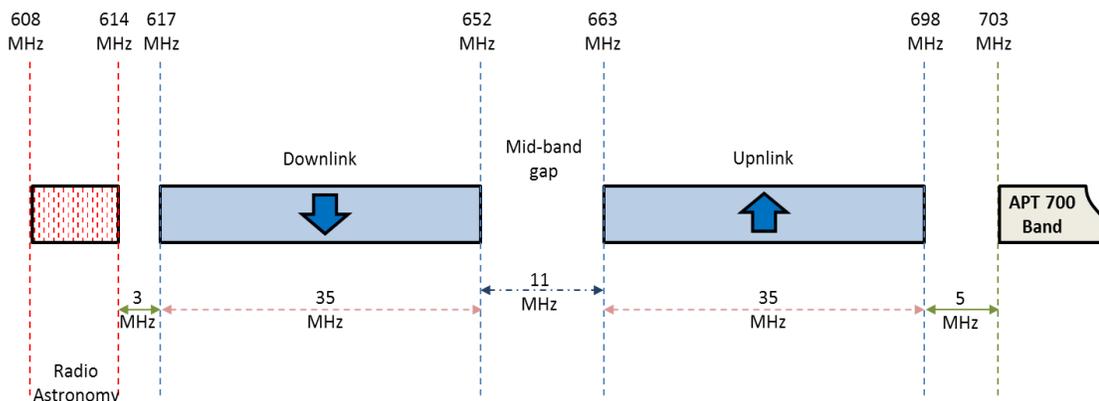


At the outset, we would like to thank the Authority for providing us with the opportunity to respond to the Consultation Paper on "Auction of Spectrum in frequency bands identified for IMT/5G". As we all know that the Spectrum is a critical resource for mobile networks. The importance of the spectrum has been recognized not only in NDCP 2018 but also in the recent telecom reforms announced by the Government in September 2021. Availability of the right spectrum at the right price is central to the growth of the telecom sector. The availability and pricing of the spectrum should align with the objective of the reforms announced by the Government in September 2021 viz. to generate employment, promote competition, protect consumer interests, infuse liquidity, encourage investment and reduce the regulatory burden on TSPs. Since all the bands have a complementary role in a 5G network, these must be auctioned simultaneously for efficient designing of the network and to deploy various use cases supported by 5G. The spectrum should be put to auction only after harmonization and ensuring that it is interference-free to ensure efficient utilization of spectrum and better user experience. A critical factor that has an impact on the pricing of the spectrum is the need to ensure /attract investments in infrastructure and also keep in mind the ARPU or the income/revenue potential in a country, and this along with international benchmarks must be considered in the valuation exercise. A large chunk (63%) of the spectrum put up for auction, remained unsold in the last auctions. Hence spectrum pricing is an area that requires a comprehensive re-look by the Authority. Sticking to old methodologies may not yield the desired results. Valuation of the spectrum may be reduced suitably across different bands. Reserve Price should be kept low and should be fixed at 50% of the valuation of the spectrum. In the case of new bands, international benchmarks may also be examined. While SUC has been removed for spectrum to be auctioned in future, SUC is still payable on spectrum acquired in the past auctions. We submit that once the spectrum is allocated through an auction mechanism, continuing with the current escalating charge approach is detrimental to consumers and operators as it works as an inverted duty structure. It increases the input cost of the spectrum leading to an excessive burden on operating margins and revenues for the spectrum holders. Most of the countries that have adopted auction as a mechanism to assign spectrum, do NOT have any revenue share such as SUC in India. Hence, we strongly believe that the existing SUC on spectrum acquired in past auctions should be lowered by 3% across all the bands for all the TSPs and the floor of 3% for the SUC should be withdrawn. Surrender of the spectrum is an important part of the reforms announced by the Govt. To enable the sector to benefit from this reform, the terms and conditions associated with the surrender of the spectrum should be kept simple and easy to implement. It is important to note that spectrum is a key finite resource with high economic value, and in the same lines, FICCI and its members have collated their views for TRAI's kind consideration. Our responses are as below:

Issues related to Quantum of Spectrum and Band Plan

- Q.1 Whether spectrum bands in the frequency range 526-617 MHz, should be put to auction in the forthcoming auction? Kindly justify your response.
- Q.2 If your answer to Q1 above is affirmative, which band plans and duplexing configuration should be adopted in India? Kindly justify your response.
- Q.3 In case your answer to Q1 is negative, what should be the timelines for the adoption of these bands for IMT? Suggestions to make these bands ready for adoption for IMT may also be made along with proper justification.
- Q.4 Do you agree that the 600 MHz spectrum band should be put to auction in the forthcoming auction? If yes, which band plan and duplexing configuration should be adopted in India? Kindly justify your response.
- Yes. We submit that the 600MHz spectrum should be put to auction in the forthcoming auctions.
 - The suggested band plan for this band is given below



- In this frequency band, the proposed frequency arrangement is based on a reverse FDD configuration, where the frequency range 617-652 MHz is for the base-station transmitter and the frequency range 663-698 MHz is for the mobile-station transmitter. This arrangement is preferred to ensure compatibility with existing frequency arrangements in the band above 698 MHz and to protect lower adjacent services in the band below 617 MHz.
- The new band plan could be considered in future auctions depending on the take up of spectrum in the auction and the status of adoption of the APT proposal.

Q.5 For the 3300-3670 MHz frequency range, which band plan should be adopted in India? Kindly justify your response.

- We suggest that TDD arrangement may be adopted as the preferred option for spectrum in 3300-3670 MHz.
- Adoption of band plan N78 will be consistent with global trends. This will also be in line with 3GPP & ITU and thus globally harmonized giving benefits of scale economies.
- Going forward the entire 3300-4200 MHz bands should be considered and evaluated for allocation for IMT, with due consideration to availability of interference free spectrum and spectrum contiguity.
- n78 (3300-3800MHz) should be adopted in India.
- Ensure contiguous and interference-free spectrum. There have been instances earlier where some of the TSPs have faced cross-border interference e.g. in the 2100MHz and 900 MHz band which could not be utilized for 3G/4G services while payment has been made for such spectrum. Such issues should be addressed before the auctions.

Q.6 Do you agree that TDD based configuration should be adopted for the 24.25 to 28.5 GHz frequency range? Kindly justify your response

Q.7 In case your response to Q6 is affirmative, considering that there is an overlap of frequencies in the band plans n257 and n258, how should the band plan(s) along with its frequency range be adopted? Kindly justify your response.

- Yes, TDD based configuration should be adopted for the 24.25 to 28.5 GHz frequency range. 3GPP has also defined this band only for TDD configuration.
- It should be ensured that when the Spectrum is assigned to any operator, there should be no overlap between n257 and n258. Thus, we suggest that the 24.25 – 27.5 GHz band may be allocated as n257, and 27.5 – 28.5 GHz as n258.

Q.8 Whether entire available spectrum referred by DoT in each band should be put to auction in the forthcoming auction? Kindly justify your response.

- All bands have a complementary role in a 5G network. The sub-GHz bands are essential for providing coverage, while mid-band and high-bands are primarily used for increasing the capacity of the network. Thus, all the 5G bands must be auctioned simultaneously for efficient designing of the network and to deploy various use cases supported by 5G.
- Further, the spectrum put to auction should be harmonized and interference-free.

Issues related to Block Size

- Q.9 **Since upon closure of commercial CDMA services in the country, 800 MHz bands is being used for the provision of LTE services,**
- a. **Whether provision for guard band in 800 MHz band needs to be revisited?**
 - b. **Whether there is a need to change the block size for the 800 MHz band? If yes, what should be the block size for the 800 MHz band and the minimum number of blocks for bidding for existing and new entrants? (Kindly justify your response)**
- There is no need for any change in the block size for the 800MHz band and the same may be maintained at 1.25MHz.
 - The same spectrum block size and other conditions as in the last auction for 800 MHz may be retained Changing spectrum plans in the new auction will impact existing operators' strategy to acquire additional spectrum.
 - Also, once DoT gives spectrum, for LTE entire 1.25 MHz block should be given instead of 1.23 MHz which was given earlier in case of CDMA to cater to guard band. In case of LTE, this guard band within the band is not required. However, appropriate inter-band distance between 850 and 900 MHz band should be maintained.
- Q.10 **Do you agree that in the upcoming auction, block sizes and minimum quantity for bidding in 700 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands, be kept the same as in the last auction? If not, what should be the band-wise block sizes and minimum quantity for bidding? Kindly justify your response.**
- Yes, the block sizes and minimum quantity for bidding as in the last auction of March 2021 should be continued, and keep it as in the last auction.
- Q.11 **In case it is decided to put to auction spectrum in 526-698 MHz bands, what should be the optimal block size and minimum quantity for bidding? Kindly justify your response.**
- Q.12 **What should be the optimal block size and minimum quantity for bidding in the 3300-3670 MHz band? Kindly justify your response.**
- Block size of 10 MHz may be defined for bidding in the 3300-3670 band.
 - Channel size for n78 spectrum band are 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100.
 - Recommend block size of 10MHz
- Q.13 **What should be the optimal block size and minimum quantity for bidding in 24.25-28.5 GHz? Kindly justify your response.**
- Channel size defined in 24.25GHz to 28.5GHz is 50, 100, 200 & 400MHz. 100 MHz of block size is recommended for bidding in the 24.25 – 28.5 GHz band.

- The minimum quantity for a new entrant who does not hold any spectrum in any band may be put at 400MHz. and it should be 100MHz for operators that already have spectrum in any band >2GHz

Issues related to Eligibility Conditions for Participation in Auction

- Q.14 **Whether any change is required to be made in the existing eligibility conditions for participation in Auction as specified in the NIA for the spectrum auction held in March 2021, for the forthcoming auction? If yes, suggestions may be made in detail with justification.**
- Q.15 **In your opinion, should the suggested/existing eligibility conditions for participation in the Auction, be made applicable for the new spectrum bands proposed to be auctioned? If not, what should be the eligibility conditions for participating in the Auction? Kindly justify your response.**
- No change is required to be made in the existing eligibility conditions for participation in the Auction as specified in the NIA for the spectrum auction held in March 2021.
 - Eligibility conditions should be kept the same as in auctions held in March 2021 as these conditions are flexible for any participant to come and bid.

Issues related to Interference mitigation in TDD bands

Q.16 **Is there a need to prescribe any measure to mitigate possible interference issues in 3300-3670 MHz and 24.25-28.5 GHz TDD bands or it should be left to the TSPs to manage the interference by mutual coordination and provisioning of guard bands? Kindly justify your response.**

Q.17 **In case your response to the above question is affirmative,**

- a. **whether there is a need to prescribe provisions such as clock synchronization and frame structure to mitigate interference issues, as prescribed for existing TDD bands, for entire frequency holding or adjacent frequencies of different TSPs? If yes, what should be the frame structure? Kindly justify your response.**
- b. **Any other measures to mitigate interference related issues may be made along with detailed justification**
 - Industry has in the past, faced several challenges with respect to interference caused from various sources, which has adversely affected the quality of services or has rendered spectrum unable, causing huge financial damage. In addition, non-contiguous spectrum assignments make it impossible to deploy mobile broadband technologies or cause inefficient spectrum use. Therefore, in the upcoming spectrum auction, the spectrum should be put to auction only after harmonization and ensuring that it is interference-free.
 - In case TSPs acquire more than one block, then these needs to be contiguous and same frequency spots should be assigned to the same TSP in all the LSAs in which they have acquired spectrum. For additional spectrum acquisition, harmonization exercise should be carried out before assignment to ensure contiguity.
 - The issue of coexistence between IMT and Satellite players is already covered by TRAI and also in the reference sent to TRAI by DoT, it is important that this co-existence between IMT and Satellite in 3300-3670 MHz and 24.5 – 28.5 GHz bands is discussed and finalized before spectrum auction. This will ensure that the bidders go for auction with complete clarity.

Issues related to Roll-out Obligations

- Q.18 **Whether the roll-out obligations for 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz as stipulated in the NIA for last auctions held in March 2021 are appropriate? If no, what changes should be made in the roll out obligations for these bands?**
- Q.19 **What should be associated roll-out obligations for the allocation of spectrum in 526-698 MHz frequency bands? Should it be focused to enhance rural coverage? Kindly justify your response.**
- Q.20 **What should be associated roll-out obligations for the allocation of spectrum in 3300-3670 MHz frequency band? Kindly justify your response.**
- Q.21 **What should be associated roll-out conditions for the allocation of spectrum in 24.25 to 28.5 GHz frequency range? Kindly justify your response.**
- Q.22 **While assessing fulfilment of roll out obligations of a network operator, should the network elements (such BTS, BSC etc.), created by the attached VNO, be included? If yes, kindly suggest the detailed mechanism for the same. Kindly justify your response.**
- There should be no change in the current rollout approach. The roll-out conditions for 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz stipulated in the last auctions held in March 2021 are appropriate. No changes are required.
 - Existing approach allows fulfilment of rollout obligations using any technology in any band. This approach may be continued.
 - Continue with current approach of no rollout obligations is a licensee has met it once using any technology. Any new operator should have rollout obligations as defined in NIAs.

Issues related to Spectrum Cap

- Q.23 Whether there is a need to review the spectrum cap for sub-1 GHz bands? If yes, what should be the spectrum cap for sub-1 GHz bands. Kindly justify your response.
- Q.24 Keeping in mind the importance of 3300-3670 MHz and 24.25- 28.5 GHz bands for 5G, whether spectrum cap per operator specific to each of these bands should be prescribed? If yes, what should be the cap? Kindly justify your response.
- Q.25 Whether there should be separate spectrum cap for group of bands comprising of 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands together? If yes, kindly suggest the cap along with detailed justification.
- Q.26 Whether overall spectrum cap of 35% requires any change to be made? If yes, kindly suggest the changes along with detailed justification.
- Q.27 For computation of overall spectrum cap of 35%, should the spectrum in 3300-3670 MHz and 24.25-28.5 GHz bands be included? Kindly justify your response
- Q.28 Any other suggestion regarding spectrum cap may also be made with detailed justification.
- The role of spectrum cap is to ensure that spectrum is used optimally and efficiently whilst ensuring competition and choice for the consumers.
 - The spectrum caps may be revisited by the TRAI keeping in mind the above principles and the quantum of spectrum that is put to auction.

Issues related to Surrender of Spectrum

- Q.29 **What should be the process and associated terms and conditions for permitting surrender of spectrum for future auctions? Kindly justify your response.**
- Q.30 **What provisions may be created in the spectrum surrender framework so that any possible misuse by the licensees, could be avoided? Kindly justify your response.**
- Q.31 **In case a TSP acquires spectrum through trading, should the period of 10 years to become eligible for surrender of spectrum, be counted from the date of original assignment of spectrum or from the date of acquisition through spectrum trading? Kindly justify your response.**
- Q.32 **Whether provision for surrender of spectrum should also be made available for the existing spectrum holding of the TSPs? If yes, what should be the process and associated terms and conditions? Kindly justify your response.**
- Q.33 **Whether spectrum surrender fee be charged from TSPs? If yes, what amount be levied as surrender fee? Kindly justify your response.**
- Surrender of spectrum is a key element of the spectrum reforms announced by the Government in September 2021.
 - Further, the terms and conditions for surrender of spectrum should be kept simple and easy to implement and the surrender fee should be levied only to cover administrative costs.

Issues related to Valuation and Reserve price of Spectrum

Q.34 Which factors are relevant in the spectrum valuation exercise and in what manner should these factors be reflected in the valuation of spectrum? Please give your inputs with detailed reasoning.

- Various factors influence spectrum valuation exercise e.g. Financial health of mobile industry, revenue potential, consumer behavior, digital divide sustainable competition, spectrum for critical services, viability of business model etc. It may be noted that globally 5G has not led to any significant improvements in revenues or ARPUs, and These above factors should be considered in such a manner that outcome of the valuation exercise ensures financial sustainability of the industry.

Q.35 In what manner, should the extended tenure of spectrum allotment from the existing 20 years to 30 years be accounted for in the spectrum valuation exercise? Please support your response with detailed rationale/ inputs.

- It is merely one of the various variables that may impact valuation and all such factors should be accounted for than taking any any factor in isolation. There are instances of countries e.eg Spain that have extended the tenure of a 20 year license for a further 20 years without any additional fees thus giving predictability and certainty to telecom investments. TRAI should not simply transpose the increased number of years into valuation exercise, which otherwise will defeat the very purpose /objective of the Government in extending the tenure of the spectrum licenses.

Q.36 What could be the likely impact of the following auction related telecom reforms announced by the Government in September 2021 on the valuation of various spectrum bands?

- a. Rationalization of Bank Guarantees to securitize deferred annual spectrum payment instalments in future auctions**
- b. No spectrum usage charges (SUC) for spectrum acquired in future auctions**
- c. Removal of additional SUC of 0.5% for spectrum sharing**
- d. Provision for surrender of spectrum**

In what manner, should the above provisions be accounted for in the valuation of spectrum? Please support your response with detailed justification.

- Reform package only helps to address current liquidity challenges given state of affair of the industry e.g. need for investments and cash flows. Package only gives deferment of liabilities, and hence should not have any bearing on the valuation of spectrum.

Q.37 Whether the auction determined prices of March 2021 auction be taken as the value

of spectrum in the respective band for the forthcoming auction in the individual LSA? Should the prices be indexed for the time gap (even if less than one year or just short of one year)? If yes, please indicate the basis/ rate at which the indexation should be done, with reasons.

- Q.38 If the answer to the above question is in negative, whether the valuation for respective spectrum bands be estimated on the basis of the various valuation approaches/methodologies being followed by the Authority in the previous recommendations, including for those bands (in an LSA) for which either no bids were received, or spectrum was not offered for auction?
- Q.39 Whether the method followed by the Authority in the Recommendations dated 01.08.2018 of considering auction determined prices of the auctions held in the previous two years be continued, or the prices revealed in spectrum auctions conducted earlier than two years may also be taken into account? Kindly justify your response.
- March 2021 auctions saw almost 67% spectrum remained unsold hence cannot be a basis for this exercise. Therefore, in the fresh exercise entire past assumptions need to be revisited and industry's ability to generate any incremental revenue at healthy ROCE should be considered
 - Any reference to previous auction prices should not be considered and entire exercise for every band should be afresh keeping market reality in perspective.
- Q.40 Whether the valuation exercise be done every year in view of the Government's intention to have an annual calendar for auction of spectrum? Please support your response with detailed justification.
- Yes, the valuation exercise should be done afresh each year
- Q.41 Whether there is a need to bring any change in the valuation approaches/methodologies followed by the Authority for spectrum valuation exercises in view of the changing dynamics in the telecom sector largely due to the usage of various spectrum bands by the TSPs in a technologically neutral manner? If yes, please provide suggestions along with a detailed justification about the methodology.
- Yes, given industry has seen tectonic changes since 2013 when the present methodologies were set.
 - A new approach should be proportionate to potential revenue generated by additional spectrum bands acquired through the auction.
- Q.42 In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 2500 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of

substitute spectrum bands or any other reasons(s)? Please support your response with detailed justification.

- Q.43 Whether the March 2021 auction determined prices be used as one possible valuation for the spectrum in 2300 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify your response.
- Q.44 Whether auction determined prices of October 2016 (i.e. for the auction held earlier than two years) be used as one possible valuation for the spectrum in 2500 MHz band for the current valuation exercise? If yes, should these prices be indexed for the time gap and at what rate? Please justify.
- Q.45 Whether the value of the spectrum in 2300 MHz/ 2500 MHz bands should be derived by relating it to the value of spectrum in any other band by using technical efficiency factor? If yes, which band and what rate of efficiency factor should be used? If no, then which alternative method should be used for its valuation? Please justify your response with rationale and supporting studies, if any.
- The past various auctions having huge unsold spectrum indicate that past TRAI valuation is totally different to what market expects. Hence past prices cannot be the basis for the present exercise.
 - Technical efficiency approach is not correct since various other factor such as incremental Capex and Opex, incremental revenue, device ecosystem etc have overpowering impact on the real usage of spectrum.
 - In-fact valuation of any band should be based on its economic value and business case i.e. marginal revenue.
- Q.46 In your opinion, what could be the possible reasons for the relative lack of interest for the spectrum in the 700 MHz band? Could this be attributed to technological reason(s) such as development of network/device ecosystem or availability of substitute spectrum bands or any other reasons(s)?
- Q.47 Whether the value of spectrum in 700 MHz band be derived by relating it to the value of other spectrum bands by using a technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your views with rationale and supporting studies, if any.
- Q.48 If your response to the above question is in negative, what other valuation approach(es) be adopted for the valuation of 700 MHz spectrum band? Please support your response with detailed methodology.

- 700MHz spectrum has been unsold in last two auctions, despite due to unrealistically high price. Its price was based on technical efficiency and has failed to consider other variables and realistic assumptions of market need and incremental revenue.
- This band's price should balance goal of rural broadband coverage and GDP growth and can be deployed for 5G last mile for rural broadband.

Q.49 Whether the valuation of the 3300-3670 MHz spectrum band should be derived from value of any other spectrum band by using technical efficiency factor? If yes, what rate of efficiency factor should be used? If no, which other method(s) should be used for its valuation? Please justify your response with rationale and supporting documents, if any.

- Technical efficiency factor being applied to derive spectrum value for 3.5GHz from 1800MHz band pricing should consider factors impacting TCO which are beyond coverage factor of these two bands. And factors such as additional sites, higher capex & opex compared to 1800 band, significant augmentation of fiber, E-band radio, new site build-outs for additional sites.
- Since 3300-3670 MHz, is being auctioned for the first time, the Authority may consider international benchmarks for valuation of these bands.
- While doing any valuation exercise using international benchmarks, the low tariffs ,ARPU and RoCE of India must also be factored in. The pricing of the spectrum should be in proportionate to the revenue potential and the sustainability of the sector.
- Moreover, in case of upper bands, OPEX and CAPEX of TSPs increases due to increase in the deployment of BTS. Hence, substantial reduction is required in spectrum pricing.
- Hence, in light of the above and considering international trend, valuation of 3300-3670MHz may be set at a maximum of 10% of earlier recommended prices. Further, the price of 24.25 - 28.5 GHz band should not be more than 1-2% of price of 3300-3670 MHz spectrum.

Q.50 In case you are of the opinion that frequencies in the range 526- 698 MHz should be put to auction in the forthcoming spectrum auction, whether the value of 526-698 MHz be derived by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.

Q.51 If your response to the above question is in negative, which other valuation approach(es) should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and any other relevant factors.

- Q.52 **Whether the value of spectrum in 24.25 - 28.5 GHz band be derived by relating it to the value of other bands by using technical efficiency factor? If yes, with which spectrum band, should this band be related and what efficiency factor or formula should be used? Please justify your suggestions.**
- Q.53 **If your response to the above question is in negative, which other valuation approaches should be adopted for the valuation of these spectrum bands? Please support your suggestions with detailed methodology, related assumptions and other relevant factors.**
- Q.54 **Whether international benchmarking by comparing the auction determined price in countries where auctions have been concluded be used for arriving at the value of these new bands? If yes, then what methodology can be followed in this regard? Please explain.**
- Q.55 **For international benchmarking, whether normalization techniques be used for arriving at the valuation of these new bands in the Indian context? If yes, please justify your response with rationale /literature, if any.**
- Considering global benchmarks and fact that incremental revenue from mmWave band is likely to be marginal, mmWave pricing should be significantly lower compared to mid-band, e.g. 1-2% of mid-band spectrum.
 - India's price should be normalized on per MHz / ARPU / Population.
 - While doing any valuation exercise using international benchmarks, the low tariffs ,ARPU and RoCE of India must also be factored in. The pricing of the spectrum should be in proportionate to the revenue potential and the sustainability of the sector.
- Q.56 **Whether a common methodology/ approach should be used for valuation of all sub-1 GHz bands, which are currently planned for IMT? If yes, suggest which methodology/ approach should be used. Please give your views along with supporting reasoning and documents/ literature, if any.**
- No, Valuation of any spectrum band should be based on its economic value & business case.
- Q.57 **Whether the extrapolated ADP based on a time-series analysis, may be considered as the valuation itself or some normalization may be performed taking into account the financial, economic and other parameters pertaining to a particular auction? If yes, which factors should be considered and what methodology should be followed?**
- Q.58 **Whether the value arrived at by using any single valuation approach for a particular spectrum band should be taken as the appropriate value of that band? If yes, please suggest which single approach/ method should be used. Please justify your response.**
- Q.59 **In case your response to the above question is negative, will it be appropriate to**

take the average valuation (simple mean) of the valuations obtained through the different approaches attempted for valuation of a particular spectrum band, or some other approach like taking weighted mean, median etc. should be followed? Please justify your response.

- 500MHz,600MHz,700MHz,3300-3670MHz, mmWave – bands do not have any reference price for ADP and no trend-line can be determined for the same. Other bands have also remained significantly unsold in past auctions hence the entire exercise should be done afresh for every band.
- The Valuation of the respective spectrum band should be based on its economic value & business case, and proportionate to the potential revenue generated by the additional spectrum bands acquired through the auction.

Q.60 Is there any valuation approach other than those discussed above or any international auction experience/ approach that could be used for arriving at the valuation of spectrum for 700 MHz/ 800 MHz/ 900 MHz/ 1800 MHz/ 2100 MHz/ 2300 MHz/ 2500 MHz/ 3300-3670 MHz/ 24.25 - 28.5 GHz/ 526 - 698 MHz bands? Please support your suggestions with a detailed methodology and related assumptions.

- Please See response to previous question

Q.61 Should the reserve price be taken as 80% of the valuation of spectrum? If not, then what ratio should be adopted between the reserve price for the auction and the valuation of the spectrum in different spectrum bands and why?

- Analysis of outcome of TRAI's past auction indicate that even 80% level has not discovered market price due to fact significant spectrum went unsold. Therefore, the new ratio should be taken as 50% of spectrum value.

Q.62 Whether the realized/ auction determined prices achieved in the March 2021 auction for various spectrum bands can be directly adopted as the reserve price in respective spectrum bands for the forthcoming auction? If yes, should these prices be indexed for the time gap since the auction held in March 2021 and at which rate the indexation should be done?

- In 2021 (as was the case in previous auctions as well), majority of the spectrum put up for auction remained unsold primarily due to the high reserve price.
- It is thus evident that valuation Prices as per last auctions are not sustainable and there is a need for fresh outlook for the valuation of the spectrum in the forthcoming auction.
- Thus, the auction determined prices of March 2021 auction should not be taken as the value of spectrum in the respective band for the forthcoming auction in the

individual LSA. Further, the approach thus far of indexing the last auction prices needs to be revisited and done away with.

Q.63 Should the method followed by DoT in the previous auction in respect of collecting bid amount from the successful bidder in case spectrum is not available in a part of the LSA be followed in the forthcoming auction? Please justify your response in detail.

- In the context of partial allocation of spectrum wherein the bids are sought for the spectrum in entire LSA but the spectrum is not available in some of the districts of that LSA, the previous method followed by DoT for collection of bid amount from the successful bidder should be continued with.

Q.64 What percentage rate of upfront payment should be fixed in case of each spectrum band?

- Recent Cabinet reforms were brought in to help industry tide over cash-flow by using moratorium option.
- There should not be any requirement of upfront payment for upcoming auctions.

Q.65 What should be the applicable period of moratorium for deferred payment option?

Q.66 How many instalments should be fixed to recover the deferred payment?

- The requirement for making upfront payment should be done away with for the upcoming 5G auction.
- We suggest a 6-year moratorium for the deferred payment option.
- We suggest that deferred payments may be recovered in 24 instalments after the 6-year moratorium

Q.67 What rate of discount should be used while exercising pre- payment/deferred payment option, in order to ensure that the net present value of payment/ bid amount is protected?

(Please support your suggestions for Q64 to Q67 with proper justifications.)

- High interest on deferred spectrum payments ultimately burdens the TSPs' finances and impairs their ability to make investments for network rollout.
- Thus, the interest rates on deferred payment instalments may be lowered to be in line with repo rate prevailing in the country.
- To alleviate financial burden on the TSPs and for fasted 5G rollout, interest rates be kept low in line with repo rate.

Issues related to Spectrum for Private Cellular Networks

Q.68 To facilitate the TSPs to meet the demand for Private Cellular Networks, whether any change(s) in the licensing/policy framework, are required to be made. If yes, what changes are required to be made? Kindly justify your response.

Q.69 To meet the demand for spectrum in globally harmonized IMT bands for private captive networks, whether the TSPs should be permitted to give access spectrum on lease to an enterprise (for localized captive use), for a specific duration and geographic location? Kindly justify your response.

Q.70 In case spectrum leasing is permitted,

- i. Whether the enterprise be permitted to take spectrum on lease from more than one TSPs?
- ii. What mechanism may be prescribed to keep the Government informed about such spectrum leasing i.e., prior approval or prior intimation?
- iii. What timeline should be prescribed (in number of days) before the tentative date of leasing for submitting a joint request by the TSPs along with the enterprise, for approval/intimation from/to the Government?
- iv. Whether the spectrum leasing guidelines should prescribe duration of lease, charges for leasing, adherence of spectrum cap provisions, roll out obligations, compliance obligations. If yes, what terms and conditions should be prescribed?
- v. What other associated terms and conditions may be prescribed?
- vi. Any other suggestion relevant to leasing of spectrum may also be made in detail.

(Kindly justify your response)

- Mobile operators are best suited to deliver necessary support to industrial use cases, and support private cellular networks in India and they have experience to run efficient networks for various use cases and solutions
- With network slicing, leasing as options, TSPs can serve requirements of private networks.
- Also allow TSPs to offer access spectrum on lease to an enterprise on commercially negotiated duration and price.
- No prior approval should be required, just intimation should be sufficient.

Q.71 Whether some spectrum should be earmarked for localized private captive networks in India? Kindly justify your response

Q.72 In case it is decided to earmark some spectrum for localized private captive networks, whether some quantum of spectrum be earmarked (dedicatedly) from the spectrum frequencies earmarked for IMT services and/or spectrum frequencies earmarked for non-IMT services on location-specific basis (which can coexist with cellular-based private captive networks on shared basis)? Kindly justify your response with reasons.

Q.73 In case it is decided to earmark some quantum of spectrum for private captive networks, either on exclusive or shared basis, then

- a) Spectrum under which band(s) (or frequency range) and quantum of spectrum be earmarked for Private Network in each band? Inputs may be provided considering both dedicated and shared spectrum (between geographically distinct users) scenarios.
- b) What should be the eligibility conditions for assignment of such spectrum to private entities?
- c) What should be the assignment methodology, tenure of assignment and its renewal, roll-out obligations?
- d) What should be the pricing mechanism for assignment of spectrum in the band(s) suggested for private entities for localized captive use and what factors should be considered for arriving at valuation of such spectrum?
- e) What should be the block size and spectrum cap for different spectrum band(s) suggested in response to point (a) above.
- f) What should be the broad framework for the process of
 - (i) Filing application(s) by enterprise at single location, enterprise at multiple locations, Group of companies.
 - (ii) payment of spectrum charges,
 - (iii) assignment of frequencies,
 - (iv) monitoring of spectrum utilization,
 - (v) timeline for approvals,
 - (vi) Any other
- g) Any other suggestion on the related issues may also be made with details.
(Kindly justify your response with reasons)
 - Private networks should continue to be offered only by licensed TSPs as they can ensure that the widest provision of services amongst consumers and industry verticals.
 - A working group may be set up by TRAI to examine issues related to spectrum leasing and introduction of a framework for the same. This would be in line with the approach followed for spectrum trading and spectrum sharing.
 - Localized captive networks will lead to a sub optimal use of spectrum and would also

be against the principles of level playing field.

- No spectrum should be set aside from any 5G/IMT spectrum band for localized private captive networks. This will cause loss to exchequer, risk 5G rollout that requires broad, contiguous bands of spectrum to support applications well. It will also disturb level playing field and concerns on Law enforcement / LI requirements

Q.74 **What steps need to be taken to facilitate identification, development and proliferation of India specific 5G use cases for different verticals for the benefit of the economy and citizens of the Country? Kindly provide detailed response with rational**

- We believe that the use cases for 5G would emerge from the market and the need of the hour is to ensure a robust ubiquitous world class 5G networks and infrastructure that are capable of supporting the various 5G use cases and the needs of industries and consumers.
- Government should become anchor tenant.
- Building R&D ecosystem, formulation of test beds can provide proof of concept and study of use cases.
- For accelerated 5G deployment collaboration among stakeholders is needed.