ERICSSON

NORTH EAST ASIA

ERICSSON MOBILITY REPORT APPENDIX

June 2014

MARKET OVERVIEW

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 region is recognized for its rapidly emerging middle class and technology-savvy consumers. Another trend having a huge impact on the development of the region is urbanization. Over the past few decades, China has experienced rapid urbanization due to rural-urban migration. In 2011, the country passed a milestone that saw half of the population living in cities. 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 700 million by the end of 2019. This means that the nation will represent more than 25 percent of the total global subscriptions for LTE. By the end of 2013, the average monthly data usage per active subscription, including all technologies, was around 150 MB in China. Total mobile data traffic in China will increase over 15 times between 2013 and 2019, compared to around 10 times globally. To put this increase into perspective, the total LTE traffic in China in 2019 will be approximately equal to total global mobile traffic in 2013.

Studies into how the global standard of 5G can support growing 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. At the same time, each market shows a distinct character, due to varying levels of development maturity and cultural differences. Consumers in China, Japan and South Korea are different in terms of attitudes towards life, personal values and their product needs, which also leads to different behavior in their use of ICT (Information and Communications Technology).

Consumers in China are optimistic about their future finances. They believe tomorrow will be better than today. More users in China than in most of the countries studied globally think that new technology is exciting. They feel that mobile phone and internet brands can be used to show an individual's personality and distinguish them from their peers. This is especially the case among young groups.

In Japan, most consumers prefer products manufactured in their own nation, as for them it indicates high quality. There is rapid smartphone uptake among young people. The Japanese are more practical when dealing with new technology, and most of them treat it as a tool they need to master to facilitate their daily jobs and lives.

Consumers in South Korea are less optimistic about their future finances, as many experienced employment issues during 2013. Like the Japanese, South Korean consumers also prefer products made in their own country. Smartphone ownership and wide internet coverage enables them to instantly access the internet anywhere and at any time.

From voice to data

The mobile phone is becoming a tool for accessing most of the services that traditionally required a computer. Voice calls and SMSs are no longer the dominant services, especially for smartphone users, more of whom are making daily use of data-based services.

Top three services used by smartphone users (Percentage of daily users)

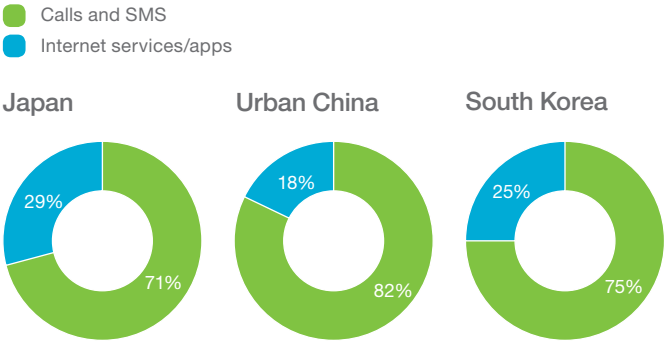
Source: Ericsson ConsumerLab (2013)
Base: Mobile phone users

In urban China, usage of data services continues to grow rapidly. Instant messaging (WeChat, QQ), which is the most popular over-the-top service, is used by more than a third of smartphone users in cities. The increasing popularity of mobile instant messaging poses a threat to the traditional SMS service. 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 a user-friendly experience are the primary drivers for the transition from SMS to instant messaging.

Mobile users in Japan are more data-oriented than voice-oriented. The most popular services used daily on mobile phones are email and web browsing. Only 30 percent make or receive voice calls on their device on a daily basis. 29 percent of mobile users in Japan think they could survive without traditional voice or SMSs if they could access internet services any time.[1]

In South Korea, 77 percent of respondents agree that a mobile phone gives them access to the information they need at the right place and time. Access to mobile data is impacting voice behavior. 47 percent of mobile data users make internet calls at least weekly, and 37 percent feel that they call people less than they did before internet calls were available. The most popular OTT service is video, followed closely by instant messaging.[1]

Preferred choice between calls/SMS and internet services/apps



Source: Ericsson ConsumerLab (2013)
Base: Mobile phone users

Media behaviors

Watching TV and video no longer involves only one screen or device – consumers choose their devices based on a range of situational factors and may switch between devices while watching. People also view more on their own and will watch content in different places and at different times. This is especially the case in markets like South Korea where 3G/4G data services are prevalent.

Korean consumers spend more time watching TV and video on mobile screens. Usage of smartphones, tablets and laptops for video has increased from a year ago. Today, 78 percent of South Koreans use mobile screens for video viewing on a weekly basis, whereas watching TV on fixed screens has declined. Over half of people use smartphones to watch TV/video outside the home and 25 percent view it when commuting.[1]

The emergence of mobile devices also affects people's device mix. The home screen mix is moving away from multiple TVs to households having just one set that is supported by a number of mobile devices. This means that TV/video can be viewed across the home. Consumers want seamless experiences across all of the various devices they use to access the internet and for entertainment.

Multi-tasking is becoming a well-established media habit. Over 45 percent of South Koreans check emails and browse the internet on a second-screen while watching videos. 43 percent research information relevant to the show and investigate products that appear in it.[1]

Social interaction is an integral part of consumers' media consumption process. In the past 2 years, the number of people using social networks while watching TV has increased. 23 percent of South Koreans use social networking sites while watching videos.[1]

Although there has been a sustained decline in the number of people subscribing to linear TV packages, there is a clear willingness to pay for HD quality, as it is important for the overall experience. In South Korea, 26 percent of video consumers would be willing to pay a premium of more than 1 US dollar per video for HD content (compared to SD quality).[1]

[1] Ericsson ConsumerLab (2013)

MOBILE SUBSCRIPTIONS

Mobile subscriptions in North East Asia exceeded 1.4 billion in 2013 and are expected to reach almost 1.6 billion by the end of 2014. This represents over 20 percent of global mobile subscriptions. Between 2013 and 2019 it is forecast that the region's mobile subscriptions will grow at a CAGR of 6 percent, leading to over 2 billion mobile subscriptions by the end of 2019. This is primarily due to the increase in mobile subscriptions in China.

Over 300 million smartphone subscriptions were added to mobile networks in North East Asia during 2013 – an increase of around 75 percent. By the end of 2014, the total number is expected to reach around 950 million, representing around 40 percent of global smartphone subscriptions. The smartphone market in Mainland China 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 2019, smartphone subscriptions are expected to exceed around 1.7 billion, surpassing the total population.

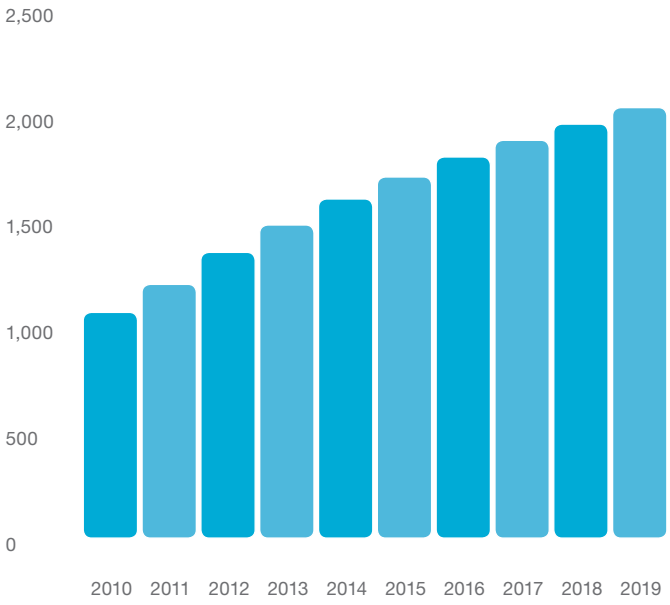
The fast adoption of smartphones among consumers in North East Asia has had a positive effect on data traffic and revenues, as well as ARPU. In Japan the adoption of smartphones has been slower than in many other developed markets, due to the fact that advanced feature phones with internet connectivity and apps were already available in the market. However, Japan's early access to mobile phones with internet connectivity has meant that data has represented a high share of operator revenue for many years now.

LTE networks were deployed widely across South Korea, Japan and Hong Kong during 2012 for both data and voice. By the end of 2013, LTE subscription penetration had already reached over 30 percent in Japan and over 50 percent in South Korea – the highest in the world. it is estimated that Japan and Korea will represent around 25 percent of the world's LTE subscriptions at the end of 2014. Mainland China has started to rollout LTE and there will be a rapid shift in China from 2G/3G to 4G, adding around 700 million LTE subscriptions by the end of 2019. Total LTE subscriptions in North East Asia are forecast to be close to 1 billion.

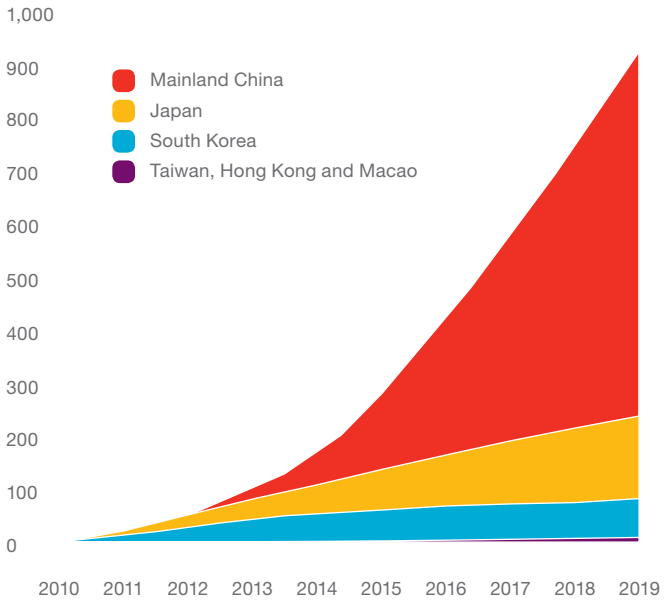
2 BILLION

mobile subscriptions
by end of 2019

Mobile subscriptions, North East Asia (million)



LTE subscriptions, North East Asia (million)



Mobile subscriptions do not include M2M subscriptions

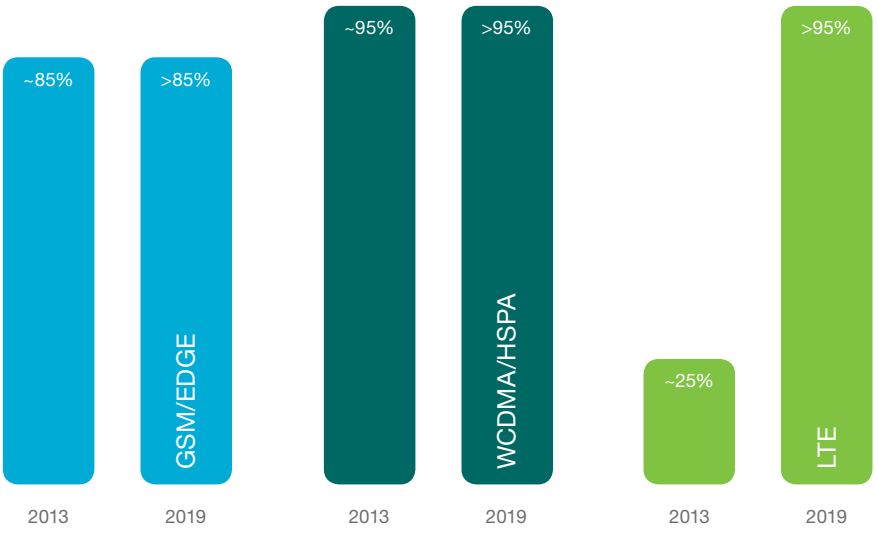
POPULATION COVERAGE

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.

Japan and South Korea have had no GSM/EDGE deployments. As a result, GSM/EDGE population coverage in the region is lower than the projected global average in 2019. WCDMA/HSPA had a population coverage of around 95 percent in the region during 2013. This is 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 started commercial LTE deployments. In 2019 it is forecast 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.

Population coverage, North East Asia



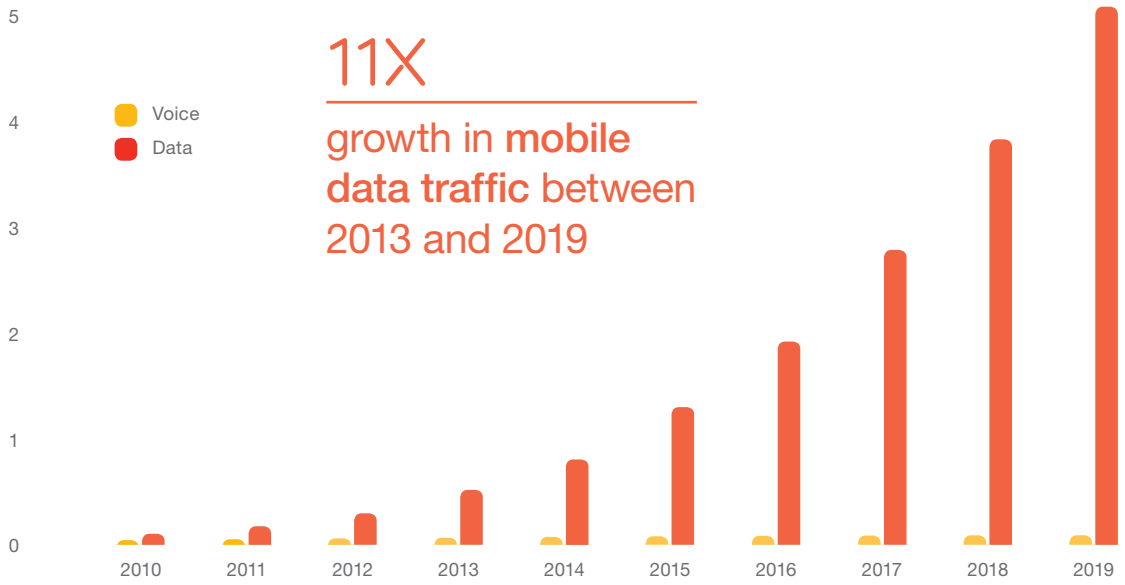
>95%

of the population will be **covered by LTE** in 2019

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 significantly increasing with the introduction of LTE. The average usage per subscription in Japan is around 1.3 GB per month. The average for LTE users in South Korea is above 2 GB per month per smartphone subscription. Mobile data traffic in the region is expected to have a CAGR of around 50 percent between 2013 and 2019 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. It is useful because 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

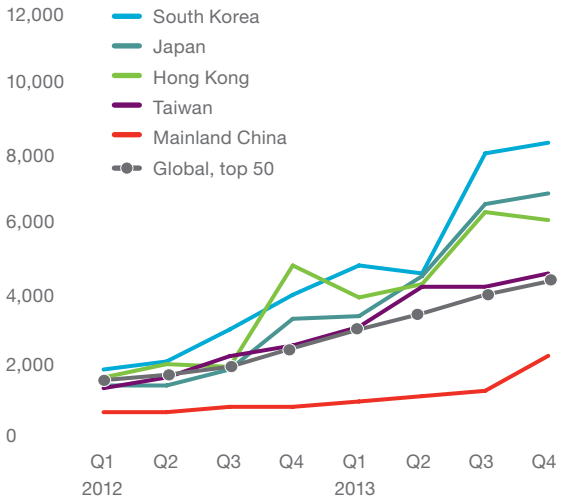
The rapid uptake of smart devices, including both smartphones and tablets, has in turn fuelled consumer demand for a better user experience. Operators are now deploying 4G/LTE coverage and capacity to meet that demand. Japan and South Korea have been at the forefront of the global LTE rollout, and massive projects for the technology are currently underway in Mainland China. LTE deployments and fast uptake of devices that can use the technology have resulted in significant improvements in user downlink throughput.

Network performance measurements from Speedtest.net have been analyzed by Ericsson to calculate median and cell edge downlink data throughput rates. 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. The figures below illustrate downlink throughput in each market in North East Asia compared to the global trend. Thanks to advanced LTE deployments in South Korea and Japan, median downlink throughput in these countries is significantly higher than the global median – 8.3 Mbps and 6.8 Mbps respectively in Q4 2013. However, the same logic does not apply for the 90 percent probability speeds, where Japan is closer to the global average. This indicates that although LTE quickly improves median downlink throughput, it requires more effort to provide good app coverage across all parts of the network. All Chinese operators were launching LTE networks in Q4 2013 and Q1 2014. These networks still have a low load and the users therefore typically get high downlink throughput, which explains the upturn for China in Q4 2013.

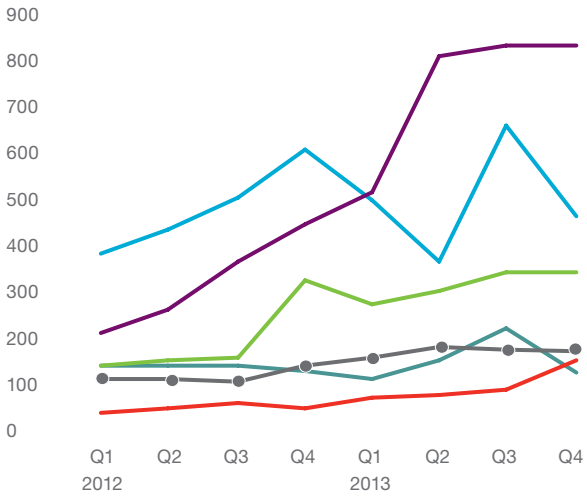
In most of the countries in the region, mobile broadband plays a very important role wherever Wi-Fi is not available. Even if there are a lot of Wi-Fi access points available, public reliance on Wi-Fi is decreasing, especially for those who use smartphones for spontaneous purposes. This creates a potential 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. They take good network performance for granted. In addition, they are becoming less tolerant towards technology and will churn if it does not live up to their expectations. 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 networks if they could get better 3G/4G data coverage and speed.[2]

Median (50% probability) downlink throughput (Kbps)



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



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

[2] 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.

Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2013 were SEK 227.4 billion (USD 34.9 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

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