

Review on spectrum auctions in India

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On 1st August 2018, Telecom Regulatory Authority of India (TRAI) had released recommendations on auction of spectrum in 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3400 MHz, 3400-3600 MHz bands. The 3300-3400 MHz and 3400-3600 MHz bands are expected to be used as primary band for early 5G introduction. Now just after few days, the Steering Committee on behalf of the high level forum is out with a report 'Making India 5G ready' that provides recommendations on subjects like spectrum policy, regulatory policy etc. for early deployment of 5G in India. The report articulates the vision for 5G in India and recommends policy initiatives and action plans to realize this vision.

Also, the report recommended that most guidelines on regulatory matters be promulgated by March 2019 to facilitate early 5G deployment. With this pace, it looks like the government is very keen on introducing 5G technology in the country.

Before we move on to 5G technology, let us look through the evolution of 2G, 3G, 4G technologies in India and the spectrum auctions that had taken place over the years in the country which aided the introduction of these technologies.

Evolution of 2G, 3G, 4G technology

The 2G technology was the first to be introduced which was followed by 3G and 4G technology that entered in 2010 and 2016, respectively, in India.

Table 1: Frequency band and supporting technology

| Technology | Frequency band |
|------------|--------------------|
| 2G | 900 MHz, 1800 MHz |
| 3G | 2100 MHz, 900 MHz |
| 4G | 1800 MHz, 2300 MHz |

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The Indian telecom industry has evolved over the years with the first frequency band of 900 MHz band being introduced in 1994 to the introduction of 700 MHz frequency band in October 2016 spectrum auction. The 900 MHz band that was initially used for 2G networks can now also be deployed for 3G services. The bands of 1800 MHz, 2300 MHz, 2500 MHz that were introduced can be deployed for 4G services and 2100 MHz band can be deployed for 3G services.

Background on spectrum auction

Till 2008, spectrum assignment was done administratively in 800 MHz, 900 MHz and 1800 MHz bands. Post this, it was for the very first time in 2010 that spectrum in 2100 MHz and 2300 MHz bands were assigned through auction mechanisms. Later from February 2012 onwards, spectrum assignment in all bands have been made through auction process. The table below provides a summary of the auctions conducted since 2012.

Table 2: Access Spectrum Auctions conducted in India since 2012

| Year | Months | Spectrum bands | Spectrum put to auction | Spectrum sold |
|---------|--------|----------------|-------------------------|---------------|
| 2012-13 | Nov-12 | 1800 MHz | 295 MHz | 127.5 MHz |
| | | 800 MHz | 95 MHz | No bidder |
| | | 900 MHz | 46 MHz | No bidder |
| | Mar-13 | 1800 MHz | 57.5 MHz | No bidder |
| | | 800 MHz | 95 MHz | 30 MHz |
| 2013-14 | Feb-14 | 900 MHz | 46 MHz | 46 MHz |
| | | 1800 MHz | 385 MHz | 307.2 MHz |
| 2014-15 | Mar-15 | 800 MHz | 108.75 MHz | 86.25 MHz |
| | | 900 MHz | 177.8 MHz | 168 MHz |
| | | 1800 MHz | 99.2 MHz | 93.8 MHz |
| | | 2100 MHz | 85 MHz | 70 MHz |
| 2016-17 | Oct-16 | 700 MHz | 770 MHz | No bidder |
| | | 800 MHz | 73.75 MHz | 15 MHz |
| | | 900 MHz | 9.4 MHz | No bidder |
| | | 1800 MHz | 221.6 MHz | 174.8 MHz |
| | | 2100 MHz | 360 MHz | 85 MHz |
| | | 2300 MHz | 320 MHz | 320 MHz |
| | | 2500 MHz | 600 MHz | 370 MHz |

Source: TRAI

From the above table, it can be concluded that the spectrum auction conducted in 2012-13 was relatively not successful as only 26.8% of the spectrum auctioned was sold while in the following years 2013-14 and 2014-15, 81.9% and 89% of the auctioned spectrum was sold, respectively. In 2015-16, no spectrum auction was conducted and later in 2016-17, spectrum auction was held in October 2016 which again was not a success where only 41% of the total auctioned spectrum was sold.

Reasons for failure of October 2016 spectrum auction

The latest auction was held in October 2016 where the overall spectrum of 2,354.55 MHz was put up for sale which belonged to 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz bands. Of this, around 965 MHz that equals to 41% of the spectrum was sold.

The spectrum however remained completely unsold in 700 MHz and 900 MHz bands. Citing high price and the lack of ecosystem for spectrum in 700 MHz band as major barriers, the telecom companies opted for spectrum in 1,800/2,300/2,500 MHz bands that can be used to provide 4G services to their customers. Also, some quantum of spectrum was unsold in other bands as well.

770 units of spectrum were put up for sale of the 700 MHz band. Each unit of 700 MHz band was reserved at Rs.11,475 crore and it required a telco to bid for a minimum block of 5 MHz. This implies that a telco had to pay a high price of about Rs.57,375 crore to get spectrum in this band. The telecom industry however found this deal very expensive and thus did not bid for it despite the fact that the 700 MHz band is found to be the most efficient band to provide 4G services. Also, the sale of spectrum depends on the availability of network and device ecosystem and this band lacks the device ecosystem necessary for its expansion.

Issue of spectrum at higher price

As discussed above, higher price was one of the major reasons for the limited success of October 2016 spectrum auction. Now the question arises that would the government still opt for the spectrum prices recommended by TRAI even when the Steering Committee has stated that the cost of spectrum, relative to per capita GDP, is much higher than most countries. It commented that in recent years, the high cost of spectrum has left large quantities of unsold spectrum. Thus, the report mentioned that it is important that India correct these anomalies in 5G.

With these recommendations by the committee and financial difficulties faced by the Indian telecom companies, it appears very unlikely that the telcos will opt for spectrum auction which the government plans to roll out in near future. However to make sure that the telcos participate in the auction, TRAI suggested initiation of frequency bands that are likely to be used as primary band for early 5G introduction. Thus, introduction of 3300-3400 MHz and 3400-3600 MHz bands is recommended for the next auction. Moreover, TRAI recommended 42.7% lower reserve price for each unit of 700 MHz band at Rs.6,568 crore. Each unit of 700 MHz band was priced at Rs.11,475 crore in October 2016 auction.

If the telcos still opt for 5G spectrum?

As per the latest release, TRAI suggested a reserve price of Rs.492 crore for each unit under new band 3300-3600 MHz band. This band will have to be put to auction in the block size of 20 MHz. Thus, a telco will have to pay Rs.9,840 crore to buy this spectrum. Also, TRAI recommended that out of the 200 MHz available in this band, 25 MHz spectrum is identified for ISRO's use and the remaining 175 MHz spectrum is available for access services. *Thus, if it is considered that the entire 175 MHz spectrum is sold at reserve price by the government, it will result in payment of Rs.86,100 crore by the telcos.*

This amount is significantly higher than the total spectrum worth Rs.64,809.1 crore sold in October 2016 auction. The table below details the value of spectrum sold in the earlier auctions.

Table 3: Year-wise value of spectrum sold in India

| Value of spectrum sold | |
|------------------------|----------------|
| Year | (in Rs. crore) |
| 2010 | 76,663.9 |
| 2012 | 9,642.1 |
| 2013 | 4,113.7 |
| 2014 | 61,162.2 |
| 2015 | 113,932.2 |
| 2016 | 64,809.1 |

Source: Wireless Planning & Coordination Wing

It is to be noted that the Steering Committee stated that India needs more quantum of spectrum and the country's spectrum allocation needs a big fillip. The report mentioned that while the licensed mobile spectrum is about 220 MHz in India, the licensed spectrum is 608 MHz in USA and 353 MHz in UK.

Concluding remarks

With recent developments and announcements, it appears like the government is very keen on early adoption of 5G technology. For this, TRAI recommended introduction of bands that could be used for deployment of 5G technology and suggested a reserve price for the same. Subsequently, the Steering Committee recommended lowering the reserve price for spectrum as its price is higher compared to other countries. However, these recommendations come at a time when the telecom industry is under pressure and is facing financial difficulties.