



ERICSSON



# NORTH EAST ASIA

ERICSSON MOBILITY REPORT APPENDIX

NOVEMBER 2014

# MARKET OVERVIEW

## Key figures: North East Asia

	2014	2020	CAGR 2014–2020
Mobile subscriptions (million)	1,575	2,100	5%
Smartphone subscriptions (million)	1,030	1,800	10%
Total mobile traffic (PB/month)	850	7,000	40%

With a population of around 1.6 billion, North East Asia represents 22 percent of the world's population. Japan and China are currently the second and third largest consumer markets in the world after the US.

The uptake in data-centric mobile devices has led to rapid data growth in mobile networks. Fast adoption of locally developed social network and instant messaging applications has emerged as a key trend among consumers in North East Asia.

Mainland China's extensive and rapid ongoing deployment of LTE means that the number of subscriptions for the technology is forecast to exceed 1.2 billion by the end of 2020. It will therefore represent more than 25 percent of the total global subscriptions for LTE. By the end of 2014, the average monthly data usage per active subscription, including all technologies, will be around 300 MB in China. Total mobile data traffic in China will increase over 14 times between 2014 and 2020, compared to around 8 times globally. To put this increase into perspective, the total LTE traffic in China in 2020 will be approximately equal to total global mobile traffic in 2014.

Studies into how the global standard of 5G can support the growth in traffic and meet the increased demand for a better user experience have been established in Japan, South Korea and China. Developers of this technology are aiming to reduce latency, support significant increases in data volumes, and improve energy efficiency and battery life.

### Consumer trends

Consumer behaviors in North East Asia are changing rapidly, enabled by mobile devices and broadband connections. However, each market displays its own distinct trends, due to varying levels of development maturity and cultural differences.

Out of the countries studied globally, China has the most users who regard new technology as exciting.

In Japan, there is rapid smartphone uptake among young people. The Japanese are practical when dealing with new technology, and it is mainly viewed as a tool that needs to be mastered in order to facilitate their jobs and lives.

Smartphone ownership and wide internet coverage enables South Koreans to instantly access the internet anywhere and at any time.

### From voice to data

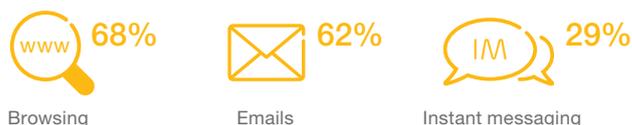
Services that once required a computer can now be accessed through mobile phones, a trend that is steadily increasing. Voice calls and SMS are no longer the dominant services, especially for smartphone users, more of whom are making regular use of data-based applications.

### Top three data services used by mobile phone users (Percentage of daily users)

#### Urban China



#### Japan



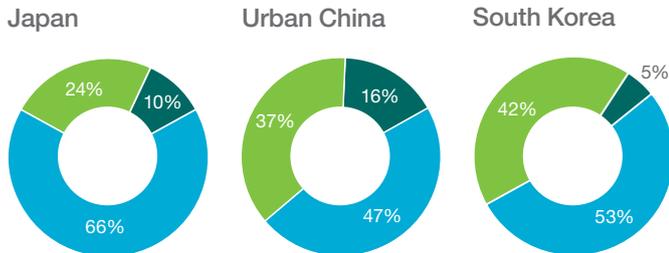
#### South Korea



Source: Ericsson ConsumerLab (2014)  
Base: Mobile phone users

“It’s important to be able to access the internet wherever I am.”

● Agree
 ● Neutral
 ● Disagree



Source: Ericsson ConsumerLab (2014)

Usage of data services continues to grow rapidly in urban China. Instant messaging (WeChat, QQ) is the most popular over-the-top service and is used by nearly 60 percent of smartphone owners in cities on daily basis. This increasing popularity of mobile instant messaging poses a threat to the traditional SMS service.<sup>1</sup> Out of those who use both mobile instant messaging and SMS, 35 percent claim that they are sending fewer text messages than before they had their messenger app. Price and user-friendly experiences are the primary drivers behind the transition from SMS to instant messaging applications.<sup>2</sup>

Mobile users in Japan are more data-oriented than voice-oriented. The most popular services used on a daily basis on mobile phones are web browsing and email. Only 19 percent regularly make or receive voice calls on their device, a decrease from 30 percent in 2013. 29 percent of mobile users in Japan think they would be fine without using traditional voice calls or SMS if they could access internet services any time.<sup>2</sup>

South Koreans, irrespective of where they are, want to have access to information at any time. Around 42 percent of consumers in South Korea rated the need for high accessibility as most important, followed by the need to be updated when they want at 19 percent. Access to mobile data has an impact on voice behavior: 47 percent of smartphone users make internet calls at least once a week, and 37 percent of those smartphone users state that they make traditional phone calls less than they did

before internet calls were available. Mobile users who plan to upgrade their mobile connection stated that they would access more messaging, payment and banking services after upgrading.<sup>1</sup>

### Media behaviors

Watching TV and video is now a multi-screen activity – consumers choose their devices based on a range of situational factors, and may switch screens while watching. People also watch more on their own and in different places and at different times. This trend is especially distinctive in markets like South Korea where 3G/4G data services are prevalent.

Mobile devices that allow for the consumption of video on the go and new services enabling seamless access to video content have given rise to another new behavior called place-shifting. This means consumers start watching a video on one device, then continue watching it on another in a new place. More than one-third of consumers in South Korea place-shift on a weekly basis.<sup>1</sup>

## >1/3 of consumers in South Korea place-shift on a weekly basis

Subscription-based Video on Demand (S-VOD) services have become the go-to choice for continuous viewing habits and routines. Traditional broadcast and Pay TV channels are seen by many as ‘content repositories’ from which consumers can cherry-pick individual pieces of content for later viewing. Binge viewing – watching multiple TV series’ episodes back-to-back – is a trend that has taken off thanks to the introduction of S-VOD. Nearly half of South Korean users prefer all TV episodes to be released at once.<sup>1</sup>

TV and media content is a core element in consumers’ ideal TV solution. As video quality improves, so do consumers’ quality expectations. 58 percent of Taiwanese consumers state that HD quality is a vital aspect of their optimal TV or video experience, and 43 percent of consumers in Taiwan are willing to pay for 4K/Ultra High Definition (UHD) content.<sup>1</sup>

<sup>1</sup> Ericsson ConsumerLab (2014)

<sup>2</sup> Ericsson ConsumerLab (2013)

# MOBILE SUBSCRIPTIONS

Mobile subscriptions in North East Asia will exceed 1.5 billion in 2014, representing approximately 22 percent of global mobile subscriptions. It is predicted that the region's mobile subscriptions will grow at a compound annual growth rate (CAGR) of 5 percent between 2014 and 2020, leading to over 2 billion mobile subscriptions by the end of 2020. This is primarily due to the increase in mobile subscriptions in China.

Around 300 million smartphone subscriptions will be added to mobile networks in North East Asia during 2014 – an increase of around 40 percent. By the end of 2014, the total number is expected to reach around 1,030 million, representing almost 40 percent of global smartphone subscriptions. Mainland China's smartphone market is the world's largest in terms of volume, and is more than twice the size of the US market, which is the second largest.

By the end of 2014, it is estimated that smartphone subscription penetration in North East Asia will reach around 65 percent. By the end of 2020, smartphone subscriptions are expected to be around 1.8 billion – more than the total population in the region.

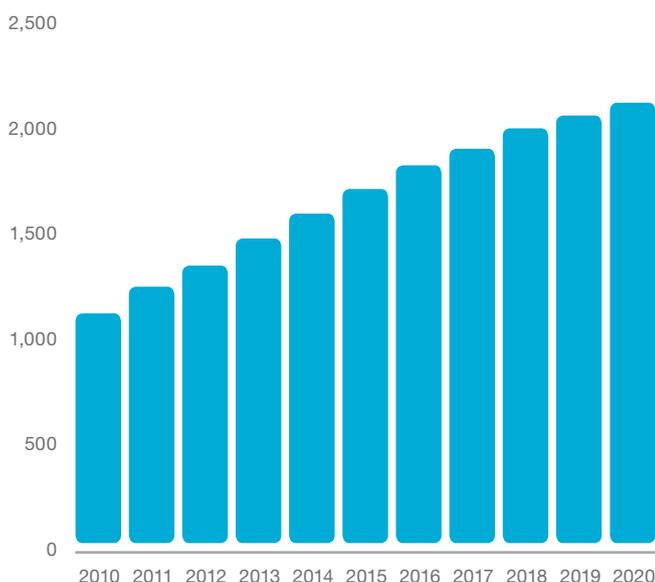
The fast adoption of smartphones among consumers in North East Asia has had a positive effect on data traffic and revenues, as well as average revenue per user (ARPU).

In Japan, the adoption of smartphones has been slower than in many other developed markets, due to the fact that advanced feature phones with internet connectivity and apps were already available on the market. However, Japan's early access to mobile phones with internet connectivity has resulted in data representing a high share of operator revenue for many years now.

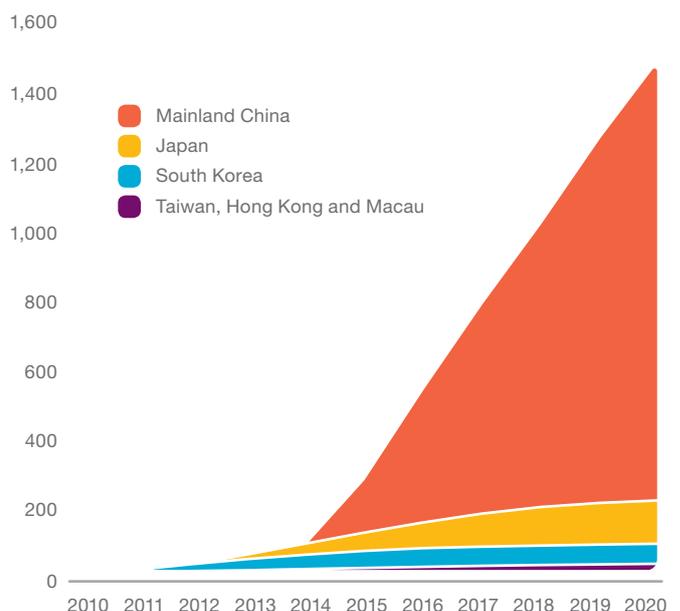
## 2.1 BILLION mobile subscriptions by the end of 2020

LTE networks were deployed widely across South Korea, Japan and Hong Kong during 2012. By the end of 2014, LTE subscription penetration will reach 50 percent in Japan and close to 80 percent in South Korea – the highest in the world. It is estimated that Japan and Korea will represent 25 percent of the world's LTE subscriptions at the end of 2014. Mainland China has started to roll out LTE and will experience a rapid shift from 2G/3G to 4G, adding around 1.2 billion LTE subscriptions by the end of 2020. Total LTE subscriptions in North East Asia are forecast to be close to 1.5 billion.

Mobile subscriptions, North East Asia (million)



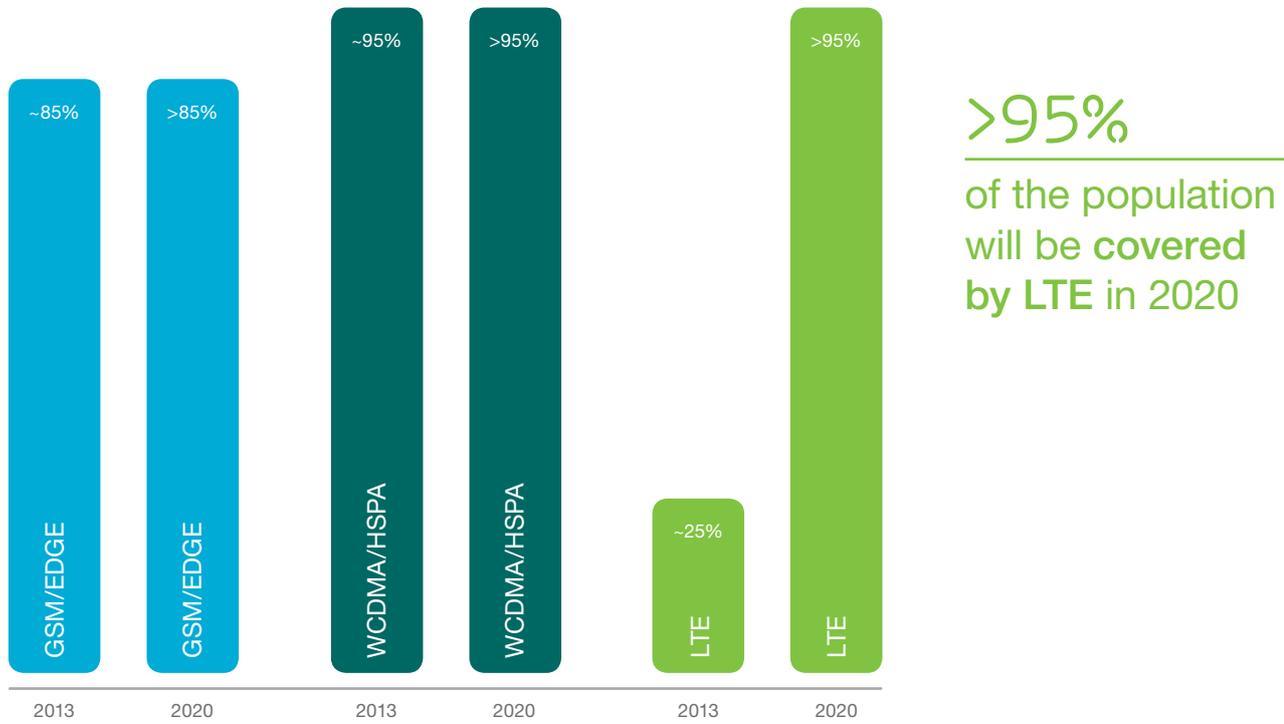
LTE subscriptions, North East Asia (million)



Mobile subscriptions do not include M2M subscriptions

# POPULATION COVERAGE

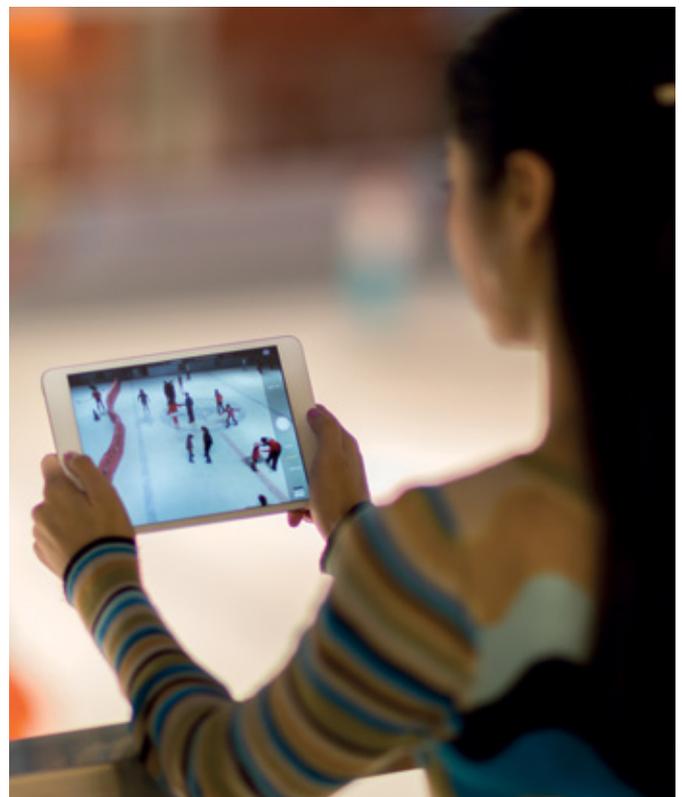
## Population coverage, North East Asia



Mobile network coverage in the region is constantly increasing as more base stations are deployed. Population coverage is the proportion of the population in an area that has sufficient signal to connect to a mobile network. It should be noted that the ability to utilize the technology is subject to other factors, such as access to devices and subscriptions.

GSM/EDGE has not been deployed in Japan and South Korea. As a result, GSM/EDGE population coverage in the region is lower than the projected global average in 2020. WCDMA/HSPA had a population coverage of around 95 percent in the region during 2013, significantly higher than the global average of around 65 percent.

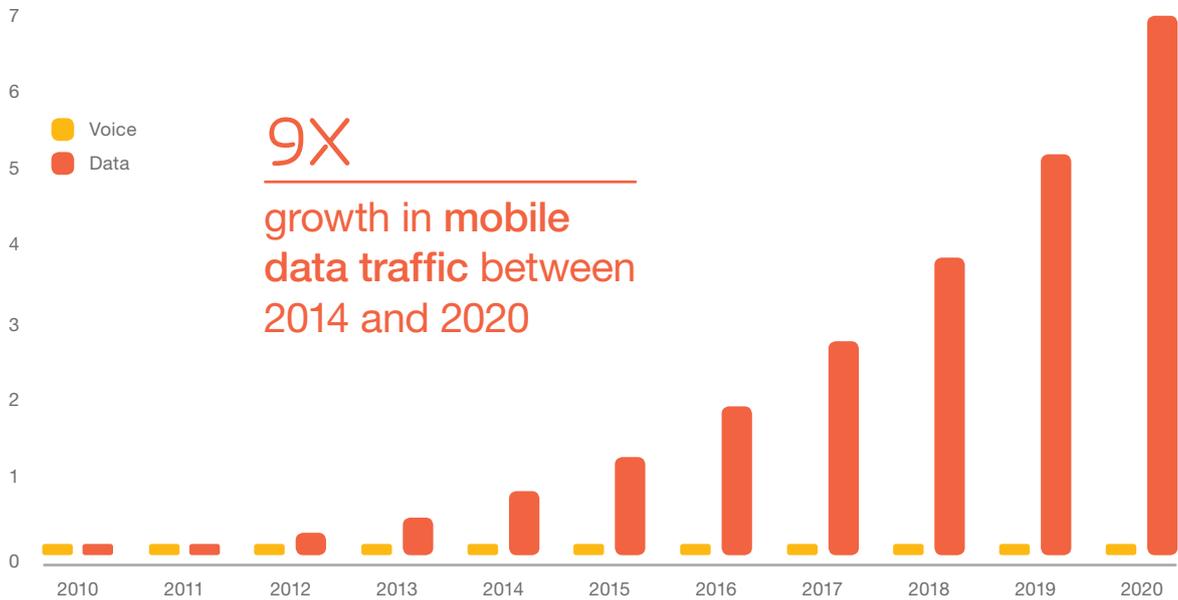
Japan and South Korea were early adopters of LTE and the population coverage is already close to 100 percent in those countries. LTE build-out is continuing to increase performance as well as cover less populated areas. Operators in Mainland China and Taiwan have also started commercial LTE deployments. In 2020 it is predicted that LTE will cover 95 percent of the population in the region. The launch of LTE in Mainland China will make North East Asia the largest market for the technology in the world.



Japan and South Korea have no GSM/EDGE deployments and therefore the regional average population coverage is lower than for China.

# MOBILE TRAFFIC

Mobile traffic, North East Asia (monthly ExaBytes)



Data consumption per subscription differs across the region. The lowest average is measured in Mainland China, however it is increasing with the introduction of LTE. The average usage per subscription in Japan is around 1.4 GB per month, while the average for LTE users in South Korea is above 3 GB per month. Mobile data

traffic in the region is expected to have a CAGR of nearly 40 percent between 2014 and 2020 due to significant increases in usage per subscription, driven by the rapid influx of smart devices. The growth rate in mobile data traffic is comparable to the global forecast.



## App coverage

The coverage area for any given app is relative to the level of network performance needed for it to function. App coverage describes the area with a high probability of experiencing sufficient network performance to run a given app, e.g. video streaming or web browsing. Smart devices and apps continually evolve to encompass newer capabilities, and therefore require more network resources to provide a good user experience. App coverage is an integrated view of mobile broadband network coverage, capacity and quality.



Network performance



Smartphone app



User experience

## Network performance

The rapid uptake of smart devices, including both smartphones and tablets, has fueled consumer demand for a better user experience. In response, operators are now deploying 4G/LTE coverage and capacity. Japan and South Korea have been at the forefront of the global LTE roll out, and massive projects for the technology are currently underway in Mainland China.

Measurements from Speedtest.net have been analyzed to better understand the real user experience. A user can expect the median rate or higher with a 50 percent probability, and the cell-edge rate or higher with a 90 percent probability, throughout the network coverage area. Due to continued LTE deployments, South Korea and Japan had median downlink throughput speeds that were significantly higher than the global median in Q2 2014 – 9 Mbps and 7 Mbps, respectively.

However, a different user experience is observed in the cell edge comparison. In Japan, users experience downlink throughput speeds that are a third lower than the global average. This could be because in Japan if a subscriber exceeds his data plan's limit, the downlink throughput is throttled. In Taiwan, cell-edge speed is ahead of other markets. One of the factors contributing to this could be the non-throttling policy imposed on service providers by regulators.

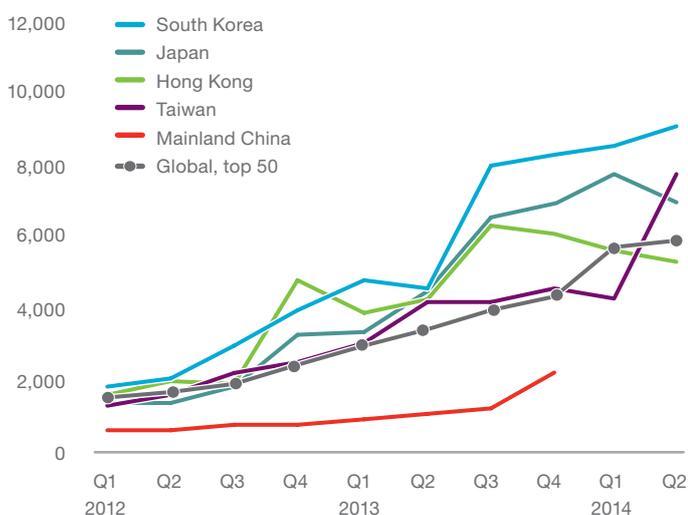
Chinese operators commercially launched LTE networks between Q4 2013 and Q1 2014. LTE traffic is just starting to

pick up, and therefore typical download throughput speed per user is higher compared to users in other more mature LTE markets with higher traffic load in the networks. This explains the upturn for China in Q4 2013 in the graphs. To benchmark median and cell-edge performance, more conclusive data is needed. Therefore, only data up to Q4 2013 for China is shown in the graphs. Overall, North East Asia markets are around 40 percent higher in downlink throughput compared to the average downlink throughput measured in the top 50 global markets.

In most of the countries in the region, mobile broadband plays a very important role wherever Wi-Fi is not available. Regardless of the availability of Wi-Fi access points, public reliance on it is decreasing, especially for those who use smartphones for spontaneous purposes. This creates a potential opportunity for LTE operators in countries such as South Korea, where more LTE users prefer accessing mobile networks on public transport or when outside in public places.

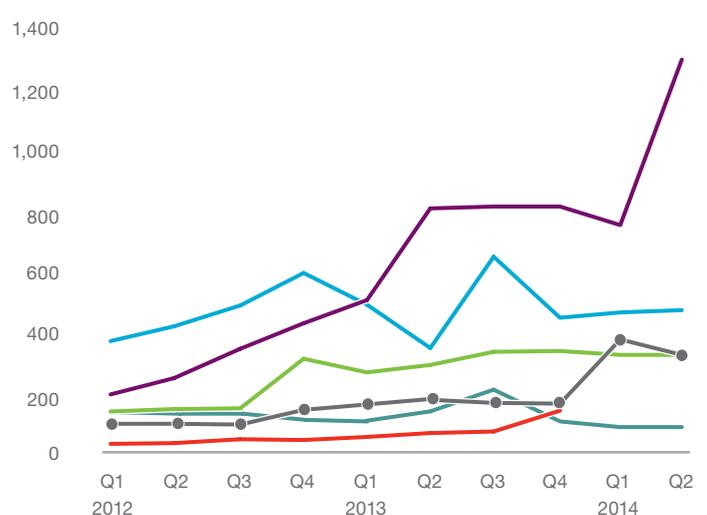
Consumers are becoming more data-centric and have high expectations for network performance. In addition, they are becoming less tolerant towards poor performance and will churn if their expectations are not met. The majority of LTE users in South Korea state that having a fast network is more important than the price plan when selecting an operator. Most LTE users in Japan claim that they would change their subscriptions for better 3G/4G network coverage and speed.<sup>3</sup>

### Median (50% probability) downlink throughput (Kbps)



Source: Ericsson analysis of data from Speedtest.net provided by Ookla (2014)

### Cell-edge (90% probability) downlink throughput (Kbps)



<sup>3</sup> Ericsson ConsumerLab (2013)

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, businesses and societies 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 more than 110,000 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.

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