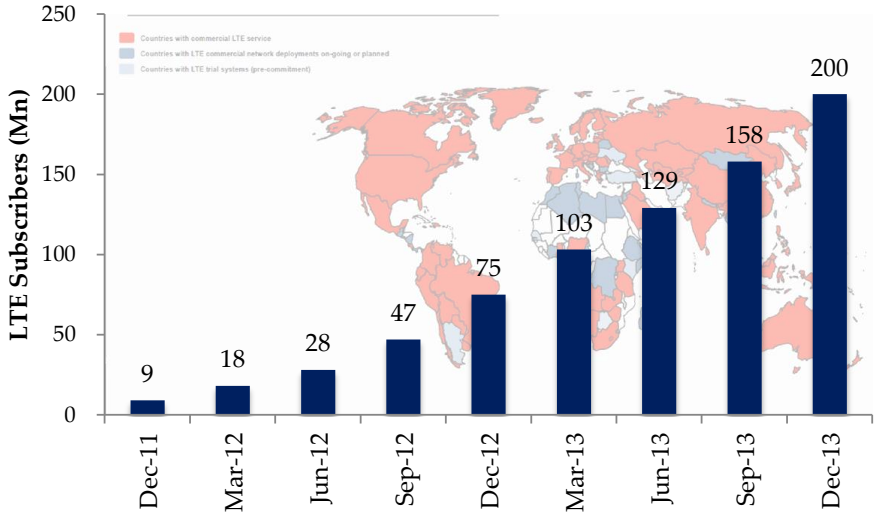
4G – India ready to join the *Elite Club* soon

India is a rare success story where telecom infiltrated the vast hinterlands before other major infrastructure. Indian wireless telephony, primarily voice-based, has completed almost two decades predominantly dominated by 2G, marked with launch of 3G and 4G in the recent future. As 3G was launched in the couple of years after the allocation of spectrum in 2010, 4G has taken little longer, although there had been few launches in some of the cities. Ecosystem challenges, apprehensions about demand for high end data services, lack of voice capability, stretched balance-sheets resulting into less room for capex intensive roll-outs, regulatory uncertainty etc were the prominent reasons for delays in 4G launches. As the commercial launches expand by multifold globally, with LTE subscriptions witnessing more than 100% growth rates Y-o-Y, there is a good pick up in smart phone penetration and data growth back home, preparing the ground for 4G. Recently concluded spectrum auctions in India have paved the way for usage of the globally popular 1800 MHz spectrum for 4G. In the coming years, war for grabbing the data pie is going get intense, with some possible overlap and cannibalization between 2G, 3G and 4G technologies. End of 2014 or early 2015 would witness action on 4G front as winners of earlier 4G spectrum (auctions held in 2010) such as Reliance Jio, Bharti AIrtel, Aircel, Tikona and Augere have to comply with roll out obligations by August 2015.

Global Scenario – LTE growing exponentially

LTE Subscriber Growth - Worldwide



Source: Global Mobile Suppliers' Association (GSA)

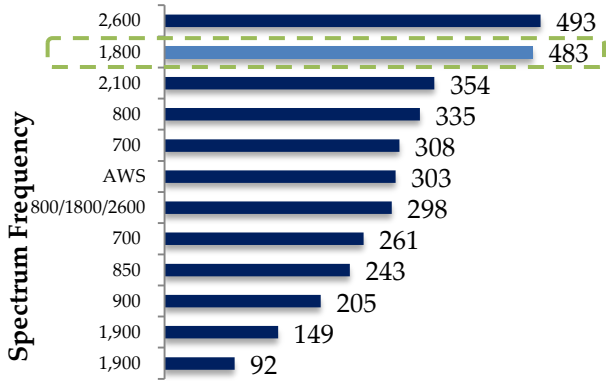
Long Term Evolution (LTE), the most prominent 4G technology, constitutes less than 3% of the global mobile subscriber base of 6.8 billion but has been growing at a phenomenal pace as the subscriber base exploded from mere 11 million at the end of 2011 to more than 200 million at the end of 2013.

Worldwide LTE technology is being adopted in 152 countries by 524 operators. 471 operators have made firm deployment commitments in 143 countries, of which 274 operators have launched commercial services in 101 countries. By the end of 2014, total 350 commercial LTE networks are expected to be in place. North America represents around 50% of the total LTE subscriber base of 200.1 million, Asia Pacific represents next 39% and Europe constitutes around 8.2%. LTE subscriptions have clocked gigantic growth i.e. 166% in 2013 vis-à-vis total subscriber growth of 6.25% in 2013. (Source: Global Mobile Suppliers' Association).

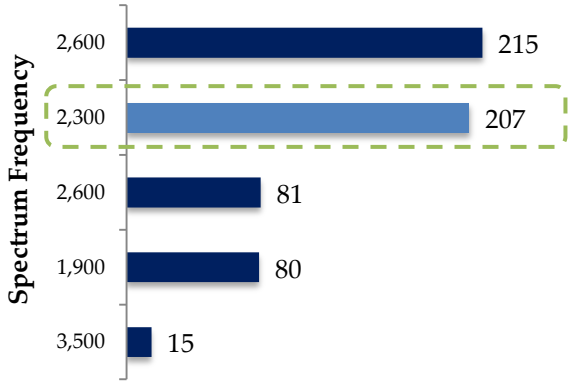
Ecosystem Challenges

One of the biggest challenges for adoption of LTE is lack of established ecosystem primarily because of two different technologies viz – Frequency Division Duplex (FDD) primarily used by American and European operators and Time Division Duplex (TDD) embraced by Chinese and Indian operators. Also there are dozens of bands across these two technologies across different spectrum frequencies. Nevertheless, the number of LTE devices available globally has more than doubled to 1,371 in December 2013 available from 132 different manufacturers which itself grew by 52% Y-o-Y.

FD-LTE Devices – January 2014



TD-LTE Devices – January 2014



Source: Global Mobile Suppliers' Association (GSA)
Indian players would be operating in 1800 MHz FD-LTE and 2300 MHz TD-LTE bands.

With allocation of 2300 MHz spectrum in 2010, Indian players went for TD-LTE alongwith their Chinese counterparts like China Mobile. Their decision to shift towards FD-LTE in 1800 MHz will help 4G to grow in India as it is the most widely used LTE band globally with 44% of the total launches in that band and will have the largest ecosystem very soon. Though TD-LTE is picking up gradually, Indian players would find it difficult to source devices

operating across these two different technologies. The biggest challenge for Indian players willing to launch 4G in both these bands would be cross-functional ecosystem across these bands.

Given the higher price point of LTE enabled smartphones, LTE dongles and Wi-fi hotspot devices like routers would be the early entrants in the 4G arena. Smartphone and tablet penetration would enhance provided there is handset subsidy from the operators' side. Considering India's 55 million DTH connected homes, next in line would be the LTE enabled set top boxes which will facilitate both broadband and television services, making a normal TV into a smart TV, enabling Video-on-Demand and cloud storage.

4G – Impact on the Indian Telephony

i. Data

In spite of the phenomenal growth in the LTE devices, device availability in the affordable range as compared to 2G and 3G, will remain a challenge in India in the near future. For basic data needs such as email, web browsing, Social Media etc, 2G and 3G data are going to remain the preferred technologies, as smartphones in those technologies are available at a price range of below Rs. 5,000. For data intensive applications like video streaming, HD gaming, video chat etc, 4G can be the technology of choice. CARE Research believes that there will not be immediate cannibalization of 2G and 3G data users by 4G in a big way in the near future but all the technologies would co-exist for few years. India has around 15 million wireline broadband users which would be the primary targets of 4G. Also there are few million dongle based data users who would be ready to shift loyalties towards 4G for better speed. Smartphones and tablet usage would pick up gradually. Also, there are various Machine-to-Machine (M-2-M) applications in the field of healthcare, banking which can be effectively run only on a high-speed internet like 4G, which would make inroads once the technology crosses the trial phase.

ii. Voice

4G's impact on voice telephony is difficult to predict in the near future but certainly would eat up the pie as **Voice-over-LTE (VoLTE)** becomes mature especially with technological innovations like HD voice. There is still a lot of ground to cover although there are 42 smartphones offering VoLTE in the global market. If successful, the voice call rates would be substantially down on VoLTE as compared to 2G/3G rates especially for long-distance calls and would pose a challenge for the traditional voice telephony.

Globally, most of the operators like Verizon, AT&T etc use **Circuit-Switched-Fall-Back (CSFB)** technology which uses the existing 2G/3G network to carry voice and LTE network for data. Even in India, leading 4G players are planning to use it to provide voice services. CARE Research believes that CSFB would not have any substantial impact on voice-telephony as ultimately 2G/3G networks would be used for voice. For CSFB, 4G operators with

existing 2G or 3G operations would have an edge over a pure play 4G operators as the latter would have to tie up with a telecom operator for 2G voice and might have to give away some share of revenue.

Infrastructure Sharing – New Mantra for Quick Turnaround

Network infrastructure is one of the constraints for launch of 4G as it requires good backhaul connectivity like Optical Fiber Cable (OFC) network. With Bharti's 178,000 route km or (rkm), Rcom's 190,000 rkm, Idea's 80,000 rkm capacity and network from few other large players like BSNL and Railtel, existing network capacity offers opportunities for the 4G players to ink deals for sharing the OFC network similar to RJio-Rcom and RJio-Bharti deal. Simultaneously, most of the players are in the process of increasing their own fiber capacity. Laying OFC is a capex intensive exercise as it requires Rs. 0.4-0.5 million per km on average, at times upto Rs. 100 million in Metros as the local governments charge exorbitantly for the Right of Way.

On the tower front, India has over 400,000 towers spread across 22 circles owned by various telecom owned operators as well as third party operators. For the existing telecom operators which provide 2G and 3G services, 4G roll-out would be relatively easy as the 4G Base Transceiver Station (4G) can be accommodated within the same premises as compared to a new entrants like Reliance Jio who will have to go for a complete greenfield roll-out. As there is near over-supply situation in the tower business and also the new BTS are energy efficient, rentals for new deals are going down bringing down the roll out costs for 4G operators.

Voice-over-LTE (VoLTE) – The 'Achilles Heel'

As India remains a voice-centric market with non-voice revenue contributing just 15-20% to operators' revenue, lack of credible voice offering is keeping 4G on back foot. Voice-over-LTE has been in the news for quite some time but has not yet established itself as a credible alternative to the existing voice technology, even globally. In India on the regulatory front, 4G operators have been allowed to offer voice services by obtaining Unified License paying Rs. 16.6 billion for a pan-India voice offering.

Spectrum in 2300 MHz, auctioned in 2010 in India, is not suitable for carrying voice being in the higher frequency band and would be used primarily for data purpose. With the recently won spectrum in the 1800 MHz, operators would be able to effectively launch VoLTE if required. In spite all the efforts to launch VoLTE, CSFB seems to be the technology of choice for the time being.

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