

Elements of 6G Unleashed

Finland Leading European 6G Flagships and Update from 6G Finland Including Verticals

hexa-x.eu

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FLAGSHIP

6G



2030

6G Flagship is the world's 1st 6G program – established 2018

Finland's flagship research program for 6G with 300M€ funding for 2018-2026

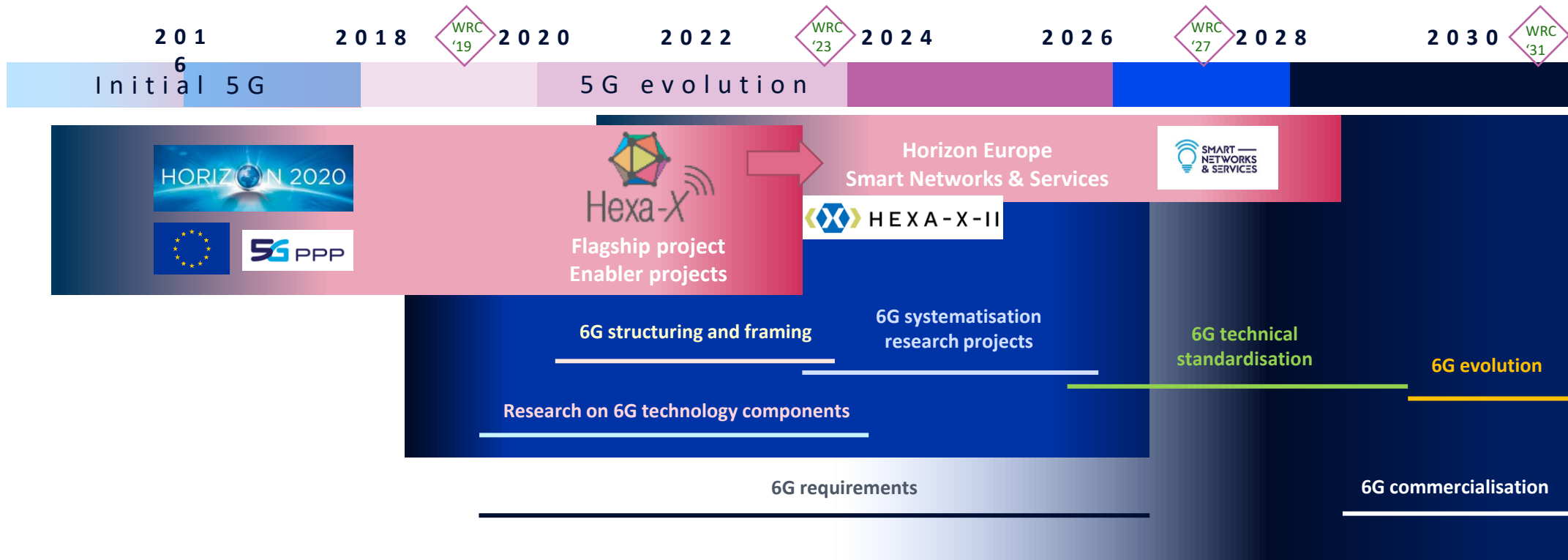
Hosting global 6G research ecosystem towards new technology and business opportunities:

- Capabilities of wireless pushed to the physical limits – speed, latency, energy
- Massive utilization of AI in networks and applications – automation, safety, reliability
- Radical innovations in wireless business ecosystems

Flagship vision for 2030

Our society is data-driven, enabled by near-instant, unlimited wireless connectivity.

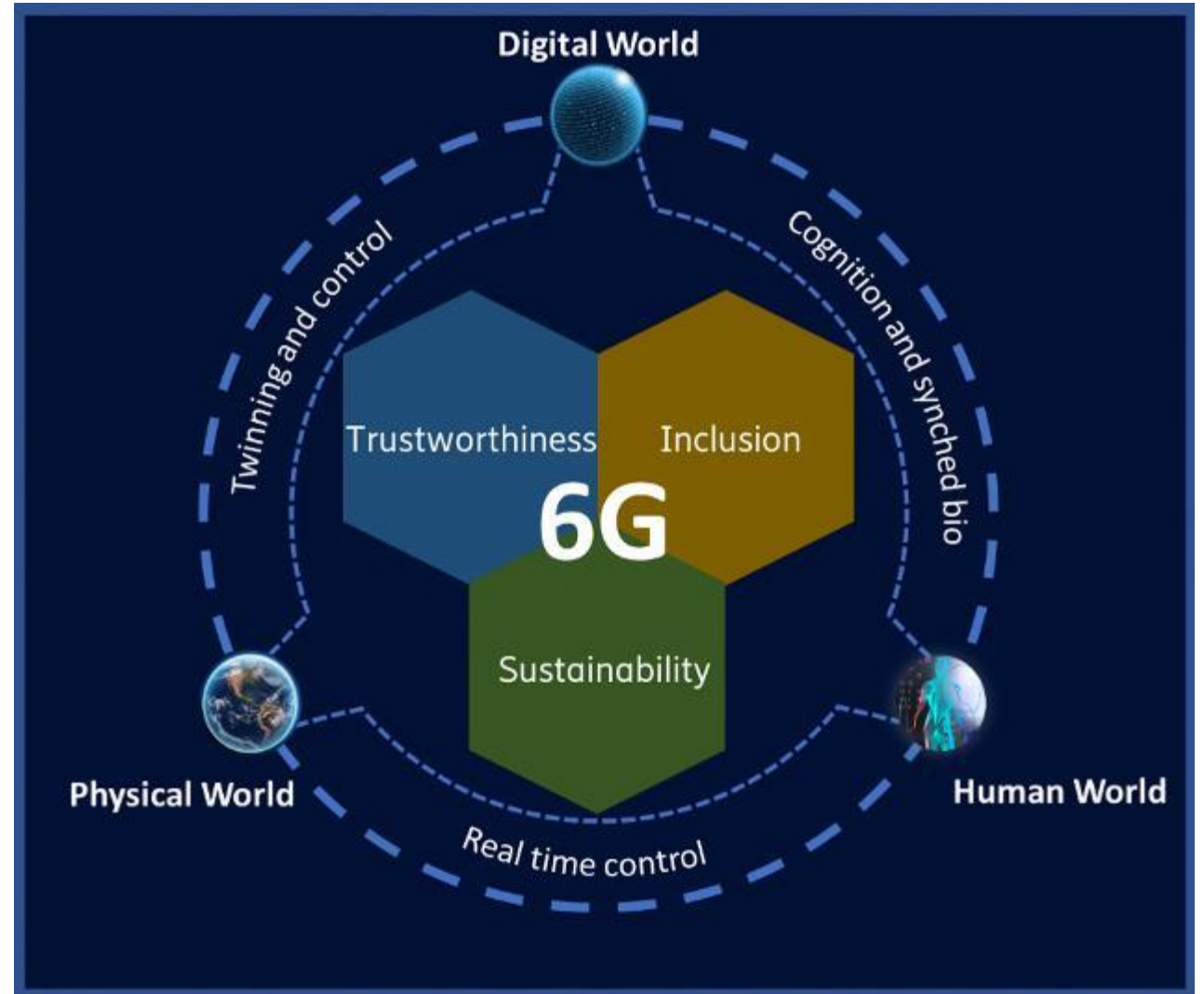
Timeline



Hexa-X vision on 6G



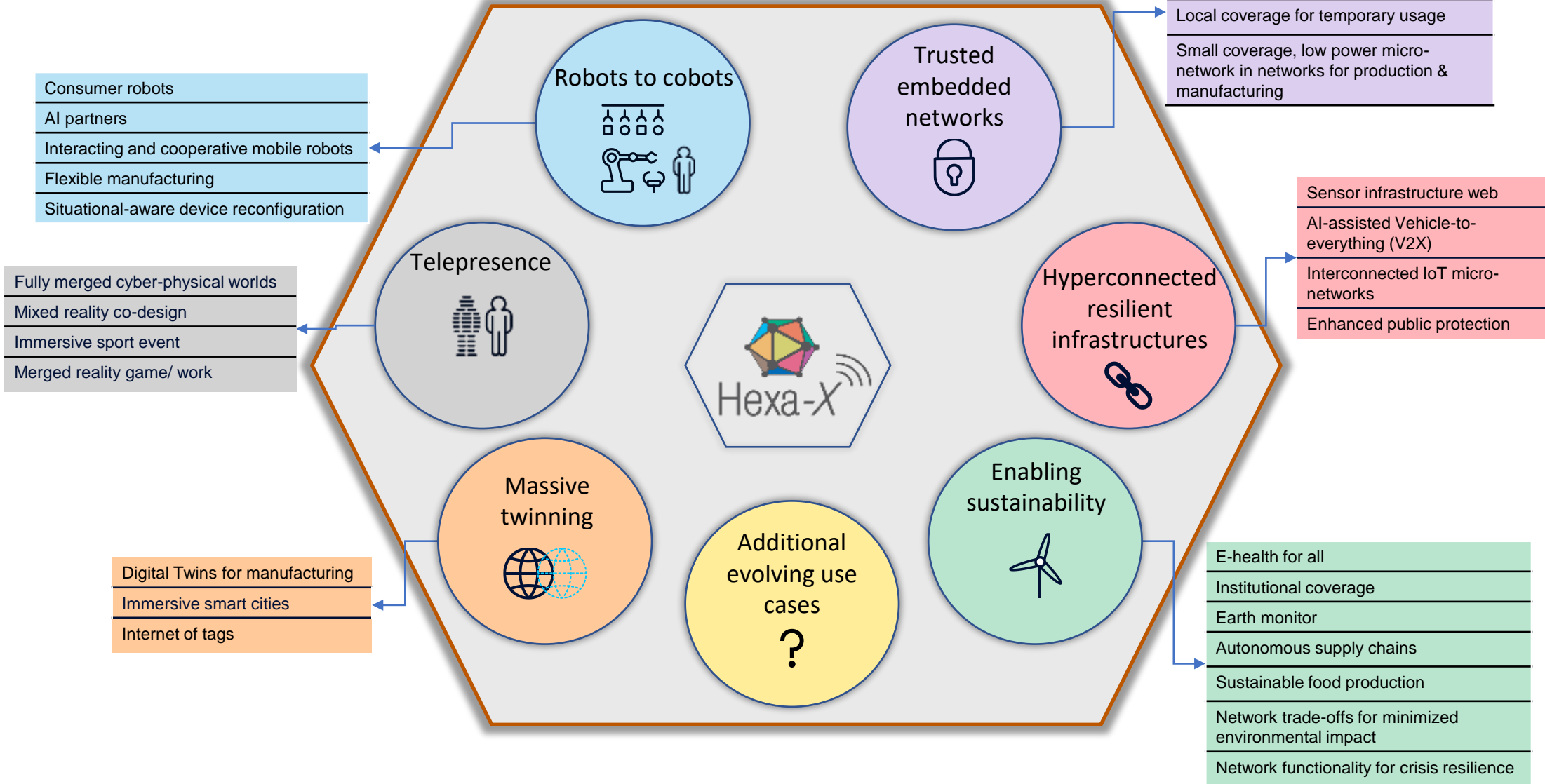
- Connecting the physical, digital and human world
- Key values:
 - Sustainability
 - Inclusion
 - Trustworthiness
- Research challenges:
 - Connecting intelligence
 - Network of networks
 - Sustainability
 - Global service coverage
 - Extreme experience
 - Trustworthiness



Hexa-X use cases



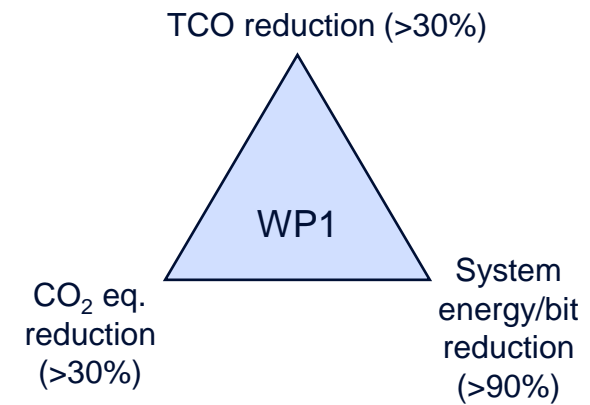
- 8** DECENT WORK AND ECONOMIC GROWTH
- 9** INDUSTRY, INNOVATION AND INFRASTRUCTURE
- 11** SUSTAINABLE CITIES AND COMMUNITIES
- 12** RESPONSIBLE CONSUMPTION AND PRODUCTION
- 13** CLIMATE ACTION



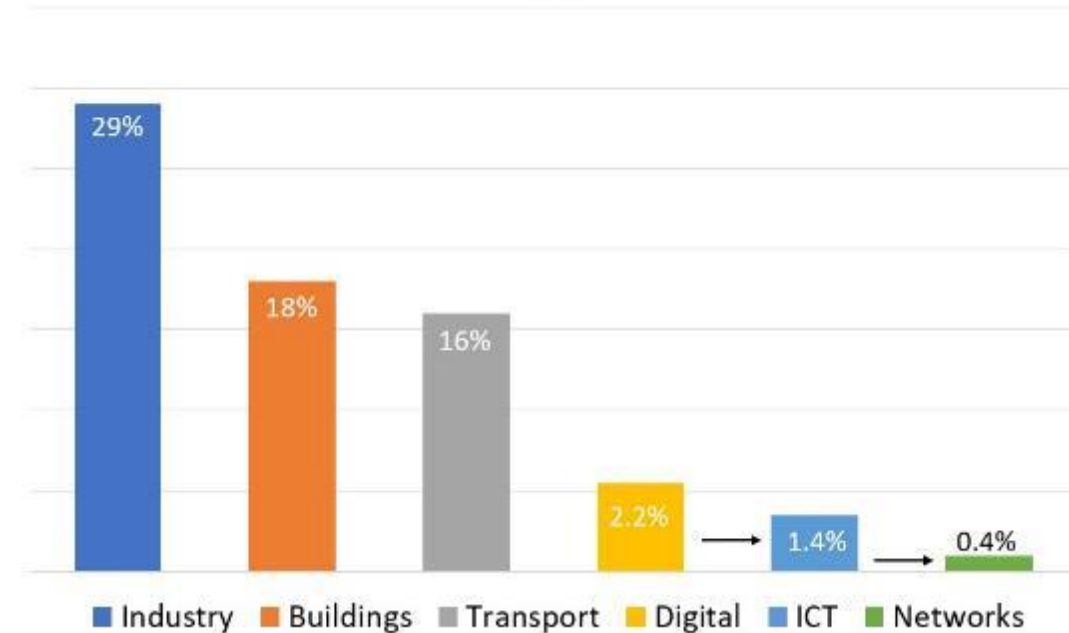
Sustainability targets



- Global KPI for sustainability has been defined in accordance with Hexa-X project objective:
 - KPI1: Enabling reduction of emission of more than 30% Co2 in a sector using 6G as an enabler.
 - KPI2: More than 30% reduction for the Total Cost Ownership (TCO) including energy fees.
 - KPI3: More than 90% energy consumption reduction per energy/bit.
- For each KPI, a baseline, methods to achieve the target and the scope of the KPI have been defined.
- Methods include
 - Life cycle analysis of products and systems for all KPIs
 - Methodology for evaluating the "Enablement effect" for KPI1
 - Networks environmental impact and trends for KPI2 and KPI3



Share of the global GHG emissions by sector
(first three columns not to scale)





Elements of 6G Unleashed

Intro to Hexa-X-II

hexa-x-ii.eu

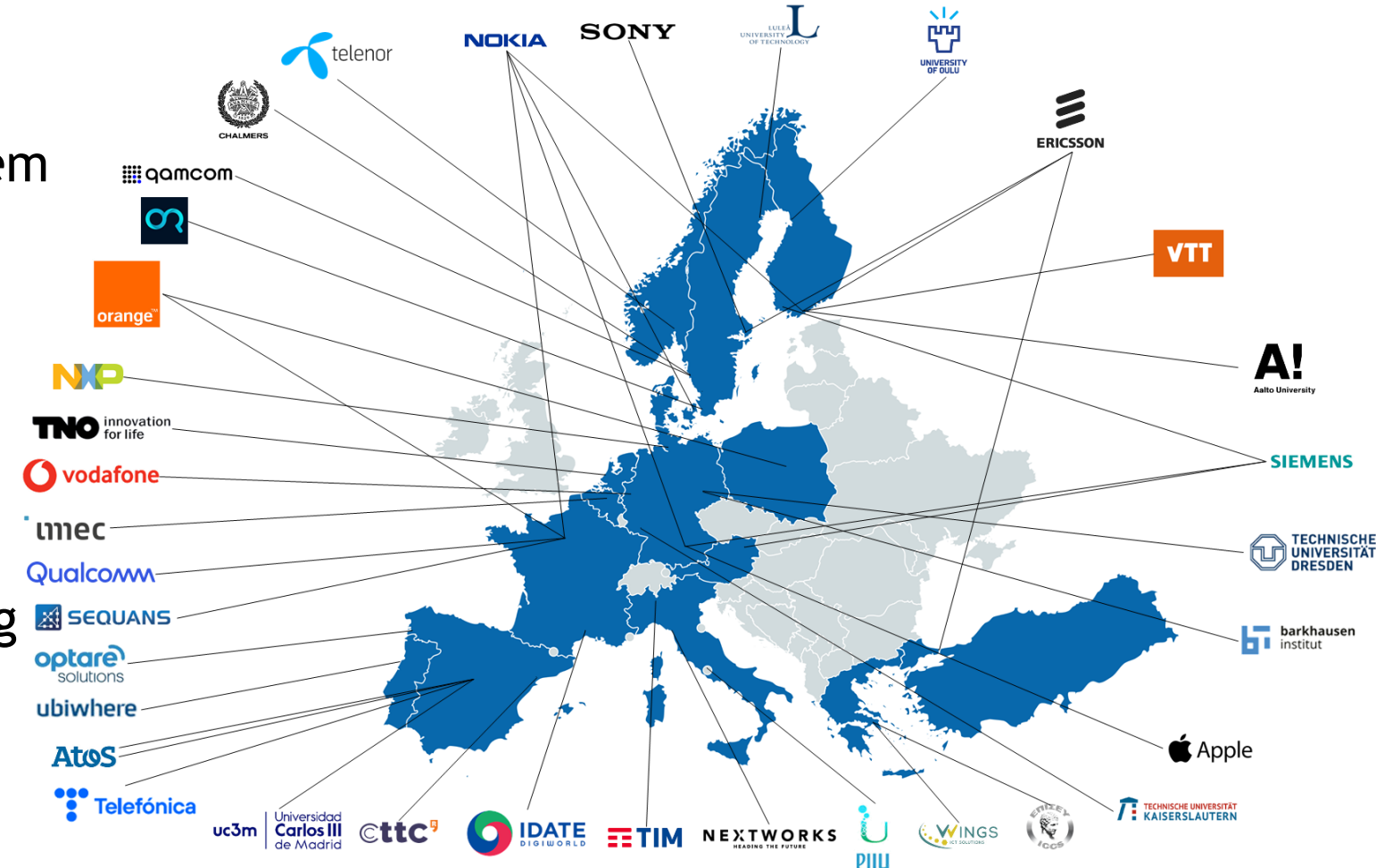
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Hexa-X-II overview



- Hexa-X-II is the next European level 6G Flagship
- Focus will be continued development of technology and define the 6G platform and system
- Funded through Horizon Europe SNS-JU
- 44 partners
 - Cover the entire value-stack from hardware to system to platform to applications to service providers and a strong academic presence
- Nokia is overall leader
- Ericsson is technical manager



Consortium



Service providers



Applications and software



Platform



System and technology



Chipset and hardware



Qualcomm

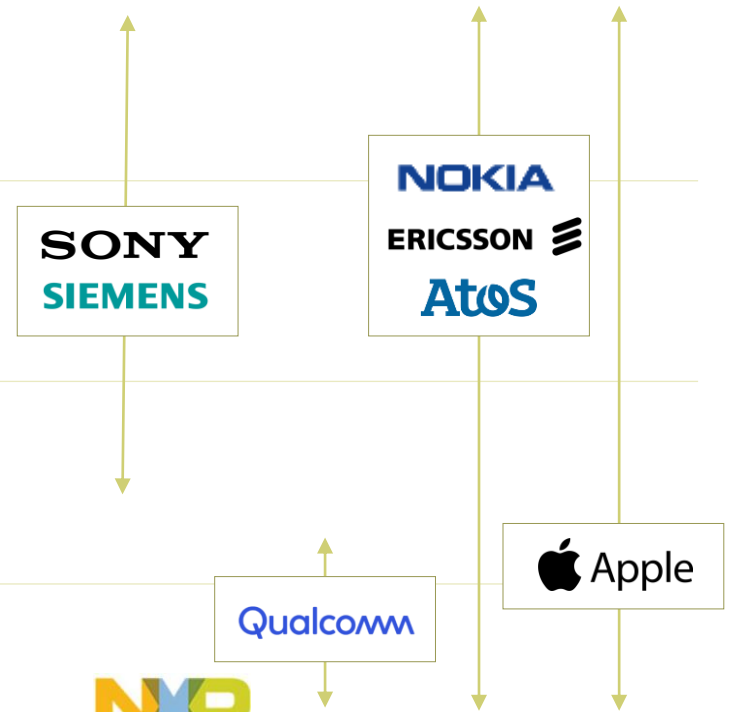


6G ecosystems and offering

Academia and RTO

SME

Large enterprise



Kickoff Jan 24-26th 2023, Espoo, hosted by Nokia



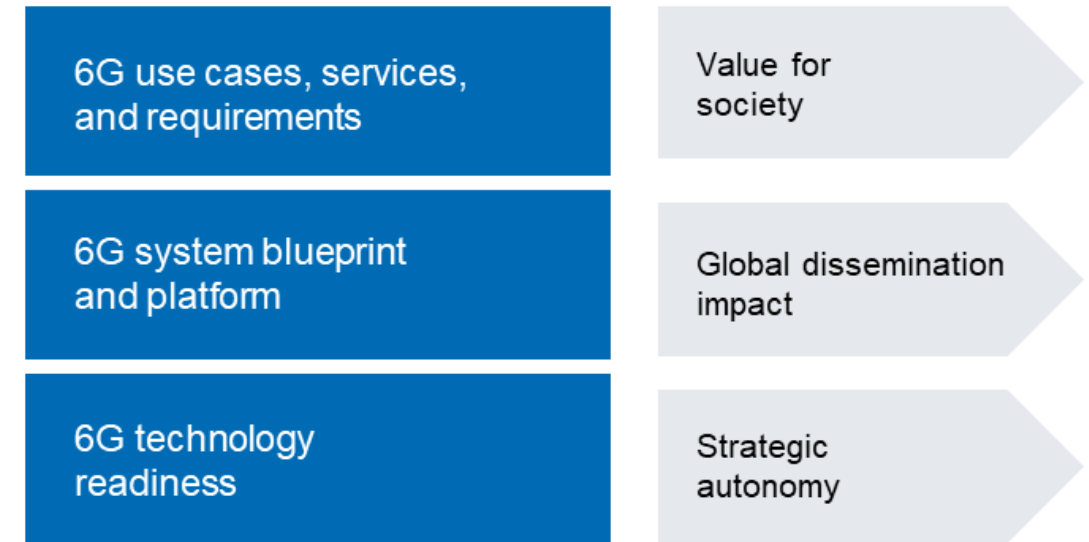


Overall objectives of Hexa-X-II

A holistic flagship towards the 6G platform and system to inspire digital transformation for the world to act together in meeting needs in society and ecosystems with novel 6G services



Hexa-X & Horizon-2020 candidate enablers



SNS stream B projects



6G

Finland

A **coalition** of world-leading Finnish companies and research institutes

Finland's 6G network of excellence.

6GFinland.fi

6G Finland

MISSION

To intensify 6G cooperation among Finnish stakeholders, to focus more on key priorities, and to increase relevant international collaboration and partnerships

Vision leadership

R&D effectiveness

6G favorable R&D environment

Building Finland's position as a global leader in...

6G vision and standardization

Research and Development

Education and training

International visibility

R&D Environment

Innovations and monetization

...across technology, business, and society.

6G is a great export and business opportunity for Finland

- Secure continued lead of Finland in 6G
- Enough funding needed for the full R&D chain
- Support verticals and others for testing and understanding the opportunities
 - Impact direction of 6G early to match your future needs
 - Verticals are an important growth area for wireless communications
- Secure enough and suitable spectrum for 6G
- Enhance attractiveness of Finland for students and more experienced researchers

B5G and 6G National Strategic Research Agenda (SRIA)

- Provides referential roadmap for the 6G Bridge program and shared via it
- Four chapters: 5G, 5G-Advanced, 6G and Test environments
- The chapter editors were:
 - Antti Toskala, Jyrki Huusko, Kyösti Rautiola, Matti Keskinen, Matti Latva-aho, Mikko Uusitalo, Mikko Valkama, Olli Liinamaa, Riku Jäntti and Sasu Tarkoma

