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This comment specifically proposes the concept of "**Band Managers**" for the allocation of backhaul spectrum. A detailed note follows:

Different bands of spectrum should not be distinguished between or compartmentalised on the basis of technology or network components. All spectrum should be treated alike from a regulatory perspective. Particularly, the distinction between "Access Spectrum", "MW Access Spectrum" and "MW Backhaul Spectrum" is against the principles of liberalisation of spectrum, technology neutrality, and is non-adaptable to future improvements in technologies due to legacy issues. The spectrum that is today used for access services could tomorrow become the most efficient spectrum for backhaul or vice-versa. Creating regulatory restrictions on the choice of technology (or network component) for spectrum would create the same impediments as previously created for introduction of 4G over 1800 MHz and of 3G over 900 MHz – the drama of "refarming" should not be repeated!

The way TRAI has repeatedly affirmed that there is no "2G Spectrum" - there is just spectrum in the 1800 MHz band and 900 MHz band that may be used for 2G, 3G or 4G depending on the choice of technology of the TSP. Similarly, TRAI needs to now affirm that there is no "Access Spectrum" or "MW Access Spectrum" or "MW Backhaul Spectrum" - there is just spectrum that may be used for access or backhaul depending on the choice of technology (or network component) of the TSP.

The current policy of command-and-control, wherein the government administratively fixes price of backhaul spectrum by way of an administrative formulae will entail high transaction costs for the government. Specifically, the government will need to account for information costs and monitoring costs, which are expected to be extremely high because of the geographic area specific (and point to point) allocations of MW access and MW backhaul spectrum. For example, the consultation paper highlights the difficulty in the application of the administrative formulae because of lack of local information, some of which has been attempted to be captured by introducing proxy variables like population density. The forced simplicity of the formulae can primarily be attributed to high cost of gathering precise information for a precise formulae. Inaccuracy of information is also expected to result in loss of revenue. As a result, command-and-control instruments of this sort may not be efficient.

In contrast, market based instruments will allow the government to reduce its transaction (information and monitoring) costs and generate revenue in a transparent manner. Additionally, the government has already committed to market oriented practices for management of spectrum in the national telecom policy. Accordingly, there need to be auctions in the primary market and trading/sharing/leasing in the secondary market for efficient use of spectrum.

Accordingly, an alternate practice of allocation of backhaul spectrum through "**Band Managers**" is proposed. In this, for allocation of backhaul spectrum in the primary market, the government auctions spectrum in large blocks (at least 10 carriers) to "Band Managers" for an entire circle. The band managers then lease the spectrum to individual TSPs in the secondary market. The Band Managers will lease this spectrum in the most efficient manner to maximise utility since they have paid the highest price for it. It then becomes the responsibility of the Band Managers to discover the price of various point to point links - they may use market oriented practices (demand vs supply) for determining the price of leasing spectrum. Competition may be created between Band Managers by having at least 3 Band Managers per circle.

In this case, the Government need not individually determine the number of carriers to be assigned

to different combination of technologies (example, BWA only or 2G+3G without BWA) as that would become the Band Managers responsibility. The Band Managers would follow market based mechanisms for determining the quantity of spectrum per TSP on the basis of demand and supply. The Band Managers would be able to perform this function better as they would have more direct and localised access to information.

The Band Manager may lease spectrum to the TSP on a point to point basis or for the entire district or for the entire circle. The government need not micro-manage the sub-allocation of spectrum. Market based theory expects the secondary market to redistribute spectrum in the most efficient manner.

Any existing UL holder should be allowed to be a Band Manager. The financial arrangement with the Band Manager should be based on 1) upfront Auction amount; and 2) yearly revenue sharing (at flat 3%). Each band manager should be mandated to send regular reports to the government highlighting usage. Penalties may be introduced for underutilisation or hoarding.

All existing operators should be required to vacate their spectrum and participate in auctions once their existing backhaul licenses terminate. If the operators are forced to prematurely vacate spectrum it will lead to an unnecessary/avoidable legal entanglement.

The circle-wise calculation of reserve price for the auction of spectrum should be on the basis of the current administrative revenues for the entire circle from licensing of backhaul spectrum so that TSP's do not have any reason to argue against this change.

There are three faces of market-oriented practice for spectrum management
1) Technology neutrality
2) Auctions in the primary market
3) Trading/sharing in the secondary market

Each one of them holds true if spectrum is auctioned to Band Managers.

Let India be progressive and take lead in developing this regulatory model. Lets not be limited by the lack of foresight of the US and UK.

Regards,
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