Mobile 2010

Markets & Trends

Facts & Figures

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The recovery is underway

The world telecom services market is estimated at 1,440 billion USD in 2009 - a 1.7% increase over the year before - and is expected to be worth over 1,481 billion USD in 2010.

After a marked decline in 2008 – to +3.8%, or two points less than in 2007 – growth in the telecom services market dropped significantly once again in 2009. After generating revenue of 1,417 billion USD in 2008, sales are expected to reach 1,441 billion USD in 2009, in other words an increase of only 1.7%, the lowest growth rate since 2002.

This decline is due to structural phenomena, i.e. the maturity of the markets that have driven growth in the past, namely mobile telephony in industrialised countries, combined with competitive and regulatory pressures, etc., whose impact has been further aggravated by the economic downturn.

Although based solidly on business models tied to subscriptions and technologies that users in industrialised nations consider essential, the telecom services market is not likely to emerge unscathed from the recession. It does nevertheless have some very strong assets that will help put it back on track, including the fact that consumption volumes continue to rise apace with the growing base. In fixed markets, the growing Internet services market is no longer fully offsetting the decline in fixed line calling, added to which the growth rate for mobile services revenue continues to shrink – decreasing by two-thirds between 2007 and 2009.

Mobile services nevertheless remain the chief driving force

With total sales estimated at 755 billion USD in 2008 and at 785 billion USD in 2009, mobile services nevertheless remain the chief driving force behind growth as a whole. They have accounted for more than half of all telecom services revenue worldwide for four years running (representing an estimated 55% in 2009), and generate more than twice as much income as landline calling. The mobile market's growth is being sustained by a massive rise in customer numbers which increased by 14% worldwide in 2009: up to 4.5 billion (or by more than 46 million customers a month!), whereas the market's value has been declining year after year.

Fixed telephony continues its decline which began in 2002, and at an ever increasing pace. In 2009, the number of fixed lines shrank again, and average revenue per line has decreased by around 2% annually for the past two years. Fixed telephony has decreased in value by 11% in three years and, at the end of 2009, it accounted for only 26% of the telecom services market worldwide, compared to around 33% in 2006.

Generating an estimated 275 billion USD in 2009, data and especially Internet services continue to increase their weight in the equation, which has risen slowly but steadily: by 0.5 to 0.7 points annually since 2006. Their share of the total market reached 19% in 2009, up from 17% in 2006 and less than 15% in 2001, although their contribution to growth is no longer compensating for the decline in fixed telephony revenue: 19.3 billion USD in losses for fixed voice, compared to 14.1 billion USD in gains for fixed data services. Excluding Internet, the data services market remained unchanged in Europe and North America in 2008 compared to 2007, and is expected to suffer a decline in 2009.

The growth of Internet and data services has been spurred by the remarkable rise of the Internet, and especially of broadband access. In terms of volume, the number of broadband subscribers grew by close to 63.3 million, which translates into 5.3 million new subscribers a month worldwide. At this pace, we predict that the 500 million mark will be reached some time in 2010. At the end of 2009, broadband access accounted for three quarters of all Internet connections around the globe.

In this new edition of our Mobile yearbook, you will find valuable data on the central components of the mobile world, along with analyses from IDATE's experts and a comprehensive round-up of the highlights of the year gone by:

- **LTE: the compelling answer?**
- **Radio Spectrum**
- **Connected Devices**
- **Mobile VoIP**
- **Mobile network outsourcing and sharing**
- **Femtocells**
- **M2M**
- **Mobile Internet**

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1. Emerging markets sustained worldwide growth in 2009

From a geographical perspective, the moderate global growth rates hides considerable regional disparities with, on the one side, emerging markets which are still growing, sustained in large part by the rise of mobile services and, on the other, industrialised regions and countries whose overall revenue is down slightly.

There has been a significant difference in growth rates between the United States and the European Union since 2007: +4.6% vs. +2.0% in 2007, +2.6% vs. +0.3% in 2008, +0.8% vs. -1.7% in 2009, respectively. From 2001 to 2004, the European Union reported higher growth than North America, but the situation was reversed for the first time in 2005, with the EU reporting growth that was half a point below North America's. In 2006, however, it was Europe that had half a point over America.

The first difference between the two markets is that fixed telephony has declined even further in Europe (by an estimated -7.1% in 2009), with users switching massively to mobile, whereas landline calling revenue in North America has held up relatively well (expected -3.0% for 2009). Second, growth in the North American market continues to be driven by mobile services (+3.2% in 2009) which are steadily losing steam in Europe (+0.2%). The fact that the mobile market is still growing in North America, combined with the healthy expansion of its mobile data market, provide a partial explanation for the different growth rates on either side of the Atlantic. The most advanced Asian markets have been affected by the ongoing decline of the Japanese market (-5.2% in 2008, -2.8% in 2009) – whose recession has been the most severe of anywhere in the world.

Industrialised countries still represent a very large portion of the global telecom market (just under 66% in 2009), but their weight in the equation is shrinking steadily: by around 2 points a year, on average, over the past three years. On the flipside, emerging markets continue to grow – increasing their share of the global market from one quarter in 2003 to over 30% since 2007. In addition, with 31 billion USD more in revenue in 2009 compared to 2008, emerging markets have more than offset the losses in industrialised markets, which are estimated at 6.5 billion USD, and sustained worldwide growth levels. Five of them combined (Brazil, China, India, Mexico and Russia) accounted for close to half (49%) of global market growth between 2008 and 2009, in addition to representing half of the emerging nation market, with China alone accounting for just under a quarter (22%).

Global telecommunications services market, 2006-2010 (Billion USD)

	2006	2007	2008	2009F	2010F
Fixed telephony	427.3	415.8	400.2	380.9	364.0
Mobile services	635.2	707.4	755.3	784.7	823.7
Data and Internet	222.2	241.3	261.1	275.1	294.0
Total	1 284.7	1 364.5	1 416.6	1 440.7	1 481.7
Annual growth rate	5.8%	6.2%	3.8%	1.7%	2.8%

Global telecom services market, by region, 2006-2010 (Billion USD)

	2006	2007	2008	2009F	2010F
North America	323.4	338.3	347.1	349.7	351.3
Europe	444.8	459.6	467.8	463.9	465.8
Asia Pacific	346.3	366.7	377.8	387.9	405.6
Latin America	105.9	122.1	136.2	144.1	155.4
Africa & the Middle East	64.4	77.7	87.7	95.1	103.6
Total World	1 284.7	1 364.5	1 416.6	1 440.7	1 481.7

F: Forecast - Source: IDATE

2. The globe's top telcos

With sales totalling 68.5 billion EUR, and falling steadily since 2000, NTT has now lost its long-held top spot to American giant AT&T.

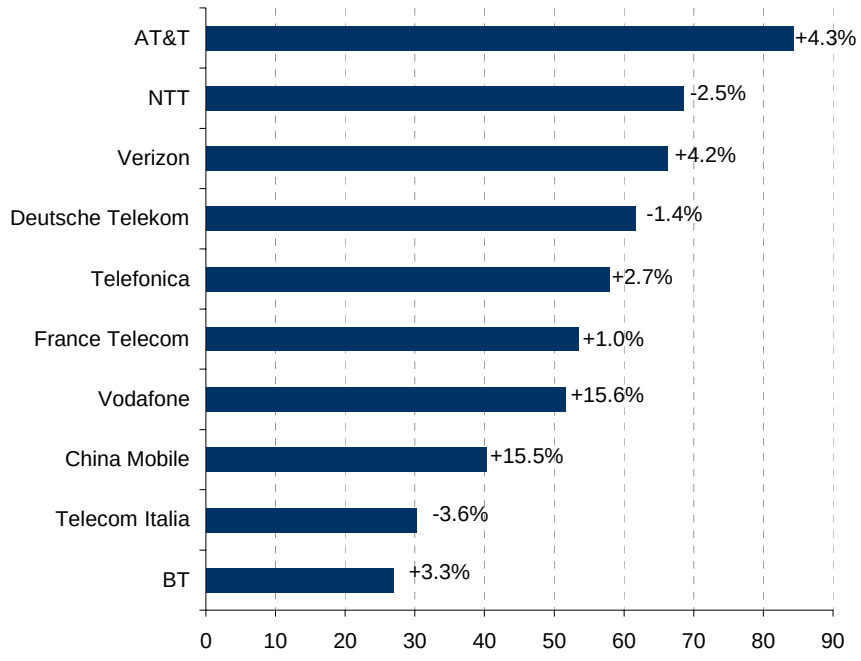
China's operators are causing major upheavals in the rankings, gradually forging themselves a position among the globe's highest ranked carriers, thanks to a fast-growing Chinese telecom market, and especially a booming mobile services segment. Over the course of four years, from 2005 to 2008, China Mobile rose to 8th place, thanks to a swift rise in revenue from its ever-expanding customer base. Meanwhile, the deep-seated restructuring of China's telecom market has pushed China Netcom into 16th spot (China Unicom had been in 29th spot in 2005, while the former China Netcom ranked 31st).

There have been several changes in the American market:

- adopting the AT&T brand for all its operations, the merger of AT&T + SBC + BellSouth + Cingular Wireless has created a carrier that generates more than 84.3 billion EUR annually, and now ranks number one worldwide;
- the new Verizon, born of the recent merger of Verizon + MCI + Alltel, is close on the heels of NTT, with annual sales of 66.2 billion EUR;
- Sprint has gained strength thanks to its merger with Nextel, but has not moved up much in the rankings, going from 10th place in 2005 to 11th in 2008.

The incumbent carriers in the main European markets – Deutsche Telekom, France Telecom, Telecom Italia, Telefónica and BT – are still among the globe's top telcos. With the exception of Telefónica, which has gone from 6th place in 2005 to 5th in 2008 with sales of 58 billion EUR – a 2.7% increase over the year before – all the others have slipped down at least one or two places in the rankings. France Telecom was in 6th spot in 2008, two places lower than in 2005, with annual sales of 53.5 billion EUR, or 1% more than in 2007-2008.

The globe's top 10 telecom service providers in 2008, in terms of sales (Billion EUR)



Source: IDATE

3. LTE: the compelling answer?

Key findings

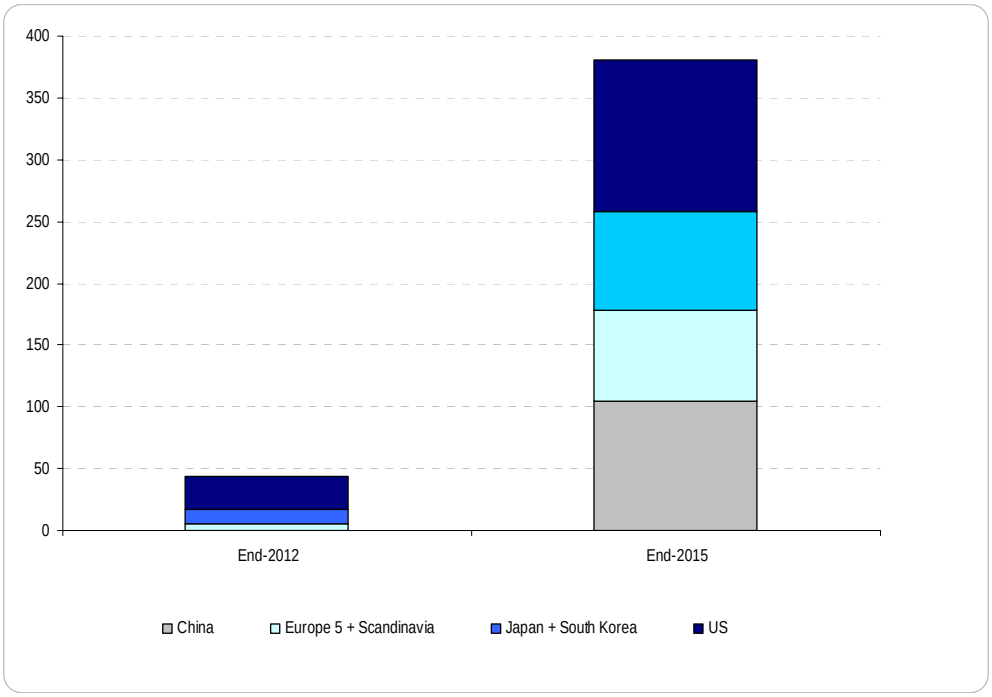
- IDATE predicts that, by 2015, a total of 380 million subscribers in the USA, EU5, Scandinavia, China, Japan and South Korea will have access to mobile data through LTE networks.
- The cost of LTE deployment for an MNO operating both GSM and UMTS/HSDPA networks amounts to 2.1 billion EUR for coverage of the urban and suburban population. This is the figure to be considered for a territory of 50 million inhabitants with the population density characteristics of a Western European country.
- Innovative services and business models, such as VoLTE which can bring benefits to both operators and subscribers, need to be deployed if operators are to maximise the potential of LTE deployment, maintain ARPU levels and continue to be a smart pipe.

3.1. The roadmap and forecasts

LTE subscriber forecasts for 2012 and 2015, plus the factors affecting subscriber growth

The USA, the EU5 plus Scandinavia, Japan, South Korea and China all have different backgrounds which affect their adoption of LTE, and this report gives forecasts for these countries for 2012 and 2015. India cannot be ignored in terms of population, but IDATE does not expect to see LTE adoption in India in the 2015 timeframe at least.

Global LTE adoption forecast (End-2012 to end-2015) (Million subscribers)



Source: IDATE

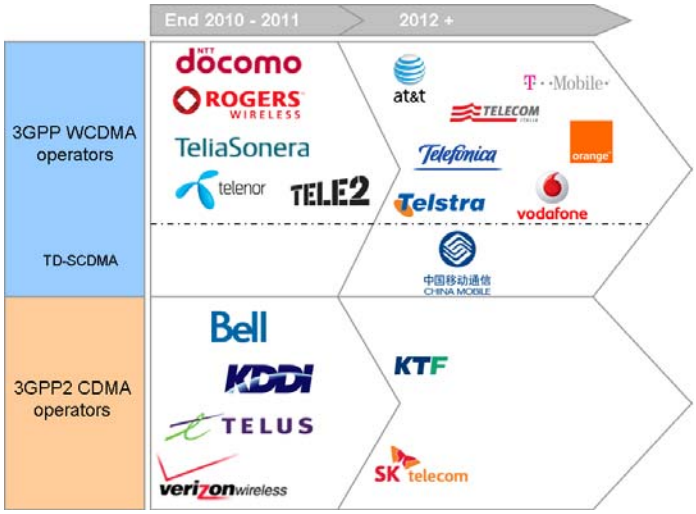
With virtually all big-name operators, handset manufacturers and network vendors on board, the LTE ecosystem is healthy in the extreme

The LTE/SAE Trial Initiative (LSTI) and the Next Generation Mobile Networks (NGMN) Alliance both demonstrate a strong commitment to LTE. The former includes 23 equipment vendors and nine operators, and the latter includes 19 operators and 33 equipment vendors.

Earliest LTE deployments announced for end-2010; many more operators are set to follow

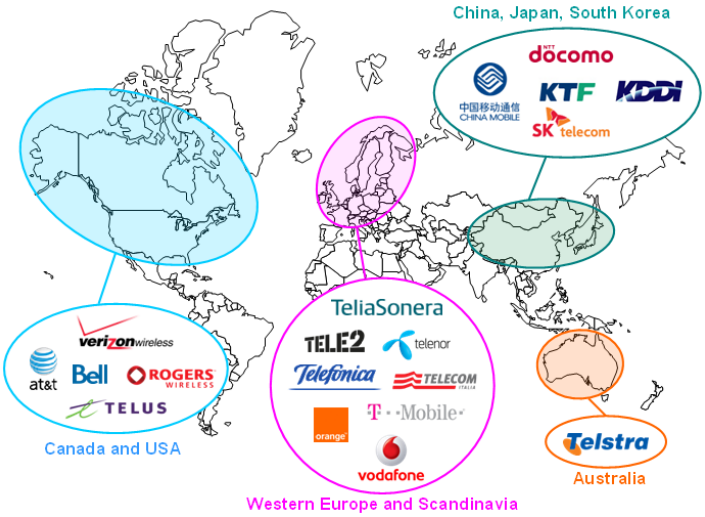
The forerunners of LTE deployment are NTT DOCOMO of Japan and Verizon Wireless of the USA. A host of other big-name MNOs is committed to deploying the technology from 2011 onwards.

Major operators LTE commercial deployment schedule



Source: IDATE

Geographical mapping of early LTE commercial deployment

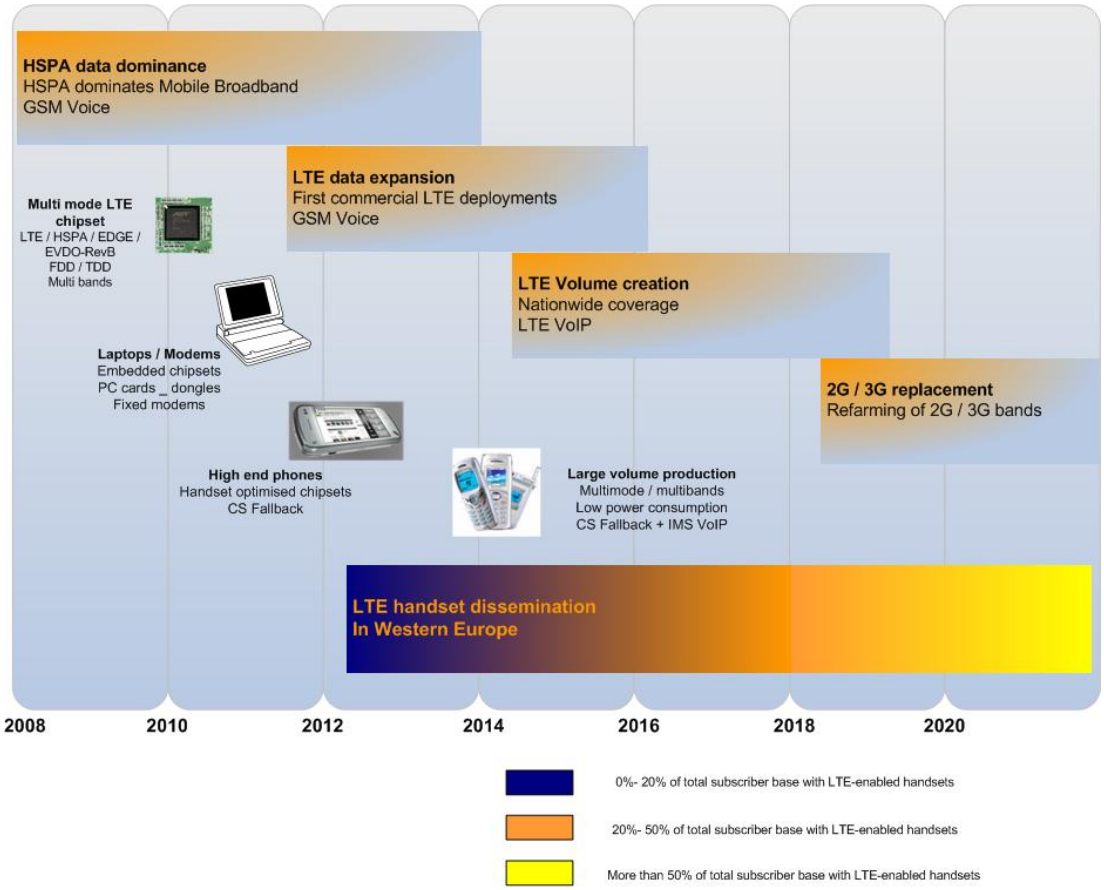


Source: IDATE, based on operator announcements

Handset vendors still poised to deploy LTE, despite the financial crisis, first through laptops, then high-end phones and on to the mass market

All major handset vendors gave recorded negative YoY shipments due to the financial downturn. This will not stop LTE devices, however, and the first terminals will be aimed for use with laptops, gradually moving on to high-end phones and then to the mass market.

LTE devices roadmap



Source: IDATE, from chipset vendors and terminal manufacturers

With advent of LTE, many MNOs could become enthusiastic about VoIP and adopt managed-VoLTE

LTE does not support circuit-switched (CS) services, but current mobile networks primarily uses CS for voice services. LTE can utilise VoIP together with an IMS (IP Multimedia Subsystem) network to deliver delay-sensitive, real-time voice services. Presently, operators see VoIP as a threat to their 3G networks, but VoLTE brings benefits to both operators and users. Initial LTE deployment is likely to see CS fallback for voice services, but in the long run managed-VoLTE could be a real possibility.

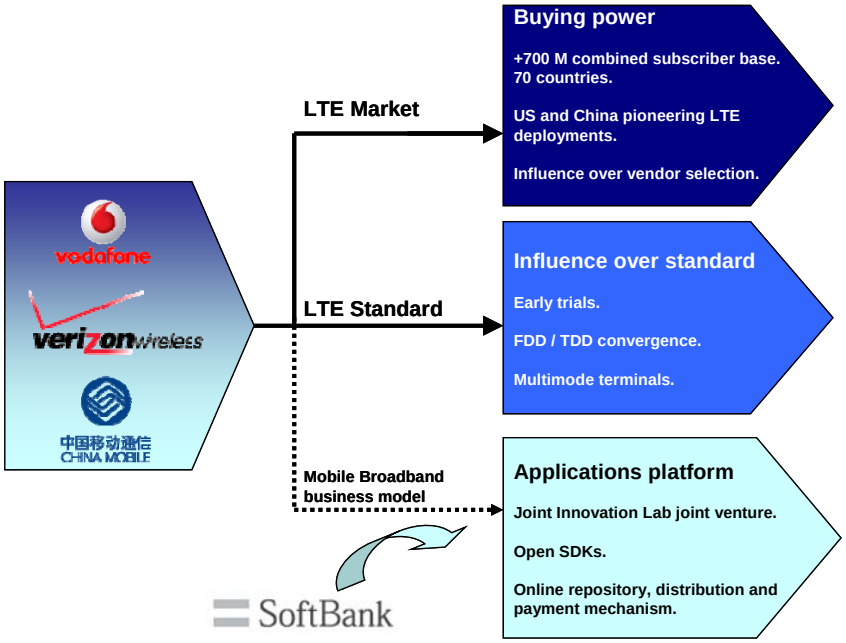
By adopting LTE, operators can hope to maintain current ARPU levels and stay being a smart pipe

LTE will certainly enhance the mobile experience, but monetising it will be difficult. Consumers are accustomed to free services from the world of Internet, and many LTE services will duplicate them. The realistic aim for operators would be to maintain current ARPU levels by offering premium services, and to keep being a smart pipe by staying at the core of the ecosystem by means of controlling the network and specific activities on top of it.

LTE will likely accelerate FMC, network sharing and strategic partnerships, especially in current financial climate

One potential downfall of LTE is its coverage, especially in its early days. Together with the expanding cellular backhaul traffic, LTE is a driver for adopting Fixed-Mobile Convergence (FMC). Network sharing and partnerships can already be seen throughout the LTE ecosystem, for a variety of reasons; for greater buying power, stronger influence over standards or to gain a foothold in a new market, to name but a few. In the current financial climate, cost-saving is also a key driver.

Influence of the Vodafone, China Mobile and Verizon Wireless partnership over LTE ecosystem



Source: IDATE

3.2. Modelling the business cases

What is the cost of initial investment in deploying LTE?

Based on modelling results and considering the case of a MNO already operating GSM and 3G networks, the total cumulated investment for the LTE RAN overlay deployment amounts to 335 million EUR during the period 2011-2018. This is the figure to be considered for a territory of 10 million inhabitants with a 75% population coverage in urban and suburban areas. It does not take into account the cost of a national radio licence for 20 MHz of paired spectrum in the 2.6 GHz band which is valued at 80 million EUR (0.20 EUR per MHz and per inhabitant), nor backhauling costs estimated at 112 million EUR.

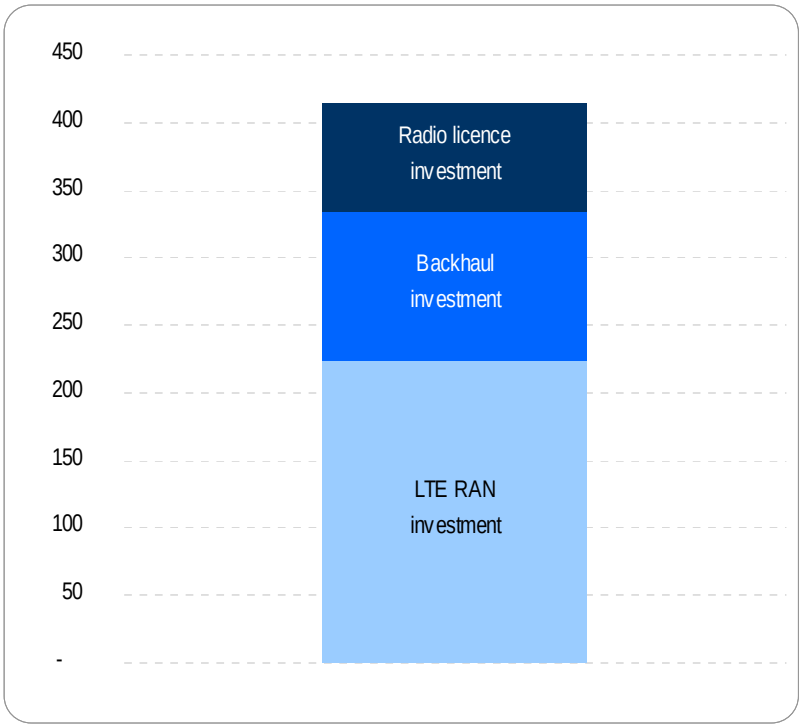
LTE CapEx for base case scenario

Scenario name:	Scenario of reference	
Scenario description:	Coverage: 75% of population (metropolitan, urban, suburban) Frequency band: 2.6 GHz, bandwidth: 2 x 20 MHz Deployment period: 7 years (2012-2018) Mast sharing for LTE: 90% Backhaul investment: 50% of LTE RAN investment	
	Population of 10 million inhabitants	Population of 50 million inhabitants
LTE RAN investment	223 million EUR	1,116 million EUR
Backhaul investment	112 million EUR	558 million EUR
Radio licence investment	80 million EUR	400 million EUR
Total investment	415 million EUR	2,074 million EUR
Average investment per inhabitant covered	55.3 EUR/ inhabitant covered	

Source: IDATE, LTE deployment model

LTE investment breakdown for base case scenario

(Total investment, in million EUR)



Source: IDATE, LTE deployment model

Which type of operator benefits most?

Integrated Tier 1 players and mobile Tier 1 players are the two types of players for whom LTE deployment has the most advantages.

Considering the investment involved in backhaul upgrades, it is the integrated operators who are even better placed than mobile Tier 1 operators as they can benefit from their existing infrastructure (ducts, chamber) to lower the cost of the upgrade.

Will LTE be just for urban hotspots or will it serve a wider audience?

LTE deployments will be undertaken in dense areas (metropolitan and urban areas). Suburban areas will be second to be covered since the LTE business case for this type of territory remains globally unchanged.

LTE deployment in rural areas is less likely to happen in the 2.6 GHz band as the cost per covered inhabitant is prohibitive. In this regard, access to lower frequencies in the digital dividend (790-862 MHz) positively transforms the LTE business case as fewer cell sites are needed to provide the same level of coverage.

3.3. Regulations and technicalities

Licences are typically required for building new base stations, and current anti-electromagnetic pressures could hinder LTE deployment

In most cases, a licence is required to build base stations, and various constraints regarding maximum power and additional antennae apply. Operators have lost court cases and been ordered to dismantle masts, for fear of the effects on health due to the electromagnetic fields.

Selected constraints for LTE deployment in France, Germany, UK and Switzerland

Country	Maximum power	Additional sites	Additional antennas		Combined antennas
France	WHO levels	Building licence required	Building licence required. Some form of 3G site sharing is likely to be imposed.	Colocation might be needed for additional racks.	Lack of room on existing masts due to high number of pieces of equipment and high number of feeders.
Germany	WHO levels	Depend on the Länder. Building licence generally required for sites higher than 10m.	Depend on the Länder. Generally no licence required if for the same use.		
UK	WHO levels	Building licence required	Planning permission required by the relevant local planning authorities.		
Switzerland	WHO levels for overall radiation; individual masts must be below 4 or 6 V/m in populated areas	Building licence required	Building licence required. Site sharing mandatory for equipment in the 2.6 GHz band.		

Source: IDATE

LTE can be deployed in both 2G and 3G frequency bands, but more is needed and awarding licences can be complicated.

New frequency bands will be allocated in the coming years, but both former bands and new bands will be used for LTE. In the USA, licences for UHF bands and 2.5 GHz band are already awarded, but in Europe the situation is much more complicated. IDATE also presents below the estimated costs of LTE spectrum based on previous auctions.

Estimates of LTE spectrum value in Western Europe

Type of spectrum	Band	Quantity	Valuation[1] (€ cents per MHz per pop)
Premium spectrum	2.6 GHz FDD	Up to 2 x 70 MHz	> 20
	UHF sub-band (Digital dividend)	2 x 30 MHz	> 50
	2.6 GHz TDD	Up to 190 MHz	2 to 10
	3.5 GHz TDD/FDD	Up to 190 MHz	0.1 to 1
	2 GHz TDD	A few 5 MHz channels	2 to 10

Source: IDATE

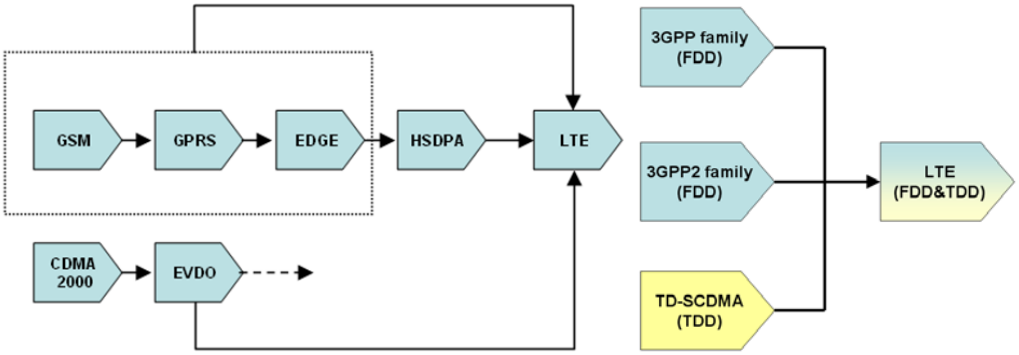
[1] for a 10-year licence

Frequency division duplex (FDD) is the dominant duplexing mode, but time division duplex (TDD) is gaining ground, under strong influence of China

The FDD mode has been used by mobile systems from the first generation. The TDD mode is currently used by Mobile WiMAX, WiBRO and the Chinese 3G standard TD-SCDMA. TDD is more suited to data services, and more operators are demanding harmonised equipment.

Both 3GPP and 3GPP2 standards lead to LTE, and LTE supports both FDD and TDD. This makes it the natural goal for all mobile broadband technologies.

Options for carrier upgrades to LTE depending on technology deployed



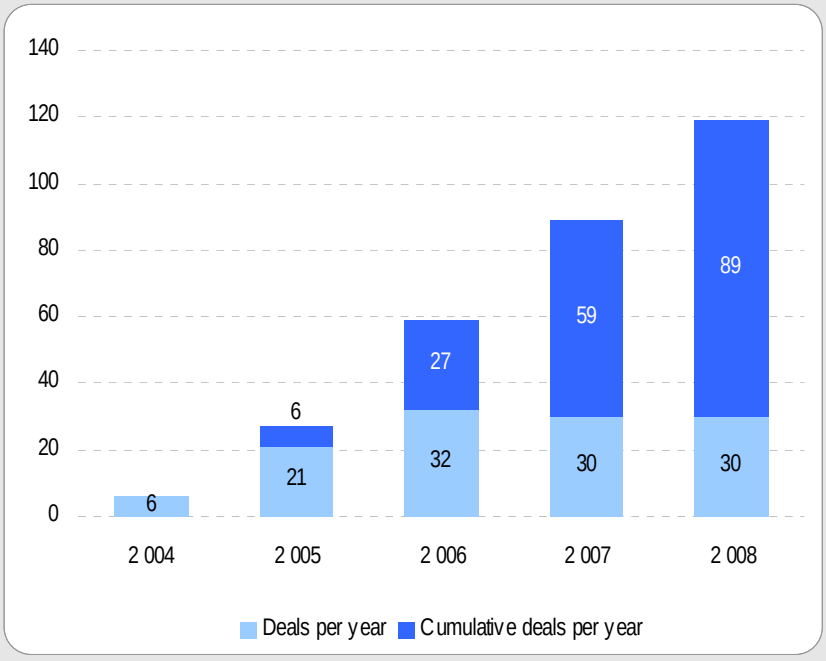
Source: IDATE

4. Mobile network outsourcing and sharing

Key findings

- Network sharing and outsourcing have gathered significant momentum in recent years and became mainstream even for tier 1 operators in major markets.
- Technical requirements and the economics of LTE roll-out will further fuel the trend towards this type of solutions.
- Cost considerations remain the main driver for telecom operators to outsource or share networks, especially in the current economic environment. Yet, other factors are also important, e.g. public concerns about electromagnetic emissions.
- Strategic relevance of network assets is diminishing for MNOs. Services increasingly play the role of the key competitive differentiator.

Network outsourcing deals worldwide



Source : IDATE

Network outsourcing and sharing at the core of MNO strategies

Network outsourcing and network sharing has been observed for several years already. Following the UMTS licence frenzy, infrastructure sharing became an economic necessity for a number of operators to meet 3G coverage license requirements.. For instance, the most important reference for network sharing in the EU is the deal struck between T-Mobile and O_2 to share infrastructures in Germany and the UK, the countries with the most expensive licences in Europe by far. Mobile network outsourcing first appeared towards the year 2004. Mobile challengers were the first players to adopt the model while multinationals were still reluctant to opt for outsourcing. Over the last 2 to 3 years, however, a real boom in the number of infrastructure outsourcing and sharing deals can be observed worldwide.

Challengers as well as tier 1 players have multiplied deals in their different worldwide markets and have broadened the scope of the agreements.

Different Flavours of network outsourcing and sharing

"Network sharing" is not necessarily the same thing as "network sharing"; there is a variety of network sharing options and scenarios. The same holds for network outsourcing, where MNOs can opt for different degrees of outsourcing their networks.

Network outsourcing

The "lightest" form of outsourcing concerns maintenance. Although the MNO keeps full responsibility for running the network operations centre, field maintenance is delegated to the service provider. Such deals may include spare parts management. In the case of network operations and maintenance outsourcing the service provider is in charge of running the infrastructure. The MNO keeps control of network planning and build out. In a full network outsourcing setting all network related tasks are delegated to the service provider.

Network sharing

The main distinction to be made is between passive and active infrastructure sharing. Passive infrastructure sharing refers to the case where MNOs share assets like sites, power supply or masts but no active elements of the network. If MNOs agree on active network sharing, the deal includes elements such as antennas, Node-B, backhaul capacity or even core network elements. So far, the majority of sharing agreements concerns passive infrastructure only. One important aspect is whether network sharing takes place in a brownfield or greenfield setting. Efficiency gains from sharing will be significantly higher in the latter case, where the infrastructure can be designed from the outset to meet multiple MNOs' demand instead of adjusting existing networks.

Offloading the network burden

There are several reasons why MNOs tend to abandon exclusive control of what might be considered their most strategic asset. Cost considerations are the single most important driver, but other factors come into the equation, too.

Cost savings

As the phase of seemingly unlimited growth has come to an end in mobile markets, operators worldwide find themselves in an increasingly competitive environment. Pressure is mounting to control costs tightly in order to maintain profit margins. Savings that can actually be made in the real world will differ from case to case depending on the given circumstances. Nevertheless, one can make reasonable estimates of the range of savings achievable depending on the approach chosen by MNOs. Network outsourcing permits cuts in OPEX and spending on capitalised network-related services. Full outsourcing will enable an MNO to reduce its total cost base of combined OPEX and CAPEX by 2 to 5%. The range of savings by which network sharing MNOs can reduce their cash costs is much wider than for outsourcing. The cost reduction potential depends on the above mentioned brownfield/greenfield setting but also on the extent to which a sharing MNO's network is concerned and on the number of sites decommissioned. Savings will be somewhere between 1% and 20% of total CAPEX and OPEX depending on the combination of factors.

Network sharing and outsourcing are not mutually exclusive. MNOs can reap the benefits of both by combining the approaches.

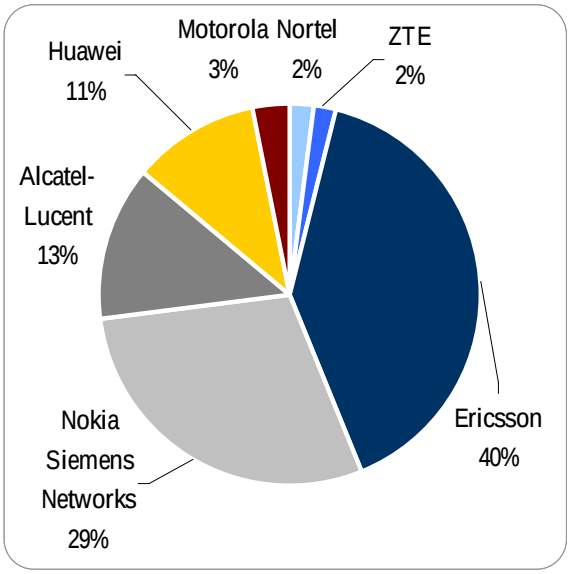
Other drivers

There are several other factors that make MNOs opt for network outsourcing and/or sharing. Among these is the increasing public concern over health impacts of electromagnetic waves and CO_2 emissions. Both items can be addressed by a reduced number of base stations through network sharing agreements. Outsourcing also allows the MNO to benefit from the expertise in managing complex technologies of the service providing equipment vendor.

Equipment vendors' positioning

Infrastructure services have been the fastest growing segment of telecommunications markets. Network outsourcing is one of the most dynamic elements of these infrastructure services. Competition among vendors is intense as the market is of strategic importance to them. Securing deals with MNOs in an early stage of the market will open the door for further contracts across their international footprints. Multiplying the number of deals also not only allows the vendor to gain expertise but also to generate economies of scale and scope.

Telecom Equipment Vendors' mobile network outsourcing market share, cumulative deals' number 2004-2008



Source: IDATE

At the same time, the number of potential clients is shrinking as more and more MNOs share their networks. Providing the additional value of network outsourcing services may therefore be vital to a vendor's long-term viability.

Impact on the industry

In the long run, network outsourcing and network sharing may have much a deeper impact on the mobile industry than merely reducing an MNO’s cost levels. As MNOs are reducing their level of involvement in the day to day business of running a wireless network, equipment vendors are stepping in to take over the management of an individual MNO's network or a shared one. Once such arrangements are put in place, they are hard to reverse. At the same time, MNOs are focussing increasingly on the services side of their business. This trend is also mirrored in the organisational structures of integrated telecoms operators, where more and more players transition from a network centric to a service centric organisation. For MNOs, innovation in services and applications provided to users is the key competitive differentiator today, rather than network coverage. Ultimately, this development can lead to a situation where equipment vendors and today's mobile network operators are highly specialised on a single domain. Equipment manufacturers can manage oall hardware-related matters, from design of equipment over network planning to network operation and maintenance. The traditional MNO on the other hand could evolve into a ServCo offering, tailor-made solutions to their subscribers without having to carry the burden of cost intensive network infrastructures.

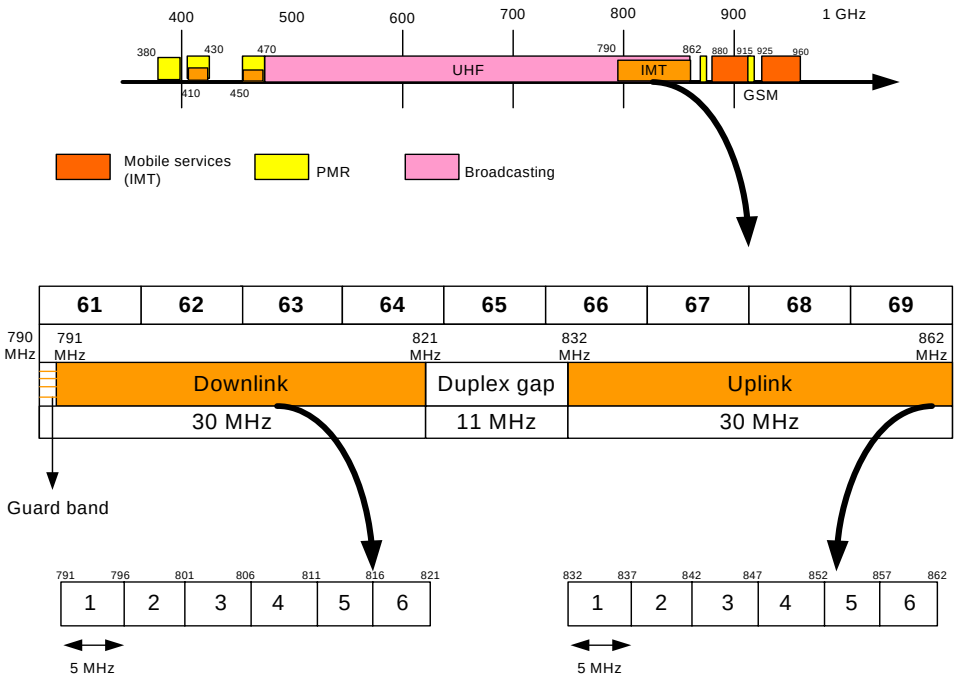
5. Radio Spectrum

Key findings

Digital Dividend

- The Digital Dividend represents a unique opportunity to facilitate the dissemination of mobile broadband in Western Europe. The 800 MHz band (790-862 MHz) freed up in Europe for mobile communications has a very high value for mobile operators. The take-off of mobile broadband adds value to this new spectrum.
- Analogue TV switch-off has already happened in the US and is progressively taking place in Europe with a switch-off to be completed by the end of 2015.
- The status of the Digital Dividend in Western European countries is getting clearer as most European countries have already allocated, or shall do so soon, the 800 MHz band (790-862 MHz) to mobile services. The regulatory framework is getting clearer and the technical conditions have been established by the CEPT.
- Harmonisation throughout Europe is likely to be reached and this adds even more value to the 800 MHz band. Most mobile operators are planning to use LTE in FDD mode in this band.
- USA took the lead and auctioned the second part of its own digital dividend early in 2008. The 700 MHz auctions in the USA were a real success even though the D block was not allocated. The reserve price ($10 billion) was largely exceeded and the winning bids reached US$ 18.9 billion. This confirms the great interest which the UHF band has for those mobile operators who are going to deploy LTE.

800 MHz band arrangements

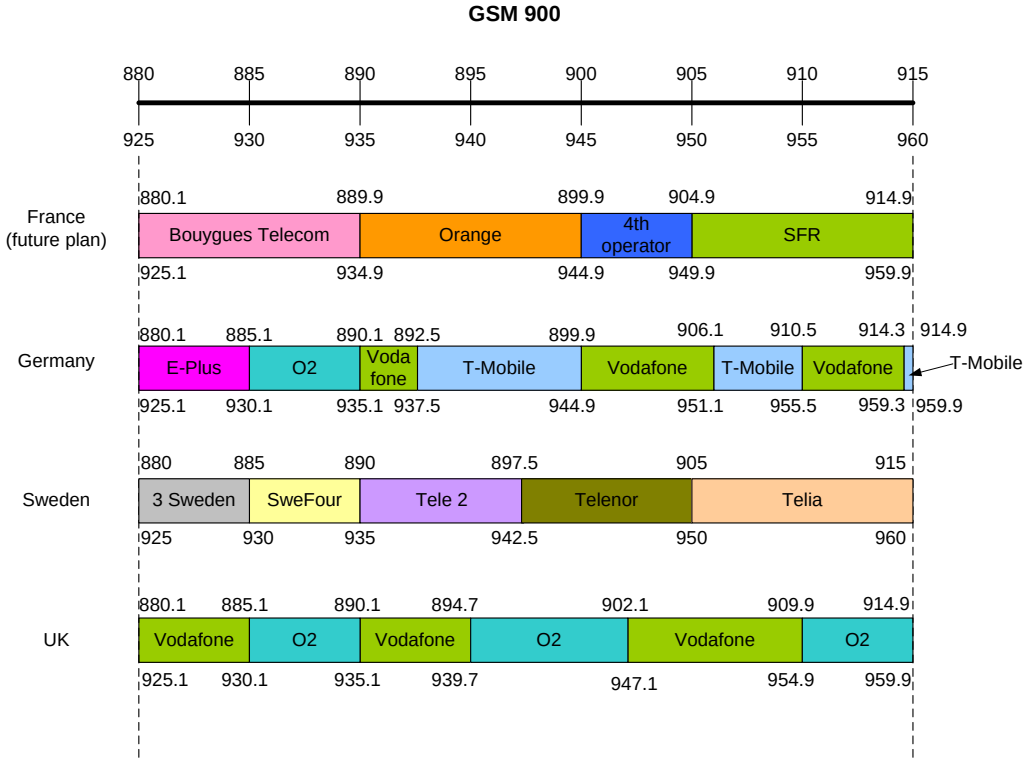


Source: IDATE

Spectrum refarming

- The use of the 900 MHz band by 3G or 4G technologies represents a short-term opportunity to facilitate mobile broadband coverage of rural areas.
- Regulatory hurdles have been lifted in Europe as the GSM Directive was repealed in mid-2009.
- The potential benefits for operators are the possibility to provide extended coverage for 3G as well as reduced CAPEX and OPEX.
- Spectrum refarming can be considered as a trend in Western Europe and is coherent with the wish of NRAs to offer broadband access in rural areas but could be slowed down in many countries due to the distribution and fragmentation of the 900 MHz spectrum between the main players.
- The refarmed 900 MHz band will be mainly used by 3G technologies but some operators are considering using the 900 MHz band for LTE (in Sweden, for instance).
- 900 MHz refarming has already begun in Finland and is planned in many other countries.

GSM 900 spectrum in selected European countries



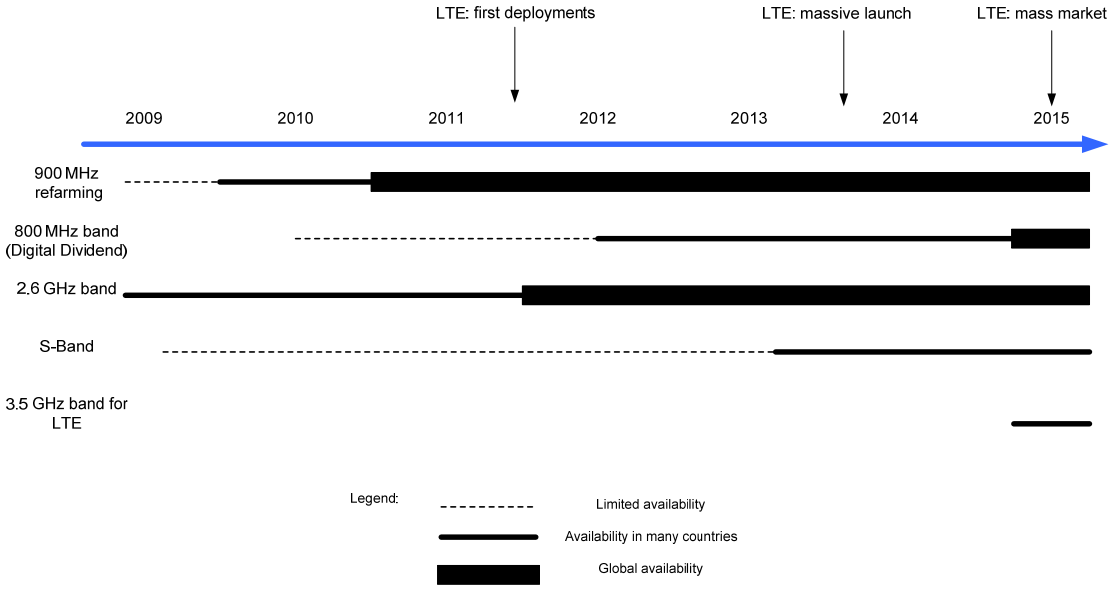
Source: IDATE

4G spectrum

- The continuous and exponential growth of data traffic on mobile networks will increase the need for new spectrum.
- LTE is going to dominate the 4G field; our projections show that there will be more than 350 million LTE subscribers at the end of 2015. LTE commercial growth is expected to start in 2011 in the USA and in Japan and from 2012 on in Western Europe.
- LTE needs larger bandwidth (typically 10 and 20 MHz) to deliver all its benefits in terms of large data rate and spectrum efficiency.

- 4G mobile networks will use various combinations of frequency bands in the different regions of the world. In the USA, LTE is first going to be implemented in the 700 MHz band.
- We expect the 2.6 GHz and 800 MHz bands to be the most widely used in Western Europe for 4G deployments. The 900 MHz band will be subject to refarming and spectrum arrangements between operators.
- 2.6 GHz status in Europe: no harmonisation in terms of FDD/TDD distribution is expected. This could slow down the availability of terminals and increase their cost.
- In the long term, the 3.5 GHz band will become available for mobile applications and could be used in the cities to provide very high data rates. Technical compatibility between fixed and mobile networks and competition issues could prove to be a problem though.
- The S-Band was allocated in May 2009 by the European Commission to Inmarsat and Solaris. It could be used as a complement to terrestrial mobile networks but the regulatory conditions still have to be clarified.
- The 2.6 GHz and 800 MHz bands will be auctioned in the years to come in Western Europe. We expect prices for the 2.6 GHz spectrum to be in the € 0.02-€ 0.5 per MHz per pop and for the 800 MHz spectrum in the € 0.1-€ 1 per MHz per pop range.
- TDD spectrum is less attractive to operators than FDD spectrum as shown by its valuation in Sweden and by the lack of interest in Hong Kong.

Availability of new spectrum in Western Europe



Source: IDATE

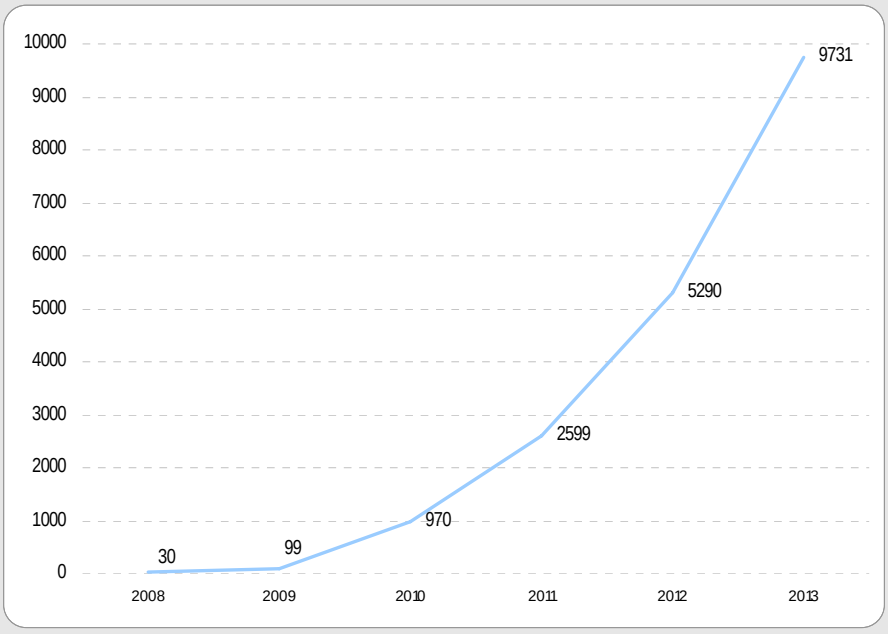
6. Femtocells

Main results

- The global femtocell market will generate **€ 875 million in revenues for Service Providers by 2013** for 9.7 million shipped units. The market is not as promising as expected since the added value a femtocell solution offers is too low in the eyes of end-users.
- In total, **integrated and mobile service providers will spend over € 734 million by 2013** for femtocell equipment. Integrated service providers are best positioned to offer femtocell solutions as in addition to extending mobile network to the household, femtocell is a fully convergent solution.
- **The most dynamic market will be the USA** as it will account for about 50 % of number of CPE shipped at the end of 2013. **Asian operators will hold 26%** of the market while the 23% remaining will be shared among some of the Western Europe service providers.
- **Regional disparities are due to different expectations associated with femtocell**. North American users see strong value in the indoor coverage capabilities of the solution. But consumers in Asia and Western Europe expect more than just a better quality network: for them, the added value of femtocell is in its convergence features.

Femtocells Units Shipped, from 2008 to 2013

(in Thousands)



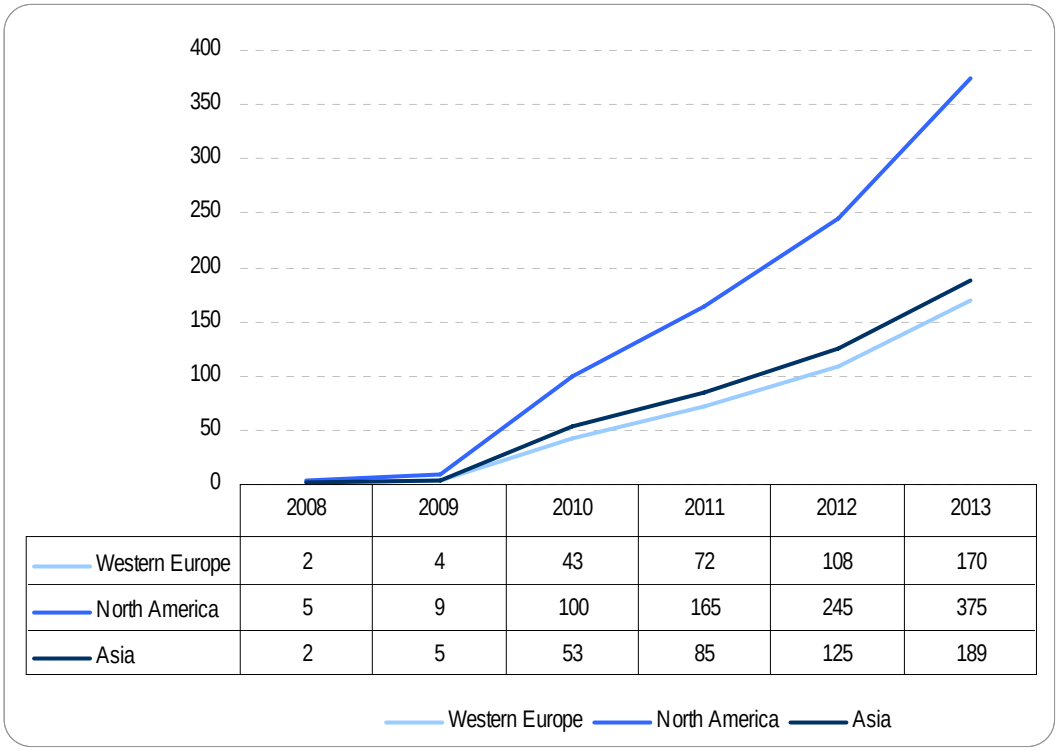
Source : IDATE

6.1. Femtocell market will reach 9.7 million CPE by 2013 but with big regional discrepancies

- Femtocell is a small, low-cost, low-capacity residential 2G or 3G base station, usually designed for use in residential or small business environments; it enables users to communicate across any IP access network using a standard mobile handset. Femtocell connects via the customer's DSL or cable broadband to the mobile network, where a controller then aggregates the traffic. By using broadband as the backhaul, femtocell is able to provide voice and data services in the same way as a regular base station, but with the additional benefits of easy installation, low unit cost and excellent mobile phone coverage at home.
- At the end of 2008, Service Providers launched femtocells trial solutions. In early 2009, American and Japanese Service Providers began launching femtocell commercial services. The interest in this new kind of "access point" is growing more slowly in Europe.
- We expect Service Providers to generate over € 500 million in North America, € 208.3 million in Asia and a little over € 160 million in Europe.
- Equipment Vendors will ship about 9.7 million units by 2013. 51 % of which will be for North America, 26 % in Asia and the remaining 23 % in Europe.
- Such a disparity is closely linked to the market structure of each region as well as the different ways in which femtocell will be used in each region.

Femtocells CAPEX Trends by Region

(in Million EUR)



	2008	2009	2010	2011	2012	2013
Western Europe	2	4	43	72	108	170
North America	5	9	100	165	245	375
Asia	2	5	53	85	125	189

Source : IDATE

6.2. Femtocell fits perfectly into the plans of Integrated Service Providers…

Both Mobile and Integrated Service Providers are going to take advantage of the femtocell technology.

- Mobile Operators have already started commercialising indoor coverage solutions in the USA market and are entering the household in direct competition with fixed service providers: for instance, Sprint offers unlimited voice calls for a flat fee while the consumer is at home.
- Integrated Operators will reap the greatest benefits from femtocell: they can offer a comprehensive convergent solution, including fixed line, IPTV, the Internet and Mobile Services at a competitive price. Thanks to femtocell, Service Providers can expect to secure more end-users by offering family plans and bundled services.
- Fixed line operators cannot market femtocells as they do not own mobile licences, but they have an important role to play. Indeed, as femtocell generated traffic is carried through their networks, they might have control over it. Consequently, we expect regulatory bodies to statute on this issue. Fixed line service providers could benefit from femtocell solution too by charging Mobile service providers for using their network as a backhaul.

Femtocell would address the lack of indoor coverage in some areas and allow the service providers to offer fully integrated solutions at attractive prices.

Value perceived by different type of service providers

Type of Operators	Value	Benefit
Fixed Broadband Service Providers	Non Addressable Market	Non Addressable Market
Mobile Service Providers	Lock-in customer Lock-in family	churn reduction customer acquisition
Convergent Service Providers	Lock-in customer Lock-in family Sell Mobile Services to fixed users Sell Fixed Broadband Access to Mobile Users	churn reduction customer acquisition customer acquisition customer acquisition

Source : IDATE

6.3. … But it is not the only solution that can meet both end-users and operators demands

There are many alternative solutions to femtocell. Repeaters can overcome coverage issues; transceivers help with capacity demand; and Homezones, FMC and UMA solutions allow service providers to have competitive at-home voice and data offers.

All these other solutions are already being offered by many service providers. The femtocell competitive advantage is that it can overcome all those issues (coverage, capacity, and pricing) with a single box solution.

However, femtocell is still a nascent technology and there is a long way to go before mass market adoption is achieved.

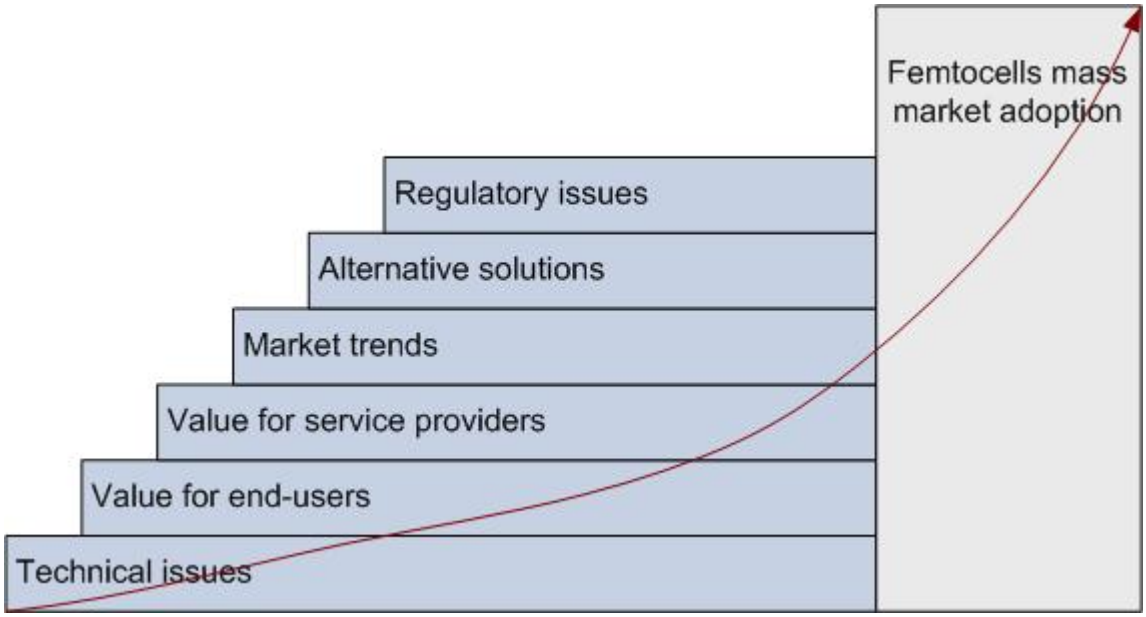
6.4. To reach mass market adoption, Equipment Vendors and Service Providers must work together to offer the right value proposition

To favour widespread take up of femtocell, service providers must first and foremost offer significant added value for the end user through this new technology.

- In the US Market, improved indoor coverage offers real improvement in service quality. At home, dropped calls are frequent and femtocell will definitely address a high demand from end-users.
- In Asian countries and in Western Europe though, the value perceived by end-users for indoor coverage is not as strong. Service Providers will have to introduce the technology seamlessly if they want mass market adoption. The best way would be for integrated service providers to integrate femtocell within existing triple play set top boxes and offer converged services.
- Therefore, Service Providers and Vendors must work together to manufacture and market femtocell CPE embedded in existing triple play set top boxes.

The road leading to mass market adoption is still a long one but once end users perceive the added value this technology offers, the femtocell market will boom.

Basic requirements to mass market adoption



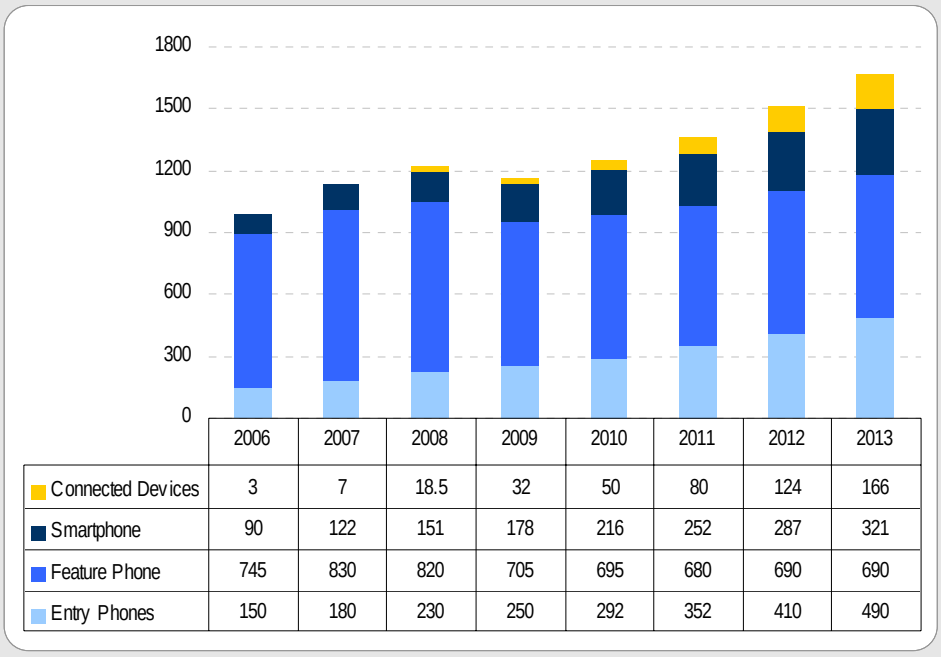
Source : IDATE

7. Connected Devices

Key findings

- Following the success of smartphones, dedicated to mobile internet browsing and data exchange, the emergence of a new category of connected devices, in which netbooks have been the most successful to date, has caused upheaval in the mobile telecom market.
- Prospects for this market are bright. Based on our estimates of the Connected Device market for each category of devices (Netbooks, MIDs, Electronics readers), IDATE forecasts that the Connected Devices market will rise from a 1.5% of total handset volumes shipped in 2008 (~18 million units) to around 11.1% in 2013 with 166 million units shipped. Netbooks will account for the main part (62 million units shipped in 2013).
- The overall connected devices market will be driven by mature markets, primarily in Western Europe for the early years (60% of current market), followed by Asia Pacific on the mid term.

Mobile Phones and Connected Devices Shipments Forecast - In million units



	2006	2007	2008	2009	2010	2011	2012	2013
Connected Devices	3	7	18.5	32	50	80	124	166
Smartphone	90	122	151	178	216	252	287	321
Feature Phone	745	830	820	705	695	680	690	690
Entry Phones	150	180	230	250	292	352	410	490

Source: IDATE

- This prosperous market has attracted the interest of major players from IT and the Mobile sector, who are trying to propose hardware and software products at the convergence of the fixed and nomad worlds. A strategic battle is thus taking place between hardware providers, such as Intel and ARM, and software providers, like Windows as well as Google (Linux based solution) , to conquer these new nomad platforms.
- In this growing market, Mobile Operators provide an entry point to the mobile web and have to broaden their devices portfolio. The value proposition has been increasingly attractive for netbooks and their associated data plans. Whereas MID and electronic book traction has been limited for now, most operators worldwide are now proposing netbooks offers bundled with a data allowance.

- However, these offers are still largely experimental with uncertain profitability and sustainability due to the lack of any incremental service strategy: operators are still trying out different levels of upfront subsidisation/monthly plan level combinations and limiting the number of authorised subscriptions for each plan.
- New challenges and opportunities are emerging for operators. Providing connected devices could add complexity: based on the success of netbook sales bundled with data plans, hopes are put on the possible transformation of mobile operators business into a new distribution channel for consumer electronics devices, but this also means customer support and product handling. On the other hand, the development of Mobile Cloud Computing services could become an important opportunity for operators proposing software as a service for this new range of connected devices.

7.1. The Rise of Connected Devices

Amidst a faltering global economy, the massive growth of Mobile Internet has preserved the optimism of many players of the mobile ecosystem. Connected Devices or Ultra-Mobile Devices are still currently benefiting from the growing interest of consumers

These devices are designed to optimize the mobile internet experience and provide new usages for users on the go. As a nascent market, it has already experienced rapid growth in the last months, thanks to the introduction of key products. This market started out with netbook devices such as the Asus EeePC, which has been one of the best selling consumer electronics products in 2008. This market expanded to include Electronic Readers, like the Amazon Kindle, and Mobile Internet Devices or MID, which are one of the latest multitasking devices to complement this market. Recently, "Home internet tablets" have been introduced by some operators in Europe, however this device is still in a trial mode.

Mobile Devices Marketing Features Comparison

	SmartPhone	MID	Electronic Reader	Netbook
Price Level (without subsidy) in USD	400 - 550	450-550	350 -650	350-500
Volume Shipped in 2008 in million units	158	0.2	1	11.4
Forecast Volume shipped in 2013 in million units	305	34	26	62
Top 3 Providers	1. Nokia 2. Samsung 3. LG	1. Compal 2. Gygabyte 3. Aigo	1. Amazon 2. Sony 3. iRex	1. Acer 2. Asus 3. HP

Source: IDATE

At the convergence of three ecosystems, Consumer Electronics, Telecommunications and Information Technology, Connected Devices are a new category of mobile devices dedicated to four main tasks: Communication (emailing), Websurfing, Mobile Entertainment (Video, Music) and Office Productivity. Those devices are also filling a void which pre-existed at the frontier between mobility and power.

In terms of Mobile experience and usages, although smartphones have gained traction in the mass market and are not only dedicated to technophiles, connected devices have yet to find their users and become the device consumers will choose for typical usages (mobile internet websurfing, mobile video or TV watching, book reading,…). On the one hand, netbooks are introducing new types of usage, but on the other, MIDs are in direct competition with smartphones, thus reducing their reach for the moment to a niche market.

Connected Devices Usage

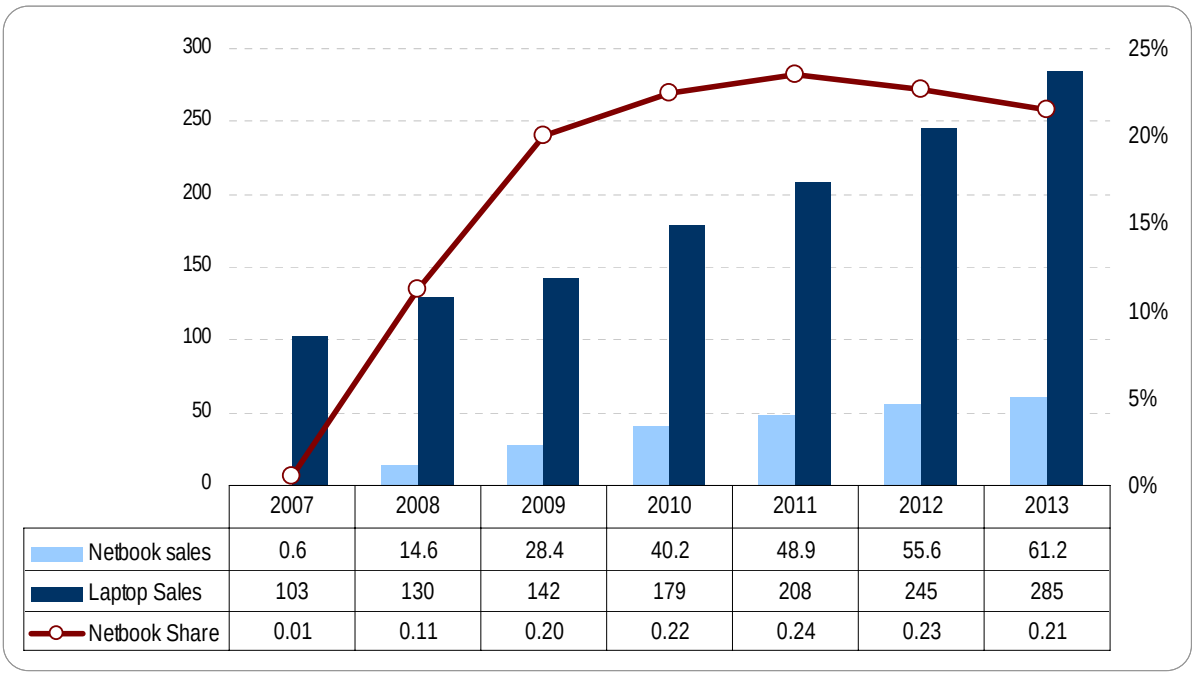
Usage	Netbook	MID	Electronic Reader	SmartPhone
Expected Usages	Secondary comuting device (vs PC) Check email and connect to simple websites while on the go Simple Office productivity	Mobile Device for multimedia application (Video and Photo) while on the go Mobile TV used in transport, during break times (with short consumption times)	Substitutes to book on the long term and press on the mid term Mostly used in transport, and during break time, similar usage to the reading of newspapers and book today	Medium Mobile Internet Use Voice Low Mobile Multimedia (video) usage

Source: IDATE

Pricewise, smartphones, MIDs, Netbooks and Electronic readers, are quite similar with an average of 450 to 550 USD. Over the short and long term, smartphone shipments should remain highest compared to the other devices. Netbooks however should experience dynamic growth over the next few years.

Netbook Key Market Data, worldwide

In million units



	2007	2008	2009	2010	2011	2012	2013
Netbook sales	0.6	14.6	28.4	40.2	48.9	55.6	61.2
Laptop Sales	103	130	142	179	208	245	285
Netbook Share	0.01	0.11	0.20	0.22	0.24	0.23	0.21

Source: IDATE

7.2. A Strategic positioning for players eager to conquer new ground

As a nascent but promising market, connected devices are poised to for major deployment and fast paced development, and companies will struggle to provide even more competitive devices based on their form factor.

On the whole, the netbook market has experienced a strong start and major companies from the mobile and fixed ecosystem have been eager to launch their netbook product. Players such as Acer and Asus, which are already present in the PC market have found a new way to penetrate more deeply the "pure mobile" market, by getting closer to the handset market; while mobile players such as Nokia, are eager to graduate to the "computing mobile market" with devices close to the mobile PC experience.

Competition is also heating up on the hardware and software component market. Netbooks and MIDs provide the battleground, which opposes Windows --the current reference platform for netbooks-- and Linux based Operating Systems that are gaining momentum and might become more dominant from 2010. With the introduction of Qualcomm, Freescale and TI CPUs based on ARM core with a Linux platform, more netbooks should become available with a non Windows OS version. Google has announced its intention to provide a version of its Chrome OS later this year, and netbooks running Chrome OS will be available for consumers in the second half of 2010. Start-up companies are also targeting directly the netbook market with simplified versions of the User Interface and OS. A new solution has been presented by a company called Jolicloud, allowing users to download the Jolicloud client directly to their Netbooks.

On the hardware level, Intel Atom x86 CPUs have been the reference processor for netbook, but ARM, the mobile handset market IP company, is increasingly present on the netbook market, as NVidia, Qualcomm and Freescale are each using ARM-based processors.

The convergence of mobile devices might also help the emergence of new connected devices, such as the Internet Tablet. The concept has been around for a few years, but there seems to be a renewed interest in this device linked to the success of the netbook. Companies like Archos (PMP suppliers and future netbook supplier) or start ups like Techcrunch with its CrunchPad are actively involved in developing such prototypes. A host of firms could also make such a device, including Apple, Microsoft, Sony, Samsung, Nokia, and Motorola.

7.3. Mobile Operators are progressively entering the Connected Devices market

Global mobile handset sales will decrease in 2009 by an estimated 9%. However, smartphones and data-dedicated devices will continue to grow within a mobile industry plagued by the crisis, especially in mature markets. Indeed, there has been a massive growth in data traffic year on year (8 to 10 times more) for most European operators

The development of computer (notebooks and netbooks) bundles offered by operators that can connect to 3G and 3G+ networks with dongles and USB keys have become the main source of data traffic on an operator's network. The recent announcement by Amazon and Sony electronic readers aimed at the European market should also foster dynamic competition between operators and a significant rise in data traffic for carriers distributing this device.

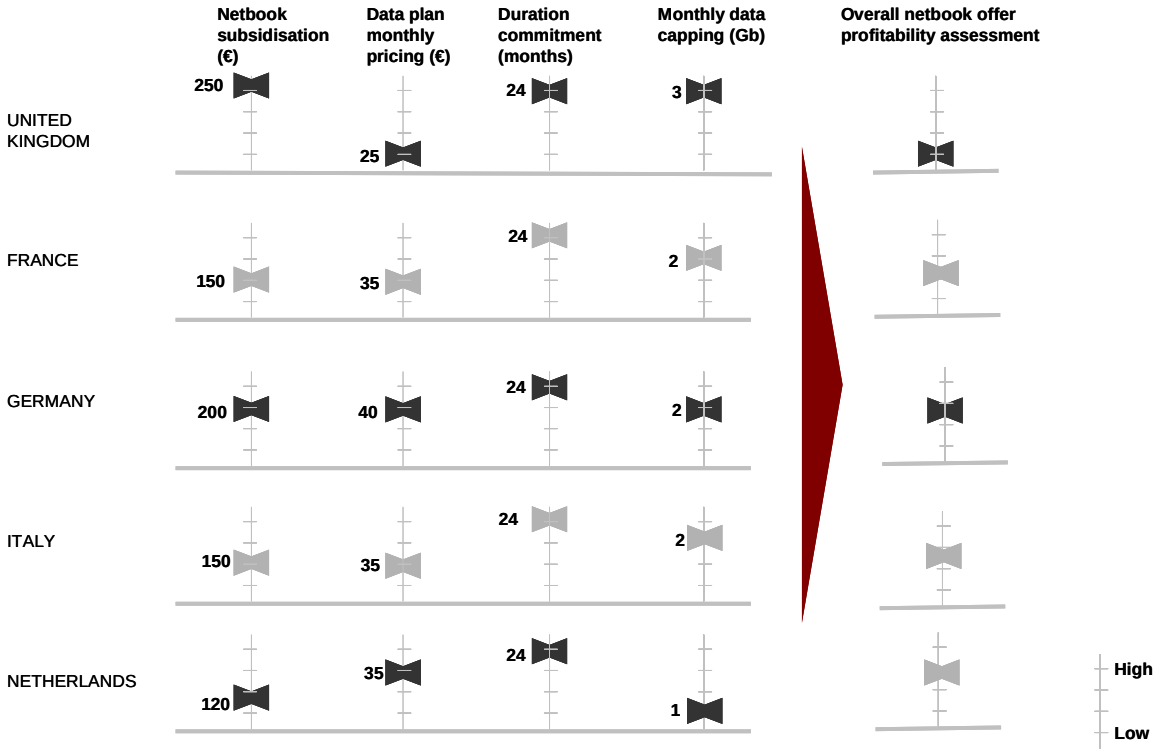
Wishing to capitalize on this success story, Mobile Operators have been introducing connected devices to their portfolios such as Netbooks and MIDs for over a year now. The netbooks proposed by operators offer 3G connectivity and a 50% to 60% price discount compared to traditional laptops bundled with attractive data plans (1 Go to 3 Go traffic allowance). In these difficult economic times, a low entry price for consumer electronic devices is very appealing to users.

The model chosen for a device distribution chain is similar to smartphones. In Europe, several operators sell netbooks with a subsidized wireless LAN data plan. Subsidisation varies significantly depending on operators and countries in which carriers are operating: device subsidisation reaches 100% in the UK whereas in France it culminates at 30% of device price for netbooks. However, operators are not that thrilled about playing the subsidy game as margins can decline and customer acquisition costs rise.

The increasing involvement of mobile operators in the distribution of these devices is also changing the landscape of an industry in which consumer electronics and traditional retailers were dominant providers. So far in Europe, mobile operators appear to have the upper hand and have been one of the major sources of distribution for such devices. In France, around 500.000 netbooks have been sold in 2008. On this total, 360.000 have been distributed by traditional retailers, whereas 140.000 have sold distributed by online websites or bundled with operator offers such as SFR and Bouygues Telecom.

In the future, the proliferation of connected devices should boost the remote accessing of web-based applications. The expansion of applications and web services into the "cloud" could create major opportunities for mobile operators. However, they have to become the companies that host their users data and applications on their servers, which should remain accessible whatever the device used: Phones, PCs, Netbooks...

Operators Netbook Associated Pricind and Allowance in Europe



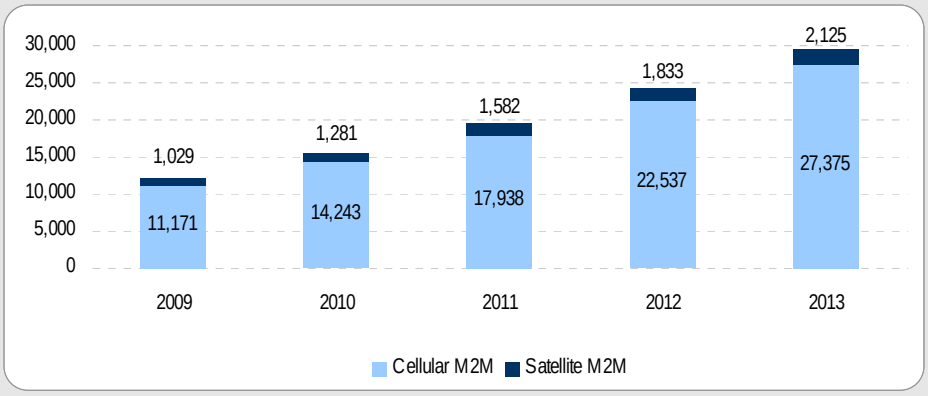
Source: IDATE

8. M2M

Key findings

- **The M2M market is still growing despite the global downturn**. In 2009, the cellular market should represent 38 million modules worldwide for a total market of 11.2 billion EUR (of which 2 billion EUR for connectivity). But growth in 2009 will be much lower than expected, less than 10% in value and 25% in volume, as most of the vertical markets are suffering from the economic crisis (automotive, industrial machines). The situation should be the same for satellite M2M, representing 1.03 billion EUR in total market value for 2009, although the target markets are not the same,
- All the players hope that emerging markets will take the M2M market to the next level with forecasts of **27.3 billion EUR for cellular M2M and 2.1 billion EUR for satellite M2M in 2013**. Expected volumes are huge because they are related to very commonplace machines (cars, meters, consumer products…) and could account for 6.5% of SIM cards in Europe by 2013. Most of these new solutions have less well defined business model and therefore remain more dependent on the application of vertical regulations which would be hard to implement without the deployment of M2M. This also explains why Europe is leading the M2M market (more vertical regulations in Europe), while USA is the leader for satellite-based solutions (especially on homeland security).
- While some telcos were reluctant to position themselves directly on these markets a few years ago, most of them are now battling actively to carve out a significant share of the market and are trying to distinguish themselves through technical initiatives (IPv6, hardened or embedded SIMs, portals…) and other business features (international one-stop shopping, leasing…). M2M offers them attractive opportunities, as, despite low ARPU, projects offer high lifetime value, reduced churn rate and average deals representing thousands of SIM cards. Connectivity alone should represent 4.3 billion EUR in 2013 and more than 4% of mobile data revenues for European telcos. MVNOs are being pushed out of the market and are therefore repositioning themselves as tool providers, while module providers are having difficulties to break even in a market in which unit prices are falling.

World M2M market, 2009-2013 (million EUR)



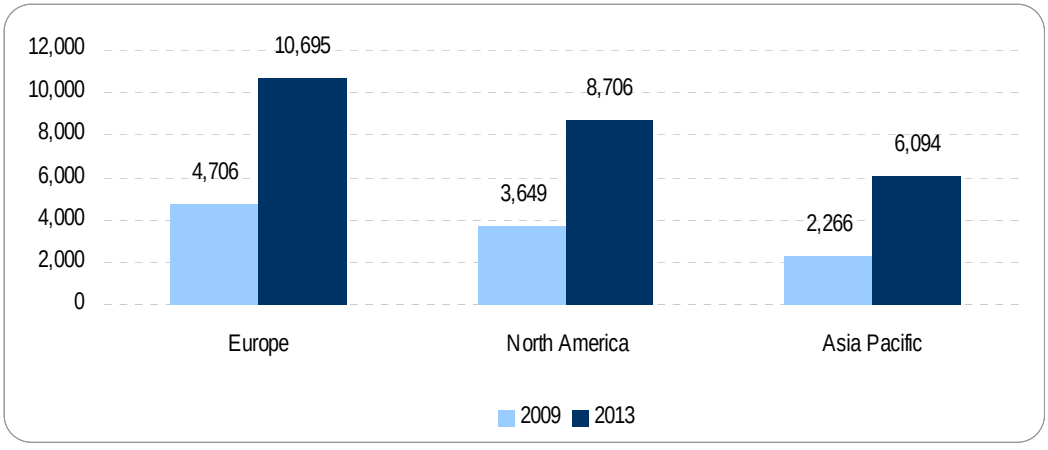
Source: IDATE

8.1. M2M market is still growing despite the global downturn

- In volume terms, the overall M2M market is growing very fast in all wireless markets (cellular and satellite) and in all regions. 38 million cellular modules and over 2 million satellite M2M modules should have been sold by the end of this year. Overall growth for the next four years should top 33% per year for cellular modules, reaching close to 122 million in 2013, and exceed 21% for satellite modules. In 2013, M2M SIM cards will probably represent 2.1% of the total SIM cards (human and machine) and over 6.5% of total SIM cards in Europe.
- Growth is clearly lower in terms of value, because new applications are generally less demanding in terms of bandwidth and/or of advanced features. In addition, a large share of the growth will come from major deployments by reference players in their respective industry which should benefit from bulk purchasing. The worldwide cellular M2M market represents 11.2 billion EUR in 2009, with most revenues coming from software and IT services. It should rise by 25% per year to reach 27.3 billion EUR in 2013. The worldwide satellite M2M market is valued at 1.03 billion EUR in 2009 and will grow by 20% per year to reach 2.1 billion EUR in 2013.
- The connectivity market for mobile telcos represents 2 billion EUR worldwide for 2009 (over 40% for Europe 27). This market should grow by a little over 20% per year during the next four years.
- The overall global downturn is having a strong impact on the market. The M2M market is still growing, but growth has really slowed this year with only 15 to 20% growth in volume and less than 10% in value (with only 5% for connectivity). There are major disparities between the different countries, especially those less advanced. Overall, the crisis should represent a loss of 10 to 20 points of growth.
- The impact is obviously very high because M2M is an enabler in the different vertical markets. Because some of those markets have been seriously impacted, like the automotive industry, and therefore some of the potential M2M applications are not being implemented. Many projects have been postponed, and some of them have been simply cancelled.

World M2M market by zone, 2009-2013

(million EUR)

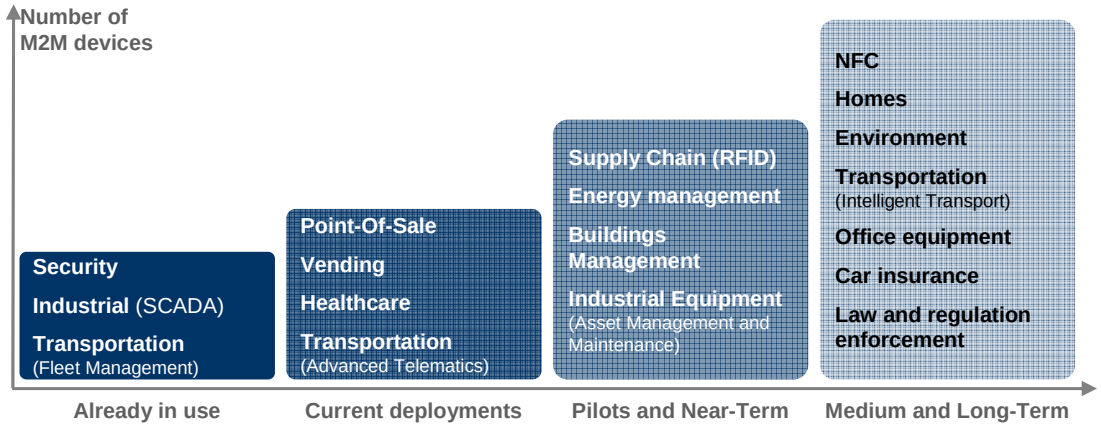


Source: IDATE

8.2. M2M future growth will come from the development of new vertical markets

- Wireless M2M market (cellular and satellite) growth has been sustained mainly by a few major vertical markets like fleet management, industrial asset management, point of sales, and security (and vending machines in Japan). Those applications are used mainly by companies to reduce their costs and/or to comply with existing regulations. The business models for those industries already offer clear ROI opportunities, mostly through the automation of activities that would be handled manually otherwise. Their adoption should therefore continue, with limited impacts due to the downturn.
- All the players are now focusing on the emerging segments, which have huge potential in terms of volumes of machines to be equipped, as these machines are more mass market. Privately owned cars, meters, containers and consumer products represent hundreds of million of machines in each main regional market, while current deployments have been focused on B2B usages which, obviously, have lower volume potential. With aging populations in developed and developing countries, M2M could also expand into the healthcare area which would also be a large volume market.
- Most of these emerging markets will benefit at first from vertical regulations, which require some automated solutions such as M2M. The most significant regulations, for the cellular markets, are related to car security (e-Call), and energy market deregulation (automated remote monitoring for accurate billing), and homeland security (tracking of containers) for satellite markets.
- If those machines are equipped with M2M modules, new features could be then developed to provide new services. Many solutions are already being tested for cars (remote diagnostic, pay-as-you-drive…) and meters (energy savings solutions, home automation…). However, most of them have no clearly defined business model, especially if the new application is a standalone offer. Success will only come after significant changes in usages and business processes. Audit-type solutions have less potential than solutions helping remote decision making.
- Other markets have more some niche potential and clearer business models like for outdoor displays, wellness, or toys, for which people are used to paying.
- The healthcare market has not been the most enthusiastic adopter of M2M. Many players are reluctant because of responsibility issues, and, even more so, due to the absence of clear business models. In most cases, M2M solutions would be used for preventive usages, however, major health insurance systems are medication centred. Therefore, volumes are set to remain low, while distribution channels are difficult to penetrate.

M2M development by vertical industry

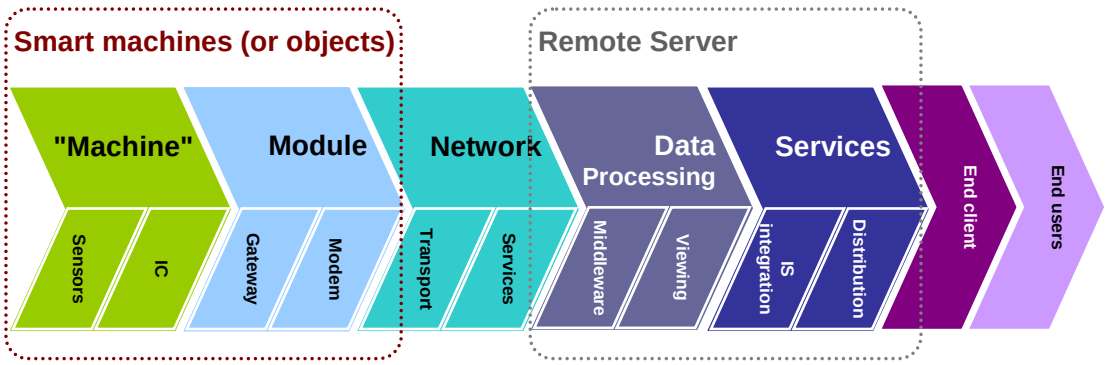


Source: IDATE

8.3. Telcos are trying to get a bigger share of M2M market

- The bulk of the market is represented by software and associated IT services as M2M offers greater added value if it is connected to existing IT systems. Major deployments therefore involve traditional IT integrators using M2M building blocks supplied by telcos and module providers.
- During the first years of the M2M markets, many telcos stayed away from this market. Only a few players were really actively involved like Orange (with a first generation platform) or BT (focused on a few verticals), leaving the door open to MVNOs like Wyless or more recently Jasper Wireless.
- The opportunities are now big enough for telcos to commit themselves wholeheartedly. The leading players are Telenor, Vodafone and Telefónica in Europe, while NTT DoCoMo (especially around vending machines) is a dominant player in Asia. By 2013, for mobile telcos, M2M could represent 4.1% of their revenues for connectivity alone. Even if ARPU is much lower and will drop further with the development of large scale projects, the economic potential is positive for telcos as acquisition costs and churn are also much lower and most deals represent several thousands units.
- The situation is somewhat similar for the satellite market, in which only Orbcomm was really involved from the beginning. Other satellite providers, like Iridium, have now entered this market (after having modified their infrastructure), and are becoming strong challengers.
- The competition in M2M is going beyond the natural footprint of each player, as most of the value is coming from network access and additional features (portal management, specific SIM cards…) rather than from bandwidth volume. Players can therefore position themselves more easily on international markets with minimal roaming agreements. For instance, Telenor is an obvious competitor in France or Spain.
- Telcos and satellite connectivity providers are strengthening their ecosystems to help their customers access integrated solutions and one-stop-shopping. Therefore, all of them are broadening their portfolio of network services and related tools (IPv6, international) to meet the needs of companies. But their positioning can be very different. Some are pure connectivity providers (Telenor, Bouygues) and others act more as integrators, in general markets or in a few vertical markets (BT).
  Telcos are also becoming the reference players because module manufacturers can not play this role anymore. Module manufacturers are finding it difficult to attain profitability and can no longer dictate market conditions. Most of the large equipment manufacturers have withdrawn from the market through spin-offs (Nokia/Aplicom) or by selling their activities (Cinterion from Siemens, Sony-Ericsonn, Kyocera). The remaining players are small and are experiencing drops in their revenues like Wavecom, whose difficulties has led to its acquisition by Sierra Wireless. They are also being challenged by Chinese players like Simcom. This is also true for satellite players, even though this has been the situation from the outset, as most module manufacturers are dependent on satellite service providers.

Smart machines value chain



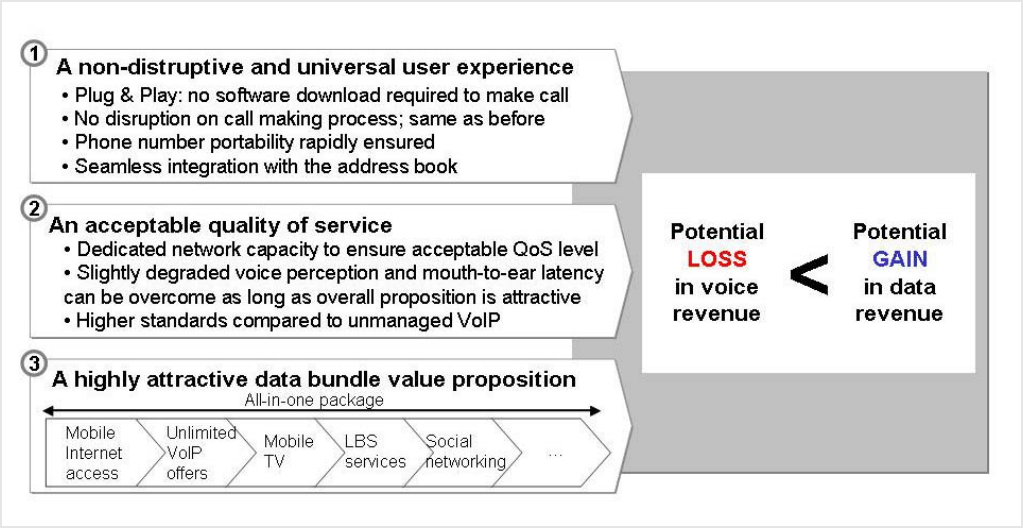
Source: IDATE

9. Mobile VoIP

Key findings

- In most cases, over-the-top mobile VoIP pricing is only attractive for international calls.
- Skype dominates the independent “cheap calls” VoIP market. Other independent players bundle Skype together with their own differentiated value to survive in the market.
- Google is the latest big name to enter the mobile VoIP field, and has the potential to disrupt the market with its unified communications approach and huge brand power.
- Currently, tier 1 MNOs are exploring possible revenue models around VoIP, or are still investigating how to profitably offer it on a large scale with acceptable QoS; whereas challengers are deploying VoIP as a means of competitive differentiation.
- It is only a matter of time before operators start to offer managed mobile VoIP. This will first manifest itself in the form of partnerships, followed by purely operator solutions.
- The following are the key factors for mobile VoIP take-off: competitiveness of the mobile market; uptake of fixed VoIP; penetration of unlimited data plans for mobile handsets; compatible handset availability; and MNO acceptance of mobile VoIP applications.
- For end-2014, mobile VoIP user penetration over total mobile users will be 17%, 14.5%, 12.5% and 8.5% in the UK, France, US and Germany respectively.
- There is potential to turn managed VoIP into increased data revenue, outweighing the loss in voice revenue, by taking elements from the success seen in fixed VoIP, as below:

The three key factors for managed VoIP success



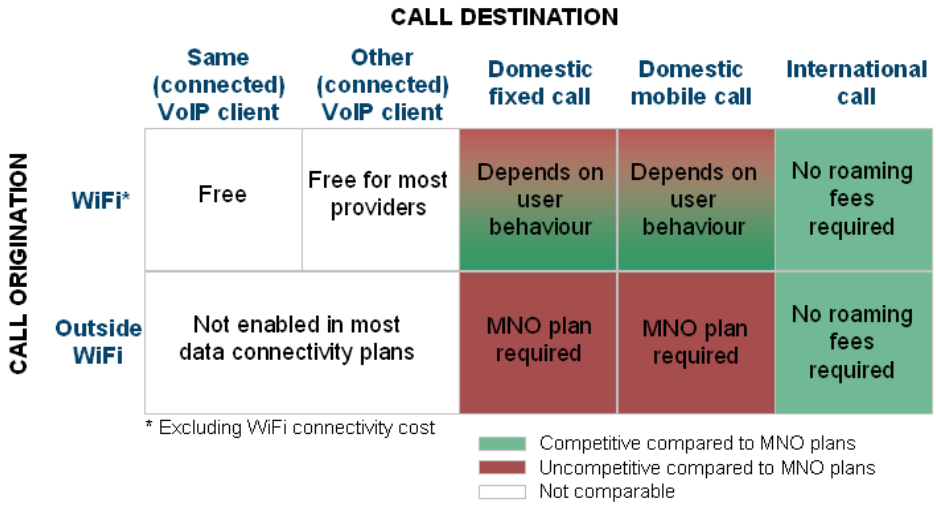
Source: IDATE

9.1. International calls are the only real advantage

The bottom line is that, for all its hype, mobile VoIP does not offer a cheaper alternative to standard MNO tariffs; this is only the case for international calls.

It could be argued that the free calling offering is a good value proposition, but, in actual practice, its restrictions (of being only between VoIP clients and over a WiFi connection) take away the concept of "mobile", where one can call from anywhere, to anybody. In addition, thanks to fierce competition and commoditisation, MNO tariffs today have become very competitive, with unlimited packages becoming standard. Under such circumstances, it is very debatable as to whether mobile VoIP has any financial advantage over MNO plans.

Comparison of price competitiveness between mobile VoIP and MNO plans



Source: IDATE

9.2. Summary of strategies of independent players

The figure below gives a quick summary of the differing strategies of the independent mobile VoIP players looked at in this report.

Summary of the strategies of Skype, Truphone, fring and Jajah

	Main strategy	Targets	Operator perspective
skype	Gain widespread recognition as the default VoIP application	All communication devices	Head-on competitor; a major threat (except H3G)
truphone	Attractive international calls and multiple national local numbers	Frequent travellers and international callers	Possibility of partnership via a franchise model
fring	Collaboration with and integration of social network applications	Young users attracted to mobile social networking	Encouraging use of VoIP over data plans is unfavorable
jajah	Provide VoIP technologies for third parties	Third parties interested in entering the market	Possibility of indirect threat, depending on the third party

Source: IDATE

9.3. Google Voice is a potential game changer

Skype is the undisputed champion of the mobile VoIP provider today. However, Google Voice will provide stiff competition; they offer the same mobile VoIP services, but from a completely different angle in the form of unified communications. At present, subscriptions are only available in the US and by invitation. Once the service becomes available worldwide it has the potential to make a real impact.

Skype versus Google Voice

	skype	Google voice
Offer	VoIP calling service; focused on provision and quality of voice/video calling	Unified communications; single number across multiple devices, automated voicemail transcription, etc.
Brand power	Most powerful worldwide VoIP brand	One of the Internet giants known throughout the world
Number of subscribers	480 million registered users 43 million active users	200 million Gmail accounts 15 million active Google Apps users
Pricing	Skype to Skype calls are free	All national calls are free

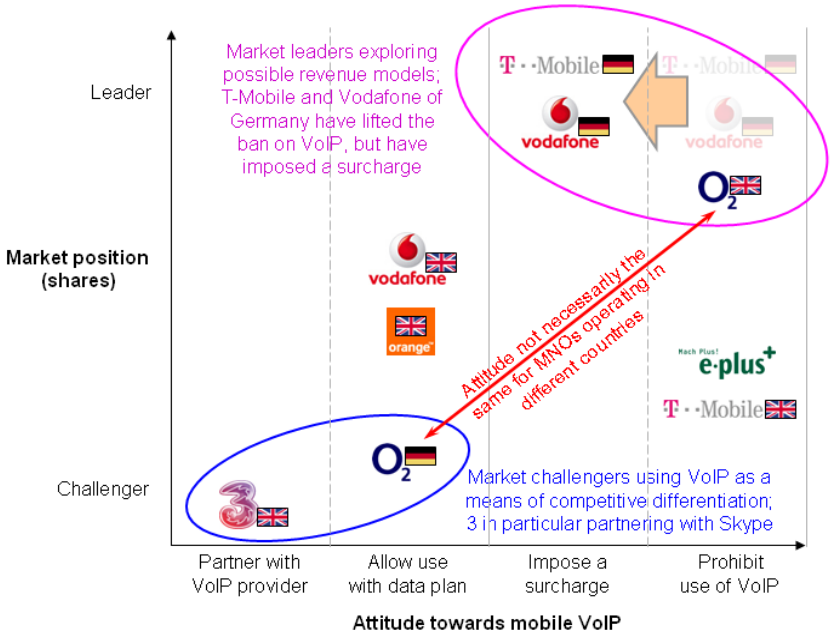
Whilst Skype is currently established as the sole biggest VoIP player, Google possesses the essential factors to potentially disrupt the market

Source: IDATE

9.4. The general trend of leaders versus challengers

T-Mobile and Vodafone of Germany, who are exploring possible revenue models around VoIP by imposing a surcharge, are market leaders with shares of 36.5% and 32.6% respectively (as of end-Q2 2009). Conversely, O2 Germany, who has decided to allow the use of VoIP without a surcharge, is bottom with 13.9% market share. In the UK, market leader O2 bans the use of VoIP whereas 3 UK, with an approximate market share of 6%, partners with VoIP provider Skype.

German and UK MNO positioning on mobile VoIP service

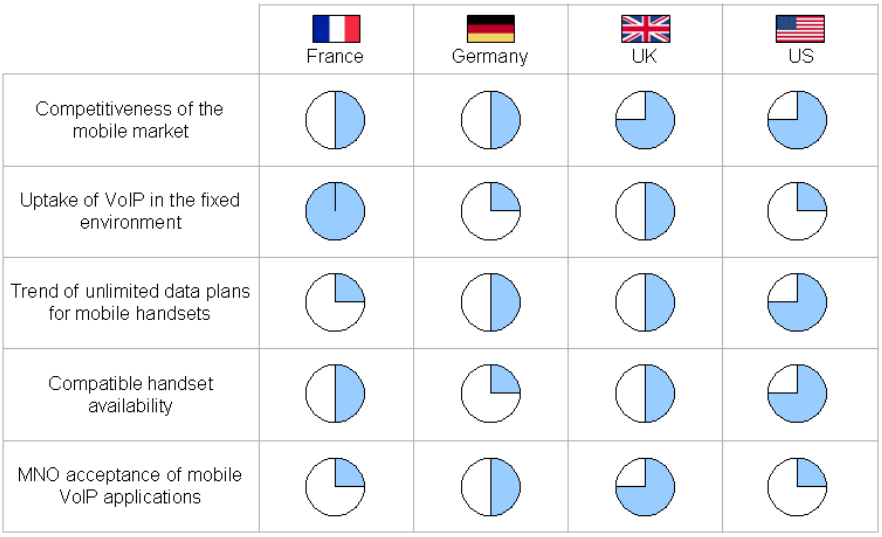


Source: IDATE

9.5. The key factors effecting mobile VoIP take-off

This report focuses on the following four countries: France, Germany, the UK and the US. IDATE has defined key factors which will affect the speed of managed mobile VoIP take-off.

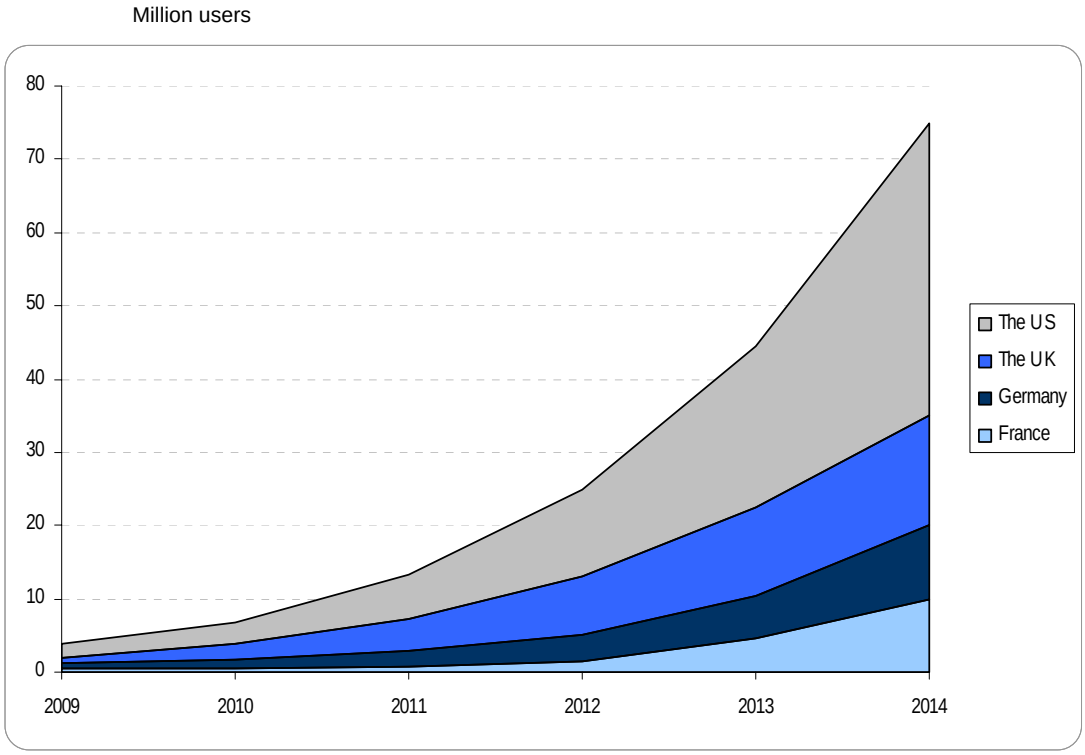
Key factors affecting mobile VoIP take-off in France, Germany, UK and US



Note: the larger the shaded area, the more potential for mobile VoIP take-off

Source: IDATE

Mobile VoIP user forecast: France, Germany, UK and US



Source: IDATE

10. Mobile Internet

Main findings

- The market of mobile Internet -- the active use of Internet on a mobile phone – is finally taking off, outside the early developments in Japan and to a lesser extent in South Korea. There are now 95 mobile Internet users in Europe and 55 million mobile Internet users in USA in 2009. By 2014, we expect to reach 232 million mobile Internet users in Europe and 117 million mobile Internet users in USA, which would represent respectively a penetration of 33% and 37%. Inside Europe, UK and Italy are currently leading the pack but other countries will catch up. Major Asian countries remain the leaders by far.
- This strong development of the mobile Internet market has been made possible by the combination of advanced technological and marketing enablers, with most of them reaching "satisfactory" status level. 3G coverage has clearly improved. The wider dissemination of smartphones (including but not limited to the iPhone) that are most suited for mobile Internet experience is also a key driving force. The software stack for mobile phones has also benefited from major breakthroughs under the influence of software and Web leaders like Apple, Google with Android or Adobe with Flash. The application stores which have been in the spotlight in 2009 provide easy ways to access additional content and software on mobile. Finally, adapted tariff plans are making their way, becoming increasingly bundled within triple play-like rate plans for postpaid while also now reaching prepaid customers through a range of options.
- A few hurdles remain in reaching the mass market and to expand beyond the initial targets of tech-savvy people and professional users. Speed and overall quality of service are still some liabilities for many users. Battery life is often quoted as a barrier to more usage, especially by very advanced users. The price range is still too expensive for most prepaid users. Finally, most mobile Internet services are extensions of the PC-based Web and many focus on entertainment, while users are still looking first and foremost for practical services. Mobile-centric services, leveraging sensors of the mobile phone, could lure those users.
- While the prospects are now looking good in volume, the main challenge is to turn usage into revenue. Telcos will benefit at least from additional revenues of connectivity, even though unlimited offers and inclusion within bundles will limit such growth. As m-commerce prospects remain limited in the short and medium term, players will turn to paid applications and advertising. A few paid applications are already successful, especially mobile games, but that model will be hard to expand on the consumer market beyond premium content and should reach EUR 13.3 billion in 2014 (with more than half on games). The other option is mobile Internet advertising, which measured only EUR 2 billion in 2009 but set to rise to EUR 13.1 billion in 2014. This represents a small share of the online advertising market, due to the present mismatch between the development of advanced, intense use and allocation of budgets by advertisers.

10.1. The real take-off of mobile Internet

- Despite the current global downturn, consumers are now really adopting mobile Internet. Even if worldwide penetration remains low at around 9% of mobile subscriptions, there are already 400 million active users of the mobile Internet in 2009 and there should be 950 million users by 2014, representing 15% of mobile subscriptions.
- The leading market for mobile Internet is still Asia-Pacific with almost half its users – some 172 million mobile Internet users in 2009, mostly thanks to Japan (87.5 million users) and South Korea (27.7 million). Most growth will now come from outside those two leaders, from China in particular, and from non-Asian countries.
- While representing fewer users in overall volume, Europe is a key region experiencing growth in the mobile Internet and is now the second market with more than 95 million active users in 2009. IDATE forecasts 232 million users by 2014 on mobile Internet, which will represent roughly one-third of mobile subscriptions. UK and Italy, with respectively 18.6% and 16.8% of mobile subscriptions, are the leaders within Europe, but France should catch up by 2014 regarding mobile Internet penetration, while Germany would be the leading market in volume.
- With even fewer users, North America is in fact the leading region for mobile Internet users with already 20% of mobile subscriptions. This is due to both recent major developments in the USA around mobile Internet, but also the lower penetration of mobile phones and mobile subscriptions in general. Nonetheless, the USA alone represents 55 million mobile Internet users already and should reach 117 million users by 2014.

10.2. The market is pushed by major technological and marketing enablers

- The coverage of 3G networks has largely improved, even though it is still incomplete in many countries (around 75% in France, for instance). 3G offers greater speeds than other available networks and helps to provide a better experience. The influence of speed in the recent boom of the market is still unclear, as only 12% of mobile subscriptions are for 3G (26% in Europe) and, furthermore, some mobile Internet do not have 3G. It is widely used in leading mobile Internet countries such as Japan.
- 2009 was also dominated by the continuous rise of smartphones, with models pushed by Apple (iPhone), with RIM (Blackberry) expanding into the consumer market, and with HTC (especially with its Google Android) and other usual players such as Nokia, Samsung or LG. Smartphones shipments represent around 15% of the total shipments worldwide of mobile phones, with a share rising to more than 30% in Europe and the USA. It should be noted that a significant share of mobile Internet users do not have a smartphone. Yet, smartphone users clearly make more intensive Internet usage on mobile phones. Another key point is that smartphones (including iPhone) are not very popular in Japan and are not expected to have a significant impact there, as they are too far removed from the regular mobile Internet experience.
- Devices have also improved beyond just computing power and memory. Touch screens, promoted by iPhone, have led to a revolution in use. Uses in combination with mobile sensors – accelerometers, GPS, compass, camera or NFC – are also developing gradually.
- All key elements of the mobile software stack have also been improved by the impulsion of new entrants (Apple and Google with Android), leading established players such as Nokia (controlling Symbian) and Microsoft. Google has much influence in the industry with its open source OS (which comes for free), even though Android devices have still little market share despite being available on expanding portfolio of devices. Late 2009 has been also marked by major buzz around rumours of a Google phone.

- In combination with major operating systems and devices, players have been offering stores or application marketplaces. Apple has clearly been the leading player in that category with its App Store being copied or adapted by all manufacturers as well as by telcos. With more than 100,000 applications available and virtually all mobile application developers flocking to its platform, Apple is becoming the major aggregator for consumer mobile software. For Apple, however, as with other players, its open platform is not really a revenue generator but rather an additional asset for selling more devices.
- While improvements have been made at all technical levels, the launch of specific and adapted tariff plans (generally below EUR 10 per month for postpaid customers) has also been a key driver for mobile Internet. Japan is also an exception with a specific (and somewhat complex) tariff plan for low and intensive users. Customers with ARPU above EUR 40 to EUR 50 will progressively have unlimited flat rate plans included anyway within their subscriptions – the latter becoming triple play. This move allows telcos to maintain ARPU by giving more-for-same value, in a context of strong competition and regulation such as with SMS and roaming. "Unlimited" flat rate plans are, in most cases, not really unlimited, with generally a cap on volume and bans on using some services such as VoIP, P2P or streaming. They are, nonetheless, still adequate for most users. The challenge is to attract prepaid users in addition; a few telcos are now targeting that market which is sometimes really large as in Italy.

10.3. Most remaining few hurdles can be overcome

- Some users are still not convinced after having experienced mobile Internet. Speed is still the major technical barrier, especially for advanced heavy users feeling the shortcomings compared to uses on wired broadband. As a consequence of limited speed in some areas, overall quality of service and satisfaction is still to be improved. WiFi is generally a first solution for hybrid devices, but can be used only in specific areas like the home which already represents 30% to 40% of usage. LTE and other 4G network technologies, expected to be launched in 2012/2013, should also to overcome this hurdle.
- The second major technical barrier is the battery life of mobile devices. Limited progress have been made in this area in recent years, while the mobile phone is consuming ever more power, especially because of WiFi, Bluetooth and to a lesser extent GPS, to enable additional features and services. This is still a critical area, as the mobile Internet experience should not lead to a deterioration of the phone experience itself.
- Price is also still slowing down the development of mobile Internet. This is not anymore really an issue for most postpaid users, as mobile Internet is integrated within their bundles and tariff plans. The challenge here is to attract prepaid users and/or subscribers with low ARPU. They are not likely to engage in subscriptions for mobile Internet, since they would not intensify their usage patterns. Telcos have reacted with specific plans, but they may remain too expensive.
- Finally, the focus of service development is clearly too much on entertainment applications and services. While this is an important category of services, especially in terms of opportunities for paid services, it can only be used as a way to attract a minor part of the population to mobile Internet. As with PC-based Internet, we expect that mass market users will look first and foremost at mobile Internet for such communication functions as SMS, email, IM and social networks and at practical services of the search, maps and news types before turning to other services. The market should develop more assertively with adaptations of PC-based practical services, but also through the development of mobile-centric services such as LBS, augmented reality and couponing.

10.4. The real challenge now on the mobile Internet is to turn use into revenue

- Activity around mobile Internet has developed very rapidly in recent years, clearly pushed by the supply-side of the market. Volumes are now significant, but the challenge is to transform this use into clear revenues around both connectivity and services.
- In the short term, the prime beneficiaries of the mobile Internet market are, and will be, the telcos, and to a lesser extent device manufacturers. The worldwide market for mobile Internet access revenues (on mobile phones) is already close to EUR 31 billion in 2009, of which the two third come from Asia-Pacific (Japan alone representing almost half of the worldwide market) and should rise to EUR 68 billion by 2014, of which EUR 14 billion for Europe and EUR 16 billion for the USA. Those revenues will help to compensate the limited level of growth for mobile telephony currently experienced by players in Europe and the USA. Mobile Internet access revenues will, in fact, account for more than 50% of the growth of telcos between 2009 and 2014. This explains why telcos have forged numerous partnerships with the Internet giants, having been reluctant, except in Japan, to open up their services including portals and devices until 2007. They now present their services as a strong selling proposition to subscribe to mobile Internet.
- The relative share of access and connectivity over overall mobile Internet services (not including media content) will drop from 85% to 72% worldwide (67% in Europe). This means that, in the long term, a large part of the market will come from the monetisation of services rather than access. This implies that telcos will also try to position themselves early on mobile Internet services. Telcos can especially try to differentiate through mobile-centric services rather than copies of existing mobile services (which have been mostly failures in the past), as they have a better understanding and control of mobile sensors. They can also develop enablers that can be provided (for free, or paid) to third parties to better interact with the end user. Typical key enablers would be, for instance, address book, billing, identity management, additional quality of service and targeting for advertising.
- There are only two main business models so far on the mobile Internet, as m-commerce is not expected to develop within the timeframe 2009-2014 beyond mobile contents. The first one is paid services and applications, benefiting clearly from the application stores (especially on iPhone). Mobile applications and services represent a total value of EUR 3.3 billion in 2009, mostly around mobile games. This business model is hard to expand beyond this type of application outside Japan, as most people are expecting free services in the same way as on the PC-based Web.
- The other business model is ad-funded services, based both on an adaptation of such traditional PC-based ad formats as banners and sponsored links and on developments of new mobile ad formats such as couponing. The market for mobile Internet advertising is small at EUR 2 billion in 2009, of which half comes from Japan alone and three-quarters from Asia-Pacific overall. This is very modest as the market is only at early stages, even though mobile Internet has been in Japan for years. Advertisers are mostly experimenting mobile Internet advertising and allocating limited budgets. They have cut some of their 2009 budgets with the downturn. Even if the growth will be tremendous, it should reach only EUR 13 billion EUR in 2014, of which EUR 2.5 billion in Europe and EUR 3 billion in USA. This will then be only a small share of the online advertising market. It will also be the prime business model in many emerging countries. The development of advertising on mobile will require statistics tools and clearer metrics that will be deployed and standardised in the coming years.
- The opportunities are therefore not that big, in the short term, for the Internet giants. They obviously need, all the same, to position themselves early in this market, where they will have to compete with other behemoths such as telcos and, to a lesser extent, device manufacturers. They are therefore preparing for the real take-off of the market in value, and not merely in volume. In the meantime, they are cross-subsidising their mobile services. Most of their services are still PC-based extensions and can be developed with limited additional developments. They are also consolidating usage on the PC, for which clear monetisation schemes are generally available and well-developed, especially for advertising.

World LTE Market

LTE Watch Service – 2010

- Database
  - Database on 24 countries
  - Deployment for +70 LTE operators
  - Selected vendors
  - Forecasts up to 2014
- Monthly insights
- In-depth market reports
- Analyst access

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World LTE Market

IDATE predicts that, by 2015, a total of 380 million subscribers in the US, the EU-5, Scandinavia, China, Japan and South Korea will have access to mobile data through LTE networks. Based on modelling results and considering the case of an MNO already operating GSM and 3G networks, the total cumulated investment for the LTE RAN overlay deployment amounts to 335 million EUR (for a population of 10 million inhabitants) during the period running from 2011 to 2018. Innovative services and business models, such as VoLTE which can bring benefits to both operators and subscribers, need to be deployed if operators are to maximise the potential of LTE deployment, maintain ARPU levels and continue to be a smart pipe.

Against a backdrop of pioneer rollouts and recent announcements, several questions emerge on the topic of LTE:

- What are the LTE commercial deployments scheduled by Tier1 operators?
- What are the regulatory constraints for LTE deployment?
- What is the cost of deploying LTE?
- Is LTE really delivering the expected high data rates?
- What agreements are there between MNOs and vendors?
- Which type of operator benefits the most?
- How could LTE bring an answer to congestion on mobile networks and accelerate the development of new popular solutions such as Mobile VoIP or FMC?
- Could LTE step up mobile market consolidation?

Our LTE Watch Service is specifically designed to provide operators, vendors, government bodies, regulators and local authorities with a comprehensive analysis of the issues affecting this promising market.

LTE Watch Service Calendar – 2010

		January	February	March	April	May	June	July	August	September	October	November	December
Database	Markets, Operators market shares, LTE projects, Forecasts up to 2014				DB1						DB2		
Insights	Monthly		I-1	I-2	I-3	I-4	I-5	I-6		I-7	I-8	I-9	I-10
Reports	LTE Business Models LTE leading Operators Strategies					R-1					R-2		
Complementary Reports	Mobile Networks Saturation Radio Spectrum						CR-1			CR-2			
Consulting Hours	5 hours - on demand												
Analyst Brief	30 min. Conference Call - on demand												
On-Site Presentation	Optional Report Presentation												

Methodology

- Primary research based on 70+ operators (LTE project managers)
- In-depth analysis of technological issues based on one-on-one interviews with vendors
- Penetration and subscription data for 24 countries
- Information on LTE rollout projects
- Cost modelling

2010 LTE Watch Service

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A unique database devoted to LTE, including market data by country and forecasts, along with a breakdown by technologies based on continuous tracking of contracts signed between operators and vendors

Markets & Forecasts

Regulation
- Major LTE regulatory issues by country

Market data
- By zone and for 24 countries

Subscribers
- 3.9G & 4G

Technologies & vendors
- FDD
- TDD

Operators Market Share
- Top 3 or 5 by country
- % LTE amongst the total broadband users
- Breakdown by technology

Projects
- Deployment targets
- Technologies: LTE FDD, TD-LTE, Mobile WiMAX
- Geographical coverage
- Spectrum used
- Main vendors: Network equipment, devices and chipsets (RAN, Core, IMS)
- Outsourcing
- Sharing contracts
- CAPEX
- ARPU
- Services & tariffs

Forecasts
- 2010 to 2014
- By zone and by country
- LTE Subscribers
- FDD, TDD

Geographical Zones & Countries

Africa

Asia-Pacific
Australia
China
Hong Kong
Japan
New Zealand
Philippines
South Korea
Taiwan

Latin America
Brazil

Middle East
Bahrain

North America
Canada
USA

Central and Eastern Europe
Russia

Western Europe
Austria
Finland
France
Germany
Ireland
Italy
Norway
Portugal
Spain
Sweden
The UK

Insights

Monthly views on key LTE issues: main event of the month, analysis of the latest market trends, player interviews (operators, vendors, regulators, public authorities), highlights from major conferences.

Market Reports (pdf, 50-100 pages)

• LTE Business Models

LTE business models are analysed based on a model developed by IDATE. We evaluate the cost of deploying LTE networks based on hypotheses of the various technical requirements, usage, spectrum used, its cost…

• LTE: Leading Operators' Strategies

The first commercial LTE rollout was by TeliaSonera in December 2009, somewhat earlier than expected. A number of mobile operators in the US, Japan, South Korea and Western Europe are expected to follow suit in 2010. How will these 3.9G networks fuel mobile data growth? What strategies are we seeing from main market players?

• Mobile Network Saturation

Mobile data is the key revenue driver for mobile network operators in mature markets. But as data usage increases, so does network congestion, so mobile operators need to plan for an explosion in traffic from increasingly data-hungry handsets. Radio access and backhauling links can both constitute bandwidth bottlenecks. This report explores the technical and strategic solutions to mobile network congestion.

• Radio Spectrum

At a time of explosive growth for mobile broadband and the progressive deployment of 4G networks starting next year, new frequency bands are being made available. Digital dividend spectrum is progressively being harmonised in Western Europe. The steady auctioning off and increasing use of 2.6 GHz band spectrum for LTE and mobile WiMAX, and the first digital dividend auctions will be the most important events affecting the radio spectrum in 2010.

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IDATE LTE Team

A **dedicated team** of consultants specialised in analysis of the LTE sector, whose task is to respond to the needs of operators, equipment suppliers, service providers, content providers, regulators, governments & public authorities.

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Basile CARLE
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Tiana RAMAHANDRY
Telecom Equipment

Christoph PENNINGS
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Carole MANERO
Services, Cost & Business Models

Soichi NAKAJIMA
Asia coverage

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