



## **Vodafone Response to TRAI Consultation Paper dated 26 November 2015 on Valuation and Reserve Price of Spectrum in 700, 800, 900, 1800, 2100, 2300 and 2500 MHz Bands**

### **I. EXECUTIVE SUMMARY**

1. Vodafone welcomes this consultation by the Authority of Spectrum with regard to the forthcoming auctions in 700, 800, 900, 1800, 2100, 2300 and 2500 MHz Bands. We believe that additional availability of spectrum will be a key accelerator in speeding up achievements of India's broadband targets and the Government's vision of a Digital India.
2. 700MHz spectrum is a band that is specifically suited for rural broadband and can be very pivotal in achieving the national objectives of the Government with regard to rural connectivity and the achievement of the Digital India vision. While, the eco system in this band is developing, we believe that as this spectrum is being put to auction for the first time, necessary caution may be exercised in respect of the terms of auction, including valuation, reserve price, rollout obligations, etc.
3. An analysis of the auctions conducted in 2012, we note that, 41% of the reserve prices that have been set by the Government in the past have been too high to allow market price discovery. Therefore, it is important that the reserve price/ estimated value ratio is kept low, especially for new bands
4. We do not agree with the Authority's proposal of a sub-1GHz cap as we believe that this will defeat the purpose for which a cap has been introduced and will in fact open the door to permitting excessive spectrum concentration in the hands of one or two operators.

We also believe that all bands should be treated separately for the purposes of an in-band cap.

5. We submit that it is desirable to go in for synchronization of TDD networks to mitigate the possibilities of interference as it will become more and more challenging to operate an unsynchronised network as more spectrum is allocated.
6. We submit that the eligibility criteria should be the same for all access spectrum bands including for 2300MHz and 2500MHz as well.
7. The guidelines for 'liberalization' cannot be 'band-specific' and should be uniformly and consistently applied across all bands. Liberalization should continue to be an option available to the licensee and it cannot be mandated under any circumstances.
8. Valuation for spectrum has just been discovered in March 2015, as a result of which a fresh 'valuation' exercise is not warranted. The prices discovered March 2015 may be used as the valuation for the respective bands. However in the case of those services areas where



spectrum went unsold, the valuation may be reduced by 30%. The above valuation may be discounted by 20% to arrive at a reserve price for the respective bands.

The May 2010 auction determined prices may be used as one possible valuation for 2300MHz spectrum. However, no indexation should be carried out.

2500MHz band has poorer propagation characteristics than 2300MHz band as well as a poorer eco-system, so the reserve price of the 2500MHz band spectrum should be priced at 30% discount to 2300MHz band.

Technical efficiency is one and not the only factor that contributes to the valuation of any spectrum. A technical efficiency factor is appropriate when the use case, eco-system and demand-supply characteristics of the spectrum bands being compared are similar. In case of 700MHz, if a technical efficiency approach is to be used, the only potential candidate band is the 2300MHz band provided the same is adjusted for the fact that the 2300MHz band eco-system is more advanced with scaled commercial deployment in Australia & China & ongoing rollouts and impending launches in India. Hence, we would recommend that 700MHz reserve prices may be set at no more than 2 times 2300MHz reserve prices on a paired MHz basis.

9. There is a need to lay down a clear roadmap for spectrum management, which should be publicly available, to not only ensure transparency but also ensure that service providers bid on the basis of their respective business case rather than on the fact that there is no certainty on when the spectrum will be available in future.
10. We, submit that it is imperative to ensure that the interference issues in 2.1GHz band must be resolved first, and only then the balance spectrum be put for auction. Any auction of 2.1 GHz Spectrum in these areas without and before resolving the present interference issues will have its adverse consequences and will also not be in public interest. Further spectrum now put to auction should be interference free.
11. We seek the support of the Authority for recommending the completion of non-standard /fragmented allocation of 1800MHz auctioned in blocks of 1.25MHz in November 2012, which is resulting in wastage of spectrum. The Authority may recommend that the fractional 0.05MHz to 0.15MHz be allocated to us as per the prevailing market price; alternatively, a separate auction of such fractional spectrum may be recommended in the next round of auctions.
12. We recommend that the next round of auctions be conducted at a SUC of 1%AGR as has been recommended by the Authority on various occasions.



13. The ongoing harmonization exercise in 1800MHz should be completed before the auctions as this will ensure a higher valuation for the 1800MHz spectrum. In the alternative the vacant/available 1800MHz spectrum identified by DoT may be put to auction and harmonization can be carried out post the auctions.. Prospective bidders should be assured by DoT that their liberalized spectrum would be made contiguous. The harmonization exercise should enable /facilitate the most optimal use of spectrum in the hands of all service providers.
14. We believe that like it was done in the case of the private operators, the spectrum of MTNL which is expiring in 2017 should stand reverted to the Government and should be put up for auction.
15. The intra-band cap of 10MHz for 800MHz prescribed in the M&A guidelines dated 20.02.2014 is at variance with other provisions, including NIA provisions with regard to an in-band cap. However, even the M&A guidelines, while prescribing a cap of 10MHz for 800MHz, carry an additional provision – i.e. “...Moreover, the relevant conditions pertaining to auction of that spectrum shall apply. Kindly confirm that an in-band cap of 50% is applicable to 800MHz as well in all circumstances.
16. We verily believe that in respect of 2.3GHz/BWA, the DoT has already permitted transmit power of 40w. Given that all spectrum being put to auction is liberalized spectrum and broadband technologies can only be offered on liberalized spectrum the Authority may kindly recommend that transmit power be revised to 40w for all liberalized spectrum.
17. The 1.8MHz in the 1800MHz reserved for Aircel cannot be held back indefinitely. It is submitted that either Aircel should take the spectrum subject to conditions contained in the Hon’ble TDSAT’s order or the spectrum should be put up for auction. Withholding this spectrum is a waste of national resources.

## II. ISSUE BY ISSUE RESPONSE

**Q1. Whether the entire spectrum available with DoT in the 800 MHz band be put for auction? Justify your answer.**

**Q2. How can the spectrum in the 800 MHz band, which is not proposed to be auctioned due to non-availability of inter-operator guard band, be utilised?**

- (a) We believe that adequate and additional availability of spectrum will be a key accelerator in speeding up achievements of India’s broadband targets and the Government’s vision of a Digital India. Thus not only 800MHz, but the entire spectrum available with DoT in various bands should be put to auction.
- (a) It is however desirable that to the extent, possible the spectrum is put to auction in blocks of 5MHz, so that a liberalized market price can be discovered for the same.



- (b) Regarding the issue of inter operator guard bands, the consultation paper appears to suggest that the need for inter operator guard bands is arising because of the fact that both CDMA and LTE are expected to be deployed in the 800MHz band and there is a possibility of interference.
- (c) It is however our understanding that the requirement for an inter-operator guard band is also required for CDMA-CDMA co-existence if networks are not synchronised.

Intra-band	Need for guard band	
	Coordinated	Uncoordinated
CDMA850 – CDMA850	Nil	300 kHz
CDMA850 – HSPA850*	Nil (with 4.2 MHz UMTS)	400 kHz (4.2 MHz UMTS)
CDMA850 – LTE850	Nil	300 kHz
HSPA850* – LTE850	Nil (with 4.2 MHz UMTS)	400 kHz (4.2 MHz UMTS)

\* There is 400 KHz of inherent GB available within a 5 MHz UMTS carrier and that would take care of the GB requirement in case of uncoordinated deployment

- (d) In view of the above, we believe that it is more desirable to ensure coordinated deployments, rather than hold back spectrum from the auctions.
- (e) It is further submitted that with the spectrum now being sold as liberalized spectrum, the operators are free to deploy the technology of their choice and that not auctioning and putting this valuable spectrum to use cannot be the answer to address inter operator issues.
- (f) It may also be noted that in the recent proposed harmonization exercise that is being discussed for the 1800MHz band, the DoT is re-shuffling carriers and allocations in a manner that all liberalized spectrum is accommodated at one end of the frequency band, whilst unliberalized allocations are proposed at the other end. A similar principled approach can be followed for 800MHz as well.
- (g) As rightly pointed out by the Authority, use of allocated spectrum for a particular technology cannot be taken as a static event as with the introduction of spectrum trading, sharing, option to liberalize spectrum, etc, deployment of multiple technologies in the same band will become the prevalent practice.
- (h) We cannot think of any utility for this spectrum if it is not put to auction.
- (i) In view of the above, we believe that all spectrum available with the Government should be put to auction in a manner that it's most effective and optimal use can be ensured.



**Q3. What should be the block size in the 700 MHz band?**

- (a) We believe that the block size of the spectrum should also be such that it gives the maximum flexibility to the bidding entity and also maximizes the supply of spectrum. In view of this, we believe that 2x5MHz will be the preferable block size for 700MHz.

**Q4. Whether there is any requirement to change the provisions of the latest NIA with respect to block size and minimum quantum of spectrum that a new entrant/existing licenses/expiry licensee is required to bid for in 800, 900, 1800 and 2100 MHz bands. Please give justification for the same.**

- (a) No. We do not believe that there is any change in the situation that warrants a change in the block size or minimum quantum of spectrum that a new entrant /existing licensee be required to bid for in 800, 900, 1800 and 2100 MHz bands
- (b) The block size of the spectrum should also be such that it maximizes the supply of spectrum and also gives the maximum flexibility to the bidding entity to deploy a technology of choice.
- (c) In view of the above, we therefore submit that:
- the block size for both 900MHz and 1800MHz be kept at 200 KHz. Existing licensees be allowed to bid for a minimum of 3 blocks, i.e. 0.6MHz, while in the case of new entrants it should be kept at a minimum of 25 blocks, i.e. 5MHz
  - For 800MHz, the block size may be kept at 1.25MHz; Existing licensees be allowed to bid for a minimum of 1 blocks, i.e. 1.25 MHz, while in the case of new entrants it should be kept at a minimum of 4 blocks, i.e. 5MHz
  - In case of 2100MHz, the block size should be at 5MHz.

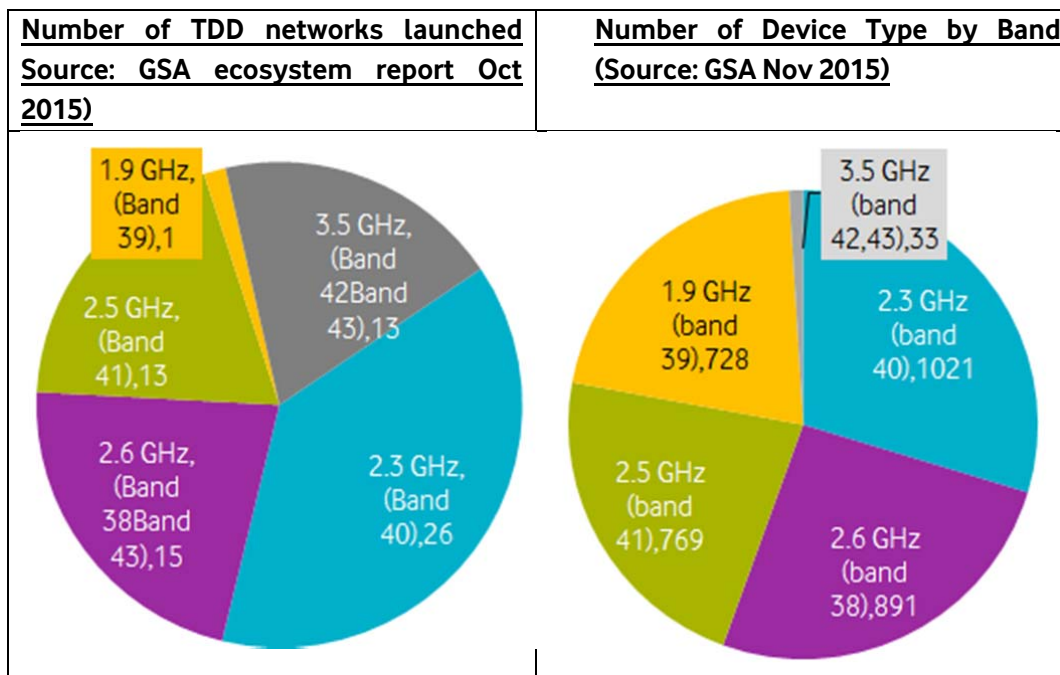
**Q5. What should be the block size in the 2300 MHz and 2500 bands?**

- (a) In the 2010 auctions, the spectrum in the 2300MHz band was auctioned as an unpaired block of 20MHz. The same block size may be followed for the forthcoming auctions as well.
- (b) In the case of 2500MHz as well, this was allocated to MTNL/BSNL in TDD/unpaired form in most service areas, with the exception being AP, Maharashtra & Gujarat, where it was given as paired 2x10MHz [as per NIA 2010]. However it appears from Table 2.18 in the present consultation that this spectrum has been returned /surrendered by BSNL and that present allocations are in TDD mode only.
- (c) The Authority has also highlighted the constraints and challenges in auctioning this spectrum as FDD. Thus whilst the ITU Option 1 [Band B7 and B38] is the most harmonized band with 86 commercially launched LTE Networks in FDD, in India, due to the occupation of this band by the Department of Space and the challenge of a lower than acceptable duplex



separation, it appears that TDD allocations [as per Band B41 appears to be the only option available to India in this band.

- (d) As per the latest GSA ecosystem report, there are 8 TDD networks in Band 41 [2.5GHz] and 10 TDD networks in 2.6GHz as noted by the Authority in Table 2.17 of the Consultation Paper. However, as per the latest GSA Report (Nov 2015), the device system is better than reported in the Consultation which is based on earlier October 2015 report, with there being 769 [not 625] and 891 [instead of 752] devices available in Band 41 and Band 38 respectively.



- (e) It is therefore our submission that this spectrum may be auctioned in a block size of 20MHz unpaired spectrum. It is our expectation that the launch of TDD LTE networks by India in this band will lead to larger global harmonization for this band.

**Q6. Considering the fact that one more sub-1 GHz band (i.e. 700 MHz band) is being put to auction, is there a need to modify the provisions of spectrum cap within a band?**

**Q7. Is there any need to specify a separate spectrum cap exclusively for the spectrum in 700 MHz band?**

**Q8. Should a cap on the spectrum holding within all bands in sub-1 GHz frequencies be specified? And in such a case, should the existing provision of band specific cap (50% of total spectrum assigned in a band) be done away with?**

**Q9. Should 2300 MHz and 2500 MHz bands be treated as same band for the purpose of imposing intra-band Spectrum Cap?**



**Please support your suggestions for Q6 to Q9 with proper justifications.**

- (a) No. We do not believe that there a need to modify the provisions of spectrum cap within a band because 700MHz band is being put to auction.
- (b) The intra-band cap of 50% of the spectrum assigned in each band in the respective service area and 25% of the total spectrum assigned in all bands put together in each service area, was first recommended by the Authority in 2012 as it was of the view that the spectrum cap limits specified should be such as to prevent monopolistic tendencies even as they allow service providers to benefit from economies of scale.
- (c) This recommendation was accepted by the DoT and formed a part of all NIAs/auctions conducted since 2012. This was also issued by DoT by way of a license amendment for UASL and CMTS licenses on 26.11.2013.
- (d) Even in the present consultation, the Authority has noted that Spectrum-acquisition caps are designed and enforced to prevent excessive spectrum concentration in one or two operators' hands.
- (e) In fact, on a reference made by DoT in follow up of an Order of the Hon'ble Supreme Court dated 14.05.2015, the Authority after going through a detailed consultation specifically on this subject of spectrum caps, opined on 02.07.2015 that "*that at present there is no need to modify the existing spectrum cap (50% of the spectrum assigned in each of the 800/900/1800/2100/2300/2500 MHz and 25% of the total spectrum assigned in all these bands put together in each service area).*"
- (f) It is submitted that the introduction of 700MHz into the auctions cannot be the basis for changing the above principles enunciated and adopted since 2012 – which cover the aspect of both an in-band as well as an overall spectrum cap. The above principles are well settled and band agnostic and do not warrant any change as proposed by the Authority.
- (g) In fact, it is our view that any attempt to introduce a sub-1GHz cap, will in fact defeat the purpose for which a cap has been introduced and will in fact open the door to permitting excessive spectrum concentration in the hands of one or two operators.
- (h) To illustrate, taking an average allocation of around 20MHz in 900MHz and 15MHz in 800MHz and 35MHz in 700MHz bands [i.e. a total of 2x70MHz] – an in-band cap of 50% for sub-1GHz spectrum, could open the way to one operator, actually acquiring [through auction, trading, etc] 100% of the allocated spectrum in both 800MHz and 900MHz bands, i.e. creating a monopoly position in these two very valuable spectrum bands, which surely cannot be the intention of the Authority. Similarly, a combined sub-1GHz band cap of 50% could potentially create a situation where a single operator acquires the entire 35MHz of the 700MHz band



spectrum. Clearly such situations are undesirable and will defeat the very purpose of a spectrum cap.

- (i) Further, it may be noted that the 700MHz band at present cannot be compared to or placed at par with either 800MHz or 900MHz, which are both well entrenched and globally harmonized bands. Clubbing the spectrums together for the purpose of caps would be like clubbing apples and oranges and will defeat the very purpose of prescribing a spectrum cap, as illustrated above.
- (j) In view of the above we submit that in line with existing provisions, an in-band cap of 50% may be applied to 700MHz as well.
- (a) It is our firm view that each band should be treated separately for the purpose of applying an in-band of 50%, as otherwise, there is always the possibility of an operator creating a monopoly position in one band, taking refuge under a common in-band cap.
- (b) Regarding 2300 MHz and 2500 MHz bands as well, it is submitted that these two bands are also different in terms of their ecosystems. There are 19 commercially launched TDD networks in 2300MHz [Band 40] and 102 devices available, as compared to 8 networks in 2500MHz and 768 devices in 2500MHz [Band 38]
- (c) In view of the above, we believe that the spectrum caps should be separately applied for each and that there should also be an overall spectrum cap – as is the present practice. In principle, there may be a case for progressive increase in the overall spectrum caps as more spectrum gets release into the market.

**Q10. Suggest an appropriate coverage obligation upon the successful bidders in 700 MHz band? Whether these obligations be imposed on some specific blocks of spectrum (as was done in Sweden and UK) or uniformly on all the spectrum blocks?**

**Q11. Should it be mandated to cover the villages/rural areas first and then urban areas as part of roll-out obligations in the 700 MHz band?**

- (a) As the Authority is aware, 700MHz spectrum is a band that is specifically suited for rural broadband and can be very pivotal in achieving the national objectives of the Government with regard to rural connectivity and the achievement of the Digital India vision.
- (b) The eco system in this band is developing and the vendors are taking a positive view on this band. Some recent media reports are enclosed as **Annexure- 1**
- (c) However, we believe that as this spectrum is being put to auction for the first time, necessary caution may be exercised in respect of the terms of auction, including valuation, reserve price, rollout obligations, etc. In respect of rollout obligations, we urge that these may be





prescribed on a conservative basis. This caution would be especially desirable in case any rural obligation is imposed as these will entail significant capex to rollout infrastructure in rural areas.

- (d) We believe that as has been past practice, the rollout obligations should be applicable uniformly on all the spectrum blocks and not on specific blocks of spectrum.
- (e) We believe that there is no requirement for such a mandate to cover the villages/rural areas first and then urban areas as part of roll-out obligations in the 700 MHz band. Once there is a rural rollout obligation that has to be met, any use of 700MHz spectrum in other than rural areas will only lead to better and more optimal utilization of this spectrum.
- (f) This is especially important in a country like India where the allocations are already sub optimal and far below international averages. Having the spectrum and not utilizing it to meet the capacity and quality requirements would indeed be a great disservice to consumers and not in public interest.

**Q12. In the auction held in March 2015, specific roll-out obligations were mandated for the successful bidders in 800 MHz, 900 MHz, 1800 MHz and 2100 MHz spectrum bands. Stakeholders are requested to suggest:**

- (a) How the roll-out obligations be modified to enhance mobile coverage in the villages? Which of the approaches discussed in para 2.58 should be used?**
- (b) Should there be any roll out obligation for the existing service providers who are already operating their services in these bands.**

**Please support your answer with justification.**

- (a) We submit that the rollout obligations for 800MHz/900MHz/1800MHz have already been crystallized and have been adopted consistently for the several auctions held since 2012. We believe that it is neither necessary nor desirable to modify the rollout obligations for these bands.
- (b) In the case of 2100MHz spectrum auctioned in 2010, it was prescribed that the licensee acquiring the 2100MHz spectrum will ensure that at least 50% of the District Headquarters (“DHQ”) in the service area will be covered using the 3G Spectrum, out of which at least 15% of the DHQs should be rural Short Distance Charging Areas (“SDCA”)<sup>6</sup>, within five years of the Effective Date.
- (c) In respect of the 2100MHz spectrum auctioned in March 2015, the Rollout Obligations were prescribed as below:-



- (i) Telecom Service Providers (TSPs), who are holding spectrum in 2100 MHz band and acquire spectrum in the same band in the auction will have the following rollout obligations over and above the existing roll out obligations.
  - a) 10% of District Headquarters (DHQs) in the LSA within one year of date of allotment of spectrum and
  - b) 10% DHQs in the LSA within two years of date of allotment of spectrum.
  
- (ii) New Entrants acquiring spectrum 2100 MHz band will have the following rollout obligations:
  - (a) 50% of DHQs in the LSA out of which 15% of DHQs should be in rural SDCA within three years from the effective date of license or date of allotment of spectrum whichever is later.
  - (b) 10% of DHQs in the LSA within 4 years from the effective date of license or date of allotment of spectrum whichever is later.
  - (c) 10% of DHQs in the LSA within 5 years from the effective date of license or date of allotment of spectrum whichever is later.
  
- (d) We submit that the above provisions may be applied to 2100MHz in the present auctions as well.
  
- (e) We would also like to highlight that there are also some logistical challenges that have been faced by the service providers with regard to meeting their rollout obligations, especially with regard to non-availability of maps for Block Headquarters, etc. It is respectfully submitted that clarity in the rollout is of essence in meeting compliance requirements and should be ensured.

**Q13. In the auction held in 2010, specific roll-out obligations were mandated for the successful bidders in 2300 MHz spectrum band. Same were made applicable to the licensee having spectrum in 2500 MHz band. Stakeholders are requested to suggest: Should the same roll-out obligations which were specified during the 2010 auctions for BWA spectrum be retained for the upcoming auctions in the 2300 MHz and 2500 MHz bands? Should both these bands be treated as same band for the purpose of roll-out obligations?**

**In case existing service providers who are already operating their services in 2300 MHz band acquire additional block of spectrum in 2300 or 2500 MHz band, should there be any additional roll out obligation imposed on them?**

- (a) We note that in case of the 2300MHz auctions in 2010, it was prescribed that the licensee to whom the spectrum is assigned shall ensure that at least 50% of the rural SDCAs are covered within five years of the Effective Date using the BWA Spectrum.



- (b) We submit that just as was done in the case of 2100MHz, the rollout obligations for BWA may be enhanced for the forthcoming auctions as well.

**Q14. Keeping sufficient guard band or synchronization of TDD networks using adjacent spectrum blocks are the two possible approaches for interference management. Considering that guard band between adjacent spectrum blocks in 2300 MHz band is only 2.5 MHz in a number of LSAs, should the network synchronization amongst TSPs be mandated or should it be left to the TSPs for the interference free operation in this band? Please support your suggestion with proper justifications.**

**Q15. In case, synchronization of the TDD networks is to be dealt by the regulator/licensor, what are the parameters that the regulator/licensor should specify? What methodology should be adopted to decide the values of the frame synchronization parameters?**

**Q16. If synchronization of the TDD networks is ensured, is there a need for any guard band at all? If no guard band is required, how best the spectrum left as inter-operator guard band be utilised?**

- (a) Current guard band of 2.5 MHz between adjacent 2300MHz spectrum blocks is not enough for TSPs to operate in an unsynchronised TDD LTE network mode.
- (b) We also believe that use of spectrum as guard bands will lead to sub optimal utilization of spectrum. For maximum spectrum utilisation we should remove need for guard band. Further, guard band will not completely eliminate interference issues specifically in India where multiple operators predominantly share same site. With no synchronisation, in addition to guard band sufficient antenna isolation on site between operators will need to be ensured. As more and more spectrum is allocated, there is possibility for more operators and it will become challenging to operate an unsynchronised network based on guard band alone.
- (c) Hence it would be desirable to go in for network synchronization to mitigate the possibilities of interference.
- (d) We believe that leaving the synchronization to mutual agreement amongst operators would become challenging as more operators acquire 2300MHz; hence TSPs needs to be mandated to operate in synchronization mode and this needs to be governed through Regulator.
- (e) We understand that Configuration 2 is the most adopted configuration globally and is also being used by the present 2.3GHz operators. In view of the above, we would like to suggest that the Authority may prescribe adoption of Configuration 2 for TDD LTE networks operating in 2300MHz band and 2500MHz band.

**Q17. Whether the ISP category 'A' licensee should be permitted to acquire the spectrum in 2300 and 2500 MHz bands or the same eligibility criteria that has been made applicable**



**for other bands viz. 800 MHz, 900 MHz, 1800 MHz and 2100 MHz band should be made applicable for 2300 MHz and 2500 MHz bands also?**

- (a) As the Authority is aware, both 2300MHz & 2500MHz bands have been categorized as access spectrum by the DoT. As per DoT amendment dated 06.12.2013, Access spectrum means the radio frequency spectrum allotted for use to carry voice and/or non voice messages from subscriber terminal to the Base Station /designated point of aggregation. Both 2300MHz and 2500MHz bands were defined as access spectrum under the said amendment.
- (b) As per various auctions conducted by DoT in other access spectrum bands such as 800/900/1800/2100MHz, the participating entity must either hold an access service license/authorization for access services or be eligible and undertake to obtain the same. Relevant extracts from the latest NIA dated 09.01.2015 is extracted below for ready reference

### ***3.1 Eligibility criteria to participate in the Auctions***

*(i) Any licensee that holds a UAS/ CMTS/ UL(AS)/UL with authorization for Access Services for that Service Area; or*

*(ii) Any licensee that fulfils the eligibility for obtaining a Unified License with authorization for Access Services; or*

*(iii) Any entity that gives an undertaking to obtain a Unified License for access service authorisation through a New Entrant Nominee as per the DoT guidelines/licence conditions can bid for the Spectrum in 1800 MHz, 900 MHz and 800 MHz band*

- (c) In view of the above, we submit that the eligibility criteria should be the same for all access spectrum bands including for 2300MHz and 2500MHz as well.

### **Q18. Stakeholder are requested to comment on**

**(a) Whether the guidelines for liberalisation of administratively allotted spectrum in 900 MHz band should be similar to what has been spelt out by the DoT for 800 and 1800 MHz band? In case of any disagreement, detailed justifications may be provided.**

**(b) Should the liberalization of spectrum in 800, 900 and 1800 MHz be made mandatory?**

- (a) We submit that the guidelines for 'liberalization' cannot be 'band-specific' and should be uniformly and consistently applied across all bands.
- (b) It is however our submission that a liberalized price can only be discovered through an auction, where the spectrum put to auction is at least 5MHz or above. This has also been the view taken by the Authority, as is evident from the following:
  - (i) The Authority had, in its recommendations dated 23.04.2012, stated, as below



*3.22 All spectrum to be auctioned in future will be liberalised spectrum, and therefore the block size should be such as to satisfy the needs of any technology. 5 MHz is the minimum amount of spectrum required to ensure that any technology can be deployed with the allocated spectrum. Therefore, the Authority holds that all auctions must offer spectrum of at least 5 MHz in any band, unless the available spectrum itself is less than 5 MHz.*

**(ii) This understanding was once again confirmed by the Authority, in its response back to DoT on 12.05.2012, where the Authority, stated, as below:**

*In respect of 800 MHz, the amount of spectrum available for auction in some Circles is less than 5 MHz. As such, it is not possible with this spectrum, to offer all services that a truly liberalised spectrum can. Therefore, the Authority would be open to the Government fixing the Reserve price of 800 MHz spectrum at 1.3 times the 1800 MHz reserve price. This is only where 5 MHz spectrum is not being made available. The 1.3 factor is twice the value of the unliberalised spectrum in the 1800 MHz band, established by the experts (combined price of < 6.2 MHz and > 6.2 MHz in the ratio of 6.2: 1.8) which bears a ratio of 1.3 to the recommended reserve price of 1800 MHz.*

- (c) It is thus also the clearly held view of the Authority that a spectrum block of less than 5MHz, is not 'truly liberalized' as it could not be used to offer advanced technologies. It is also evident from the above that for the market to discover a 'liberalized price, the spectrum put to auction, must be at least 5MHz.
- (d) It is therefore submitted that the price for liberalized spectrum should be one that is discovered when at least 5MHz spectrum has been put in the auction.
- (e) It is submitted that liberalization should continue to be an option available to the licensee and it cannot be mandated under any circumstances.

**Q19. Can the prices revealed in the March 2015 auction for 800/900/1800/2100 MHz spectrum be taken as the value of spectrum in the respective band for the forthcoming auction in the individual LSA? If yes, would it be appropriate to index it for the time gap (even if this is less than one year) between the auction held in March 2015 and the next round of auction and what rate should be adopted for indexation?**

- (a) It is submitted that a valuation for spectrum has just been discovered in March 2015, as a result of which a fresh 'valuation' exercise is not warranted.
- (b) We are however strongly against the suggestion of indexation as we believe that such an approach is incorrect in principle and ought not to be adopted. It is economically illogical to presume that the price of a commodity [in this case spectrum] can only move in one direction, viz. upwards. This is very evident from the experience of 2100MHz band where the



2015 auction in Delhi, Mumbai and Andhra Pradesh did not attract any buyer interest even when the reserve price was same as the prices discovered in 2010 auction. Thus, market prices for 2100MHz spectrum in these service areas actually declined from 2010 to 2015.

- (c) We had submitted earlier as well [in response to the previous consultation] that indexing historic market prices is not appropriate as the expectations on which the historic market prices are based change, with time. Further, price discovery is the result of many factors demand, supply, ecosystem, relevant technology, propagations characteristics, etc., to name a few. Also, as submitted above, such an approach [indexation] wrongly assumes that the prices of spectrum can only go up, not down, which is not correct.
- (d) We therefore recommend that the **prices discovered March 2015 may be used as the valuation for the respective bands**. However in the case of those services areas where spectrum went unsold, the valuation may be reduced by 30%.
- (e) The above valuation may be discounted by 20% to arrive at a reserve price for the respective bands.

**Q20. If the answer to Q.19 is negative, should the valuation for respective bands be estimated on the basis of various valuation approaches/methodologies adopted by the Authority (as given in Annexure 3.1) in its Recommendations issued since 2013 including those bands (in a LSA) for which no bids were received or spectrum was not offered for auction?**

- (a) As submitted above, we believe that the prices discovered March 2015 may be used as the valuation for the respective bands and in the case of services areas where spectrum went unsold, the valuation may be reduced by 30%.
- (b) The above valuation may be further discounted by 20% to arrive at a reserve price for the respective bands.
- (c) However, in the event that the Authority desires to conduct a fresh valuation exercise now or in future we would like to submit the following:
  - (i) A bottom-up valuation exercise depends on numerous assumptions and is prone to errors. There may be merit in such an exercise only if recent auction data is not available, but not otherwise as any such exercise will be tantamount to substituting market-revealed information with desktop analysis.
  - (ii) Detailed inputs and assumptions should be made public to allow stakeholders to examine their validity and provide comments which will help improve the model. For



instance, in the December 2014 recommendations for the 2100MHz band, the workings are silent on several key assumptions such as:

- Producer surplus model: Industry benchmarks used by the Authority for inputs such as 3G subs, HHI and 3G usage per sub have not been provided
- Model based on growth in data usage: Data ARPU and opex assumptions used by the Authority have not been provided. In the absence of this, it is difficult for stakeholders to understand how this method yielded a valuation for Delhi that is more than 2x the valuation in Mumbai

(iii) Revenue surplus and cost savings should be projected on a post-tax basis since operators will incur taxes on their income which will reduce the savings. In previous exercises, the Authority appears to have used pre-tax revenue surplus or cost savings, thereby over-estimating the gains to operators from owning the spectrum

- In case the Authority uses pre-tax cash flows, the discount rate also should be pre-tax i.e. grossed up for the impact of taxes. The Authority had used 12.5% as the discount rate in the December 2014 recommendations for 2100MHz spectrum band. This is similar to the post-tax WACC used to value larger telcos in India by research analysts. Instead, we recommend c.19.1% (i.e.  $12.5\% / (1 - 34.6\%)$ ) (i.e. post-tax discount rate grossed up by the marginal effective corporate tax rate in India). Alternatively the Authority could adjust the projected savings in cash flows by deducting tax at the rate of 34.6% and discount them by the post-tax rate (i.e. 12.5%). It must be noted that even a 12.5% post-tax rate is more appropriate for larger telcos and is not representative of the new entrants.

(iv) Specifically, some of the assumptions used in the bottom-up approaches of previous exercises do not appear to be justified. By way of example, we cite the following from the December 2014 recommendations for the 2100MHz band:

- The producer surplus model appears to assume that purchasing a second carrier would result in halving of network opex and capex. This is simply not correct for various reasons:
- Traffic load on networks is not evenly spread. Additional spectrum leads to savings only to the extent of congested sites and not all sites
- Any network will have coverage and capacity sites. Coverage sites are required to spread the availability of network over a large geographic area and cannot be saved by purchasing a second carrier. In particular, non-metro service areas will have a large proportion of coverage sites
- In a number of metro areas, operators may have already split cell sites to take care of growing traffic needs due to delayed availability of spectrum. For such cell sites, capex is already incurred and tower-related opex is already contractually committed (with foreclosure penalties). Hence, the savings due to additional spectrum for such cell sites will be very low as the additional site has already been put up



- The model based on data usage growth makes several unrealistic assumptions
- It assumes that a new operator will have a 10% market share in the first year growing up to 20% eventually. This is unrealistic for several reasons:
- A 20% market share of the data market will require the use of multiple carriers to support the resulting traffic; the cost of acquiring all such additional spectrum must also be factored into the calculations.
- A late entrant acquiring 10% market share in the first year of operations is not backed by actual industry evidence. The Authority only needs to examine its own data on operator market shares to disprove this assumption
- By definition, the total market is only 100%. There are already service areas with more than 5 operators with data spectrum. Hence, it is impossible for all of them to gain 20% market share just by virtue of purchasing a single piece of spectrum, leave alone a late entrant
- Purchasers of 2300MHz spectrum still have close to 0% market share more than 5 years after the 2010 auctions
- The EBITDA margin assumptions have not been specified but in the October 2014 recommendation for the 1800MHz spectrum, the Authority had assumed a 30% EBITDA margin through the projection period which is very abnormal for a new entrant given several operators in the country are struggling to break-even on EBITDA despite multi-years of operations

**Q21. Should the value of 700 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factor? If yes, what rate of efficiency factor should be used? Please support your views along with supporting documents/literature.**

**Q22. Should the valuation of 700 MHz spectrum be derived on the basis of other sub-GHz spectrum bands (i.e. 800 MHz/900 MHz)? If yes, what rate of efficiency factor should be used? Please support your views along with supporting documents/literature.**

**Q23. In the absence of financial or non-financial information on 700 MHz, no cost or revenue based valuation approach is possible. Therefore, please suggest any other valuation method/approach to value 700 MHz spectrum band along with detailed methodologies and related assumptions.**

- (a) Technical efficiency is one and not the only factor that contributes to the valuation of any spectrum.
- (b) No. we do not believe that the valuation of 700 MHz spectrum should be derived on the basis of other sub-GHz spectrum bands (i.e. 800 MHz/900 MHz)
- (c) It is submitted that apart for a similarity in the propagation characteristics, there is a very vast difference between 700MHz and 800/900MHz bands – whether it is in terms of the eco-





systems of these bands, the availability of handsets/devices, the extent of global harmonization, etc., that absolutely warrant that the valuation of 700MHz should not be derived on the basis of either the 800MHz/900MHz bands. Further, prices in the 900MHz bands in previous auctions have been inflated due to extension risks faced by operators and limited supply. Neither of these factors is applicable to the 700MHz band.

- (d) A technical efficiency factor is appropriate when the use case, eco-system and demand-supply characteristics of the spectrum bands being compared are similar.
- (e) If a technical efficiency approach is to be used, the only potential candidate band is the 2300MHz band provided the same is adjusted for the fact that the 2300MHz band eco-system is somewhat more advanced with scaled commercial deployment in Australia & China & on-going rollouts and impending launches in India.
- (f) Hence, we would recommend that 700MHz reserve prices may be set at no more than 2 times 2300MHz reserve prices on a paired MHz basis.
- (g) If any other band is used for reference, the technical efficiency factor should be much lower because of the large disparities in eco-system development.
- (h) In the absence of sufficient data, the valuation may also be sense-checked from international data for sub-1GHz LTE spectrum. The following table uses prices achieved in international digital dividend auctions to estimate pan-India prices for 700MHz band

<b>Country</b>	<b>Value/MHz/Pop (PPP adjusted) (Auction price)</b>
	US\$
Iceland	0.07
Latvia	0.07
Switzerland	0.19
Denmark	0.28
Brazil	0.30
New Zealand	0.33
Finland	0.36
Sweden	0.41
Ireland	0.53
Netherlands	0.62
Belgium	0.63
Spain	0.66
Portugal	0.67
Croatia	0.69
Greece	0.72
Czech Republic	0.83



Australia	0.88
Germany	0.90
Italy	1.02
Taiwan	1.20
<b>Mean</b>	<b>0.57</b>
<b>Estimated India population</b>	<b>1,250m</b>
<b>Implied pan-India spectrum value</b>	<b>US\$709</b>
<b>PPP adjusted exchange rate</b>	<b>Rs20/ US\$</b>
<b>Implied pan-India value in rupees</b>	<b>Rs1,419cr./ MHz</b>

Note

1 Auction data from GSMA

- (i) It is important that the reserve prices are pegged at a reasonable level, sufficient only to deter non serious bidders, but facilitate fullest market participation, otherwise there will be a risk of a failed auction. Given the competitive nature of the Indian market, a reasonable reserve price will definitely deliver a fair market price.

**Q24. Should the value of May 2010 auction determined prices be used as one possible valuation for 2300 MHz spectrum in the next round of auction? If yes, then how? And, if not, then why not?**

- (a) The May 2010 auction determined prices may be used as one possible valuation for 2300MHz spectrum
- (b) However, no indexation should be carried out. In May 2010, the Government had carried out auctions for both 2100MHz and 2300MHz bands. In 2015, the Government carried out another auction for 2100MHz band. A comparison of the 2010 and 2015 results clearly demonstrates that in most circles, the escalation in prices in 2015 over 2010 was much less than any indexed values. In Delhi, Mumbai and Andhra Pradesh, spectrum could not be sold even at 2010 prices indicating that market prices have actually gone down.

**Q25. Should the value of the 2300 MHz spectrum be derived on the basis of the value of any other spectrum band using the technical efficiency factor? If yes, please indicate the spectrum band and technical efficiency factor with 2300 MHz spectrum along with supporting documents.**

- (a) We believe that if at all, a technical efficiency factor is to be used, it should be used between spectrum bands that are at a similar stage of development and where the technical efficiency/propagation characteristics is nearly the only differentiating factor.
- (b) We do not think there is any existing band which is comparable to 2300 MHz spectrum since the eco-systems for other bands are years ahead of the 2300MHz band eco-system. Further,



2300 MHz is expected to be used only for LTE whereas all other spectrum bands assigned so far in India are also used for circuit-switched voice.

**Q26. Should the valuation of the 2500 MHz spectrum be equal to the valuation arrived at for the 2300 MHz spectrum? If no, then why not? Please support your comments with supporting documents/ literature.**

- (a) 2500MHz band has poorer propagation characteristics than 2300MHz band as well as a poorer eco-system, so the reserve price of the 2500MHz band spectrum should be priced at 30% discount to 2300MHz band

**Q27. Is there any other method/approach than discussed above that could be used for arriving at the valuation of 700/800/900/1800/2100/2300/2500 MHz spectrum bands or any international auction experience/ approach that could be used for valuation of any of these bands? Please support your suggestions with detailed methodology and related assumptions.**

- (a) We submit that in case of 800MHz/900MHz/1800MHz and 2100MHz bands, the auctions have just been held in March 2015.
- (b) In cases where a market clearing price was discovered [i.e. demand > supply], the valuation for the band may be taken at the auction price discovered in March 2015 and that, as per practice, reserve price may be set at a 20% discount so as to encourage market participation.
- (c) In cases where spectrum went unsold, valuation may be adjusted by 30% and reserve price may be set at a further 20% discount to the revised valuation so as to encourage market participation.
- (d) In case of 700/2300/2500MHz band, a different approach will have to be adopted as in case of 700MHz and 2500MHz, this spectrum is being put to auction for the first time, whilst in the case of 2300MHz, the last price discovery was over 5 years ago.
- (e) We would like submit that while a revenue based approach is not feasible for 700MHz/2300MHz bands, a cost based approach (producer surplus) model can still be attempted. Existing data spectrum holders will save on network capex and opex by deploying spectrum in the 700MHz/ 2300MHz band. In attempting a producer surplus approach, it must be kept in mind that, the busy hour data capacity of each LTE site will be at least 2 times the capacity of a 3G node B. Monthly traffic can be derived based on 3G data since it is only existing 3G subscribers who will be migrated to LTE.
- (f) As submitted above, reserve prices should be pegged at reasonable levels for these bands, sufficient only to deter non serious bidders, but facilitate fullest market participation; otherwise there will be a risk of a failed auction.



**Q28. As was adopted by the Authority in September 2013 and subsequent Recommendations and adopting the same basic principle of equal-probability of occurrence of each valuation, should the average valuation of the spectrum band be taken as the simple mean of the valuations obtained from the different approaches/methods attempted for that spectrum band? If no, please suggest with justification that which single approach under each spectrum band, should be adopted to value that spectrum band.**

- (a) In our view it is incorrect to assume equi-probability of various approaches without regard to the market context. For instance, applying the same probability to the revenue surplus and producer surplus is unjustified. The revenue surplus method is applicable to a new operator only (with no data spectrum in a service area) whereas the producer surplus method is applicable to an existing operator. In recent auctions, there are very few instances of new operators purchasing spectrum in any service areas hence the probability accorded to the revenue surplus method should be much lower
- (b) It must be noted that for an operator with existing data spectrum in any band, purchasing data spectrum in any other band (e.g. 700 or 2300) will not create a “new” source of revenue. It will only create cost efficiencies in supporting existing revenue stream and therefore only the producer surplus model is relevant for such an operator

**Q29. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands and why?**

- (a) We submit that the practice of taking 80% of valuation as the reserve price for the spectrum in 800/900/1800/2100/2300 MHz bands may be continued.
- (b) In the case of 700/2500MHz bands, because these bands are being auctioned for the first time, we believe that there may be a case for added caution by taking the reserve price at 30% of the estimated valuation.
- (c) There have been several instances in the past where high reserve prices set in Indian auctions have led to auction failures and prevented the discovery of market prices. The following table summarises the number of instances where market price has not been discovered in auction in India from 2012:

Year	Band	Total lots put for auction	Lots with unsold spectrum at reserve price	% failure
2012	1800	22	4	18%
2012	800	21	21	100%
2013	800	22	13	59%



2013	900	3	3	100%
2013	1800	4	4	100%
2014	900	3	0	0%
2014	1800	22	10	45%
2015	800	12	2	17%
2015	900	17	0	0%
2015	1800	15	4	27%
2015	2100	17	3	18%
	Total	<b>158</b>	<b>64</b>	<b>41%</b>

Note

1 A lot denotes spectrum in a given band in a given service area

- (d) As evident above, 41% of the reserve prices that have been set by the Government in the past have been too high to allow market price discovery. This clearly indicates that bottom-up valuation models of the past have tended to over-estimate the spectrum value. In order to compensate for these estimation errors, it is important that the reserve price/ estimated value ratio is kept low, especially for new bands.

**Q30. Should the realized prices in the recent March 2015 auction for 800/900/1800/2100 MHz spectrum bands be taken as the reserve price in respective spectrum bands for the forthcoming auction? If yes, would it be appropriate to index it for the time gap (even if less than one year) between the auction held in March 2015 and the forthcoming auction? If yes, then at which rate the indexation should be done?**

- (a) It is submitted that whilst the realized prices can be taken as the 'valuation' of spectrum in the respective bands, these should not be taken as the reserve price for the next round of auctions. To do so would restrict scope for price discovery based on the current market conditions.
- (b) It is therefore our suggestion that in cases where price has been discovered, the same should be taken as the value of the spectrum and the reserve prices should be pegged at a 20% discount to the same.
- (c) In cases where spectrum went unsold, there is a case to discount the valuation by 30% and give a further 20% discount to arrive at the reserve price.

### **III. ADDITIONAL ISSUES**

#### **A. Spectrum Road Map:**

- (i) There is a need to lay down a clear roadmap for spectrum management, which should state the requirement and availability of the spectrum for each LSA as well as for the whole country.



- (ii) The need for a clear roadmap has also been enunciated by the Authority in its recommendations.
- (iii) This roadmap should be publicly available to not only ensure transparency but also ensure that service providers bid on the basis of their respective business case rather than on the fact that there is no certainty on when the spectrum will be available in future.

## **B. Interference**

### **3G Interference in Spectrum acquired through auctions in 2010**

- (i) As the Authority is well aware we have been suffering serious harmful interference in 2.1GHz spectrum acquired by us through auction in 2010 in Gujarat and Haryana service areas. This issue has not been resolved even after 5 years despite even the Authority's earlier recommendations **that the issue of interference, reported in the 2100 MHz band in some LSAs, needs to be resolved before putting fresh Spectrum blocks to auction in these LSAs and that Spectrum blocks being put to auction are interference-free.**
- (ii) However the above recommendation of TRAI was not accepted by DoT constraining affected Operators, including us, to file Petitions in the Hon'ble TDSAT.
- (iii) A Committee appointed by the Hon'ble TDSAT also concluded that there is harmful interference in the said areas and that the Committee has recommended swapping of frequencies in the 2.1GHz band in Gujarat Service area.. In respect of Haryana the Committee has also concluded that there is harmful interference and the Report has been filed in TDSAT.
- (iv) In the last hearing before the Hon'ble TDSAT on 23.11.2015, the Learned Solicitor General of India made *an unequivocal statement that the problem of interference in their uplink frequencies, as canvassed on behalf of the petitioners, in different regions (as noted in the earlier order) would be finally and fully resolved by mid-January 2016.* Thus as per the above, a full and final resolution is now to be provided by the Government to the Operators. This needs to be kept in mind while making any further recommendations in the matter of 2.1 GHz Spectrum auction.
- (v) We, submit that it is imperative to ensure that the interference issues must be resolved first, which would require swapping of spectrum, including as per the Committees Reports appointed by the Hon'ble TDSAT and only then the balance spectrum be put for auction. Any auction of 2.1 GHz Spectrum in these areas without and before resolving the present interference issues will have its adverse consequences and will also not be in public interest.



## **Spectrum now put to auction should be interference free**

- (vi) In addition to the above, the Authority must also ensure that all spectrum put to auction is interference free.
- (vii) This is required not only for 2.1GHz spectrum, which was wrongly put to auction in "March 2015 on an "as-is-where-is" basis, but also other spectrum bands including the 700MHz band.
- (viii) We submit that as per the Preamble of the TRAI Act, 1997, the Authority has to protect the interest of both the service providers and consumers as also to promote and ensure orderly growth of telecom sector. An interference prone Spectrum neither protects the interest of the service providers, nor the consumer; on the contrary it directly and adversely affects the quality of service to consumers and add to, inter alia, call drops. It is also not contra to orderly growth of telecom sector.

We have also written to the Authority in this regard on 16.12.2015, copy of our letter is enclosed as **Annexure-2** for ready reference.

### **C. Completion of Nov 12 allocations**

- (i) As the Authority is aware, spectrum in the 1800MHz has historically been allocated in carrier width of 200KHz. There was an aberration in the November 2012 auctions, where 1800MHz spectrum was auctioned in 1.25MHz blocks.
- (ii) **This non-standard allocation has not only resulted in wastage of spectrum by the operators of 0.05MHz per block and up to 0.15MHz in case 3 blocks were acquired by any operator, but also had the unintended consequence of spectrum being left idle by the Government as the residual part of the 200KHz carrier is also unusable by any other operator.**
- (iii) In addition to the above, this **wastage has been further exacerbated in cases where the spectrum allocations were not as per the GSM ARFCN table** and the non-aligned start and stop frequencies auctioned in November 2012, has resulted in upto 2 blocks, i.e. 400KHz being unusable in some cases.
- (iv) However, despite our repeated follow ups with DoT, to allocate the **additional 0.05 to 0.15MHz to us so as to complete the block size of 200 KHz and our offer to pay price for the allocation of such assignments of peculiar smaller than 200MHz blocks**, the problem of fractional assignments continues to subsist for spectrum auctioned in November 2012.



- (v) **Such wastage /non-use of valuable spectrum is most undesirable** and unwarranted as efficient and optimal use of valuable spectrum is the over-arching objective of the Government; such objective being in the highest interest of the public, the economy and the operators.
- (vi) We seek the support of the Authority for recommending the allocation of the fractional 0.05MHz to 0.15MHz to us as per the prevailing market price. In the alternative, we suggest that in the event that the view is that this spectrum cannot be allocated to us as per prevailing market price, a separate auction may be recommended of such fractional spectrum in the next round of auctions.

Copy of our letter to the Authority in this regard is enclosed as **Annexure-3**.

**D. Spectrum Usage Charges for the Forthcoming auctions be applied at 1% AGR**

- (i) We request that the SUC for the spectrum that will be acquired in the forthcoming auctions be prescribed at 1% AGR as has been recommended by the Authority on many occasions.

**E. Harmonization of 1800MHz**

- (i) As the Authority is aware, there are discussions going on between the industry and DoT for the harmonization of the spectrum in the 1800MHz band for moving Defence out of the commercial band and also carrying out inter se harmonization amongst operators.
- (ii) We welcome this initiative of the DoT as we believe that harmonization of 1800MHz frequencies will enable and expedite achievement of national vision of broadband as a utility for every citizen. This exercise is most timely and warranted as the existing spectrum allocations in 1800MHz are fragmented and non-contiguous,
  - o resulting in sub optimal use of spectrum,
  - o and also inhibiting operators from deploying advanced technologies and offering broadband services.
- (iii) We believe that the re-arrangements of spectrum in 1800MHz band to make the holding contiguous should be carried out in a comprehensive manner with pre-defined time frames and for all services areas, in order to ensure the fullest benefits of harmonization for the consumers, economy and the Government.
- (iv) It is our submission that the harmonization exercise should be completed before the auctions as this will ensure a higher valuation for the 1800MHz spectrum, rather than the same being auctioned in fragmented currently available blocks.
- (v) In the alternative since DoT/WPC while drawing up the harmonization plan, has been able to identify the amount of spectrum that will fall vacant [after being vacated by Defence],





this vacant/available 1800MHz spectrum may be put to auction so that it can be picked by prospective bidders to either acquire 5MHz blocks wherever available or to acquire additional spectrum to complete a 5MHz block for their existing allocations. Prospective bidders should be assured by DoT that their liberalized spectrum would be made contiguous.

- (vi) The harmonization exercise should enable /facilitate the most optimal use of spectrum in the hands of all service providers.
- (vii) The implementation of the harmonization exercise will deliver the best results for the consumers, Government and the operators.

#### **F. MTNL spectrum**

- (i) We note that whilst both the DoT and the Authority are aware that the spectrum of MTNL in 900 and 1800MHz bands is expiring in 2017, it appears that this spectrum may not be put to auction.
- (ii) We believe that such a suggestion is not fair as it places MTNL on a more advantageous footing versus its competitors.
- (iii) It may be noted that at the time when MTNL entered mobile services, this apprehension of advantageous treatment was raised by the private operators and in a clarification issued by DoT on 01.10.1999, it was categorically assured that there will be the same licensing regime for all operators. Copy of DoT clarification dated 01.10.1999 is enclosed as **Annexure-4** for ready reference.
- (iv) In view of the above, we believe that like for done in the case of the private operators, the spectrum of MTNL which is expiring in 2017 should stand reverted to the Government and should be put up for auction. This will also be in consonance with the Hon'ble Supreme Court's judgment dated 02.02.2012 in Writ Petition (Civil) No. 423 of 2010 and 14.05.2015 in Civil Appeal No.2803 of 2014.
- (v) Without prejudice to the above, it may also be noted that such a reservation /administrative allocation approach was adopted by the DoT in 2010 where one block of 2X5MHz 2100MHz spectrum and one block of 20MHz in 2500MHz was reserved in Delhi and Mumbai for MTNL and in the remaining service areas for BSNL. It was stated that BSNL and MTNL shall not be participating in the 3G and BWA Auction, but shall be required to match the Winning Price achieved in the respective service areas in the respective spectrum bands.
- (vi) Thus at the very least and in line with the past practice, the spectrum allocated to MTNL can only be extended as per the price discovered by the market.



- (vii) It may however be noted that it is the approach and stand of the Government that the auction price is relevant only for 1 year post which fresh auctions must be held. The price of 900MHz was last discovered in 2014, and hence cannot be taken at the market price for expensing the spectrum of MTNL.
- (viii) It is also submitted that the 2010 approach adopted was DoT was prior to the Supreme Court decision referred to above, and hence also, it may not be appropriate to adopt these in the current environment.
- (ix) It is also submitted that such a decision may also be against the interest of MTNL who will rather than having the ability to discover its own price and the quantum of spectrum, may have the same thrust upon it. The same was the case in the auction of 2500MHz, where MTNL not finding the spectrum price conducive to its business plans was forced to surrender the spectrum.
- (x) In view of the above, we believe that the spectrum allocated to MTNL in the 900 and 1800MHz band should be put to auction in the forthcoming auction along with all other spectrum and MTNL should have the freedom and choice to re-acquire the same as per a quantum and price suitable to it.

#### **G. Spectrum Caps**

- (i) We would like to draw the kind attention of the Authority to an anomalous provision in the M&A guidelines, which provide for an intra band cap of 10MHz for 800MHz – which amounts to an in-band cap of as much as 80% in some service areas. The M&A guidelines dated 20 February 2014, state as below:

*“Consequent upon the implementation of scheme of compromises, arrangements or amalgamation and merger of licenses in a service area thereupon, the total spectrum held by the Resultant entity shall not exceed 25% of the total spectrum assigned for access services and 50% of the spectrum assigned in a given band, by way of auction or otherwise, in the concerned service area. The bands will be as counted for such cap in respective NIAs for auction of spectrum. **In respect of 800 MHz band, the ceiling will be 10 MHz. Moreover, the relevant conditions pertaining to auction of that spectrum shall apply...**”*

- (ii) Besides this being completely unfair and against the principles of level playing field, it may be noted that even in the M&A guidelines, while prescribing a cap of 10MHz for 800MHz, there was an additional provision – i.e. “**...Moreover, the relevant conditions pertaining to auction of that spectrum shall apply...**”.



- (iii) It is submitted that that the NIA 2015 clearly stipulates an in-band cap of 50% for 800MHz. Some bidders were restricted in acquiring spectrum in the recent auctions because of the application of spectrum caps and to ignore these caps now would create inequities.
- (iv) It is also submitted that if an operator could not have bid and won more than 50% of spectrum in 800 MHz in any service area due to restriction of caps in the NIA, it cannot be allowed to hold more than 50% (i.e. a total of 10 MHz) by other means such as M&A. It is a settled proposition of law that what cannot be done directly, is not permissible to be done indirectly. Furthermore, as submitted above, even the M&A Rules state that the relevant conditions pertaining to auction of that spectrum shall apply.
- (v) The auction rules have prescribed an in-band cap of 50% for, 800 MHz which has to be applied in respect of all transactions be it Auctions, Spectrum Trading, Spectrum Sharing or Merger & Acquisitions. Any other interpretation, will lead to a violation of NIA conditions.

#### **H. Review of Transmit Power Limit of 20W**

- (i) The Authority may recall that as a part of the response to the TRAI Consultation Paper dated 2 December, 2014 on Valuation and Reserve Price of Spectrum: 2100MHz band, the industry association as also Vodafone had highlighted that :
  - The BTS Transmit power guidelines for the mobile networks were introduced in 1995 when GSM was the most common network.
  - Since then technologies have evolved, however, transmit power regulation have not been reviewed and the same norms are being followed for all new technologies such as 3G and LTE.
  - Current guidelines of RF power from DoT on transmit power (RF) from the BTS is 20W at the output of the BTS port.
  - Given that the new broadband technologies introduced beyond 2010 are having different characteristics there need for review of this 20w transmit power requirement.
- (ii) In the White Paper submitted to the Authority on this subject, it was submitted that
  - (a) From the calculated method and field measurement results shown above for a heavily loaded site, it is clear that the EIRP/EIRP<sub>th</sub> values for 60W/80W power of 3G and LTE are well within the limits of EMF guidelines described by DoT.
  - (b) Transmit power per MHz (power density) for 3G & LTE base station (having transmit power of 60W & 80W respectively) is lower than that of a GSM base station,
  - (c) EIRP/EIRP<sub>th</sub> for 3G and LTE base station is lower than that of GSM base station. This is pertinent to 3G deployment in 2100MHz or 900MHz band and LTE deployment in 2300MHz or 1800MHz band,



- (d) 3GPP specifications ensure same out of band emission norms for 3G and LTE base station with transmit power of 43dBm (20W) or higher,
  - (e) 3G and LTE base stations with transmit power of 60W & 80W respectively, comply to the 3GPP specifications and are within emission levels as per EMF regulations,
  - (f) Suggested modifications for EIRP value in case of 3G, LTE-FDD, LTE-TDD deployments by taking average transmit power during a frame. This is mandatory as LTE technology (FDD&TDD) consistent power is only transmitted during specific Resource Elements. Additionally in LTE-TDD base stations are transmitting power only during specific intervals of time (downlink sub-frames), while at other time intervals its only in the receiving mode with no transmitting power (uplink sub-frames). Similarly in 3G only the CPICH is transmitted as full power (30-33dBm) , only when users are scheduled the further additional delta power is required
  - (g) Given the above facts, TSPs should be allowed to configure transmit power in 3G and LTE base stations beyond 20W, maintaining compliance to the EMF norms.
  - (h) Increasing the power will not have any interference impact on adjacent carrier so far operator is complying with the 3GPP mentioned ACLR and SEM requirements
- (iii) The Authority noted these submissions, but did not make any specific recommendation on the issue, rather it recommended that the DoT should carry out the EMF impact study and decide within a period of 6 months whether the power radiation limits from base stations can be enhanced beyond the present limits of 20 Watts for HSPA/HSPA+ or LTE technologies.
- (iv) However no such study has been carried out by DoT in this regard.
- (v) In this regard we verily believe that in respect of BWA, the DoT has already permitted transmit power of 40w. Given that all spectrum being put to auction is liberalized spectrum and broadband technologies can only be offered on liberalized spectrum the Authority may kindly recommend that transmit power be revised to 40w for all liberalized spectrum.

#### **I. Aircel 1.8MHz**

- (i) As the Authority is aware, following the Hon'ble TDSAT's order dated 31 January 2014, spectrum of 1.8MHz in the 1800MHz has been reserved for Aircel. However, it is submitted that this spectrum cannot be held back indefinitely. Withholding this spectrum is a waste of national resources.
- (ii) It is submitted that either Aircel/Dishnet should take the spectrum subject to conditions contained in the Hon'ble TDSAT's order or the spectrum should be put up for auction.

New Delhi  
21 December 2015