

ANNUAL ECONOMIC REPORT I 2015

EUROPEAN TELECOMMUNICATIONS Network Operators' Association



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01/ ETNO: EUROPE'S DIGITAL SPINE

ETNO has been the strong and reliable voice of Europe's telecommunications network operators since 1992.

ETNO's 34 member companies* and 7 observers* from Europe and beyond are the backbone of Europe's digital progress and, in a fully digitised future, they will be enablers of Europe's progress as a whole. Thanks to their investment and innovation in new e-communications services, they have been and will continue to be the enablers of a smarter, more competitive and prosperous continent.

ETNO member companies investment accounted for almost 60% of fixed and mobile CapEx in 2014 (EUR 26.6bn). In 2014, ETNO member companies employed over 600,000 people, thus being the main employer in the sector.

The telecom industry is instrumental to accelerating the implementation of a European Digital Society, leveraging its assets, expertise and knowledge and serving as a key agent of change. ETNO closely contributes to shaping the best regulatory and commercial environment for its members so they can continue to deliver top quality services to European consumers and businesses.



^{*}December 2015

02/ PERSPECTIVES ON THE INDUSTRY

LEADING THE DIGITAL RACE: WHY TELECOM REFORM IS ESSENTIAL

By Steven Tas, ETNO Executive Chairman

The ETNO-IDATE Annual Economic Report is a milestone for learning more on the status and prospects of Europe's digital economy as a whole.

While telecoms are only one part of a diverse and thriving value chain, they are the essential part. Commissioner Günther Oettinger and DG Connect's Director General Roberto Viola have underlined it several times. Telecom networks are the prerequisite to a growing digital economy. Think of many of the current and future opportunities: the app economy, smart cities, the industrial internet, Internet of Things, eHealth, connected driving and much more. None of this can be possible without powerful digital networks.

Network investment - a strategic objective

At ETNO, we welcome the Commission's renewed focus on network deployment. We see it as strategic. This is the reason why we are glad that "incentivising investment in high speed broadband networks" is one of the central objectives of the overhaul of the Telecoms Regulatory Framework — as indicated in the 2015 Digital Single Market Strategy.

In this context, ETNO regularly surveys its companies and the investor community to ascertain how regulatory reform can help achieve this strategic objective. A new, light-touch and more market-based approach is required, one that provides network builders with the incentives to create the next generation networks that will offer the appropriate returns to investors.

We believe that the figures and trends highlighted in this year's Annual Economic Report are very informative and support the reflections outlined above.

We are proud that once again this year, the investment efforts of the ETNO community have been confirmed through IDATE's numbers. It is impressive to see how we account for almost 60% of the total sector investment, meaning that ETNO companies have delivered a significant €26.6bn investment effort. The remaining part, €20.4bn, was mainly delivered by cable companies and other operators.

As expected, total sector investment increased 1% in 2014



compared to the previous year. This is good news and reflects the efforts of the whole sector to keep up the good job despite the continued decrease in service revenues (-1.1% in 2015) and ARPU (contraction continues).

In a 2015 study, the Boston Consulting Group identified a gap of €106bn to meet the digital agenda targets by 2020. This means that, if investment keep on progressing at the current pace – even taking into account public funds, we will still be missing a significant money envelope to realise the connected Europe dream.

Therefore, what we still miss – and what we hope for – is the big jump that will grant Europe a new generation of future-proof networks. This is the game we should all be in for..

3 reasons for strong confidence

Regulatory reform is good news, but many positive signals are also coming from markets, consumer habits and innovative business areas

This year's report highlights at least 3 reasons for confidence. First, as far as our core business is concerned, we see an enthusiastic take-up of mobile and data services. Just an example: there were 74.1mln 4G subscribers in 2014, and they are expected to reach the 135mln mark by the end of this year.

Second – and in line with the figures on mobile and data - we see consumers being more and more excited about online services and applications. Social media usage is still projected to grow across key markets, as is the usage of online search and e-commerce services.

Third, we see our companies embracing growing business areas such as M2M and cloud. M2M associated revenues are projected to grow constantly and they will account for almost 3% of mobile revenues by 2018. Similarly, telco enterprise cloud revenues will register a 73% growth in 2015 alone (year-on-year) and will continue growing significantly in the coming years.

Markets are dynamic, technology-driven enthusiasm is widespread, the economic and societal opportunities are significant. Positive telecoms reform can support all of this and can be a game changer in Europe's effort to lead in the digital race.

THE PATH TO RECOVERY: WHY STRONGER TELCOS ARE GOOD FOR THE EU



By François Barrault, Chairman of IDATE

As the year 2015 is coming to its end, this edition of ETNO's Annual Economic Report provdies the digital community with unbiased facts and figures about the evolution of markets. For this reason, it adds an important contribution to the ongoing economic and regulatory debates.

At first sight, telcos' market environment seems to remain largely unchanged and as difficult as in previous years. Different challenges simultaneously affect network operators: pressure on prices, competition from over-the-top players and the need to undertake costly infrastructure upgrades. However; there are a number of encouraging elements. Already last year's report concluded that for the European electronic communications industry the glass might finally be half full rather than half empty. The data for 2014 and the estimates for 2015 and beyond indeed seem to confirm that the industry has embarked on a path to recovery and will finally return to positive growth levels in 2016; for the first time since 2008!

This perspective of recovery is based on 3 factors: the customers' appetite for data in relation with the fixed and mobile broadband deployments; the telcos' efforts to optimize their operations and drive productivity; the trend to a stabilization of a price competition restricted giving more room to differentiation. Telcos are also actively pursuing the expansion into new services such as cloudbased offers or in the M2M/loT arena and are embracing new two-sided business models as strategic partners of the vertical digitalisation.

Despite the difficulties on the revenue side, operators in the ETNO perimeter have also stepped up their investment efforts in 2015 to build the networks capable of supporting innovative service propositions. As the digital transformation of the economy and the society as a whole is further gathering steam, entirely new opportunities will arise for the telecom sector to develop new activities and be a driving force of this process.

In order to be able to realise this potential, operators require a supportive and reliable regulatory environment, including merger policy. However, as far as networks are concerned, much more is at stake. With the ongoing review of the common framework, the essential issue will be to find the right balance between the incentives to sustain NGA investments and a convergent application of the competition policies within EU. At the same time, this review should take the opportunity of finally creating a truly level playing field between telecom operators and other players competing in the very same markets. More space for innovation will support a more dynamic digital value chain.

Telecoms are not a self-contained industry; high-quality networks and innovative services are more important than ever before for economic growth and social inclusion. Thriving network operators are the first step for Europe to cash in on this potential.

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03/ MARKET TRENDS

Is the turnaround finally within reach?

The deceleration of the decline of revenues in the **European communications industry continues:** total telecommunications revenues fell by 3% in 2014 in the ETNO perimeter as opposed to a contraction of 4.2% in the previous year. For 2015, growth will remain negative, but at a more modest rate of -1.1%. IDATE expects growth to return to positive levels next year, for the first time since 2008.

All services have improved their growth rates in 2014. Fixed data and internet services grew by 2.4% in Europe, following a +2.1% in 2013. The risk of negative growth in this segment seems off the table for the time being. In mobile the situation is less advantageous, with revenues still falling by 0.9% in 2015. However, the evolution of the growth rate is positive and mobile services should show positive growth again in 2016. For traditional fixed telephony further decline seems inevitable, but even in this segment the downswing seems to lose some steam and the decline of -6.7% was the smallest in the entire 2009-2015 period.

The European industry continues to fare worse than their With almost 600,000 employees and almost 57% of the total peers in the US or in Japan in terms of revenue evolution. The US consistently enjoy positive growth, whereas Japan faced negative growth in 2014, too, albeit less than Europe and will

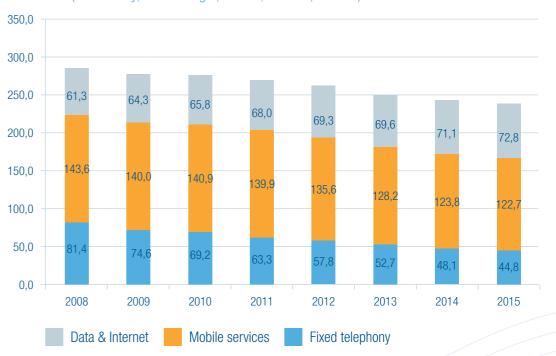
return to positive growth already in the current year. With respect to investment, European telcos returned to the positive camp over the period 2013-14, after a negative in 2012-13. While investments in the US and Japan slowed down in 2014 and growth was negative in the case of the latter, European operators invested more than in the preceding year. Yet, at a rate of 1% investment growth Europe is still well below the 4.4% growth in the USA.

Notwithstanding the unfavourable revenue trend. **the cumulative** number of access lines remains on an upward trend, despite the fact that ever more users abandon their traditional fixed line. In 2014, the number of fixed broadband lines has for the first time surpassed that of traditional fixed lines. At 170 million to 169 million lines the margin was still quite narrow in 2014. In 2015 the gap will have widened to 176 million versus 160 million lines. The number of mobile subscriptions continues to grow and after reaching 790 million subscribers last year, it should pass the 800 million mark during this year.

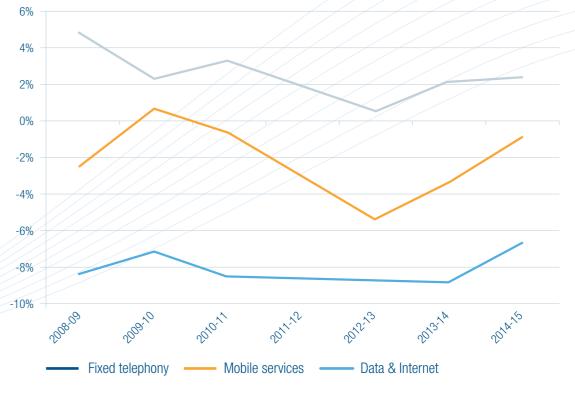
sector investment, ETNO's members remain at the heart of the



Telecom service revenues in Europe (incl. Turkey, excl. Georgia, Russia, Ukraine, EUR bn) *

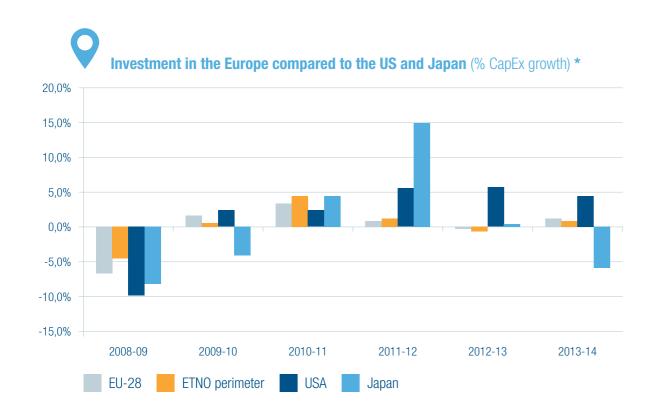


European telecom revenue by service (EU28, %) *



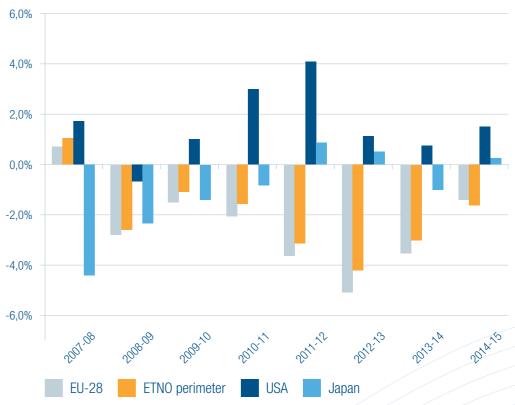
^{*} Source: IDATE

03/ MARKET TRENDS

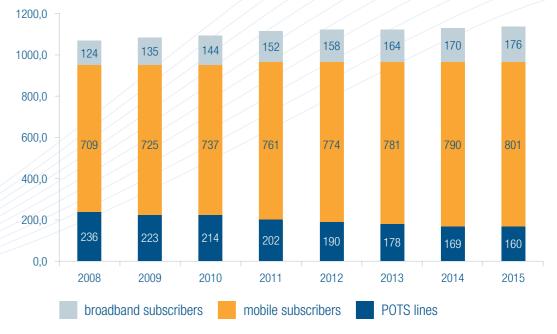


	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
EU-5	-7,0%	4,2%	4,5%	1,3%	-1,5%	1,1%
EU-15	-6,5%	2,8%	4,0%	1,0%	-0,3%	1,0%
EU-28	-6,8%	1,5%	3,4%	0,9%	-0,2%	1,2%
ETNO perimeter	-4,7%	0,7%	4,3%	1,3%	-0,6%	1,0%
USA	-10,0%	2,3%	2,6%	5,3%	5,7%	4,4%
Japan	-8,2%	-4,0%	4,5%	15,1%	0,4%	-5,9%

Telecom service revenue growth by geography (%) *

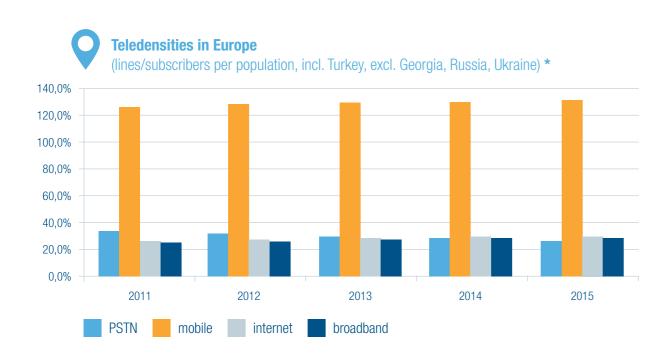


Access to telecom services in Europe (million lines/subscribers, incl. Turkey, excl. Georgia, Russia, Ukraine) *

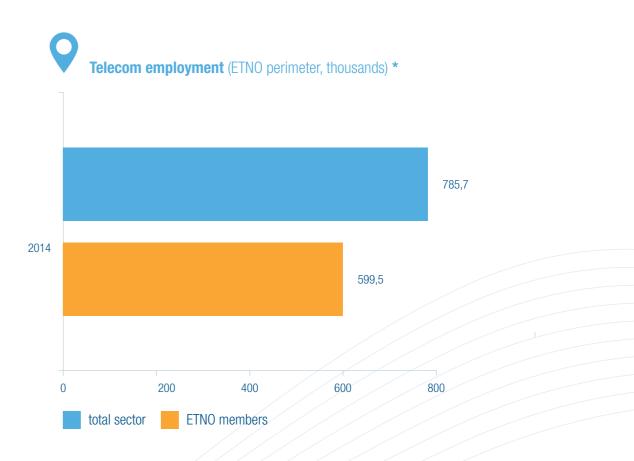


^{*} Source: IDATE

03/ MARKET TRENDS



	2011	2012	2013	2014	2015
PSTN	33,6%	31,5%	29,5%	27,8%	26,3%
mobile	126,7%	128,3%	129,1%	130,0%	131,4%
internet	26,8%	27,4%	28,1%	28,9%	29,7%
broadband	25,2%	26,1%	27,1%	28,0%	28,8%



^{*} Source: IDATE

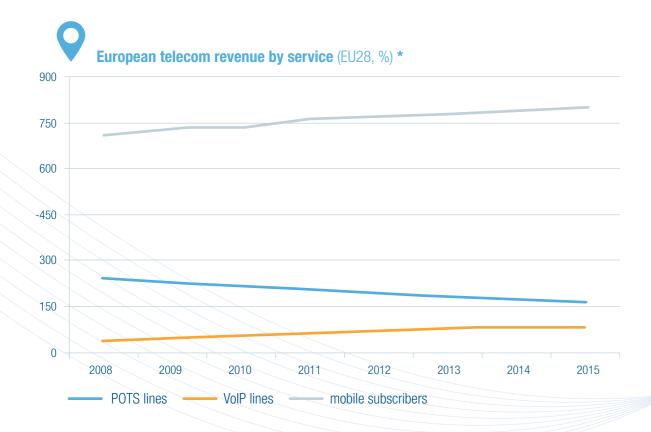
04/ REVENUE AND SERVICE TRENDS

In 2014 as well as in the current year, one can observe a positive growth yet, but fixed broadband ARPU has stabilised continuation of some of the industry's main trends. **Mobile** at EUR 23.7/month. Mobile ARPU is on a downward trend, but continues to be in demand and despite penetration rates at a slower pace than in previous year. In 2014, mobile ARPU well above 100% across the EU28 and the ETNO perimeter, fell from EUR 14.1 to EUR 13.4 in 2014 and will have reached the number of subscriptions is still on the rise. As users keep EUR 13.1 in 2015. Mobile benefits from innovation in pricing substituting broadband subscriptions for PSTN lines, the number and business models as well as the persistent demand for of managed VoIP clients is steadily increasing too. The gap between the managed VoIP lines and the users of plain old 2015. Further stabilisation of prices, potentially helped by the telephony services is diminishing, but with 88.1 million lines development of new specialised services and a lower degree of to 160.4 million lines, the latter will continue to outnumber managed VoIP for a number of years still. However, a number of operators have started large-scale migration of their subscribers to IP-telephony, which accelerates the transition.

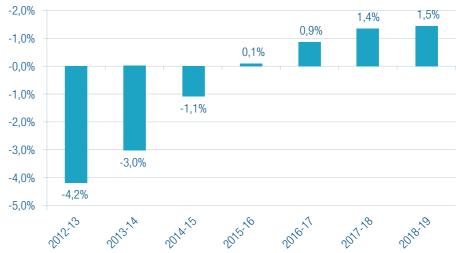
With respect to **ARPU levels in fixed broadband and mobile** course of 2016. services, a similar evolution can be observed as for total revenues. At present, there is still no turnaround to significantly

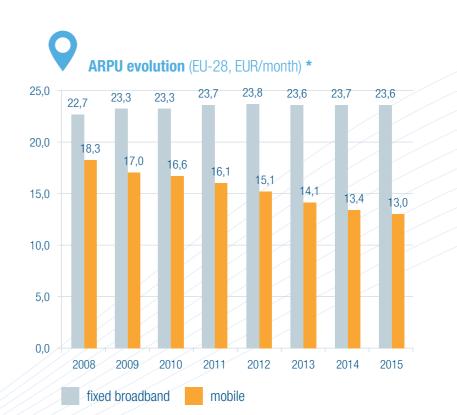
data, which will account for almost half of mobile revenues in market fragmentation combined with the higher user numbers give rise to some reasonable optimism regarding the industry's return on a growth path.

Our estimation is that such positive trend will show already in the



Telecom services revenue growth (% growth, ETNO perimeter) * 1.4%

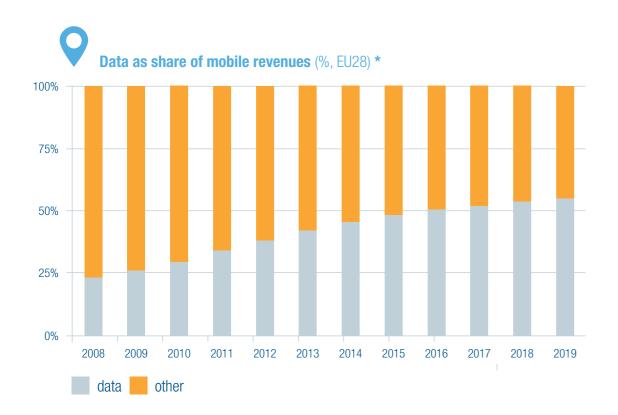




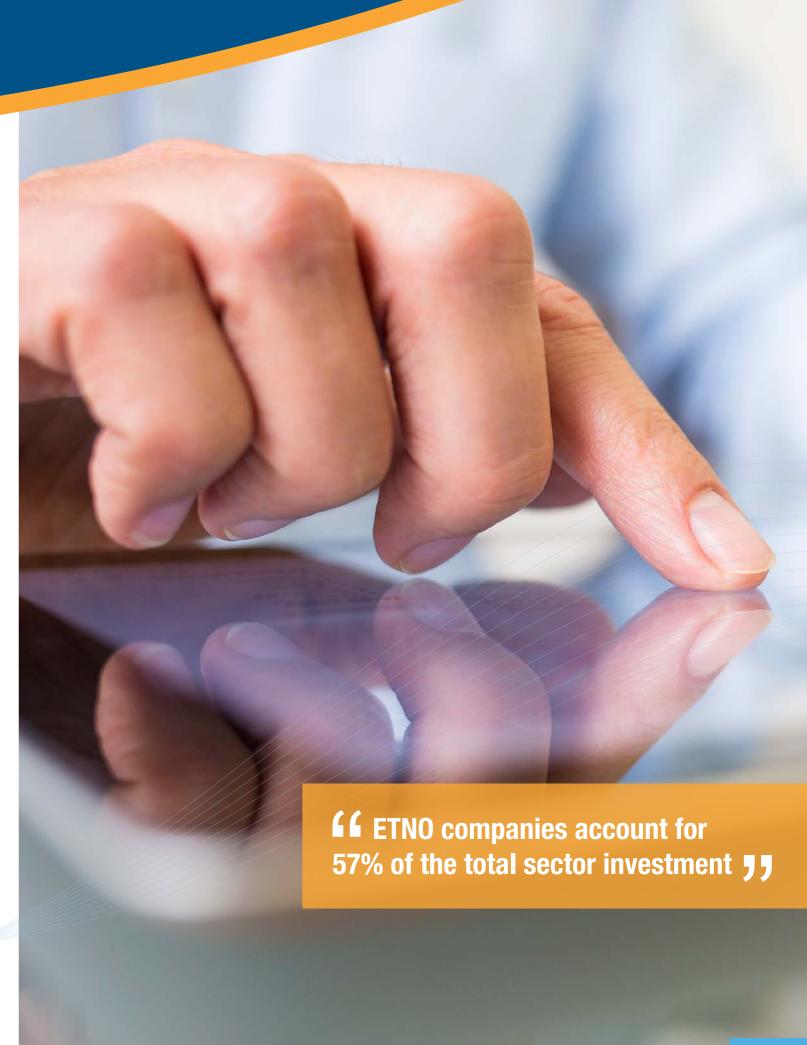
	2008	2009	2010	2011	2012	2013	2014	2015
Fixed broadband	22,7	23,3	23,3	23,7	23,8	23,6	23,7	23,6
Mobile	18,3	17,0	16,6	16,1	15,1	14,1	13,4	13,0

^{*} Source: IDATE

04/ REVENUE AND SERVICE TRENDS



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
data	23,1%	26,1%	29,5%	34,1%	38,1%	41,9%	45,4%	48,2%	50,5%	52,4%	53,8%	54,9%
other	77%	74%	70%	66%	62%	58%	55%	52%	49%	48%	46%	45%



* Source: IDATE

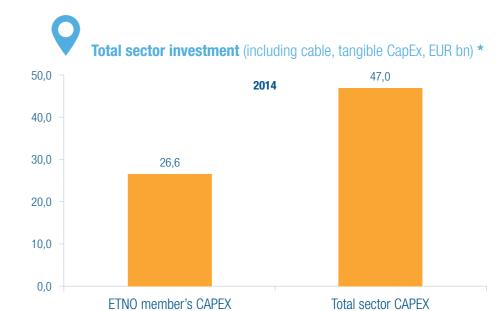
05/ INVESTMENT TRENDS

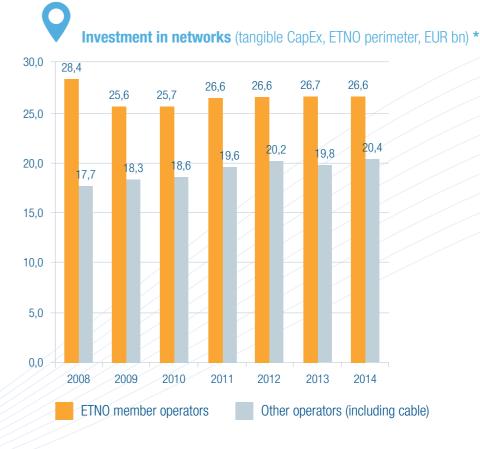
In the past years, despite the still challenging evolutions on the revenue side, operators continued deploying fibre and 4G **networks** and kept investment levels to a stable or positive level. thus stepping up their efforts even more in relative terms than in absolute terms.

in the ETNO perimeter. Telcos thus invested half a billion EUR more than in the previous year. The majority of these funds, i.e. 54%, were devoted to upgrades of the fixed network, which reflects the high costs of civil engineering for laying fibre optic cables in the ground.

ETNO members have been particularly active upgrading their infrastructures. In total, EUR 26.6 billion were invested by the companies represented by ETNO. This accounts for 57% CapEx in the ETNO perimeter has grown 1% in 2014.. Telcos are of overall capital expenditures, the rest being deployed by cable and alternative operators together. Fixed networks accounted for EUR 15.4 billion of ETNO members investments, compared to EUR 9.9 billion by other operators in the ETNO perimeter. The **Total CapEx of the sector has reach EUR 47 billion in 2014** members of ETNO also 'out-invested' their peers in the mobile sector, albeit by a smaller margin, with EUR 11.2 billion to EUR 10.4 billion.



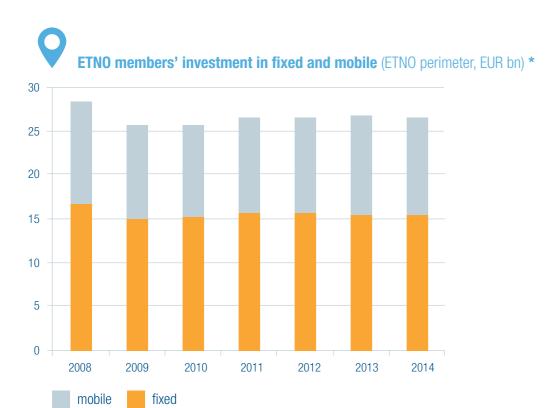




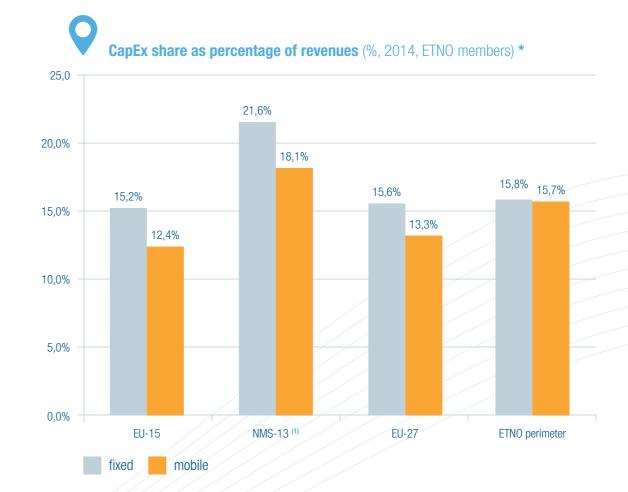
	2008	2009	2010	2011	2012	2013	2014
ETNO members	28,4	25,6	25,7	26,6	26,6	26,7	26,6
others	17,7	18,3	18,6	19,6	20,2	19,8	20,4

^{*} Source: IDATE

05/ INVESTMENT TRENDS



	2008	2009	2010	2011	2012	2013	2014
fixed	16,7	14,9	15,2	15,7	15,6	15,3	15,4
mobile	11,7	10,7	10,5	10,9	10,9	11,4	11,2



^{*} Source: IDATE

⁽¹⁾ NMS = New Member States

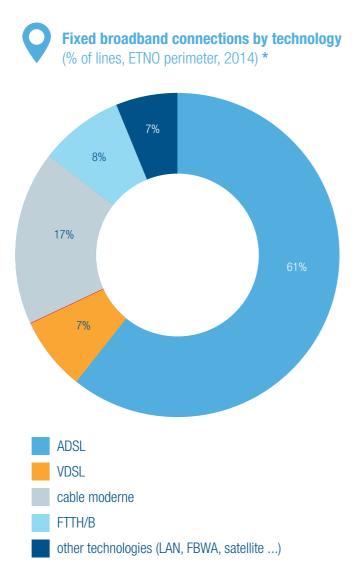
06/ BROADBAND

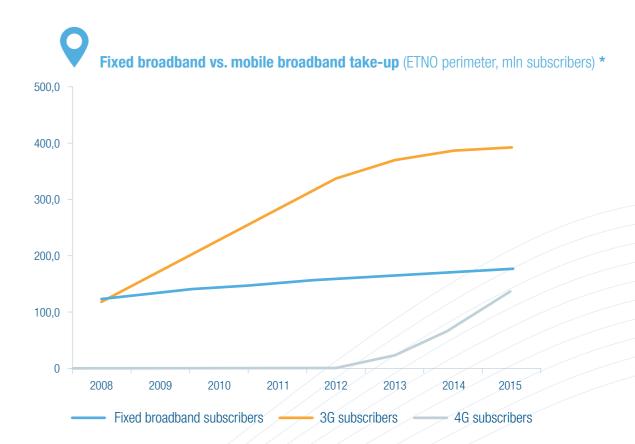
The development of the broadband market remains encouraging in the ETNO perimeter. By the end of 2015, the penetration rate of fixed broadband will stand at 28.8 lines per 100 inhabitants. This is an increase from 27.1 lines in 2013 and 28.0 lines in 2014.

Comparing the evolutions of fixed and mobile broadband accesses is another interesting point. **Fixed broadband take-up is on a steady, moderate growth.** 3G accesses have outnumbered fixed broadband subscriptions since early 2009 already. The differential between the two continues to expand, but the growth of 3G has levelled off and is progressing much slower than some years ago.

In fact, mobile users have embraced 4G and take-up of LTE services seems to be moving up the S-curve rapidly. From only 3.1 million LTE lines in 2012 the number of subscribers has increased to 74.1 million in 2014 and will surpass the 135 million mark by the end of 2015. At such a high rate of growth LTE take-up will surpass fixed broadband in the following year and Europe will continue catching up with the leading 4G markets in the US and Asia.

4G and fixed broadband should be seen as complementary technologies, not only for backhaul purposes, but also for coverage in less dense areas as well as for additional capacity through bundling of the two.





^{*} Source: IDATE

broadband networks is making progress in the ETNO perimeter. The aggregate number of homes passed across all technologies reach 240.4 million in 2014, up from 196.8 million merely one year before. Yet, the perspective investment effort is still significant.

Members of ETNO have increased their share of NGA deployments and account for 41.3% of homes passed at the end of 2014, In terms of adoption, data shows that telcos still need to exploit the across all technologies.

the leadership from FTTx/docsis3 in terms of homes passed.

As growing CapEx levels indicate, the roll-out of high-speed The number of homes passed by VDSL increased to 93.9 million compared to 74.5 million in 2013, whereas upgraded cable networks reach 85.5 million households, up from 78.2 million in the previous year. Coverage of FTTH/B has risen by 16.2 million homes in 2014 attaining 58.6million homes at the end of the year. FTTx+LAN remains a niche technology, reaching 2.2 million homes in the ETNO perimeter in 2014.s

potential of their recent investment offers. Among the 49.7 million NGA subscribers 19.4 million have an FTTx/docsis subscription. In terms of technologies, VDSL deployments have taken over FTTH/B totals 14.7 million subscribers, closely followed by VDSL with 13.1 million users.

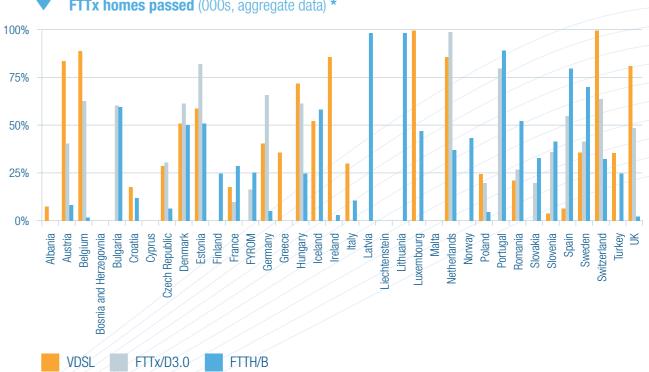




Main technologies/network architecture models (homes passed at end 2014) *

	Total EU	ETNO members	% ETNO members
FTTH/B	58,6	31.6	53.9
other FTTx* (incl. VDSL, FTTLA, LAN)	240.4	99.3	41.3%







Main technologies/network architecture models (homes passed at end 2014) *

	Standard (1)	VDSL	FTTx/D3.0	FTTH/B	FTTx+LAN
Albania	na	7%	0%	0%	0%
Austria	100%	84%	40%	7%	0%
Belgium	90%	89%	63%	0%	0%
Bosnia and Herzegovina	na	na	na	0%	0%
Bulgaria	90%	0%	60%	60%	na
Croatia	94%	18%	na	11%	0%
Cyprus	100%	0%	0%	0%	0%
Czech Republic	98%	29%	30%	6%	49%
Denmark	98%	51%	62%	50%	0%
Estonia	84%	59%	83%	51%	0%
Finland	93%	na	na	24%	na
France	99%	17%	9%	28%	0%
FYROM	na	0%	16%	25%	0%
Germany	97%	40%	66%	5%	0%
Greece	99%	35%	0%	na	0%
Hungary	92%	72%	61%	24%	0%
Iceland	94%	52%	0%	58%	0%
Ireland	97%	86%	0%	2%	0%
Italy	98%	30%	0%	10%	0%
Latvia	92%	na	0%	99%	0%
Lithuania	97%	0%	na	99%	0%
Luxembourg	100%	100%	na	46%	0%
Malta	100%	0%	0%	na	0%
Netherlands	100%	86%	99%	37%	0%
Norway	96%	na	0%	43%	0%
Poland	69%	24%	19%	4%	na
Portugal	100%	0%	80%	90%	0%
Romania	90%	21%	27%	52%	na
Slovakia	75%	na	19%	32%	0%

Slovenia	74%	4%	35%	41%	0%
Spain	98%	6%	55%	80%	0%
Sweden	99%	35%	41%	70%	na
Switzerland	100%	122%	64%	32%	0%
Turkey	100%	35%	na	25%	0%
UK	100%	82%	49%	1%	0%
ETNO	99%	38%	35%	24%	1%

^{*} Source: IDATE

(1) Source European Commission



08/ INTERNET USAGE AND DIGITAL SERVICES

businesses, though. They are also actively exploring new opportunities in the Internet and digital services arenas. Other players, notably over-the-top (OTT) services providers are already established in these markets. While telcos and OTTs' offers may be complementary in certain cases, there is intense competition between the two types of players in other segments, such as international calls or messaging.

Users, in any case, are eagerly adopting these new services. More than half the users in each of the EU5 markets has M2M is an enabler for vertical solutions and the number of **signed up to social networks.** British and Italian subscribers are the keenest users of social networks whereas French and German internet users are somewhat more reluctant to use social networks. In turn, the latter are the most ardent users of online search, with more than 97% of them carrying out web searches.

Differences in usage patterns remain most significant In the enterprise cloud market, telcos benefit not only from rather in the use of e-commerce offers. In the UK, 79.6% of fixed internet users used the web to buy goods and services online in 2014. In Italy and Spain on the other hand only 24.7% and Globally, telcos' enterprise cloud revenues are forecast to virtually 36.1%, respectively of the fixed Internet users used e-commerce services. These numbers are set to increase by 2018 but with 39.9% and 46.1% the share of Italian and Spanish online shoppers will only be around half as much as in the UK with 82.3% of fixed users.

Telecom operators are not only active in their traditional core Contrary to telcos, which are struggling to transform growing demand for their services in higher revenues, OTT players enjoy double-digit annual revenue growth throughout the entire 2012-2019 period. Telcos' growth on the other will not be positive until 2016 and will peak a 1% year-on-year growth in 2019.

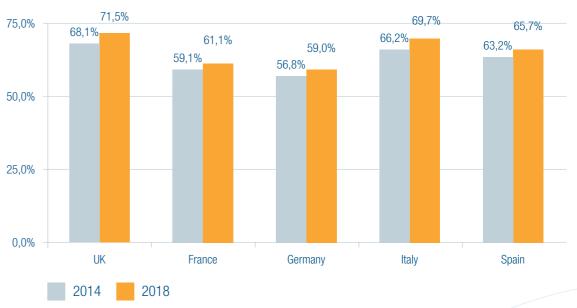
> Among the new markets with significant potential for telcos one can mention M2M and the cloud.

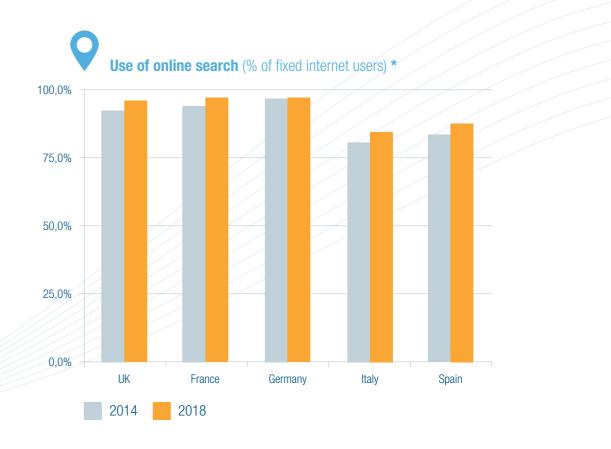
> connected devices is expected to skyrocket over the years to come. Between 2014 and 2018 the number of cellular M2M modules in the EU28 will rise from just under 60 million units to 139 million. By the end of the period, M2M will account for as much as 3% of total mobile revenues.

> substantial levels of users' trust but the fact they are local players in their different national markets may also play in their favour. quadruple to EUR 21.3 billion between 2014 and 2018.



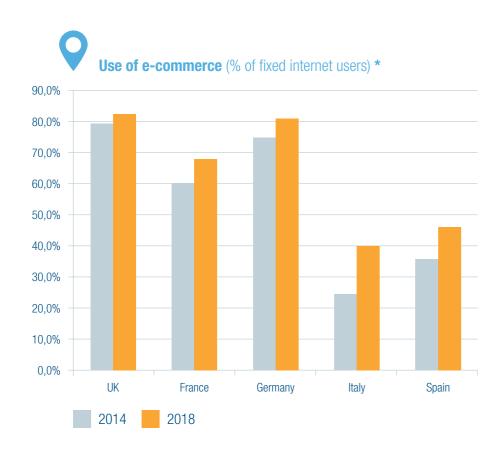


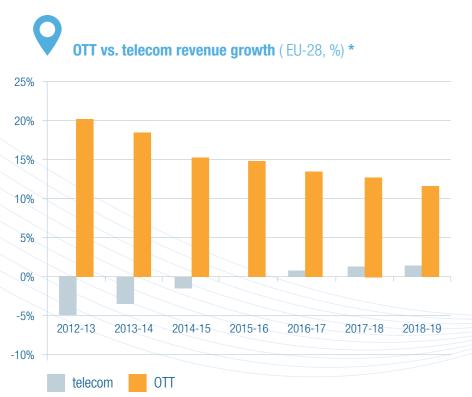




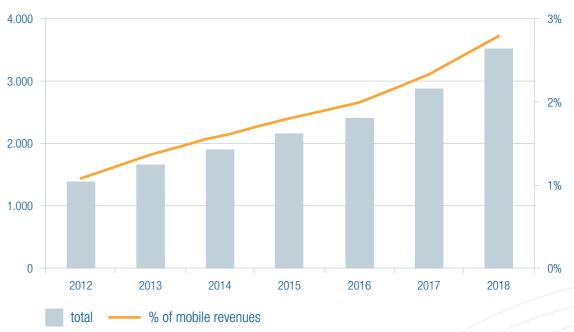
^{*} Source: IDATE

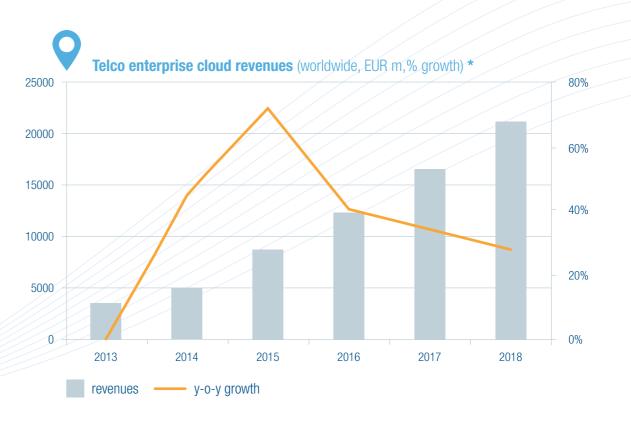
08/ INTERNET USAGE AND DIGITAL SERVICES





M2M communications and associated services revenues (EU28, EUR m, % of mobile revenues) *





^{*} Source: IDATE

09/ RANKING IN EUROPEAN AND WORLD TOP COMPANIES

9

Top 50 telecom operators in the world *

: ETNO observers : ETNO Members

Rank	Company	Country	2014 sales (million €)
1	AT&T	USA	99 829,4
2	Verizon	USA	95 783,3
3	China Mobile	China	78 698,5
4	NTT	Japan	77 726,0
5	Deutsche Telecom	Germany	62 658,0
6	Vodafone	UK	54 094,3
7	Telefónica	Spain	50 377,0
8	America Movil	Mexico	50 116,5
9	Softbank	Japan	47 429,0
10	China Telecom	China	39 799,5
11	Orange	France	39 445,0
12	China Unicom	China	34 927,2
13	Comcast	USA	33 269,7
14	KDDI	Japan	30 831,0
15	BT	UK	22 680,3
16	Telecom Italia	Italy	21 573,0
17	Telstra	Australia	17 866,2
18	Time Warner Cable	USA	17 194,1
19	KT	South Korea	16 765,6
20	Vimpelcom	Netherlans	14 793,5
21	BCE	Canada	14 338,6
22	Liberty Global	USA	13 754,3
23	CenturyLink	Norway	13 590,5
24	Telenor	Norway	12 743,1
25	SK Telecom	South Korea	12 286,2
26	Numericable-SFR	France	11 436,0
27	TeliaSonera	Sweden	11 102,5
28	Bharti Airtel	India	10 589,9
29	MTN	South Africa	10 204,5
30	Singtel	Singapore	10 022,4
31	Etisalat	UAE	10 008,7
32	Swisscom	Switzerland	9 628,2
33	STC	KSA	9 207,2
34	Oi	Brazil	9 046,9
35	Rogers Communications	Canada	8 756,3
36	Telus Corporation	Canada	8 177,1

KPN	Netherlans	8 083,0
MTS	Russia	8 067,1
LG U+	South Korea	7 873,9
Ooredoo	Qatar	6 857,2
MegaFon	Russia	6 182,4
Proximus	Belgium	6 050,0
Turk Telecom	Turkey	4 684,5
Bouygues Telecom	France	4 432,0
Turkcell	Turkey	4 147,9
Telekom Austria	Austria	4 018,0
TDC	Denmark	3 135,0
Tele2	Sweden	2 851,4
Portugal Telecom	Portugal	2 717,8
Hutchison	Hong Kong	1 582,3
	MTS LG U+ Ooredoo MegaFon Proximus Turk Telecom Bouygues Telecom Turkcell Telekom Austria TDC Tele2 Portugal Telecom	MTS Russia LG U+ South Korea Ooredoo Qatar MegaFon Russia Proximus Belgium Turk Telecom Turkey Bouygues Telecom France Turkcell Turkey Telekom Austria Austria TDC Denmark Tele2 Sweden Portugal Telecom Portugal



Top 20 European telecom operators *

Rank	Company	Country	2014 sales (million €)
1	Deutsche Telecom	Germany	62 658
2	Vodafone	UK	54 094
3	Telefónica	Spain	50 377
4	Orange	France	39 445
5	BT	UK	22 680
6	Telecom Italia	Italy	21 573
7	Liberty Global	UK	13 754
8	Telenor	Norway	12 743
9	Numericable-SFR	France	11 436
10	TeliaSonera	Sweden	11 103
11	Swisscom	Switzerland	9 628
12	KPN	Netherlands	8 083
13	Proximus	Belgium	6 050
14	Turk Telecom	Turkey	4 685
15	Bouygues Telecom	France	4 432
16	Turkcell	Turkey	4 148
17	Telekom Austria	Austria	4 018
18	TDC	Denmark	3 135
19	Tele2	Sweden	2 851
20	Portugal Telecom	Portugal	2717,8

^{*} Source: IDATE

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