

India initiates the world's most complicated spectrum auction

A regular column on the information industries

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In August 2018, the Telecom Regulatory Authority of India (TRAI) recommended that, subject to certain modest caveats, all of the available unsold and expiring spectrum in the 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz, 2.3 GHz, 2.5 GHz and 3.3–3.6 GHz bands should be sold via auction. The TRAI proposed that the 3.3–3.6 GHz band – set aside for 5G services – should be divided into 20 MHz unpaired blocks with a cap of five blocks per bidder but without the imposition of roll-out obligations. However, there should be an embargo on secondary sales for a period of five years. Needless to say, constant squabbling among the operators – for example, Reliance Jio wanted to proceed immediately, whereas Vodafone Idea wanted a delay to bolster its finances and Bharti Airtel wanted the 4G but not the 5G spectrum to be auctioned – led to a proposed delay until 2019H2.

Progress was again held up when, in April 2019, the Department of Space and the Indian Space Research Organisation refused to vacate their controlled spectrum in the 3.5 and 28 GHz bands proposed for 5G services.

In June, the government announced that there would be an auction for more than 8200 MHz of spectrum before the year-end, comprising spectrum in the

700 MHz, 800 MHz, 1800 MHz, 2.3 GHz and 3.5 GHz bands. The need to revive state-owned operators BSNL and MTNL would be factored into the proceedings. The auction was pencilled in for April 2020 but the widespread view was that exorbitant reserve prices and a lack of suitable spectrum for 5G would put off the bidders that were short of cash – that is, the majority.

In May 2020, further disquiet was expressed about the proposed reserve price of \$65m per megahertz in the 3.5 GHz band and there was general agreement that this band would need to be excluded from any auction that might take place during 2020.

It was noted that there was still no official news concerning the availability of the 26 GHz band and that the Department of Telecommunications had yet to request recommendations on pricing from the TRAI. Reliance Jio had requested that it be allowed to conduct trials using an 800 MHz channel in the band (as well as a 100 MHz channel in the 3.5 GHz band) for its proposed new home-grown network. However, until it was finally clear whether Huawei or ZTE would be permitted to participate in 5G network construction, which seemed unlikely given recent antipathy by the government towards

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matters Chinese, 5G in India remained in a state of semi-limbo.

Furthermore, backhaul limitations were affecting the roll-out of 5G. There was a preference to use the E-band (71–78 GHz) and V-band (57–64 GHz) for backhaul but these had yet to be assigned centrally – the TRAI's preference – or auctioned – the preference of the operators that want to exclude non-telecom players.

In December, the government approved a plan to auction 2309 MHz of spectrum in March 2021, to be used for 2G/3G/LTE. The bands were as follows: 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz, 2.3 GHz and 2.5 GHz. Notably, the 5G 3.3 and 3.5 GHz bands were not to be included in the sale although the 700 MHz band was also potentially suitable for 5G services.

The total reserve prices amounted to \$53.3bn which seemed likely to discourage participation. However, with so few private operators left in the market, and Vodafone Idea (trading as “Vi”) under severe financial stress, the likeliest outcome seemed to be selected buying at reserve prices.

In the event, only Bharti Airtel, Reliance Jio and Vodafone Idea deposited Earnest Money Deposits (EMDs), and as bids are normally capped at roughly seven times EMD this indicated that not all of the available spectrum would be sold. It was suggested that this might be to preserve some cash for the subsequent sale of 5G spectrum. The 660 MHz available across all circles in the 700 MHz band that could be upgraded for 5G might have seemed to be the most attractive on offer but the very high reserve prices were an obvious deterrent and in the event it received no bids. The 2.5 GHz band also remained wholly unsold.

The total spectrum won was 855.6 MHz and the total raised was \$10.6bn. Bharti Airtel paid \$2.5bn for

a total of 355.5 MHz, Reliance Jio paid \$7.8bn for 488.4 MHz and Vodafone Idea paid \$0.3bn for a mere 11.8 MHz in the 900 and 1800 MHz bands.

Overall, the three bidders bought only 37% of the spectrum on offer. The only sensible conclusion to draw was that the operators sought to repurchase their existing licences that were due for renewal and bought only sufficient extra spectrum to provide capacity to meet demand for 4G. 5G appeared to have been ignored. Predictably, the government claimed that the auction had been a success.

In January 2021, Bharti Airtel announced that its network was 5G-ready and had been tested using the 1800 MHz band in use at the time for 4G provision. It intended to wait for the release of 5G spectrum prior to a widespread launch as it considered that the price of 5G-capable smartphones needed to fall significantly.

The incentive for the government to hold a 5G auction before the end of April 2022 was that receipts would be counted as part of the 2021/2022 financial year and in May the three major incumbents were authorised to conduct trials in the 700 MHz, 3.5 GHz and 26 GHz bands, but it was notable that the authorised vendors were Ericsson, Nokia, Samsung and state-owned C-DOT – a list containing no Chinese vendors.

Inevitably, there were further delays but it became clear that these were caused in good part by the extraordinary scale of what was proposed. In June 2022, there appeared a 153-page document accompanied by a number of Annexures such as Annexure A containing details of reserve prices and Annexure F containing details of the precise blocks within spectrum bands to be sold. In all, 10 spectrum bands will be auctioned simultaneously, and while they will in practice mostly be assigned by operators for 2G/3G/4G services, all

of the spectrum is issued on the basis of technical neutrality and hence can be used to provide 5G services.

The auction will take the form of a Simultaneous Multi-Round Ascending e-auction conducted over the internet. The initial clock stage will allocate spectrum blocks simultaneously for the Licensed Service Areas (LSAs) with bidders subject to spectrum caps. This will be followed by a second stage to identify specific bands for the winning bidders

The “effective date” on which licences will commence was stated as 20 years commencing on “the date of frequency assignment as mentioned in the Frequency Assignment Letter, or the 31st day of receipt of upfront payment, whichever is earlier”.

The licences will be allocated on the basis of (up to) 22 LSAs comprising three metro, five “A”, eight “B” and six “C” categories. The frequency bands on offer comprise (Annexure F):

- 600 MHz: 673–703 MHz paired with 622–652 MHz. Six blocks of 5 MHz paired (a total of 60 MHz) in each of 22 LSAs.
- 700 MHz: 723–748 MHz paired with 778–803 MHz. Five blocks of 5 MHz paired (a total of 50 MHz) in each of 22 LSAs.
- 800 MHz: 824–844 MHz paired with 869–889 MHz. However, the number of blocks, each of 1.25 MHz paired (a total of 2.5 MHz), available in 21 LSAs varied between 3 and 8.
- 900 MHz: 890–915 MHz paired with 935–960 MHz. However, the number of blocks, each of 0.2 MHz paired (a total of 0.4 MHz), available in 21 LSAs varied between 4 and 42.
- 1800 MHz: 1710–1765 MHz paired with 1805–1860 MHz. However, the number of blocks, each of 0.2 MHz paired (a total of 0.4 MHz), available in 19 LSAs varied between 5 and 142.

- 2100 MHz: 1939–1979 MHz paired with 2129–2169 MHz. However, the number of blocks, each of 5 MHz paired (a total of 10 MHz), available in 19 LSAs varied between 1 and 3.
- 2300 MHz: 2300–2380 MHz unpaired. However, only one block of 10 MHz was available in six LSAs in the 2370–2380 MHz band.
- 2500 MHz: 2535–2555 MHz unpaired and 2635–2655 MHz unpaired. However, the number of blocks, each of 10 MHz, available in 19 LSAs varied between 1 and 4.
- 3300 MHz: 3300–3630 MHz unpaired. 33 blocks of 10 MHz unpaired (a total of 330 MHz) available in all 22 LSAs.
- 26 GHz: 24250–27500 MHz unpaired. 57 blocks of 50 MHz unpaired (a total of 2850 MHz) available in all 22 LSAs.

It should be noted that, in the cases where the spectrum is paired, the Annexure only refers to the amount of MHz available in one half of the pair – that is, half that cited above.

Annexure A details the reserve price per MHz and per block in each band together with the EMDs per block. These must be adjusted in practice where the spectrum is sold as paired – as the tables treat this as unpaired – for example, the reserve price per block in the 600 MHz band is five times the reserve price per MHz whereas a block comprises 10 MHz (5 MHz paired). Reserve prices vary by an extraordinary amount between LSAs – for example, in the 600 MHz band, the reserve price in Delhi is 30 times as high as in Jammu & Kashmir. Unsurprisingly, Delhi and Mumbai are consistently the most expensive, but that is far from true of Kolkata, the third Metro LSA. Maharashtra is in

most cases the third-most expensive LSA. Unsurprisingly, the 26 GHz band has extremely low reserves. It is worth noting in this context that there are no Spectrum Usage Charges.

Annexure B details the spectrum holding caps. These are divided between the sub-1 GHz, 1800–2500 MHz, 3300 MHz and 26 GHz bands. In the first two bands there are small differences among the 22 LSAs whereas the caps in the latter two bands are the same for all – equivalent to roughly 130 MHz in the 3300 MHz band and 1100 MHz in the 26 GHz band. Specifically, as stated in section 9.7, the caps were:

- 40% of the combined spectrum holding in the sub-1 GHz bands including existing spectrum holdings in these bands;
- 40% of the combined spectrum holding in the 1800, 2100, 2300 and 2500 MHz bands including existing spectrum holdings in these bands;
- 40% of the total spectrum offered in the 3300 MHz band (rounded off); and
- 40% of the total spectrum offered in the 26 GHz band (rounded off).

It is noted that spectrum reserved for BSNL in the 600 MHz, 3300 MHz and 26 GHz bands will be excluded when calculating spectrum caps.

Section 6 of the document sets out the payment options. If an up-front payment is made covering a period of years – for example, two of the 20 – than no further payment becomes due until the beginning of the third year. Annexure D details an indicative schedule for payment, using an example where a licence winner pays two instalments of the cost up-front followed by a further 18 instalments commencing two years later at an interest rate of 7.2%. What this indicates is that these 18 instalments,

which are each identical, result in the winner paying almost twice as much as it would have done if paying the full fee up-front.

The role of a new entrant is dealt with in the document section 3.2. This starts by observing that a licensee with spectrum in one band in a given LSA will be treated as a new entrant if bidding for any other band in the same LSA. It notes that any licensee whose licences expire during calendar 2022 will be treated as a new entrant. A potential new entrant will be obliged to demonstrate that its net worth exceeds a specified minimum in any LSA where it seeks a licence.

Section 8 of the Notice details the roll-out obligations. In all bands these are divided between those imposed in Metro LSAs and those imposed in non-Metro LSAs. Both sets of obligations are identical for the five lowest bands.

The above represents the world's most complicated spectrum auction so far, covering as it does four generations of technology, 10 spectrum bands and up to 22 LSAs. It is a tribute to Indian bureaucracy but how it will pan out is another matter. It may be argued that the failure to offer national licences is a complicating factor, but that has always been the norm in India. The fact that there is one very well-funded operator, Reliance Jio, essentially competing with two poorly funded operators, Bharti Airtel and Vodafone Idea, is also problematic. At the end of the day, this auction is supposed to herald the long-delayed issue of 5G licences but there remains a suspicion that this objective will only be achieved in part.

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