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ITU-APT/L/22-23/499

Dr. P D Vaghela
Chairman
Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan
Jawahar Lal Nehru Marg
New Delhi – 110002

Subject: ITU-APT Foundation of India - Spectrum and Pricing recommendations for Captive Non-public Networks (CNP)

Dear Dr. Vaghela,

Greetings from the ITU-APT Foundation of India (IAFI) a non-profit, non-political, registered society in India. As you are aware, IAFI is working for last 20 years with the prime objective of encouraging involvement of professionals, corporate, public/private sector industries, R&D organizations, academic institutions, and such other agencies engaged in development of Indian Telecom sector in the activities of the International Telecommunication Union (ITU) and the Asia Pacific Telecommunity (APT).

We very much appreciate TRAI's well thought out recommendations dated 11-04-2022 and reconsidered recommendations dated 09-05-2022 for the option i.e., Enterprises to obtain the spectrum directly from DoT for establishing their own isolated Captive Wireless Private Network to paves the way for development of Industry 4.0 infrastructure in the country. India has vast presence of Industries across various sectors ranging from Manufacturing, Transportation, Mining, Land & Sea Ports, Automotive, Steel, Pharma, Education, where true potential of private networks can be exploited to drive "Make in India" initiative and eventually contributing to the national GDP. Thus, direct spectrum allocation and licensing of captive Industrial and enterprise 5G networks is in the overall national interest of all sectors of the economy.

It has been estimated¹ that by 2030, the business value resulting from manufacturing 5G use cases running on improved connectivity especially with the use of ultrafast 5G

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https://www.mckinsey.com/~media/mckinsey/industries/technology%20media%20and%20telecommunications/telecommunications/our%20insights/connected%20world%20an%20evolution%20in%20connectivity%20beyond%20the%205g%20revolution/mgi_connected-world_executive-summary_february-2020.pdf

technology could generate from \$400 billion to \$650 billion of GDP impact (see Mckinsey report). That's because the enhanced bandwidth, higher speed, significantly lesser latency, improved security and device density that high-band 5G connectivity and private networks bring, can support manufacturing automation and numerous high-impact applications to achieve higher operational efficiencies. Apart from manufacturing, many other industries / sectors are also looking at 5G as the backbone for their equivalent of the Fourth Industrial Revolution.

It is also pertinent to mention that the enterprise connectivity would require utmost customer centric approach where network's reliability, speed, latency, efficiency, density each need to be defined by the Enterprises and can vary for each Enterprises depending on their operational requirement. For example, 5G network for a manufacturing plant with large assembly line would be completely different from the one being used by an educational institution for R&D. It would immensely be difficult for a Telecom service provider to customize its network for each Enterprises and fulfil the desired network with specific values of different connectivity parameters of such enterprises.

Several Regulators, particularly those in the developed countries around the world have realized the importance of captive private 5G communications by their industries and enterprises and have been proactively working towards making the necessary spectrum resources available directly for their captive needs, keeping in mind importance of these users in nation building and economic growth. Internationally, there were 955 private mobile networks by November 2022 in 72 countries, led by the US, China and Germany. Manufacturing, education and mining are the leading user sectors and 5G is used by 41 percent of these networks. Many Countries are already implementing rules and have started allocating spectrum directly for the vertical markets/private broadband/local area licensing. In fact, most industrial countries have already allocated mid band spectrum for deployment of private 5G Networks. *Please see enclosed annexure with details of countries who have made regulatory decisions in this regard.*

India too, could consider the popular mid-band and mmWave category as typical frequency spectrums for 5G private networks. We are happy to note that the TRAI has already recommended few such frequency bands for direct allocation to enterprises and industry verticals for captive non-public networks in India.

In the recently concluded spectrum auction, DoT (Department of Telecommunications) has already found the market determined price for both mid-band as well as mmWave spectrum bands. This is the price at which the spectrum was bought by Mobile network operators for their 5G network rollouts. The Unified Access Service licenses of these Mobile network operators permits them to cover any of the licensed service area (LSA) with the respective spectrum for public networks and provide services as stipulated in the licensing conditions. If we exclude the forest and unproductive lands in different

LSAs, nearly 70 percent of the geographical area is a potential for any public mobile network operator for which the operator deploys his network coverage with respective spectrums.

The IAFI with our members propose that the same market determined price identified in Spectrum auction 2022 may be applied to CNPN networks as well based on the coverage area of the CNPN network, that way the actual price to be paid by the CNPN Licensee can be determined. In this regard, below example may kindly be seen –

Example: Calculation of Spectrum price for Captive Private 5G network within 10 Sq. Km area network

LSA	Category	Auction Price in Rs. Crores per 10 MHz block in for 1 Years (mid Band)	Area (in Sq KM)	Usable area @ 70% of area	Price per 10 Sq. Km per 10 MHz Block -Mid Band (in Rs Lakhs) per year
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
Kerala	B	104	38,863	27204.1	3.8

We believe, it is urgent and essential for the Government to reserve adequate spectrum for direct allocation basis proposed spectrum pricing under the CNPN licenses for deployment of Private 4G/5G (Non-public as well as Captive) networks to the Enterprises.

We therefore earnestly request TRAI to kindly consider IAFI spectrum allocation and pricing methodology while framing its recommendations to the Government to prepare a policy framework for allocation of dedicated spectrum for captive industrial and enterprise 4G/5G networks based on globally harmonized IMT technologies in standardized 3GPP frequency bands soon.

We would be happy to make a presentation on this issue at a suitable date/time as per your convenience.

Warm Regards,



Bharat B Bhatia,

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