

Etisalat DB Telecom's Response to Consultation Paper on Overall Spectrum Management and Review of License Terms and Conditions

With the advent of new technologies (e.g. 3G, LTE etc), the steady shift towards convergence and increased demand for triple play all of which are bandwidth intensive, the demand for spectrum has attained new heights. Considering the future requirements of spectrum by various technologies and services and ever growing appetite of subscribers across the globe, the effective and efficient management of spectrum is the pressing need of hour, failing which the audacious projections and plans of governments to usher in true information age would also end abruptly.

Also, for any resource including radio spectrum the primary economic objective is to maximize the benefits to economy and society and an efficient distribution of resource to stakeholders. Prices are an important mechanism to ensure the spectrum resources are used efficiently by users; however the balance has to be maintained between revenue generation by authorities and avoiding collusive behaviors and hoarding of scarce resources by those who have financial wherewithal to weaken competition, efficiency and larger public benefits. Hence only revenue maximization as primary goal would only compromise other factors.

Various researches have shown the value of improved connectivity achieved either through Voice or Data or both. E.g. for each 1% increase in mobile penetration the GDP per capita goes-up by US\$ 240, and 1% increase in internet penetration leads to per capita GDP increment of US\$ 593 (Source: TMG Telecom Research '2006). *In India, every 10 % increase in Tele Density leads to 0.6 % increase in GDP.*

Hence, this consultation paper and the issues dealt with in this are a welcome step in the right direction

1. Do you agree with the subscriber base projections? If not, please provide the reasons for disagreement and your projection estimates along with their basis?

Etisalat's Comments:

Yes, we are more or less in agreement with TRAI's subscriber base projection given in the consultation paper. We had prepared our own estimate of subscriber base which we earlier submitted to the Authority in the context of MNP related issues and the same as projected is reproduced below:

Year	Average Monthly Additions (mn)	Average Annual Additions (mn)	Total Subscribers at end (mn)
Mar-10	11.00	132	522.94
Mar-11	10.00	120	642.94
Mar-12	9.00	108	750.94
Mar-13	8.00	96	846.94
Mar-14	7.00	84	930.94
Total (5 years)		540	

2. Do you agree with the spectrum requirement projected in ¶ 1.7 to ¶1.12? Please give your assessment (service-area wise).

Etisalat's Comments:

It is submitted that the future spectrum requirement will be based on the assumptions made to arrive at those projections and the projections are indicative only. **The spectrum requirement would also be dependent upon the technological innovations, development of applications, consumer behavior and market trends.** The impact of introduction of MNP will also play a significant role in shaping the demand for spectrum as operators garner additional subscribers from each others' network and not necessarily through new acquisitions which would in turn reduce the spectrum requirement of donor operator.

At the same, spectrum availability would depend upon several factors such as vacation by government agencies, spectrum sharing, M&A activity etc.

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3. How can the spectrum required for Telecommunication purposes and currently available with the Government agencies be re-farmed?

Etisalat's Comments:

Inarguably, refarming must be initiated at the earliest. The spectrum currently held by government agencies (e.g. MoD, Indian Railways etc.) but not being utilized, should be made available for commercial use on non-interference and non-protection basis. However the exclusive right to the spectrum may continue to remain with the primary holders, till withdrawal / re-farming of such spectrum is formalized by the Govt. of India.

Some opportunities for refarming include:

CDMA: Reduce the inter-operator guard band in CDMA from 600 KHz to 270 KHz along-with harmonization of CDMA allocations by assigning contiguous carriers.

Digital Dividend: The UHF 5 band should be vacated by Doordarshan to make available the spectrum in 700 MHz for LTE.

GSM: Refarming of 900MHz spectrum is gaining momentum across the world especially in Europe in view of its special characteristics due to which operators that have not been assigned spectrum in this band are at a competitive disadvantage vis-à-vis those who hold spectrum in this band. The UMTS 900 (also known as 'WCDMA-900') can be used most effectively and efficiently for next generation services due to its better propagation characteristics. As per various studies and analysis it is established that majority of internet access and data access over mobile happens indoors and it is an accepted fact that 900 MHz frequency has higher penetration power and almost no loss of quality, **hence refarming of 900 MHz also should be considered on priority.** In fact the new EU rules make it easier to adapt spectrum allocation in the 900 MHz frequency band to allow even newer 4th generation high-speed broadband technologies.

Quoting from a public consultation initiated by OFCOM in October 2009, "*.....In the Digital Britain report, the Government indicated that it saw a rebalancing of existing spectrum holdings as a desirable outcome. This would address historical anomalies that have arisen due to previous methods of allocation and which had*

resulted in operators having spectrum holdings of different levels and in different bands. In particular, as described above, those operators holding 900MHz spectrum have potential competitive advantages.....”

The recent EU DIRECTIVE 2009/114/EC dated 16-September-2009 also states that, “..... **where certain mobile operators have not been assigned spectrum in the 900 MHz band, they could be put at a disadvantage in terms of cost and efficiency in comparison with operators that will be able to provide 3G services in that band.....”** The European Conference of Postal and Telecommunications Administrations (CEPT) has successfully demonstrated the co-existence of systems and technologies apart from GSM in the 900MHz band.

The benefit of 900MHz for 3G technologies was demonstrated by Ovum in a report to GSMA in as early as 2007, “*The full use of 900MHz spectrum for the provision of 3G services in the future may be a barrier for new entrants. The licence holders of 900MHz band may be able to deploy UMTS900 in current GSM spectrum in some countries without applying for a separate 3G licence...*” (Source: “*Market Study for UMTS900, A report for GSMA*”, February 2007)

The said Ovum report also mentioned that, “*In Asia Pacific there is a mixed picture. In countries with high population density, the economic benefit that deployment of UMTS900 can yield is to speed-up the substitution of 2G to 3G thus stimulating the reshape of business models. In countries such as Australia and New Zealand, UMTS900 can also play an important role in bringing 3G to more remote areas improving economic activity of indigenous population and reducing transaction costs for farmers.*”

As per the UMTS Forum, 11 networks have been launched world-wide for providing 3G services in the 900MHz band and these include Finland (Elisa in Jan 2007), Australia (Optus), France (Orange) etc.
(Source: www.umts-forum.org)

Handsets by world’s top mobile handset manufacturers are available in the market today that are compatible with 900MHz band for 3G (UMTS) as well as 2G such as Nokia E-75, Nokia N-97, Nokia E-66, Samsung I-8510, Samsung INNOV-8, Sony Ericsson C903, Sony Ericsson Satio, Sony Ericsson YARI, Sony Ericsson Xperia etc. Majority of these phones are available in Indian market as well. (Source: www.gsmarena.com, www.nokia.co.in)

It is therefore emphasized that 900 MHz band should be recognized as a preferable frequency for deployment of WCDMA networks. An operator having spectrum in 900 MHz is already at an advantageous position vis-à-vis an operator holding spectrum in 1800 MHz. In India, the incumbent operators would be able to use and exploit their existing legacy infrastructure instead of making totally new investments. Therefore it is desirable to plan for re-farming of 900MHz in India by retrieving the 900MHz spectrum from such operators and assigning the same for 3G services.

As per OFCOM’s estimates an operator, who is using 900 MHz instead to 2.1 GHz for providing 3G services, would save nearly £1 billion in case of deployment costs in densely populated areas and £250 million in rural areas, giving a total potential cost saving to an operator of £1.25 billion. (Source: *Application of Spectrum Liberalization and trading to the mobile sector*, Nov’07).

Leading mobile equipment vendors like Ericsson, NSN etc. have conducted a series of tests to ascertain the compatibility of equipment currently deployed in 900MHz for use in 3G and based on the results of which some telecom operators have already deployed 3G networks in 900MHz (eg. Elisa in Finland using NSN as vendor in 2007). From the test findings, it can be readily inferred that:

- a. Coordinated Networks (i.e. usage of same cell site locations of GSM & WCDMA) can be deployed along with 1 mbps data service capability in cell area of 8 Sq Kms.

- b. In un-coordinated scenario, where the geographical locations differ, WCDMA-900 is capable to deliver voice with a cell area of 12 Sq. Kms.
- c. With flat network hierarchy, HSPA, (3.5G) is able to further deliver “broadband like speeds - with lower latency” complementing the WCDMA in precious 900 MHz band well.
- d. New techniques enable to compress the available spectrum in such a manner that an operator may conveniently be able to deploy WCDMA using (say) 4.2 MHz, instead of the usual 5.4 MHz, & yet be able to spare enough spectrum for continuing to deploy GSM/EDGE.
- e. WCDMA carrier can be centered in own GSM spectrum to avoid un-coordinated/ interference scenarios with other operators

(Source: WCDMA 900 Deployment Considerations by Aingharan Kanagaratnam Nov’ 2008;
<http://www.nokiasiemensnetworks.com/portfolio/products/broadband-connectivity/wcdma-frequency-refarming-solution>)

4. In view of the policy of technology and service neutrality licences, should any restriction be placed on these bands (800,900 and 1800 MHz) for providing a specific service and secondly, after the expiry of present licences, how will the spectrum in the 800/900 MHz band be assigned to the operators?

Etisalat’s Comments:

The prevailing practice of technology neutrality should continue subject to permissible evolution of 2G-GSM and 2G-CDMA within their respective bands. To elaborate, 900MHz should be reserved for evolution of 2G-GSM standard towards higher/superior standards like WCDMA, HSxPA, LTE etc and similarly 800MHz should be reserved for evolution of 2G-CDMA standard towards higher/superior standards like CDMA-2000, EVDO etc.

Secondly, upon expiry of existing license term, renewal should be based on predefined terms & conditions that DoT should notify sufficiently in advance and **subject to payment of upfront price for spectrum which should be based upon the latest auction price adjusted for the specific spectrum band (i.e. higher for 900 MHz than 1800 MHz).**

The 900 MHz band should not be renewed automatically; rather all efforts should be made to give spectrum in 1800 MHz as a part of spectrum harmonization and refarming. In case this is not possible only then spectrum in 900 MHz should be renewed subject to a sufficiently higher fee to reflect the true market value of this band.

Up till now, bands like 900MHz were primarily considered to be exclusively GSM. However, with technological evolution, 900MHz can be used to deploy 3G and further 4G networks thereby putting incumbents who were allocated this frequency at an undue advantage vis-à-vis the new entrants holding only or mainly 1800MHz. It is therefore desirable that pricing of 900MHz for re-distribution should also be determined taking two things into account:

- i. Reference price as a potential 4G Band **AND**
 - ii. A premium for the higher penetration and coverage characteristics inherent due to its being on lower side of spectrum chart.
- In any case, due to the advantages and benefits attached with 900MHz band, the TRAI/DoT should design a formula to quantify the volume of 1800 MHz spectrum equivalent to 1MHz of 900 MHz band keeping in view the higher price & efficiency of 900 MHz band and the operator charges and entry fee should be charged accordingly.

- Further, ITU, WRC-2000 identified following bands for 3G usage i.e. 900 MHz, 1900 MHz, 1800 MHz, 2100 MHz and 2500 MHz in which IMT-2000 technologies can be deployed and there are countries (e.g. France, Finland, Australia and New Zealand) that are either re-farming 800 MHz/900 MHz or using for in-band migration to provide next generation services i.e. 3G etc.
- **As per Nokia Siemens Networks, the WCDMA-900 requires 65% fewer sites than WCDMA 2100 and total cost of ownership (TCO) in the rural areas is lower by as much as 60% over a 5 year period (Source: "Extending 3G coverage with cost- efficient WCDMA frequency refarming")**
- **According to a one report by Ovum for GSMA on UMTS 900** the significant benefits of 900 MHz refarming for UMTS use are explained. It mentions: *"The report indicates that **UMTS900 provides between 44% (in urban areas) and 119% (rural areas) increased coverage per Node-B compared with UMTS2100. This is primarily due to the propagation characteristics of the lower frequency band and leads directly to lower capex and increased mobility benefits, providing a new option, with greater service capability, for operators who may wish to replace their GSM networks."***
- **The same Ovum report also states that** *"If revenues over a five year period are also considered, then a simple analysis indicates NPV improvements ranging from 40% - 55% in the Middle East and Sub-Saharan Africa respectively (with investment in UMTS900 to provide the same coverage as would be provided with UMTS2100). If the cost savings are reinvested to enable the operator to reach a larger customer base by extending geographic coverage, then **the NPV improvements of 39% - 105% are indicated in Western Europe and Asia Pac**"*

(Source: "Market Study for UMTS900, A report for GSMA", February 2007)

5. How and when should spectrum in 700 MHz band be allocated between competitive services?

Etisalat's Comments:

Communication networks are increasingly recognized as fundamental for economic and social development. Mobile Broadband serves as a communication and transaction platform for the entire economy and has the potential to improve productivity across all sectors. It also increases the impact and efficiency of public and private investments which depend on high-speed communications.

700 MHz spectrum is also being adopted the world over for mobile broadband access and LTE technologies. DoT should allocate spectrum in 700MHz for LTE within 6 to 12 months of auction of 3G spectrum. It is desirable that the winners of 3G and BWA auctions should not be allowed to participate in the auction of LTE /700 MHz spectrum (only in the circles where they have been declared winners) as these winners would have already won the spectrum for BWA.

Timely auction of the 700MHz band will ensure that the digital dividend is utilized in a pro-competitive way to open up the market **for new operators and new services**, giving the required boost to the telecommunications industry in particular and the economy at large. This could help the new entrants to create alternative/new wireless access network infrastructures, competing with incumbent operators.

6. What is the impact of digital dividend on 3G and BWA?

Etisalat's Comments:

Since DoT has decided to auction only 2 to 4 blocks of 3G spectrum in 2.1GHz band with 1 additional block reserved for PSUs in various service areas, a majority of GSM based mobile operators would be deprived of the opportunity to offer 3G services. In order to ensure a level playing field, DoT should auction the digital dividend spectrum within 6 to 12 months of auction of 2.1GHz spectrum blocks wherein winners of 2.1GHz should not be permitted to participate.

A recent World Bank econometrics analysis of 120 countries estimated that for every 10-percentage-point increase in the penetration of broadband services, there is an increase in economic growth of 1.3 percentage points (Qiang 2009). This growth effect of broadband is even stronger in developing countries than in developed economies.

7. Should the spectrum be delinked from the UAS Licence? Please provide the reasons for your response.

Etisalat's Comments:

In our opinion this is **not advisable** since the demand for UAS License is primarily for acquiring the right to provide commercial mobile communication services, which requires spectrum. For other services covered under the UAS License, there is either negligible demand (e.g. Wire-line services) or there is an alternate license available (e.g. VAS License, ISP License etc)

As the major part of 2G spectrum in 800/900 and 1800 MHz bands is exhausted (except to the extent to be vacated by Defence) there is therefore no logic in de-linking spectrum from the UAS License. Further, the initial allocation of 4.4 MHz must continue to be bundled with the license and a further allocation of 1.8 MHz and upto 6.2 MHz as per contractual obligation.

However allocation beyond the 6.2 MHz but upto 8 MHz should be based on:-

- (a) Subscriber Linked Criteria AND**
- (b) Payment of Upfront One-Time Spectrum Fee determined through auction/benchmarked to the latest spectrum auction AND**
- (c) Higher rate of annual spectrum usage charges commensurate to the higher holding of spectrum to manifest the significant economic & efficiency advantages over operators with lower holdings**

DoT should not allocate spectrum beyond 8MHz to any entity and any spectrum above 8MHz should necessarily be acquired through spectrum sharing or market consolidation only. Hence no entity should be permitted to hold spectrum above 8 MHz under any circumstance and this should be considered as spectrum cap for all operators.

To facilitate provision of certain Access Services (e.g. fixed wireline) that do not require spectrum, DoT may prescribe a lower entry fee than the current Entry Fee for UAS Licenses. The existing UASL entry fee contains the entry cost of spectrum and is therefore unjustified for a license that does not carry a right to spectrum. This issue is being dealt-with in response to question no-13 below.

- 8. In case it is decided not to delink spectrum from UAS license, then should there be a limit on minimum and maximum number of access service providers in a service area? If yes, what should be the number of operators?**

Etisalat's Comments:

As far as mobile services are concerned the number of service providers in a service area is a function of:

- (a) Spectrum availability
- (b) Operator efficiency and fragmentation
- (c) Affordability and Competition and
- (d) Profitability and Sustainability of the licensee

We agree with the findings of the technical expert that 8 MHz is sufficient for an operator to run efficient network in the densest of areas. However, in exceptional circumstances, an operator may require additional spectrum to sustain its operations in the short term till the time it is able to deploy additional sites/equipment. Assuming that the total spectrum available for allocation is 2 X 120 MHz (GSM and CDMA both) and 8 MHz is an optimal allocation, we find that upto 12 operators can comfortably be accommodated in a service area.

The TRAI has shown that around 2X70 to 2X80 MHz of 2G spectrum is commercially available currently (varying circle to circle) and the balance 50 to 40 MHz is available with government agencies. We would like to state that at-least 8 operators can be comfortably adjusted within this allocated spectrum. It is expected that in the long run, mergers and acquisitions will eventually consolidate the market amongst 5 to 6 players.

Elsewhere in the consultation paper, TRAI has shown calculations of HHI index and referred to the Report of Spectrum Committee dated May 2009. As per the said Report, international studies have shown that bringing in more operators beyond 4 to 5 will not significantly change the competitive scenario represented through the HHI Index. This is unlikely to apply to the Indian context in the next 5 years due to the peculiarities of the Indian telecom market & the limitations of the assumptions of the model as are explained below:

- (a) The concept of HHI is applied to gauge the impact of entry of a new player on the level of competition in an industry. The impact of a new player upon competition, in a market with over 100% teledensity may be negligible but this may not be the case in India with teledensity under 45%. An additional player is bound to have a positive influence upon competition in an unsaturated and evolving market like India.
- (b) The countries covered for the HHI studies have predominantly been those where teledensity has crossed 100% and therefore the limited relevance to India. In a near-saturated market with 85 - 100% teledensity, any new operator will primarily seize a customer from an existing operator (churn/multiple-SIMs) resulting in miniscule incremental effect on competition. Whereas in the case of India where teledensity was still 30% in 2008 with multiple SIM holdings and almost two-thirds of market is unserved, there is still ample scope to bring in new players to cover the hitherto untapped market resulting in increased competition & coverage.

A comparative analysis of such international countries vis-à-vis India is shown below:

S.N.	Country	Population, Subscribers & Teledensity			Number of Mobile Operators		
		Population	Mobile Subscribers	Teledensity	Current	Planned	Total
		2008	2008	2008	Nos.	Nos.	Nos.
1	Hong Kong	6.98	11	162.9	5		5
2	Italy	59.60	89	148.6	4		4
3	Singapore	4.62	6	138.2	4		4
4	Russia	141.39	188	132.6	11		11
5	Germany	82.26	107	130.4	4		4
6	Finland	5.30	7	128.8	4		4
7	Greece	11.14	14	123.9	3		3
8	United Kingdom	61.23	76	123.4	6		6
9	Netherlands	16.53	20	120.6	3		3
10	Denmark	5.46	7	120.0	3		3
11	Sweden	9.20	11	119.4	4		4
12	Switzerland	7.54	9	116.4	5		5
13	Norway	4.77	5	110.9	4		4
14	New Zealand	4.23	5	109.2	5		5
15	Australia	21.07	22	105.0	3		3
16	Malaysia	27.01	27	100.4	4		4
17	France	62.04	58	93.5	3		3
18	Thailand	67.39	62	92.0	7		7
19	Turkey	73.91	66	89.1	3		3
20	United States	311.67	271	86.8	5		5
21	Japan	127.29	110	86.7	5		5
22	Viet Nam	87.10	70	80.4	6	2	8
23	Brazil	191.97	151	78.5	8		8
24	Philippines	90.35	68	75.4	5		5
25	Canada	33.26	21	64.5	5		5
26	Indonesia	227.35	141	61.8	10		10
27	China	1,337.41	634	47.4	3		3
28	India *	1,181.41	347	29.4	7	6	13

* RCOM and Tata GSM and CDMA considered one in India

Source:

ITU, www.waepedia.mobi/en

- (c) **Past experiences indicate** that stimulation of competition in the mobile telephony market in India has resulted in tariff reduction, subscriber growth and innovation. Not just that, it has also ensured that the burgeoning subscriber base of India also sustains the businesses of both incumbents and new entrants. Those fledgling operators with time have gained enough market-share to effectively compete with behemoths without any casualty so far. Rather, it has evinced interest from foreign players and attracted more investments in the sector.

- (d) The Indian subscriber has suffered tariffs as high as Rs.16.80/minute in early years of mobile telephony when there were only 2 players in 1997-98. Even in 2001-2003 when there were 3 to 4 cellular operators per circle in a vast market like India, the tariffs were as high as Rs.8/minute for voice calls. *It is only after the entry of 5th and 6th entrant that subscriber tariffs gradually started a southward journey.* The same is also very true that with the entry of 7th and 8th operators during 2008-09, the tariffs have reached from Rs 1 to 2 per minute to half paise per per second. **We are sure that as soon as other new entrants launch their services in next few months, there will be further innovation and affordability in customer offerings.**
- (e) The argument that tariffs in India are the cheapest in the world is also a fallacy. An ISD call from US to India today costs as low as 1cent/min whereas the lowest local call rates in India are 1.2 cents/min (indexed to one paisa/sec tariffs with 1USD=Rs.46.5/-).

Hence, HHI index might not be a true reflection of competitiveness of the telecom industry in case of India (at-least in the medium term) since there is every possibility that the overall subscriber base expands as operators roll-out in un-served markets with existing players scampering to retain their market share while new entrants gain market share through fresh acquisitions and churn. A discernible impact of entry of new players would become clear in medium to long term over next 3 to 5 years. ***It should be noted that number of operators in a market should bear logical correlation with the population and subscriber base of countries - If 5 operators co-exist in the US with a population of 30 crore and teledensity of 100%, then India can easily sustain 12 operators with almost 3.5 times the population (i.e. 110 crores) with one-third the teledensity (43.5%). Needless to state that the number of operators will eventually reduce to around 6 as the market consolidates in the long term.***

Also, the HHI is based on the market share only, and any effectiveness of new competition will be dependent upon the marketing and subscriber acquisition strategy of new operators, as there is enough opportunity to gain a decent market share by any new entrant in medium to long term.

A basic simulation analysis below suggests that as teledensity increases and market shares of various operators change over a period of time, there is a benefit in bringing in new operators in the market:

Years(s)	Teledensity (%)	OP-1 Share	OP-2 Share	OP-3 Share	OP-4 Share	OP-5 Share	OP-6 Share	OP-7 Share	OP-8 Share	OP-9 Share	OP-10 Share	OP-11 Share	OP-12 Share	Total
Y-1	30%	30%	28%	22%	20%									100%
Y-2	40%	28%	25%	25%	20%	2%								100%
Y-3	50%	25%	23%	26%	18%	5%	2%	1%						100%
Y-4	60%	22%	20%	25%	15%	7%	4%	3%	2%	1%	1%			100%
Y-5	70%	19%	18%	24%	12%	8%	4%	3%	3%	4%	3%	1%	1%	100%
Y-6	90%	18%	15%	22%	11%	9%	5%	4%	4%	6%	3%	2%	1%	100%
Y-7	100%	16%	10%	24%	11%	10%	6%	3%	3%	9%	4%	2%	2%	100%
Y-8	110%	16%	10%	25%	10%	10%	6%	3%	3%	8%	4%	3%	2%	100%

- (a) The above table indicates that in year-1 a market with teledensity of say 30% is divided between 4 players in the proportion shown in row-1.
- (b) As the number of operators is gradually increased from 4 to 12 over a period of 4 years (i.e. Y-2 to Y-5), teledensity also grows from 30% to 70% with the new entrants start gaining a slim slice of the market pie.

- (c) The 4 year period is also characterized by a reshuffle of market shares of the initial 4 players - with few expanding their shares marginally, few sustaining their shares and few losing some market share to other players – as can be reasonably be expected in any under-penetrated developing market.
- (d) The next 3 years (Y-6 to Y-8) witness growth in teledensity from 70% to 110% due to the increased competition and the consequent saturation of market.
- (e) The HHI table below correlates the fall in HHI consequent upon increase in competition and teledensity.

Years(s)	No. of Operators	HHI
Y-1	4	0.257
Y-2	5	0.244
Y-3	7	0.218
Y-4	10	0.181
Y-5	12	0.153
Y-6	12	0.134
Y-7	12	0.131
Y-8	12	0.133

- (f) Notably, the increase in market players from Y-2 to Y-5 lead to drastic decline in HHI from 0.257 to 0.153. Once teledensity reached 100 in Y-7, the market attains a short-run equilibrium with stagnation in HHI. After Y-7, there is a visible trend towards concentration as HHI starts to rise ushering the phase for consolidations. It is therefore clear that infusing more players in a market of 4 operators positively impacted the level of competition till the market was moving towards saturation. Once the market achieved 100% teledensity, the contribution of competition towards market growth gets marginalised. Therefore any further addition in competition in a near-saturated market serves no purpose which is what the international studies attempt to illustrate. **But in India, we are not in Y-7 or Y-8 rather we are positioned in the period ranging from Y-2 to Y-5 with a vast un-served and under-penetrated market and therefore the impact of competition would be visible in India over the next 2 to 3 years. If the steady growth in subscriber base is sustained in India, it is quite likely that the state of Y-6 to Y-8 arrive in India much earlier ushering in consolidation.**

In case of 2G bands (900, 1800 MHz) since the new entrants have received only the initial spectrum of 4.4 MHz (except a very few cases) and the balance contracted spectrum of 1.8MHz is yet to be made available through vacation by Defence, a cap on the number of Access Providers is imperative due to the limited availability of spectrum. The market can sustain upto 12 operators in the medium term whereas M&A activities in the long term will bring the market to equilibrium with around 6 operators. It is our strong belief that any lesser number of operators in a big market like India would seriously undermine competition.

9. What should be the considerations to determine maximum spectrum per entity?

Etisalat’s Comments:

We endorse the findings of the technical expert that 8 MHz is an efficient allocation per operator. In order to ensure a level playing field and effective competition, 2X8 MHz should be allocated by DoT and any further

spectrum requirement should be met through spectrum sharing or market consolidation. Hence we recommend that the maximum spectrum holding per entity should be capped at 8 MHz for 2G for GSM.

This ceiling also takes into consideration the following factors:

1. Spectral efficiency and technological advancements
2. Number of operators and competition
3. The large size of Indian population & teledensity
4. State Welfare Objectives

We have tried to analyze the tradeoff between CAPEX required in terms of increased BTSs vs. additional spectrum allocation for Metro (Delhi as sample) & Category A Service area (Maharashtra as sample). The calculations below have been performed based on following assumptions:

1. We have considered the existing subscriber linked criteria of 17.01.2008 to determine traffic in erlangs.
2. This study is more in line with Subscriber Link Criteria (SLC), hence traffic in Erlangs is of importance and 900 MHz or 1800 MHz Band spectrum is not taken into account.
3. However for CAPEX considerations, it can be noted that based on theoretical calculations (path loss same), Radius of 900 MHz Cell is roughly 1.7 times the radius of 1800 MHz cell. These calculations take 3-sector antenna with 4-cell frequency reuse pattern cluster, a commonly used cluster pattern in GSM deployment.
4. To ensure Grade of Service (GoS), the much prevalent blocking probability of 2% has been considered using Erlang B table to derive traffic calculations for different spectrum blocks.
5. The calculation considers a standard GSM call assuming all channels are for TCH (for voice and data purposes). The actual configuration may vary depending upon the different RBS (Radio Base Station) configurations adopted by RF planners.
6. Any technology innovation in enhancing the capacity would hardly induce any significant change in percentage changes as it would equally impact all the spectrum blocks.

Metro Service Area (Sample - Delhi Circle)

Spectrum Bandwidth available (in MHz)	4.4		6.2		8.2		10.2		12.2
City Area (in Sq. Km)	1484	1484	1484	1484	1484	1484	1484	1484	1484
No. of Customers to be Accomodated as per SLC Criteria	500000	1500000	1500000	2100000	2100000	3200000	3200000	4800000	4800000
No. of BTS Required	740	2,220	1,425	1,994	1,453	2,214	1,671	2,507	2,005
Customers served per BTS (40 mE/customer)	676	676	1,053	1,053	1,445	1,445	1,915	1,915	2,394
% Increase in Customer servings (from 4.4 to 6.2 & 6.2 to 8 Mhz and beyond)	-	-	56%	-	37%	0	32%	-	25%

* All time slots available are assumed to be TCH i.e. carrying voice and data traffic

Particulars Column References	4.4		6.2		8.2		10.2		12.2
	I	II	III	IV	V	VI	VII	VIII	IX
No. of Subscribers	500,000	1,500,000	1,500,000	2,100,000	2,100,000	3,200,000	3,200,000	4,800,000	4,800,000
No of BTSs	740	2,220	1,425	1,994	1,453	2,214	1,671	2,507	2,005
Increase / (Decrease) in number of BTSs over previous base		200%	93%	40%	2%	52%	15%	13%	20%
Total CAPEX on BTSs	222	666	427	598	436	664	501	752	602
Incremental CAPEX within same spectrum allotment to serve increased subscribers (II-I, IV-III, VI-V)		444		171		228		251	
Incremental CAPEX still to be invested after getting additional spectrum to serve increased subscribers from previous threshold (III-I, V-III, VII-V)			205		9		65		100
Additional CAPEX as % of Total CAPEX			48%		2%		13%		17%
Capacity Increased by (Subscribers) (II-I, IV-III, VI-V)		1,000,000		600,000		1,100,000		1,600,000	
Additional CAPEX per 1 lac Incremental subscribers (Rs. Cr)		44.40	20.54	28.49	1.43	20.76	5.95	15.67	6.26
Traffic offered per MHz (in erlangs/mhz)	4545	13636	9677	13548	10244	15610	12549	23415	18824
% of traffic load decrement per MHz due to additional spectrum			113%		6%		23%		50%

Category A Service Area (Sample – Maharashtra):

Spectrum Bandwidth available (in MHz)	4.4		6.2		8.2		10.2		12.2
City Area (in Sq. Km)	307109.6	307109.6	307109.6	307109.6	307109.6	307109.6	307109.6	307109.6	307109.6
No. of Customers to be Accomodated as per SLC Criteria	800000	3000000	3000000	5300000	5300000	8200000	8200000	9800000	9800000
No. of BTS Required	1,184	4,440	2,849	5,033	3,667	5,674	4,283	5,118	4,094
Customers served per BTS (40 mE/customer)	676	676	1,053	1,053	1,445	1,445	1,915	1,915	2,394
% Increase in Customer servings (from 4.4 to 6.2 & 6.2 to 8 MHz)			56%		37%	0	32%		25%

* All time slots available are assumed to be TCH i.e. carrying voice and data traffic

Particulars Column References	4.4		6.2		8.2		10.2		12.2
	I	II	III	IV	V	VI	VII	VIII	IX
No. of Subscribers	800,000	3,000,000	3,000,000	5,300,000	5,300,000	8,200,000	8,200,000	9,800,000	9,800,000
Cost per BTS (Rs. Crores)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
No of BTSs	1,184	4,440	2,849	5,033	3,667	5,674	4,283	5,118	4,094
Increase / (Decrease) in number of BTSs over previous base		275%	141%	77%	29%	55%	17%	20%	-4%
Total CAPEX on BTSs	355	1,332	855	1,510	1,100	1,702	1,285	1,535	1,228
Incremental CAPEX within same spectrum allotment to serve increased subscribers (II-I, IV-III, VI-V)		977		655		602		251	
Incremental CAPEX still to be invested after getting additional spectrum to serve increased subscribers from previous threshold (III-I, V-III, VII-V)			500		245		185		-57
Additional CAPEX as % of Total CAPEX			58%		22%		14%		-5%
Capacity Increased by (Subscribers) (II-I, IV-III, VI-V)		2,200,000		2,300,000		2,900,000		1,600,000	
Additional CAPEX per 1 lac Incremental subscribers (Rs. Cr)		44.40	22.71	28.49	10.67	20.76	6.37	15.67	-3.54
Traffic offered per MHz (in erlangs/mhz)	7273	27273	19355	34194	25854	40000	32157	47805	38431
% of traffic load decrement per MHz due to additional spectrum			166%		34%				-20%

The above technical analysis reveals the following:

- (a) Allocation of additional 1.8MHz of spectrum to an operator that holds 4.4MHz of spectrum leads to greater trunking efficiency gains than allocation of an additional 2MHz of spectrum to an operator that already holds 6.2MHz.
- (b) Operators who are assigned additional spectrum beyond 8.2 MHz simply gain capacity in terms of subscriber serving from additional spectrum without investing anything in CAPEX (or marginal investing).
- (c) Allocation of additional spectrum beyond 6.2MHz to operators without charging anything for that additional spectrum allocation enables them to save CAPEX without any corresponding public gain and also these operators have not paid any upfront fee to the government for this spectrum.
- (d) Any additional spectrum allocation beyond 6.2 MHz leads to a constant CAPEX saving of Rs. 80 Cr per MHz in case of Delhi Metro and Rs. 200 Cr per MHz in case of Category A service area at each additional allocation of 1MHz.
- (e) The operator who moves from 4.4 MHz to 6.2 MHz also saves CAPEX when it gets this additional 1.8 MHz, but still incurs almost equivalent amount of CAPEX to sustain the larger subscriber base even after getting additional spectrum.

Hence we propose the following:

- (1) **The need for additional spectrum allocation is more pressing when an operator moves from 4.4 to 6.2 MHz in order to remain competitive, make services affordable and serve a larger subscriber base.**
- (2) **Hence, we propose that additional 1.8 MHz should be allocated immediately to those operators on priority (reserved/earmarked) who are having only 4.4 MHz of initial spectrum than any of other operators who already have spectrum beyond 6.2 MHz.**
- (3) **An operator who is getting additional allocation beyond 6.2 MHz and upto 8.2 MHz reaches efficiency in terms of CAPEX savings and can serve additional subscriber base by investing in further CAPEX even if he doesn't get any additional spectrum.**
- (4) **Hence in order to make sure that the operators holding spectrum beyond 6.2 MHz use techniques to enhance the spectral efficiency rather than simply obtaining additional spectrum, they should be incentivised to invest in CAPEX.**

Considering our analysis which is based on stated assumptions, we are sure that an operator can comfortably serve increasing subscriber base in the densest of areas within 8 MHz and must invest in further CAPEX to serve further increases in subscriber base.

Hence the maximum spectrum per entity in case of 2G GSM should be capped at 8 MHz. Also, operator holding 4.4 MHz should immediately be assigned additional 1.8 MHz on priority (reserved/earmarked) for level playing field before allocation to any other operator.

The above mentioned principles apart from other decided by the authority from time to time; should also guide the spectrum caps in other bands as well. However, a relaxation in this cap in case of M&A and consolidation in the industry should be given (dealt-with in response to M&A)

10. **Is there a need to put a limit on the maximum spectrum one licensee can hold? If yes, then what should be the limit? Should operators having more than the maximum limit, if determined, be assigned any more spectrum?**

Etisalat's Comments:

Yes, there should be a cap on the spectrum one licensee can hold. Spectrum is a finite resource and subject to competing claims. Placing a ceiling also serves another purpose i.e. if in future the Licensor/TRAI plans to bring in new competition; the spare spectrum can be allocated to new entity rather than allocating it amongst the existing players only. With newer technologies, almost all existing operators would have multiple spectrum holdings apart from 2G (i.e. 2.1 GHz/2.5GHz etc) and therefore a ceiling is justified.

The principle of spectrum capping is also essential to incentivize adoption of technologies that improve efficiency in spectrum utilization. Since spectrum is technology neutral, operators with spectrally efficient technologies but with small blocks will be at disadvantage than operators having big blocks but with less spectrally efficient technologies. ***Hence in order to ensure that every operator big or small uses spectrally efficient technologies and invests more in such developments than just demanding additional spectrum the concept of maximum spectrum holding is strongly supported.***

Also, to ensure that operators are under pressure to better their performance, **no operator should be assigned spectrum above 8 MHz by the DoT**; and, spectrum that can be acquired through spectrum sharing or consolidation.

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11. **If an existing licensee has more spectrum than the specified limit, then how should this spectrum be treated? Should such spectrum be taken back or should it be subjected to higher charging regime?**

Etisalat's Comments:

Yes, since we propose a spectrum limit per entity, then any entity holding spectrum in excess of that limit should return the excess spectrum within a stipulated time of such a "Spectrum Cap" being announced, subject to the following:

- TEC/TRAI/DoT should evaluate the technical advancements and innovations as best practices across the globe and periodically prescribe how many subscribers/traffic are adjustable per MHz in various category service areas/cities.
- If the entity holding excess spectrum has not yet reached the prescribed subscriber mark and there is excess demand of spectrum in the particular service area/city, then this excess spectrum should be taken back by the DoT and allocated to another operator based on its appropriate allocation criteria.
- The subscriber base of operators should be independently audited by TEC/DoT/TRAI on a periodic basis to preclude any over-statement by inflating the data.
- Since the usage of spectrum is not uniform throughout a service area i.e. spectrum concentration in densely populated areas / busy districts is higher than in areas with sparse habitation, it becomes all the more important to retrieve excess spectrum from an operator.

- In case there is no demand of excess spectrum in the service area/city and an operator wants to hold the excess spectrum, then it should be **allowed to keep the excess spectrum subject to much higher spectrum charges which are of a deterring nature so as to incentivize use of more equipment/towers/BTS to substitute the spectrum.**
- The subscriber linked criteria; traffic carrying capacity per BTS etc should be revised by DoT/TRAI periodically in accordance with international best practices so that operators focus on deploying efficient techniques and processes.

12 In the event fresh licences are to be granted, what should be the Entry fee for the license?

Etisalat's Comments:

Fresh UAS Licenses for 2G services should be granted at the same entry fee as paid by the 4th CMSP to maintain a level playing field provided DoT can allocate the contractual spectrum of 6.2 MHz in a defined timeframe.

All new technology spectrum i.e. in the spectrum bands of 2.1GHz/2.5GHz/2.3GHz/700 MHz or any new band identified later, should be auctioned as suggested by TRAI in its *"Recommendations on Review of license terms and conditions and capping of number of access providers"* dated 28th August 2007:

*"2.78 As far as a new entrant is concerned, the question arises whether there is any need for change in the pricing methodology for allocation of spectrum in the 800, 900 and 1800 MHz bands. Keeping in view the objective of growth, affordability, penetration of wireless services in semi- urban and rural areas, **the Authority is not in favour of changing the spectrum fee regime for a new entrant.** Opportunity for equal competition has always been one of the prime principles of the Authority in suggesting a regulatory framework in telecom services. **Any differential treatment to a new entrant vis-à-vis incumbents in the wireless sector will go against the principle of level playing field. This is specific and restricted to 2G bands only i.e. 800, 900 and 1800 MHz. This approach assumes more significance particularly in context where subscriber acquisition cost for a new entrant is likely to be much higher than for the incumbent wireless operators.**"*

Any spectrum beyond the contractual limit of 6.2 MHz must be allocated upon payment of a price which is benchmarked to any last spectrum auction or a specific index linked pricing and also keeping a premium on the 900 MHz band due to its substantial advantages over other bands.

13. In case it is decided that the spectrum is to be delinked from the license then what should be the entry fee for such a Licence and should there be any roll out condition?

Etisalat's Comments:

As stated earlier in response to questions 7 & 8 above, we reiterate that de-linking is not desirable as far as 2G mobile services are concerned and the contractual spectrum of upto 6.2 MHz for commercial mobile services should necessarily come bundled with the license.

As far as other wireless services are concerned (i.e. using spectrum in bands other than 800/900/1800MHz), it is already recommended by TRAI that spectrum would be auctioned and therefore the license necessarily follows the spectrum. In such cases where **spectrum is being auctioned**, the entry fee for the license would be nominal to

cover the administrative cost of the Licensor whereas spectrum is acquired through market mechanism. In its "Recommendations on Review of license terms and conditions and capping of number of access providers" dated 28th August 2007 TRAI observed that:

"2.73 ...It is in this background that the Authority is not recommending the standard options pricing of spectrum, however, it has elsewhere in the recommendation made a strong case for adopting auction procedure in the allocation of all other spectrum bands except 800, 900 and 1800 MHz."

In case of services that do not require spectrum e.g. plain vanilla land-line services, it is inequitable to levy an entry fee equivalent to the 4th CMSP since the entry fee includes a component of upfront fee for 6.2MHz of spectrum. This was also highlighted by the Authority in the Recommendations of 28 August 2007 as excerpted below:

"2.55 ... In case the applicant does not require this spectrum for providing the access service, he may want to use only wire-line or may want to provide services using some other spectrum, e.g. BWA, there is no clear cut path for him. He is required to pay the full license entry fee..."

For such licenses, DoT may design an all-India license with a reasonably lower entry fee.

14. Is there a need to do spectrum audit? If it is found in the audit that an operator is not using the spectrum efficiently what is the suggested course of action? Can penalties be imposed?

Etisalat's Comments:

Yes, there is a need for spectrum audit for operators holding spectrum beyond 6.2 MHz to ensure that the operators utilize spectrum efficiently and to curtail any kind of manipulation in reporting of subscriber numbers. It is desirable that TRAI defines the criterion/parameters to judge if operators are utilizing spectrum efficiently. This will also result in improved QoS on the whole and effective competition.

An independent audit of spectrum holdings would also help in identifying bands and places where immediate changes can take place.

As added safeguards, it is suggested that if during two continuous audits by DoT/TRAI within a span of 6 months it is learnt that spectrum is not properly utilized or subscriber base is inflated, then the excess spectrum in tranches of 1 MHz, or in excess of contractual limits should be taken back from the defaulting operator. The same can be returned to the spectrum holder if say within the next 3 months, the operator is able to demonstrate a more efficient / better utilization. Such a defaulting operator should also not be permitted to seek any additional spectrum beyond 6.2 MHz. Any 2G operator holding spectrum beyond 6.2 MHz but utilizing it inefficiently must necessarily return the spectrum to DoT otherwise the **whole efficiency principle would be compromised.**

Penalties should be imposed after giving a reasonable grace period (of about 6 months) post the "notice" for surrender of spectrum; the penalties should NOT be linear, & should exponentially increase with passage of defaulting time (perhaps, in steps of every three months), & at a certain stage of default (perhaps, after 3 steps of 3 months each are over), the license should itself be revoked.

15. Can spectrum be assigned based on metro, urban and rural areas separately? If yes, what issues do you foresee in this method?

Etisalat's Comments:

Yes, DoT should consider allocation of spectrum District / Cluster wise to enable **effective and efficient** roll-out of services as there are a few operators awaiting allocation of even the initial spectrum. It is also well known that spectrum usage, traffic, subscriber base etc are also not uniform throughout a service area and some locations warrant/demand greater spectrum than others. Therefore, even if a single operator holds additional unused or inefficiently used spectrum in some pockets (town/cities) and at the same time there are some other operators that need spectrum for initial startup/rollout purposes, there is a net loss to the society.

TRAI/DoT must plan a national grid of spectrum in various districts/towns/villages on the lines of international best practices as already done in Australia, US etc. This will make sure that the densities, spectrum availability and allocations are handled smoothly. There are various expert agencies that handle such kind of process e.g. Canton in US.

Also, the allocation of additional spectrum should be based on stricter parameters than prescribed today i.e. sustained BTS overloading over a period of time. E.g. the subscriber base is achieved across the circle whereas there are only a few locations/BTSs that are overloaded that too for a short time (this can be due to any sporadic incidence e.g. fairs, natural calamities etc). In such cases giving additional spectrum is not a prudent decision rather a relaxation in QoS should be given as this is a sporadic occurrence that does not warrant additional spectrum. If at all in a district where this sporadic demand has happened requires spectrum it should be given for a short period of time as stop-gap arrangement, and must be withdrawn within a period without (this period should not be more than 15 days to 30 days).

It is desirable that DoT adopts the Subscriber Link Criterion as a qualifying criterion for additional assignment whereas the actual assignment is done district/cluster-wise on the basis of **sustained BTS overload**. Further, for allocation beyond 6.2MHz, the upfront fee should be at auction rate for the congested districts/clusters whereas at discounted rates in under-congested districts/clusters with lesser demand even within a service area. For example, in UP(East) circle, the demand for spectrum is higher in Kanpur and Lucknow districts whereas marginal in other districts such as Azamgarh/Mirzapur.

In addition, the operators with spectrum holding above 6.2MHz should be liable to pay a higher rate of annual spectrum usage charges commensurate to the higher holding of spectrum to manifest the significant economic & efficiency advantages over operators with lower holdings.

This assumes all the more significance today, at a time when ARPU's are coming down drastically for the whole industry and there are operators who would be happy to start their services even from rural/semi-urban/low revenue yielding pockets, if they are granted spectrum. The concept of spectrum allocation based on metro/urban/rural basis also ensures that one operator or another is present in at-least one area, which another operator might be neglecting due to its business priorities or simply taking the allocated spectrum for granted.

16. **Since the amount of spectrum and the investment required for its utilisation in metro and large cities is higher than in rural areas, can asymmetric pricing of telecom services be a feasible proposition?**

Etisalat's Comments:

We have earlier proposed that any spectrum allocation beyond 6.2 MHz should entail payment of an upfront fee determined through/indexed to an auction and a higher rate of annual spectrum usage charges commensurate to the higher holding of spectrum to manifest the significant economic & efficiency advantages over operators with lower holdings. An inherent upshot of this is that all pricing will be market determined i.e. based on demand and supply. Even today, subscriber tariffs for all services barring airtime for domestic roaming and rural wire-line are market determined.

17. **Whether the existing licence conditions and guidelines related to M&A restrict consolidation in the telecom sector? If yes, what should be the alternative framework for M&A in the telecom sector?**

Etisalat's Comments:

In order to keep pace with technological advancements, changing subscriber preferences, new ways and means adopted by operators to sustain in the market etc, the authority needs to ensure that M&A guidelines play a pivotal role in strengthening the telecom industry per se and not the individual operators. Hence the following should be looked into individually and in totality to address the genuine policy concerns:

- **Re-look at Lock-In Period:** The lock-in period should be done away with for merger of two licensed operators in a service area in order to enhance consolidation in the industry.
 - **SMP criteria should be revised downwards** from 40% to 25% with the increase in number of players. In the event of organic growth the 30% subscriber share should be considered a SMP, and in the event of inorganic growth 25%.
 - **The criteria of minimum 4 operators post M&A to be revised** to minimum of 6 operators to preclude possibility of cartelization since the market base itself has grown manifold.
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18. **Whether lock-in clause in UASL agreement is a barrier to consolidation in telecom sector? If yes, what modifications may be considered in the clause to facilitate consolidation?**

Etisalat's Comments:

The growth of Indian telecom market and Indian operators is a world class case study, and this has been achieved through continuous innovations, improvements and policies in line with time and liberalization. To facilitate consolidation in the interest of growth, efficiency and overall development of the telecom infrastructure and not to fill private pockets, lock-in clause may be removed as far as merger of two licensed service providers as far as M&A are concerned.

19. Whether market share in terms of subscriber base/AGR should continue to regulate M&A activity in addition to the restriction on spectrum holding?

Etisalat's Comments:

It is important to continue to regulate M&A activity in terms of subscriber & revenue market share especially when the 2-3 incumbent pan-India operators control more than 50% subscriber / revenue market share.

It is also necessary to revisit the SMP criteria as it was prescribed at a time when there were 3-4 large operators and the situation today is quite different. In our opinion, the SMP criteria should be revised downwards from 40% market share as this is no longer relevant today with around 12 operators licensed to provide Unified Access Services. Further, any consolidation activity may be permitted inter alia subject to at least 6 operators remaining in a service area.

A 40% market share in a small market (when subscriber base was 1/50th of today's subscriber base) was fair, however the changing market dynamics with more competition requires that these figures are revised.

At 500mn + wireless base coupled with a minimum of 6 operators there is every possibility that top 2-3 operators would retain their market share in the range of 20% to 30% each. This will severely test the effectiveness of free and fair competition. Hence a fair share of 25% post M&A in a circle in respect of subscriber market can be applied.

As far as revenue market share is concerned it also needs to be brought down from 40% to around 30% but remain a tad higher than subscriber market share % since the revenue is a function of perceived value of products and services and effective marketing by the operator.

Hence, a post M&A share of 25% in terms of subscriber base or 30% in terms of revenue market share should be applied with 6 operators remaining.

20. Whether there should be a transfer charge on spectrum upon merger and acquisition? If yes, whether such charges should be same in case of M&A/transfer/sharing of spectrum?

21. Whether the transfer charges should be one-time only for first such M&A or should they be levied each time an M&A takes place?

22. Whether transfer charges should be levied on the lesser or higher of the 2G spectrum holdings of the merging entities?

Etisalat's Comments:

The DoT may prescribe a transfer charge, which should apply on the spectrum transfer / acquisition in the case of M&A of two licensees. This Transfer Charge should apply on each incident of M&A (i.e. transfer of spectrum). No distinction should be made in treatment of application of transfer charge whether the spectrum is acquired through auction or through government assignment, and all the cases of spectrum transfer should attract Transfer Charges. This will ensure that spectrum is not misused and all operators have incentive to deploy most efficient techniques for spectrum utilization.

The transfer charges on M&A should be such that they do not act as detrimental to consolidation however should not lead to SMP behavior. The transfer charges should be applied on each successful M&A happening in a service

area. However the distinction should be made in case of a pan-India M&A and regional or circle specific M&As. The transfer charges in case of pan-India or at a large scale (e.g. more than 50% of circles) should have some leniency or lesser rates/quantum than on individual or circle based charges.

It should be applied to the higher of the 2G spectrum holdings of the merging entities.

23. Whether the spectrum held consequent upon M&A be subjected to a maximum limit?

Etisalat's Comments:

Yes, there should a cap on the combined spectrum holding consequent upon Merger or Acquisition of two licensed service providers to accommodate the combined subscriber base. While it makes sense that spectrum travels with the deal, a cap of 12.4MHz in case of GSM may be imposed. This is also supported by the fact that the initial spectrum bundled in a UASL is 6.2MHz for GSM and the 2 merging entities should be permitted to retain their assigned spectrum of 6.2MHz each that comes coupled with the UASL. In the event that an M&A is likely to breach this ceiling of 12.4MHz, the additional spectrum above this limit should be returned to DoT.

24. Is spectrum trading required to encourage spectrum consolidation and improve spectrum utilization efficiency?

Etisalat's Comments:

An important aspect of a good spectrum policy is its ability to create an environment that encourages and nurtures new technologies and efficient spectrum use while at the same time maintaining the Regulator's ultimate control over the scarce public resource. Allowing spectrum trading will not only diminish the government's control over this scarce and valuable **public good**, it will also open up avenues for speculative profiteering and hoarding much to the detriment of the society. Trading also increases the risk of concentration of spectrum and market power resulting in anti-competitive and sub-optimal outcomes. Trading will invite non-licensed entities to invest in spectrum artificially inflating the price and depriving operators with genuine needs of the much valued and scarce resource. In addition, trading poses serious concerns related to interference and co-ordination issues. It is also well known that implementation of a successful trading platform in the form of a secondary market requires creation of an extensive automated infrastructure in the form of an exchange/on-line registry which entails considerable regulatory costs that are not warranted at this stage.

Further, due to heavy demand and supply mismatch in the 2G spectrum, any such move to introduce trading would severely undermine the affordability and reasonable cost principles due to artificial cost inflation which is not warranted at all.

Currently, any transfer or assignment of licence requires prior written approval from the DoT. Trading would entail transfer of spectrum in a secondary market, without prior consent of the DoT. This naturally will increase the need for monitoring of spectrum by the DoT with respect to the technology deployed, unexpected interference etc.

Also trading internationally has been brought in phases where the regulator and licensor act as one entity and that gives them leverage to monitor spectrum and its usage.

Mindful of these deleterious consequences, most National Regulatory Authorities (NRAs) have so far not permitted spectrum trading. A handful of countries where spectrum trading has infact been allowed such as Australia, New Zealand and United States, have not witnessed any significant efficiency gains either. It is also pertinent to note that in the United Kingdom, where OFCOM introduced spectrum trading at the end of 2004 as a key element in its market-based reform initiative, spectrum trading does not cover 2G and 3G bands.

The TRAI has rightly observed in para 2.38 of the consultation paper that, “.....*One can argue that in view of the fact that presently all the spectrum available with the service providers has been allocated for the one time Entry fee, it is akin to lease of land. The ownership of the spectrum continues to rest with the Government. Permitting trading for such spectrum may not be legally tenable.....*” In India, the allocation of 2G spectrum comes bundled with the CMTS/UAS License and the licensee is given a right to use the spectrum during the currency of the license. Therefore in India, spectrum trading per se in not justifiable under the existing license terms.

A more plausible option for India is “spectrum sharing” which is elaborated in subsequent pages. Allowing Spectrum Sharing is also in consonance with TRAI’s responsibility to ensure efficient spectrum management and is a win-win situation for all – unused/under-utilized portions of spectrum will get productively utilized, operators will gain entry to previously unavailable markets and consumers will gain access to a greater range of wireless services and the government will fulfill its objective to promote coverage of rural & remote areas.

In our opinion, the objectives of spectrum consolidation can be effectively achieved through M&As and concerns regarding improvements in spectrum utilization efficiency will be better addressed through spectrum sharing.

25. Who all should be permitted to trade the spectrum ?

Etisalat’s Comments:

As explained in response to question 24 above **we are not in favour of spectrum trading** at this point of time, rather the focus should be on spectrum sharing only.

26. Should the original allottee who has failed to fulfill “Roll out obligations” be allowed to do spectrum trading?

Etisalat’s Comments:

We are not in favour of spectrum trading at this stage due to obvious reasons stated in response to question 24 above hence this question does not arise.

27. Should transfer charges be levied in case of spectrum trading?

Etisalat’s Comments:

We are not in favour of spectrum trading at this stage due to obvious reasons stated in response to question 24 above hence this question does not arise.

28. What should be the parameters and methodology to determine first time spectrum transfer charges payable to Government for trading of the spectrum? How should these charges be determined year after year?

Etisalat's Comments:

We are not in favour of spectrum trading at this stage due to obvious reasons stated in response to question 24 above hence this question does not arise.

29. Should such capping be limited to 2G spectrum only or consider other bands of spectrum also? Give your suggestions with justification.

Etisalat's Comments:

Since spectrum is a scarce resource, **capping on all bands is a must.**

To obviate any emergency in future, as has been experienced by the industry for co-ordination in respect of unused bands like 700 MHz or generously allocated spectrum to Defense/Broadcasting, it is imperative that a cap is placed on the quantum of spectrum that an entity can hold and in all bands. Further, the spectrum allocation and capping depending upon the needs of the relevant industry should be considered e.g. content hungry broadcasting industry would require larger chunks than pure voice/data/wireless communication.

However a relaxation in case of consolidation / M&As should be provided separately.

30. Should size of minimum tradable block of spectrum be defined or left to the market forces?

Etisalat's Comments:

We are not in favour of spectrum trading at this stage due to obvious reasons stated in response to question 24 above hence this question does not arise.

31. Should the cost of spectrum trading be more than the spectrum assignment cost?

Etisalat's Comments:

We are not in favour of spectrum trading at this stage due to obvious reasons stated in response to question 24 above hence this question does not arise.

32. Should Spectrum sharing be allowed? If yes, what should be the regulatory framework for allowing spectrum sharing among the service providers?

Etisalat's Comments:

Yes, spectrum sharing should be allowed. As spectrum is a scarce resource thereby limiting our ability to make cellular telephony more common and less expensive. If one measures spectrum utilization, it is clear that much of

the spectrum remains idle at any given time. One reason is that we often prevent interference between systems by giving each system exclusive access to a block of spectrum. Thus, whenever such a system is not transmitting, spectrum sits idle. **Our goal is to increase the amount of communications that can take place in a given amount of spectrum.** And Spectrum sharing is an answer to this problem. Spectrum can be shared in multiple dimensions e.g. time, space and geography. Another argument that strongly favors spectrum sharing is the non-linear (more than linear proportion) nature of the capacity that a bigger spectrum chunk provides, versus a smaller chunk; this could be more relevant for rural areas, & other low-traffic areas.

Further, spectrum with govt. bodies (MoD, Indian railways etc.) should be allowed to use for Commercial purposes through sharing on non-interference (i.e. the secondary user will not interfere the operations of primary holders) and non-protection (i.e. the secondary users cannot claim for any interference to them by the existing operations of the primary holders of that spectrum) basis. Most of the spectrum assigned to govt. bodies is not being utilized by them so it can be allowed to be shared by mobile operators facing spectrum shortage. However the exclusive right of the spectrum will remain with primary holders.

Even sharing of such bands that do-not raise potential public concerns should be put to sharing mechanism. Such a sharing market would also enhance efficient utilization and innovations. Sharing is required for more market based approach, effective competition and efficient utilization of spectrum. Sharing through pooling is a concept in which operators pool their respective spectrums for usage in one or more areas. However the exclusive rights of usage will remain with the primary holder(s) who have been allocated spectrum by Govt. There can be various ways of sharing e.g:

1. In a circle 2 (or more) operators share their respective spectrum by where one operator holds spectrum in 'X' districts out of total 'Y' districts and other operator in 'Z' districts. Both the operators pool their spectrums thereby making total spectrum available to both operators as 'Y' = 'X'+ 'Z' coverage.
2. In a circle 2 operators can swap their spectrum in some districts/areas where both need it more than the other

Example If there are 5 districts in a service area and a frequency block **F** is given to operator **A** for these 5 districts, then Operator **A** can share the spectrum with Operator **B** with the condition that **A** will use the spectrum in some of the 5 districts and remaining districts will be served by **B** with the same block of spectrum. *It will allow the operators to provide the services in the districts where it has not been allotted spectrum.*

There are various software and methods through which sharing can be effectively leveraged. E.g. Cognitive Radio or CR in which either a network or a wireless node changes its transmission or reception parameters (frequency carrier etc.) to communicate efficiently avoiding interference with licensed or unlicensed users. This alteration of parameters is based on the active monitoring of several factors in the external and internal radio environment, such as radio frequency spectrum, user behaviour and network state.

Regulatory Framework overseeing Sharing - Any sharing should necessarily be through TRAI/DoT i.e. the Regulator/DoT must be intimated about the proposed sharing deal. No deal wrt spectrum sharing should be done without knowledge of TRAI/DoT.

The agreements should have standard fields such as frequency planned for sharing, period for sharing, charges for sharing, and subscriber base at the date of agreement and other relevant technical parameters etc.

Spectrum Usage Charges – the issue that needs careful consideration in spectrum sharing is applicability of spectrum usage charges since the shared spectrum gets added to either or both of the operators' kitty. However it is pertinent to note that spectrum sharing is tool to enhance effective and efficient utilization, hence rather than

increasing the spectrum charge based on consolidated holding of an operator through sharing, they should be incentivized.

Also, the DoT/TRAI cannot charge for the same block of allocated spectrum (from multiple operators) twice since any such move would tantamount to double taxation.

Hence we propose that spectrum sharing should be allowed and there should be no increase in spectrum usage charges due to spectrum sharing.

33. What should be criteria to permit spectrum sharing?

Etisalat's Comments:

Sharing should be allowed on the following basis:

- a. In case an operator has not been assigned initial start-up spectrum in any district/cluster.
- b. An operator holding spectrum above 4.4 MHz alone should be allowed to share since sharing by an operator which has only received the start-up spectrum would encourage profiteering by operators who fail to roll-out.
- c. The operator sharing his spectrum must have fulfilled the 1st year roll-out obligations.
- d. There should be no increase in spectrum usage charges due to sharing for any operator.

34. Should spectrum sharing charges be regulated? If yes then what parameters should be considered to derive spectrum sharing charges? Should such charges be prescribed per MHz or for total allocated spectrum to the entity in LSA?

Etisalat's Comments:

Yes, charges for spectrum sharing should be regulated. However it is pertinent to mention here that since spectrum sharing is meant to increase efficient utilization of spectrum, and quicker roll-out of services, the charges should be prescribed to recover administrative cost only and should not burden the operators who are already paying LF, Spectrum charges, M&A transfer charges etc. Further, the sharing charges should not be based on per MHz basis since:

- (a) The spectrum exclusivity is not transferred to other operators,
- (b) Spectrum is being shared for a defined time period
- (c) The per MHz price would always warrant a revision after some time thereby increasing the complexity

Hence we propose that spectrum sharing charges should be prescribed as a % of AGR and should not be linked with the quantum of spectrum being shared in order to (a) facilitate sharing and (b) charge for spectrum usage only. The sharing operators should pay this % independently on their respective AGRs at the time of sharing.

The Sharing Charge %:

This sharing charge % should be $1/X$ of the respective spectrum usage charges % payable by the individual operators where the value of 'X' should be the number arrived at by way of sum of the % of respective usage charges of operators multiplied by the **number of operators involved per sharing**. This is explained below:

1. 2 operators namely A and B are sharing spectrum (A with 6.2 MHz holding and B with 8 MHz)
 2. Applicable spectrum charges % will be 3% and 4% respectively making it total 7%
 3. We take '7' as a value from 7% above
 4. Multiply this value 7 with 2 since 2 operators are sharing the spectrum
 5. This gives us value of 'X' as 14 ($7*2$)
 6. Hence the spectrum sharing charge would be $1/14^{\text{th}}$ of respective spectrum usage charges payable by operators A and B i.e. $1/14^{\text{th}}$ of 3% and $1/14^{\text{th}}$ of 4%.
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- 35. Should there be any preconditions that rollout obligation be fulfilled by one or both service provider before allowing the sharing of spectrum?**

Etisalat's Comments:

Yes, 1st year obligations of 10% roll-out should be successfully fulfilled by any operator who wants to share the spectrum. Both the service providers should not be taken into account for roll-out obligations before allowing them to share.

- 36. In case of spectrum sharing, who will have the rollout obligations? Giver or receiver?**

Etisalat's Comments:

Both the operators should have their roll-out obligations independently. Linking of rollout obligations can lead to various complexities (e.g. in the event of termination of agreement who gets the ultimate benefit of roll-out etc.) and also lead to collusive behaviors by operators trying to take roll-out benefit by entering into unnecessarily longer period of sharing.

- 37. Should there be a time limit on licence or should it be perpetual?**

Etisalat's Comments:

The License term should be finite say 20 years and extensible by a term of 10 years.

- 38. What should be the validity period of assigned spectrum in case it is delinked from the licence? 20 years, as it exists, or any other period**

Etisalat's Comments:

Since we have not suggested delinking of spectrum from license this question does not arise. Further, without license no entity can hold spectrum hence spectrum should always be co terminus with license period.

- 39. What should be the validity period of spectrum if spectrum is allocated for a different technology under the same license midway during the life of the license?**

Etisalat's Comments:

The spectrum allocation should be co terminus with the license period and not the opposite. Hence the validity period of spectrum whether initial or additional should automatically expire when the license term expires.

- 40. If the spectrum assignment is for a defined period, then for what period and at what price should the extension of assigned spectrum be done?**

Etisalat's Comments:

The license should be renewed for a finite term say 10 years after the initial term of 20 years expires but the spectrum should not get automatically renewed. Rather spectrum allocation should be renewed only against payment of an upfront fee estimated from recent auction of comparable frequency/ adjusted for index. **It is also emphasized that 900MHz should not be automatically re-allocated to those who possess this at present.**

- 41. If the spectrum assignment is for a defined period, then after the expiry of the period should the same holder/licensee be given the first priority?**

Etisalat's Comments:

It is well known that spectrum in 900MHz band is dearer than the other bands due to its special characteristics and suitability for 3G/UMTS services. Therefore it is strongly recommended that spectrum in 900MHz should not be automatically re-allocated to the initial holders. Allocation to the same holder might however be subject to a right of first refusal but at the higher price defined for 900MHz. In case the license holder refuses to pay the premium price for this band, it may be granted equivalent spectrum in 1800 MHz band.

This will ensure that the higher capability spectrum are not simply renewed or taken just like that and also serves the purpose of long-term investment commitments by the operators by reducing any investment risks for them.

- 42. What are the advantages and disadvantages of a uniform license fee?**

Etisalat's Comments:

The Indian telecom industry is one of the most significant growth stories in recent times despite being one of the most taxed (regulatory levies) telecom industries globally. A uniform license fee has been recommended by the Authority in its recommendations on Unified Licensing dated January 13, 2005. Excerpts:

".....Since for the services being offered, the service providers are charged service taxes of 10%, we are of the view that the maximum level of license fee should not exceed the contribution towards USF and Administrative fee. The present level of USO contribution is 5% and the level of Administrative fee shall be 1% of AGR presently. Therefore it is recommended that for Unified License, Class License and Niche operators the License fee shall be (contribution to USF (5%) + Administrative cost (1%)) i.e. 6% of Adjusted Gross revenue (AGR). The administrative cost is required for managing, licensing and regulating the sector....."

A uniform license fee was again recommended by the Authority in its Recommendations on components of Adjusted Gross Revenue (AGR) dated September 13, 2006. Excerpts:

“.....The Authority observed that many service providers are now integrated operators and provide all telecom services. Since licence fee on number of services is charged at different rates, it is possible for the service providers to book revenues in such a manner that licence fee liabilities are minimized. The Authority noted that recently DoT has brought a few services at par for payment of licence fee. The Authority therefore observed perhaps a uniform rate licence fee regime could obviate the recourse of diverting revenue from one service and booking it to another where incidence of licence fee is lower.....”

The reduction in License fee would add to the investible capital of operators to further plan and invest in rural and under developed areas from perspective of not only the rollout but also for providing affordable and good quality services. Hence, in order to meet the vision of affordable communications and broadband for all there is an urgent need to end the differential license fee that will only benefit the economy as a whole. **We therefore support adoption of a uniform license fee.**

43. Whether there should be a uniform License Fee across all telecom licenses and service areas including services covered under registrations?

Etisalat's Comments:

We support migration to a uniform License Fee (LF) as it will reduce administrative/logistical costs for the DoT to administer and police a differential LF regime. It will also remove arbitrage opportunities sustained through creative accounting. It is understood that the DoT was proposing a uniform LF rate of 8.5%. However, this will clearly disadvantage the standalone licensees for services which have a license fee that is lower than the flat rate defined by the DoT/TRAI and also not make any substantial benefit to the consumer in the form of lower tariffs and affordable services. It is therefore necessary to preserve the conflicting interests of various licensees in defining the uniform flat rate.

We therefore propose that Uniform License Fee @ 6% p.a. should initially be applied on an asymmetric basis only to the new entrants to compensate them for the uneven playing field which is serrated by unequal spectrum holding, disparity in spectrum bands and other externalities. The benefit of the uniform license fee rate of 6% p.a. should be extended to all incumbent players on a gradual basis to reach 6% over the next 4 years. This is necessary to avoid a sudden decline in the LF revenues of the government since the impact of reduction in LF would be more pronounced on the incumbent operators rather than on the new entrants. By staggering the reduction in LF on incumbent operators, the DoT would be able to moderate the reduction in its revenues. The DoT had earlier extended such an asymmetric treatment of 2% lower License Fee to the 1st & 2nd cellular Licensees in circle service areas vide circular dated 28th January 2004. This benefit of lower LF was extended for a period of 4 years.

The integrated operators holding multiple licenses under one company / affiliates should be subject to the uniform license fee of 6%. Small or standalone operators (e.g. standalone in NLD/ILD/ISP/VSAT etc. except Access Services) should continue to enjoy existing LF rates so that their business viability is not impacted adversely.

No Access Services Licensee should have any equity stake in any standalone non-access services companies (i.e. NLD/ILD/ISP/VSAT etc). This is to ensure that arbitrage opportunity is not exploited in other ways (in case the LF rate of standalone operators also is reduced further). This would also lead to situation where access providers

(standalone or integrated) will be better focused on negotiating rates than arbitrage only. Even if a case of a stake in a non-Access Licensee is decided, the stake should not be substantial (i.e. less than 10%)

As far as the services under registration *which are only ancillary to telecom* are concerned we strongly disagree on any such move by the Authority as this will become a big hindrance in the way of successful rollout of any telecom service (i.e. 3G, 2G, 4G or WIMAX etc) or national growth as it **would only add to the increased costs for all i.e. the tenant in form of rentals and for infrastructure owners/service providers in form of an additional tax and ultimately the end user or consumer of that services**. Hence, when we want to take the telecom growth to next trajectory, any move to apply any charge on infrastructure services would only create roadblocks to growth.

The Authority would appreciate the important role played by telecommunications and services under registrations in the nation-building and increasing its economic benefits. The kind of employment generated by these services for skilled manpower (BPO, KPO etc) and unskilled or semi-skilled manpower (IP-1 etc) is unmatched and in fact these services have created so many small and allied industries (educational and vocational institutions, trainers, small entrepreneurs, contract workers, labors in villages and small towns etc) that any charge to these services would be akin to strangulating their livelihood. Hence in order to ensure inclusive growth, it is required that no levy is applied on services under registration.

44. If introduced, what should be the rate of uniform License Fee?

Etisalat's Comments:

In order to ensure optimum benefit to the economy and industry, it is proposed that the rate of uniform license fee should be fixed at 6% for the new entrants initially and may be applied to incumbents on a staggered basis over a 4 year period. A uniform LF will end any arbitrage opportunity for any operator and also would not burden the small standalone operators unnecessarily.

45. If the initial spectrum is de-linked from the licence, then what should be the method for subsequent assignment?

Etisalat's Comments:

In our opinion, elaborated hereinabove, there is no need to de-link spectrum from the license.

46. If the initial spectrum continues to be linked with licence then is there any need to change from SLC based assignment?

Etisalat's Comments:

The Subscriber Linked Criteria needs to be strengthened and made more congenial for deploying innovative techniques for efficient utilization of spectrum so that all operators find incentive in deploying more CAPEX in physical infrastructure than hog spectrum using sub-optimal techniques. We have tried to work out an example where it can be seen that the maximum gain that an operator makes in terms of either increased customer serving per BTS (i.e. capacity) when it moves from 4.4 to 6.2 MHz. Beyond 6.2 MHz level the gain is incremental for an operator and not substantial and any subsequent gain remains at a decreasing range. This brings to the fore that

beyond the cap of 8 MHz the operators should invest more in CAPEX, BTSs and other innovative technologies and methods.

Indian telecom market is such that it has now been looked upon by the world as innovative and whose practices can be replicated globally hence the spectrum linked criteria should be transformed wherein it serves as a tool to gauge spectrum efficiency of operators beyond 6.2 MHz.

Clearly at present the Indian telecom industry can be categorized into *incumbents* and *new entrants*. It is anyone's guess that the established players will have a higher probability in meeting SLC criteria compared to new entrants. It is pertinent to note that the existing large players who command dominant subscriber share will be able to reach a subscriber linked threshold much sooner than a new entrant. Hence in order to ensure effective competition and fair distribution of resources, it is desired that SLC be made more robust beyond 6.2 MHz and should be used as a parameter to judge spectral efficiency.

47. In case a two-tier mechanism is adopted, then what should be the alternate method and the threshold beyond which it will be implemented?

Etisalat's Comments:

The UAS License carries an inherent contractual right for spectrum upto 6.2 MHz of which 4.4MHz is the initial start-up allocation and another 1.8MHz is allocated based on a Subscriber Linked Criteria. To acquire spectrum beyond 6.2MHz and upto 8MHz, an operator should be required to fulfill the Subscriber Linked Criteria AND pay an upfront fee based on auction determined / indexed price for the appropriate spectrum band AND pay a higher rate of annual spectrum usage charges commensurate to the higher holding of spectrum to manifest the significant economic & efficiency advantages over operators with lower holdings.

Hence in order to maintain level playing field in the industry, the additional spectrum should be immediately allocated or reserved till it is vacated from government agencies on priority for operators currently holding 4.4 MHz only, as we have shown above that an operator gains maximum in terms of efficiency when it moves from 4.4 MHz to 6.2 MHz.

Any allocation beyond 6.2 MHz should be allocated not only on the basis of SLC but also on the basis of growth rate, efficient use of spectrum and the trade-off analysis between opportunity costs of CAPEX deployment vs. spectrum acquisition. To acquire spectrum beyond cap of 8MHz the policy guidelines should permit sharing/ market consolidation through M&A.

48. Should the spectrum be assigned in tranches of 1 MHz for GSM technology? What is the optimum tranche for assignment?

Etisalat's Comments:

In our opinion, the tranches in which spectrum is currently assigned upto 8MHz should be continued. All existing operators have earlier acquired additional spectrum based on SLC in tranches of 1.8MHz or more. If the new operators are allocated in smaller tranches, they would be seriously disadvantaged resulting in discrimination and imperfect competition.

As suggested hereinbefore, DoT should not allocate spectrum above the 8MHz. Any spectrum beyond 8MHz and should be acquired through sharing or M&A.

49. In case a market based mechanism (i.e. auction) is decided to be adopted, would there be the issue of level playing field amongst licensees who have different amount of spectrum holding? How should this be addressed?
50. In case continuation of SLC criteria is considered appropriate then, what should be the subscriber numbers for assignment of additional spectrum?
51. In your opinion, what should be the method of assigning spectrum in bands other than 800, 900 and 1800 MHz for use other than commercial?

Etisalat's Comments:

- (i) As mentioned before, the spectrum in 800MHz/900MHz/1800MHz which is a contractual right of a UAS Licensee should continue to be assigned as per current practice to all the licensees. Also the auction mechanism was advocated by TRAI for spectrum in bands other than 800, 900 and 1800 MHz bands in the *"Consultation Paper on Review of license terms and conditions and capping of number of access providers"*. However to address the anomalies and issues of non-level playing field for spectrum allocation beyond 6.2MHz; any additional spectrum above this contractual limit should be assigned based on Subscriber Linked Criterion and subject to payment of an auction determined/ benchmarked upfront price. All operators who have already been assigned spectrum beyond 6.2MHz should be mandated to pay the equivalent auction price without discrimination. Unless this principle is followed, there will be grave injustice to new licensees who are not only being granted spectrum in the less-dear 1800MHz band but also face a substantially higher subscriber acquisition cost and the issue of non-level playing field would continue to haunt the industry
- (ii) As far as spectrum assignment in bands other than 800,900 and 1800 MHz to non-commercial users is concerned, we would like to submit that as far as Defence requirement is concerned, there should be a dedicated Defence band for them as already done in many countries (e.g. USA, UK, Germany etc).

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52. Should the service providers having spectrum above the committed threshold be charged a one-time charge for the additional spectrum?

Etisalat's Comments:

Yes, service providers holding spectrum beyond 6.2MHz should pay a one-time upfront fee for the additional spectrum beyond 6.2MHz. This one-time upfront fee may be based on a recent auction price indexed for type of spectrum (e.g. 900/1800 etc.). It is reiterated that the price of spectrum upto 4.4 MHz and a further allocation of 1.8 MHz totaling upto 6.2 MHz comes bundled with the license and its cost is covered in the entry fee paid at the time of acquisition of license. However the spectrum that is allocated beyond this 6.2 MHz threshold is neither committed in the license nor its cost is built-up in the license acquisition cost, hence a one-time spectrum acquisition charge should be applied. *This will also set a base for any future allocations of spectrum beyond 6.2*

MHz for new entrants also. Another reason for the upfront fee is to discourage operators from substituting spectrum for equipment to minimize their CAPEX.

53. In case it is decided to levy one time charge beyond a certain amount then what in your opinion should be the date from which the charge should be calculated and why?

Etisalat's Comments:

The one-time charge for holding additional **spectrum beyond** the threshold of **6.2MHz** should apply retrospectively from the date of allocation of that spectrum. Every operator holding spectrum above 6.2MHz should mandatorily pay this upfront charge in order to continue to enjoy the benefits of using the additional spectrum.

This will also act as an example for the new operators that before taking any additional spectrum beyond 6.2 MHz would cost them higher so they make use of all available technological advancements.

54. On what basis, this upfront charge be decided? Should it be benchmarked to the auction price of 3G spectrum or some other benchmark?

Etisalat's Comments:

The one-time price should be benchmarked to the auction price of 3G but adjusted for the band and its relevance for use as 3G and 4G spectrum. Accordingly, 900MHz spectrum should be charged at a premium to indicate its propensity to serve as a 3G band.

55. Should the annual spectrum charges be uniform irrespective of quantum of spectrum and technology?

Etisalat's Comments:

To compensate the new entrants for the uneven playing field, it is suggested that the annual spectrum charges for holding upto 6.2MHz should be fixed at 2% of AGR. This is also in consonance with the fact that the UAS license comes bundled with a contractual spectrum of 6.2MHz (4.4MHz + 1.8MHz).

However for the operators holding spectrum in excess of 6.2MHz, the annual spectrum usage charges should continue to be on the currently applicable graded basis since higher holdings should attract higher rate of spectrum usage charges. As allocation beyond 6.2MHz is outside the contractual limit, it should attract a higher charge. The graded charging also ensures that operators possessing the scarce resource use it in most effective and efficient manner. Moreover, only the payment of one time spectrum enhancement charge beyond 6.2 MHz would not be a sufficient mechanism to ensure efficient utilization.

56. Should there be regular review of spectrum charges? If so, at what interval and what should be the methodology?

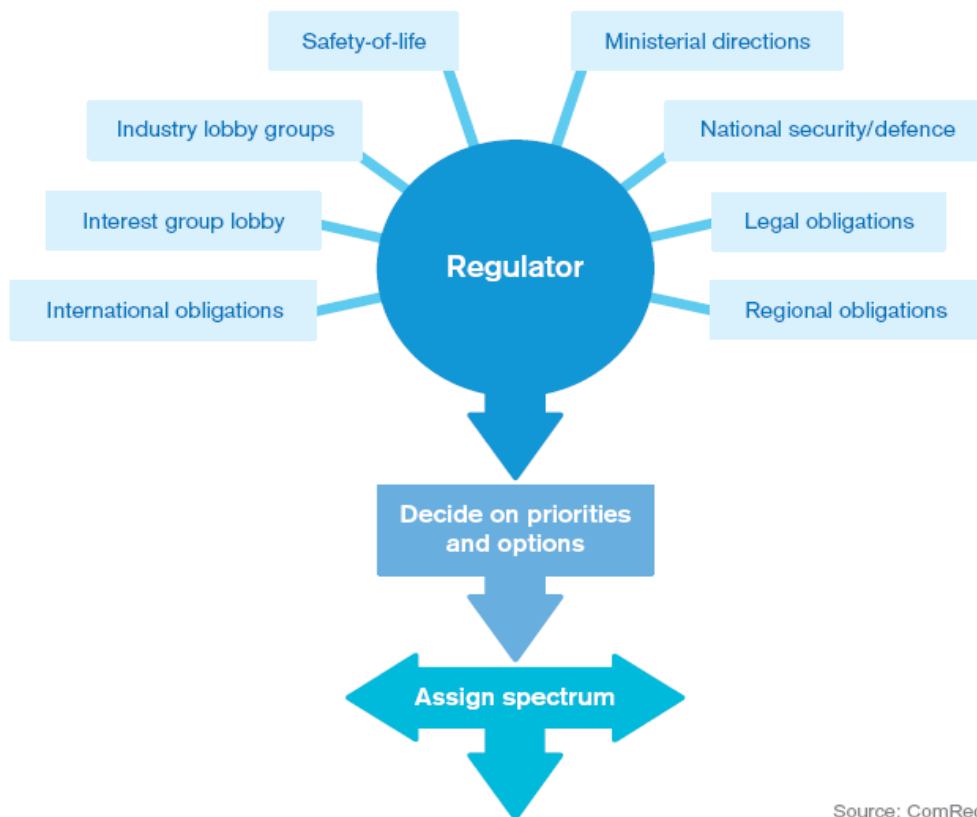
Etisalat's Comments:

Yes, there should annual / biennial review of spectrum charges.

57. What in your opinion is the desired structure for efficient management of spectrum?

Etisalat's Comments:

The increase in demand of spectrum dependent wireless technologies has led to proliferation of challenges in spectrum management like identification of bands, technology innovations, changes, their management, planning and implementation to meet national policy goals under ITU international best practices would require that regulatory bodies show flexibility and alertness while accommodating the technological developments. Hence in implementing spectrum management and policy goals, the regulator/DoT must balance a number of issues, at times conflicting ones as described in the figure below:



Source: ComReg

Figure 1: Source of policy goals

Hence the plan for a framework should hinge upon the following:

1. Keep in focus the goals of NTP'99 while deciding any issues that impact universal access, competition, affordability, tele-density and welfare objectives of the State.
2. Develop a roadmap for identifying spectrum needs to support existing and Next Generation service requirements
3. Adjust the regulatory framework in a fashion that flexibility of modern technology is accommodated
4. Since spectrum in any band is a scarce resource, facilitate and ensure different services over the existing infrastructure (e.g. in-band migration from GSM to UMTS in 900 MHz)

5. Enable BWA access without identifying technologies that must be employed so that innovation is supported in home grown technologies as well.
 6. Identify the spectrum available, to be made available over next 2-5 years with a clear-cut plan of how we want to achieve this. In addition try to assess the opportunity costs of any delay in identifying new bands, making more spectrum available and technological advancements.
 7. DoT/TRAI must share details of all available spectrum bands and used by various services. A frequency summary plan should be published from time to time (preferably, updated once in a quarter) on its website with details as required above.
 8. The regulator/DoT should strive to achieve the overall economic efficiency of Indian telecom market with a focus towards both the allocative efficiency and technical efficiency.
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