

Source: NTT DOCOMO, INC.  
Agenda item: 4.3

# **Study on above 71 GHz frequency range**

NTT DOCOMO, INC.

- In Rel-16, RAN-level study on scenarios and requirements for above 52.6 GHz (52.6 – 114.25 GHz) was performed, and TR38.807 is available
- In Rel-17, considering the urgency i.e., spectrum availability and workload aspects, SI/WI on 52.6 - 71 GHz frequency range was approved with reusing existing NR waveform design
- Higher frequency range such as above 71 GHz is also promising to provide wide bandwidth for very high throughput
  - It can potentially be one of key aspects for “5G-Advanced”
- Therefore, it is important to discuss when/how to unlock the above 71 GHz frequency range for 3GPP system

- **3GPP RAN should discuss on when/how to unlock the above 71 GHz frequency range as part of Rel-18 scope discussion**
  
- **The study on above 71 GHz should start from fundamental aspects such as waveform design, numerology, channel and transmitter/receiver RF models**
  - **Phased studies for a long-term project (e.g., across multiple releases) can be considered**
  - **For the study on waveform design for above 71 GHz, low PAPR waveform (other than CP-OFDM/DFTS-OFDM) should be studied**
  
- **The target frequency range for the study should be 71 – 114.25 GHz**
  - **Fragmentation for below 71 GHz frequency range should be avoided**

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# Appendix

- Waveform design for frequency range between 71 and 114.25 GHz:
  - Study whether **low PAPR waveform instead of CP-OFDM** should be considered to minimize PA backoff and improve power efficiency, meanwhile, high SE and compatibility with CP-OFDM are still preferable
  - Waveforms adopted in current NR specifications, **CP-OFDM & DFT-s-OFDM**, should be served as a starting point.
  - **The enhancement schemes based on CP-OFDM and DFT-s-OFDM** should not be precluded
- Numerology for frequency range between 71 and 114.25 GHz:
  - Study whether **SCS and/or CP** should be revisited, based on the outcome of R17 B52.6G WI
- Channel and transmitter/receiver RF models for frequency range between 71 and 114.25 GHz, especially:
  - Phase noise modeling
  - PA model