Take-up of 4G-LTE in China will happen twice as fast as the earlier move to 3G, according to new GSMA Intelligence research. We forecast that there will be almost 900 million 4G connections in the country by the end of 2020, up from around 100 million this year.

Given the sheer size of the Chinese market, the recent allocation of TD-LTE licenses to all three operators in the country is a significant juncture in the lifecycle of TD-LTE. But rather than being seen as a competing technology to the more common FDD-LTE, the two LTE variants are complementary and interoperable and therefore the entire 4G ecosystem stands to benefit from the Chinese launches.

Market-leader China Mobile became the country’s first 4G operator in December 2013, with reports suggesting that it had upgraded some 200,000 of its TD-SCDMA base stations to support TD-LTE at launch. This represents a significant level of initial coverage, taking in all of the major cities on China’s East coast and therefore potentially covering as many as 500 million people. The number of 4G base stations is expected to increase to 500,000 by the end of 2014. In addition, China Mobile is set to offer more than 200 different 4G-compatible handsets this year, including a handset priced at CNY 1,000 ($165) and a number of self-branded 4G devices. Apple’s iPhone portfolio has also recently been made available to China Mobile customers.

Similarly, third-placed China Telecom plans to launch entry-level 4G smartphones at similar prices to its rival in the first half of the year before introducing mid-range and high-end models before year-end. By this time it expects to have 60,000 4G base stations.

With such large-scale rollouts underway, we expect these two operators to have the fastest initial 4G migration rates seen outside of South Korea, with close to 10% of their combined total connections migrating to 4G by the end of this year. By contrast, it took twice as long for China Mobile and China Telecom to migrate their 2G customers (on GSM and CDMA2000 1x networks, respectively) onto their 3G networks (TD-SCDMA and CDMA2000 EV-DO) following launch. For example, it took China Mobile 14 quarters to migrate 10% of its 2G connections base to 3G, but it will take approximately half that time to reach the same milestone in the move from 3G to 4G.

It is likely we will see a rather slower start to the 4G era for China Unicom. The country’s number-two operator confirmed in December 2013 that although it has been issued a licence for TD-LTE (like its rivals), it remains focused on running the majority of its 4G network via FDD-LTE – for which it is yet to receive a licence.

It is important to note that FDD and TDD LTE are two flavours of what is essentially the same standard, marking a different situation to when two technology standards (GSM/HSPA and CDMA) were competing for 2G and 3G hegemony. The availability of dual-mode FDD-TDD chipsets help mobile operators running either LTE variant to offer a wider choice of attractive 4G devices. Device manufacturers can therefore generate greater economies of scale given that
dual-mode FDD-TDD chipsets remove the need to create multiple variants, serving to lower costs.

The capability for FDD-TDD roaming (both inbound and outbound) is another advantage that mobile operators are looking to develop. A year ago, China Mobile completed international roaming trials with South Korea’s KT, Clearwire in the US and its own operation in Hong Kong to demonstrate FDD-TDD LTE interoperability and create a unified LTE marketplace. In 2012, the Multi-Mode Multi-Band (MMMB) project led by the Global TD-LTE Initiative notably defined seven core LTE bands required for global smartphone devices and an additional set of four to seven roaming bands.

In our recent report Global LTE network forecasts and assumptions, 2013-17, we explain that although 4G networks are running on a dozen different FDD/TDD frequency bands at a global level, the mobile industry has made good progress in ensuring 4G spectrum harmonisation on a regional basis. As of January 2014, there were 17 TD-LTE mobile networks commercially available worldwide (along with an additional 11 TD-LTE fixed-wireless networks), while an additional 40 mobile operators have committed to launching TD-LTE in the years to come.

At the end of 2013, TD-LTE connections made up just over one in 40 LTE connections globally, but we expect this to grow to approximately one in four by 2020. By then, the global TD-LTE market will have crossed the half a billion connections mark, with more than one in four of those connections coming from China alone.

China mobile connections by technology generation, 2000–2020

Source: GSMA Intelligence

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