



ERICSSON



WESTERN EUROPE

ERICSSON MOBILITY REPORT

NOVEMBER 2016

MARKET OVERVIEW

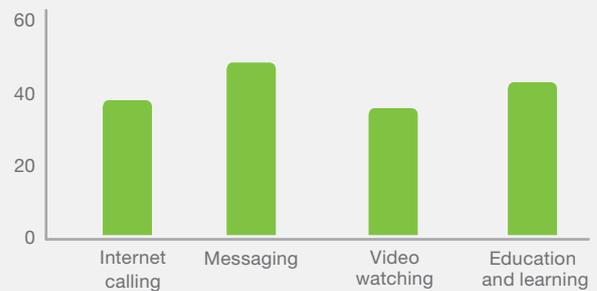
Key figures: Western Europe

	2016	2022	CAGR 2016–2022
Mobile subscriptions (million)	550	580	1%
Smartphone subscriptions (million)	380	480	5%
Data traffic per active smartphone (GB/month)	2.7	22	40%
Total mobile traffic (EB/month)	1.2	10	40%

Western European countries have developed economies, with high per capita GDPs. This has enabled high information and communication technology (ICT) adoption. By the end of 2016, around 70 percent of the region's mobile subscriptions will be for smartphones, compared to 50 percent globally.

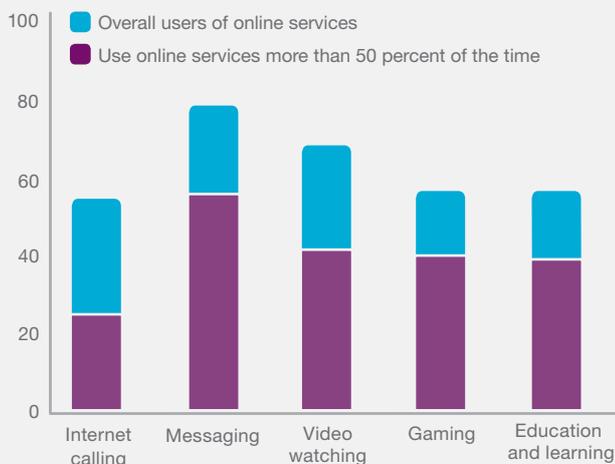
In Western Europe internet usage is penetrating activities that were traditionally performed offline. This trend widely impacts entertainment activities: three out of four consumers use the web to access TV and video content and two out of three enjoy gaming experiences through the internet. When it comes to communication, there is a high penetration of internet-based services for messaging (85 percent of users) and a significant penetration of web-based tools for voice calling (close to 60 percent). The significant use of internet-based services extends to activities such as education and learning.

Consumers in Western Europe who have increased the use of mobile apps over a period of 12 months (percent)



Source: Ericsson ConsumerLab, Analytical Platform (2015)
Base: Internet users and smartphone owners aged 15–69 in France, Germany, Italy, Norway, Sweden and the UK

Online services usage in Western Europe (percent)



Source: Ericsson ConsumerLab, Analytical Platform (2015)
Base: Internet users ages 15–69 in France, Germany, Italy, Norway, Sweden and the UK

The figure to the left shows that a considerable proportion of users rely primarily on the internet to perform these activities. For example, 4 out of 10 users spend more time watching TV and video content through online services than on traditional broadcast channels.

The installed smartphone base for Western Europe is 350 million, making the device an integral part of daily life that people increasingly rely on to perform daily activities. Smartphone users have increased their usage of various applications over the last 12 months. The figure above shows that almost 40 percent have increased their usage of internet calling apps and close to 50 percent have increased their usage of messaging apps. Over 40 percent have increased their usage of education and learning applications and a third have increased their usage of mobile video streaming apps.



Reliance on high quality mobile connectivity is becoming more important as access to online services increase

GAMING ON THE GO

When analyzing where consumers prefer to perform certain entertainment activities, video is preferred at home, but music and gaming are more popular when commuting

The figure to the right shows that around 40 percent of consumers listen to online music or play games while commuting. Within the analyzed countries in the region, gaming-on-the-go behavior is most popular in Sweden, where it is exhibited by one in two smartphone users.

In July 2016, the popularity of gaming-on-the-go reached new heights with the launch of Pokémon Go on smartphones. Tracking gaming applications¹ on Android phones shows that any single game rarely has a penetration above 5 percent. However, Pokémon Go reached around 20 percent during July in Western Europe, and as high as 30 percent in Sweden. This example shows the potential appetite consumers have for gaming and interacting in new ways with the environment around them.

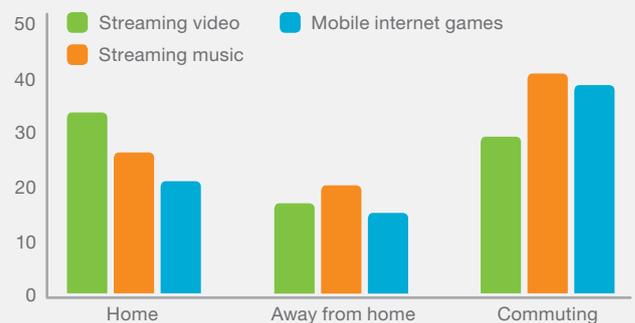
The future of gaming

Gaming is an area that is continually evolving with new technologies and capabilities, such as the recent focus on both virtual reality² (VR) and augmented reality³ (AR). Both of these trends are becoming a reality this year with many major consumer electronic brands launching VR headsets. The launch of AR-based games like Pokémon Go by Nintendo has also taken AR to the mass market.

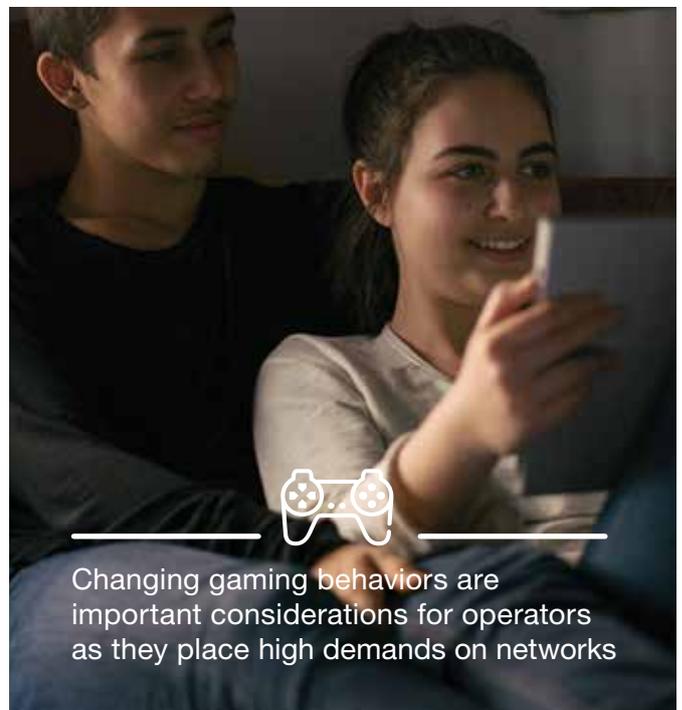
When measuring consumer interest in more immersive technology for gaming, over 40 percent of smartphone users in London and Paris believe it is a good idea to be able to play games with VR headsets, and around 40 percent believe it is a good idea to have games that let them move their phone around and play with a 360-degree view. Significantly, 70 percent of smartphone users think this will be mainstream within 3 years.⁴

Changing gaming behaviors are important considerations for operators as they place high demands on network quality, especially in terms of latency. Low latency is already critical for online gaming, but those demands will significantly increase with the move towards more immersive gaming. This is particularly true with VR, where synchronization of movements and what is seen in the headset is critical to avoid motion sickness. This will need even lower levels of latency. The evolution towards the 5G network architecture will help to meet these new requirements.

Smartphone usage by location in Western Europe (percent)



Source: Ericsson ConsumerLab, Experience Shapes Mobile Customer Loyalty (2016)
Base: All 3G/4G users in Germany, Ireland, Sweden and the UK, aged 18–69 who use an app on mobile broadband at least weekly



¹ Ericsson analysis of App Annie data for Android smartphone apps (July 2016) in each country

² Virtual reality (VR) is a computer technology that uses software-generated realistic images, sounds and other sensations to replicate a real environment or an imaginary setting, and simulates a user's physical presence in this environment to enable the user to interact with this space

³ Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment with elements augmented (or supplemented) by computer-generated sensory input, such as sound, video, graphics or GPS data

⁴ Ericsson ConsumerLab, 10 Hot Consumer Trends (2015). Base: Smartphone owners in London and Paris aged 15–69

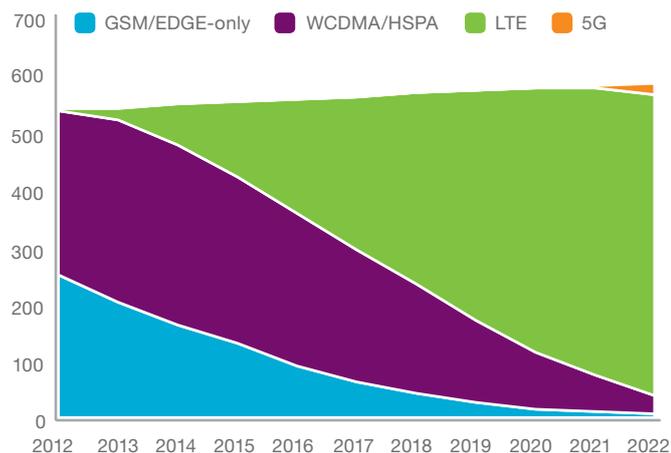
MOBILE SUBSCRIPTIONS

By the end of 2016, mobile subscriptions in Western Europe are expected to pass the 550 million mark, representing a market penetration of 131 percent

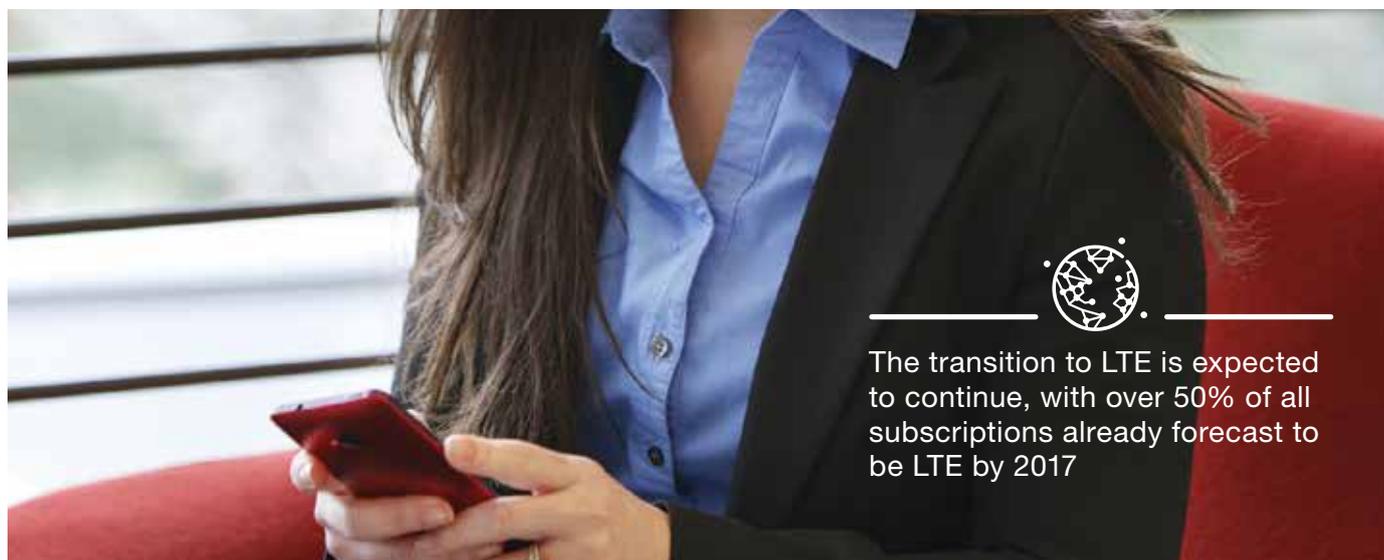
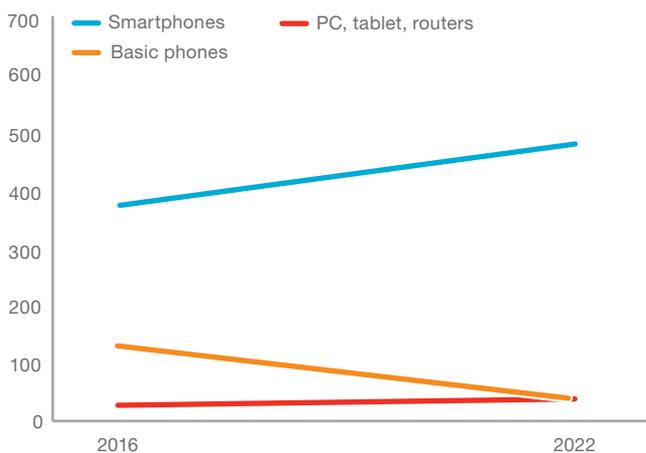
Mobile subscriptions are forecast to grow to near 580 million by 2022, giving a relatively flat outlook in the region with a compound annual growth rate (CAGR) of just 1 percent. Within the region, the transition to LTE is expected to continue, with around 50 percent of all subscriptions expected to be LTE by 2017. This transition is expected to continue through to 2022, when almost 90 percent of all subscriptions will be LTE. 5G subscriptions are expected to ramp up in 2021, with around 20 million subscriptions forecast for 2022.

The graph below demonstrates the high penetration of smartphones, which currently stands at around 70 percent and will continue to grow to around 85 percent by 2022. During this period, the cellular PC, tablet and router segment is expected to grow, increasing from around 40 million to almost 55 million, but it will still only represent a small proportion of overall subscriptions.

Mobile subscriptions by technology in Western Europe (million)



Mobile subscriptions by device type in Western Europe (million)



The transition to LTE is expected to continue, with over 50% of all subscriptions already forecast to be LTE by 2017

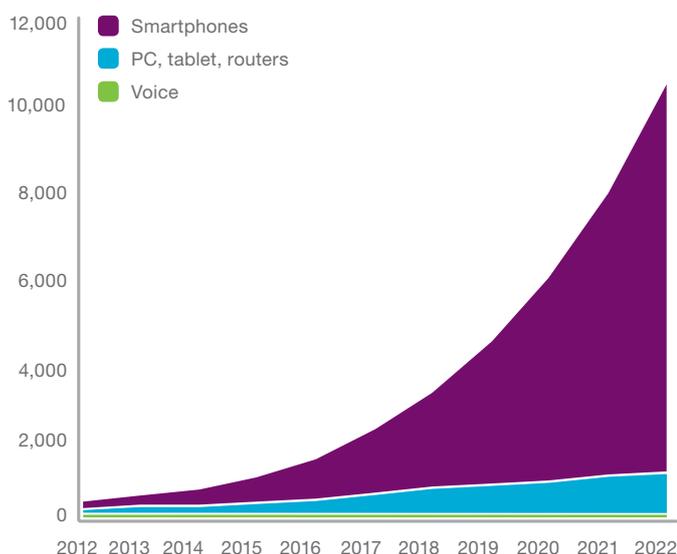
MOBILE TRAFFIC

In Western Europe, mobile traffic is set to reach around 10 ExaBytes (EB) of data per month by 2022, an eight times increase in the volume of data traffic

This growth is fueled by the rapid transition to LTE and the increased usage by each smartphone user. Average data traffic per smartphone will increase from 2.7 GB per month per user today to 22 GB by 2022: a CAGR of 40 percent. Meanwhile, voice traffic remains constant at around 8 PetaBytes (PB) per month.

Video services and social networking are driving data traffic in Western Europe, as shown by analysis of the top five applications in six countries outlined in the table below. In each country, both video and social networking apps dominate the top five applications, driving a significant proportion of traffic on the network, along with web browsing.

Mobile traffic per month in Western Europe (PB)



Top five applications per country by mobile traffic

UK	Germany	Sweden	France	Italy	Spain
YouTube	Facebook	YouTube	YouTube	Facebook	Facebook
Facebook	YouTube	Facebook	Facebook	YouTube	YouTube
Instagram	WhatsApp Messenger	Spotify	Snapchat	Instagram	WhatsApp Messenger
Snapchat	Instagram	Instagram	Instagram	WhatsApp Messenger	Instagram
Spotify	Maps	Snapchat	Spotify	Maps	Twitter

Source: Ericsson analysis of App Annie data for Android smartphone apps (July 2016) in each country excluding web browsers

Applications are evolving and consumers are adopting the new functionalities that they offer. Many popular applications now include embedded video and broadcasting capabilities, meaning video is no longer contained to specific applications like YouTube. The inclusion of live broadcast capabilities within applications such as Twitter and Facebook is also driving

increased pressure on upload requirements in the networks. For example, in Sweden, 43 percent of smartphone users watch video within streaming apps like Spotify; in the UK, 19 percent watch live streams of celebrities through Facebook; and, in Ireland, 13 percent already use live streaming apps like Periscope to watch live broadcasts or to broadcast themselves.⁵

⁵ Ericsson ConsumerLab, Experience Shapes Mobile Customer Loyalty (2016)

Base: All 3G/4G users in Germany, Ireland, Sweden and the UK, aged 18–69 who use an app on mobile broadband at least weekly

MEASURING NETWORK PERFORMANCE

Increasing demands and expectations of smartphone users have resulted in new ways to evaluate the performance of mobile operators

The figure below shows the most common ways consumers in Western Europe measure and evaluate network performance. Time-to-content is the most commonly used performance measure across all markets. Time taken to upload pictures to social media is another performance criterion used across all markets, showing how networks today are becoming measured by both their upload and download performance.

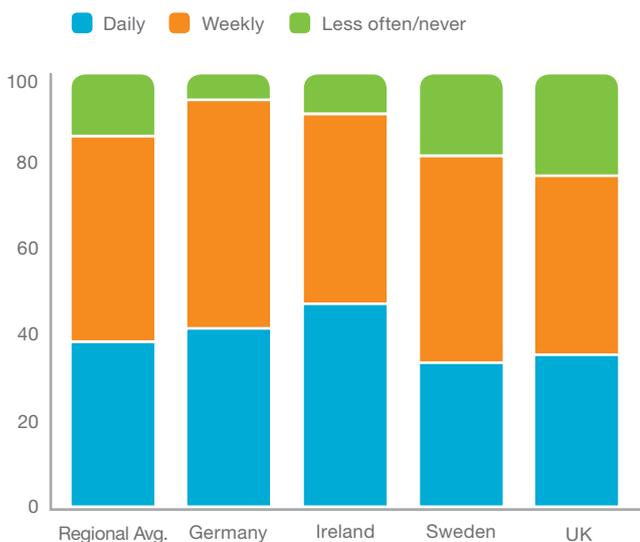
As video consumption increases, “time taken for video to load” has become a significant performance indicator as it is connected to stress levels⁶, and is more prominent in the UK, Sweden and Ireland. “Speed-test” apps are widely used in Sweden to evaluate performance.

Indicators consumers use to judge network performance in Western Europe



Source: Ericsson ConsumerLab, Experience Shapes Mobile Customer Loyalty (2016)
Base: All 3G/4G users in Germany, Ireland, Sweden and the UK, aged 18–69 who use an app on mobile broadband at least weekly

Frequency of performance issues faced in Western Europe (percent)



Source: Ericsson ConsumerLab, Experience Shapes Mobile Customer Loyalty (2016)
Base: All 3G/4G users in Germany, Ireland, Sweden and the UK, aged 18–69 who use an app on mobile broadband at least weekly

While cellular networks have improved over time, 40 percent of Western European smartphone users still face performance issues on a daily basis. Experiences vary between the markets; for example, in Ireland, 47 percent of users claim to face performance issues on a daily basis, compared to 33 percent in Sweden. In the UK, the share of users facing daily issues is the same today as it was three years ago, despite improvements to networks. This is most likely due to increasing user demands and requirements on the networks.

The types of issues faced by smartphone users range from a lack of coverage to slow time-to-content for web, video and social media applications. As behaviors change, so do customer issues. In 2013, the most common issues were related to content upload and download, while today most issues relate to video streaming. This highlights the need for continual network improvement, optimization and adaptation to customers’ ever-changing demands.

⁶ Ericsson Mobility Report, Mobile World Congress Edition (February 2016)

RAPID IOT DEVELOPMENT

Western Europe is expected to become the second largest market globally for the Internet of Things (IoT)

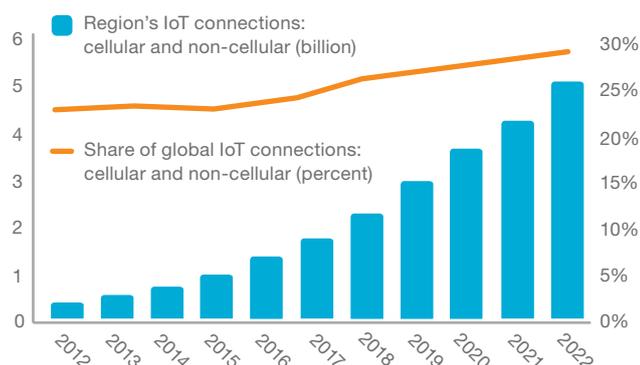
A quarter of all IoT connections globally come from Western Europe and this proportion is expected to grow in the region, with a CAGR of around 25 percent between 2016 and 2022. Cellular will make up a smaller proportion of overall IoT connections, but will enjoy stronger growth between 2016 and 2022, with a CAGR of around 30 percent. The growth in both cellular and non-cellular IoT will be driven in three ways: government and European regulations, industry development and consumer electronics.

Firstly, government and European regulations are supporting IoT development in Western Europe, with two focus industries being

utilities and automotive. Close to 200 million smart meters will be rolled out for electricity and 45 million for gas in the European Union by 2020.⁷ In the automotive industry, the regulatory push can be seen in the requirement for all new cars to be equipped with eCall from April 2018, which automatically dials Europe's single emergency number in the event of a serious accident.

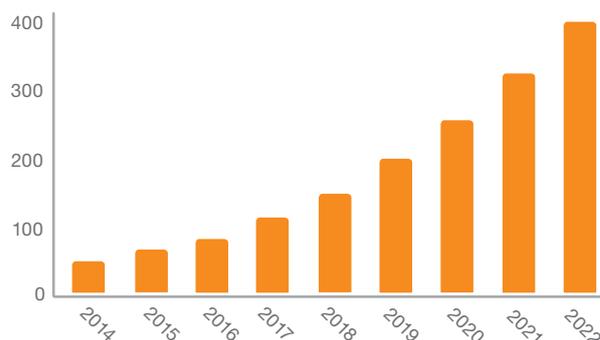
Secondly, the automotive industry is planning to use IoT to improve customer relationships, provide enhanced navigation and entertainment services and better maintain vehicles. The utility industry is also developing, looking to put customers in control and optimize energy usage and costs.

IoT connections



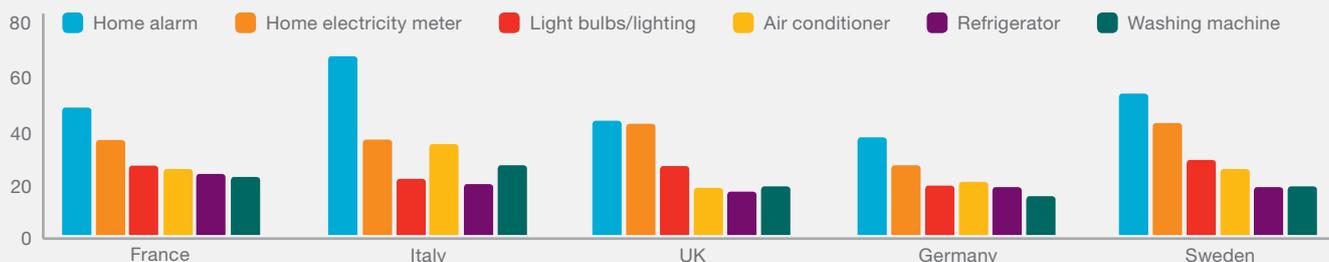
Finally, from a consumer perspective, IoT is beginning to move beyond entertainment and communications devices. Phones, laptops, TVs and games consoles are being connected to wearable devices. For example, 8 percent of Western Europeans own a smart watch, and a further 8 percent intend to buy one in the next 12 months.⁸

Cellular IoT connections (million)



But interest is also high in connecting other household devices and appliances, as seen in the graph below. This interest directly links with the developments in the utility industry around smart meters and the control of energy consumption by customers.

Devices consumers want to connect (percent)



Source: Ericsson ConsumerLab, Analytical Platform (2015)
Base: Internet users aged 15–69

⁷ European Commission, Report from the Commission: benchmarking smart metering deployment in the EU-27 with a focus on electricity (2014)

⁸ Ericsson ConsumerLab, Analytical Platform (2015)

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, business and society to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With approximately 115,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.