SNS JU Webinar

Hexa-X-II

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hexa-x-ii.eu

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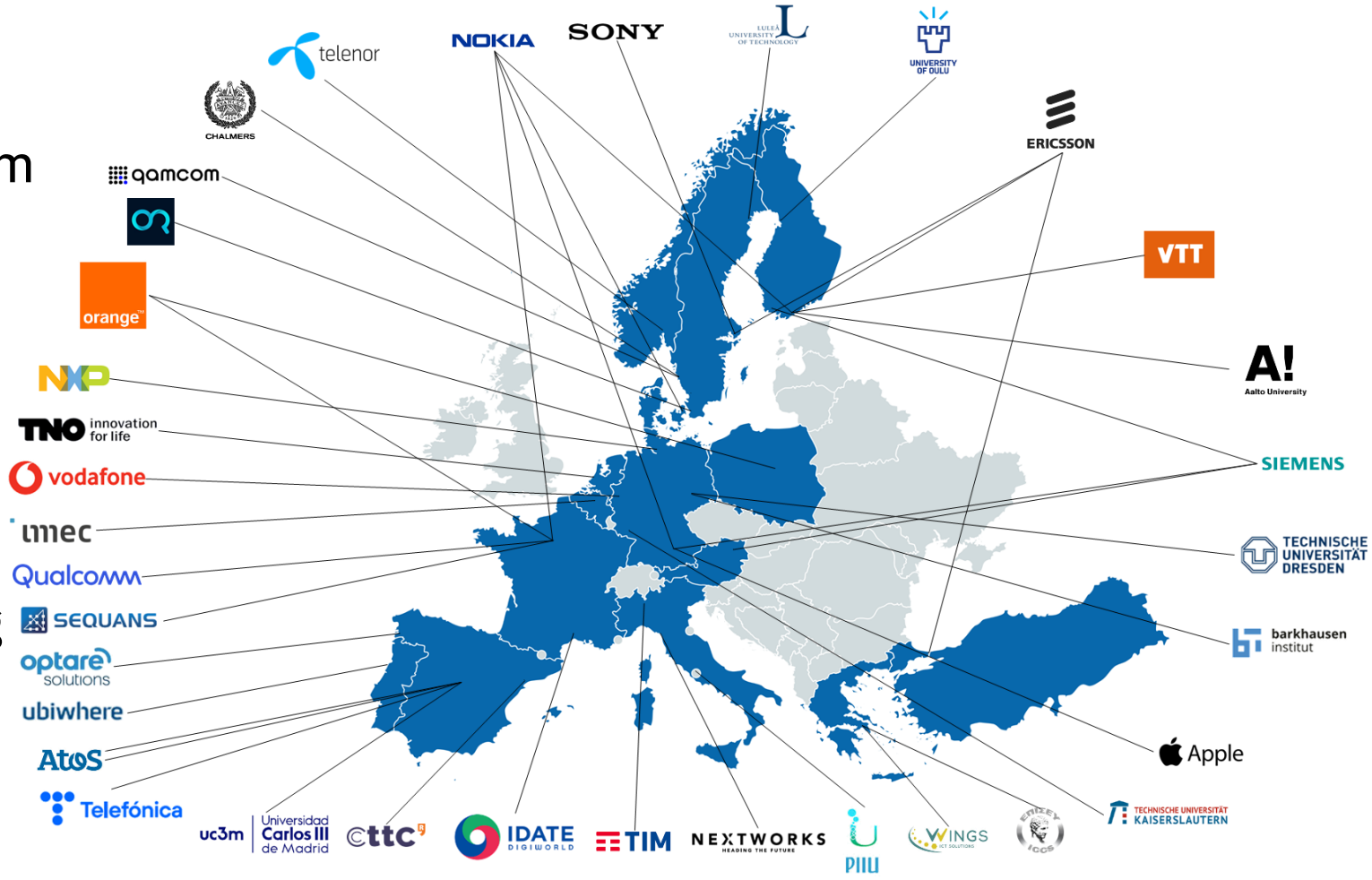
Hexa-X-II overview

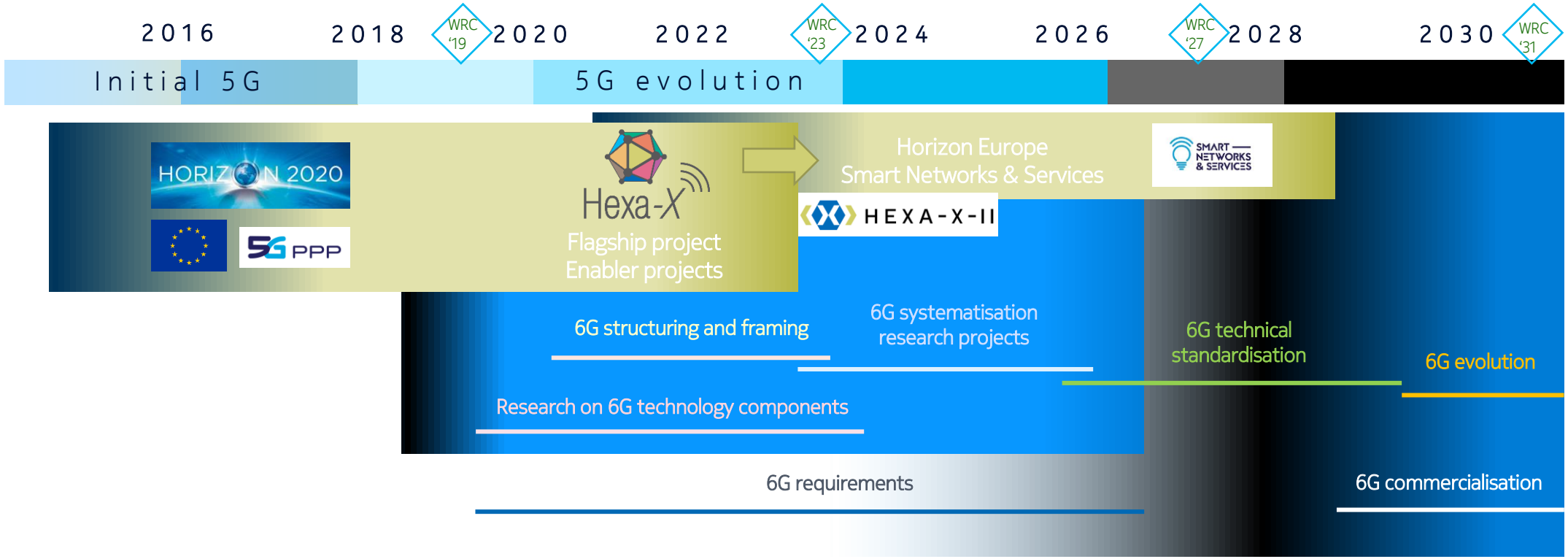
- Hexa-X-II is the next European level 6G Flagship
- Focus will be continued development of technology and define the 6G platform and system
- Funded through Horizon Europe SNS-JU
- 44 partners
  - Cover the entire value-stack from hardware to system to platform to applications to service providers and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



Consortium

Service providers	PIIU, TNO		orange, TIM, vodafone, Telefónica, telenor
Applications and software		IDATE DIGIWORLD, optare solutions, ubiwhere SUITING THE FUTURE	
Platform	TECHNISCHE UNIVERSITÄT DRESDEN, ttc, UNIVERSITY, VTT, CHALMERS UNIVERSITY OF TECHNOLOGY, ICCS	WINGS ICT SOLUTIONS, NEXTWORKS ENGINEERING FORWARD	SONY, SIEMENS, NOKIA, ERICSSON, Atos
System and technology	Aalto University, TECHNISCHE UNIVERSITÄT KAISERSLAUTERN, uc3m Universidad Carlos III de Madrid, LULEÅ TEKNISKA UNIVERSITET, barkhausen institut	qamcom	Apple
Chipset and hardware	imec	SEQUANS COMMUNICATIONS	Qualcomm, NXP
6G ecosystems and offering	Academia and RTO	SME	Large enterprise

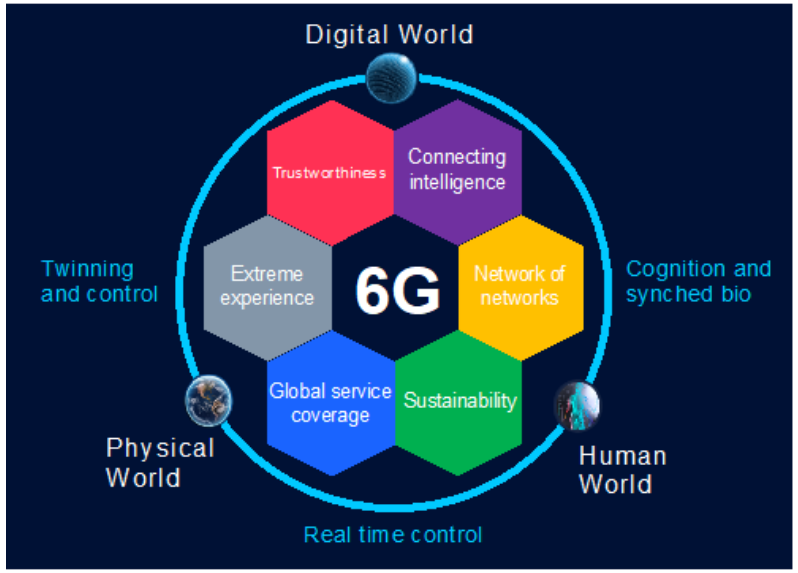
Timeline


2016
2018
WRC '19
2020
2022
WRC '23
2024
2026
WRC '27
2028
2030
WRC '31
Initial 5G
5G evolution
HORIZON 2020
5G PPP
Hexa-X
Flagship project
Enabler projects
Horizon Europe
Smart Networks & Services
SMART NETWORKS & SERVICES
HEXA-X-II
6G structuring and framing
6G systematisation research projects
6G technical standardisation
6G evolution
Research on 6G technology components
6G requirements
6G commercialisation

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



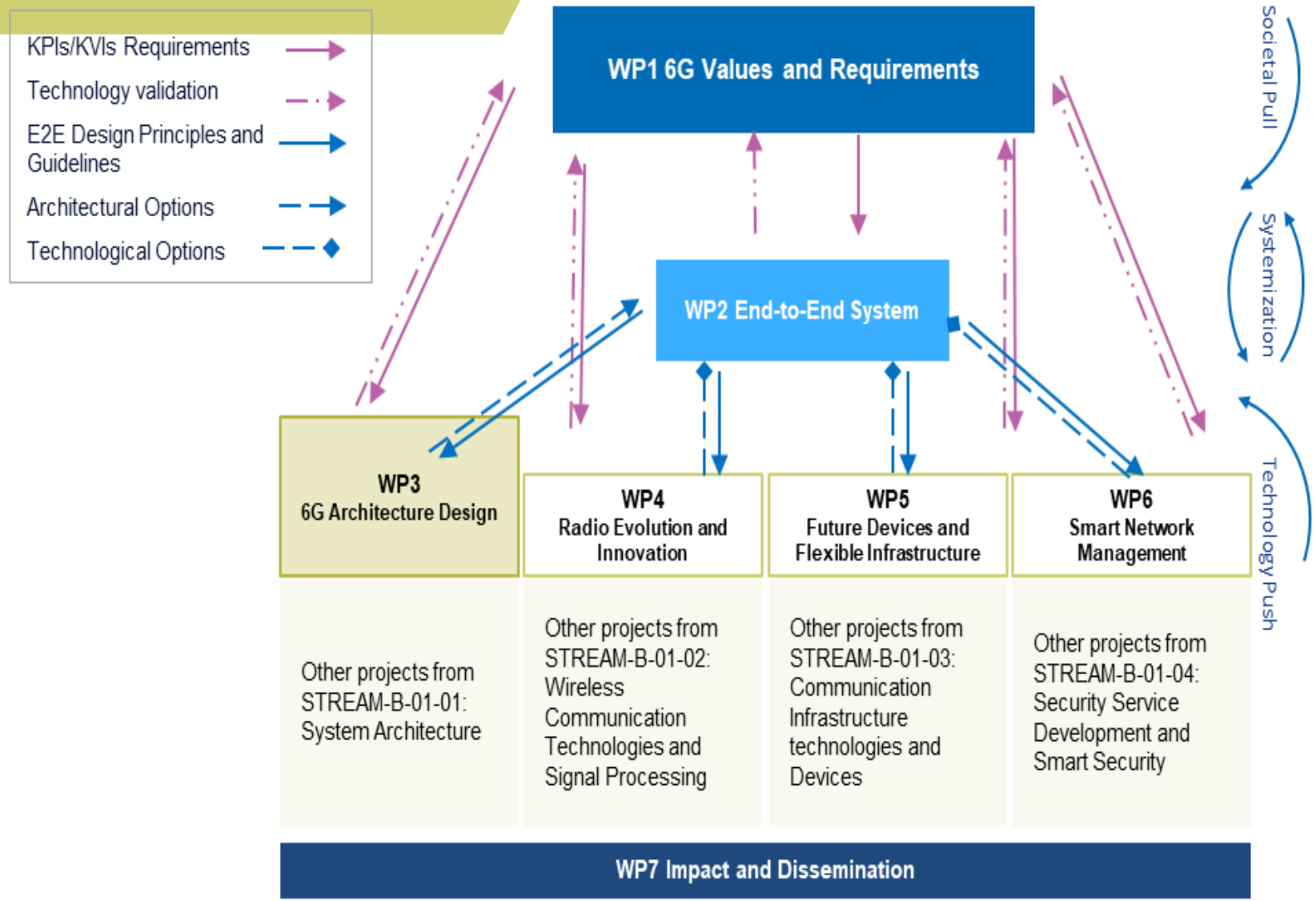
Hexa-X & Horizon-2020 candidate enablers

HEXA-X-II

- 6G use cases, services, and requirements → Value for society
- 6G system blueprint and platform → Global dissemination impact
- 6G technology readiness → Strategic autonomy

SNS stream B projects

WP structure



6G Use cases and requirements

Objective 1 – WP1 Requirements for the sustainable, inclusive, and trustworthy network platform

6G system blueprint and network platform

Objective 2 – WP2 Design blueprint of the sustainable, inclusive, and trustworthy network platform, and system validation

6G technology readiness

Objective 3 – WP3,4,5
Enhanced connectivity for 6G service

Objective 4 – WP3, 4, 6
Network sensing, compute, and AI novel digital services

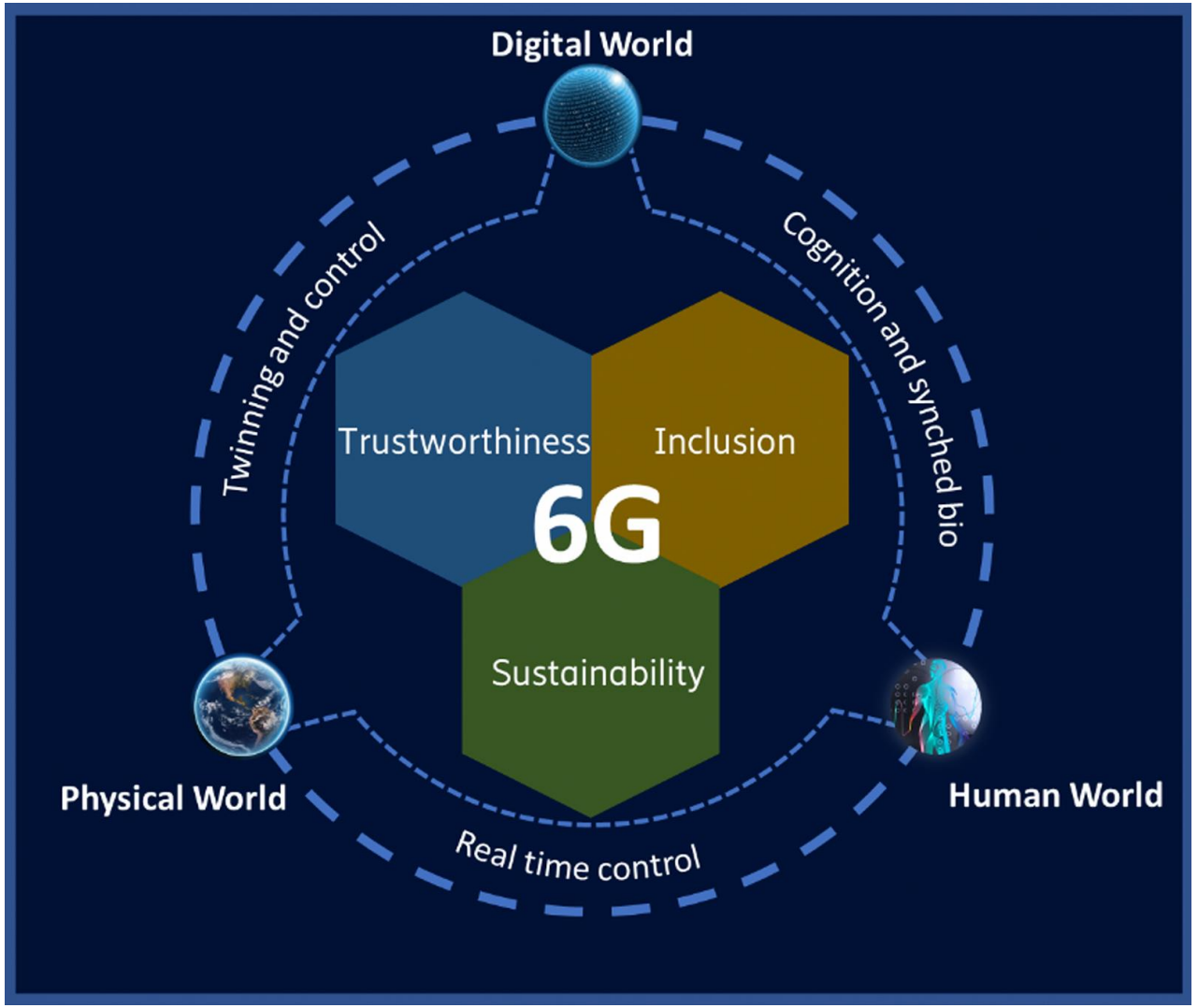
Objective 5 – WP2, 3, 5, 6
Efficient network realization, implementation, and management

6G harmonisation

Objective 6 – WP7
Impact creation towards a global & holistic 6G era

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

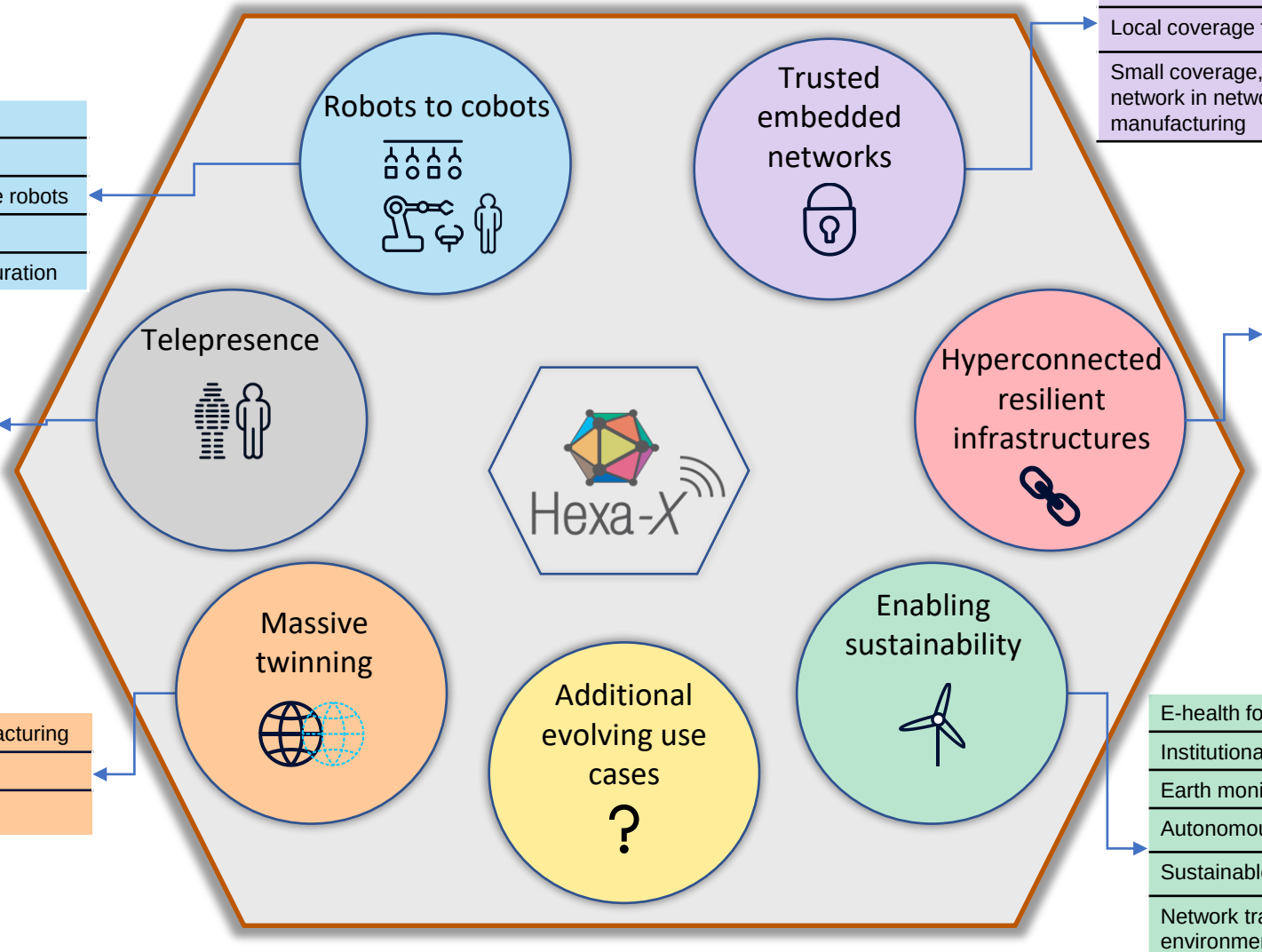
8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION



- Consumer robots
- AI partners
- Interacting and cooperative mobile robots
- Flexible manufacturing
- Situational-aware device reconfiguration

- Human centric communication
- Infrastructure-less network extensions and embedded networks
- Local coverage for temporary usage
- Small coverage, low power micro-network in networks for production & manufacturing

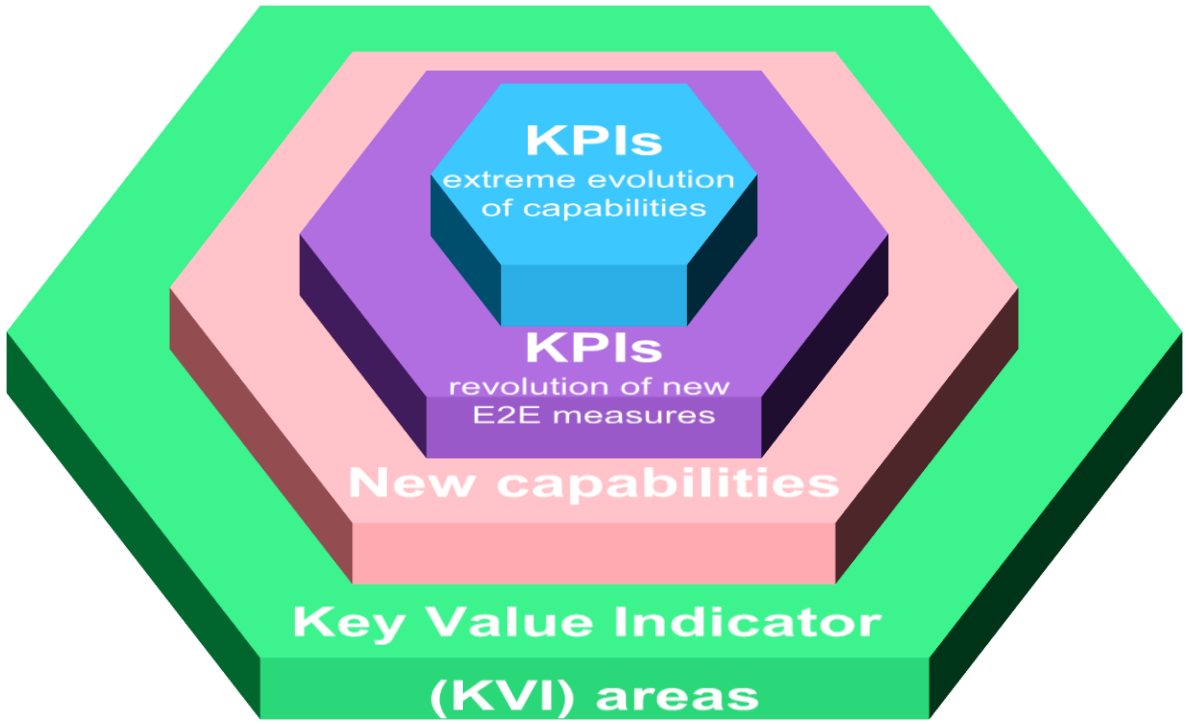
- Fully merged cyber-physical worlds
- Mixed reality co-design
- Immersive sport event
- Merged reality game/ work

- Sensor infrastructure web
- AI-assisted Vehicle-to-everything (V2X)
- Interconnected IoT micro-networks
- Enhanced public protection

- Digital Twins for manufacturing
- Immersive smart cities
- Internet of tags

- E-health for all
- Institutional coverage
- Earth monitor
- Autonomous supply chains
- Sustainable food production
- Network trade-offs for minimized environmental impact
- Network functionality for crisis resilience

Needed capabilities for 6G



Extended KPIs
- Bit rates
- Connection density
- Traffic capacity
- Location accuracy

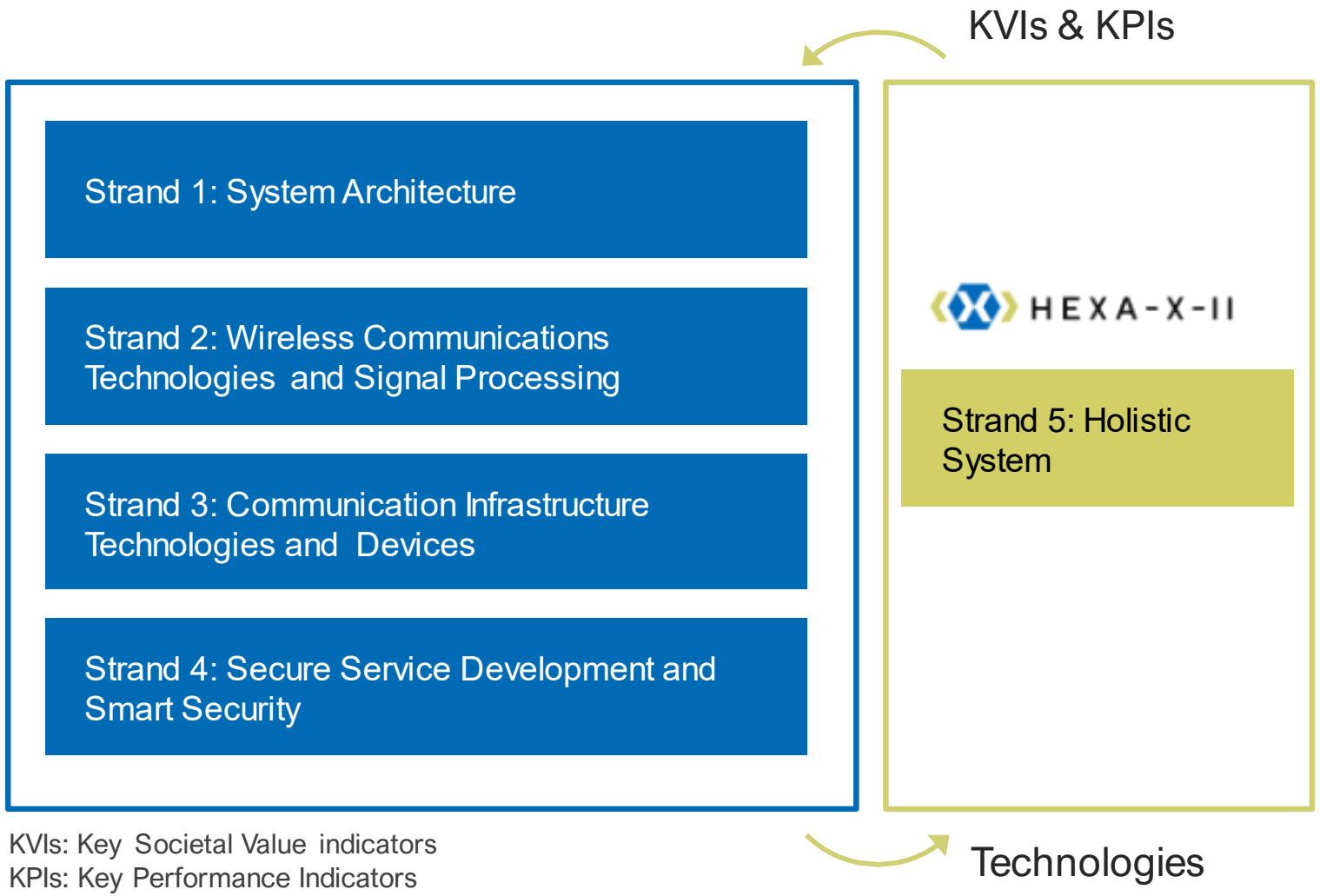
E2E KPIs
- NW energy efficiency
- Dependability
- Coverage
- Service availability

New capabilities – beyond communication
- Integrated sensing
- Local compute
- Ubiquitous AI
- Embedded devices

KVIs – quantify the human-centric values
- Sustainable 6G
- 6G for sustainability
- Trustworthiness
- Digital inclusion

Interactions with other SNS JU projects

July 3rd: D1.1 Environmental, societal and economical drivers and goals for 6G



KVIs: Key Societal Value indicators
KPIs: Key Performance Indicators

Hexa-X: July 3rd : D1.4 Hexa-X architecture for B5G/6G networks (including updates on use cases and KVIs&KPIs)
Earlier version already available from Hexa-X

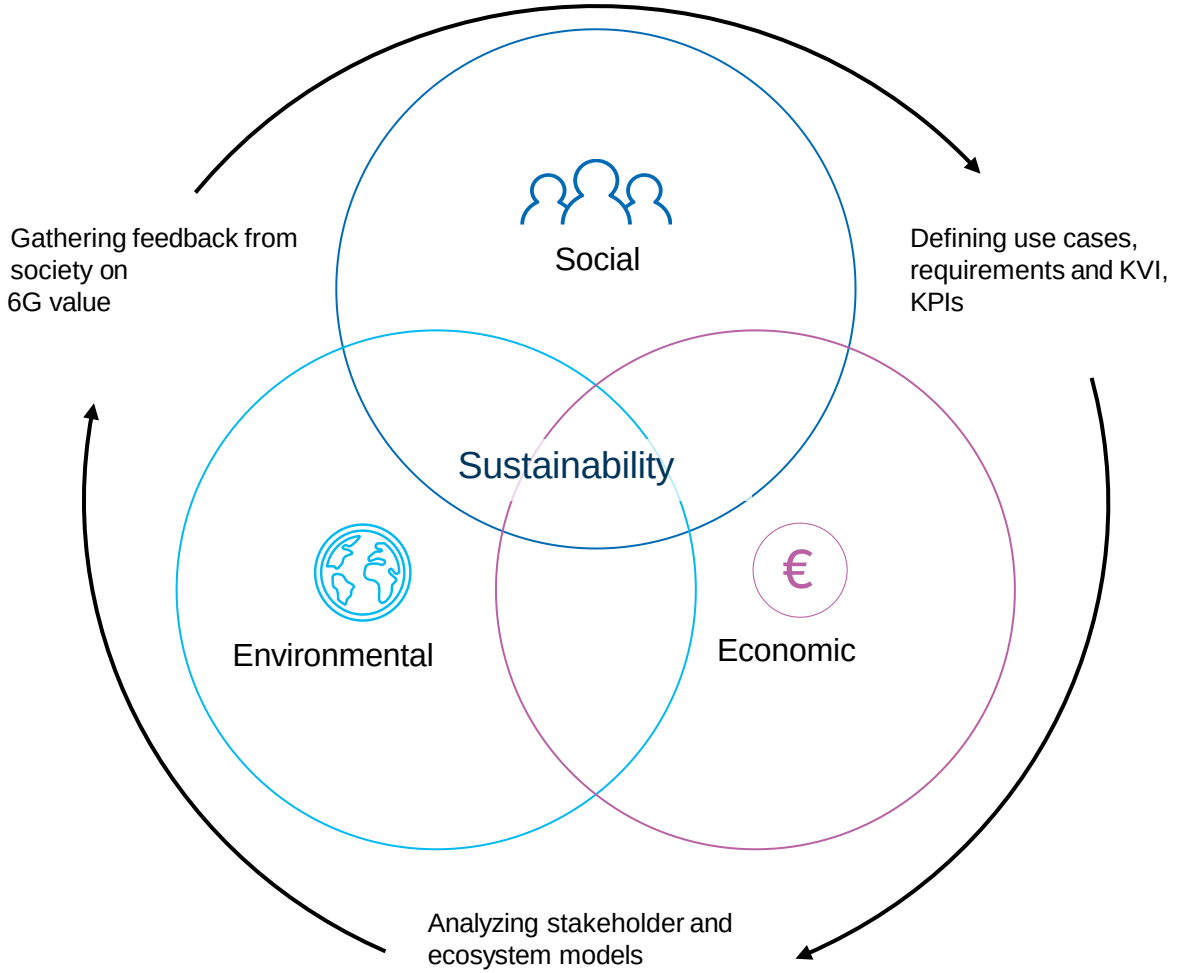
Jan 2nd 2024: D1.2 6G use cases and requirements

6G SNS

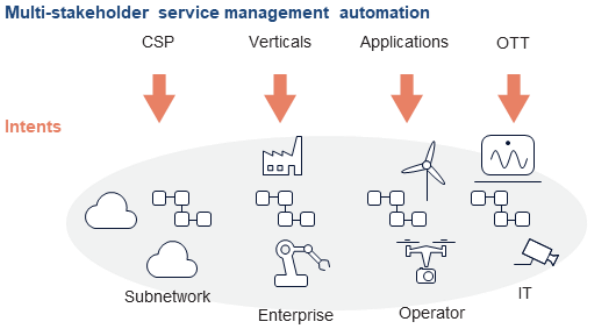
Coordination/synchronization via the 6G SNS WGs

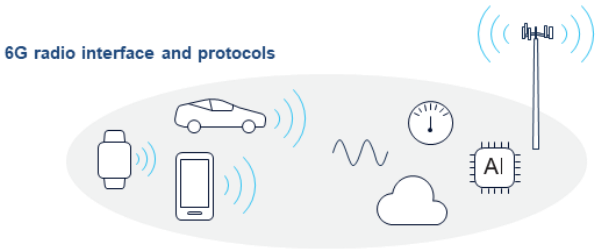
Hexa-X-II welcomes all input, participates to Working groups and organizes workshops and other sessions. Further methods under discussion.

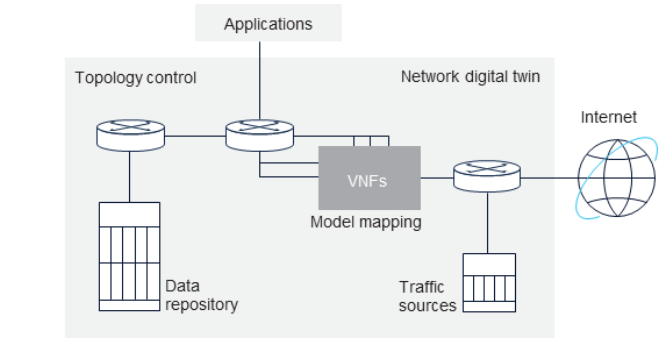
WP1 Value, requirements and ecosystems

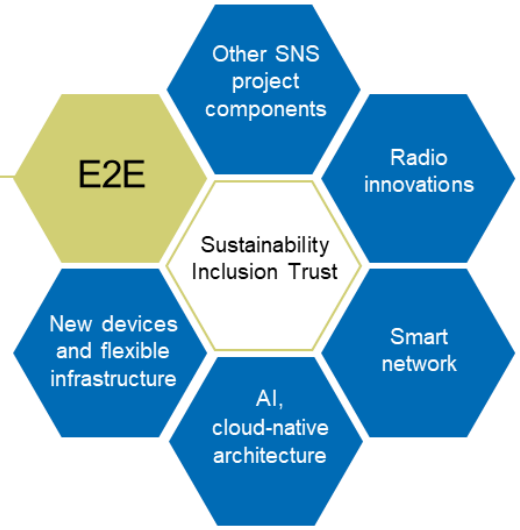


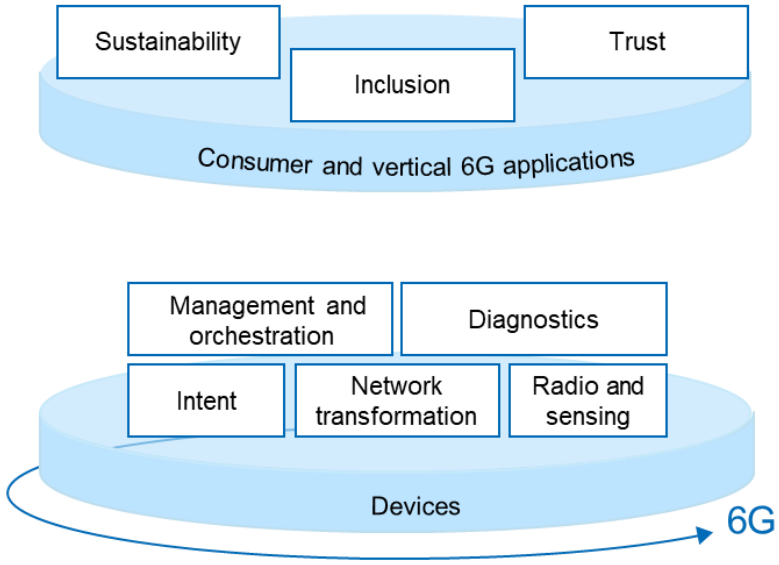
WP2 End-to-end system





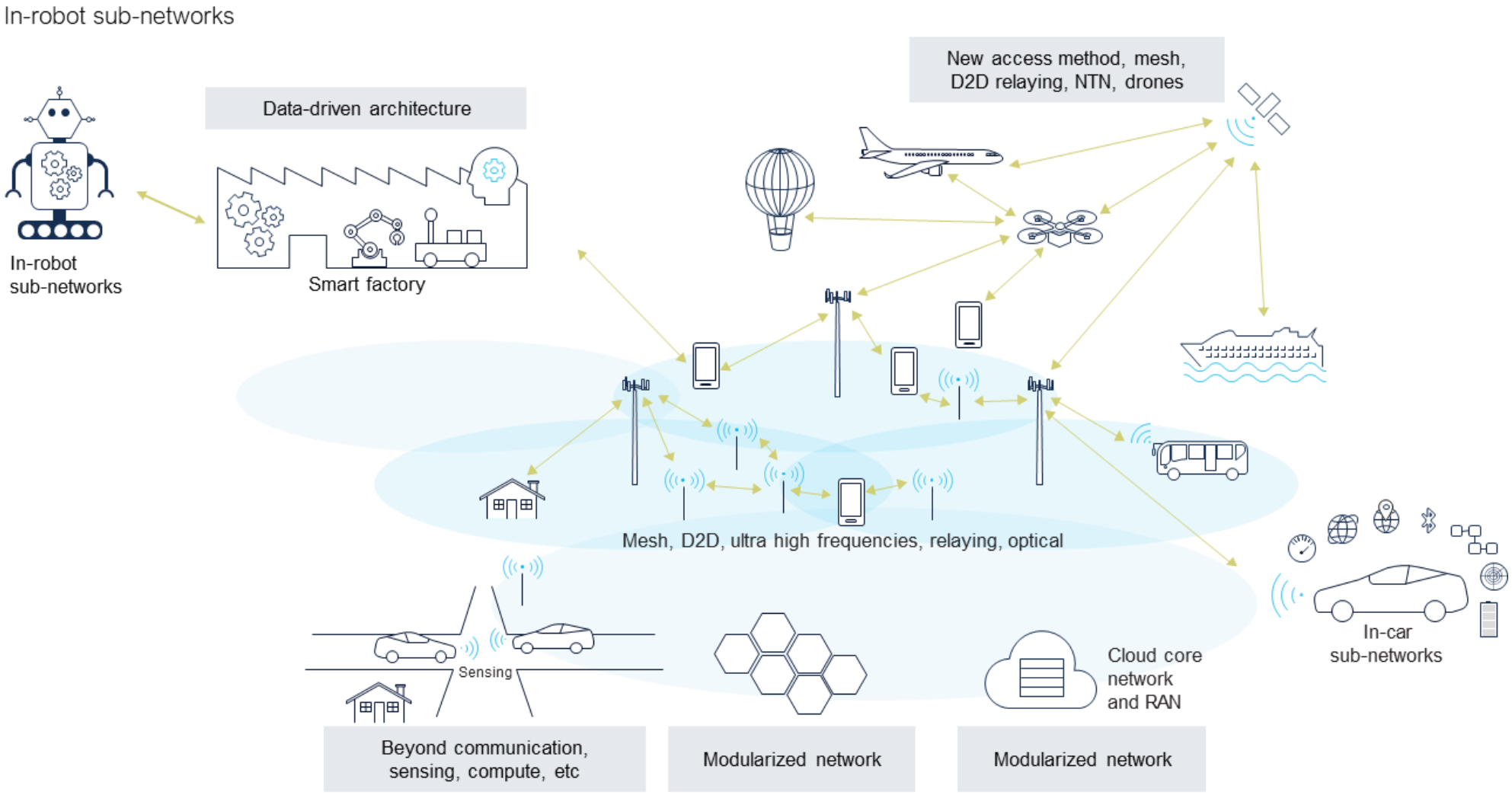






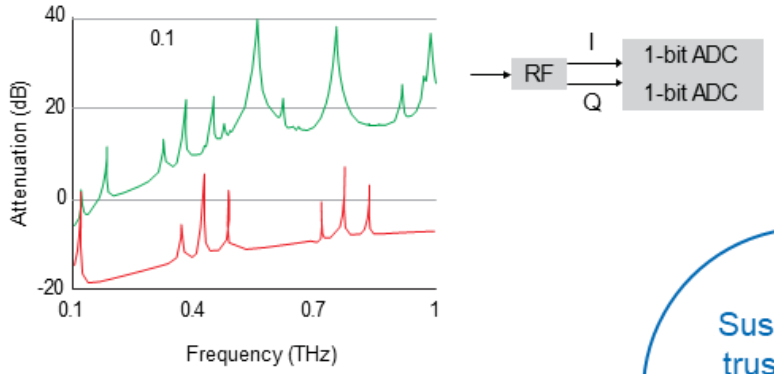
6G network platform blueprint → E2E system validation

WP3 6G architecture design



WP4 Radio evolution and innovation

Towards THz communications

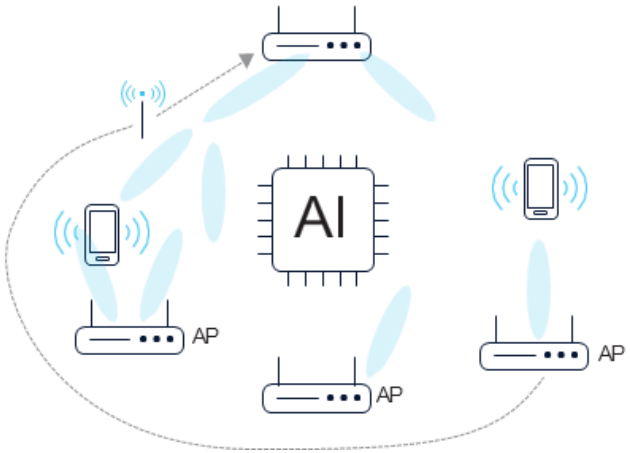


Joint communications and sensing

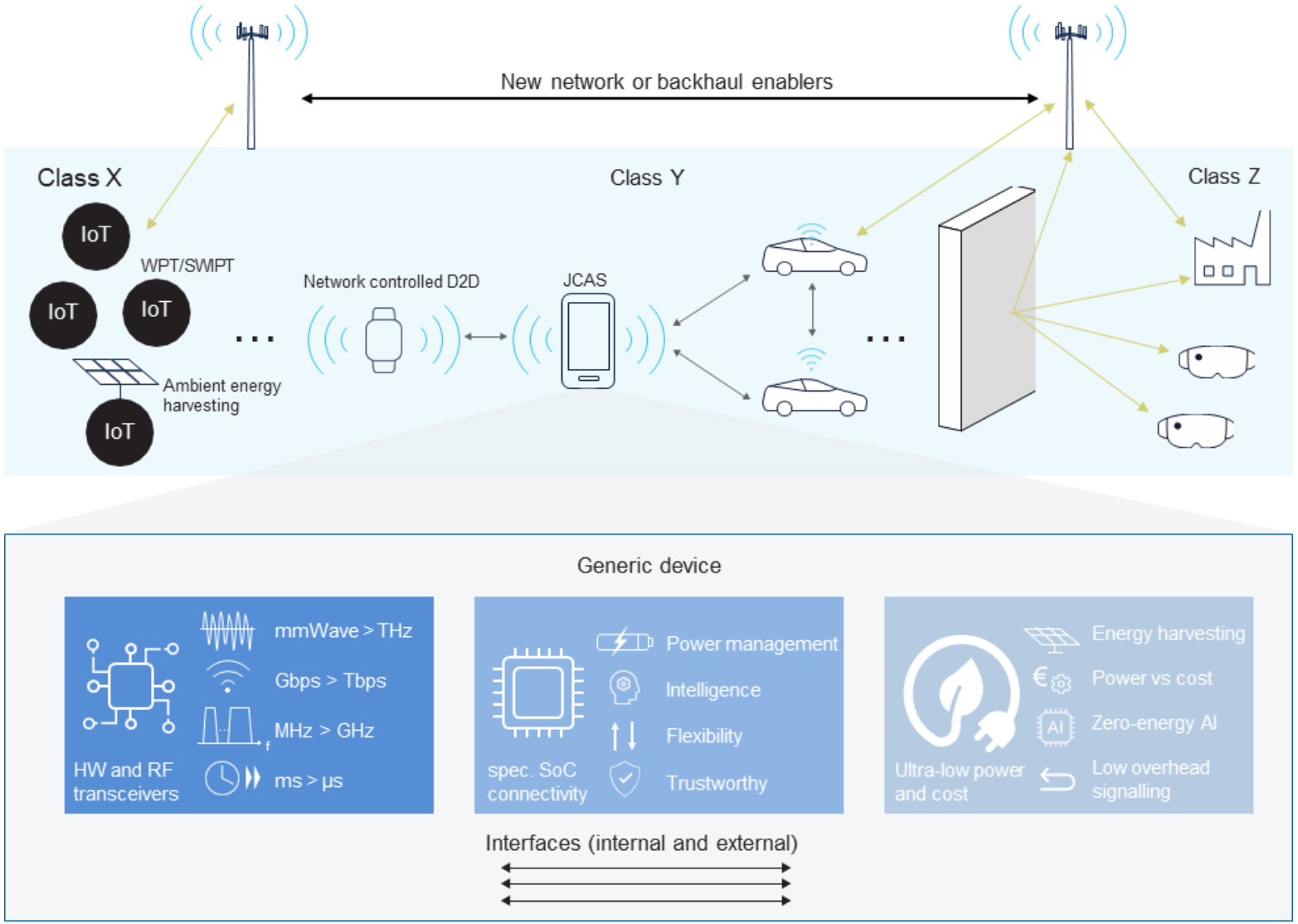
Sustainable, trustworthy, inclusive and holistic radio design

Flexible spectrum access solutions

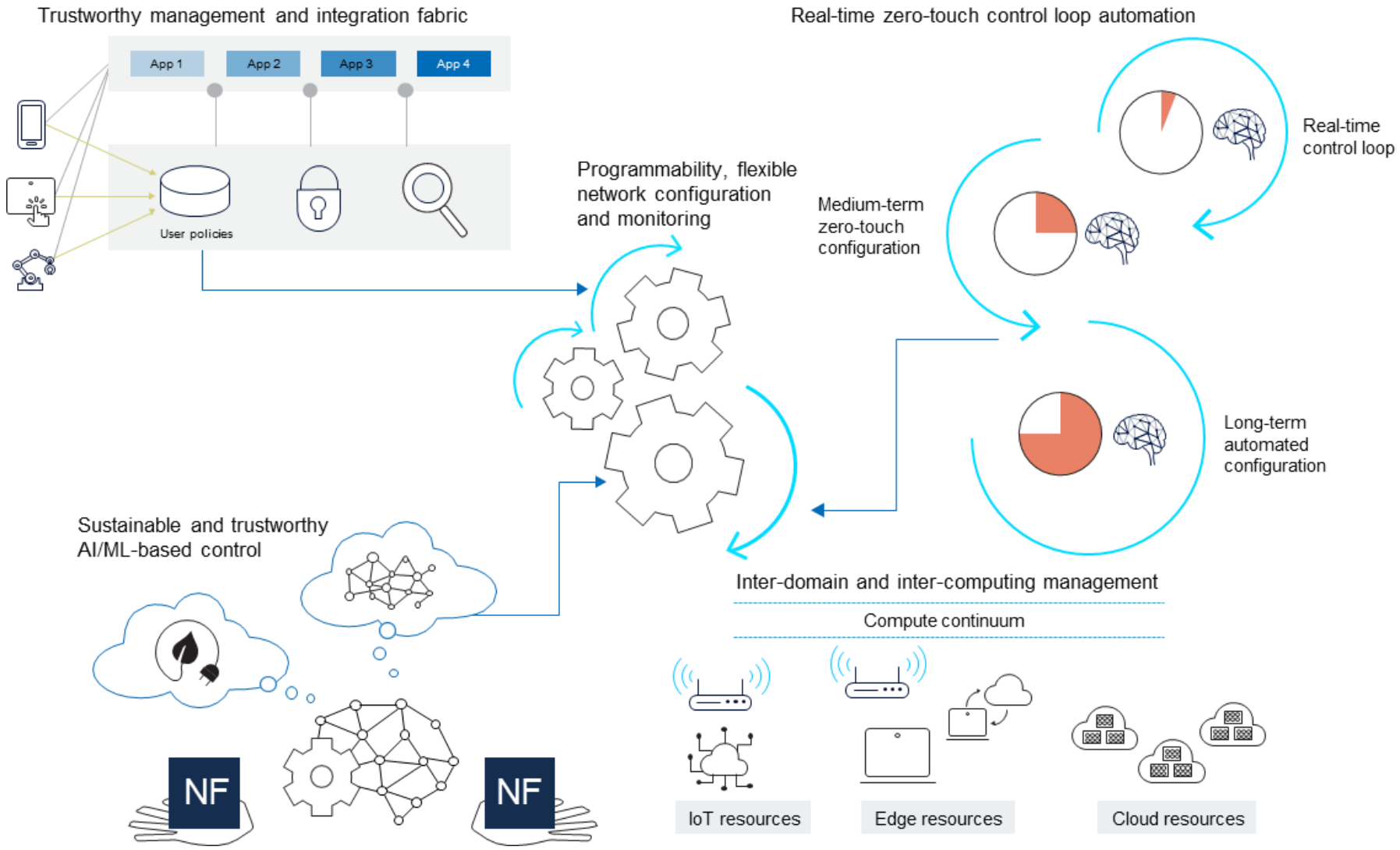
Intelligent radio air-interface design



WP5 Future devices and flexible infrastructure



WP6 Smart Network Management



Some key deliverables

Id	Deliverable name	Date
D1.1	Environmental, societal and economical drivers and goals for 6G	June 2023
D2.1	Draft foundation for 6G system design	June 2023
D3.1	Initial identification of Architectural enablers	June 2023
D4.1	Identifications of key enablers for 6G radio design and spectrum access	June 2023
D5.1	Draft Characteristics and classification of 6G device classes	August 2023
D6.1	Identification of 6G smart network management and orchestration enablers	August 2023

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6GSNS

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