



HEXA-X-II

## D1.2 6G Use Cases and Requirements - Summary

Hexa-X-II

[hexa-x-ii.eu](http://hexa-x-ii.eu)

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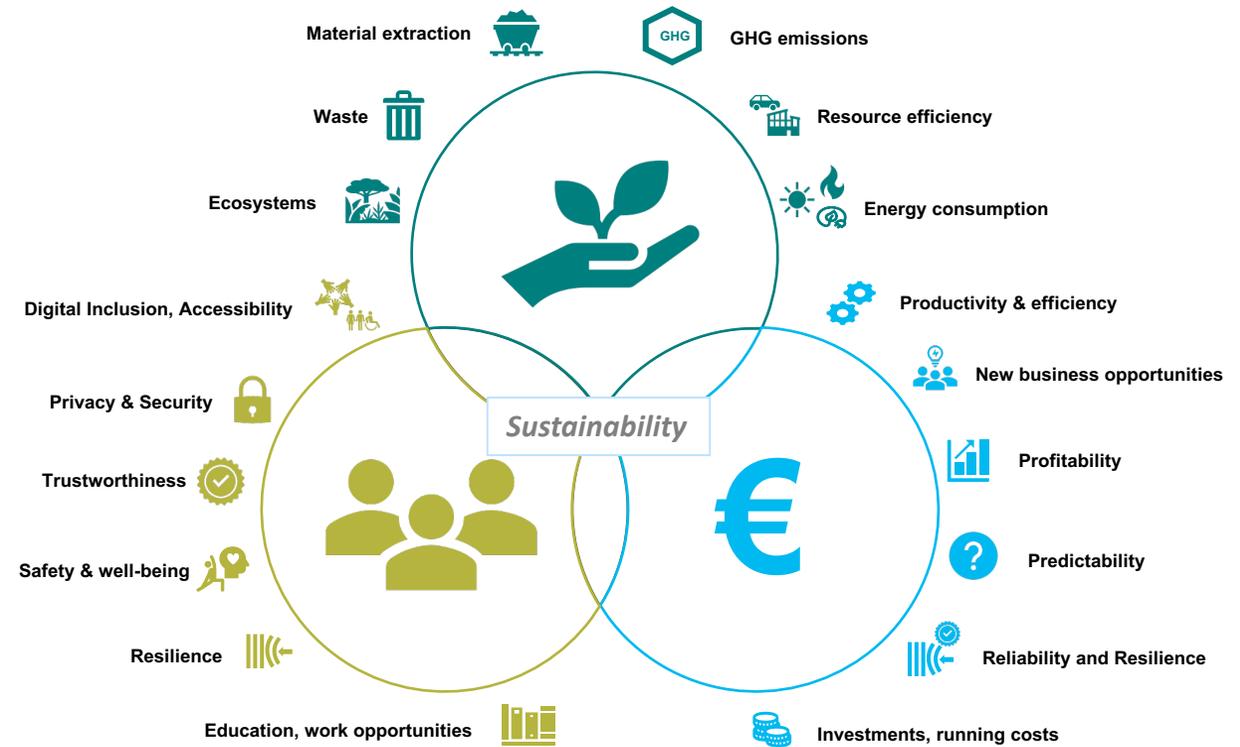
# Introduction

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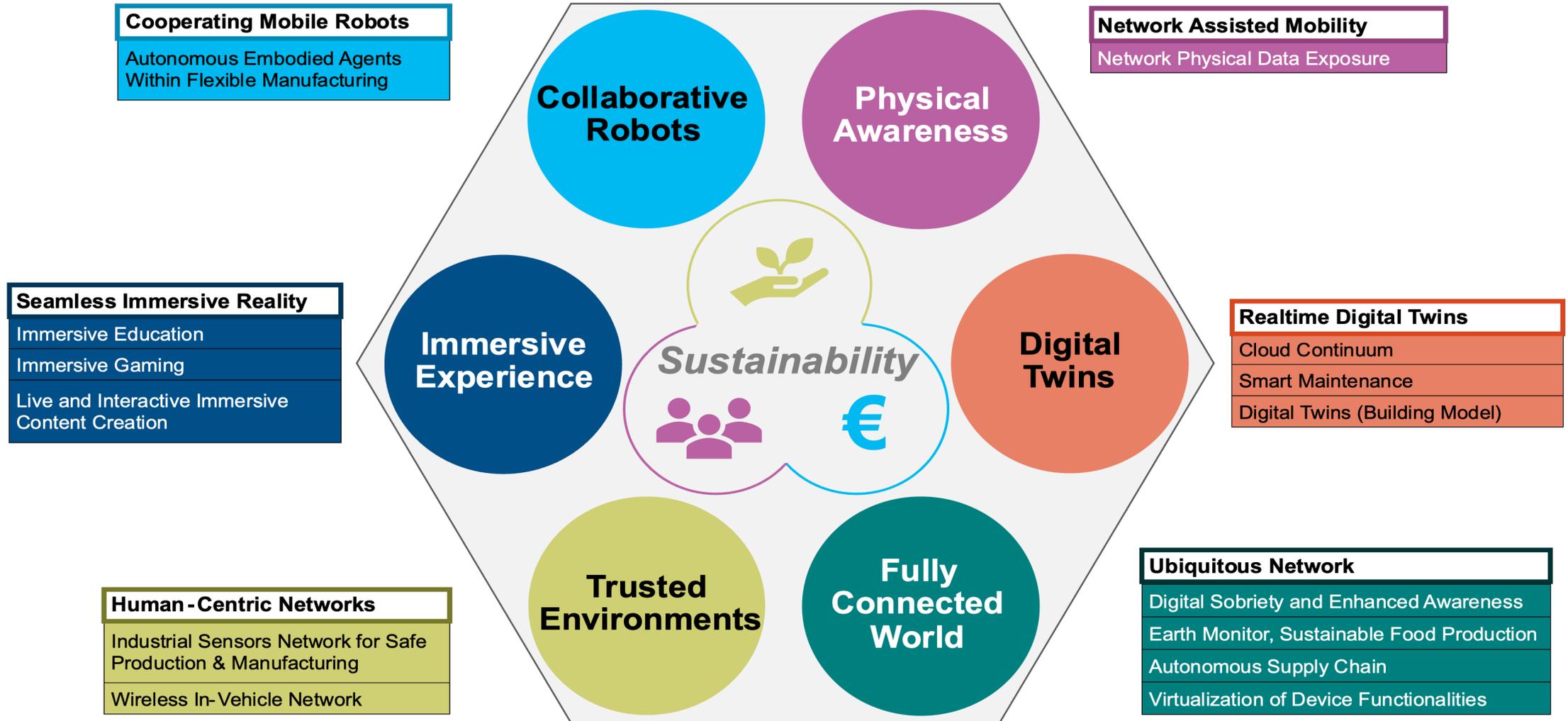
# Hexa-X-II's Use Cases



- Evolved from Hexa-X's use cases + contributions from partners → Deliverable 1.2 (12/23)
- Sustainable, inclusive, and trustworthy 6G platform
- Use Cases approach
  - Description/KPIs/Technical requirements/...
  - Sustainability analysis
  - Challenges, risks, and mitigation strategies
  - Business models/stakeholder analysis



# Hexa-X-II Use Case Families



Hexa-X-II Use Cases with **Highlighted** Representative Use Cases



# Hexa-X-I Use cases

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# COLLABORATIVE ROBOTS

*The network's main users are machines.*

*Emphasis lies on task-specific local connectivity. Depending on the task or needs, the network topology may undergo frequent changes. The level of machine autonomy determines the communication requirements.*

## Use Cases

Cooperating Mobile Robots | Autonomous Embodied Agents with Flexible Manufacturing

# PHYSICAL AWARENESS

*Physical Awareness use cases build on beyond-communication capabilities in networks: sensing, positioning, compute, and AI. By gathering 3D data about physical scenarios and situations, efficiency and safety can be improved.*

## Use Cases

Network Assisted Mobility | Network Physical Data Exposure



# DIGITAL TWINS

*Digital Twins is a set of use cases where digital equivalents of the real world are created and displayed for interaction, control, maintenance, as well as process and component management.*

## Use Cases

Realtime Digital Twins | Cloud Continuum | Smart Maintenance | Digital Twins (Building Model)

# FULLY CONNECTED WORLD

*Ensuring connectivity **everywhere**, expanding beyond purely traditional terrestrial networks to deliver the benefits of communications to everybody.*

*Besides expanding coverage cost-effectively, it also enables network function availability for crisis management, earth monitoring, digital health services, virtualisation of device functionalities, or support of autonomous supply chains.*

## **Use Cases**

Ubiquitous Networks | Digital Sobriety and Enhanced Awareness | Earth Monitor & Sustainable Food Production | Autonomous Supply Chain | Virtualization of Device Functionalities



# TRUSTED ENVIRONMENTS

*Comprehends use cases in local environments (streets, hospitals, schools, retirement homes) delivering human-centric services and promoting health, well-being, safety, inclusion, and autonomy in daily life.*

*These are based on sensing technologies as well as AI/ML and compute support to create spatial and situation awareness and enable context-driven interventions.*

## Use Cases

Human-Centric Networks | Industrial Sensors Network for Safe Production & Manufacturing | Wireless In-Vehicle Network

# IMMERSIVE EXPERIENCE

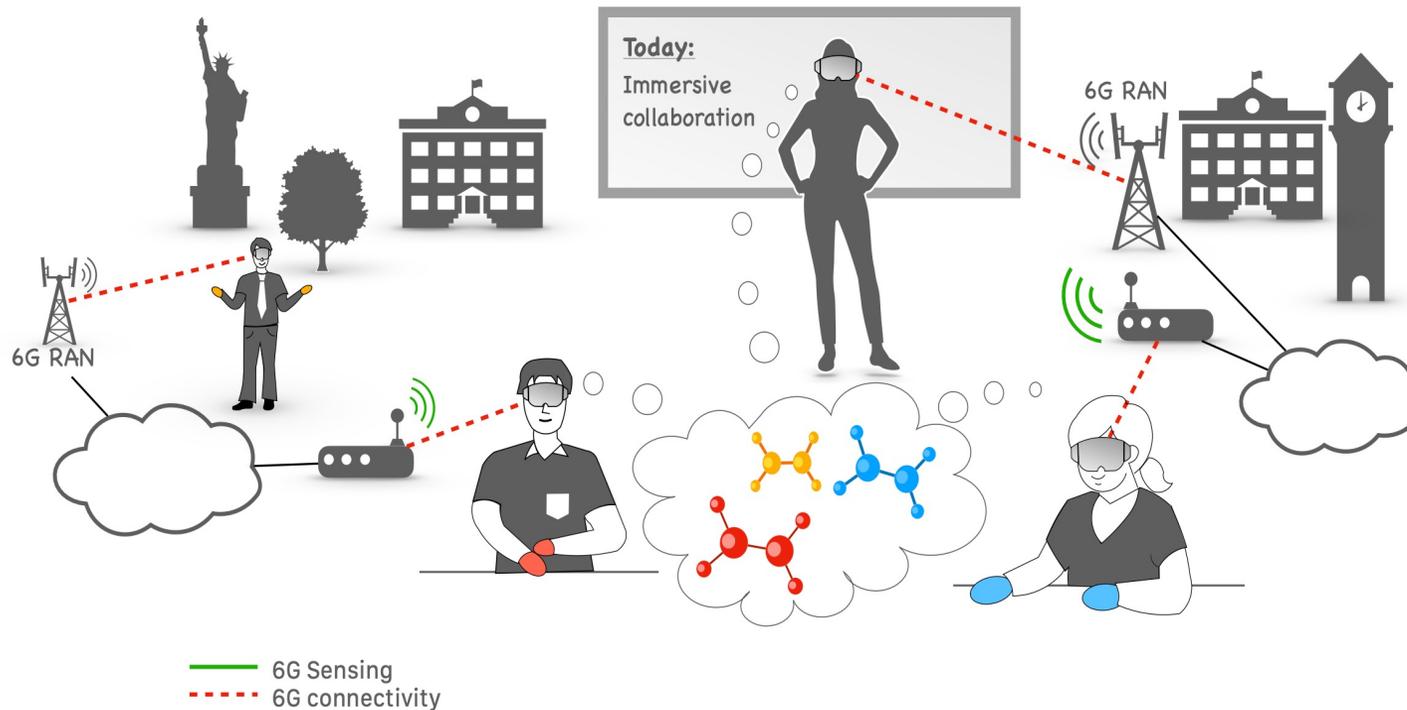
*Immersive Experience use cases are based on an evolving XR technology.*

*Immersive Experience is all about meeting the fundamental human need of “experiencing” a now digitally extended or virtual environment to understand and to act.*

## Use Cases

Seamless Immersive Reality | Immersive Education | Immersive Gaming | Live and Interactive Immersive Content Creation

# Seamless Immersive Reality



## Immersive collaboration

Mixed reality collaboration and immersive telepresence

e.g., remote lectures

## Immersive experience “on the go”

Tailored experience and capabilities depending on user’s situation and role

e.g., XR city tour

# Seamless Immersive Reality



## Functional Requirements



AI/ML/Compute



Sensing



Positioning



Privacy & Security



Service Continuity



Low Latency Synchronization

## KPIs

  
User-experienced data rate [Mb/s]

Depending on scenario:  
**250**

DL,  
UL for UE taking role of gateway

  
Area traffic capacity [Mb/s/m<sup>2</sup>]

**20**

Wide area: focus on immersive experience “on the go”

  
E2E Latency [ms]

**<10**

Split rendering scenario

  
Positioning [cm]

**<10**

Positioning accuracy (H and V)



# Seamless Immersive Reality: Sustainability Analysis

Main categories for further impact analysis

Immersive Experience

<b>Environmental</b> 	<b>Social</b> 	<b>Economic</b> 
 Resource efficiency	 Education, work opportunities	 Productivity, efficiency
 Energy consumption	 Social interaction, well-being	 Profitability
 Material extraction	 Privacy and sensitive data handling	 Knowledge transfer, training environments
 e-waste	 Isolation, alienation	 Investment, training, maintenance cost

# Next Steps



- 3GPP SA1 Workshop 05/24
- Ongoing/Open to improvements

## Deliverable 1.2





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HEXA-X-II.EU //   



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