

NOVA

5G networks

As enabler to economy digitization

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5G Journey



Growing 5G footprint , starting with DSS in 2100Mhz



C-Band for capacity and throughput upscale



MU-MIMO and beam forming in order to maximize spectrum and power efficiency



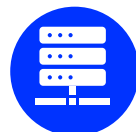
LNR700 for deep indoor and rural



Spectrum refarming to serve growing needs in 5G



5G terminals penetration is growing in line to EU trends however still <30%



Stand alone 5G Core

5G

Coverage

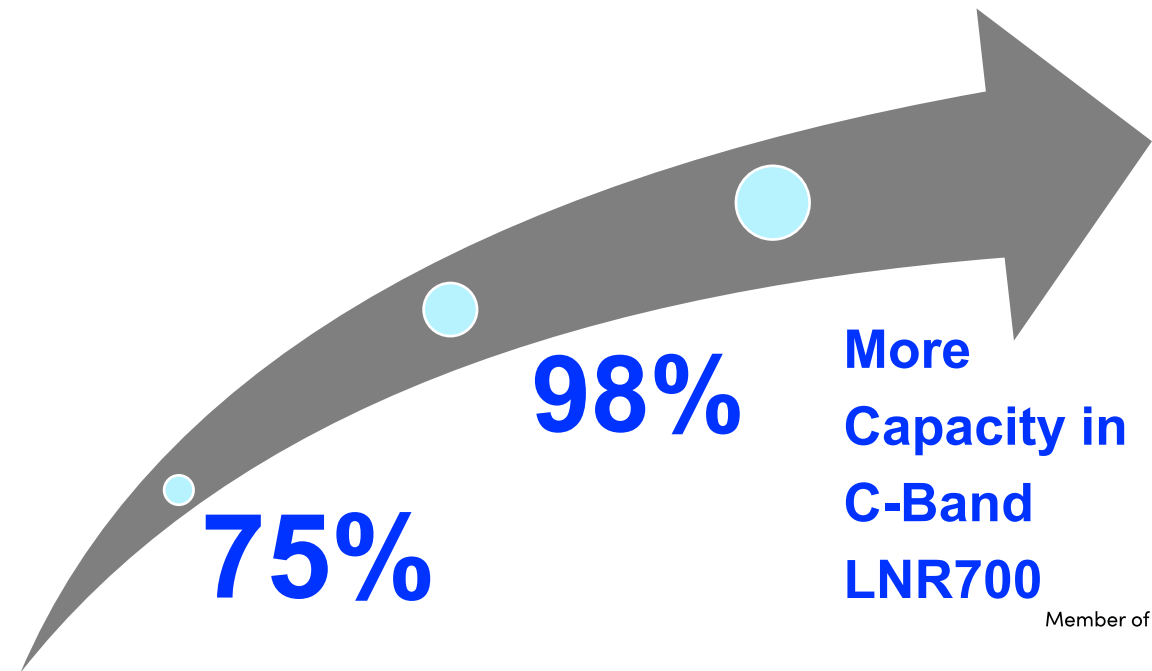
75%

By end of 2023

x5 YoY 5G Traffic

250m RAN € investment in 5Ys

5G coverage is Growing Fast

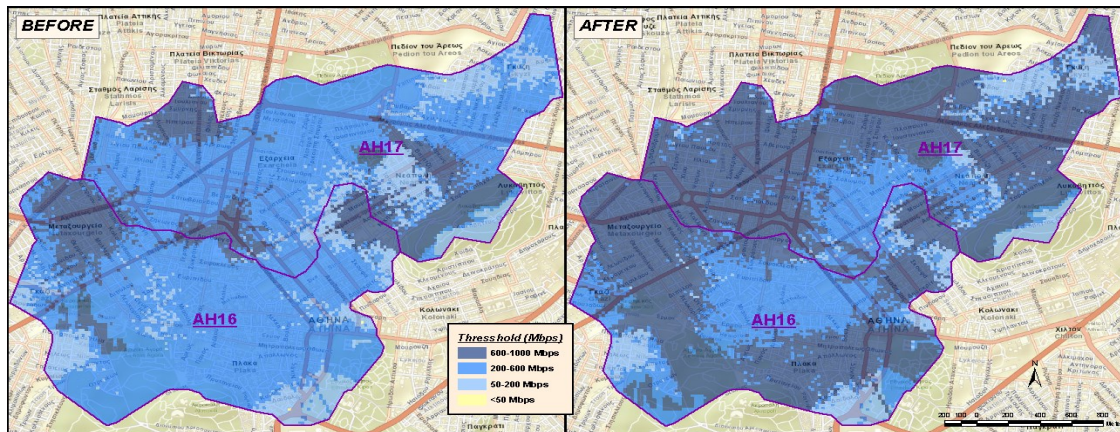
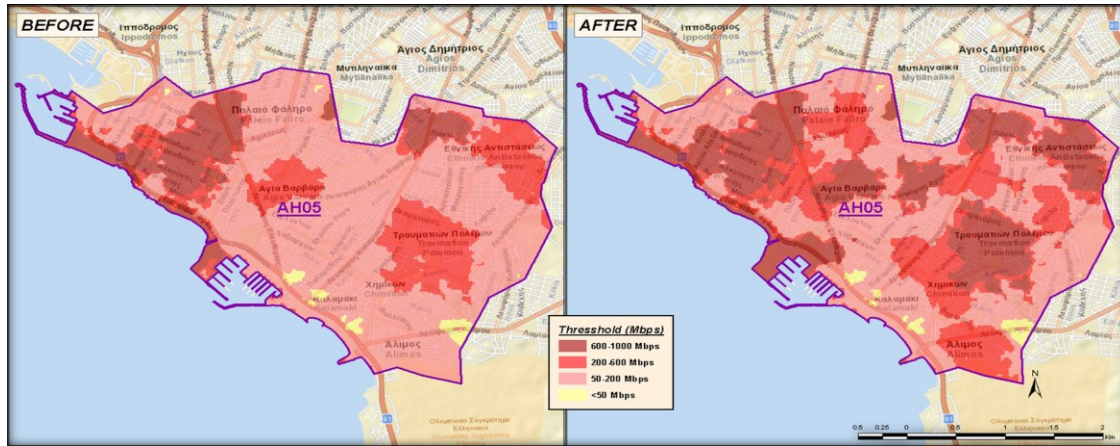


5G contribution to Gigabit society

From quick 5G Footprint to Gigabit service level

60% ICNIRP – Greek case

100% ICNIRP



Medium term Service level target in the order of 600Mbps-1Gpbs



EFM limits are challenging . 50% more sites will be needed.




Sites acquisition and upgrades pace is limited by Environment hostility and Licensing ecosystem


New Challenges and Communication needs to be served

Different connection objects

Traditional
People




Local Campus
Things




Different connection requirement

Traditional
Best effort



Local Campus
Consistent Experience

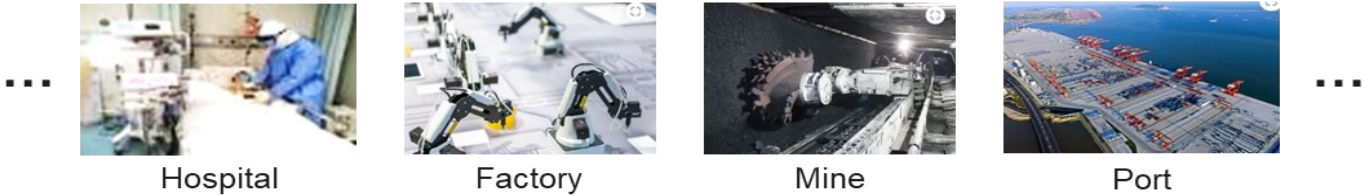



Different traffic model

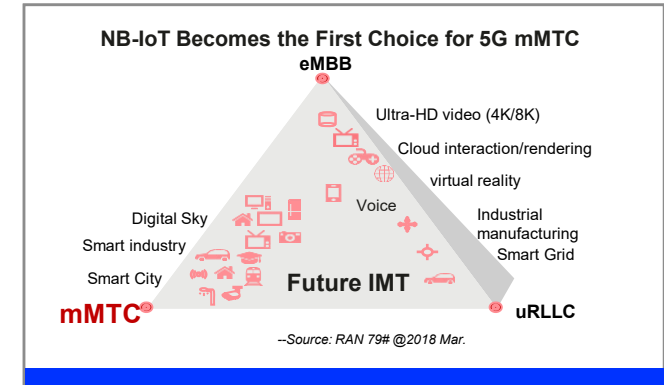
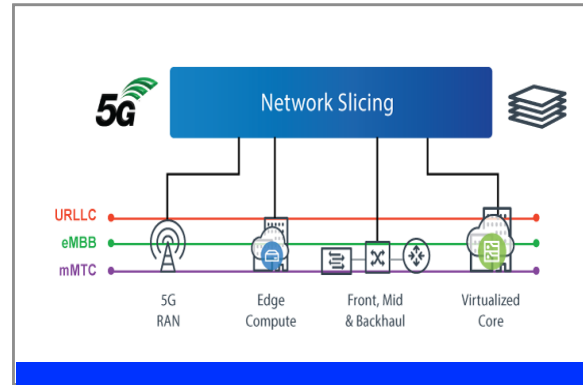
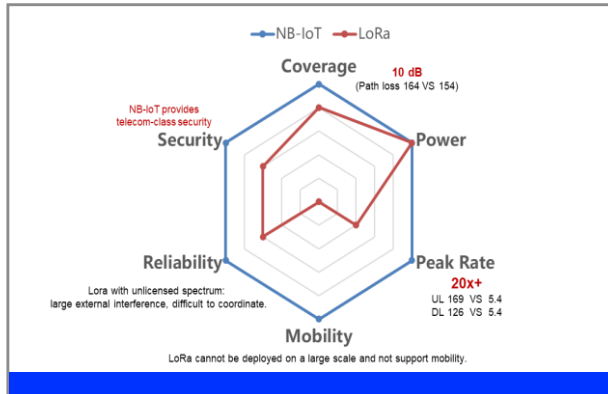
Traditional
DL



Local Campus
DL & UL



Cellular based IoT (C-IoT) and network slicing



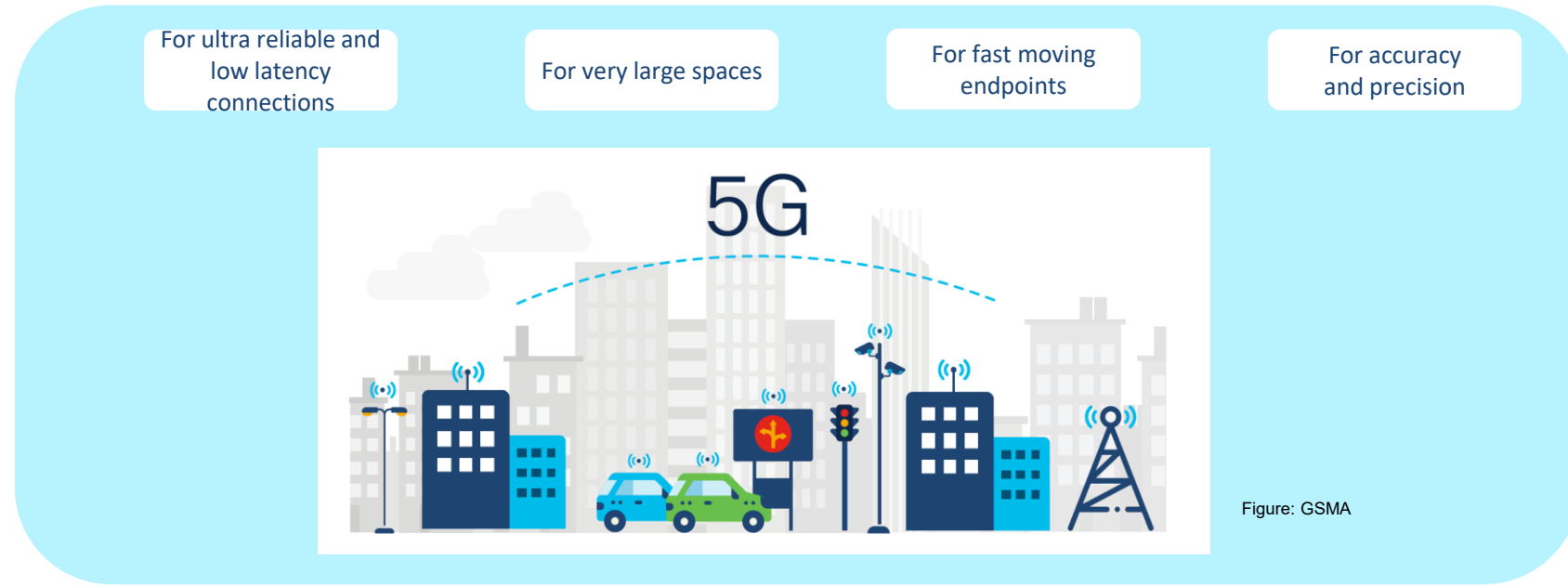
A new Era of Services
 and
 Monetization opportunities

- Functional components and resources** may be shared across **network slices**, capabilities such as **data speed, capacity, connectivity, quality, latency, reliability**, and services can be customized in each slice to conform to a specific **Service Level Agreement (SLA)**.
- Enhanced Mobile Broadband (eMBB)** use cases which are high-bandwidth, video-centric, and generate the most traffic on a mobile network.
- Internet of Things (IoT)** use cases, supported by massive Machine Type Communication (mMTC), connecting billions of devices to the network .
- Ultra-reliable Low-Latency Communications (urLLC)** use cases that address activities like remote surgery or vehicle-to-X (v2x) communication, which require edge computing to reduce latency.



- Network capabilities are exposed to Service developers via APIs **creating a new service providers ecosystem**.
- Worldwide service companies are developing new service flavors ;thus **resulting to an unlimited variety of services**.
- New monetization opportunities and business models** will emerge due to slicing . i.e Dynamic , on demand reservation of network resources, capabilities , SLAs

5G based Smart city & Mobile private Networks

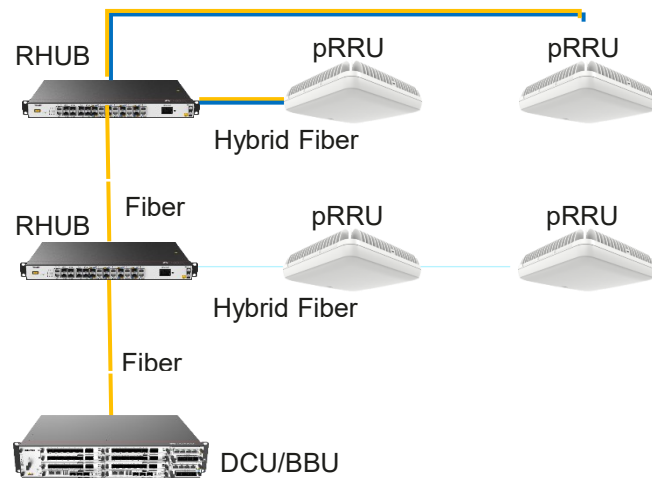
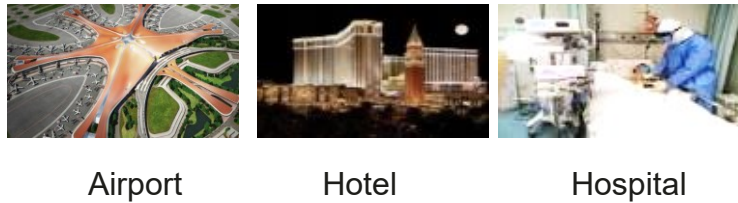


- 5G Radio technology efficiency including the share of costs between retail 5G and private C-IOT network.
- Mobile private network capacity / security / QoS warranty
- C-IoT scale economies , including worldwide device developments and off the self implementations
- New monetization opportunities.
- 5G Core network slicing and edge computing
- Compatibility with a growing number of 5G use cases including autonomous driving , smart grid, AR , smart industry e.t.c.

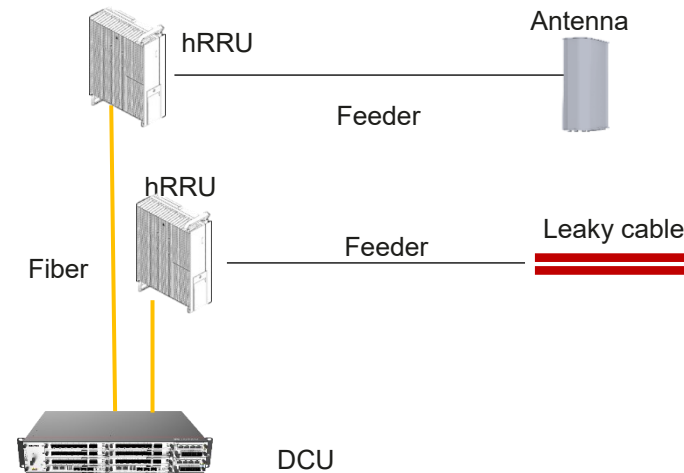
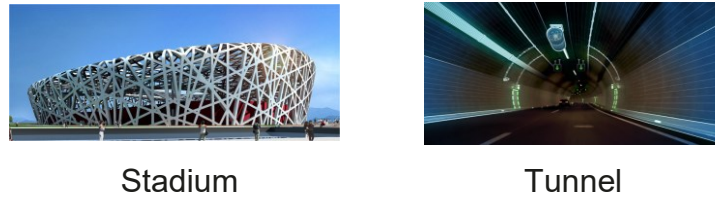
Indoor Solutions shall be adapted for high traffic / Throughput Pico cells and front hauling to be largely deployed

- Structured FO, Feeder or hybrid cables
- Pico cells emitters, distributed antennas and front hauling / equipment
- Leaky feeders shall be embedded to infrastructure where needed.

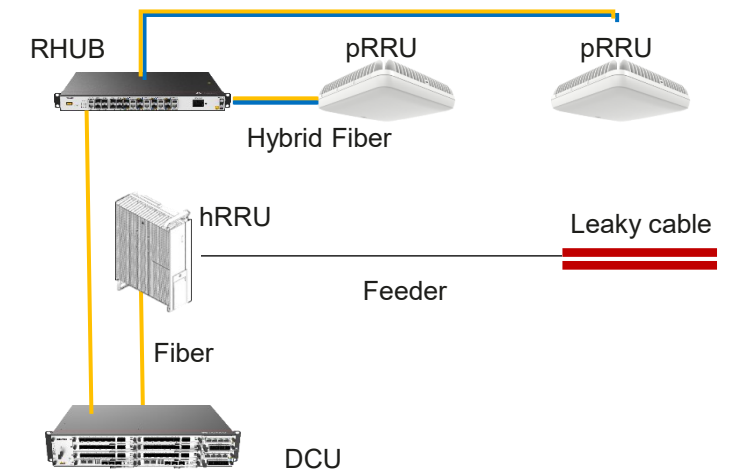
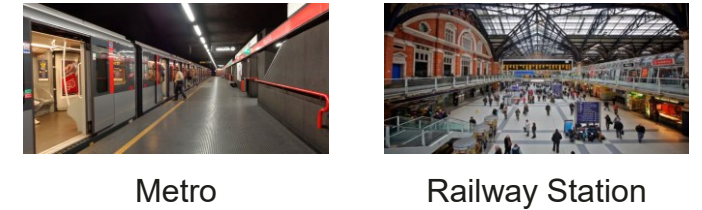
① Low Output Power



② High Output Power



③ Hybrid Scenario



Digital Economy

Powered by 5G

Conclusive Key elements of Success

Top Mobile Services



- Best in Class Mobile Coverage including 5G C-Band service
 - Deep indoor 5G coverage for all residential and business points of presence.
 - Gigabit society user experience at any place any time.
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5G Innovation



- IoT connectivity that is reliable and in line with industry standards and global trends.
 - Massive IoT, Ultra low latency services and 5G Network slicing will guarantee compatibility with Industry 4.0 use cases.
 - Mobile private networks
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Futureproof



- Based on technological excellence .
- Take advantage of exponential technologies and developments around 5G.
- Enjoy 5G global scale that will unavoidably drive IoT devices and associated connectivity.

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