



Association of Unified Telecom Service Providers of India

AUSPI/12/2014/114

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Shri Arvind Kumar,
Advisor (NSL-I),
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Old Minto Road,
New Delhi 110002.

Sub: Response to TRAI Consultation Paper No. 13/2013 on 'Reserve Price for Auction of Spectrum in the 800 MHz Band'

Dear Sir,

Enclosed please find AUSPI's Response to TRAI Consultation Paper No. 13/2013 regarding Reserve Price for Auction of Spectrum in the 800 MHz Band.

We request the Authority to take AUSPI's views into consideration when it makes recommendation on the subject.

Thanking you,

Yours faithfully,

Ashok Sud
Secretary General
Mob: 9312941515

Encl: As above

Copy to:

1. Dr. Rahul Khullar, Chiarmen, TRAI
2. Shri R K Arnold, Member, TRAI
3. Smt. Vijayalakshmy K Gupta, Member, TRAI
4. Shri Rajeev Agrawal, Secretary, TRAI



AUSPI's Response to TRAI Consultation Paper No. 13/2013 on Reserve Price for Auction of Spectrum in the 800 MHz Band

1. AUSPI welcomes the opportunity to respond on the issues raised in the consultation paper on Reserve Price for Auction of Spectrum in 800 MHz Band. In this context the following is noteworthy.
2. The Authority has carried out fresh valuation for 900 and 1800 MHz bands while taking note of the following:
 - a) There was lack of interest by bidders due to high reserve price. Changed economic situation and sector specific conditions required fresh valuation of 1800/900 MHz bands;
 - (b) 1800 MHz is contiguous and the most widely used band for LTE deployments globally and is greatly assisting international roaming. The reserve price for 1800 MHz has been reduced by 25%;
 - (c) 900 MHz band is contiguous and is being used for UMTS deployment. One of the biggest operators in India has already issued RFP for UMTS deployment in 900 MHz band. The reserve price for 900 MHz band has been reduced by 47%.
3. Like 900/1800 MHz bands, there was no participation in 800 MHz band in most circles. As the experience shows that the due to high reserve price, there was total lack of interest in the auction and the participation was almost nil. There is need to look afresh at 800 MHz reserve price and reduce it significantly so that there is larger participation in auction.
4. The Authority in its recommendations over the years has brought down the valuation of 1800 MHz spectrum band. The valuation was Rs 4571 crores per MHz in Feb'2011 and now reduced to Rs 1872 crores. The reduction of 1800 MHz valuation was 58% in two consecutive exercises carried out in 2012 and 2013. The summary of TRAI recommendations on 1800 MHz valuation is given below:

TRAI Recommendations	8 th Feb, 2011 (>6.2MHz)	23 rd April, 2012	9 th September, 2013
Per MHz valuation in 1800 MHz band (Rs.)	4571 crores	4527 crores	1872 crores



5. Based on TRAI recommendations, EGoM/Cabinet have approved following reserve prices for 1800 MHz band:

DOT Determinations	Nov'2012	Dec'2012 (One Time Charge)	Feb'2014
Per MHz Reserve Price for 1800 MHz (Rs.)	2800 crores	2378.6 crores	1762 crores

6. Thus, TRAI/DoT have been recommending/reducing the valuation and reserve price of 1800 MHz spectrum band time after time to increase demand and participation in 1800 MHz auction. **Any attempt to increase reserve price would again see no participants in 800 MHz band and it would also be inconsistent with valuation methodology for 900/1800 MHz which resulted in significant decrease in reserve price.**
7. It may be noted that spectrum available in 900/1800 MHz bands is contiguous and ready for deployment of advanced technologies like LTE. On the other hand, spectrum being auctioned in 800 MHz is non-contiguous and at present can only be used for CDMA services. Further eco-system of LTE850 is not as developed as LTE1800. Therefore, there is strong case for even higher reduction in 800 MHz reserve price compared to 900/1800 MHz bands.
8. Considering the above factors, EGoM had recommended lower reserve price for 800 MHz spectrum in 2013 and on the basis of its recommendations, Cabinet approved lower price for 800 MHz band in January 2013. The reserve price for 800 MHz spectrum band was fixed at 0.65 times the reserve price for 1800 MHz spectrum band in the auction held in March, 2013. AUSPI is of the view that the ratio of reserve prices between 800 MHz and 1800 MHz bands as decided earlier is close to true valuation of 800 MHz.
9. **Accordingly, the reserve price for 800 MHz spectrum, should be kept much lower than the already determined price of 1800 MHz during the auctions held earlier or at the most it should be pegged at 0.65 times the latest 1800 MHz reserve price as this ratio between 800 MHz and 1800 MHz was decided by the Union Cabinet earlier.**
10. AUSPI has also noted that the Authority in its Consultation Paper has made certain observations/suggestions which have a relation to one of our member SSTL. These observations/suggestions in paragraph 3.11 of the Consultation Paper have been



made as a background to Issue No. 4 on which comments have been sought. AUSPI feels that any restriction on any operator for participation in next 800 MHz auction would be unfair.

11. AUSPI would also like to place on record for the Authority against their point No 2.5 of consultation paper that one of our members namely Tata Teleservices was permitted by Hon'ble High Court to surrender part of their CDMA spectrum in 800 MHz band without prejudice to its rights and contentions.

Q.1. What should be the quantum of spectrum in the 800 MHz band that should be put up for auction?

AUSPI is of the view that the entire spectrum readily available with the DoT in 800 MHz band i.e. 824-844 (U/L) paired with 869-889 (D/L), in all service areas should be put to auction. Creating any artificial scarcity of 800 MHz spectrum in the auction may discourage potential bidders from participating in the auction leaving the spectrum unsold resulting in inefficient utilization of spectrum and loss to the Government.

We would also like to state that internationally, 25 MHz in 800 MHz band i.e. 824-849 MHz paired with 869-894MHz, has been harmonized for CDMA services but on the contrary, only 20 MHz CDMA spectrum is allocated in 824-844 MHz paired with 869-889 MHz in India. AUSPI has requested many times in the past for re-farming of additional 5 MHz spectrum (844-849/ 889-894 MHz) for CDMA services.

We also believe that the TRAI proposal of enhancing availability of spectrum in 800 MHz by withdrawing CDMA spectrum from BSNL/MTNL is uncertain. PSUs are using this spectrum for serving more than one million customers for voice, data and RDel services. Any action to withdraw CDMA spectrum from PSUs may lead to poor customer experience and adverse impact on their expansion plans in future

We, therefore, suggest that the entire spectrum readily available in the 800 MHz band in all service areas at the time of auction should be put to auction.

Q.3. Should the value of 800 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors?

We do not concur with TRAI's proposal to derive valuation of 800 MHz using technical efficiency over 1800 MHz band. It is submitted that other key factors viz. availability of spectrum, limited contiguity, spectrum efficiency/coverage



vis a vis 1800 MHz for LTE deployment, limited eco-system, limited user equipment availability should also be considered while deriving pricing for 800 MHz.

TRAI's argument that 800 MHz is more advantageous vis-à-vis 1800 MHz band for area coverage is not valid / applicable today in Network deployments scenario for Dense urban and Suburban areas where the Tower Infrastructure is at an inter tower distances of 400 mts to 600 mts. The Tower Infrastructure would only be used as Point of Presence (POP) for BTSs to be deployed for any technology based services launched at lower power levels. **Hence, the theory of lower bands giving advantage over higher bands for propagation is no more relevant in the current pragmatic network deployment scenario in Urban and Suburban deployments which is one of the most well known facts for any Telco today.**

Moreover, since, the throughput for data services inherently decreases as the distance from the center of the cell increases, cells of smaller size are mandatory for deployment of LTE or LTE Advanced; thereby it precludes any area coverage benefit that 800 MHz band would have accrued vis-à-vis 1800 MHz band.

The availability of spectrum in 800 MHz is only 20 MHz (paired) with restricted contiguity as compared to 1800 MHz (55 MHz paired). This is a major reason why deployment of LTE in multi-carrier mode i.e 2*5 MHz is not a feasible option for the operators in 800 MHz band. LTE in this band is suitable for deployment as Narrow band LTE i.e. 5Mhz channels only as against other popular bands of 1800 MHz where quantum supports 10Mhz channels in multiple telco deployment scenario .Hence 800 band does not provide any major advantage for nextgen technologies over the current deployments

Given the small global scale of adoption of 800 MHz band at around 3 % as compared to other popular bands, the device ecosystem for LTE is unlikely to develop at the same scale as in other bands to meet the Indian market's needs.

In the light of the above, it is clear that 800 MHz band is challenged by lack of contiguity, limited multi carrier growth / expansion capability, limited User and Network equipment availability, lack of harmonization internationally and a diminishing subscriber and vendor base across the world. 800 MHz Band is the least popular, has the least Quantum of spectrum and thus has the lowest business potential.



We therefore request that, the reserve price for 800 MHz spectrum, should be kept much lower than the already determined price of 1800 MHz during the auctions held earlier or at the most it should be pegged at 0.65 times the latest 1800 MHz reserve price as this ratio between 800 MHz and 1800 MHz was decided by the Union Cabinet earlier.

Q.4. Is there any case for application of a lower efficiency factor (1.3) over the valuation of 1800 MHz spectrum, for determining the valuation of 800 MHz, as was done in the previous auction? If yes, give detailed reasons for the same.

The application of efficiency factor of 1.3 for the 800 MHz band, over the valuation of 1800 MHz spectrum, for data services, would be grossly exaggerated and should not be applied. For any technology, including LTE and LTE Advanced, the 800 MHz band is challenged by lack of spectrum contiguity, limited multi carrier growth / expansion capability, limited User and Network equipment availability, lack of harmonization internationally and a diminishing subscriber and vendor base across the world. 800 MHz Band is the least popular, has the least Quantum of spectrum and thus has the lowest business potential. Therefore, it should be at the lowest price due to almost unacceptable Techno-Economic feasibility.

AUSPI believes that Indian 800 MHz CDMA spectrum should have a fair value considering the following factors:

- Frequency band's current and future service capability potential
- Current subscriber uptake and future market opportunity,
- Indian CDMA band global harmonization scale for current and next generation technologies i.e. CDMA and 4G LTE FDD
- Current device ecosystem and future migration path for 4G and global scales of economy for a range of devices
- Network Infra Equipment Roll out economics
- Support for Multi Carrier operation in expansion mode from Single Carrier
- Total Spectrum Quantity being available in the band
- Network loading efficiency for Mobile Broadband when non-contiguous spectrum of less than 5 MHz is only available etc.

Considering the above factors, EGoM had recommended lower reserve price for 800 MHz spectrum in 2013 and on the basis of its recommendations, Cabinet approved lower price for 800 MHz band in January 2013. The reserve price for 800 MHz spectrum band was fixed at 0.65 times the reserve price for 1800 MHz spectrum band in the auction held in March, 2013.



In light of our response to issue 3 above and the stated facts of poor ecosystem and adaptability of 800 MHz (band 5) globally, we request that **the reserve price for 800 MHz spectrum, should be kept much lower than the already determined price of 1800 MHz during the auctions held earlier or at the most it should be pegged at 0.65 times the latest 1800 MHz reserve price as this ratio between 800 MHz and 1800 MHz was decided by the Union Cabinet earlier.**

Further to above, in reference to para-3.11 of the consultation paper, AUSPI would also like to submit that no restrictions should be imposed on any existing licensee holding any amount of spectrum within the spectrum cap prescribed by the DoT in 800 MHz band, to participate in proposed auction and acquire spectrum as per its requirement. Any such restriction will be against the principle of level playing field and will be discriminatory and hence against the objective of conducting fair and transparent auction.

Q5. Should the value to be paid for 800 MHz spectrum be based upon the potential growth in data services? If yes, please state whether you agree with the assumptions made.

There is no merit in linking the 800 MHz spectrum value based upon the potential growth in data services as there is limited opportunity for growth in data exists in CDMA .

It may be noted that adoptability of 850 MHz for deployment of advanced technologies like LTE is much lower compared to 1800 MHz. The latest data available on GSA website, on networks deployed in various bands and even used in the current consultation paper, clearly shows that globally 1800 MHz is used in 44% of the commercial launched LTE networks and 800 MHz (Band 5) is not the preferred band for LTE deployment in future.

Globally, only few countries like Puerto Rico, USA (Sprint), Philippines, South Korea(2 networks), Australia have deployed advanced technologies like LTE in the 800 MHz (Band 5) spectrum band. On the other hand 1800MHz spectrum band is witnessing a mushrooming of LTE networks and is emerging as the preferred band for the same.

Moreover the device availability in 800 MHz is much lower than the other preferred band for advanced technologies deployment. Therefore, TRAI's viewpoint that 800 MHz is an efficient band and has more data growth potential in the future, by deployment of 3G/4G technologies based services is incorrect.



It would not be out of place to mention that, the quantum of spectrum available in 800 MHz band is just 2x20 MHz as compared to availability of higher spectrum in 1800/2100/2300/2500 MHz bands and therefore the potential data revenue is much lesser in 800 MHz band. As more spectrum is made available in these and other bands like 700MHz the share of data revenues of 800MHz band will be much lower. Thus we differ with TRAI assumption of continuing 25% data revenue from 800 MHz band over 20 years. The growth of data services in 800 MHz band is mainly led by dongles. However, dongle business is being replaced by smartphones and it is unlikely that the current growth would continue in future. There are hardly any smart phones available in India in 800 MHz band and therefore long term data growth is not very encouraging.

TRAI has suggested following assumption for valuation of 800 MHz spectrum which AUSPI **does not support** and if applied would lead to wrong estimation of 800 MHz spectrum valuation:

- a) Auction of 800 MHz spectrum will be for liberalized use and demand for 800 MHz spectrum will not be confined to TSPs using 800 MHz for providing CDMA services.
- b) Over the next 20 years, the share of the 800 MHz band in the total revenue from data services will be around 25% in each LSA.
- c) The number of subscribers will grow at a tapering rate, starting from 6% in 2014-15.
- d) Revenue per unit of usage from data services as well as non-data services remain the same over the next 20 years.

We beg to differ with the assumptions given in the consultation paper for valuation of 800 MHz band due to the following reasons:

- The 800 MHz spectrum being auctioned is non-contiguous and cannot be used to deploy LTE efficiently.
- Total spectrum available in 800 MHz is only 20 MHz and out of it only 12 carriers are available in major markets like Delhi and Mumbai. Thus the spectrum availability in 800 MHz is only 10% of the total access spectrum in 900, 1800, 2100 and 2300 MHz spectrum bands. The 800 MHz spectrum is non-contiguous and not ready for LTE deployment. The share of 800 MHz spectrum would further decline once 700 MHz and additional 3G spectrum is released for data service deployment. Thus with 5-6% non-contiguous



spectrum holding in 800 MHz band, the assumption that it would generate 25% of total data revenues is highly exaggerated. The correct assumption for data revenue in 800 MHz would be around 5-6%.

	800 MHz	900 MHz	1800 MHz	2100 MHz	2300 MHz	% of Access Spectrum in 800 MHz Band
Delhi	17.5	22.2	55	20	60	10.0%
Mumbai	17.5	22.2	55	20	60	10.0%

- There is reduction in demand for 800 MHz dongles. Smartphone usage in 800 MHz is negligible.
- As a general market trend when data usage increase, tariffs fall and do not remain constant as has been assumed above. The revenue does not grow at the same rate as consumption of services. Thus TRAI should consider fall in tariff by 5-8% every year.
- More data player with UMTS/LTE 4G are expected to launch services in 900/2300 MHz bands which would result in significant reduction in tariffs and increased market competition; thus further reducing the share of 800MHz in overall data market.
- 850 LTE ecosystem is not as developed as LTE1800.

In view of the above we request the Authority to make correct and reasonable assumptions relating to revenue and potential growth of data service in 800 MHz band. It would be fair to take following assumptions for 800 MHz valuation:

- Market share in terms of revenue of 800 MHz is taken as 5-6% for data services
- **The reserve price for 800 MHz spectrum band should be kept much lower than the already determined price of 1800 MHz during the auctions held earlier or at the most it should be pegged at 0.65 times the latest 1800 MHz reserve price as this ratio between 800 MHz and 1800 MHz was decided by the Union Cabinet earlier.**



Q.6. Should the value of spectrum in the 800 MHz band be assessed on the basis of producer surplus on account of additional spectrum? If you are in the favour of this method, please furnish the detailed calculations and relevant data along with results.

The producer surplus approach hinges on the inverse relationship between the quantum of spectrum available with an operator and the costs incurred in servicing the subscriber base. As it assesses the network cost elements by factoring the spectral efficiency of the spectrum band under consideration, it provides the engineering value of the spectrum.

The 'Producer Surplus' model calculates the value of additional spectrum as the difference between the total cost of BTS and spectrum usage charge (SUC) being accrued on account of acquiring additional spectrum based on the hypothesis that more spectrum obviates the need for expenditure on installation of additional BTSs. However, in today's scenario, given the fact that the BTS, backhaul and even the power infrastructure is a shared commodity, the logic of savings on account of network expansion by adding spectrum is firstly, limited to RAN electronic equipments and secondly, is equally applicable for all the spectrum bands. Hence, it is submitted that the contention that 800 MHz spectrum shall accrue any advantage on account of 'Producer Surplus' is unjustified.

We also understand that producer surplus is relevant to voice services only as it assumes the value of spectrum vis a vis requirement of BTSs to be installed. However, in the mixed environment of voice and data services, the characteristics data points (voice and data usage) required to determine producer surplus are not available.

Engineering value may not always be a good indicator of the prices eventually discovered through auctions as evident from the Swedish experience of 800 MHz and 2.6 GHz auctions held in 2011 and 2008, respectively. In both these auctions, the value discovered through auctions was a fraction of the engineering value estimated for the spectrum. The deviation between the engineering value and auction prices ranged from a factor of 1.5 to as high as a factor of 10¹.

Further, engineering value may not be an appropriate representation of the full economics of cellular business. Mobile business valuation depends on a host of parameters including existing and potential tele-density, mobile subscriber base, competitive intensity, voice & data revenue, capital expenditure on network and

¹ Bengt G Mölleryd and Jan Markendahl, 22nd European Regional ITS Conference Budapest, 18-21 September, 2011



other elements, operating expenses including non-network related expenses such as personnel and marketing, etc. A player looking to enter the cellular business would evaluate all these parameters together to estimate the price it can pay for the spectrum. While the producer surplus approach offers close assessment of the network requirements and costs thereof, it overlooks the revenue potential of the market under consideration, as well as the non-network costs of running a wireless business. Hence, it provides only a limited view of the business dynamics and consequent price an operator would be willing to pay for spectrum.

AUSPI is of the view that the value of spectrum should not be assessed on the basis of producer surplus on account of additional spectrum as it provides only a limited view of the business dynamics and consequently it will not reflect the correct price an operator would be willing to pay for the spectrum.

Q.7. Should the value of spectrum in the LSAs in India for 800 MHz be determined by utilizing the data on international prices? What other variables do you suggest for arriving at robust value estimates using the multiple regression approach? Is there any alternate approach for valuation of spectrum in 800 MHz using the data on international auctions?

No Sir. AUSPI does not agree that value of spectrum in the LSAs in India for 800 MHz can be determined by utilizing the data on international prices for contiguous spectrum in the 700 MHz spectrum band.

(i) The spectrum to be auctioned in 800 MHz is fragmented and non-contiguous which is not efficient for LTE deployment. The international valuation could be used for estimating 800 MHz valuation only if quality of spectrum being similar for deployment of next generation technologies like LTE.

(ii) Just benchmarking against price per MHz in PPP terms is not the right way as it ignores factors like quantum of spectrum offered, competition in the market, ARPU levels, profitability etc. thus providing wrong estimations.

(iii) Hence, we do not support price determination on the auction results in various European countries for auction of 791-862 MHz bands.

Use of 800 MHz spectrum band in India cannot be compared with its use internationally. Ecosystem for 800 MHz is poor and its value should be much lower than other countries in the world. Even the Government is conscious of this fact that for this reason reserve price for 800 MHz were kept lower compared to any other band auctioned earlier.



We do not suggest other variables for arriving at robust value estimates using the multiple regression approach. Co-relation of sale price amongst others in similar LSA, does not capture the effect of –

- Technological changes,
- Market expectations,
- Unique characteristics of specific LSAs etc.

Additionally, it may be noted that TRAI in its recommendation dated Sep09, 2013 (para 4.34) has itself taken a stand that international precedence/prices cannot be used to determine the price of spectrum in India. We request TRAI to continue with its stated position.

In view of the above, we do not agree with the view that the value of spectrum in the LSAs in India for 800 MHz be determined by utilizing the data on international prices.

Q.8. Apart from the approaches discussed in the paper, is there any alternate approach for valuation of spectrum in 800 MHz that you would suggest? Please support your answer with detailed data and methodology.

We recommend a reasonable Reserve Price to ensure fair market price discovery of spectrum. We also recommend that the Authority should come out with a clear road map of how much spectrum will be auctioned in future, in what all years and in what all bands as the Unified License will be valid for a 20 years period. This clear road map will benefit the Government and the operators. This road map will also help operators to mitigate their risks accordingly.
