

bharti airtel ltd.  
india & south asia  
airtel center, plot no. 16,  
udyog vihar, phase - IV,  
gurgaon - 122 015

www.airtel.in  
call+91 124 4222222  
fax +91 124 4248063

No. RP/ FY 13-14/ 062/013

Dated: 15<sup>th</sup> January, 2014



To,

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

**Sub: Response to consultation paper on "Reserve Price for Auction of Spectrum in the 800 MHz Band"**

**Ref: Consultation Paper No. 13/ 2013 dated 30<sup>th</sup> December, 2013**

Dear Sir,

In reference to the above consultation paper, please find enclosed our response to the consultation paper for your consideration.

With Regards  
For Bharti Airtel Limited

A handwritten signature in black ink, appearing to read 'R. Gandhi', written over a horizontal line.

**Ravi P. Gandhi**  
Chief Regulatory Officer (Policy)

**Bharti Airtel's Response to TRAI's Consultation paper on "Reserve Price for Auction of Spectrum in the 800 MHz Band"**

At the outset, we would like to thank the Authority for initiating this consultation exercise, and scheduling an open house discussion with the Industry on the 27<sup>th</sup> of January, 2014. We wholeheartedly support the Authority, in its efforts to value the 800 MHz spectrum carefully, and believe that a deeper study is definitely warranted.

Our stand on this subject mirrors our position on an earlier consultation exercise on the "Valuation & Reserve price of Spectrum" conducted by the Authority in July, 2013. The concerns and questions raised in this paper are not new to the Authority or the Industry, and are issues that have been addressed by both in the past. We stand by our earlier position, in that the most efficient use of this spectrum will be realized only if it is auctioned as 900 MHz E-GSM spectrum.

We would like to articulate some of the key issues that need to be considered before this spectrum is auctioned as 800 MHz.

**I. Demand for 800MHz is low:**

**a. Diminishing customer base for CDMA based mobile services and low demand for 800MHz spectrum:**

- The Authority is already aware that the subscriber base of CDMA has diminished by around 30% over a period of three years. On the contrary, the GSM subscriber base has increased by 65% over the same period. For the QE March 2013, the average revenue per user per month (ARPU) of CDMA services was Rs. 95 as compared to Rs. 105 for GSM services. Similarly, the minutes of usage per subscriber per month (MoU) of CDMA services was 275 as compared to 383 for GSM services.
- Due to a diminishing subscriber base, the spectrum held by CDMA operators is already in excess of the prescribed Subscriber Linked Criterion. We understand that one of the dual technology operators has in fact surrendered a part of 800MHz spectrum to DoT.
- Presently, there is hardly any demand for 800MHz spectrum. This is evident from this fact that in November 2012 auction, there was no participation in the bidding for 800 MHz band. This spectrum was again put up for auction in March 2013 after reducing the reserve price by 50%, which was even lower than 1800MHz. In spite of this reduction, only one licensee took part in the auction and acquired spectrum only in eight LSAs.

Hence, it is evident that the auction of 800MHz only for CDMA is unlikely to attract many bidders.

**b. Inefficient utilization of spectrum in 800 MHz band:**

While CDMA is a more efficient technology than GSM, utilization of 800 MHz band remains far lower than 900/1800 MHz. The following table illustrates the value to society and fiscal contribution (as revenue to the exchequer) for both technologies.

S. No.	Parameter	GSM (1800MHz/ 900MHz)	CDMA (800MHz)	Efficiency of CDMA as compared to GSM
1	Subscriber per MHz	751,681	274,015	36.45%
2	Annualized Revenue in Rs. Crores per MHz (Basis AGR)	99.25	24.18	24.37%
3	Annualised radio spectrum usage charge in Rs. Crores per MHz	4.98	0.73	14.58%

Note:

- Wireless GSM & CDMA subscribers are as reported by TRAI in its PMR Report for the quarter ending June 2013.
- Revenue figs are as per TRAI for quarter ended June 2013. The quarterly figs have been annualized for computational purposes.
- In case of dual technology operators, their Wireless AGR has been divided into GSM and CDMA in the proportion of their respective GSM and CDMA subscribers as on June 2013.
- The radio spectrum charges have been derived from the Industry data published by TRAI on GR, AGR, LF and WPC charges for the quarter ending June 2013. The quarterly figs have been annualized for computational purposes.

Therefore, it would be in the national interest to ensure that this spectrum is utilized efficiently, both technically and economically, which is not happening in the present scenario.

**c. Low availability of 900 MHz band versus higher demand:**

While the spectrum in 900 MHz band spans from 890 MHz – 915 MHz paired with 935 MHz – 960 MHz i.e. a total of 25 MHz paired, the actual availability of spectrum in 900 MHz is considerably lower, at around less than 20 MHz per service area. The following table lists the total spectrum in 900 MHz allocated to operators across all service areas.

S No	Circle	Total 900 MHz spectrum allocated to operators
1	A.P.	20.2
2	Assam	18.6
3	Bihar	18.6
4	Delhi	22.2
5	Gujarat	20.2
6	H.P	18.6
7	Haryana	18.6

8	J & K	18.6
9	Karnataka	20.2
10	Kerala	18.6
11	Kolkata	20.2
12	Maharashtra	20.2
13	MP	18.6
14	Mumbai	22.2
15	NE	19.4
16	Orissa	18.6
17	Punjab	21.8
18	Rajasthan	18.6
19	TN	20.2
20	UP (East)	18.6
21	UP(W)	18.6
22	WB	19.4
	<b>Grand Total</b>	<b>430.8</b>

From the above table, it is clear that 13 out of the 22 service areas have less than 20 MHz of spectrum in 900 MHz band. This scarcity has led to an increase in demand for spectrum in this band.

On the other hand, there is adequate availability of spectrum in bands higher than 1 GHz, with over 125MHz of spectrum available across all service areas in the 1800, 2100 and 2300MHz bands. This has naturally led to the employment of skewed economics in the allocation of this integral national resource.

Therefore, the dwindling subscriber base, inefficient utilization of CDMA spectrum as well as higher demand for 900MHz makes the auction of 800 MHz spectrum only for CDMA services unjustifiable. Therefore, it will be a prudent decision, both technically and economically to harmonize the vacant 800MHz spectrum and auction it as 900MHz band. The true value of spectrum in 800 MHz band will be recognized when, and only when it is auctioned as E-GSM MHz.

In fact, the Authority in its recommendations dated 9<sup>th</sup> September, 2013, agreed with this approach, and proposed the following:

*2.98 Therefore, the Authority recommends that the feasibility of adoption of E-GSM should be explored in a time-bound manner. The Authority also recommends that the auction in the 800 MHz band should not be carried out now.*

In summary, the auction of 800 MHz spectrum as E-GSM is a win-win for all stakeholders for the following reasons:

- The interest for acquiring 900MHz spectrum has been shown by GSM as well as CDMA operators from time to time. The harmonization of E-GSM band would give an equal opportunity to all stakeholders to acquire spectrum in 900MHz.
- The harmonization of E-GSM band will unlock the precious 800 MHz band from CDMA technology enabling its usage for newer technologies.
- It will bring more revenue to the exchequer while ensuring continuity of services to CDMA subscribers due to higher participation for auction in 900MHz.

## II. Spectrum is scarce, invaluable, and can be used across technologies

The prevailing scarcity of sub 1 GHz spectrum makes it extremely valuable and any efforts to allocate this spectrum should be preceded by a thorough techno economic study of this band taking into account the following facts:

- a. **Well Developed eco-system for 800MHz spectrum:** 800MHz spectrum is being commonly used for providing mobile voice and broadband services using latest technologies like WCDMA (3G) network and LTE in addition to the legacy technologies like CDMA-1X and EVDO.

There are more than 50 networks serving more than 150 Million 3G subscribers. There are more than 1500 devices (representing 40% of the total 3G devices) supporting this band, clearly representing global harmonization of the band for 3G services. At present, this ecosystem is getting developed at a faster pace than the ecosystem in 900MHz band. Operators like AT&T, VIVO, Telefonica, America Movil, Telcel, Telstra, Clario, SKT, etc. who have been using the band for CDMA services in the past, are now using the same spectrum for offering 3G & LTE services in the North American, Latin American and Asian markets.

The 800MHz band is also being used for LTE services. There are four operators, namely SKT, LGU+, MetroPCS, Leap wireless, who have launched LTE-FDD services using this spectrum and serving more than 10Million LTE subscribers. Globally, 190 LTE devices (including 100+ smartphone models) are available which support 800MHz band.

- b. **Better propagation characteristics:** 800MHz spectrum has better propagation characteristics than 900MHz band.
- c. **Limited availability of sub 1GHz band:** There is a limited spectrum (approx. 40MHz per circle in 800 & 900MHz band combined as compared to other bands) in sub 1GHz band.

In light of the above, it would be in the national interest to use a large part of spectrum in this band (in 800MHz band) efficiently, both technically and economically. Therefore, the government should harmonize 800 MHz band and make the 10 MHz of E-GSM band as a part of the overall 900 MHz band.

### **III. Harmonization of E-GSM is operationally feasible**

The harmonization of E-GSM is operationally feasible. CDMA operators concerns that the conversion of 800 MHz band into E-GSM will negatively impact the continuity of service, adversely affect investments made by CDMA operators, infringe on the legal rights of these operators, and negatively impact the subscriber base of PSUs is completely unfounded as explained below:

#### **a. No adverse impact on continuity of service**

Harmonization of E-GSM will not deny CDMA operators the use of their assigned spectrum, as the process only involves shifting of frequencies assigned from one operator to another in the same band. In fact, such activity is routinely carried out by the WPC. During November 2012 auction, Airtel along with other operators was asked by WPC to shift their existing frequencies spots in 1800 MHz band to facilitate contiguous spectrum for auction.

#### **b. No adverse impact on existing investments**

CDMA operators are also concerned that harmonization will have a negative impact on their existing investments. This is clearly not true, since these operators can continue to offer services on a different set of frequencies within the same band. This exercise would involve the retuning of a small number of RF filters, the cost of which would be negligible compared to the benefits that would accrue to society from unlocking this spectrum from 800 MHz band.

#### **c. No adverse impact on legal rights of CDMA operators**

Harmonization will neither reduce the amount of spectrum held by these operators, nor will it change the allocated spectrum band. Therefore, the legal rights of CDMA operators will continue to be protected.

#### **d. Pragmatic solution for the issues related to surrendering of spectrum by Defence and captive users:**

With respect to the issue of vacating spectrum from 925 MHz -935 MHz from defence agencies as well as other captive users and using it for EGSM, we wish to state the following:

**i) Around 7MHz is being used by Defence:**

DoT in its response to the Authority dated 20<sup>th</sup> Dec, 2013 states

*“Defence has intimated that due to operational requirements, it is not feasible to migrate the equipment to other bands in a definite time frame”*

We believe that the issue of spectrum holdings to the amount of 7 MHz by Defence should be deliberated upon further. This 7 MHz may not be employed for cellular networks or any other pan India system. At the most, these 900MHz frequencies are used in some confined areas/geographies, and can be utilized for cellular mobile services across the country except in the few areas identified by Defence in co-ordination with the WPC.

**ii) 448 assignments to different users for captive use:**

We understand that 448 assignments for captive use would either be point-to-point connectivity or point-to-multipoint connectivity with at the most 1 transceiver. These 448 transceivers or point-to-point links by captive users is miniscule when compared to the huge number of BTSs deployed for cellular mobile services across the country. The non-availability of E-GSM spectrum in a few pockets should not deter its use in a majority of locations. Such practices have been adopted in the past in other frequency bands as well, i.e. 1800 MHz/2100 MHz where the assigned spectrum was not made available in few pockets of a particular service area. Thus, once the E-GSM is put up for auction, interested bidders can always take informed decisions. Nevertheless, the government may move these captive users to alternate media.

**We propose that a special multi-disciplinary committee comprising defence personnel, and members of the DoT, the TRAI and the industry be selected and tasked to work out the specifics of surrendering this spectrum in selected locations as well as conversion of 800MHz into E-GSM.**

**IV. Summary**

Since spectrum in 800MHz band can be used for multiple technologies, any allocation of this spectrum for only CDMA would result into locking it for the next 20 years. It is therefore imperative to have a clear roadmap for allocation and harmonization of this spectrum.

**The industry is in dire need of clarity and affirmative action from the Authority as well as the government, especially in the management of this resource.**

Our responses to the questions raised by the Authority are included below:

**Q1. What should be the quantum of spectrum in the 800 MHz band that should be put up for auction?**

**Bharti Airtel's Response:**

We would like to allude to our stand above, i.e. this spectrum should be auctioned as 900 MHz E-GSM and not 800 MHz.

In the event that this spectrum absolutely has to be auctioned as 800 MHz, we propose the following:

- All available spectrum in 800 MHz band, including the spectrum vacated by M/s TTSL and excess spectrum with BSNL/ MTNL be auctioned.
- At least 5 MHz of contiguous spectrum should be made available in all LSAs where spectrum is to be auctioned

(Annexure – I indicates that at least 5 MHz of spectrum in 800 MHz can be made available in all circles except Kolkata and Rajasthan)

**Q2. What should be the block size in the 800 MHz band?**

**Bharti Airtel's Response:**

In respect of block size and the eligibility to bid, the following is proposed:

- a. Block size should be 1.25 MHz
- b. New Entrants or existing operators who do not currently hold spectrum in 800 MHz will have to bid for at least 4 blocks (i.e. 5 MHz) of spectrum.
- c. Existing operators who currently hold spectrum in 800 MHz can bid for a minimum of 1 block (i.e. 1.25 MHz).
- d. 800 MHz spectrum that is allocated via this auction can be combined with existing spectrum in 800 MHz for providing services other than CDMA, only after existing spectrum holdings are paid for at auction determined price prorated for the remaining validity of the original assignment. **This principle should also be followed for spectrum allocated at the end of the March, 2013 auctions since the sole argument cited for reducing the price of 800 MHz spectrum was the fact that the quantum of spectrum was less than 5 MHz and hence cannot be utilized for newer technologies (3G/LTE etc. ) other than CDMA.**

**Q4. 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.**

**Bharti Airtel's Response:**

There is no case for the application of a lower efficiency factor over the valuation of spectrum in 1800 MHz band, for determining the valuation of spectrum in 800 MHz band.



In case such an approach is adopted, the same should apply to the auction of 1800 MHz spectrum in February, 2014 since it would be non-contiguous and less than 5 MHz, making it less efficient.

However, it has been clearly stated by the DoT in the NIA that the price of spectrum in 1800 MHz will be the same irrespective of it being less than 5 MHz or non-contiguous. No opportunity has been granted to the bidder to deny the spectrum in case it bids for 5 MHz and is allocated less.

**Q3. Should the value of 800 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors?**

&

**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.**

&

**Q6. 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.**

&

**Q7. 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?**

&

**Q8. 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.**

#### **Bharti Airtel's Response:**

We have already submitted our views on methods to value the spectrum vide our response to the Consultation paper floated by the Authority on "Valuation and Reserve Price of Spectrum" and the same is enclosed as **Annexure - II**.

We herein re-iterate that all spectrum allocated for mobile communication be valued consistently so similar services provided using different spectrum bands are priced similarly.

We also wish to submit that while the Authority may use any valuation method, the same should be used consistently for valuing all bands. It may also be worthwhile to mention that:

- Spectrum in 800 MHz band has even better propagation characteristics than spectrum in 900 MHz band.

- As per the ecosystem of devices/ equipment available, spectrum in 900 MHz band can be used for either GSM or WCDMA, while spectrum in 800 MHz band can be used for CDMA, WCDMA as well as LTE technologies.

Considering the above, the value of spectrum in the 800 MHz band should be equal, if not more than the value of spectrum in the 900 MHz band.

It is also important to note that by the time networks are deployed in the next 2-3 years, the device ecosystem in 800 MHz band for various technologies will also improve and spectrum in 800 MHz band would be more valuable and efficient than spectrum in the 900 MHz band.

**Q9. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum? Would it be optimal to fix reserve price equal to valuation of spectrum?**

**Bharti Airtel's Response:**

Given the superior propagation characteristics of 800 MHz spectrum over 900 MHz spectrum, the reserve price for the 800 MHz band should be **equal, if not more than** the reserve price for the 900 MHz band.

**Annexure - I**

S. No.	LSA	Total No. of Carriers	Carriers presently allocated to					Total Carriers Allocated	Total Carriers available as on date	Carriers to be got surrendered from MTNL/ BSNL	Carriers to be surrendered by TTSL	Additional carriers available post surrender by MTNL/ BSNL/ TTSL	Total Carriers available post surrender by MTNL/ BSNL/ TTSL
			BSNL/ MTNL	SSTL	TTSL	RCL/ RTL	HFCL						
1	Delhi	14	2	3	4	4	-	13	1	2	1	3	4
2	Mumbai	14	2	-	4	4	-	10	4	2	1	3	7
3	Kolkata	13	2	3	3	4	-	12	1	1	1	2	3
4	Maharashtra	14	2	-	4	4	-	10	4	1	2	3	7
5	Gujarat	14	2	3	3	3	-	11	3	1	1	2	5
6	Andhra Pradesh	13	2	-	3	4	-	9	4	1	1	2	6
7	Karnataka	14	2	3	3	4	-	12	2	1	1	2	4
8	Tamilnadu	14	2	3	3	4	-	12	2	1	1	2	4
9	Kerala	14	3	3	3	4	-	13	1	2	1	3	4
10	Punjab	13	2	-	3	3	2	10	3	1	1	2	5
11	Haryana	14	2	-	3	3	-	8	6	1	1	2	8
12	UP (West)	14	2	3	3	4	-	12	2	1	1	2	4
13	UP (East)	14	2	-	3	4	-	9	5	1	1	2	7
14	Rajasthan	12	2	4	3	3	-	12	-	1	1	2	2
15	Madhya Pradesh	13	2	-	2	4	-	8	5	1	-	1	6
16	West Bengal	14	2	3	2	3	-	10	4	1	-	1	5
17	Himachal Pradesh	14	2	-	2	2	-	6	8	1	-	1	9
18	Bihar	14	2	-	3	4	-	9	5	1	1	2	7
19	Orissa	14	2	-	2	3	-	7	7	1	-	1	8
20	Assam	14	2	-	-	2	-	4	10	-	-	-	10
21	North East	14	2	-	-	2	-	4	10	-	-	-	10
22	J&K	14	2	-	-	2	-	4	10	-	-	-	10
	<b>Total Carriers</b>	<b>302</b>	<b>45</b>	<b>28</b>	<b>56</b>	<b>74</b>	<b>2</b>	<b>205</b>	<b>97</b>	<b>22</b>	<b>16</b>	<b>38</b>	<b>135</b>
	<b>Total Spectrum (MHz)</b>	<b>377.50</b>	<b>56.25</b>	<b>35.00</b>	<b>70.00</b>	<b>92.50</b>	<b>2.50</b>	<b>256.25</b>	<b>121.25</b>	<b>27.50</b>	<b>20.00</b>	<b>47.50</b>	<b>168.75</b>

1 Carrier denotes 1.25 MHz paired spectrum



## **Bharti Airtel's Response to TRAI's Consultation paper on "Valuation and Reserve Price of Spectrum"**

At the outset, we would like to thank the Authority for initiating the much needed consultation process on "Valuation and Reserve Price of Spectrum".

We would also like to place on record our sincere appreciation for an objective, progressive and fair consultation paper that includes all the relevant and critical issues facing the industry. We sincerely hope that the present consultation process will culminate in forward looking recommendations that would enable the industry to meet the policy objectives enshrined in the National Telecom Policy 2012.

### **The vision of the National Telecom Policy 2012**

The National Telecom Policy 2012 has articulated a very ambitious vision for the industry - *"To provide secure, reliable, affordable and high quality converged telecommunication services anytime, anywhere for accelerated inclusive socio-economic development."*

The policy emphasizes the power of the 'broadband information highway' to transform the lives of people and envisages 175 million broadband customers by 2017 and 600 million by 2020.

With over 850 million wireless consumers and a mere 30 million wireline consumers, it is obvious that wireless is going to be the driver of broadband growth. Clearly, the catalyst for broadband growth is going to be the management and policy framework to do with spectrum - a very scarce and precious national resource.

We believe that there must be a clear set of five guiding principles that should be considered while framing this policy. It is important that these principles stand the test of time and create a win-win for all stakeholders - consumers, government and industry.

These principles are:

1. Ensuring adequate spectrum, so as to provide quality broadband services
2. Ensuring affordable and consistent quality of services to consumers
3. Maximizing the overall revenue for the exchequer in the long term
4. Ensuring the sound financial health of the industry, so as to drive investments
5. Ensuring an enduring and non-discriminatory policy framework

#### **1. Ensuring adequate spectrum, so as to provide quality broadband services:**

It is a well known fact from the experience around the world that data growth is exponential, requires large availability of spectrum and is decoupled from revenue growth. In fact, today, even in India, data volume with a consumer penetration of less than 20% is almost equal to voice volume (in MBs) despite contributing only 5-7% of wireless revenues. In recognition of this, in 2010, the Authority had projected a requirement of 600 MHz of

additional spectrum by 2014. Similarly, as a part of the 12<sup>th</sup> Five Year Plan, the Telecom Sector Working Group projected a spectrum demand of 800 MHz by 2015. We believe that the additional spectrum required by the Indian mobile industry could be 900-1000 MHz by 2015 and over 2000 MHz by 2022.

Against this backdrop, we believe there are three critical enablers to meet this demand in future. First, availability of spectrum needs to be in line with demand and a roadmap for this must be shared with the stakeholders so as to bring clarity to the industry. Second, adequate availability of spectrum needs to be ensured to each TSP to avoid needless fragmentation of holdings. Third, the efficient utilization of spectrum granted should be ensured through a framework of optimal management of spectrum band along with a policy to share and trade spectrum.

## **2. Ensuring affordable and consistent quality of services to consumers:**

Provision of seamless continuity and uninterrupted and consistent quality of service to consumers should be of paramount importance to the government as well as industry. This is the basic telecom promise, and its importance in building and maintaining consumer and investor trust cannot be overstated.

We believe that there are three key enablers to meet this objective. First, to encourage participation in the auction, the reserve price should be set at a level that is not a deterrent to serious players. Second, the price of spectrum (upfront and recurring) needs to be set at an optimal level. Failure to do so will result in an immediate increase in tariffs thereby impacting affordability. In addition, it will inhibit the required investment in infrastructure and technology. Third, continuity and consistency of services needs to be ensured. Withdrawing 900 MHz spectrum holdings from existing TSPs will result in disruption of services to more than 500 million consumers due to coverage gaps and inferior quality of service.

## **3. Maximize the overall revenue for the exchequer in the long term:**

The last two spectrum auctions conducted in November 2012 and March 2013 saw a major portion of spectrum remaining unsold due to exorbitant and unsustainable reserve prices. The unsold spectrum resulted in substantial loss of revenue opportunity to the exchequer. It bears repeating that there are two streams of revenue for the exchequer – the upfront spectrum charge and the recurring charges in the form of spectrum usage charge and license fee. To maximize revenue, both these streams must be seen in conjunction and not in isolation.

We believe that there are four key enablers to maximizing revenues for the exchequer. First, all available spectrum should be offered at a reasonable reserve price in order to realize upfront revenue from its sale. The total spectrum put up for auction must include spectrum that has been returned voluntarily, spectrum that is underutilized with TSPs, spectrum

available post cancellation of licenses, E-GSM spectrum and spectrum lying with the Defence and other government bodies. Second, investments by TSPs need to be encouraged so that there is rapid growth of broadband and recurring revenue share for the government. Third, a lower rate of spectrum usage charge should be ensured, given that the upfront spectrum charge is market determined. Fourth, by doing all this, an environment must be created to catalyze rapid broadband growth, thereby maximizing revenues for the exchequer while also realizing higher economic growth for the nation.

#### **4. Ensure sound financial health of the Industry so as to drive investments:**

To support the broadband revolution, we estimate that the industry may need to invest over Rs 2,00,000 Crs. over the next five years. These investments will be towards spectrum, infrastructure and backhaul including RoW, which will become increasingly important as data grows.

Presently, the cumulative debt burden on telecom companies has more than doubled from Rs.82,726 Crs. in 2008-09 to Rs.1,85,720 Crs. in 2011-12. The EBITDA margins of telecom companies have fallen from 33.8% in 2008 to 28.9% in 2012. The PAT of the TSPs which was in the range of 35% to (-)53% in 2006-07 has declined in the range of 14% to (-)101% in 2011-12. This has led to TSPs exiting the sector, scaling down their operations and reducing future investments.

Looking at the current financial precariousness of the industry, making these investments will not be feasible unless the price of spectrum is reasonable and affordable. The price of spectrum must be determined by demand and supply through a transparent and vibrant auction. In addition, unless there is a framework that allows sharing, trading and consolidation of spectrum there is a likelihood that spectrum may not be utilized and investments may be held back.

We believe that there are four key enablers to ensure sound financial health of the industry. First, a reasonable reserve price needs to be set, which enables demand and supply to determine the final price in a transparent and rational manner. Second, the total cost of spectrum for TSPs must be viewed as a combination of the upfront spectrum price and the recurring spectrum usage charges. Third, sharing and trading should be allowed for efficient utilization of spectrum. Fourth, a sound merger and acquisition policy must be put in place. The policy should encourage healthy competition, while also utilizing precious spectrum efficiently with the ultimate objective of ensuring quality telecom services to more and more consumers.

#### **5. Ensure an enduring and non-discriminatory policy framework:**

As licences come up for extension from 2014 onwards, it is important to have a consistent and non-discriminatory policy and approach towards determining the quantum and valuation of spectrum.

We believe that there are two key enablers to ensuring an enduring and non-discriminatory policy framework. First, the total cost of spectrum needs to be equitable for all TSPs across the period of their license / spectrum. This can be achieved by a low, flat and uniform spectrum usage charge independent of the quantum of spectrum / technology / revenue. Second, the policy should facilitate incremental investments in existing spectrum throughout the term of license and allowed extension thereafter.

Considering the above, we would like to make the following submission on the questions raised by the Authority in the consultation paper:

**Q1. What method should be adopted for refarming of the 900 MHz band so that the TSPs whose licences are expiring in 2014 onwards get adequate spectrum in 900/1800 MHz band for continuity of services provided by them?**

**&**

**Q2. In case spectrum is to be reserved for such TSPs, should it be restricted to licenses expiring in 2014 (metros) or include licenses expiring afterwards (LSA other than metros)?**

#### **Bharti Airtel's Response:**

The alternatives being proposed by the Authority for carrying out refarming of spectrum, have wide implications. These include disruption of an existing and well established network that serves a large consumer base of more than 500 million consumers on 900 MHz band, continuity of service for these consumers and major financial ramifications for the industry.

We believe that unless these implications are addressed and resolved, the proposed alternatives of refarming are not in the interest of either consumers; government or industry. We, therefore, urge the Authority to consider our alternative proposals.

Further, while considering any form of refarming, it is also extremely important to consider the relevant clauses of the UAS/CMTS license w.r.t. the period/term of the existing Licenses and allocated spectrum.

As per clause 4.1 of the UAS/CMTS License, these licenses along with the allocated spectrum, are for a term of 20 years, with the express provision of extension by 10 year periods thereafter. It is, therefore, evident that the incumbent TSPs have a legal right to extension along with the allocated spectrum (including 900 MHz). Based on the legal right of extension of the license along with allocated spectrum, and continuity of business beyond 20 years, TSPs have made massive investments towards network infrastructure and other costs.

In this context, it was a surprise that the DoT chose to include our spectrum in the March 2013 auction. Our Writ petition challenging the decisions rejecting our request for extension by DoT is pending final disposal before the Delhi High Court.

Therefore, without prejudice to our rights in the above Writ petition, our responses to your queries are detailed below:

1. **Extension of License and Spectrum:**

- In the present consultation paper, the Authority has rightly acknowledged (vide para 1.8) the principles laid down in the NTP-99, which awarded Licenses for an initial period of 20 years, extendable by additional periods of 10 years at one time thereafter.
- It submitted that these licenses have been allocated through a competitive bidding process and are bundled with spectrum. It is, therefore, evident that the extension of the existing licenses on expiry of initial term would also include corresponding extension of the bundled spectrum allocated to the licensee in both the 900 MHz/1800 MHz band. Since spectrum is the “heart and soul” and “basic feature” of the licenses issued till date, any extension of these licenses without spectrum is as good as denial of the licensee’s legal right of extension, which is enshrined in the license itself.
- Based on the terms of clause no. 4.1 of the UAS license & NTP-99, it is our view that the extension of license along with the allocated spectrum is our legal right and including existing spectrum in the upcoming auction is incorrect.

2. **Impact of withdrawal of spectrum in 900 MHz band:**

Globally, the term ‘refarming’ is used when either the spectrum usage is changed from non-commercial to commercial, or is changed from one technology to the other. In our submission, the proposed exercise of refarming is neither of the two. TRAI’s proposal of withdrawing spectrum from one TSP and assigning it to another TSP (post auction) is actually “redistribution” of spectrum.

Highlighted below is the impact of withdrawal of spectrum from TSPs on the consumer, the industry, the nation and the overall objectives of the government:

a. **Impact on Consumer:**

Due to the progressive policies of the government, consumers currently enjoy superior quality yet affordable telecom services with vast coverage. It is our view that re-distribution will be a regressive step and will impact consumers adversely – especially on parameters like **affordability and consistent quality of services**. This is detailed below:

- **Disruption of services:** Withdrawal of 900 MHz from the existing TSPs will force these TSPs to migrate their GSM network to 1800 MHz band, resulting in major



coverage gaps. Re-planning and installation of the network in 1800 MHz band includes surrendering/removing the existing BTS sites, installing a large number of new sites and optimization of the network thereof. Obtaining new sites is a challenging task, especially in metros/big cities. All this will result in huge customer inconvenience during the interim state when the 900 MHz network is switched off and before all the sites required in 1800 MHz band network are installed and the network optimized. While it is inevitable that another TSP will come in and offer services on the redistributed 900 MHz spectrum; getting back to the same coverage levels will take precious time since networks will need to be optimized and configuration of sites will need to undergo changes. This will lead to disruption of services, which is clearly not the intent of the Policy.

- **Coverage gaps affecting QoS for consumers:** Coverage gaps will have an adverse impact on QoS and will also result in un-connecting the connected. Due to transition from 900 MHz network to 1800 MHz network, the TSPs will not be able to meet the stringent QoS parameters set up by the Authority in the short term. In addition to QoS issues for the consumer, the TSPs will have to pay hefty penalties for non-compliance with the QoS regulations.
- **Affordability/ increase in tariff:** The additional capex and opex cost due to migration from 900 MHz network to 1800 MHz network will result in consequent increase in tariffs, thereby impacting affordability.

b. **Impact on the financial health of the industry:**

In the event of non-allocation of existing spectrum in the 900 MHz band during license extension, the TSPs impacted by this decision will be forced to deploy the supplementary network in 1800 MHz band. Since the propagation characteristics of 1800 MHz band are poor as compared to 900 MHz band, provision of similar coverage will require 171,954 additional base stations in rural areas where the availability of electricity is negligible and diesel consumption is very high.

To continue providing the services to their existing consumers using spectrum in 1800 MHz band, the existing TSPs will have to rollout new sites, the cost of which has been estimated by Analysys Mason as over Rs. 54,739 Crs. towards capex and an additional Rs. 11,762 Crs. (annually) towards opex. The magnitude of this will negatively impact the financial health of the industry and its ability to attract investments. Over and above this cost, there will be a needless write-off of over Rs. 22,310 Crs. as existing TSPs on 900 MHz network switch off their base stations and migrate to 1800 MHz network.

All of this at a time when the industry is already in a financially precarious position is a matter of grave concern and has the potential of seriously undermining investor confidence.

c. **Impact on national objectives:**

- Telecom industry is at the cusp of exponential growth of broadband services. To meet the NTP-2012 objectives of providing affordable mobile services, 100% rural penetration/ubiquitous coverage and broadband for all, TSPs are required to focus on rolling out broadband networks. Any redistribution of 900 MHz spectrum would require TSPs to shift their focus to reconfiguration of their existing networks, primarily catering to voice services. This will delay investments in driving **broadband** growth and will not be in line with national objectives.
- **Impact on the environment/ Green Telecom Regulation:** The government is promoting greener networks and has come up with certain mandates via the Green Telecom Regulation. In our endeavour to build a greener network, our company has been constantly working with the partner tower companies, towards reduction of green house gas emissions. As a result, our company's CO<sub>2</sub> emission per terabyte reduced by 11% in the year 2011-12 over 2010-11.

Unfortunately, the proposed re-distribution exercise will result in increasing the number of BTSs, thereby increasing the greenhouse gas emissions. Assuming an average consumption of 11,500 litres of diesel every year per tower, adding more towers will result in an additional diesel consumption of 1.2 billion litres of diesel annually. This increase is in stark contrast to the reduction in diesel consumption over the last few years.

On an average, a telecom tower requires 6 kWh - 8 kWh of energy per hour for two TSPs, which will lead to an additional 1 GWh of electricity consumption per year. For every litre of diesel, about 2.48 kg of CO<sub>2</sub> is emitted and for every KWh of grid electricity consumed, 0.84 Kg of CO<sub>2</sub> is emitted. As per our estimate, the additional 1,71,954 BTS will result in an incremental 5.4 million tons of CO<sub>2</sub> emitted per year contributing to the already alarming issue of environmental pollution which is against public interest.

3. **International benchmarks w.r.t. refarming of spectrum:**

We believe that it may also be helpful to look at some international benchmarks w.r.t refarming / redistribution of spectrum while shaping this policy. A look at these throws up three critical facts that deserve consideration while shaping this policy:

- **Re-distribution has mainly occurred to bring in a new TSP:** Countries such as Denmark, France, Sri Lanka and Sweden have gone down this path. However, **it is important to note that all these countries had an average of just 4 operators.**

- In all these countries, there has been only a **partial surrender of 900 MHz spectrum** leaving behind a significant quantum with existing TSPs (7.5MHz or more) to ensure continuity of service. (Annexure-1 with details).
- As per our information, there are no examples anywhere in the world, where there has been a complete withdrawal of 900 MHz spectrum from existing TSPs.

In India, the sub 1 GHz band had been divided into two bands i.e. 900 MHz band and 800 MHz band with approximately 20 MHz of spectrum in each band.

The holding of 800/ 900 MHz in terms of number of circles and the relative VLR/ MHz for the two bands compared together is as below:

Sub-1GHz band		Bharti	Vodafone	MTNL/BSNL	Idea	Aircel	Reliance	Tata	MTS	Avg.
800 MHz	No. of LSAs	0	0	22	0	0	22	19	9	
	VLR Subs (in '000)/ MHz	0	0	26.84	0	0	359.58	198.67	206.40	216.25
900 MHz	No. of LSAs	15	12	22	9	4	7	0	0	
	VLR Subs (in '000)/ MHz	1108.21	1040.49	259.87	1153.09	734.84	542.74	0	0	746.44

Note:

1. The subscriber base is as per TRAI Performance Monitoring Report of December 2012. VLR percentage is as per monthly subscribers report for December 2012.
2. It has been assumed that subscribers are being served proportionate to the quantum of spectrum held in 1800 MHz and 900 MHz in the same circle to arrive at the VLR subscribers for 900 MHz band.

The data in the table above and the details of vacant spectrum (indicated by the Authority in table 2.13) suggest that while most of the TSPs have access to sub-1 GHz band:

- the average utilization of spectrum (VLR subs/ MHz) in 800 MHz band is 28% of the utilization of spectrum in 900 MHz band and;
- an average of 8-10 MHz of spectrum is lying vacant in 800 MHz band.

Given the above spectrum holdings and low utilization of spectrum in 800 MHz band, we propose the following alternatives that will enable the Authority to discover the price of 900 MHz spectrum with TSPs whose licenses come up for extension in 2014 and thereon.

### **Proposal - 1:**

- Since, the demand of 800 MHz (CDMA) is fast diminishing and the demand for 900 MHz (GSM/WCDMA) is on the rise, the Authority should consider shifting of 10 MHz spectrum (880-889 MHz) from 800 MHz band and aligning it with 900 MHz band (as E-GSM band) by changing its pairing. The details of this proposal are in response to Q4.
- Such realignment/refarming of CDMA spectrum to E-GSM band would increase the availability of spectrum in 900 MHz band from 25 MHz to 35 MHz while retaining 10 MHz of spectrum in 800 MHz band for continuity of services for the existing ( but fast shrinking) consumer base.

- Since License coupled with spectrum is technology neutral, TSPs can use spectrum in both 800/900 MHz band for any technology, i.e. 2G, 3G, LTE etc. This will enable the GSM operators to migrate to 3G/WCDMA in their 900 MHz band and the CDMA operators to provide 3G/WCDMA or 4G/LTE in their existing 800 MHz band.
- Auction the E-GSM spectrum as 900 MHz band. Such an auction will meet two objectives:
  - It will provide an opportunity to interested TSPs to acquire the sub 1 GHz band spectrum.
  - Further, it will help in determining the value of 900 MHz band which can then be applied to the existing licensees at the time of extension of their license along with allocated spectrum in 900 MHz band.

In our view, the above proposal would obviate the need for the proposed refarming/redistribution.

### **Proposal - 2:**

In addition to Proposal-1, the existing TSPs could be allowed to retain only 5 MHz of sub GHz band at the time of extension. The balance spectrum could be put to the auction along with E-GSM spectrum. For continuity of existing mobile services and for meeting the QoS requirement, spectrum deficit created due to retention of only 5 MHz of spectrum in 900 MHz band should be recouped through reservation of spectrum in 1800 MHz band.

**In response to question 2**, we believe that the government should have a complete roadmap for availability of spectrum as the licenses come up for extension. This is essential for ensuring continuity of services. In the event there is ambiguity on the availability of spectrum at a future date, then the government should reserve spectrum for all licenses coming up for extension post 2014 as well.

### **Q3. Is any restriction required to be imposed on the eligibility for participation in the proposed auction?**

#### **Bharti Airtel's Response:**

The eligibility for participation in the proposed auction should be as per the January 2013 Notice Inviting Application. With respect to cap on spectrum holding, we believe that the spectrum put to auction should be included in the 'total spectrum assigned' in any service area. Further, TDD spectrum should be counted as half, for the purpose of determining the cap e.g. 20 MHz of TDD spectrum should be treated as 10 MHz of FDD (10+10).

While formulating the policy on eligibility for participation in the proposed auction, we believe that it is crucial for the government to ensure:

1. Efficient utilization of spectrum via allocation of adequate block size of spectrum
2. Minimal fragmentation of holding via adequate availability of spectrum

1. **Efficient utilization of spectrum via allocation of adequate block size of spectrum:**

It is well understood that spectrum is a scarce resource. It is, therefore, imperative for the government to ensure optimal utilization of spectrum at all times.

**Block size for 900/1800 MHz band:** In our view, the block size of 1.25 MHz is not suitable for deployment in majority of available technologies. While 3G/WCDMA are supported in 5 MHz, which is a multiple of 1.25 MHz; 4G/LTE is also supported in block sizes of 1.4 MHz / 3 MHz and none of these are multiples of 1.25 MHz. The block size of 1.25MHz is, therefore, not suitable for GSM, 4G/LTE and even for fractional 3G/HSPA (3.8 MHz) and is likely to result in serious underutilization and wastage of spectrum. GSM technology uses spectrum in the block size of 200 KHz, which is not a factor of 1.25 MHz. Considering that maximum spectrum has been allocated to the GSMA operators and will continue to be utilized for GSM technology for a substantial portion of the term of spectrum allocation, such wastage of scarce spectrum is not justified and needs immediate attention.

By contrast, the bandwidth required for both 3G/WCDMA and 4G/LTE can be in multiples of a lower block size of 200 KHz, which is used in all GSM networks. A lower channel size of 200 KHz provides the necessary flexibility to TSPs to buy spectrum in multiples of 200 MHz as per their actual requirement thereby reducing their cost as well as the wastage that would occur on account of unutilized spectrum.

With the above rationale in mind, we believe that both “New Entrants” as well as “Existing Licensees” (holding a UAS/ CMTS/ UL (AS) License) should be allowed to bid for spectrum in the 1800 MHz/900 MHz band as per block size of 200 KHz.

The bidding eligibility proposed by us for 900 / 1800 MHz band is as under:

S. No.	Category	Minimum Blocks	Maximum Blocks
1	New Entrant	25 blocks of 200 KHz (paired)	Subject to spectrum holding capping rule
2	Existing Licensee with spectrum in 800 MHz band		
3	Existing Licensee with spectrum in 900 /1800 MHz band	5 blocks of 200 KHz (paired)	
4	Extension Licensee with spectrum in 900/1800 MHz band		

While the existing GSM operators may be permitted to acquire minimum 1 MHz in 900 MHz/1800 MHz band; however, market discovered price of either 900/1800 MHz band should be deemed as the market determined price **only when** any operator acquires minimum 5 MHz.

2. **Minimal fragmentation of holding via adequate availability of spectrum:**

It is crucial that while framing the rules for spectrum auction, the Authority takes into consideration a long-term view on the availability of spectrum per operator, in line with international benchmarks and national requirements.

Globally, policymakers ensure that telecom operators attain the requisite economies of scale required for efficiency in the market. It is recognized that the competitive health of the telecom market cannot be measured by the number of operators alone, but rather by the extent to which competition delivers sustainable long-term economic and social benefits. Therefore, worldwide, the emphasis has always been on providing large blocks of spectrum to TSPs rather than distributing it in smaller blocks.

The Authority has observed in Para 2.27 of the Consultation paper, that the average allocation across the European region is in the order of 71.6 MHz FDD (across the 800, 900, 1800, 2100 and 2600 MHz ranges). On a band-specific basis, the aggregate spectrum bandwidth allocations to service providers across Europe are around 20.5 MHz in 900 MHz band and 30.6 MHz in 1800 MHz band.

It is well recognized that fragmented spectrum results in inefficient utilization of spectrum, creates scarcity and eventually results in an artificial increase in price. That is why, globally, the entry of new operators is considered and deliberated upon very carefully.

It is also worth taking into account that the next telecom revolution is likely to result in the widespread adoption of wireless broadband. This broadband revolution is critically dependent on adequate availability of spectrum. In the event of a likely spectrum deficit, further fragmentation of spectrum between a larger numbers of players is likely to result in inefficient use of this scarce resource.

In data, unlike voice, there is a decoupling effect. In voice, MoU and spectrum move in tandem largely with revenues whereas in data, GB and spectrum move abruptly i.e. consumption takes a steep increase, which is not followed by a corresponding increase in revenues.

We request the Authority to take cognizance of the abovementioned submissions while finalizing the aspect of eligibility.

- Q4. Should India adopt E-GSM band, in view of the diminishing interest in the CDMA services? If yes,**
- a) How much spectrum in the 800 MHz band should be retained for CDMA technology?**
  - b) What are the issues that need to be addressed in the process?**
  - c) What process should be adopted for migration considering the various issues involved?**

**Bharti Airtel's Response:**

Yes, we recommend that India should adopt the E-GSM band as soon as possible, as it will lead to more efficient utilization of spectrum in 800 MHz band and maximization of overall revenue for the exchequer in the long run. More importantly, it will free up spectrum that could be used for growth of broadband, which is clearly in the national interest. It will also obviate the need for withdrawal of 900 MHz spectrum from the existing TSPs, which would have otherwise, resulted in disruption of services to consumers.

Globally, 880-889 and 925-934 MHz band is known as the 'extended 900 MHz band' and is a part of the overall GSM 900 MHz band. A list of 33 countries, which have adopted E-GSM band as 900 MHz band, is attached as [Annexure-2](#). In India, however, E-GSM band has been historically used for CDMA services.

Given the higher demand for 900 MHz band clubbed with the diminishing demand for 800 MHz band, in our view, the government should harmonize 800 MHz band and make the 10 MHz of E-GSM band a part of the overall 900 MHz band. Additionally, this E-GSM spectrum should be included in the upcoming auction. This exercise will not only lead to better spectral efficiency, but will also benefit the exchequer by selling E-GSM spectrum on the same terms as 900 MHz band.

**a) Spectrum to be retained in the 800 MHz band for CDMA technology**

While earmarking the 800 MHz spectrum for CDMA technology, we urge the Authority to consider the following:

- There should be no adverse effect on the continuity of services to the CDMA subscribers.
- Presently the total allocated spectrum in CDMA is 245 MHz. A total of 192.43 MHz is free and should be used for E-GSM - Table below
- Due to a diminishing subscriber base, the CDMA operators are unlikely to meet the subscriber linked criteria; therefore excess spectrum held by them should also be added to the 192.43 MHz of already available free CDMA spectrum.

Therefore, in our view a maximum of 10 MHz of 800 MHz spectrum across all circles should be retained for ensuring continuity of service for CDMA subscribers in long run.

S. No.	LSA	No. of Carriers Assigned*	No. of Operators except PSUs	Amount of spectrum assigned in CDMA	Spectrum left for E-GSM spectrum auction	Spectrum surrendered by one of the dual technology operator (*)	Spectrum left for liberalization in EGSM post considering spectrum surrendered by one of the dual technology operator (**)
1	Delhi	11	3.00	15.71	4.29	1.25	5.54
2	Mumbai	8	2.00	11.42	8.58	1.25	9.83
3	Kolkata	10	3.00	14.48	5.52	1.25	6.77
4	Maharashtra	8	2.00	11.42	8.58	2.50	10.00
5	Gujarat	9	3.00	13.25	6.75	1.25	8.00
6	AP	7	2.00	10.19	9.81	2.50	10.00
7	Karnataka	10	3.00	14.48	5.52	1.25	6.77
8	Tamil Nadu	9	3.00	13.25	6.75	1.25	8.00
9	Kerala	10	3.00	14.48	5.52	1.25	6.77
10	Punjab	8	3.00	12.02	7.98	1.25	9.23
11	Haryana	6	2.00	8.96	11.04	2.50	10.00
12	UP - West	10	3.00	14.48	5.52	1.25	6.77
13	UP - East	7	2.00	10.19	9.81	1.25	10.00
14	Rajasthan	10	3.00	14.48	5.52	1.25	6.77
15	M.P.	6	2.00	8.96	11.04	-	10.00
16	West Bengal	8	3.00	12.02	7.98	-	7.98
17	H.P.	4	2.00	6.50	13.50	-	10.00
18	Bihar	7	2.00	10.19	9.81	1.25	10.00
19	Orissa	5	2.00	7.73	12.27	-	10.00
20	Assam	4	2.00	6.50	13.50	-	10.00
21	North East	4	2.00	6.50	13.50	-	10.00
22	J&K	4	2+ Defence	7.10	12.90	-	10.00
Total					195.69	22.50	192.43

**Note:**

(\*) One of the dual technology operator has reportedly surrendered 1.25 MHz in 800 MHz band in 12 circles and 2.5 MHz in 3 circles.

(\*\*) This does not include the excess spectrum in 800 MHz band being held by other operators in excess of their eligibility on Subscriber Linked Criterion.

**b) Issues to be addressed in the process:**

The most important issue to be addressed would be harmonization of spectrum.

CDMA operators will need to reconfigure their BTS with alternate CDMA frequencies. This is possible through software configuration from the OMCR / OSS platform as a majority of deployed BTSs support configuration of the CDMA frequency within the complete 20 MHz band (870 MHz to 890 MHz).

As per the estimate, reconfiguration will be required for approximately 75 blocks out of 165 blocks presently allocated. A change/ retuning of CDMA TX filters may be required to avoid interference on E-GSM side by restricting their transmission to 879 MHz. The cost of retuning of filters would be negligible as compared to the benefits of unlocking this spectrum from the 800 MHz band.

Further, the guard band of 1 MHz should be provisioned for CDMA and E-GSM network to co-exist. This guard band will ensure minimum requirement of special CDMA filters assuming average of 100m of inter-site distance between CDMA & GSM sites.



**c) Process to be adopted for migration:**

The following process can be followed for achieving the objectives of harmonization and allocation of EGSM spectrum:

- CDMA operators will need to reconfigure new CDMA allocations in their BTS through OMCR, which is expected to take about 6-9 months across existing infrastructure.
- Upon completion of this reconfiguration, the vacated spectrum from 880 MHz to 890 MHz can be used for deployment of E-GSM networks. This must be done with urgency and within a stipulated time frame.

**Q5. Should roll out obligations for new/existing/renewal/quashed licenses be different? Please give justification in support of your answer.**

**&**

**Q6. Is there a need to prescribe additional roll-out obligations for a TSP who acquires spectrum in the auction even if it has already fulfilled the prescribed roll-out obligations earlier?**

**Bharti Airtel's Response:**

In our view, rollout obligations need to be different for new/existing/extension/quashed licenses for the following reasons:

- **Rollout obligations for new entrant acquiring startup spectrum in the auction**

The objectives of roll out obligations are essentially to - a) ensure expansion of networks & services in a specified time within a specified geography b) prevent spectrum hoarding and c) achieve efficient utilization of spectrum. It is, therefore, imperative that new entrants fulfill their rollout obligations on allotment of start-up spectrum. We recommend continuation of the roll out obligations, prescribed during the previous spectrum auctions in November 2012 and March 2013.

- **Rollout obligations for existing telecom operators acquiring incremental spectrum**

Existing TSPs fulfilled their roll out obligations when they were allocated start up spectrum. These have also been duly tested by the DoT. Hence the existing TSPs should not be subject to any additional rollout obligations upon acquiring incremental spectrum. In this context, it is important to highlight that no additional rollout obligations were imposed on incremental spectrum given administratively in the past. Also, incremental spectrum is only used for capacity enhancement and not for coverage. Therefore coverage related rollout obligations on incremental spectrum are not justified.

- **Rollout obligations for licenses upon extension**

Currently, the incumbent private operators have more than 83% market share in rural areas and are increasingly covering uncovered areas. Airtel alone has invested thousands of crores in the network and covers more than 85% population and 4.60 lac non census towns and villages. It is, therefore, evident that incumbent TSPs, whose licenses are due for extension, have gone beyond their obligation of fulfilling the mandated roll out obligations. If fresh rollout obligations are imposed on incumbent TSPs, it will only increase administrative hassles and duplicate costs for these TSPs without serving the intended purpose.

**Q7. What should be the framework for conversion of existing spectrum holdings into liberalised spectrum?**

**Bharti Airtel's Response:**

- a) It is our submission that spectrum held by us is already 'liberalized' / technology neutral. Therefore, we are unable to recommend a framework for conversion of the existing spectrum to 'liberalized' spectrum.
- b) The following excerpts from DOT guidelines/press note/ NTP-99/UAS License support our contention that the present spectrum holding is already liberalized :
  - "CMSPs shall be free to provide all types of mobile services utilizing any type of network equipment" (see para 3.1.1 of NTP-99)
  - "CMSPs will be technology wise neutral...be permitted to expand their network using any other technology or GSM technology" (See DoT's Press Note dated 13.09.1999);
  - "CMSPs can provide any type of network equipment... that choice of technology is to be left to CMSP's (and has to be digital) " (See DoT's letter dated 01.10.1999);
  - "Operators have been permitted to operate the Cellular Mobile Telephone Service in any technology (shall be digital) (See DoT letter dated 09.04.2001);
  - The UAS licensing regime lays down that UASL are free to use any technology without any restriction (See UAS guidelines dated 11.11.2003);
  - The UAS license provides that any digital technology having been used for a customer base of 1 lakh subscribers for 1 year is permissible for use regardless of its changed versions (See clause 23.1 of UAS License);

- Both DoT and TRAI have stated multiple times that spectrum is already technology neutral i.e. services can be operated in any technology in the given band (i.e.800/900/1800 MHz). Like ... present policy on spectrum use is technology neutral (See para 2.2 of TRAI Consultation Paper dated 31.05.2004).
- c) We would also like to point out that contrary to the government's stance that spectrum given in bands of 800, 900/1800 MHz is for use in specific technology i.e. CDMA and TDMA (GSM) respectively; dual spectrum operators have been offering **3G EVDO services in the 800 MHz band**. If indeed, it is incumbent under the license that 800 MHz can only be used for CDMA, it is extremely surprising that dual technology operators have been allowed to continue providing EVDO services.
- d) Under Clause 43.5(i) the License allows assignment of spectrum up to 4.4+4.4 MHz if the chosen technology is TDMA based systems. In such a case, the channel plan will be 200 KHz per carrier or 30 KHz per carrier. It further states that the type(s) of systems to be deployed are to be indicated for making available appropriate frequency spectrum for rollout of services under the license. The Licensee is free to choose any technology. There is no mention of spectrum band in Clause 43.5(i). In fact, Clause 43.5(ii) simply mentions the designated frequency bands under the license. It is clear from these clauses that there is no restriction on the use of spectrum in 800/900/1800 bands to any specific technology.
- e) Currently, more than 500 million consumers are using GSM based mobile services, primarily voice over 900/1800 MHz network across the country. Even though we believe that spectrum is liberalized, it is not realistic or feasible to abandon or change the use of existing spectrum from the current GSM technology in favour of the futuristic UMTS/LTE technology. It is, therefore, incomprehensible how the Authority can seek views to create a framework for liberalization of already 'liberalized' spectrum which in any event, is unlikely to be used for UMTS/LTE technology in the near future.
- f) Further, we believe that an erroneous view has been taken by the government that since spectrum in 900/1800 MHz band was given in channel plan of 200 KHz it was not 'liberalised' spectrum. It is our submission that the license does not restrict the usage of spectrum in 900/1800 MHz bands to any specific technology or to any prescribed channel plan. The license is only a mechanism for allotment of spectrum and the decision to deploy any technology lies with the TSP. Since the TSP chose to deploy GSM / CDMA technologies, spectrum was allocated by WPC in the channel plan of 200 KHz/ 1.23MHz. Subsequently, if the TSP intends to deploy some other technologies in the allocated spectrum, the clubbing of channels is not disallowed. Even the CDMA operators that have been allocated spectrum in the channel plan of 1.23MHz have combined allocated channels to deploy 3G EVDO Rev. B services. Even today, while spectrum allocated via auction is being deemed to be 'liberalised', it is allocated in the channel plan of 1.25MHz. A liberalised use will require four such blocks to be clubbed for deployment of new technologies. If four blocks of 1.25MHz can be combined together for liberalised use; by

the same principle, 25 channels of 200 KHz can surely be combined together.

- g) It is imperative for the Authority to formulate a consistent and non-discriminatory policy. Accordingly, since CDMA operators have been allowed to continue EVDO services, GSM operators must also be allowed to combine channels and offer 3G/4G services.

In conclusion we request the Authority to allow market forces to determine the price of spectrum which is far more relevant than a framework for already 'liberalized' spectrum.

**Q8. Is it right time to permit spectrum trading in India? If yes, what should be the legal, regulatory and technical framework required for trading?**

**Bharti Airtel's Response:**

We strongly believe that spectrum trading should be permitted in India for spectrum that has been assigned through auction.

Spectrum trading will provide flexibility to TSPs requiring more spectrum to purchase it from the market. It will also provide the necessary flexibility to TSPs wanting to exit; resulting in efficient utilization of spectrum. For example, in 2010, the TSPs acquired 3G and BWA spectrum at exorbitant price as the market uptake for these services was perceived to be very high. However, 3G services have not taken off as expected. In case of BWA, only Airtel has launched services - and that too, only in a few circles. Given the tough financial condition of the telecom sector, it has become difficult for some TSPs to rollout their network in 3G or BWA spectrum band even after holding spectrum for almost 3 years. These TSPs can neither sell their 3G/BWA spectrum nor surrender spectrum back to the government without forfeiting the auction price. The present M&A policy does not allow these TSPs to selectively demerge spectrum in a particular band and then sell it to some other TSP.

We recommend the following legal, regulatory and technical framework for spectrum trading:

- Eligibility conditions for spectrum trading and participation in spectrum auction should be the same. This is to ensure that only existing TSPs or serious new entrants can trade spectrum. However, the Authority should frame the rules for trading in a manner which prevents speculation and spectrum hoarding.
- There should be a uniform cap for spectrum holding per circle in case of trading, spectrum auction and merger & acquisition.
- There should not be any spectrum trading charges for the auctioned spectrum as the government has already collected the market value of spectrum.

- The government should not link spectrum trading with fulfillment of the related rollout obligations or with any other condition. There are only two possible scenarios:-
  - In case, spectrum trading takes place before the fulfillment of rollout obligations, then the buyer should be responsible for fulfilling the rollout obligations.
  - If spectrum trading takes place after the mandatory rollout obligations period, but without fulfilling it, then the seller company should be responsible for the consequences, before trading is allowed.
- Definition of the technology to be adopted should be ratified by WPC to ensure that the traded channel plans do not interfere with the adjacent existing spectrum which is already in use.
- Any harmonization request as a result of acquiring non adjacent blocks through trading should be done within a stipulated period.

#### **Alternate approach:**

In case, the government decides not to allow spectrum trading, then as a special case, it should allow band wise exit enabling TSPs to sell the entire spectrum in a particular band. This will certainly enable such TSPs to improve efficiency, reduce costs, optimize their balance sheets and focus on providing the remaining telecom services, while retaining flexibility of technology.

**Q9. Would it be appropriate to use prices obtained in the auction of 3G spectrum as the basis for the valuation in 2013? In case the prices obtained in the auction of 3G spectrum are to be used as the basis, what qualifications would be necessary?**

**&**

**Q11. Is indexation of 2001 prices of 1800 MHz spectrum an appropriate method for valuing spectrum in 2013? If yes, what is the indexation factor that should be used?**

#### **Bharti Airtel's Response:**

In our view, the value of spectrum should neither be too high which will inevitably result in significant increase in consumer tariffs, unsold spectrum and consequently no revenues for the exchequer; nor should it be too low, which will result in non-serious players hoarding spectrum. The value of spectrum should strike a delicate balance between maximizing revenues for the exchequer while being financially viable for the TSPs.

The value of spectrum, at any particular point of time depends on a large number of factors:

- Demand for services.
- Growth of the ecosystem – handsets, applications and network equipment.

- Stage of the technology in its life cycle for which spectrum is suitable
- Level of competition – number of operators
- Availability of spectrum – demand/ supply
- Per capita income/ disposable income – purchasing power of the consumer
- Teledensity/ residual teledensity – addressable consumer base
- ARPU & RPM – usage behaviour

Each of these factors has a significant impact on the valuation of spectrum. It is, therefore, imperative that prices discovered in the past be considered relevant only if the factors mentioned above remain largely unchanged.

### 1. 3G spectrum as the basis for the valuation of Spectrum in 2013:

3G prices should not be used as the basis of valuation of spectrum in 2013 due to the following reasons:

- **Overestimated perceived demand:** In 2010, the TSPs perceived a high demand for 3G services by the consumer. The industry believed that 3G services had a high revenue potential with a market mature enough for speedy uptake. However, the last few years have revealed that the demand perceived by the TSPs was grossly overestimated and resulted in disproportionate investments being made by existing TSPs for 3G/ BWA spectrum. The TSPs are finding it very difficult to recover these investments, primarily due to the low penetration of 3G enabled handsets, (still as low as around 6-8%, even after 3 years of auction) resulting in very slow adoption of 3G services by the consumers.
- **Demand Supply Gap:** The supply of 3G spectrum in auction was constrained to only 3-4 blocks per circle as compared the high demand due to the presence of 10-12 TSPs in each circle. This gap became more acute as the existing TSPs were waiting for allocation of additional spectrum in the last few years. Moreover, the Authority also recommended limiting the administrative 2G spectrum as per the prescribed limit i.e. 10 MHz for Delhi / Mumbai and 8 MHz for remaining service areas.
- **Auction Process:** Flaws in the simultaneous ascending auction process requiring the operator to bid continuously in order to be assured a block of spectrum in a circle led to a steep rise in prices of certain circles.

The failure of November 2012 and March 2013 auctions where the reserve price was derived basis the final price of 3G spectrum makes it amply clear that 3G spectrum prices were unrealistically high and therefore should not be used to determine the valuation of spectrum in 2013.

In fact, a study conducted by COAI & PwC in May 2012 stated that consumer tariffs would go up by 26 paise if TRAI's recommendations of May 2012 were accepted. In June

2012, a similar study of COAI & E&Y also concluded that there will be a significant impact of TRAI's recommended spectrum price on operators' cost per minute and consumer tariffs. (PwC and E&Y report attached as Annexure 3 and 4)

## **2. Indexation of 2001 prices of 1800 MHz spectrum for valuing spectrum in 2013:**

In the past 12 years, a large number of factors determining the valuation of spectrum have changed considerably. Few of these are indicated below:

- Teledensity has increased from 3.5 – 4 % in 2001 to 73% in 2013.
- Level of competition has increased from 2-4 mobile operators in 2001 to 7-9 operators in 2013, resulting in a significant drop in tariffs.
- New technologies such as 3G/4G are being deployed as compared to only 2G networks during the year 2001.
- Network and usage was purely voice/SMS centric during the year 2001.

**Therefore, we believe that after so many years it would be incorrect to use the price of spectrum in 2001 to derive a valuation of spectrum in 2013.**

**Q17. Should the valuation of spectrum and fixing of reserve price in the current exercise be restricted to the unsold LSAs in the 1800 MHz band, or should it apply to all LSAs?**

**&**

**Q12. Should the value of spectrum in the areas where spectrum was not sold in the latest auctions of November 2012 and March 2013 be estimated by correlating the sale prices achieved in similar LSAs with known relevant variables? Can multiple regression analysis be used for this purpose?**

### **Bharti Airtel's Response:**

During the Auction of November 2012 & March 2013, reserve prices were determined on the basis of the final price of 3G spectrum auctioned in year 2010. Despite the fact that all spectrum released as a result of quashed licenses was not put up for auction and a great degree of artificial scarcity was created, the complete spectrum put to auction could not be sold except for one LSA. It is fair to assert that the exorbitantly high reserve price led to the failure of these two auctions.

A majority of spectrum sold during November 2012 and March 2013 was a result of “**distress buying**” for continuity of services and adjustment of entry fee by those operators whose licenses were cancelled by the orders of Hon'ble Supreme Court of India.

In this context, we believe that the prices discovered through the “distress buying” in November 2012 and March 2013 cannot be termed as the market discovered prices even for

those 18 LSAs where spectrum was sold. Therefore, they should not be used as a reference for estimating the value of spectrum in the remaining 4 circles. We would earnestly request the Authority to recalibrate the valuation of spectrum for all LSAs afresh after taking into consideration the present market/economic realities.

**Q10. Should the value of spectrum for individual LSA be derived in a top-down manner starting with pan-India valuation or should valuation of spectrum for each LSA be done individually?**

**Bharti Airtel's Response:**

Each circle/ LSA represents a unique business case depending upon the following:

- Perceived demand for services
- Level of competition – number of operators
- Availability of Spectrum – demand/ supply
- Per capita income/ disposable income – purchasing power of the consumer
- Teledensity/ residual teledensity – addressable consumer base
- ARPU & RPM – usage behavior
- Infrastructure & power availability
- Geographical area – dense urban, urban, sub-urban & rural area
- Urban and rural population
- Population density
- Literacy rate

Since these factors vary widely from one LSA to another, the value of spectrum cannot be the same for all the circles or a group of circles. Therefore, we propose a bottom up approach to determine the value of spectrum.

**Hence, in our view, value of spectrum should be derived for each LSA individually.**

**Q13. Should the value of spectrum be assessed on the basis of producer surplus on account of additional spectrum? Please support your response with justification. If you are in favour of this method, please furnish the calculation and relevant data along with results.**

**Bharti Airtel's Response:**

No, we don't agree with the methodology of deriving the value of spectrum using the producer surplus method.

It is a fundamental economic principle for any industry that the greater the size and scale, the greater the efficiency. Therefore applying the method of producer surplus:



- Penalizes the serious operators with efficient operations due to economies of scale, productivity and / or operating efficiencies.
- Strikes at the core philosophy of deriving efficiencies in operation, thereby dis-incentivizing the TSPs from becoming more productive / efficient since the “State” will appropriate all such efficiencies as part of spectrum valuation.

Moreover, the producer surplus method also suffers from following shortcomings:

- Various TSPs utilize spectrum in different ways, and as a result the efficiency of spectrum utilization varies from one TSP to another. When the producer surplus method is used to arrive at a value of spectrum, it leads to erroneous results which cannot be applied uniformly to all TSPs.
- Factors such as revenue earning potential, the different technologies available, availability of ecosystem in respect of technology and incumbency are not considered by this approach, making it unsuitable for assessing the value of spectrum.
- When a new TSP enters the market, it has the freedom to use its resources/ spectrum to employ the latest technology whereas the existing TSPs are tied in to their existing technology due to the network deployed and existing consumers using that technology.
- Various TSPs may use spectrum for different technology whereas this approach would assume a single technology and therefore is not realistic.
- Finally, the producer surplus will be different for different TSPs depending on their capacity expansion forecasts and existing footprint. Hence, any result basis these calculations cannot be applied uniformly to all TSPs.

As deliberated above, using the producer surplus methodology on spectrum valuation has many inherent drawbacks that make it unsuitable in deriving the value of spectrum.

**Q14. Should the value of spectrum in the 1800 MHz band be derived by estimating a production function on the assumption that spectrum and BTS are substitutable resources? Please support your response with justification. If you are in favour of this method, please furnish the calculation and relevant data along with results.**

**Bharti Airtel’s Response:**

The production/ substitution model proposed by the Authority is based on the premise that the end product i.e. the produced MOUs is based on two factors that are mutually substitutable – i.e. the number of BTSs and the quantum of spectrum. Therefore, the value of spectrum can be determined by the cost of equivalent quantity of BTS.

It is worth noting that typically, the Cobb-Douglas production function is used in manufacturing industry wherein:

- There is no supply constraint
- Man and machine are fully substitutable
- Input prices i.e. prices of man and machine are constant
- Goods produced can be stored to meet the demand at a later date/ time (e.g. production can be done at night for meeting the demand in the day time)

It is our submission that using this production function to estimate the value of spectrum by correlating it to the cost of equivalent quantity of BTSs is totally erroneous for the following reasons:

- a) Firstly, the BTS and Spectrum are not fully substitutable in a mobile network due to the following major reasons:
  - **Interference issues:** In all the new spread spectrum technologies the network is interference limited and hence the density of base stations cannot be increased beyond a point
  - **Spectrum is a scare and finite resource:** One of the inputs i.e. spectrum is finite and in limited supply so there cannot be infinite substitution of spectrum with BTS or vice versa. Spectrum is not tangible i.e. neither is it available whenever required nor can it be 'dispensed' with when the demand falls since it has been paid for, upfront, for the next 20 years.
  - **Associated intangible costs:** There cannot be an enormous/ infinite increase in number of BTSs in lieu of spectrum as there are other associated intangible costs like the costs to the environment, radiation impact etc.
  - **Site acquisition:** The efforts and the cost of getting sites in cities cannot be undermined to which there can be no real substitution.
- b) Secondly, the price of input i.e. spectrum can vary over a period of time
- c) Thirdly, the demand in telecom networks is to be met instantaneously. The network is designed basis peak load and the minutes unutilized at any moment of time cannot be stored and used at a later stage.
- d) Fourth, the Cobb-Douglas production function does not adequately capture the different stages of network growth. These stages are described below:-

#### **Stage 1 - New network deployment for providing coverage**

- There is no substitution between the number of BTSs and spectrum at this stage of the network since a new TSP deploys network to provide coverage and not for capacity.
- The number of BTSs are fixed and coverage can be provided with minimal number of transceivers and minimal spectrum

### **Stage 2 – Utilizing the capacity of initial BTSs**

- In this stage there can be no substitution between BTS and spectrum as both are fixed - the capacity of the initially deployed BTSs is simply utilized to meet the demand.

### **Stage 3 – Expanding the capacity of network:**

- Expansion may happen in two ways – additional BTS or more spectrum
- More spectrum will allow the TSP to install more transceivers in existing BTSs thereby increasing capacity. Capacity is somewhat proportional to the number of transceivers because of scale economies of trunking.

### **Stage 4 – Interference limited network:**

- The network is so congested that it is difficult for TSPs to construct new BTSs without causing radio interference.
- Only additional spectrum can create additional capacity as the number of BTSs cannot be increased.

- e) Last but not the least; different TSPs may deploy different technologies. The Cobb-Douglas approach does not account for change in technology.

**We therefore are of the view that the value of spectrum should not be estimated using a production function.**

**Q15. Apart from the approaches discussed in the foregoing section, is there an alternate approach for valuation of spectrum that you would suggest? Please support your answer with detailed data and methodology.**

#### **Bharti Airtel's response:**

Spectrum valuation is a function of multiple factors and is only relevant for the period in which the auction is taking place. The economic, technological and competitive factors involved in securing spectrum through an auction or tender, change radically across a given period.

In April 2012, the Authority recommended an exorbitant reserve price of Rs.18,111 Crs. for 5MHz in 1800 MHz band. For 800/900 MHz, the reserve price was set at 2x of the 1800 MHz reserve price. However, before the November 2012 auction, the government reduced the reserve price of 1800 MHz by 23% to Rs.14,000 Crs. Also, at the Authority's recommendations, the reserve price of 800 MHz was kept at 1.3 times the reserve price of 1800 MHz band, i.e. Rs.18,200 Crs.

However, despite the fact that the reserve price of spectrum was reduced to this extent, the government failed to sell all spectrum blocks put to the auction. While no spectrum was sold in 800 MHz band; for the 1800 MHz band, a majority of spectrum sale was a result of 'distress buying' by TSPs whose licences had been quashed. They bought this spectrum to

ensure continuity of services to their consumers and in an attempt to adjust the non refundable entry fee. In four circles namely Delhi, Mumbai, Karnataka and Rajasthan, no spectrum was sold in 1800 MHz band.

Thereafter for the March 2013 auction, the government further reduced the reserve price of 1800 MHz band for four circles by 30%. For 900 MHz band, the reserve price was set at 2x of the reserve price of 1800 MHz. For 800 MHz band, the reserve price was reduced by 50% across all circles. However, no operator acquired spectrum in 900 MHz and 1800 MHz despite this reduction and only one TSP whose license had been quashed acquired spectrum in 800 MHz band for eight circles.

The results of the last two spectrum auctions show that the above reductions were not sufficient to attract investors. The valuation of spectrum needs to be done keeping these failed auctions in mind and should ideally result in a significant reduction in the auction prices over November 2012 and March 2013. The reduced price should be independently corroborated by a separate valuation exercise on the basis of discounted cash flow at an industry level for each LSA.

**Q16. Should the premium to be paid for the 900 MHz and liberalised 800 MHz spectrum be based on the additional CAPEX and OPEX that would be incurred on a shift from these bands to the 1800 MHz band?**

**Bharti Airtel's response:**

The coverage efficiency of sub 1 GHz frequencies has a tangible advantage over 1800 MHz because of its propagation characteristics. This is especially important from a penetration loss perspective, where indoor coverage is critical for quality of service.

However, most networks in metros/urban areas are getting capacity limited where inter site distance for both 900 MHz & 1800 MHz spectrum is similar. Therefore the network costs in these cities are determined by the number of sites deployed for capacity requirements. In this case the coverage efficiency and service quality advantage of 900 MHz over 1800 MHz is not significant.

In non-metro circles, rural sites account for 40-50% of the total sites where 900 MHz has an advantage over 1800 MHz.

In summary, we believe that the advantage towards better coverage and quality of service will justify a premium in the valuation of 800/900 MHz spectrum over 1800 MHz. Based on the total cost of ownership the ratio of 800/900 MHz over 1800 MHz should be 1.2. However this ratio will vary depending on the absolute value of 1800 MHz.

Q18.

- a) Should annual spectrum usage charges be a percentage of AGR or is there a need to adopt some other method for levying spectrum usage charges? If another method is suggested, all details may be furnished.
- b) In case annual spectrum usage charges are levied as a percentage of AGR, should annual spectrum charges escalate with the amount of spectrum holding, as at present, or should a fixed percentage of AGR be applicable?
- c) If your response favours a flat percentage of AGR, what should that percentage be?

**Bharti Airtel's Response:**

The guiding principles governing Spectrum Usage Charge must ensure that the total cost of spectrum is equitable for all TSPs across the entire period of the license.

The present method of levying escalating spectrum usage charges was relevant when spectrum was allocated administratively on the basis of Subscriber Linked Criteria and no upfront charges were required to be paid for incremental spectrum.

It is important to make a reference to the press release dated 31<sup>st</sup> October 2008 wherein DOT has stated that *"In case spectrum is auctioned, it would not have been possible to charge the higher spectrum usage charges of the order of 2-6% and maintenance and administration cost which is typically of the order of 0.5% to 1% could be recovered in a judicial manner"*. Thereby, DoT has also acknowledged that escalating spectrum usage charge was just a substitute for an upfront/onetime fee. There was never any intent to continue with both the charges i.e. an upfront fee as well as an escalating spectrum usage charge.

Further, wherever spectrum is sold globally, against an upfront price determined through auction, the spectrum usage charge is always kept at a nominal/minimal level so as to recover the cost of spectrum management and administration.

**In light of the above, in our view, the annual spectrum usage charge for the auctioned spectrum should be uniform @ 1% of Adjusted Gross Revenue.**

The above proposal will ensure a non discriminatory framework while also ensuring overall revenue for the exchequer in the long term. Moreover, it will effectively address the prevailing anomalies in the present regime of escalating spectrum usage charge which has been rightly acknowledged. Some examples of this discrimination are as under:

- TSPs who hold 2G spectrum in 900 MHz & 1800 MHz (GSM operators) pay higher spectrum usage charge based on their combined spectrum holdings in 900 MHz and 1800 MHz band as compared to the dual technology operators who hold spectrum in 1800 MHz and 800 MHz. This is because the latter pay spectrum usage charges for 1800 MHz & 800 MHz separately as a share of segregated revenues from two independent spectrum bands which typically works out to a lower amount.

- In the new regime where spectrum is being sold against the upfront charges determined through the auction, a higher and escalating spectrum usage charge leads to a wide variation in the total cost of spectrum, paid over the period of the license by existing TSPs in comparison to new TSPs. For example, while two operators would pay the same upfront charges for spectrum procured through auction, a new entrant will pay the spectrum usage charge at the lowest slab i.e. 3% of AGR and an existing TSP would pay at a higher slab on the basis of its total spectrum holding in 2G band.
- The discrimination on account of escalating spectrum usage charge is further perpetuated by adding the quantum of spectrum procured through auction in the administrative spectrum holding which is used to determine the slab of spectrum usage charge.

The table below compares the difference in total cost of ownership of spectrum between new and existing TSP on account of spectrum usage charge:

S No	Charges	New TSP	Existing TSP
A	Upfront charges determined through auction	Same	Same
B	Additional Spectrum Usage Charges on <b>“existing revenues” from the existing spectrum</b>	<b>Nil</b> as the new TSP has no existing AGR	1% of existing AGR in case the TSP is allocated 1 block of 1.25 MHz  2% of existing AGR in case the TSP is allocated 2 blocks of 1.25 MHz
C	Spectrum Usage Charge on <b>“new revenues” from Spectrum allocated via auction</b>	<b>3-4%</b>	<b>5-8%</b>

In light of the above, we sincerely hope that the Authority will correct the discrepancies in the current practice of levying spectrum usage charge and consider our proposal which is aimed at ensuring a level playing field as well as long term benefits to the exchequer.

**Q19. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum?**

**Bharti Airtel’s Response:**

The Authority has rightly recognized the distinction between the estimated market price vs. reserve price. We agree with the Authority’s view that the reserve price should be set at an

optimum level. It should not be too high which may result in TSPs being deterred from participation and therefore in unsold spectrum and the resultant inefficiency. Nor should it be too low which may result in collusive behavior or the entry of non-serious players in the auction. The advantage of an optimal reserve price is that it encourages participation significantly whereas the competitive auction process and hubris drives up the market prices during the auction.

Table 4.2 of the consultation paper shows international benchmarks on reserve price which have a mean value of 0.45 and a median of 0.4173 for the ratio of reserve price to the final price. We concur with these numbers and suggest the Authority keep the Reserve Price at 0.45(45%) of the estimated value of spectrum. This will allow the TSPs to freely and fairly exercise their options.

Any premium attached with any spectrum band will have higher demand and attract higher auction price, therefore, it is proposed that the reserve price of all spectrum bands, i.e. 800, 900 and 1800MHz should be kept uniform.

**International instances of Re-distribution**

<b>Market</b>	<b>Spectrum holdings before Re-distribution</b>	<b>Spectrum holdings after Re-distribution</b>
<b>Sweden</b>	Tele2: 10 MHz Telenor: 10 MHz TeliaSonera: 10 MHz Swefour: 5 MHz	Tele2: 7.5 MHz (25% reduction) Telenor: 7.5 MHz (25% reduction) TeliaSonera: 10 MHz Swefour: 5 MHz Hi3G: 5 MHz
<b>France</b>	Bouygues Telecom: 9.8 MHz Orange France: 12.4 MHz SFR: 12.4 MHz	Bouygues Telecom 9.8MHz Orange France 10 MHz (20% reduction) SFR 10 MHz (20% reduction) Free Mobile 5 MHz
<b>Sri Lanka</b>	Celltel 13.0 MHz MTN Networks 7.5 MHz Hutchison 10.5 MHz	Celltel 7.5 MHz (35% reduction) MTN Networks 7.5 MHz Hutchison 7.5 MHz (29% reduction) MobiTel 7.5 MHz
<b>Denmark</b>	Telia 14.8MHz TDC Mobil 9 MHz Telenor 9 MHz	Telia 11.8 MHz (20% reduction) TDC Mobil 9 MHz Telenor 9 MHz Hi3G 5 MHz



S. No.	EGSM Band assigned to GSM operators
1	Albania
2	Lithuania
3	Luxembourg
4	Austria
5	former Yugoslav Republic of Macedonia
6	Belgium
7	Montenegro
8	Bulgaria
9	Netherlands
10	Croatia
11	Norway
12	Czech Republic
13	Denmark
14	Romania
15	Estonia
16	Russian Federation
17	Finland
18	France
19	Slovak Republic
20	Georgia
21	Slovenia
22	Germany
23	Spain
24	Sweden
25	Switzerland
26	Iceland
27	Ukraine
28	Italy
29	United Kingdom
30	Latvia
31	Liechtenstein
32	Sri Lanka
33	Bangladesh