5G for Smart Utilities and Smart Cities

Speaker : Ashok Kumar, Director (WA), NTIPRIT

There are over 2 billion cellular IoT connections and it is expected to grow to around 5 billion connections by 2025

Topics

5G Key Capabilities and Potential use cases for smart Utilities and Smart Cities

- Enhanced Mobile Broadband (eMBB)
- 5G Ultra Reliable Low Latency Communications (uRLLC)
- 5G Massive Machine Type Communications (mMTC)

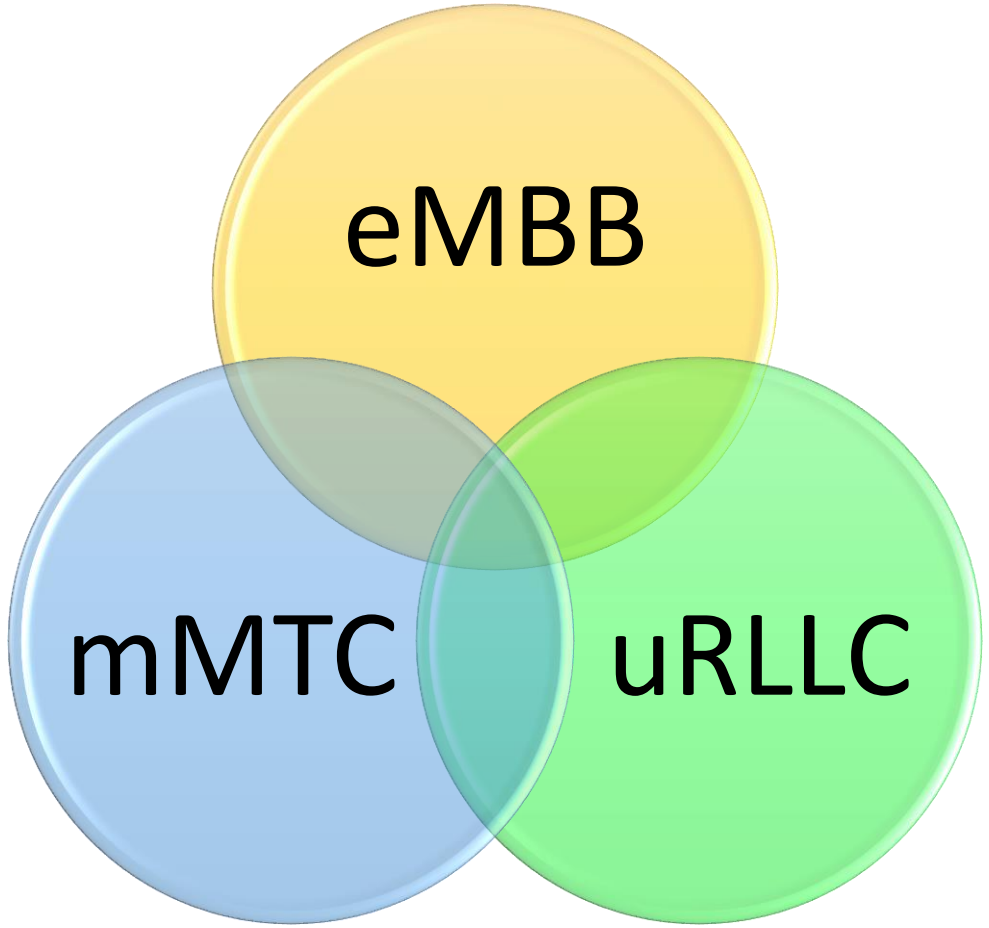
Coexistence of Cellular Technologies (NB IoT and LTEm with 5G)

Promise of 5Gi

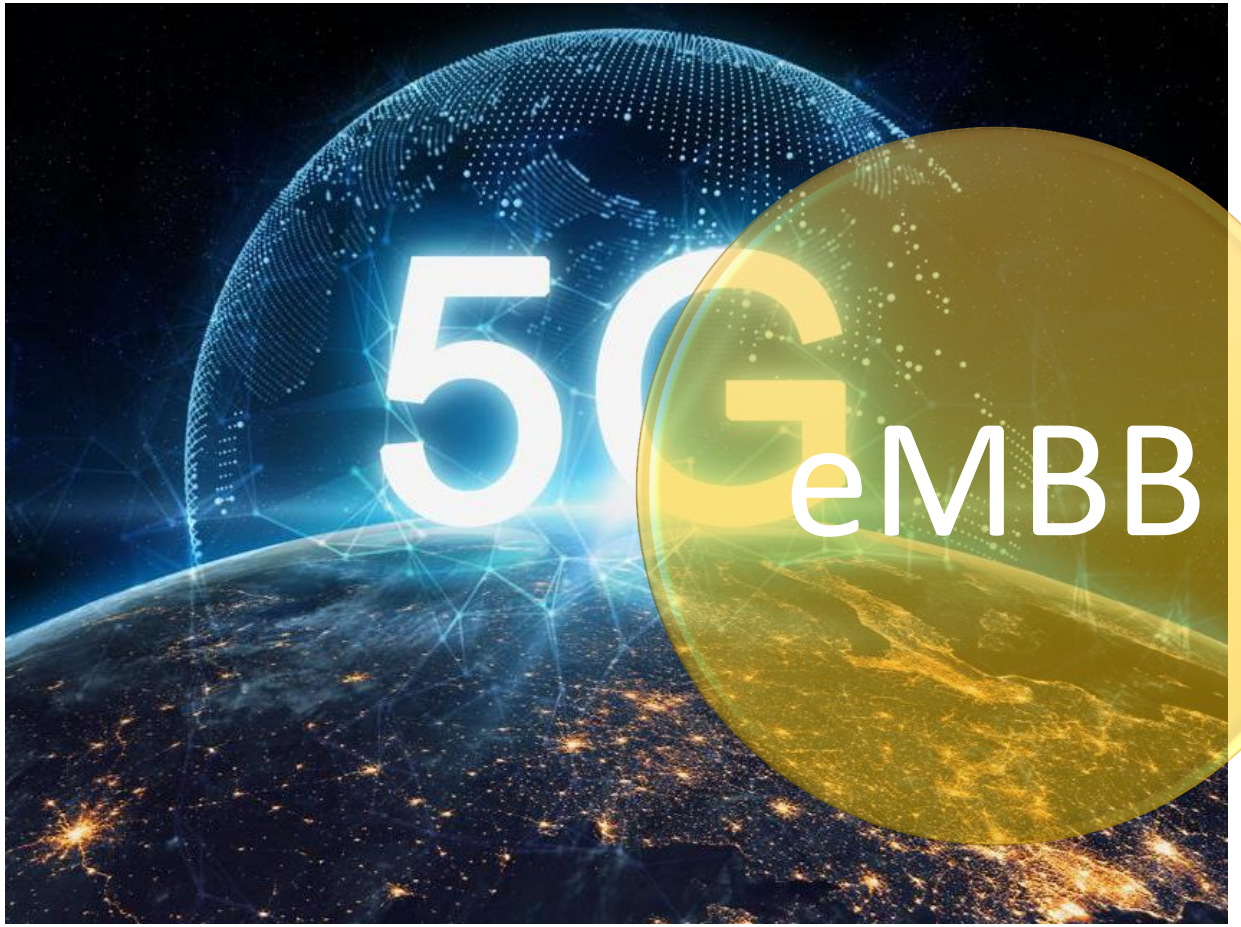
Redcap 5G NR for new IoT use cases

Convergence of Mobile and Power Infrastructure

ITU defined 5G Usage Scenarios

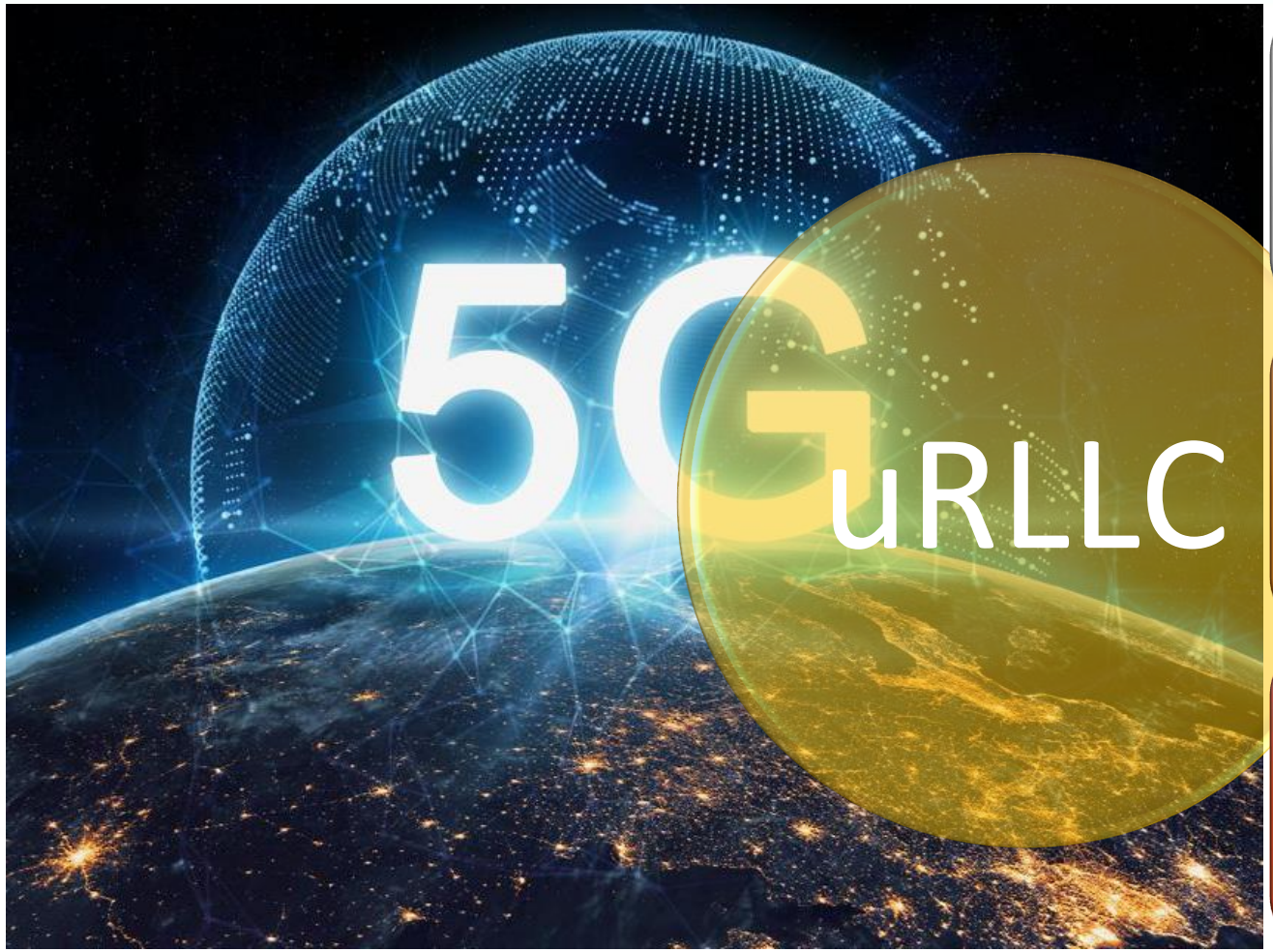


5G Enhanced Mobile Broadband



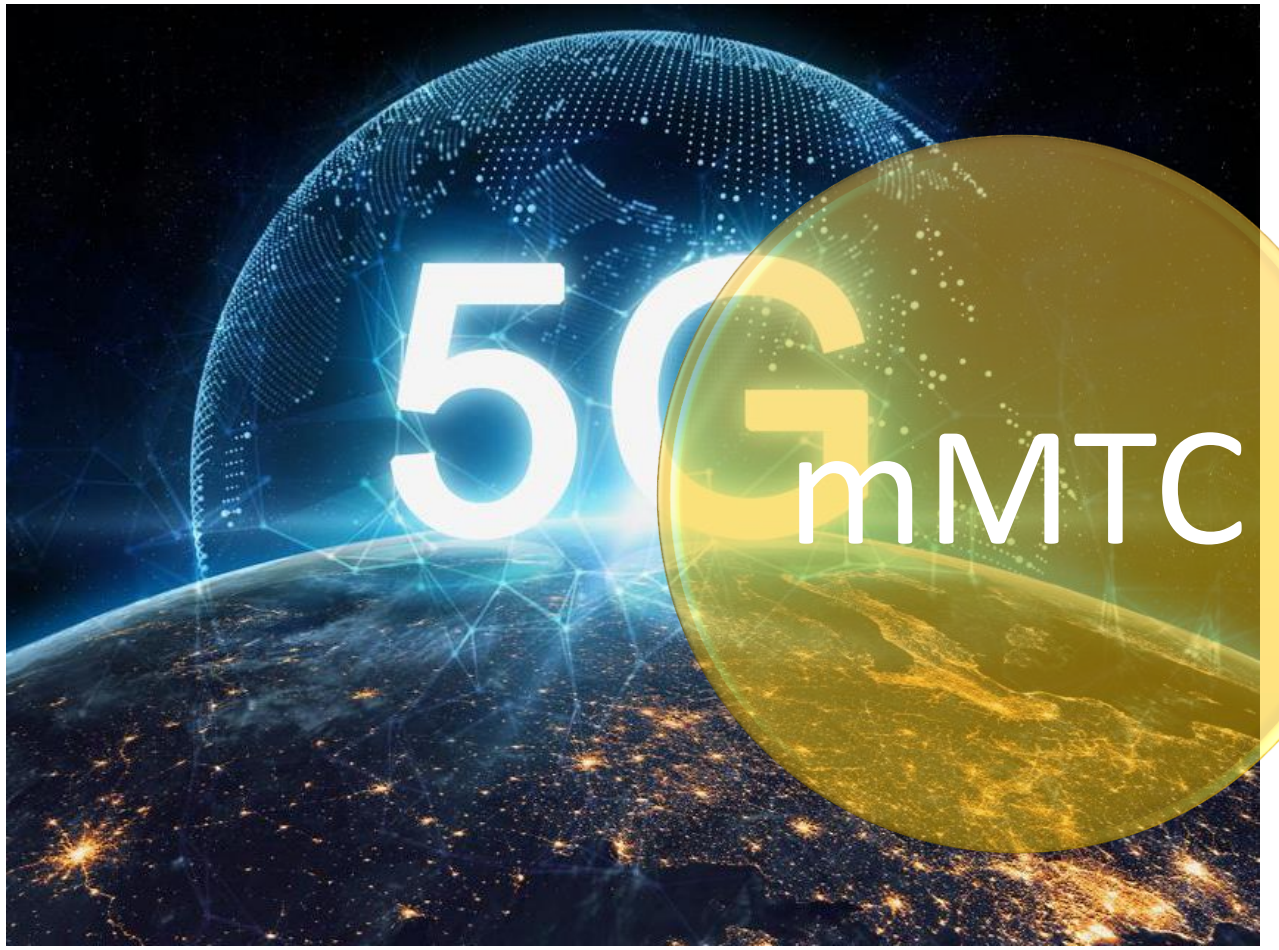
Peak Data Rate	• Downlink 20 Gbit/s. • Uplink 10 Gbit/s.
Peak Spectral Efficiency	• Downlink 30 bit/s/Hz. • Uplink 15 bit/s/Hz.
User Experience Data Rate	• Downlink 100 Mbit/s. • Uplink 50 Mbit/s.
Mobility	• 500 Km/Hour

5G Ultra Reliable Low Latency Communications



User Plane Latency	• 1ms
Reliability	• Ultra Reliable
Mobility Interruption	• 0ms

5G Massive Machine Type Communications



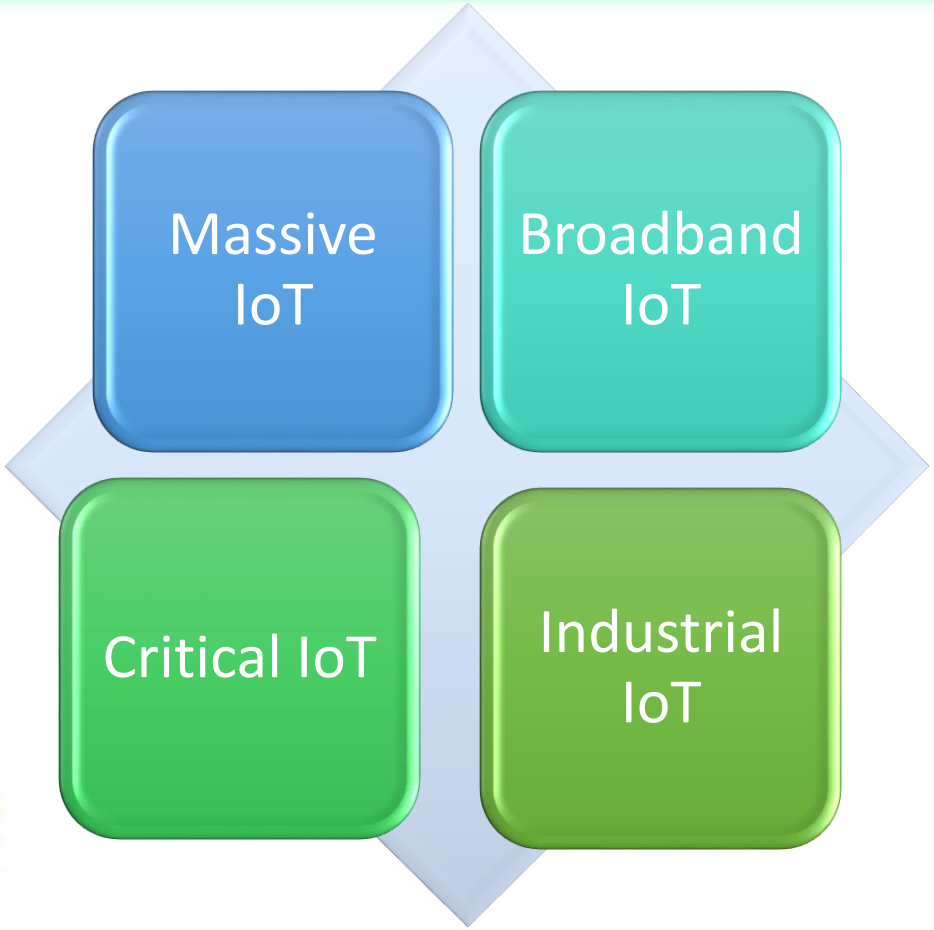
Connection Density

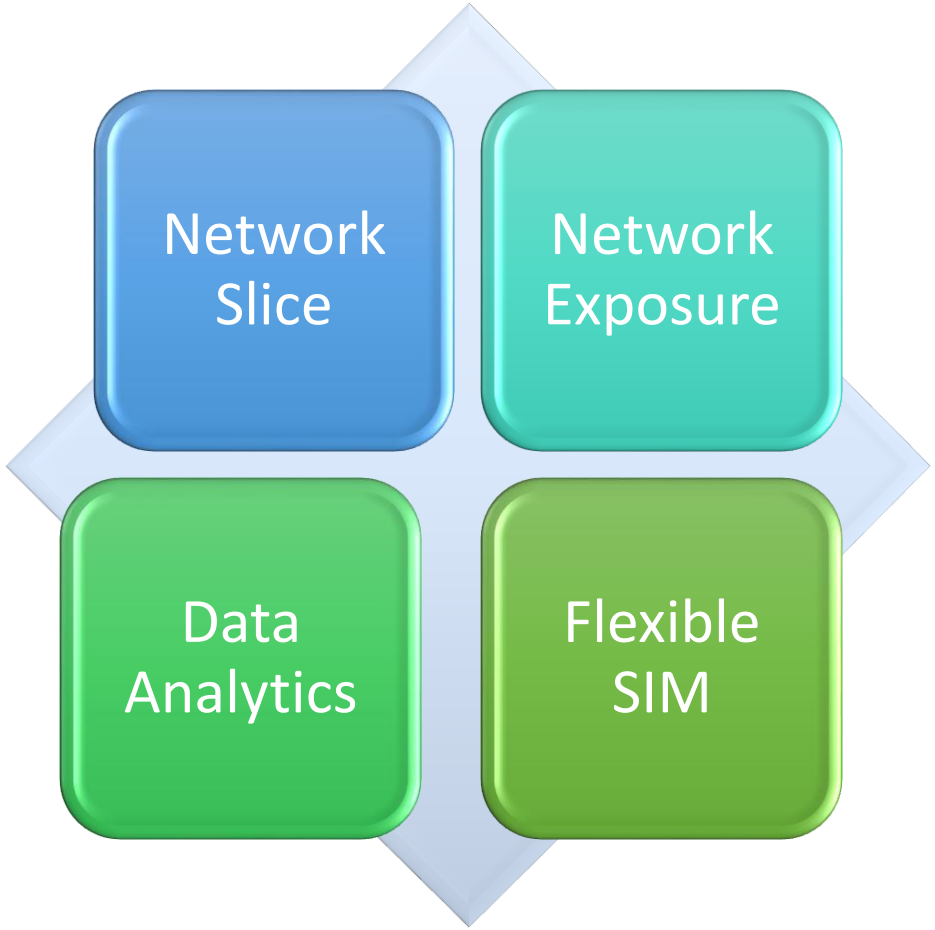
- 1 000 000 devices per km^2

Energy Efficiency

- Efficient data transmission in a loaded case;
- Low energy consumption when there is no data.

5G Supports all IoT requirements



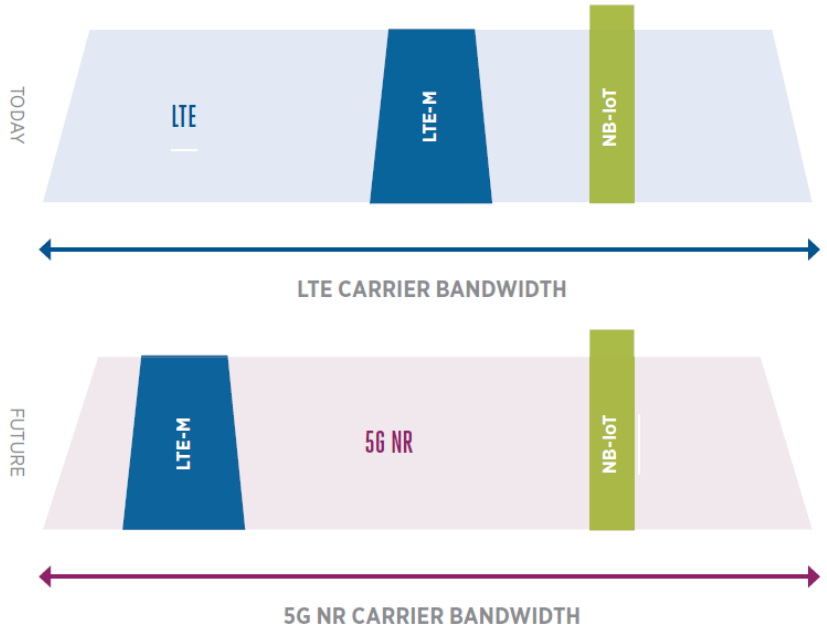


NB IoT and LTE m coexistence with 5G NR

NB IoT and LTE m coexistence with 5G NR

The NB-IoT and LTE-M are designed for IoT applications and offer low cost, long battery life, ubiquitous coverage and high system capacity.

NB-IoT and LTE-M will coexist with 5G NR

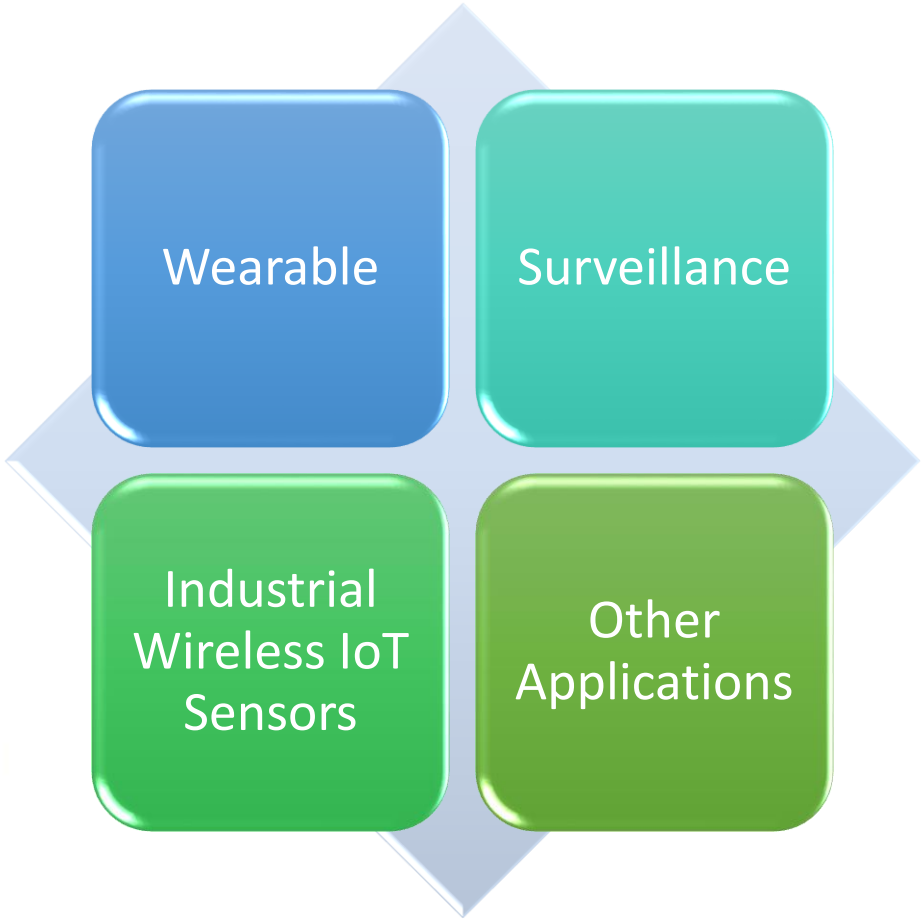


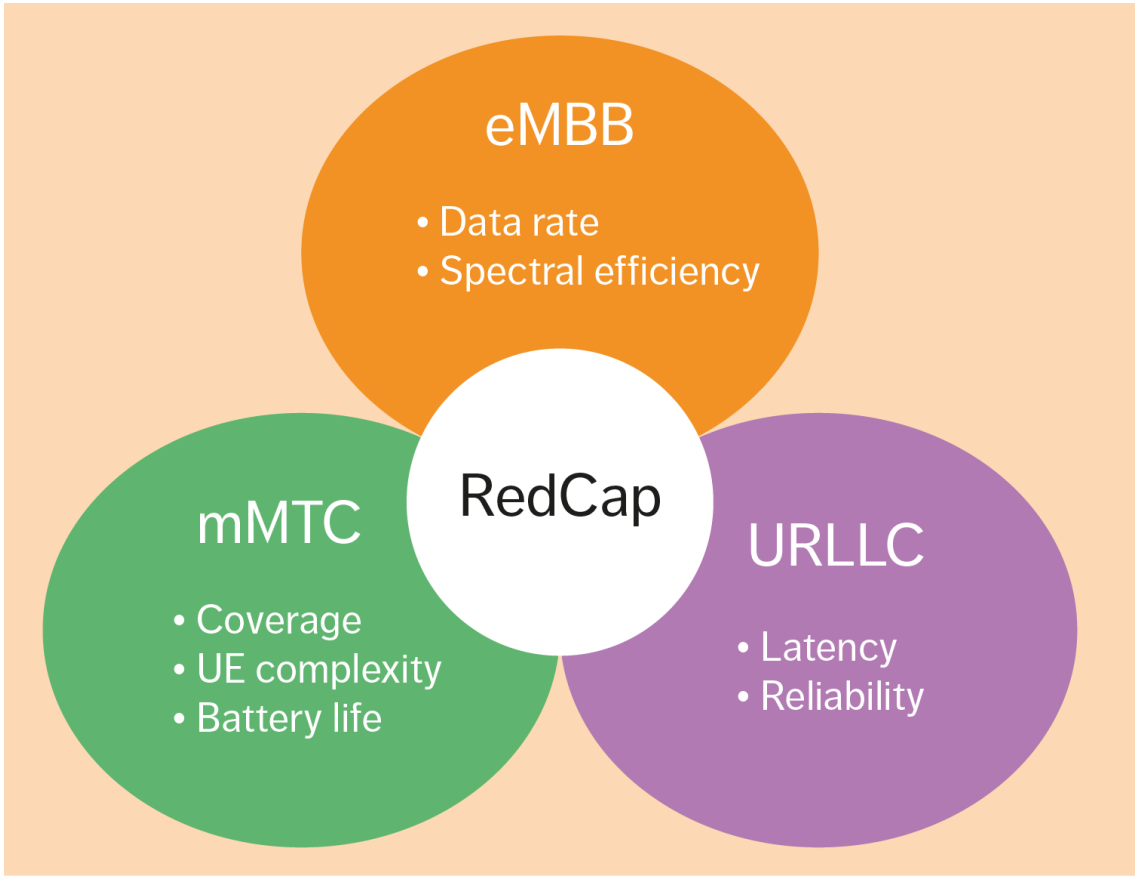
5Gi

Part of Release 17

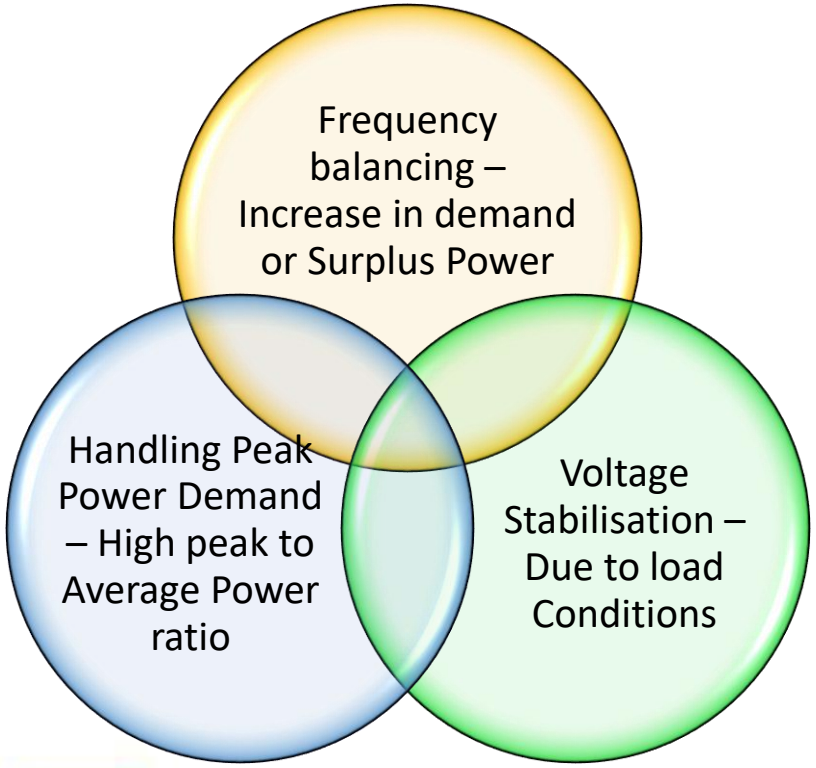
Can provide wide Coverage requirement

5G Redcap

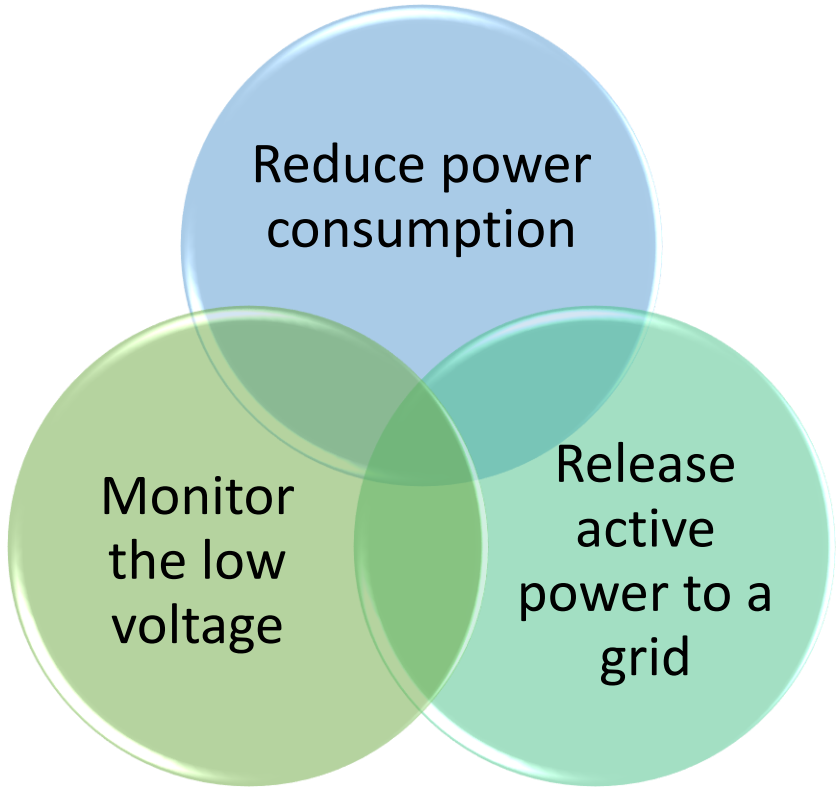

Wearable
Surveillance
Industrial Wireless IoT Sensors
Other Applications


eMBB
• Data rate
• Spectral efficiency
RedCap
mMTC
• Coverage
• UE complexity
• Battery life
URLLC
• Latency
• Reliability

New opportunities for TSOs/ DSOs to use mobile networks infrastructure to address future power grid challenges.



Mobile networks consist of Lakhs of mobile towers with battery backup geographically distributed countrywide and connected to local grids, with concentration linked to populated and densified areas.



Power Assets used by TSPs and TSPs asset used by TSOs/DSOs

Thank You

For discussions/suggestions/queries email: www.indiasmartgrid.org
www.isgw.in
Links/References (If any)

India Smart Grid Forum
CBIP Building, Malcha Marg,
Chanakyapuri,
Delhi-110021
Website: www.indiasmartgrid.org