6G Research & Innovation in Europe

one6G Summit 2022
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Smart Networks and Services Joint Undertaking
A joint undertaking for 6G Networks and Services

To facilitate and develop industrial leadership in Europe for 6G networks and services by 2030

EU R&I funding of € 900 million for the period 2021-2027, at least equally matched by private side resources

Media & Entertainment
Gaming & Metaverse
PPDR, security - safety
Industrial IoT
Energy
Automotive
Smart Cities
E-Health
Tourism & Culture
Smart Farming

Drivers
- EU technological excellence
- Competitive global business placement
- Ensure Security and Privacy
- Address Green Deal and SDGs
- Need for globally accepted standards

Enablers
- Cloudification
- Native AI
- Flexible Architecture
- Holistic cybersecurity

Expected Results
- Technological Leadership
- EU industry competitive global value propositions
- Meet demanding KPIs
- Meet demanding KVIs
- Sustainable and interoperable communications technologies

International collaboration

Drivers & Enablers

Smart Services
- Metaverse
- Digital Twinning
- Advanced services for Verticals
- Holographic communications

EU SNS Economy

Stronger European SNS Economy

Strategic Objectives
- Research & innovation for 6G networks - connectivity, devices and services infrastructures
- New applications: "Internet of Sense", XR/VR, digital twins, holographic type communications
- Reinforce Europe's technological leadership
- Safeguard European values (security and privacy)
- Enable a massive digital and green transitions towards low carbon footprint of vertical industries
- Cost Effective Affordable Solutions

Main Missions
- Fostering Europe's technology sovereignty in 6G
- Boosting 5G deployment in Europe

The 6G PPP and the 6G SNS are funded by the European Commission under the Horizon 2020 and Horizon Europe Research Framework Programmes.
6G Vision and status

6G in the R&I domain: multiple programmes globally (US, CN, JP, RoK..) + EU MS’s

No declared commercial initiative yet, deployment around 2030

No globally established vision. 5G-PPP EU vision from June 2021

Based on **convergence/twinning** Physical + Digital + Human worlds

**Targets:**

- beyond 5G capabilities for verticals + totally new application domains
- Step change in performances with AI, blockchain..
- Systematic coverage of Sustainability issues (security, energy, affordability, access..)

⇒ Open opportunities to shape the future 6G landscape. Europe should be leading
(Core) Technological Areas

Requirements:
- Connecting intelligence
- Programmable
- Determinism
- Integrated sensing
- Sustainable
- Trustworthiness
- Affordable and scalable

AI/ML assisted:
- Network Architecture & Control
- Edge & Ubiquitous Computing
- Radio Technology & Signal Processing
- Optical Networks
- Network & Service Security
- Non-Terrestrial Communication
- Devices & Components

KPIs:
- Energy efficiency
- Spectral efficiency
- Throughput (e.g., Tb/s)
- Reliability (e.g., 1-10^-8)
- Latency (e.g., sub-ms)
- Positioning (e.g., cm level)
- Density
- Coverage
- Privacy
- Cost

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6G SNS Call 1

Stream A (RIA): Smart communication components, systems and networks for 5G mid-term Evolution systems

Radio:
Building Blocks and Systems

System and Security:
Secure Softwarisation
Real-time/ Zero touch Services

Architecture:
Evolved Design
Advanced Cloud/Edge
Converged Optical Transport

Stream B (RIA): Research for Revolutionary 6G Technology and systems

System Architecture

Wireless Communication Technology and Signal Processing

Holistic System Perspective

Trustworthy and Secure Service Development and Provision

Communication Infrastructure Technologies

Stream C (RIA): SNS experimental infrastructures

Stream D (IA): Large Scale SNS Trials and Pilots with Verticals

See Results: Europe scales up 6G research investments and selects 35 new projects worth €250 million
SNS JU Call 1 in figures

10+ Vertical Industries

- Smart Cities, 5%
- eHealth, 7%
- PPDR / security and safety, 14%
- Construction/building, 5%
- Industrial IoT, 18%
- Automotive, 5%
- Energy, 7%
- Other relevant verticals, 2%
- Smart Farming, 2%
- Media, xR communications, 25%
- Gaming, metaverse, 9%
- Tourism and culture, 2%

Key technological Areas

- Orchestration & Management, 7%
- Security, 13%
- RAN, 15%
- Sustainability - energy efficiency & EMF, 11%
- NTN, 7%
- Optical communications, 9%
- Microelectronics, 10%
- Architecture - including Edge, 25%

288 unique beneficiaries
~18% funding for SMEs w/o considering cascade funding
~30% not 6G-IA members
SNS JU Next steps

- SNS WP2023-24 is under preparation and publication target is Dec 2022
- Call 2 (~130M) to open mid-January 2023

**2023**

- Low TRL topics including those not covered during the 1st call
  - Micro-electronics for 6G EU-US Cooperation
- Complement Phase 1 + federation
- Automotive
  - Health, Smart Cities, Farming, Education
- Societal challenges

**Stream B (RIA):** Research for technology advancement towards 6G

**Stream C (RIA):** SNS experimental infrastructures

**Stream D (IA):** Large Scale SNS Trials and Pilots with Verticals

**2024**

- PoC and Standardization
  - Collaboration JP&SK Sustainability
- Microelectronics for 6G
- Vertical use cases implementing 6G Vision
- SNS Operational Support

**CSA:** Support Action
Europe is fully committed to 6G with vibrant and running R&I, that capitalizes on 5GPPP results and is amplified by the 6G SNS JU.

Important new technologies and applications, societal and sustainability drivers, full supply chain from microelectronics to services.

Massive stakeholder efforts for SNS Call 1, will form a good basis for future calls.

First portfolio of 35 SNS research, innovation, and trial projects (around €250 million) to start in Jan 2023; SNS WP 2023-2024 to be published in Dec 2022.

2 years ahead of us as window of opportunity to shape the 6G technologies and prepare for standards; no time to waste.
Thank You!

The Smart Networks and Services Joint Undertaking | Shaping Europe’s digital future

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