

Telecom Regulatory Authority of India
Consultation paper
On
Spectrum related issues:
Efficient Utilization, Spectrum Allocation, and Spectrum Pricing

Issues for Consultation

Chapter 2: Current spectrum availability and requirement

- (i) Should the 450 MHz or any other band be utilized particularly to meet the spectrum requirement of service providers using CDMA technology?
- ?? 450 MHz is well suited for rural applications. Allocation of frequency should be technology neutral on a case to case basis. Service providers must be assigned additional spectrum only if they have justified the efficient usage of the already existing spectrum.
- ?? Allocation of any other band will not be in line with international standards specified by International Telecommunication Union (ITU).
- (ii) The consultation paper has discussed ITU method for assessment of spectrum requirement. Based upon the methodology submit your requirement of spectrum for next 5 years. While calculating the required spectrum, please give various assumptions and its basis.
- ?? Attached in **Appendix – A** is the methodology used to calculate spectrum requirement for a typical metro
- (iii) Whether IMT 2000 band should be expanded to cover whole or part of 1710 – 1785 MHz band paired with 1805 – 1880 MHz?
- ?? No. At this stage, the priority should be for the Authority to focus on the core IMT-2000 / WARC 92 identified band (i.e. the 1900 – 2170 MHz band) that was identified in WARC92. This has already been allocated and licensed in more than a couple of dozen countries worldwide. It is the core IMT-2000 band that will establish the underlying commonality and synergy among all IMT-2000 countries worldwide, and for which a wide variety of infrastructure and terminal equipment are ready already.
- ?? The issue of expansion of the IMT-2000 band should only be considered once the existing band allocations for IMT-2000 (WARC-92 identified and catered for in NFAP) have been fully allocated for 3G services.
- ?? Furthermore, at present, the 1700/1800 MHz band is earmarked for 2/2.5 G services for both GSM and CDMA operators and will be required to meet the increased spectrum assignments to existing GSM & CDMA

operators for their 2/2.5G services. Based on current growth forecasts, we believe that the earmarked 2x75 MHz spectrum in this band would be fully required to meet the demand for spectrum for 2/2.5G services over the next few years. The TRAI should therefore ensure that the 1700/1800 MHz band is preserved, for the meantime, for 2G use only.

?? Furthermore, 3G spectrum must be made available simultaneously to all GSM & CDMA operators and only for 3G services – 3G spectrum should not be made available pre-emptively for 2G services, or only to CDMA operators for 3G services.

(iv) Should IMT 2000 spectrum be considered as extension of 2G mobile services and be treated in the same manner as 2G or should it be considered separately and provided to operators only for providing IMT 2000 services?

?? No. IMT-2000 spectrum is clearly earmarked for 3G applications and should be considered and dealt with separately from 2G. IMT 2000 spectrum should not be considered as an extension of 2G mobile services. To the best of our knowledge, there is no country in the world that has treated 3G as a continuum of 2G.

?? Government should expeditiously formulate and announce a clear-cut 3G policy to cover both GSM and CDMA operators and, until that time, the IMT-2000 band should not be tampered with.

(v) Reorganization of spot frequencies allotted to various service providers so as to ensure the availability of contiguous frequency band is desirable feature for efficient utilization of spectrum. Please suggest the ways and means to achieve it.

?? We agree that reorganization of frequencies towards more contiguous bands is highly desirable because this makes the frequency blocks wider, resulting in better network planning /optimal design besides improved spectral efficiency.

?? We would like to point out that this process of reorganization /harmonization is already underway under the aegis of WPC and in fact contiguous spectrum has already been made available in Delhi

(vi) Whether the band 1880 – 1900 MHz be made technology neutral for all BSOs / CMSPs / UASLs and be made available with the pair 1970 – 1990 MHz or should it be kept technology neutral but reserved for TDD operations only.

?? The 1880–1900 MHz band should not be paired up with 1970–1990 MHz because the latter is part of the IMT 2000 paired band, and this would render its IMT 2000 pair useless. It may also create the need for further guard bands to be introduced, thereby reducing the overall utility of the band further. Given the amount of international effort that has gone into ensuring efficient compatibility between GSM1800, DECT and IMT 2000 allocations, it would be counter-productive to introduce a sub-optimal deviation. Fragmenting and corrupting the IMT-2000 band would reduce its overall utility to operators and the resulting service and price benefits to customers.

Chapter 3 Technical efficiency of spectrum utilization

(vii) Please offer your comments on the methodology outlined in this Chapter for determining the efficient utilization of spectrum. Also provide your comments, if any, on the assumptions made.

?? Spectral efficiency of GSM network improves substantially in markets where operators have an allocation of adequate spectrum.

?? As shown in the consultation paper that GSM is the second best technology to CDMA, then more and more allocation to CDMA is not justified.

?? The concerned authority should

~~///~~ Ensure and encourage service providers to efficiently use the allocated spectrum being technology neutral

~~///~~ Also availability of more spectrum to advance the network to facilitate efficient usage.

(viii) Please provide your perception of the likely use of data services on cellular mobile systems and its likely impact on the required spectrum including the timeframe when such requirements would develop?

?? Data traffic in India is on the rise, and expected to grow to 10% by 2008.

?? Data services being used by cellular mobile systems is going to increase, as providers have to differentiate themselves from the competition.

?? In fairness there should be no extra allocation of spectrum for data services provided by the service providers.

?? Also, in 3G the authority must come out with a clear guideline and equal spectrum availability for all operators at the beginning.

Chapter 4: Spectrum Pricing

- (ix) Is there a necessity to change from the existing revenue share method for determining the annual spectrum charge?
- ?? No, there is no necessity for change in the existing revenue share method for determining the annual spectrum charge but percentage charged should be changed as it is on the higher side.
 - ?? The overall bar must be lowered; the incremental charges should be kept at a moderate level with a cap prescribed on the maximum spectrum charge.
- (x) If yes, what methodology should be used to determine spectrum pricing for existing and new operators? (Please refer table in Section 4.8)
- ?? The methodology – Revenue sharing is appropriate in determining annual spectrum usage charges.
 - ?? Also, keeping in mind to increase tele-density and the need for efficient usage of spectrum, there should be a minimal suggested overall cap for spectrum charges for spectrum allocation up to 2 * 15 MHz.
- (xi) In the event AIP is adopted as a means to price spectrum, would it be fair to choose GSM as a reference for determining the spectrum price?
- ?? AIP as method for determining spectrum price is not advisable.
 - ?? AIP, as explained in the consultation paper will lead to increased spending (operating cost) for service providers and in turn an increase in tariff to the end customer.
 - ?? Furthermore, AIP claims GSM as a second best technology to CDMA for in the consultation paper, which is discriminatory by the authority. The authority should view all providers with a technology neutral outlook, not comparing the available technology.
- (xii) Please provide your comments on the assumptions used in A.I.P.
- ?? The assumptions made in the AIP calculation seem to be on the flawed side. It seems possible theoretically but not practically.
 - ?? It might add more constraint on the system and lead to increased spending by the provider thus burdening the end customer.
- (xiii) In case Auction methodology is used for pricing the spectrum, please give suggestions to ensure that spectrum pricing does not become very high and spectrum is available to those who need it.
- ?? Auctioning is not needed for a Telecom market like India it will only be counter productive for its growth.
 - ?? In terms of new operator, the authority should stop taking in new providers if there is a severe lack of spectrum;

- (xiv) Should the new pricing methodology, if adopted, be applicable for the entire spectrum or should we continue with revenue share mechanism till 10 + 10 MHz, and apply the new method only for spectrum beyond this?
- ?? Spectrum usage charges should be kept as low as possible to increase the much talked about tele-density in India.
 - ?? The millions of Indian people must not be denied the bouquet of services possible by the service providers.
- (xv) What incentives be introduced through pricing to encourage rural coverage and / or using alternative frequency bands like 450 MHz?
- ?? Incentives introduced should be technology agnostic not partial to any one of the technologies.
 - ?? Coverage in rural areas, even if uneconomic using the 450 MHz band, the authority must consider special incentives from the Universal Service Obligation fund (USO) fund. (These incentives must be administered by the proper authorities)
- (xvi) Does $M \times C \times W$ formulae for fixed wireless spectrum pricing need a revision? If so, suggest the values for M, C, and W?
- ?? The era of M, C & W formulae is long over with. This is still used on calculation for Fixed Broadband Wireless Access (Internet) which should be abolished with and revenues share regime introduced.
- (xvii) Should there be different pricing levels for shared spectrum versus spectrum that is allocated with protection? How should this be determined?
- ?? Spectrum pricing should be for covering the regulation of the spectrum, thus justifying the cost difference for Shared spectrum versus protected spectrum.

Chapter 5 Spectrum allocation

- (xviii) How much minimum spectrum (refer approach (I) and (II)) in section 5.4) should each existing operator be provided? Give the basis for your comments.
- ?? Existing spectrum allocation policy decided by the Government of India is justified (2 * 15 MHz allocation to GSM operators). In terms for CDMA operators this is fixed at 2 * 5 MHz allocation.
 - ?? If an operator reaches 15 MHz or 5 MHz and requires more, allocation should be considered by the authority, if the allocated spectrum has been efficiently used by the operator.
 - ?? Future planning for operators who might reach the figures mentioned above must also be factored in when new operators request for allocation.

- (xix) At what stage the amount of spectrum allocation to new entrants be considered in the 800 MHz / 900 MHz / 1800 MHz frequency bands?
- ?? The scarcity of spectrum is a well known fact for all parties involved in the business of wireless services. Allocation should be considered first for existing operators before letting new operators to enter the market.
 - ?? The Indian telecom scenario has reached a point of saturation with each telecom circles reaching 7 – 8 operators. Cap on operators per circle must be enforced with open competition in mind and new operators must be allotted in circles where the cap is not reached.
 - ?? Lessons must be learnt from foreign countries where spectrum was frozen for new operators thus forcing the existing ones to quit the market.
- (xx) Should spectrum be allocated in a service and technology neutral manner?
- ?? Spectrum should be allocated on service basis but the technology choice must be up to the operator.
 - ?? In particular, the allocation of the entire IMT-2000 band intact, maximizes the amount of spectrum that can be made genuinely technology neutral since it provides an upgrade path for both GSM and CDMA technologies and allows the two to co-exist efficiently. Allocation of spectrum for CDMA at 1900MHz would be a step backwards, because it would never be of practical use to GSM operators and would be, de facto, tied to a single technology.
- (xxi) What should be the amount of cap on the spectrum assigned to each operator?
- ?? A cap on the amount of spectrum for an operator is not the correct way forward. The operator must be allocated fresh spectrum as long as previous allocated spectrum is efficiently used. Additional spectrum is justified to allow level playing field and fair competition is ensured.
- (xxii) What procedure for spectrum allocation be adopted for areas where there is no scarcity and in areas where there is scarcity?
- ?? Telecom market in India is reaching saturation as mentioned above, thus new operators entering the scene is going to be a negligible percentage.
 - ?? Allocation of spectrum must be for existing operators and in thus allocation must keep in mind level playing field, open competition and fair justification.
 - ?? As before the IMT – 2000 band must not be utilized till the authority announces a 3G policy.

- (xxiii) Which competitive spectrum allocation procedure (Auction / Beauty Contest) be adopted in cases where there are scarcity?
- ?? The current rationing of spectrum on need base and efficient utilization should be followed, not a blood bath like Auction/Beauty contest.
 - ?? The 1800 MHz should be vacated as soon as possible for future allocation of spectrum to the existing GSM and CDMA operators.
 - ?? New player entry in to the market in to the market is going to be negligible as mentioned above.
- (xxiv) Should we consider giving some spectrum in 900 MHz band to fourth CMSPs?
- ?? If there is an availability of spectrum in the 900 MHz, it must be allocated to the 4th CMSP. This will help in efficient utilization of the spectrum allocated and coverage cost in rural areas.
- (xxv) Comments of stakeholders are invited on the minimum blocks such as 2 X 2.5 MHz / 2 X 5 MHz of additional spectrum to be allocated to existing service providers in situations where IMT 2000 band is opened as well as in situation where it is not opened. Additionally, comments are also invited on the minimum allocation to new entrants.
- ?? Allocation of IMT – 2000 to a specific set of players in the mobile market by the authority is irrational and totally against the concept of level playing field.
 - ?? As proposed above the IMT – 2000 must be set aside for 3G services and not included in the 2/2.5G services as it is not a done anywhere in the world.
 - ?? Authority must come out with guidelines for usage of IMT – 2000 for 3G services; till then, the spectrum should not be offered. As soon as the authority comes out with the guidelines the IMT – 2000 band can be opened for 3G services so as to allow Indian customers and operators to take advantage of the new services.
- (xxvi) In the event that IMT 2000 spectrum is treated as continuum to 2G, should existing operators using spectrum below the specified benchmark be treated as those eligible for IMT 2000 spectrum?
- ?? IMT – 2000 band must be reserved for 3G services and to assume it as a continuum is a grave error (3G as a continuum to 2G is not followed anywhere in the world)
 - ?? The licenses of operators and the national frequency allocation plan clearly prescribe the 2G spectrum bands as 800/900/1800 – existing

operators must be allocated spectrum from these bands only, for their 2G services.

- ?? 3G spectrum should NOT be used until a national 3G policy is announced and 3G services are opened up to all operators.

Chapter 6 Re-farming, Spectrum trading, M&A and Surrender

Re-farming of spectrum

(xxvii) What approach should be adopted to expedite the re-farming of 1800 MHz and IMT-2000 spectrum from existing users?

- ?? Re-farming in the above mentioned spectrums should be carried out as soon as possible in measured steps.
- ?? Relocation of existing users in the appropriate bands should be carried out in a phased manner. The cost implication (if any) should be calculated on basis of existing spectrum and relocation to new spectrum.

(xxviii) What approach should be adopted for re-farming of spectrum after expiry of license?

- ?? Existing operators not in the public mobile service should be asked to vacate the spectrum on expiry of their license. They should be moved to a new spectrum and cost for relocation should be justified. Reasonable period of notice to the operator must be given and an effort to get new spectrum for them must be ensured (if required).

Surrender of spectrum

(xxix) Should there be any refund for spectrum surrender in principle?

- ?? Uses should only be refunded where they have been asked to surrender spectrum, in advance of the expiry of their licences, so that the spectrum can be used by a public mobile operator.
- ?? The Government should not be required not to give any refunds in cases where licensees have chosen to exit their businesses.
- ?? However, in cases where such surrender has become fait accompli as a result of a change in government policy – such as the introduction of unified access licensing, refunds for such surrender must be considered.

(xxx) Should there be refund for spectrum surrender consequent to Unified Access license policy? If yes, what should be the basis?

?? Yes, as mentioned above, in case of introduction of a unified access license, operators holding both fixed and mobile licenses (and consequently both GSM as well as CDMA spectrum) find that one of their licenses has become redundant. In such cases, where redundancy has been forced upon the operators because of government policy, refunds should be made.

?? The amount of refund could be based upon return of entry fee pro rata for un-expired term of license / spectrum taken from the time that the license became redundant - i.e. introduction of the unified access licensing policy.

(xxxii) How should the amount of refund be estimated?

?? In the case of redundancy created by government policy / regulation, refunds should be provided pro-rata on the un-expired term of license calculated from the time that the license was rendered redundant by Government policy.

?? In the case of voluntary surrender, no refunds should be considered.

Spectrum trading

(xxxiii) Should we open up the spectrum market for spectrum trading? If yes, what should be the time frame for doing so?

?? The market for spectrum trading in India is very nascent (premature) as there are neither guidelines nor any regulations to go by.

?? Spectrum trading might increase spectrum usage efficiency but there are a lot of complications which will have to be dealt in greater lengths.

(xxxiv) What are the pre-requisites to adopting spectrum trading?

?? Guidelines (regulations) must be drawn up by the concerned authority as a first step towards trading in spectrum.

?? Pre-ownership, post ownership, maximum level of spectrum for an operator must all be taken in to account. This can be considered only after the authority takes the initial steps.

Mergers & Acquisitions

(xxxv) Whether we should specify a cap higher than 2 X 15 MHz for Metros and Category "A" service area and 2 X 12.4 MHz for Category "B" and "C" service area in case of M&As or should it be retained?

- ?? Cap specified for M&A would be irrational if two large entities merge without going over the prescribed limits in the M & A guidelines issued by the authority.
 - ?? Cap becomes obsolete as extra spectrum is allocated only after proper justification and efficient utilization of the previous allocated spectrum.
- (xxxv) In case, IMT 2000 is considered as a continuum of 2G Services, is there a need to have a cap higher than that without IMT 2000 services? Should there be individual caps on 2G and 3G spectrum or a combined cap?
- ?? Strongly reiterating IMT – 2000 band should not be considered as a continuum of 2G services. Also, it should not be allocated to 2G services.
 - ?? Allocation of IMT – 2000 will lead to lot of network problems, interference etc thus reducing the efficiency of the working system.
- (xxxvi) In case of M&As where the merged entity gets spectrum exceeding the spectrum cap, what should be the time frame in which the service provider be required to surrender the additional spectrum?
- ?? The question does not make a lot of value as the extra spectrum allocated is only after demonstrating full justification, thus an artificial cap/limit does not arise.

Other Major Issues:

- ?? The consultation paper does not talk about allocation of spectrum to Wireless Internet Service Providers (WISP).
- ?? Also the paper discusses that issues relating to other technologies (Internet) will be discussed as when it arises, but a future planning and allocation will lead to a better handling of the system.
- ?? As per the TRAI consultation paper on Internet and Broadband growth in India, all means and methods of last mile should be encouraged. In this wireless as a last mile will play an important role given the lack of wired means having a far and wide reach.
- ?? Totally avoiding WISP parties is not an indication of level and fair playing field.
- ?? The authorities concern on Internet, made them release a consultation paper on it but the lack of mention in this paper is a let down. The authorities had mentioned numbers like 20 million broadband subscribers by 2010 and for achieving such base spectrum should also be considered for wireless Internet operators on par with mobile operators.