

TELEWINGS COMMUNICATIONS SERVICES PRIVATE LIMITED

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08 September 2014

Shri Arvind Kumar,
Advisor (Networks, Spectrum and Licensing)
Telecom Regulatory Authority of India
Mahanagar Doosanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi 110002

Subject: Response to Consultation Paper (10/2014) on Valuation and Reserve Price of Spectrum: Licences expiring in 2015-16

Dear Sir,

Please find enclosed our response to the Consultation Paper subjected above.

We hope that the Authority will find our response useful and consider our inputs while formulating the recommendation on the subject.

Thanking you,

Yours sincerely,
For **Telewings Communications Services Private Limited**

(Pankaj Sharma)
Sr. Vice President and
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Encl: a.a.

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Telewings (Uninor) Submissions

on

TRAI Consultation Paper – Valuation and Reserve Price of Spectrum: Licenses expiring 2015-16 dt 7th August 2014 (No. 10 of 2014)

Preamble

At the outset, we would like to submit that this consultation is a welcome step towards transparency in the spectrum allocation policy and we hope that the recommendations of the Authority should ensure level playing field for all the telecom service providers.

The paper has comprehensively covered the issues related to the availability of spectrum from the expiry licenses, their non-contiguous nature and a recapitulation on the detailed valuation methodologies adopted in the recommendations made in September 2013. However, there are a few other issues which warrant the Authority's consideration, these are covered in subsequent paragraphs.

Successful Auction Feb'2014

The auction held in Feb'14 was highly successful. The expiry licensees were able to secure spectrum in Metro circles of Delhi, Mumbai and Kolkata. Existing service providers exhibited active participation in all service areas for additional top-up spectrum based on their business plans. The entire spectrum in 900 MHz band and 80% of spectrum in 1800 MHz band were sold in well formulated bidding process. The Government was able to garner adequate amount of funds from that auction. Foreign telecom companies like Telenor through its subsidiary M/s Telewings also reposed faith in the auction process by acquiring spectrum in new service area Assam and additional spectrum in four of its existing circles.

Key takeaways from Feb'2014 auction

This makes us reflect on the key factors which has aided to the confidence of Indian and foreign investors in the telecom sector. The following were the key take away from Feb'14 auction:

- Reasonable reserve price (40 to 50 % less than prohibitive reserve price of 2012)
- Adequate availability of spectrum (429.2 Mhz)
- First time spectrum was acquired in new geographies and newer bands.
- Successful auction of spectrum in 900 MHz band (100% auctioned due to high demand) in addition to 1800 MHz band (80% auctioned)

In our opinion, the **Government should replicate the success of Feb'2014 auction and aim to generate similar interest in potential bidders during this round of auctions by retaining the positive elements from the last successful auction.**

TRAI had undertaken an exhaustive exercise of valuation and reserve price of spectrum in 2013, this was well debated in open house discussions and through written submissions. **These reserve prices have been accepted by the market place and we feel there is no need to relook at this aspect since results may not be substantially different from the last time. Instead, it is recommended that all energies should be channelized towards making the right set of policy decisions to make the next round of auction equally successful.**

Does the proposed auction create entry barriers for prospective new entrants?

As is emerging from the current situation, licenses of some of the TSPs in few of their key markets are expiring and it is essential for them to secure back their spectrum holding to ensure continuity of service. In the present round of consultation, the Authority itself has noted that the availability of spectrum for this auction is not sufficient and has accordingly proposed 184 MHz of spectrum to be put to auction in the 900 MHz band, entire quantum of this spectrum is presently being held by expiry licensees. As the Authority has rightly explained in Section 2 and summarised the business continuity risks of expiry licensees in table 2.8 of the consultation paper. The inventory of spectrum for the forthcoming auctions is severely depleted and unless immediate steps are taken on an urgent footing to make available adequate spectrum in the forthcoming auctions, there is a very real danger that there will not be sufficient spectrum on offer at the forthcoming auction to meet the demands of the operators as well as the objectives of the Government.

Due to the limited quantum of spectrum availability, although equal opportunity will be available for prospective new entrant to acquire the spectrum, however their chances of winning will be minimal considering that expiry licensees will try to retain their existing spectrum holdings in 900 MHz band to avoid disruption in services which might lead to **concentrated bidding, with disastrous results for the industry** which is already under severe financial burden.

Similarly, in 1800 MHz band, it is proposed to auction 104 MHz out of which only 35 MHz is in contiguous full blocks, the remaining is in small chunks of fragmented spectrum. **This fragmented spectrum is not useful for launch of any data centric network for prospective new entrants.** It will be safe to infer that there is **no spectrum in 900 band for new service provider** is available for new service provider and the only available spectrum for new service provider in 1800 band is in Kolkata, Orissa, Tamilnadu.

From the above, it is clear that the possibilities of acquiring spectrum by prospective new entrants are significantly low and hence Government should strive to ensure availability of adequate amount of spectrum for this auction.

Spectrum availability – an ingredient for successful auction

Presently, it is the case of many chasing a few. The severe crunch of spectrum is further accentuated by fragmentation. The entire 45 mhz in sub-Ghz band should be harmonised and **all service providers should have equal opportunity to secure at least 5 Mhz in sub-Ghz band.**

Present auction should support Broadband / Digital India

The clear objective enunciated in NTP 2012 is to maximize public good by making available affordable, reliable and secure telecommunication and broadband services across the entire country. It also enunciates creating multiplier effect and transformational impact of such services on the overall economy. Similarly, the stated objective for auction is to maximise revenue proceeds from the auctions within the set parameters in the NIA.

In view of above objectives, TSPs are bound to support the Government vision of 'Digital India' for enabling faster rollout of Broadband in the country. To achieve the same, the primary objective of Government is always to ensure providing necessary resources (Spectrum) to TSPs in a time bound manner to prepare them for making the vision of Digital India into a reality whereas the secondary objective can be achieved from auction proceeds, annual revenue shares and growth of GDP. As per World bank estimates, the

10% increase in broadband penetration accelerates economic growth by 1.38%.¹ The implicit gain of Broadband penetration is many fold to the economy than direct auction proceeds.

The broadband technologies like 3G work at a minimum of 5MHz paired, while the LTE can be deployed at lower bandwidths, but the minimum quantum for commercial use is in 5MHz paired or 10MHz TDD. It is universally accepted that 5MHz liberalised spectrum is the minimum ask for a data centric network.

During the last auction, geographically and spectrally partial spectrum was sold as liberalised spectrum. In the proposed auction also 49 Mhz in 900 band and 69 Mhz in 1800 band (104 less 35) is partial hence not fit for broadband deployment. The valuation arrived at is for 5 Mhz liberalised spectrum and it cannot be applied to fragmented small chunks of spectrum.

It is incumbent on Regulator and Licensor to put in place **policies to make available contiguous blocks of 5 Mhz liberalised spectrum in all possible bands**, so that the networks are being rolled out in the next 2 to 3 years and the telecom sector is fully geared to meet the future data demand from mobile broadband.

Hence, we request TRAI to recommend -

- **50% discount on the reserve price (fixed for 2015 auctions) where either partial and / or less than 5 MHz (smaller chunks) of fragmented spectrum is available for auction** in line with the Government decision of reducing 50 percent² reserve price of 800 MHz band in lieu of partial availability of the spectrum in 800 MHz band.
- **Reiterate its earlier recommendation of rearrangement of all spectrum within the band (liberalised and administrative).** This exercise should be completed in a time bound manner before commencement of the auction.

Continuous supply of spectrum is imperative for data growth

The present consultation acknowledges the significant growth of data usage (from 4381 crore MB in April 2013 to 6055 crore MB in March 2014). In the current situation where 6 to 8 service providers are vying for the limited quantum of spectrum having no visibility of additional quantum / band may prove to be detrimental to data growth. It will be an impediment to ensure Quality of Service at all times.

We are at the cusp of exponential growth in mobile data and Government should channelize all its resources to make available additional spectrum as an enabler to data growth.

In view of above, **all efforts should be made for timely availability of resources (contiguous spectrum at reasonable price and faster allocation of MW backhaul etc.) to support data growth.**

1. EY report "Broadband Highways: Driving India's Growth Story" August 2014

2. As per the press release on Union Cabinet's approval of Revised Reserve Price for the Auction of Spectrum in 800 MHz band (CDMA) and Pricing of Spectrum for current spectrum holding in 800 MHz band(CDMA) by existing operators issued on 17th Jan, 2013 available at pib.nic.in

Spectrum harmonising with Defence and other Govt users

We gather from media that an agreement has been arrived upon between the Defence and Department of Telecom way back in Y2009 on vacation of spectrum and creation of a separate defence band.

In this context, we would bring to the attention of Authority the recent FCC recommendations on '**incentive auction**'³ summarised as below:

- The Spectrum Act has permitted the FCC to conduct incentive auctions, that is, to establish a mechanism whereby spectrum capacity may be relinquished for auction by some license-holders, who would then share in the proceeds.
- The purpose of incentive auctions is to reward license-holders, such as television broadcasters, who repurpose their spectrum for a different use.
- The act has established procedures for the FCC to follow in reallocating television broadcasting spectrum licenses for commercial auction. Through a reverse auction process, the broadcasters would establish the amount of compensation they are willing to accept for the spectrum they voluntarily release for auction. Additionally, broadcasters that do not voluntarily relinquish spectrum rights but are required to relocate or make other required changes may be compensated for costs incurred.

There is a possibility that such incentive auctions might be used by FCC for other types of license-holders, who wish to relinquish spectrum.

Specifically on the issue of **Federal Spectrum Use and Reallocation**, the recommendations are reproduced below:

- The Spectrum Act has addressed how spectrum resources might be repurposed from federal to commercial use through auction or sharing, and how the cost of such reassignment would be defined and compensated, among other provisions. The Commercial Spectrum Enhancement Act of 2004 (P.L. 108-494, Title II) was amended to facilitate the transfer of spectrum rights to commercial purchasers from the agencies relinquishing spectrum.
- **Expenditures incurred by federal agencies for planning may now be included among those costs eligible for reimbursement as part of the transfer of spectrum to the commercial sector.** Other reimbursable costs cover a wide range of technical options, including spectrum sharing.

TRAI vide its response dated 12 May 2012 to back reference received from DoT on its recommendation of 23 April 2013, had recommended for creation of a spectrum fund where a part of the auction proceeds are parked and used for refarming / reallocation. We recommend that such mechanisms should be re-emphasised by Authority for making additional spectrum available in future.

3. Research Paper "Spectrum Policy in the Age of Broadband", published by Congressional Research Services, May 2013. (www.crs.gov)

Building investor confidence (MW Backhaul allocation)

While the access spectrum is sold through auction, TSPs require other necessary support from Licensor / TRAI especially for rollout of green-field commercial networks. We as a foreign telecom operator and investing in the Indian telecom growth story should be adequately assured that these resources, approvals are provided in a time bound manner. For instance, it is common knowledge that Microwave spectrum is essential for rollout of any network.

The migration to fibre does take place progressively, but it is hampered by issues like ROW. **Microwave remains the first and preferred option for rollout of networks irrespective of technology deployed by the telecom service providers.** Moreover, the rollout of networks in hilly areas like Assam, NE, J&K, HP as well as LSAs with vast geographical spread is highly dependent on microwave as backhaul spectrum.

However, **there are restrictive clauses in the earlier NIAs and Unified License which does not recognise the need of microwave as backhaul spectrum to meet the rollout obligation and are contradictory to recent TRAI recommendations on allocation and pricing of Microwave Access and Microwave Backbone RF carriers.** These conditions are reproduced below for reference:

NIA condition:

2.2 Backhaul Spectrum

Allotment of spectrum for individual point-to-point fixed links i.e. Microwave Backhaul Spectrum would be subject to separate application and the allotment of the same is not linked to the compliance of roll out obligations. The allotment of backhaul spectrum is subject to the usual processes, terms and conditions, and applicable charges. The Government shall make available spectrum for these purposes under the terms and conditions specified by the WPC Wing, subject to availability. However, it must be noted that these frequencies are not part of the Auctions, and payment of the Successful Bid Amount does not ensure allotment of backhaul spectrum. Separate charges as prescribed from time to time, are payable for backhaul spectrum.

UL condition:

42.7 Allotment of spectrum for individual point-to-point fixed links i.e. Microwave Backhaul Spectrum shall be subject to separate application to WPC Wing and the allotment of the same is not linked to the compliance of roll out obligations where prescribed. The allotment of backhaul spectrum is subject to availability, usual processes and terms and conditions. Separate charges as prescribed from time to time shall be payable for microwave backhaul spectrum.

42.8 The Licensor/ WPC Wing reserves the right to modify the procedure for allotment of spectrum and/or rates for payment for said allotment and use of spectrum any time.

We welcome TRAI recommendations sent to DoT recommending that **the assignment of both access spectrum and MWA carriers should be done simultaneously within a period of one month from the date the TSP makes the auction bid amount for access spectrum, failing which TSP should be paid compensation at the SBI PLR rate of the amount it had already paid to acquire the access spectrum.**

We feel that this will go a long way in assuring the foreign telecom companies like Telenor investing in Indian telecom market and boost their confidence for further deployment of funds for expansion of networks as well as introduction of new technologies. This will bring predictability to the overall auction process and beyond. The Government should accept these recommendations at the earliest and allocate MW spectrum on immediate basis to rollout the network.

Reserve Price

For any successful auction, it is necessary that the spectrum assignments through auction should be that the bidding process leads to:

- Prices leaving no spectrum unsold (market clearing prices)
- Allocation of spectrum to bidders with the higher willingness to pay (efficiency).

Too high reserve prices will prevent market clearing prices from being discovered, and lead to unsold spectrum. Determination of block sizes and the minimum blocks a bidder must acquire in order to be identified as a winner may lead to inefficient spectrum allocation among bidders, if implemented sub optimally.

In the February 2014 spectrum auction it is fair to say that market clearing prices were discovered in 12 Licensed Service Areas (LSAs) for the 1800 MHz band, and 3 LSAs for the 900 MHz band. It is reasonable to assume that these prices reflect (marginal) spectrum value. In the remaining 1800 MHz LSAs spectrum remained unsold at the reserve price. In these LSAs auction prices do not reflect spectrum value.

Predicting spectrum value is difficult. In the LSAs where market clearing prices were discovered, the auction price *relative* to the valuation estimate of TRAI (2013) was in the range of 37% (J&K) to 319% (AS). For the remaining LSAs (with no market clearing prices discovered) spectrum value is unknown, but the estimates made in 2013 were far too high. In Rajasthan, for instance, the reserve price was set at 34% of the estimated value, but still 44% of the spectrum remained unsold.

The conclusion must be that previous attempts to estimate spectrum value holds little merit, and has proven an inefficient method of setting appropriate reserve prices for auction. Government should therefore rather base forward-looking reserve prices on observed market clearing price points from previous auctions where available. When such price points are not available, reserve prices should be substantially reduced compared to previous auction, and could further be guided and “sanity checked” by international benchmarks adjusted properly for differences in population, ARPU, GDP/capita, licence duration etc.

Setting reserve prices involves one-sided risk. The auction in February 2014 showed that as long as reserve prices are set sufficiently low, competition will drive prices up to the market clearing level. Too high reserve prices, however, will not trigger a downward pressure on prices, but rather leave spectrum unsold. Therefore the main objective should be to avoid reserve prices that are too high.

We recommend as follows:

- Spectrum value from a bidder perspective will typically change over time. **In LSAs where market clearing prices were discovered in February 2014 auction, the reserve prices should be set 20%-40% below the market clearing price, in order to control the risk of unsold spectrum.**

- **In LSAs where no market clearing price was discovered in February 2014 auction, reserve prices need to be reduced even further.** Setting reserve prices based on valuation estimates has proven inefficient. It is likely that new valuation estimates will also lead to too high reserve prices. The upcoming auction is the fourth attempt to sell all available spectrum in the 1800 MHz band. We therefore **recommend that reserve prices are to be reduced by 40%-60% in these LSAs from the last Reserve Price.**
- **Reserve Price for 900 MHz band should be uniformly fixed at 1.5 times that of 1800 MHz band for all circles.**
- **Reserve Price for 2100 MHz should be fixed at 83.34% of the 1800 MHz reserve price⁴.**
- **50% discount² on the reserve price (RP as fixed for 2015 auctions) where either partial and / or less than 5 MHz (smaller chunks) of fragmented spectrum is available for auction.**

4. Para 3.80 of TRAI recommendations dated 23 April 2012 on Auction of Spectrum as reproduced “ *In view of the above discussion, the Authority holds that the 1800 band can be taken as 1.2 times more efficient than 2100 band for the purpose of calculating the reserve price in this band*”.

Issue wise response

Q.1 Please comment on the issue of making available additional spectrum in contiguous form (as discussed in para 2.5 and 2.13) in the 900 MHz and 1800 MHz band.

Response:

It is well recognized that fragmented spectrum results in inefficient utilization of the spectrum, creates scarcity. It is also worth taking into account that the next telecom revolution is likely to be driven by the widespread adoption of wireless broadband, which requires availability of contiguous spectrum. This broadband revolution is critically dependent on adequate availability of spectrum. In the event of a likely spectrum deficit, further fragmentation of spectrum is likely to result in inefficient use of this scarce resource. Hence, it is important for the Government to make available adequate spectrum, more so, contiguous spectrum for auction. At the very least, such contiguity should be promised and be made available through appropriate re-arrangement of allocations of existing operators.

In view of above, the reorganisation of spectrum within the same band should be done for all spectrum (administrative and auction acquired) for ensuring optimal spectral efficiency. **TRAI should reiterate its earlier recommendation of frequency rearrangement in the same band from within the assignments made to all Licensees** and ensure that the exercise is completed before the start of auction.

We would request Authority to kindly consider the following suggestions for making available additional spectrum in contiguous form in 900, 1800 & 2100 MHz band:

900 MHz band:

The existing administrative allocations should be reorganised to make available an additional 5MHz contiguous block and this should be included in forthcoming auction. The 3rd block of 5 MHz should be made available in all possible circles.

The above proposal will increase the number of contiguous blocks of 5 MHz in Mah, Guj, AP, Ktk, PB, WB, NE circles.

1800 MHz band:

The 1800 MHz band is highly fragmented both in terms of frequency and geographical domain. Moreover, assignment of spectrum in Feb'14 auction are also fragmented and non-contiguous. In order to use the liberalised spectrum for higher technologies like LTE, larger block of contiguous spectrum is imperative and without which investment by TSP in acquiring spectrum in this band will be wasted. This can only be enabled by doing necessary rearrangement of already assigned frequencies (both administrative & liberalised) among stakeholders (DoT, Defence & Operators). This exercise will result into additional 5 MHz blocks of contiguous spectrum in various service areas.

2100 MHz band:

The use of 2100 MHz band for 3G has major advantages. Globally, it is the most harmonized band and has the most developed ecosystem of any band that supports mobile broadband services. Therefore, in order to meet the growing data

usage demand of mobile broadband, it is essential to have adequate contiguous spectrum available for TSPs in 2100 MHz band. We understand from various news sources that 15 MHz in 1900 band is lying unused but reserved for refarming for the Y2001-2004 licenses which are due for expiry after 10 years. Therefore, in order to derive economic value of this idle scarce resource, TRAI should recommend that DoT to engage with Defence immediately for the exchange of 15 MHz in 2100 MHz band in lieu of 15 MHz spectrum lying idle in 1900 MHz band. In this proposal, defence is not required to vacate any additional spectrum. Moreover, defence will get larger block of contiguous spectrum and DoT will be able to get 3 blocks of 2x5MHz spectrum in 2100 Mhz band available for forthcoming auction.

TRAI should use all resources at its disposal for rearrangement of frequencies to make it contiguous and also to strive for making available additional frequency in existing bands as well as identify new bands.

In view above, we recommend -

- **Reorganisation of frequencies within telecom users should be carried out immediately irrespective of whether spectrum is liberalized or not.**
- **Harmonisation of frequencies with Govt. Users should be done and their expenditure should be funded from auction proceeds.**
- **10Mhz spectrum in sub-GHz band, 10Mhz spectrum in 1800 band and 15Mhz in 2100 band due to harmonisation with Defense should be done on immediate basis for making available additional contiguous spectrum and made part of this auction.**
- **As stated in Preamble, TRAI should reiterate its earlier recommendation for creation of a spectrum fund to be used for compensating Govt users for refarming / reallocation and make additional spectrum available for commercial use.**

Q.2. Please comment whether only contiguous blocks of minimum 5 MHz spectrum should be put for auction.

Response:

It is suggested that all efforts should be made to get as much contiguous spectrum as possible however in the end both contiguous and non contiguous spectrum should be put to auction including blocks of 5 MHz and smaller blocks. It is also pertinent to highlight that the value of smaller blocks is much less than contiguous 5MHz considering the fact that with the such smaller chunks of spectrum (<5 MHz) for a Telecom Service provider (TSP) to offer all services that a truly liberalised spectrum is capable of, therefore, **TRAI should recommend 50 percent discount on the reserve price (RP as fixed for 2015 auctions) where either partial and / or less than 5 MHz spectrum is available for auction** in line with Government decision of 50% reduction in 800 MHz band reserve price due to non-availability of minimum 5 MHz spectrum for auction communicated vide press release dated on 17 January 2013.

Further, as stated in the Preamble, the severe crunch of spectrum is further accentuated by fragmentation. Therefore, the entire 45 Mhz in sub-Ghz band should be harmonised and **all service providers should have equal opportunity to secure at least 5 Mhz in sub-Ghz band.**

Additional 15 MHz in 2100 band should be put to auction to support Digital India / Broadband / data growth.

Existing allocations (administrative and auction) should be reorganised so that the spectrum holdings of all operators are made contiguous in all bands. This should be completed before the start of auction process.

Q.3. What should be the block size to auction the spectrum in (a) 900 MHz band and (b) 1800 MHz band?

Response:

The block size should be the same as was in the February 2014 auction:

- 1 MHz blocks in the 900 MHz band
- 0.2 MHz blocks in the 1800 MHz band
- additionally
- 2x5 MHz for 2100 MHz band

Q.4. What should be the minimum quantum of spectrum in the 900 MHz and 1800 MHz band that (a) a new entrant and (b) an existing licensee should be required to bid for?

Response :

Any licensee holding 5MHz spectrum in 1800 / 900 band should be allowed to acquire topup spectrum as per their business case.

In case of NIL spectrum holding in 1800/900 band, the prospective bidder should be mandated to bid for a minimum of 5MHz. This condition is necessary for efficient utilisation of scarce natural resource.

Q.5. Should the licensee whose licences are due for expiry in 2015 and 2016 be treated as an existing licensee or as a new entrant?

Response:

All bidders should have the flexibility to choose whether to be treated as a “new entrant” or an ‘existing licensee”.

We recommend that rather than pre-defining the bidder’s status as “new entrant” or existing licensee” in a band, the bidder should have the option to choose its own status, i.e. decide whether the bid placed is for a minimum amount.

The bid for 5 MHz can be assigned priority over the bid for partial spectrum. For instance, if two Operators A & B bid for 5 MHz and 1 MHz spectrum respectively on the same price, the auction rules should be framed in such a manner that priority ranking for allocation of spectrum should be given to Operator A who has bid for 5 MHz spectrum instead of Operator B who need only 1 MHz spectrum. This will ensure optimal spectral efficiency by ensuring allocation of contiguous spectrum.

In view of above, **we recommend that the new entrants and existing service providers having minimum 5 MHz liberalised spectrum together in 900 & 1800 MHz band, should have flexibility to decide their eligibility status for participating in this auction.**

Q.6. Should the valuation exercise for 1800 MHz spectrum be undertaken afresh for all the 22 LSAs?

Q7. Should the prices revealed in the February 2014 auction for 1800 MHz spectrum auction be taken as the value of 1800 MHz spectrum for the forthcoming auction in the respective LSA? Would the response be different depending on whether the forthcoming auction is conducted within one year of completion of last round of auction of February 2014 or later?

Q8. If the prices revealed in the February 2014 auction for 1800 MHz spectrum are taken as the value of 1800 MHz for the forthcoming auction, would it be appropriate to index it for the time gap (even if this is less than one year) between the auction held in February 2014 and forthcoming auction? If yes, what rate should be adopted for the indexation?

Q.9. What should be the criteria for defining a 'market clearing price'? Can the auction determined price be considered as market clearing price, when (i) the demand for spectrum is greater than the supply and when (ii) the demand is greater than or equal to the supply? Can the auction determined price be considered as the market discovered price?

Q.10. Should the valuation of spectrum and determination of reserve price be done only for those LLSAs where market clearing price was not achieved for 1800 MHz spectrum in February 2014 auction?

Q.11. Should the auction determined price for LSAs where market clearing price was achieved in February 2014, be taken as equal to the value of spectrum?

Q.12. Should the market determined price be taken as the value of spectrum in all LLSAs?

Response:

As rightly observed by the Authority in the consultation paper, it is not necessary that results of fresh estimation exercise will yield valuations that are significantly different from TRAI's recommendations of September 2013, since the variables and inputs used in different approaches for valuation of spectrum would not have changed radically. Moreover, if any auction of spectrum in a particular band takes place within less than one year of the previous auction in the same spectrum band, there may not be a need for new exercise for valuation.

The valuation of spectrum at any point in time depends on market dynamics, technological factors, micro and macro variables. Only change which we foresee, if we compare the Feb'14 auction to the proposed 2015 auctions, is quantum of spectrum available for auction (385.2 MHz was available in Feb'14 vis-a-vis 288 MHz proposed for this auction). Moreover, the availability in 1800 MHz band though 104 Mhz is in small chunks and may not find much use for data applications. **These smaller chunks are unfairly priced at the same level as 5MHz liberalised and should be made available at 50 percent discount**

on reserve price. The reserve price should be the same for a given LSA, a discount of 50% should be applied for fragmented spectrum.

As stated in the Preamble, in the February 2014 spectrum auction it is fair to say that market clearing prices were discovered in 12 Licensed Service Areas (LSAs) for the 1800 MHz band, and 3 LSAs for the 900 MHz band. It is reasonable to assume that these prices reflect (marginal) spectrum value. In the remaining LSAs 1800 MHz spectrum remained unsold at the reserve price. In these LSAs auction prices do not reflect spectrum value. Predicting spectrum value is difficult. In the LSAs where market clearing prices were discovered, the auction price relative to the valuation estimate of TRAI (2013) was in the range of 37% (J&K) to 319% (AS).

For the remaining LSAs (with no market clearing prices discovered) spectrum value is unknown, but the estimates made in 2013 were far too high. In Rajasthan, for instance, the reserve price was set at 34% of the estimated value, but still 44% of the spectrum remained unsold. Setting reserve prices involves one-sided risk. The auction in February 2014 showed that as long as reserve prices are set sufficiently low, competition will drive prices up to the market clearing level. Too high reserve prices, however, will not trigger a downward pressure on prices, but rather leave spectrum unsold. Therefore the main objective should be to avoid reserve prices that are too high.

In view of above, it is recommended as follows:

- **No need for fresh estimation exercise for valuation of 1800 MHz band across all 22 LSAs. In LSAs where demand was greater than or equal to supply, the auction price can be considered as market clearing.**
- **For the LSAs where a market clearing price was discovered in the February 2014 auction, there is no need to update valuation estimates. However, reserve prices should be set 20%-40% below the market clearing price, in order to control the risk of unsold spectrum.**
- **Setting reserve prices based on valuation estimates has proven inefficient. It is likely that new valuation estimates will also lead to too high reserve prices. We therefore recommend that in LSAs where no market clearing price was discovered in February 2014 auction, reserve prices need to be reduced by 40%-60% in these LSAs from the last Reserve Price.**
- **Since auction determined price is less than one year old hence there is no need for indexing⁵ for price revealed in Feb'14.**
- **For the LSAs, where demand was greater than or equal to supply the market clearing price could be taken as equal to the value of spectrum and not in LSAs where no market clearing price was discovered.**

Q.13. Should the value of spectrum in the LSAs where market clearing price was not achieved be estimated by correlating the sale prices achieved in similar LSAs where market clearing price was achieved with known relevant variables (paragraph 3.19)? If yes, please suggest which single variable is best suited for this purpose?

Q.14. Can multiple regression analysis be gainfully employed for this purpose given the limited number of sample data points?

5. Para 2.3 "Technology", NIA dt 12 December 2013 for 'Auction of Spectrum in 1800 MHz and 900 MHz band'

Q.15. Should the value of spectrum in 1800 MHz band be assessed on the basis of producer surplus on account of additional spectrum?

Q.16. Is there any need for a change/revision of any of the assumptions adopted by the Authority in producer surplus model in the Recommendations of September 2013? Justify with reasons.

Q.17. Should the production function model based on the assumption that spectrum and BTS are substitutable resources be used as a valuation approach (as was done in the earlier valuation exercise)? Please support your response with justification/ calculations/ relevant data and results.

Q.18. Should the revenue surplus approach be used to arrive at the value of 1800 MHz spectrum? Do you agree with the assumptions made?

Q.19. Should the values contained in the Report of 8th February 2011 for spectrum up to 6.2 MHz be incorporated after indexation in the calculation of the average value of the 1800 MHz spectrum in the current exercise?

Q.20. Should the prices revealed in the February 2014 auction for 1800 MHz spectrum auction be used as one of the values of 1800 MHz spectrum?

Q.21. Apart from the approaches discussed as above, is there any other approach for valuation of spectrum that you would suggest? Please support your answer with detailed data and methodology.

Q.22. Would it be appropriate to value 1800 MHz spectrum as the simple mean of the values thrown up in all the approaches? If no, please suggest with justification that which single approach should be adopted to value 1800 MHz spectrum?

Q.23. Should the value of 900 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors (1.5 times and 2 times) as discussed above? Should the economic efficiency approach as discussed above be used to calculate the premium for the 900 MHz spectrum, based on the additional CAPEX and OPEX that would be incurred on a shift from this band to the 1800 MHz band?

Q.24. Should the economic efficiency approach as discussed above be used to calculate the premium for the 900 MHz spectrum based on the additional CAPEX and OPEX that would be incurred on a shift from this band to the 1800 MHz band?

Q.25. Is there any other method that could be used for arriving at the valuation of the 900 MHz spectrum? Please support with detailed methodology.

Q.26. As in the case of the September 2013 Recommendations and adopting the same basic principle of equi-probability of occurrence of each valuation, should the average valuation of the 900 MHz spectrum be taken as the simple mean of the valuations obtained from the technical and economic efficiency approaches (and any other method)?

Response:

As stated in the preamble, for any successful auction, it is necessary that the spectrum assignments through auction should be that the bidding process leads to prices leaving no spectrum unsold (market clearing prices) and allocation of spectrum to bidders with the higher willingness to pay (efficiency). Too high reserve prices will prevent market clearing prices from being discovered, and lead to unsold spectrum. Determination of block sizes and the amount a bidder minimum must acquire in order to be identified as a winner may lead to inefficient spectrum allocation among bidders, if implemented sub optimally. In the February 2014 spectrum auction it is fair to say that market clearing prices were discovered in 12 Licensed Service Areas (LSAs) for the 1800 MHz band, and 3 LSAs for the 900 MHz band. It is reasonable to assume that these prices reflect (marginal) spectrum value. In the remaining 1800 MHz LSAs spectrum remained unsold at the reserve price. In these LSAs auction prices do not reflect spectrum value.

Since predicting spectrum value is difficult Yes, for LSAs with market clearing prices, discovered prices could be used as values. For the remaining LSAs (with no market clearing prices discovered) spectrum value is unknown, but the estimates made in 2013 were far too high. In Rajasthan, for instance, the reserve price was set at 34% of the estimated value, but still 44% of the spectrum remained unsold.

There is little merit in bottom-up valuation as a method of setting appropriate reserve prices for auction, as proven by previous attempts. Government should therefore rather base forward-looking reserve prices on observed market clearing price points from previous auctions where available (reserve price should be 20-40% below these prices). When such price points are not available, reserve prices should be substantially reduced compared to previous auctions (40-60% below previous reserve prices), and could potentially be further guided and "sanity checked" by international benchmarks (appropriately adjusted for population, ARPU, GDP/capita, licence duration as needed).

Setting reserve prices involves one-sided risk. The auction in February 2014 showed that as long as reserve prices are set sufficiently low, competition will drive prices up to the market clearing level. Too high reserve prices, however, will not trigger a downward pressure on prices, but rather leave spectrum unsold. Therefore the main objective should be to avoid reserve prices that are too high.

Operators use a number of approaches, including bottom-up estimates and benchmarking. To estimate likely non-strategic market-clearing auction prices, the government would have to estimate each bidder's marginal valuations (i.e. estimate bidders' spectrum demand curves) and then derive auction prices based on spectrum availability. The uncertainty of such estimates would be very large and we recommend suitably adjusted benchmarking for this purpose.

In view of above, we recommend the following:

- **In LSAs where market clearing prices were discovered in February 2014 auction, reserve prices should be set 20%-40% below the market clearing price , in order to control the risk of unsold spectrum.**
- **In LSAs where no market clearing price was discovered in February 2014 auction, reserve prices need to be reduced even further by 40%-60% in these LSAs from the last Reserve Price.**

- Spectrum in the 900 MHz band holds a higher value than 1800 MHz due to propagation characteristics. However, to what extent the value of 900 MHz exceeds the value of 1800 MHz spectrum depends on utilization. If the 900 MHz spectrum is used as a capacity layer in urban areas, then 900 MHz and 1800 MHz spectrum are close substitutes. **We recommend therefore the reserve price for 900 MHz band should be uniformly fixed at efficiency factor of 1.5 times that of 1800 MHz band for all circles.**
- **The reserve Price for 2100 MHz should be fixed at 83.34% of the 1800 MHz reserve price.**

Q.27. Should the reserve price of 1800 MHz spectrum in the forthcoming auction be fixed equal to the realized price of 1800 MHz spectrum in the February 2014 auction? If not, what should be the ratio between the reserve price for the auction and the valuation of the spectrum?

Response:

As reiterated above, No, we recommend that reserve prices are set 20%-40% below the final auction price in LSAs where market clearing prices were discovered. In LSAs where the reserve prices exceeded market clearing prices the reserve price should be reduced by 40%-60%.

Q.28. If the realized prices in the February 2014 auction for 1800 MHz spectrum is taken as the reserve price of 1800 MHz for forthcoming auction, would it be appropriate to index it for the time gap (even if less than one year) between the auction held in February 2014 and forthcoming auction? If yes, what rate should be adopted for the indexation?

Response:

We do not believe that indexation is an appropriate method for valuing spectrum. A general principle of deriving the spectrum price at the time of the auction should be established. In several recent auctions (e.g. India 2012/2013/2014, Romania 2012, Australia 2013) spectrum has been left unsold, indicating that governments have over-estimated the value of spectrum. A possible explanation for this unsold spectrum is that benchmarks, such as prices in previous auctions, are used to estimate future prices. However, we believe that spectrum scarcity is decreasing as a result of the government's success in freeing up more spectrum for the wireless sector.

Technology performance is improving, allowing the transfer of more data per Hz and thereby reduces spectrum value further because improved technology is equivalent to price reduction of a substitute for spectrum (one needs fewer towers to make up for the loss of a MHz). Increased competition in the markets for wireless services reduces expected profits, and, to the extent expected profits drive spectrum valuation, also bidders' willingness to pay for spectrum. If the trend is that spectrum value (measured on a per MHz level) is declining (as we believe), then such benchmarking will have a tendency to overshoot and to result in value estimates that are too high.
