BUSINESS FINLAND

BF Digitalks & SNS JU: Resilience in 6G – the Finnish View

4 September 2025 at 13:00-14:30 (CEST)

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Business Finland

Please note that this webinar
will be recorded

A BLUEPRINT TOWARDS REAL-TIME ECONOMY WITH WIRELESS AI

Resilience in 6G the Finnish Vew

6G Bridge Program Perspectives

Unlocking New Value with 5GA and 6G – 4 Sep 2025

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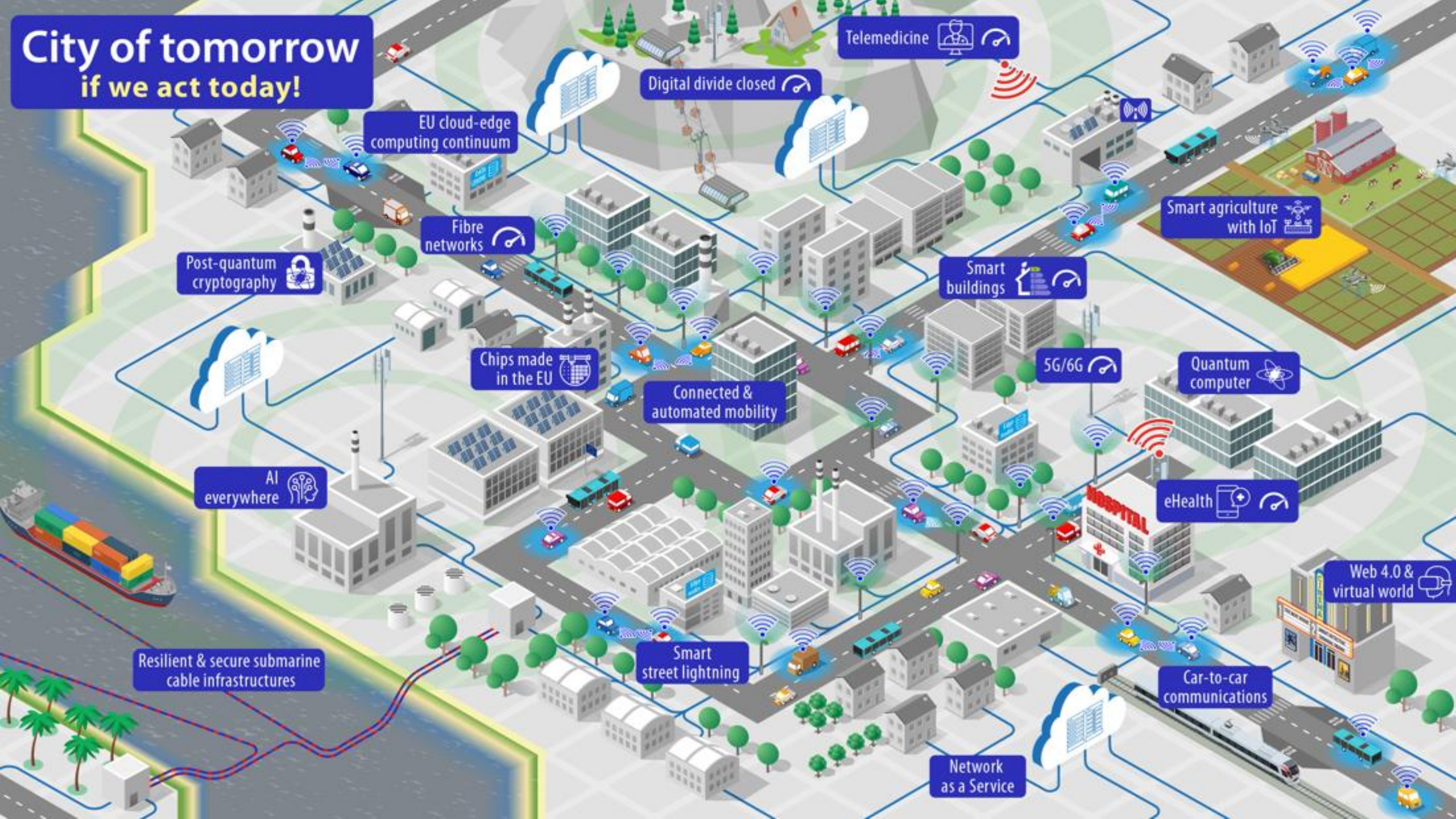

City of tomorrow
if we act today!
Telemedicine
Digital divide closed
EU cloud-edge computing continuum
Fibre networks
Post-quantum cryptography
Smart agriculture with IoT
Smart buildings
Chips made in the EU
Connected & automated mobility
5G/6G
Quantum computer
AI everywhere
eHealth
HOSPITAL
Web 4.0 & virtual world
Resilient & secure submarine cable infrastructures
Smart street lightning
Car-to-car communications
Network as a Service

$(6G)^3$ – How They Are Related in Finland

6G Flagship

Research Council of Finland funded flagship research program for 6G with 300 MEUR funding for 2018-2026.

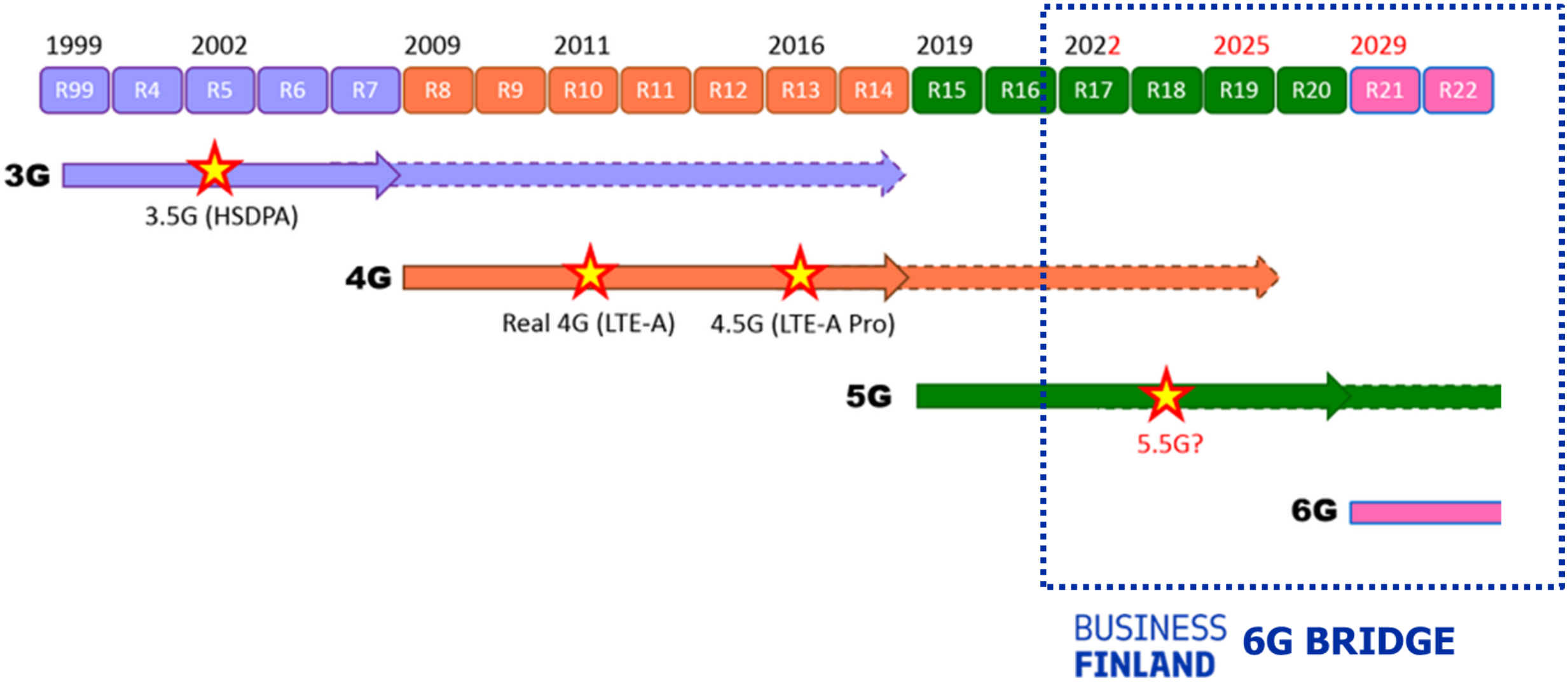
6G Finland

The active coalition of Finnish 6G R&D organizations incl. Nokia Bell Labs.

6G Bridge

Business Finland funded national program focusing on 5G Advanced and 6G. Runtime 10/2022-12/2026, 130 MEUR of committed national funding.

3GPP Releases Timeline



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6G Bridge Portfolio & Potential Touchpoints for Collaboration in Resilience

Maritime	6G SW for massive networks of connected devices	Liquid IoT system architecture	Robustness of 6G via AL/ML	Integrated sensing and communications	6G networks with reflective intelligent surfaces
Local 6G	Next gen healthcare	Multi-band RF	QoS for heavy machines	Terahertz antennas	Radio channel aware ML based 6G design
RedCap over NTN	Digital twinning of PANs	Energy awareness & efficiency	Extreme machine communications for 6G	Neural Publish / Subscribe method	Network security in 6G
Custom silicon for 5GA/6G, edge AI	Energy vertical	Cloudify i.e. joint comms and computation	3D Model	Autonomous traffic	6G test network

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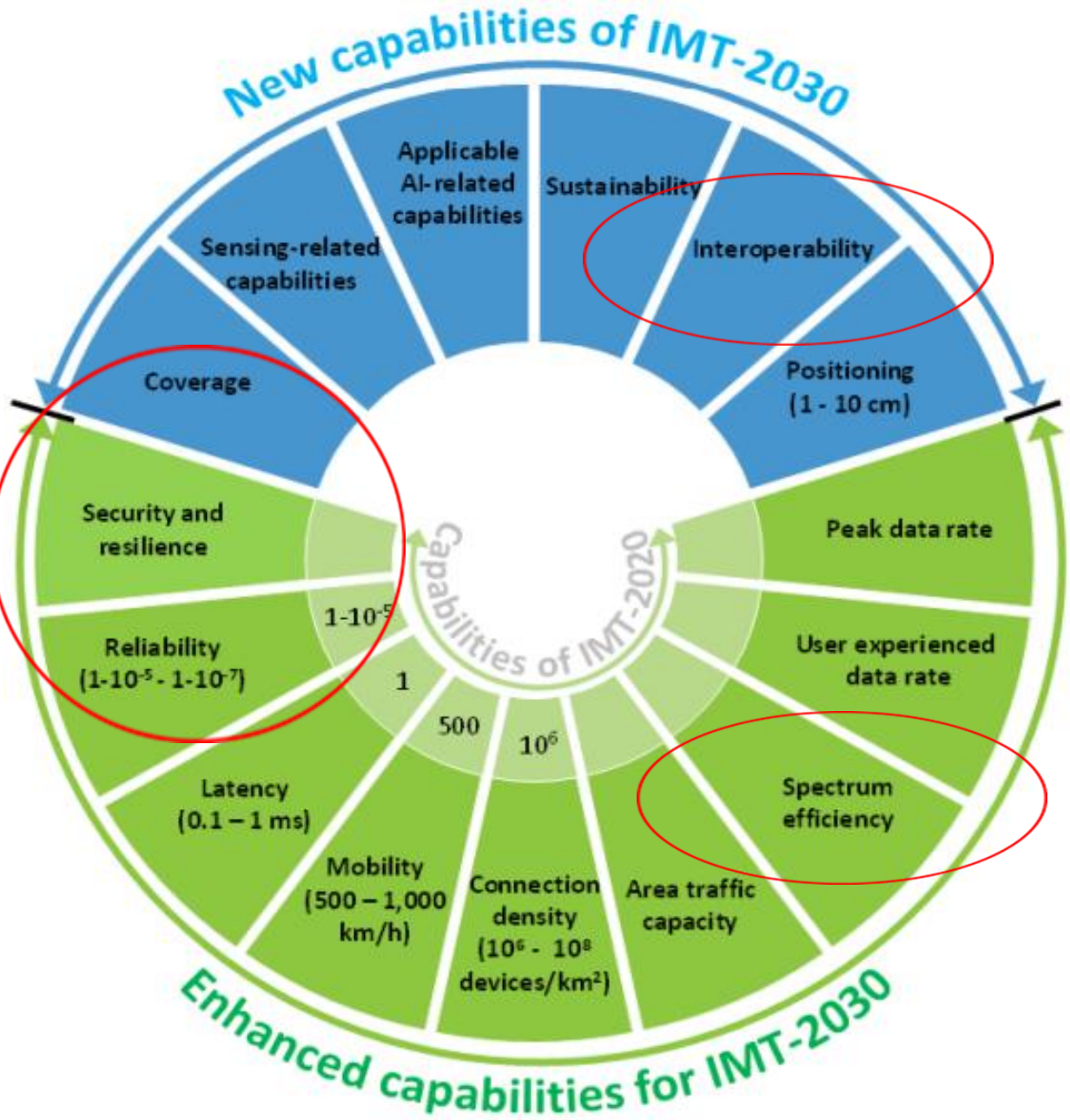
6G & Resilience



INTERNATIONAL TELECOMMUNICATIONS UNION VISION OF 6G

ITU-R | Capabilities of IMT-2030

- The Framework Recommendation identifies **15 capabilities** for IMT-2030 technology.
- The **range of values given for capabilities are estimated targets for research and investigation of IMT-2030**.
- IMT-2030 is also expected to help **address the need for increased environmental, social and economic sustainability**, and also support the goals of the Paris Agreement of the United Nations Framework Convention on Climate Change.

Connected Collaborative Computing in 6G: Vision & Enablers

+3B People
#Internet users +60%

Sustainability
Energy efficiency 20–100x

3 Worlds Combined
Biz potential 10–100x

AI
APIs
AR

Chips
Cloud
Cybersecurity

Regulation
Spectrum
Standardization

Additional Notes on Resilience (1/2)

- Life cycle assessment is scarce in EU wide projects.
- Social acceptance of 5GA/6G with adequate awareness & training to use latest technology are utmost important. Solid UX important also.
- Security in 6G encompasses eg. DLTs, AI, quantum technologies which brings complexity and opportunities/challenges.
- Attack surface in 6G will increase dramatically: limited UIs affect threat awareness and response; weak computation power at the edge (they lack robust mechanisms); decoupling of control and data planes introduces vulnerabilities; O-RAN expands the attack surface; multivendor interoperability challenges.
- We currently lack autonomous network type capabilities pertinent to resilience.

Additional Notes on Resilience (2/2)

- We have to get rid of the human error possibility since a wrong code or configuration could it kill people during accidents when network is not present.
- National roaming is one way towards more resilient networks.
- The concept of hybrid networks (5G, 6G, HAPS..) could be part of the solution.
- Precise atomic clock backup service has to be in place too if GPS signals are not available. Using several GNSS technologies instead parallel is one option.
- Base stations could operate in a 'limp' mode without power grid for a while. Renewable energy could play a role here.
- MNOs have not been incentivized enough to provide resilient networks.
- In order to prepare for unknowns of the unknown future, prepare for the worst case what could happen as a start.

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THANK YOU FOR YOUR ATTENTION!

Pekka Rantala
Head of 6G Bridge Program

#Worldclass #5GAdvanced #6G #130MEUR
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