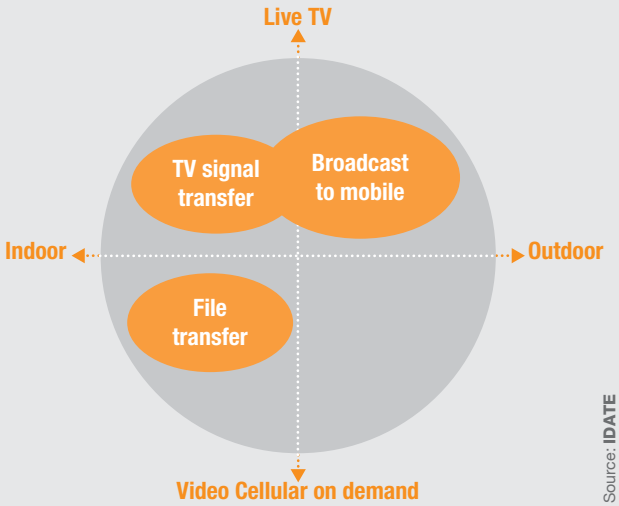
- The Unicast solution uses cellular networks (for streaming or downloading). Largely used by operators, this option will have difficulty sustaining the more widespread distribution of mobile TV at an acceptable cost;
- The Multicast solution on cellular networks (MBMS) is still in its test phase;
- The Broadcast solution uses a terrestrial and/or satellite network downlink, at least for voice. However, decisions have to be taken on the standards used and heavy investment is required (especially to provide indoor reception).

Mobile telephony is also gradually entering the digital home in the form of portable players which store and play multimedia content. Fixed-to-mobile convergence also heralds the possibility of connecting a portable device to fixed Internet via a Wi-Fi connection, not just for voice-over-IP services but also for accessing content.

The specific features of each solution could lead to some network specialisation, in response to where the content is consumed and the content people want to consume:

- cellular networks for mobile VOD
- broadcast networks dedicated to live mobile TV, especially outdoors
- broadband Internet connection for transferring “live” TV to a mobile device at home
- the mobile as a portable multimedia

Figure 14. Methods of broadcasting to mobile terminals



Source: IDATE

Table 13. Mobile TV and video revenues
2006-2011, million euros

	2006	2007	2008	2009	2010	2011
France	25	34	206	409	618	846
United Kingdom	20	65	162	346	624	967
Germany	13	40	109	246	476	766
Italy	45	118	249	484	828	1 169
Spain	6	21	49	118	269	517

Source: IDATE

Positioning of mobile TV and video

Mobile TV and video are clearly handled differently, depending on whether the offer is in 3G or broadcast. For TV packages available via cellular networks, the offer is included in the operator's multimedia services portal. It even plays a central role in operators' efforts to encourage consumers to migrate to broadband subscriptions (Edge/3G/3G+). Most of the time, 3G mobile VOD services are not in a separate, clearly identified offer on the multimedia portal.

Videos may in fact be accessed via themed sections which, in addition to video, offer other multimedia content related to the particular theme.

Less comprehensive than 3G offers, broadcast packages are generally sold in a single block and use very attractive subscription plans: free trial periods, compatible handset subsidies, etc. The pricing for 3G mobile TV offers is quite mixed, while TV services broadcast on mobile are generally sold in the form of monthly subscriptions.

Table 14. Overview of mobile TV (mTV) and video offers in broadcast

Name of operator	Breakdown of offer	Billing system
3 Italia	Broadcasted mTV (DVB-H)	Monthly subscription to DVB-H channel package (excl. Playboy which is part of a separate offer). Unlimited access to DVB-H channel package (excluding Playboy) with an all-inclusive voice subscription.
Telecom Italia Mobile	Broadcasted mTV (DVB-H)	Monthly subscription providing users access to 30 content items (not including WAP navigation costs which are billed separately).
Virgin Mobile (UK)	Streamed mTV (DAB)	Monthly subscription to channel package for prepaid plans. Unlimited access to channel bouquet with an all-inclusive voice subscription.
SK Telecom - TU Media (Korea)	Streamed mTV (S-DMB)	Hook-up fees. Monthly subscription to channel package (excluding pay-per-view channel). Pay-per-view programmes billed on a per-use basis.
MBCO (Japan)	Streamed mTV (S-DMB)	Hook-up fees. Monthly subscription to MoBaHo! service. Monthly subscription to all or part of the channel package via different options available.
Japanese terrest. offer	Streamed mTV (ISDB-T)	Free channel package.
Korean terrestrial offer	Streamed mTV (T-DMB)	Free channel package.

Source: **IDATE**

Table 15. Overview of mobile TV (mTV) and video offers in 3G

Name of operator	Breakdown of offer	Billing system
3 Italia	Streamed mTV	Billed per minute of viewing.
		Browsing on portal billed per page.
	Streamed mobile VOD	Rental of short and feature films billed on a per-view basis.
		Browsing on portal billed per page.
3 UK	Streamed mTV for most channels	Monthly subscription to channel packages.
	Streamed or downl. mobile VOD	Theme-specific monthly packages consisting of diverse multimedia content, including videos.
Orange France	Streamed mTV	Theme-specific monthly option with unlimited TV and video.
	Streamed mobile VOD	Access to TV and video limited to 10Mb/month + unlimited access weekends for 1 year included in Intense plans.
Orange UK	Streamed mTV	Theme-specific monthly packages limited to 1 Gb/month.
	Downloadable mobile VOD	Monthly rate plan, volume of content calculated in Mb. Pay-per-view billed per Mb.
SK Telecom (Korea)	Streamed mTV VOD mobile	Monthly subscription. Pay-per-view.
Sprint (US)	Streamed mTV	Monthly multimedia packages including channel packages.
Verizon Wireless (US)	Streamed mobile VOD and a downloading option for certain contents	Monthly subscription for unlimited access to all videos (excluding additional cost for Premium videos).
Vodafone UK	Streamed mTV	Monthly unlimited theme-specific packages.
	Downloadable mobile VOD	Some videos are free. Paid videos are accessed via a monthly subscription
Vodafone	Streamed mTV	Monthly subscription to channel packages.
Germany	Streamed mobile or downloadable VOD depending on type of handset	Pay-per-view, prices depend on content and transmission method (downloading or streaming).
Helio (US)	Streamed mTV	Unlimited, free access to 9 channels for all-inclusive subscriptions. Billing per Kb for à la carte plans.
	Streamed mobile VOD (except for music clips that are downloaded)	Unlimited, free access to VOD for all-inclusive subscriptions (excluding Premium content). Billing per Kb for à la carte plans.
Amp'd (US)	Streamed mTV Streamed or downloadable mobile VOD	Monthly plans with unlimited access to TV and VOD (for customers only). Pay-per-view + transfer costs billed per Mb for prepaid plans.
Freebe TV (US/UK)	Streamed mTV	Free offer. User billed for traffic costs.

Source: **IDATE**

Digital Home

Portable Media Player

Pioneered by the iPod, portable media players are making their way en masse into digital homes, offering large content storage capabilities (the new iPod has a capacity of 80 Gb), and the ability to enjoy the content outside the home. Some devices can even be plugged directly into speakers, and so becoming a portable hi-fi.

These new portable players offer a wide range of features. In addition to video and music players, they allow users to download video, music, games and photos from their computer or media centre, in addition to enabling game, audio books and radio and TV programme downloads from online services.

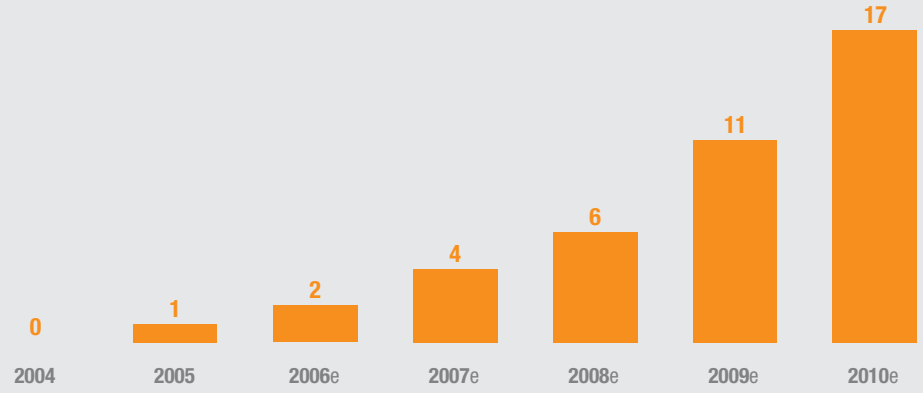
Another type of portable player, notably the one developed by Thomson, can be compared to a mobile STB. Equipped with a screen, the portable player lets users watch DTT broadcasts at home when connected to the TV set, or watch DTT channels when on the move outside the home. Also now available on the market are portable DVD players equipped with a DTT tuner, marketed by Toshiba, among others.

So there are a host of portable players available, offering a range of features and connectable to the digital home. The vast majority of these devices are, however, video/music players which serve to extend the digital home to nomadic use in the outside world.

The global portable player market is a very dynamic one, with growth estimates of 9% in 2005 and 10% in 2006 for Europe, so doubling in the space of a year. More specifically, the MP3 and MP4 market is expected to increase in value by 60% in that time.

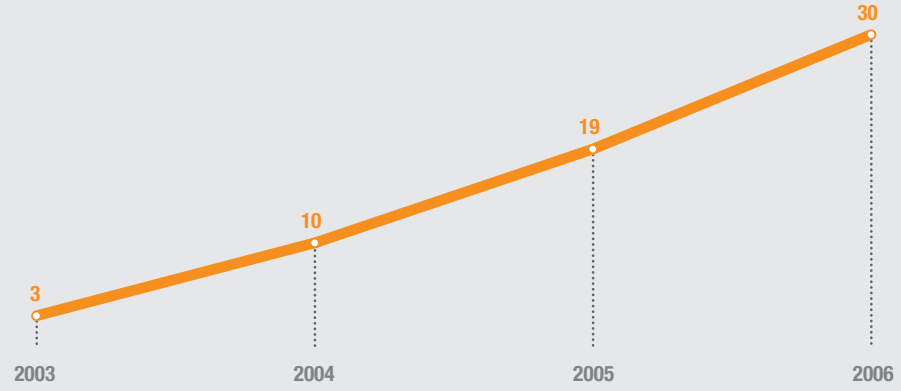
The North American market is thought to represent double the European market in 2005, with the portable audio-video player segment accounting for close to 25% of the total market. Digital media players equipped with a hard drive are now owned by 2% of the American population, a percentage that is projected to increase to 17% by 2010.

Figure 15. Equipment rate in the US for digital media players with hard drive
2004-2010, %



Source: portable multimedia analysis and forecsts, 2005. **Park associates**

Figure 16. Growth of portable MP3 player equipment in French households
2003-2006, %



Source: Use IT survey, 2006. **IDATE**

Spectrum

3G Spectrum cost

In Western Europe, operators spent a total of roughly 100 billion EUR to acquire UMTS licenses, as indicated in the table.

By way of comparison, Asian operators have paid less than 6 billion EUR for their UMTS licenses, although the major markets of China and India have not yet allocated 3G licenses – a process which will dramatically increase the price of spectrum in the region.

For now, South Korea and Taiwan were home to the highest prices paid by operators for 3G spectrum in the region ■

Table 16. Price per UMTS license in selected countries

Country	3G Holders	Price per licence (EUR)	Spectrum FDD+ TDD	Method
Austria	tele.ring	0.113 billion	2x5MHz + 5MHz	Auction
	T-Mobile Austria	0.120 billion	2x5MHz + 5MHz	
	Mobilkom (Telekom Austria)	0.121 billion	2x5MHz + 5MHz	
	Connect Austria	0.120 billion	2x5MHz + 5MHz	
	H3G	0.114 billion	2x5MHz + 5MHz	
	Telefonica	0.118 billion	2x5MHz + 5MHz	
Belgium	Belgacom Mobile (Proximus)	0.15 billion	2x15MHz + 5MHz	Auction
	BASE	0.15 billion	2x15MHz + 5MHz	
	Mobistar	0.15 billion	2x15MHz + 5MHz	
Denmark	TDC	0.127 billion	2x15MHz + 5MHz	Sealed-bid process
	Telia Denmark	0.127 billion	2x15MHz + 5MHz	
	Orange	0.127 billion	2x15MHz + 5MHz	
	H3G	0.127 billion	2x15MHz + 5MHz	
France	Orange France	619 million, plus a 1% tax on UMTS revenues	2x15MHz + 5MHz	Beauty contest
	SFR		2x15MHz + 5MHz	
	Bouygues Telecom		2x15MHz + 5MHz	
Germany	Vodafone D2	8.4 billion	2x5MHz + 5MHz	Auction
	T-Mobile Deutschland	8.5 billion	2x5MHz + 5MHz	
	E-Plus	8.4 billion	2x5MHz + 5MHz	
	O2 Germany	8.4 billion	2x5MHz + 5MHz	
	Mobilcom*	8.4 billion	2x5MHz + 5MHz	
	Quam (3G Group)	8.4 billion	2x5MHz + 5MHz	
Italy	TIM	2.417 billion	2x10MHz + 5MHz	Hybrid: auction and beauty contest
	Vodafone Omnitel	2.448 billion	2x10MHz + 5MHz	
	Wind	2.427 billion	2x10MHz + 5MHz	
	ISPE2000	2.442 billion	2x15MHz + 5MHz	
	Andala (H3G)	2.427 billion	2x15MHz + 5MHz	
The Netherlands	KPN Mobile	0.7 billion	2x15 MHz +5MHz	Auction
	Vodafone (Libertel)	0.7 billion	2x15 MHz +5MHz	
	Orange (Dutchtone)	0.4 billion	2x10 MHz	
	Telfort	0.4 billion	2x10 MHz	
	T-Mobile Netherlands	0.4 billion	2x10 MHz	
Spain	Telefonica Moviles	0.13 billion	2x15MHz + 5MHz	Beauty contest
	Vodafone Spain (Airtel)	0.13 billion	2x15MHz + 5MHz	
	Amena	0.13 billion	2x15MHz + 5MHz	
	Xfera	0.13 billion	2x15MHz + 5MHz	
United Kingdom	Vodafone UK	9.85 billion	2x15MHz + 5MHz	Auction
	O2 UK	6.65 billion	2x10MHz + 5MHz	
	Orange UK	6.75 billion	2x10MHz + 5MHz	
	T-Mobile UK	6.61 billion	2x10MHz + 5MHz	
	Hutchison 3G UK	7.23 billion	2x15MHz	

Source: **IDATE**

Annex

Mobile Market Data

France

1. Key general indicators

Population	million	(December 2005)	60.7
Mobile customers	million	(Start of July 2006)	48.7
Cellular penetration	%	(Start of July 2006)	80.1

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	33.3
MoU [2]	minutes	(December 2005)	235
Prepaid	%	(December 2005)	36.1
3G customers	million	(Start of July 2006)	2.7

Source: IDATE

3. Mobile operators market share

Orange France	%	(Start of July 2006)	47
SFR	%	(Start of July 2006)	36
Bouygues Telecom	%	(Start of July 2006)	17

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	37 343	40 389	43 140	46 459	50 000	53 754	56 738	58 391	60 405
Annual change	%	-	8.2	6.8	7.7	7.6	7.5	4.9	3.6	3.4
Density	% population	62.3	67.1	71.4	76.6	82.1	88.0	92.0	95.0	98.0

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

Germany

1. Key general indicators

Population	million	(December 2005)	82.4
Mobile customers	million	(Start of July 2006)	82.0
Cellular penetration	%	(Start of July 2006)	99.5

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	26.0
MoU [2]	minutes	(December 2005)	80.0
Prepaid	%	(December 2005)	49.6
3G customers	million	(Start of July 2006)	3.9

Source: IDATE

3. Mobile operators market share

T-Mobile Germany	%	(Start of July 2006)	37
Vodafone Germany	%	(Start of July 2006)	36
E-Plus	%	(Start of July 2006)	14
O2 Germany	%	(Start of July 2006)	13

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	59 177	64 793	71 314	79 182	85 046	88 169	89 783	90 563	91 334
Annual change	%	-	9.5	10.1	11.0	7.4	3.7	1.8	0.9	0.9
Density	% population	71.9	78.6	86.5	96.1	103.2	107.0	109.0	110.0	111.0

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

Italy

1. Key general indicators

Population	million	(December 2005)	58.1
Mobile customers	million	(Start of July 2006)	75.3
Cellular penetration	%	(Start of July 2006)	129.6

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	25.7
MoU [2]	minutes	(December 2005)	118.0
Prepaid	%	(December 2005)	91
3G customers	million	(Start of July 2006)	13.9

Source: IDATE

3. Mobile operators market share

TIM	%	(Start of July 2006)	40
Vodafone Italy	%	(Start of July 2006)	32
Wind	%	(Start of July 2006)	19
3 Italy	%	(Start of July 2006)	9

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	54 300	58 644	62 661	71 514	80 000	84 896	87 218	88 933	90 041
Annual change	%	-	4.3	10.6	14.1	11.9	6.1	2.7	2.0	1.2
Density	% population	93.7	97.7	107.9	123.1	137.6	146.0	150.0	153.0	155.0

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

Spain

1. Key general indicators

Population	million	(December 2005)	44.7
Mobile customers	million	(Start of July 2006)	45.3
Cellular penetration	%	(Start of July 2006)	101.3

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	31.4
MoU [2]	minutes	(December 2005)	150.0
Prepaid	%	(December 2005)	58.0
3G customers	million	(Start of July 2006)	1.9

Source: IDATE

3. Mobile operators market share

Telefonica Moviles Spain	%	(Start of July 2006)	45
Vodafone Spain	%	(Start of July 2006)	31
Amena	%	(Start of July 2006)	24

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	33 530	37 505	39 229	43 114	47 010	48 890	49 966	50 965	51 883
Annual change	%	-	11.9	4.6	9.9	9.0	4.0	2.2	2.0	1.8
Density	% population	83.5	93.3	97.4	106.9	101.3 (*)	105.2	107.4	109.5	111.4

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

(*) The drop in 2006 is due to corrections made on the official population figures

United Kingdom

1. Key general indicators

Population	million	(December 2005)	60.4
Mobile customers	million	(Start of July 2006)	68.0
Cellular penetration	%	(Start of July 2006)	112.9

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	27.7
MoU [2]	minutes	(December 2005)	145.0
Prepaid	%	(December 2005)	66.3
3G customers	million	(Start of July 2006)	7.6

Source: IDATE

3. Mobile operators market share

O2 UK	%	(Start of July 2006)	25
Vodafone UK	%	(Start of July 2006)	24
Orange UK	%	(Start of July 2006)	22
T-Mobile UK	%	(Start of July 2006)	24
3 UK	%	(Start of July 2006)	5

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	50 888	54 494	62 143	67 754	69 200	70 561	71 914	73 214	74 461
Annual change	%	-	7.1	14.0	9.0	2.1	2.0	1.9	1.8	1.7
Density	% population	84.9	90.7	103.1	112.1	114.2	116.1	118.0	119.8	121.5

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

USA

1. Key general indicators

Population	million	(December 2005)	295.8
Mobile customers	million	(Start of July 2006)	220.6
Cellular penetration	%	(Start of July 2006)	74.6

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	39.0
MoU [2]	minutes	(December 2005)	na
Prepaid	%	(December 2005)	10-20
3G customers	million	(Start of July 2006)	11.9

Source: IDATE

3. Mobile operators market share

Cingular Wireless	%	(Start of July 2006)	26
Verizon Wireless	%	(Start of July 2006)	25
Sprint Nextel	%	(Start of July 2006)	23
T-Mobile USA	%	(Start of July 2006)	11
Others	%	(Start of July 2006)	15

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	140 767	158 722	182 140	207 896	232 750	252 958	270 404	285 044	296 796
Annual change	%	-	12.8	14.8	14.1	12.0	8.7	6.9	5.4	4.1
Density	% population	48.9	54.7	62.2	70.3	78.0	84.0	89.0	93.0	96.0

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

China

1. Key general indicators

Population	million	(December 2005)	1 284.3
Mobile customers	million	(Start of July 2006)	410.9
Cellular penetration	%	(Start of July 2006)	32

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	7.8
MoU [2]	minutes	(December 2005)	na
Prepaid	%	(December 2005)	60-66
3G customers	million	(Start of July 2006)	0

Source: IDATE

3. Mobile operators market share

China Mobile	%	(Start of July 2006)	67
China Unicom	%	(Start of July 2006)	33

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	207 500	268 649	317 602	374 446	450 000	535 000	630 000	695 000	770 000
Annual change	%	-	29.5	18.2	17.9	20.2	18.9	17.8	10.3	10.8
Density	% population	16.2	20.9	24.7	29.2	35.0	41.7	49.1	54.1	60.0

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

Japan

1. Key general indicators

Population	million	(December 2005)	127.4
Mobile customers	million	(Start of July 2006)	92.9
Cellular penetration	%	(Start of July 2006)	72.9

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	57.3
MoU [2]	minutes	(December 2005)	na
Prepaid	%	(December 2005)	3.4
3G customers	million	(Start of July 2006)	39.4

Source: IDATE

3. Mobile operators market share

NTT Docomo	%	(Start of July 2006)	56
KDDI	%	(Start of July 2006)	28
Softbank Mobile	%	(Start of July 2006)	16

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	73 500	79 800	85 500	90 200	95 612	101 349	107 430	111 727	116 196
Annual change	%	-	8.8	7.1	5.5	6.0	6.0	6.0	4.0	4.0
Density	% population	57.8	62.7	67.1	70.8	75.0	79.5	84.3	87.7	91.4

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

South Korea

1. Key general indicators

Population	million	(December 2005)	48.6
Mobile customers	million	(Start of July 2006)	39.4
Cellular penetration	%	(Start of July 2006)	81.0

Source: IDATE

2. Key market indicators

ARPU [1]	EUR	(December 2005)	26.6
MoU [2]	minutes	(December 2005)	na
Prepaid	%	(December 2005)	3-5
3G customers	million	(Start of July 2006)	14.2

Source: IDATE

3. Mobile operators market share

SK Telecom	%	(Start of July 2006)	51
KTF	%	(Start of July 2006)	32
LG Telecom	%	(Start of July 2006)	17

Source: IDATE

4. Mobile customers and penetration rate

MOBILE SERVICES		2002	2003	2004	2005	2006	2007	2008	2009	2010
Mobile customers	thousand	32 343	33 592	36 588	38 342	40 067	41 790	43 504	45 244	46 872
Annual change	%	-	3.9	8.9	4.8	4.5	4.3	4.1	4.0	3.6
Density	% population	67.4	69.7	75.6	78.8	82.0	85.2	88.4	91.6	94.6

Source: IDATE

[1] net service revenue per user
[2] outgoing call traffic per customer per month

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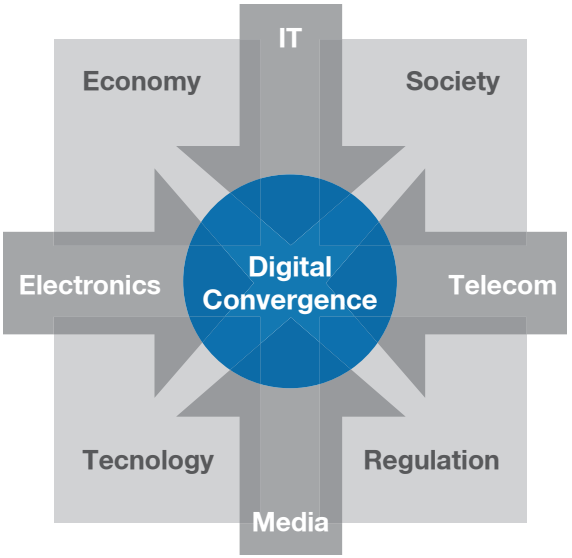

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