3GPP – On the road to 6G

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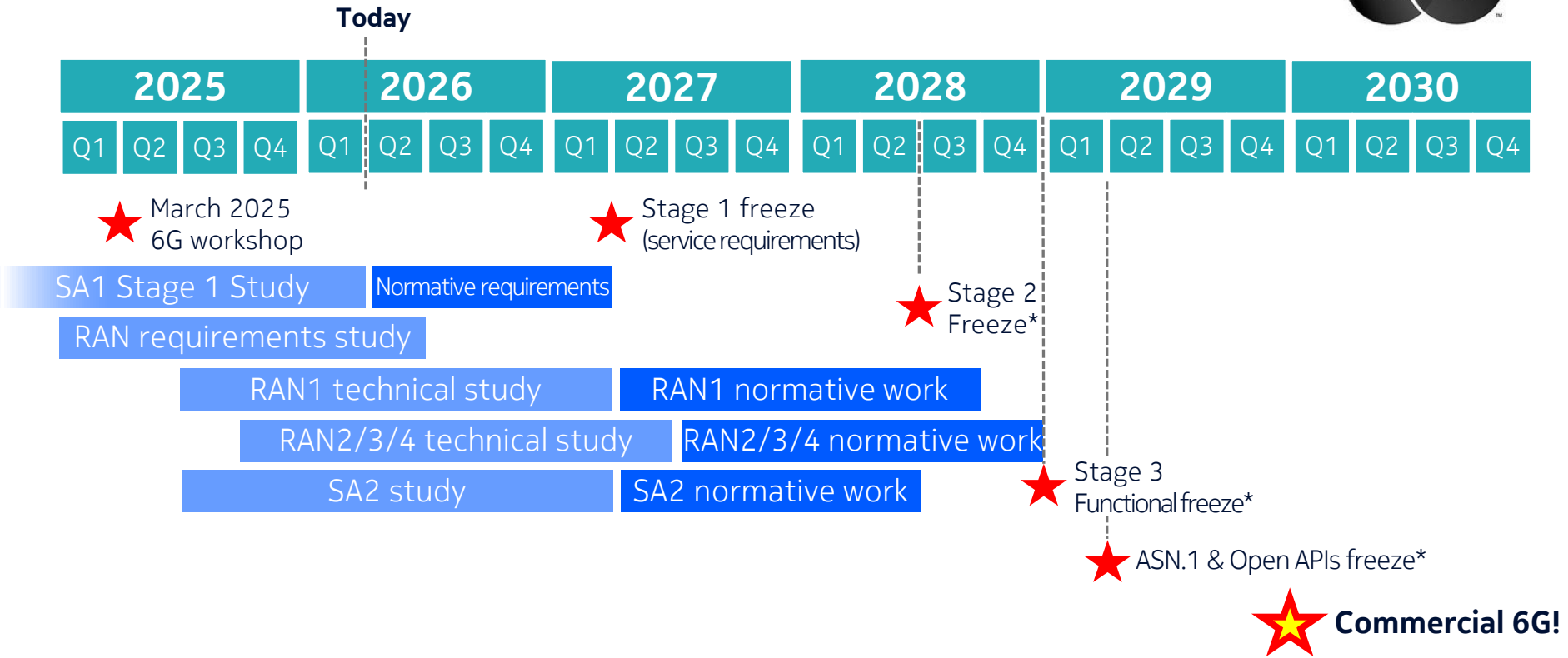
International Workshop on
6G Standardization,
New Delhi, 18th March 2026

One year ago….
First 6G Workshop in 3GPP

Timeline to commercial 6G



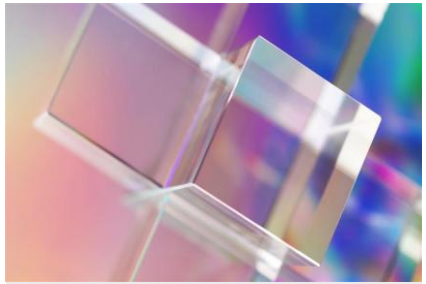
* To be confirmed in June 2026

A single drop for 6G Day-1

Soon enough to
meet early demand

Late enough to
ensure quality specs

Key considerations for architecting the 6G network



Performant

Driving performance, network efficiency, innovation, and unlocking a new spectrum to fuel economic growth

Intelligent

Leveraging AI for network design, optimization, and operation, while ensuring seamless connectivity for devices and applications

Sustainable

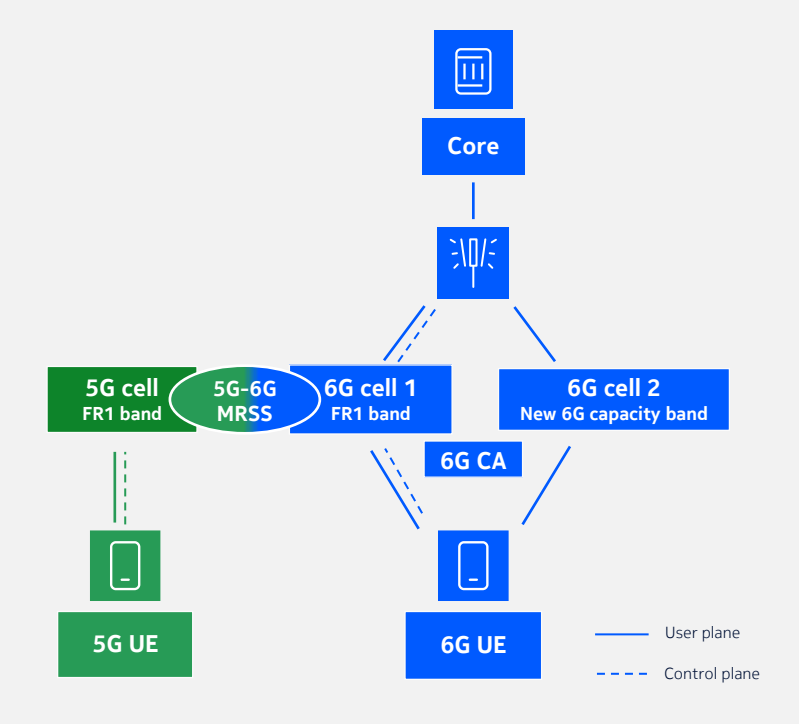
Supporting a low-carbon, circular future, and fostering greater equity for people and the planet

Secure & cyber-resilient

Focusing on innovative security measures and pioneering quantum-safe technologies

A single standalone architecture

Multi-RAT Spectrum Sharing (MRSS) with 6G-6G Carrier Aggregation as baseline



Radio physical layer

Key decision points progressing well

Waveform & modulation

- CP-OFDM and DFT-s-OFDM supported as basis for uplink
- CP-OFDM supported as basis for downlink
- Initial set of 5G-compatible sub-carrier spacings agreed
- QAM as basis for 6G radio modulation
- Frame and slot durations compatible with 5G

Compatibility with MRSS is assured

Channel coding

Data:

- Reuse of 5G NR LDPC design within NR data rate range
- Potential LDPC extension under study

Control:

- Reuse of 5G NR Polar code design within NR range (larger than 11 bits)

Hardware impacts are crystallising

Support for diverse device types

Scalable and forward-compatible 6G radio design

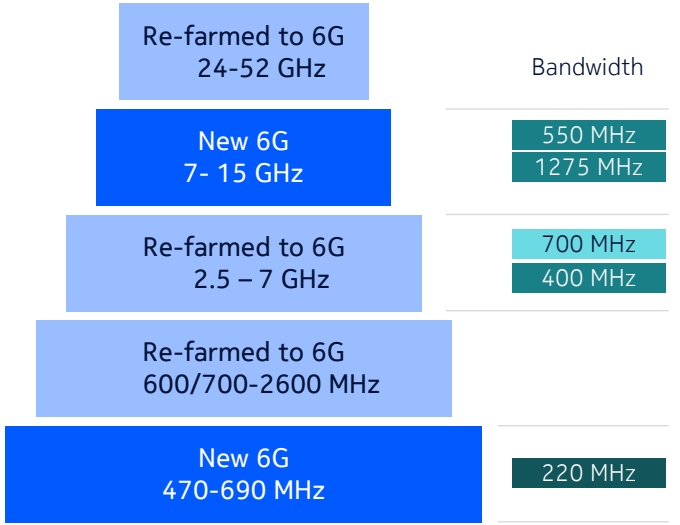
Mobile Broadband

Fixed Wireless Access

Massive IoT

Operation in both existing and new spectrum

WRC-27/31 expected to build on WRC-23 IMT identifications



5G-6G MRSS

14.800 GHz - 15.350 GHz **7.125 GHz - 8.400 GHz**	Wide area capacity and data rate boost
6.425 GHz -7.125 GHz 4.4 GHz - 4.8 GHz	Expansion of existing mid-bands
470 MHz - 690 MHz	Extended coverage at low bands

Note: frequency ranges and availability of bands may vary from one ITU Region to another

IMT: International Mobile Telecommunications

WRC-23 IMT identification | WRC-27 approved to study for IMT | WRC-31 subject for discussion

Increased Maximum Channel Bandwidth

System

400 MHz downlink

400 MHz uplink

Devices

400 MHz downlink as a single carrier

200 MHz uplink as a single carrier

Additional support of >200 MHz uplink may be added later

Coverage

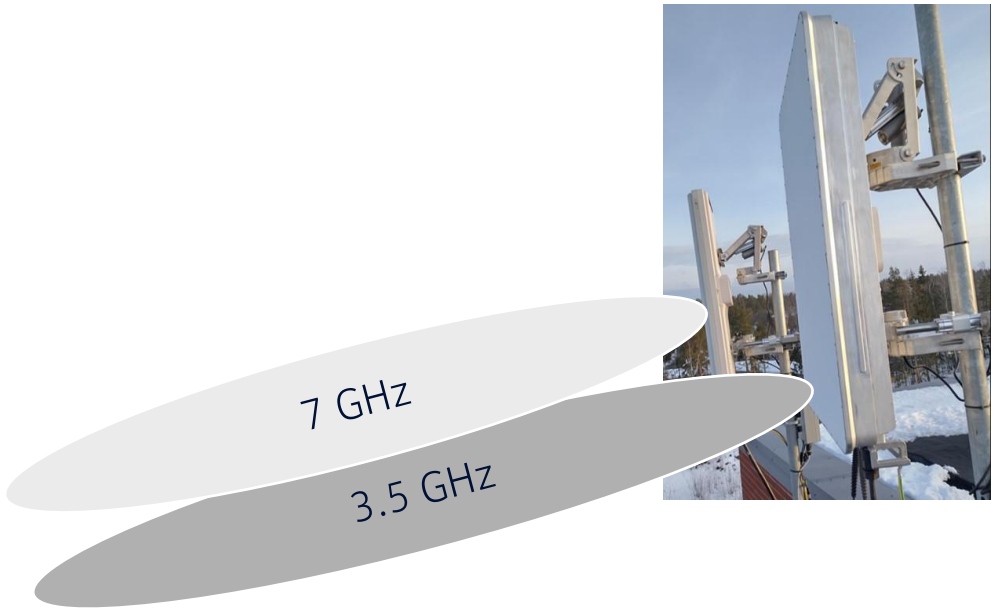
Aim to reuse mid-band (~3.5 GHz) site grid for 6G deployments around 7 GHz

Targets for 6G radio

Same coverage (as 5G mid-band) for initial access.

Comparable coverage for data channels with same data rate.

Enhanced overall coverage compared to 5G in the same band, focusing on **cell-edge performance** and **uplink coverage**.

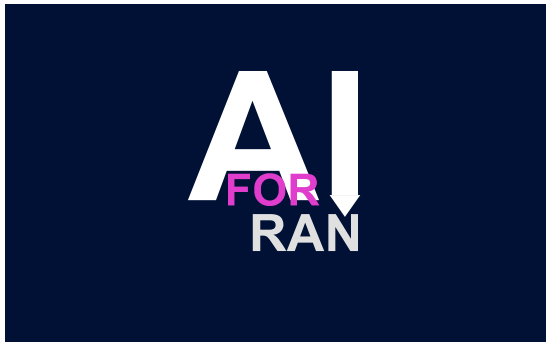


AI-RAN unlocks monetization and efficiency opportunities

Paving the path to AI-native 6G networks

RAN augmenting
AI-app performance

Monetization



AI augmenting
RAN performance

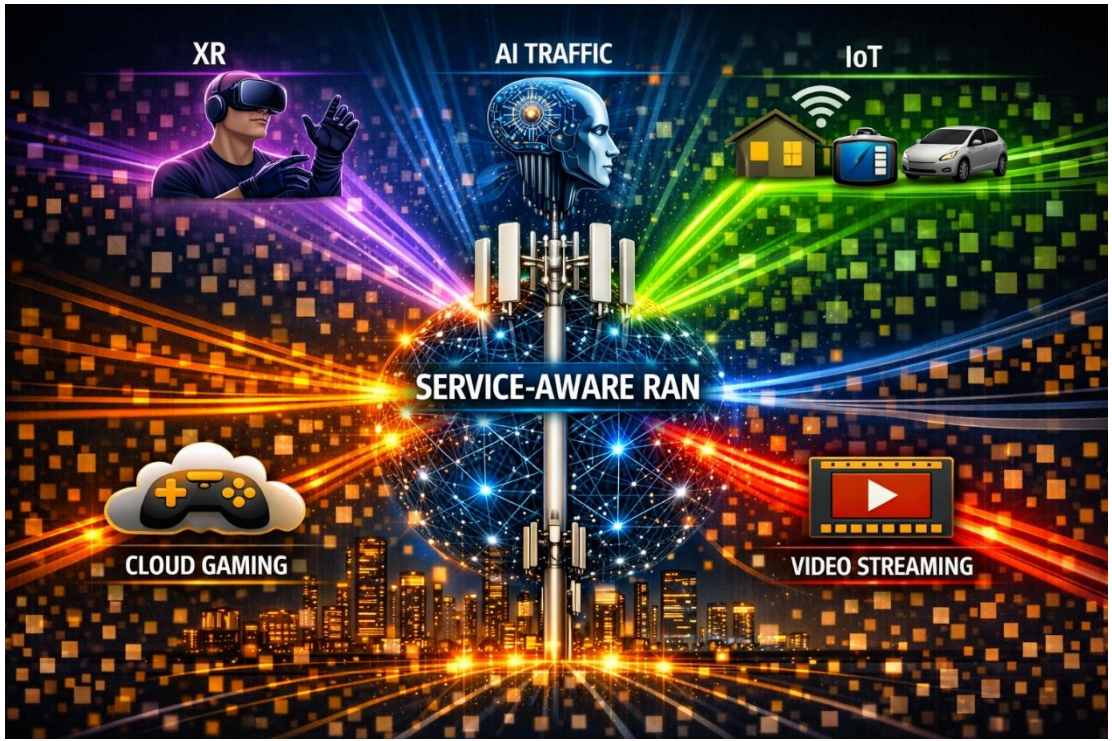
RAN efficiency

Leveraging
synergies

Future-proofness

Service-Aware RAN

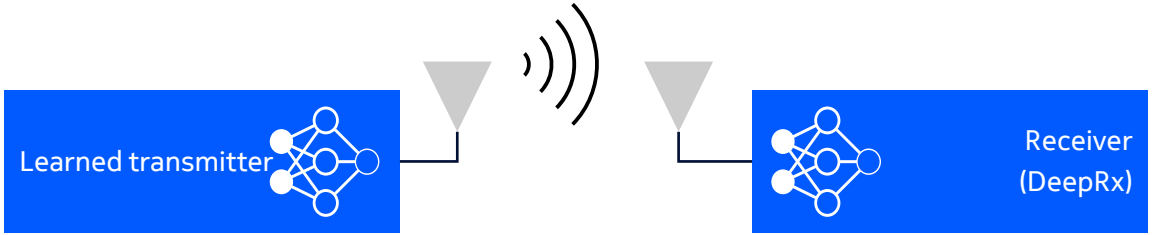
Understanding and adapting to the traffic demands of applications

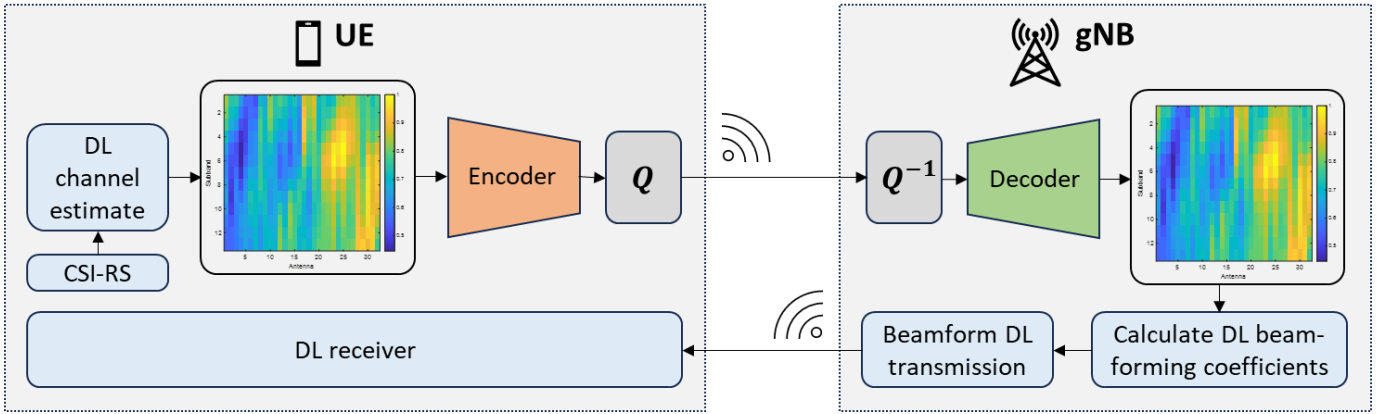


Assured end-to-end user experience depends on differentiated traffic handling based on service characteristics

AI for RAN

AI-native air interface learns from its surroundings





Ubiquitous 6G service through Non-Terrestrial Networks (NTN)

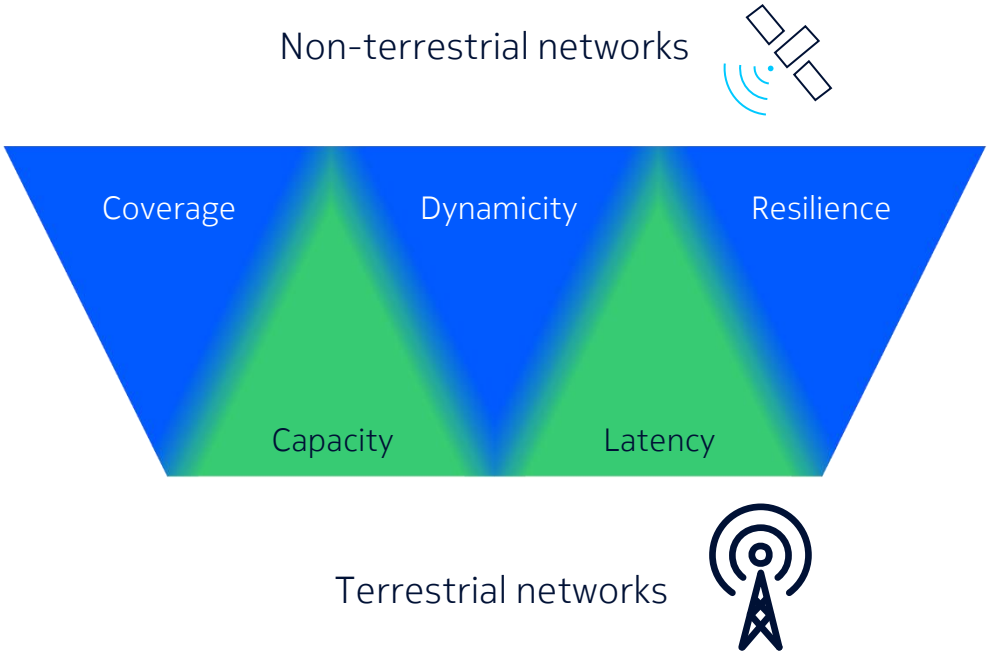
Complementary connectivity natively included

Harmonized 6G radio and RAN architecture
Common design for TN and NTN

GNSS-free operation
6G NTN to able to be independent from GNSS

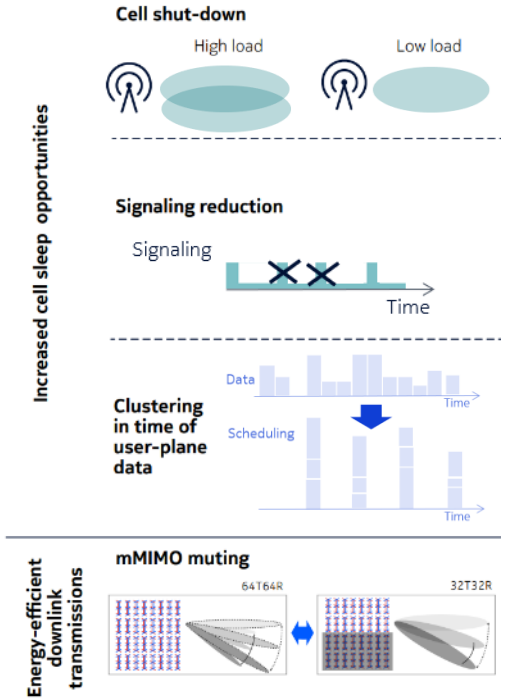
TN-NTN interworking and mobility
Seamless mobility between TN and NTN

Multi-orbit support
GEO – MEO – LEO – HAPS



RAN energy saving

For both network and devices



Cell / beam shut-down schemes

Enhanced elegant, more reliable, and faster shut-down of capacity cells and beams

Network Energy Saving design for Signaling Reduction

Leaner carrier for always-available network with on-demand or load-based provisioning of SSB, synchronization signals, system information, PRACH and paging occasions

Network Energy Saving schemes for Data

More flexible and effective cell discontinuous transmission and reception (cell DTX/DRX)

Adaptive base station transmit antennas and transmit power control with UE assistance via SRS and CSI feedback

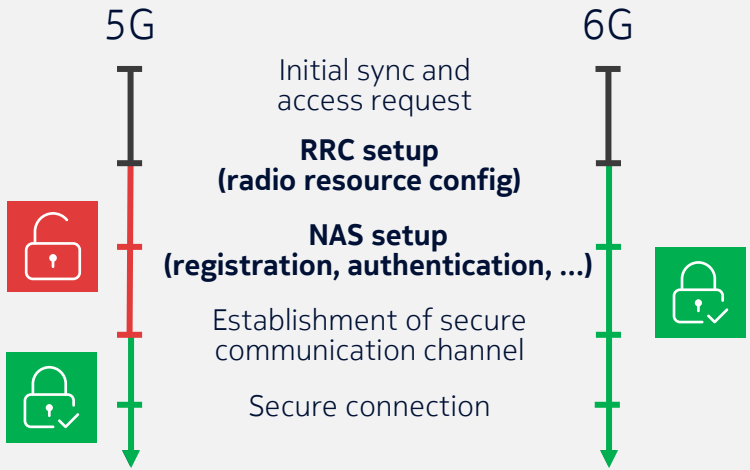
Key targets

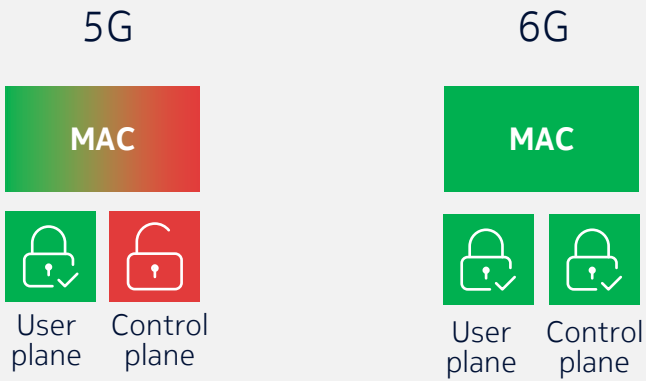
Near-zero Watts at zero load

Maximize bits per Watt without compromising QoS/QoE

Security at the forefront of 6G design

Addressing an ever wider range of threat vectors





Sensing

6G Radio to support detection and/or tracking of passive objects

UAVs – People – Vehicles – AGVs – …

Summary

1

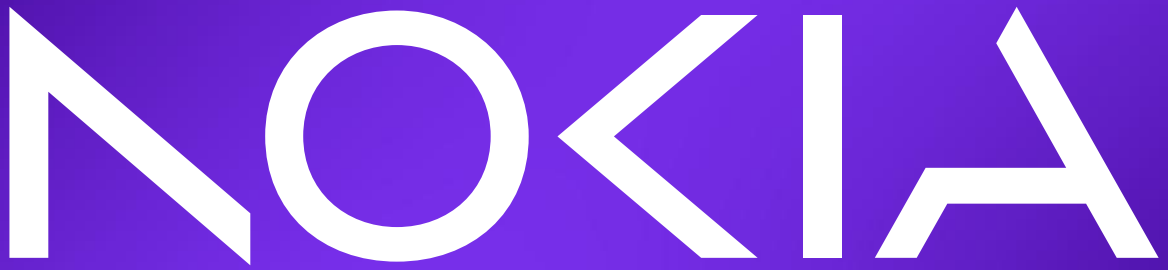
6G requirements and timeline are clear

2

Key decisions for timely implementation are progressing

3

Foundations being laid for high-performing, AI-native, service-aware design for 6G


NOKIA