

Evolution of Auction Designs and other market mechanisms for optimum allocation & utilization of Spectrum

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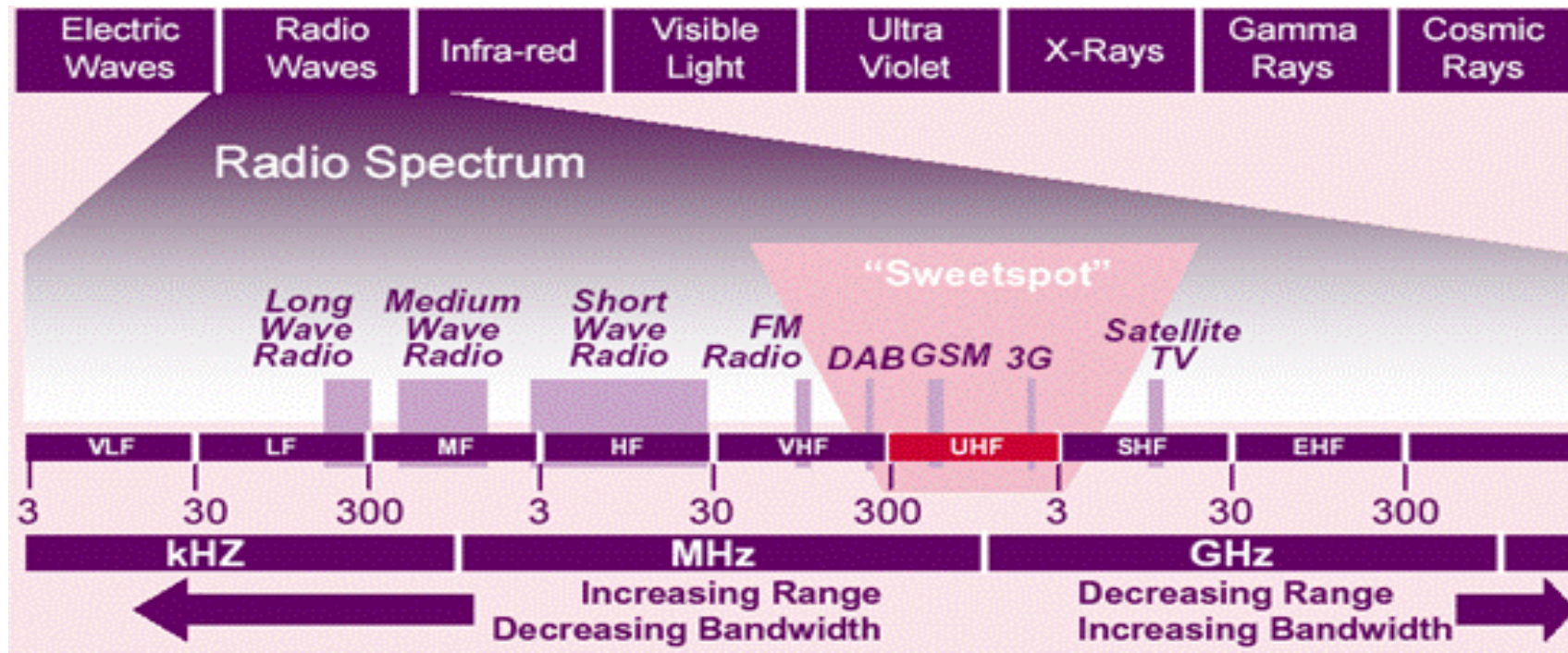


ITU's Association in India

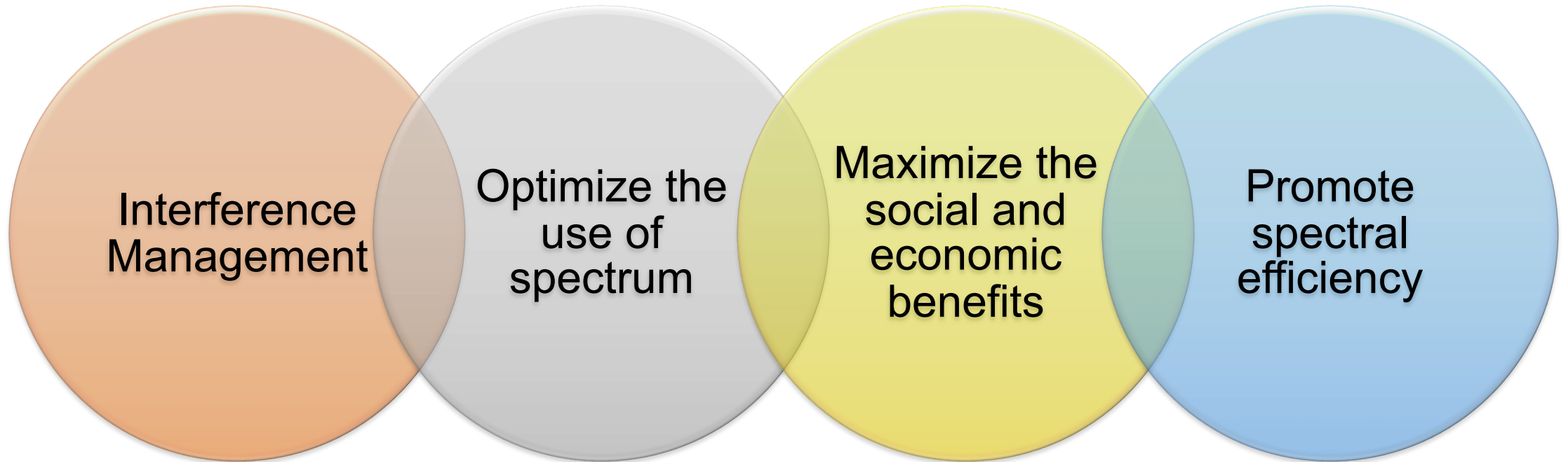
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Why optimum allotment of Spectrum

- Spectrum is a natural and scarce resource which is wasted if not used. It does not respect national or international boundaries. It is managed through international treaties and national policies, rules and licenses
- ITU Radio Regulations allocate specific frequency bands to 40+ radio services
- In most cases, specific frequencies are allotted for providing broadcasting or communications or navigation services while some portions are delicensed for all to use under specified conditions



Benefits of optimum allotment of Spectrum



optimum use of spectrum can make a big difference to a country's prosperity, as most economies rely heavily on wireless technologies

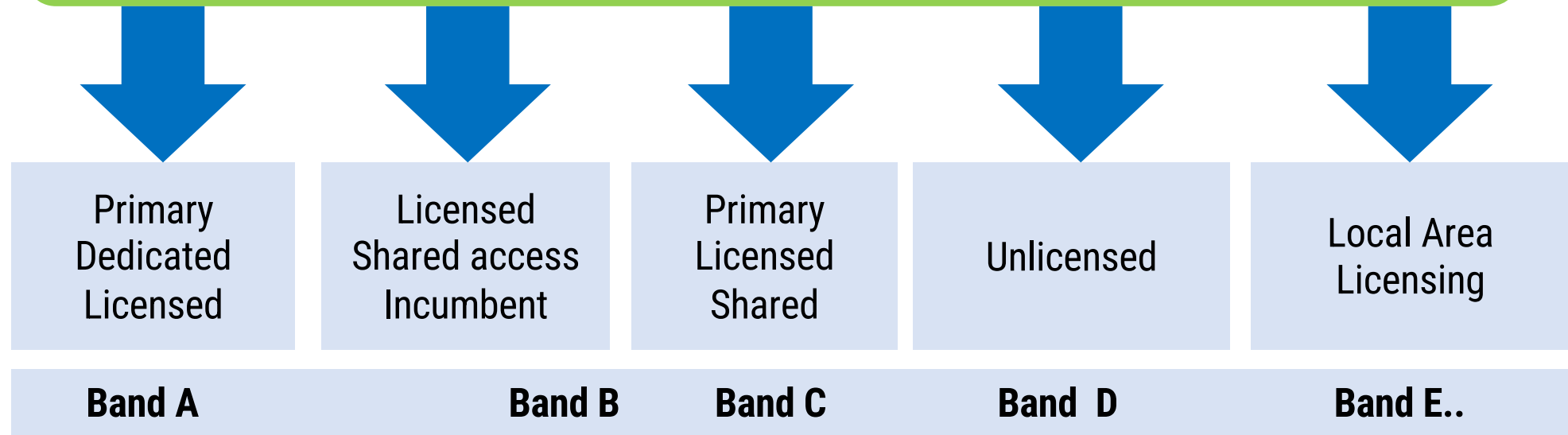
Mechanisms for optimum allotment of Spectrum

Administrative Allotment	Spectrum Auctions	Unlicensed
<ul style="list-style-type: none"> • Government knows the best value of Spectrum and decides who can use it • Best mechanism for: <ul style="list-style-type: none"> • Government users • Captive users • Shared spectrum such as satellites, Met, Maritime, aeronautical, etc 	<ul style="list-style-type: none"> • Market knows the best value of Spectrum and decides who can use it • Pro “Big Business” • Legal rights and protection • Best for allotment of spectrum for commercial mobile services 	<ul style="list-style-type: none"> • Nobody knows the best value of Spectrum and every one can use under defined technical rules • No Legal Protection but only Technical Protection • High flexibility and Pro-“Innovation”



Globally new spectrum allotment models are evolving for commercial mobile spectrum

MULTIPLE SPECTRUM BANDS WITH DIFFERENT REGULATORY MODELS IS EVOLVING



“Toolbox” of different spectrum & Licensing categories is already evolving to support needs of commercial markets

PM's Vision of Digital India



Moratorium

Zero SUC



30 yrs. validity

No additional
SUC on sharing



2021 Cabinet Reforms: Spectrum Aspects

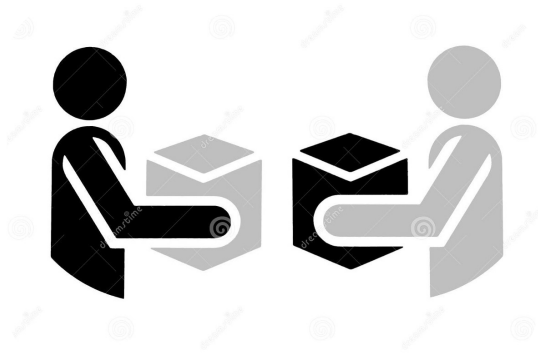


Surrender
after 10 yrs.

Annual auctions



New Spectrum reforms needed to realize Digital India Vision



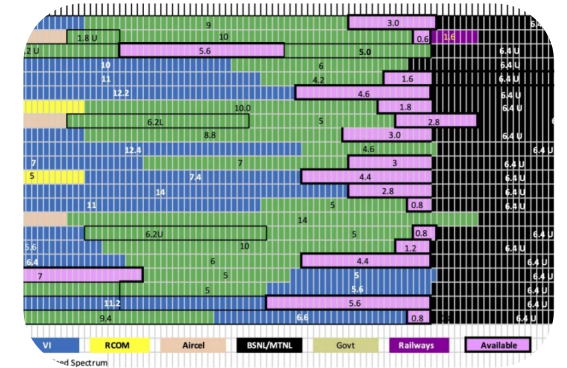
Spectrum Swapping



Spectrum Valuation



Lower 6GHz delicensing



Spectrum Harmonisation

Benefits of Spectrum Swap Policy

Auctions

Trading

Swapping Policy

Spectrum Efficiency

Maximizing Govt. Revenue

Boost to Investments

More flexible spectrum policy

Rural Connectivity

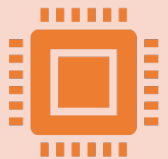
Promotion of Competition

Spectrum Harmonization

What is the real value of spectrum - Reserve Price



All previous spectrum auctions have shown that the final auction prices do not reflect the true value of the spectrum but rather the need of the bidder to preserve his market Competitiveness and protect his investments



The reserve prices have artificially increased the spectrum prices to uneconomic values with the result that the most valuable spectrum of 600 MHz and 700 MHz bands have been lying unused in India. These bands are key to connectivity in rural and suburban areas.

How to find the real value of satellite spectrum



Satellite spectrum is always assigned administratively at international level, the cost of spectrum can vary significantly from country to country. There is however a general tendency towards spectrum fee reduction



Modern satellite systems can use large amount of spectrum (e.g. around 4GHz in Ka-band)



it could be reasonable to use the proposed 1% of the AGR as the value of satellite spectrum. This is a good reflection of the true value of spectrum, as directly linked to the actual spectrum use/revenue in the country

How to find the real value of captive networks spectrum



Use the last 4G/5G auction determined price and apply it to CNPN networks based on the coverage area of the CNPN network to determine the fair value of the spectrum to be paid by the CNPN operator



Example Calculation of Spectrum Price for 5G CNPN network with 10 Sq. Km area

		Auction Price in Rs. Crores per 10 MHz block in for 1 Years		Usable area @ 70% of area	Price per 10 Sq. Km per 10 MHz Block -Mid Band (in Rs Lakhs) per year
LSA	Category	(mid Band)	Area (in Sq KM)		
Delhi	Metro	357	1,484	1038.8	343.7
Mumbai	Metro	313	603	422.1	741.5
Tamilnadu	A	125	1,30,058	91040.6	1.4
Haryana	B	53	44,212	30948.4	1.7

Delicensing Lower 6GHz

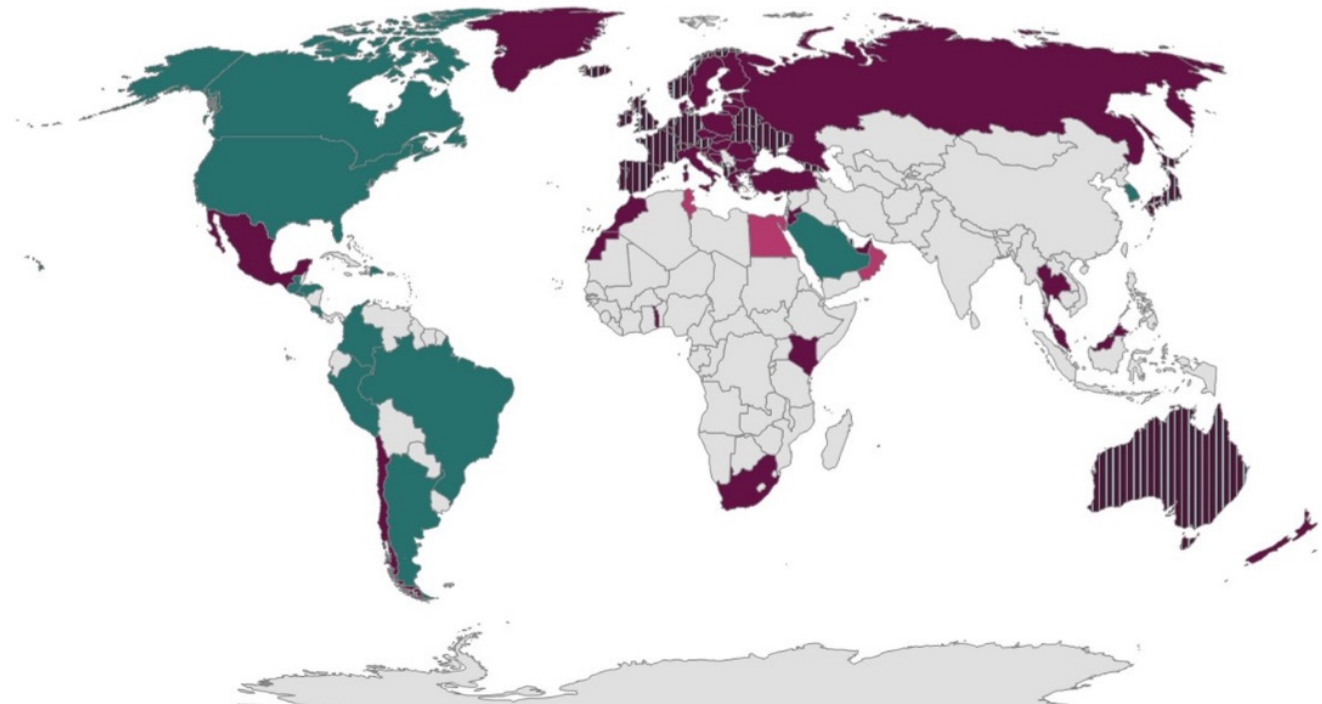
Most Countries in the world have delicensed the lower 6GHz band for wifi-6e

India missed the 5GHz export opportunities as the band was delicensed 15 years after the world

Most Industrial products in future will have 6GHz. If we want India to be an export lead trillion-dollar economy, we need to promote 6GHz WiFi

Countries Enabling Wi-Fi in 6 GHz (Wi-Fi 6E)

- Adopted 5925-6425 MHz
- Adopted 5925-7125 MHz
- Adopted 5925-6425 MHz, Considering 6425-7125 MHz
- Considering 5925-6425 MHz



Spectrum Harmonization

- A harmonised frequency arrangement facilitates economies of scale resulting in the availability of affordable equipment and services
- Global harmonization of spectrum bands support the same application ensuring efficient spectrum use, seamless communication services over wide areas, and improved overall usage quality
- In India, the high point of spectrum management has been the harmonisation of spectrum below 2.5 GHz
- Mandating of TDD spectrum uplink-downlink synch can further increase spectrum efficiency

Clear Demarcation of Services

Interference Management

Improved Efficiency

Device ecosystem

Newer technologies



THANK
YOU

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