

5th GENERATION RADIO (5G)

SCHEDULE

- Standards to be completed 2016-18
- Deployment ~2020

DRIVERS

- High-speed data
- Machine-to-machine (M2M)
 - Smart grid
 - Smart homes and cities
 - E-health

SPECIFICATION GOALS

- 1000x the system capacity of 4G
- 10x 4G's
 - spectral efficiency
 - energy efficiency
 - peak data rate
 - 10G low mobility
 - 1G high mobility

TECHNOLOGIES

- Massive MIMO Multiple antenna system and DSP for higher data capacity
- Add new spectrum: mmWave frequency (3 to 300GHz)
 - Promising bands
 - 28-30GHz
 - 60GHz license-free
 - E-band: 71-76, 81-86 and 92-95GHz

POSSIBLE DIRECTIONS AND IDEAS

- Energy efficient
 - RANs currently consume 70% of overall power
 - Cloud-RAN
 - Base station to cloud
 - Base station virtualisation
- Spectral efficiency
- Full - duplex Simultaneous transmit and receive
- Low end-to-end latency
- Rethinking of cells within the radio access network
- M2M support Huge numbers of low-rate devices
- Network densification
 - Space Large numbers of small cells
 - Self-organising networks
 - Interference cancellation
 - Frequency Using spectrum in diverse bands
- 5G devices become nodes of the Internet A source and sink of information

ORGANISATIONS & R&D PROGRAMMES

- ETSI Framework 7
 - 5GNOW
 - METIS
- 5G Research Centre (UK)
- IMT-2020 Forum