From Combinatorial Innovation to Compounding Value

Designing 6G Systems to Capture Growth

Smart Networks and Services Joint Undertaking

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Combinatorial Innovation and Compounding

Challenge of reconciling **value creation** and **value capture** activities

Explore + **Exploit**

"We are entering a new period of **combinatorial innovation.**"
Eric Schmidt

"Long Term Value comes from compounding"
Warren Buffet

Combinatorial Innovation creates options

Progress accelerates when technologies become modular, interoperable and reusable, because the **number of possible combinations explodes, continuously recombining based on context.**

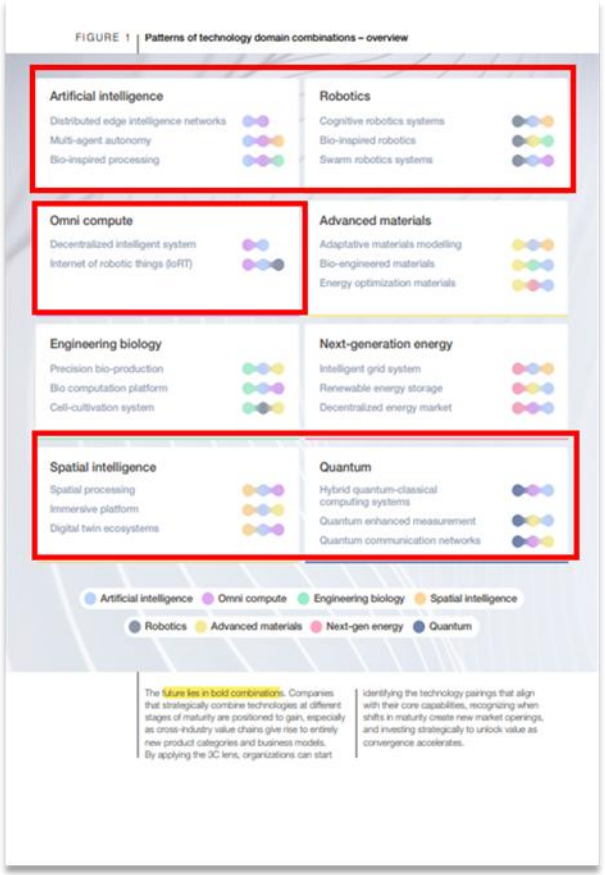
Compounding develops options that matter

Business reality incentivises focus on proven re-usable components to deepen investments and scale adoption.
The real **cost of fragmentation is not inefficiency: it is lost compounding.**

Technology Convergence will create growth opportunities

Software is the central **enabler of future convergence**

Example / Illustrative

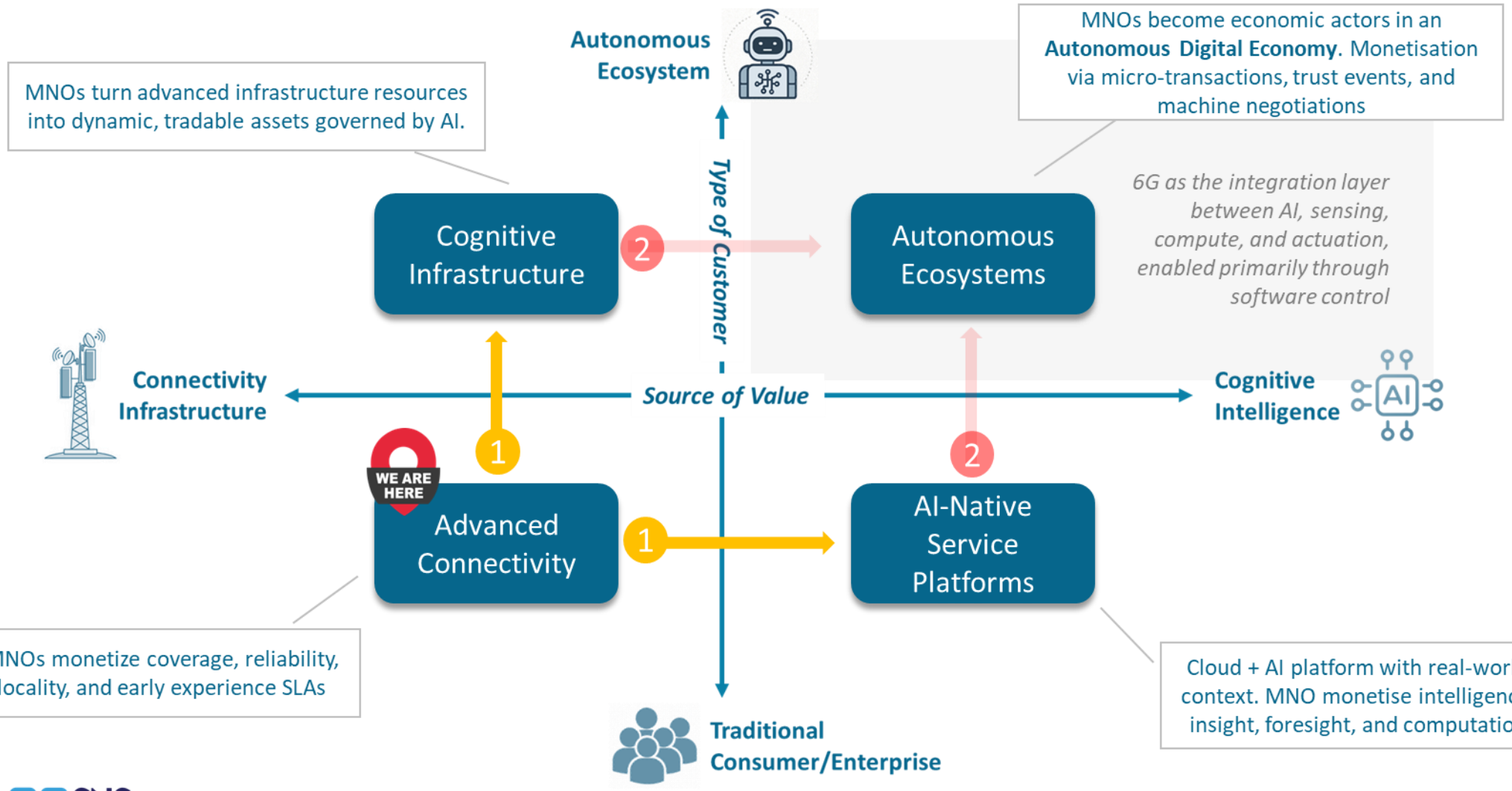


Software

- **Dissolves traditional sector boundaries** (telecom, cloud, AI, quantum, robotics, energy).
- Acts as a common abstraction layer that **allows capabilities from different domains to interoperate** without redesigning physical infrastructure.
- **Allows players to evolve** from individual component suppliers **to full-service innovation partners**.
- **Enables** innovative services and **new monetization opportunities**
- As a result, has the potential to **reshape future connectivity systems**

Shaping the evolution towards future connectivity systems

Expansion into new **value sources** and new **types of customers**



Software is a key **Strategic Control Point**

6G innovation will not be based on any specific killer feature

Telco-Cloud Systems

6G value is the combination: connectivity + compute + sensing + AI + edge/cloud automation + security, enabled primarily through software control

Virtualisation and Cloud-Native

- Service-Based Architectures
- MANO and Interfaces
- VNFs/CNFs Lifecycle
- Cloud continuum

Project Examples

6G CLOUD, HEXA-X-II, SANDBOX, 6G BRICKS

Automation and Intelligence

- AI-native control loops
- Intent
- Digital twins
- Real time optimisation

6G TWIN, CHORSE, Across, NANCY, VERGE, 6G LEADER, GOALS

Open-source and Developer Tools

- Experimentation platforms
- Trials
- CI/CD
- Reference components
- Network/MEC APIs

SANDBOX, fidal, TrialsNet, Imagine B5G

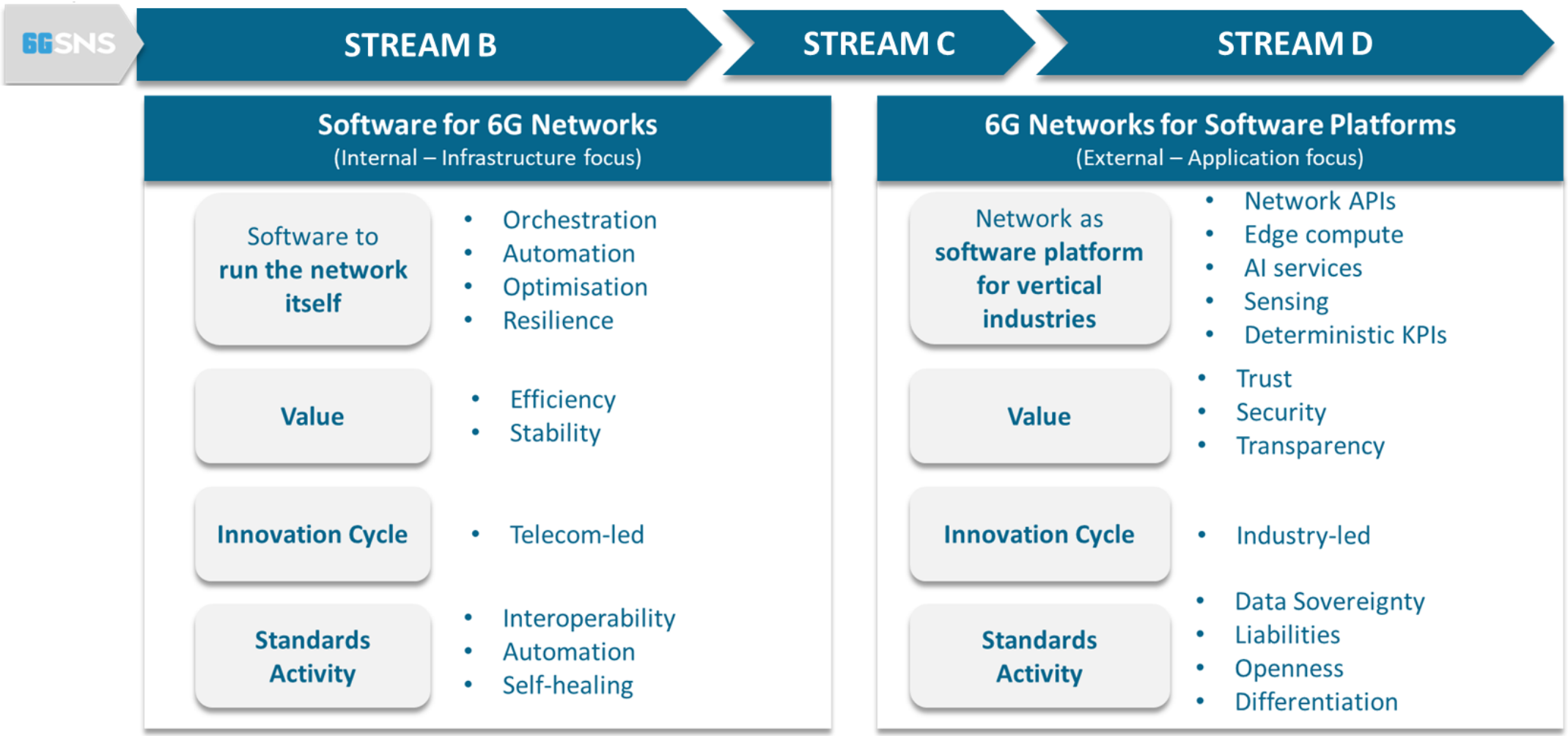
Security and Reliability

- Zero-trust
- Security orchestration
- Observability
- Confidential compute

iTrust6G, PRIVATEER, CONFIDENTAL6G, RIGOUROUS, SAFE-6G, ROBUST-6G, XTRUST-6G

SNS JU working on 2 different **software domains**

These domains have **different lifecycles, governance, and innovation** speeds.



Collaboration and Differentiation

How do we build an open ecosystem that allows **innovation** without **fragmentation?**

In healthy ecosystems, they form a **continuous loop:** the next wave of combinations starts from a higher baseline.

For discussion / Illustrative

Areas of collaboration

Interoperability and Standards

1. Core Network Architecture
2. **Cloud-Native Interoperability**
3. Open RAN Interfaces and RIC Interoperability
4. Network Data, Telemetry, and Observability Models
5. **AI Governance (Model Assurance and Safety)**
6. **Network APIs**
7. **Federated Edge Cloud and Compute Continuum**
8. Spectrum Sharing
9. Sensing and Localization

Areas of differentiation

Innovation and Execution

1. AI Models and Automation Intelligence
2. **Network API Monetization & Vertical Solutions**
3. Developer experience
4. **Digital Twins** and Simulation Platforms
5. Sovereign cloud integration
6. Confidential computing
7. **Vertical-Specific Network Services**
8. Value-Added Software Layers above connectivity

Compounding

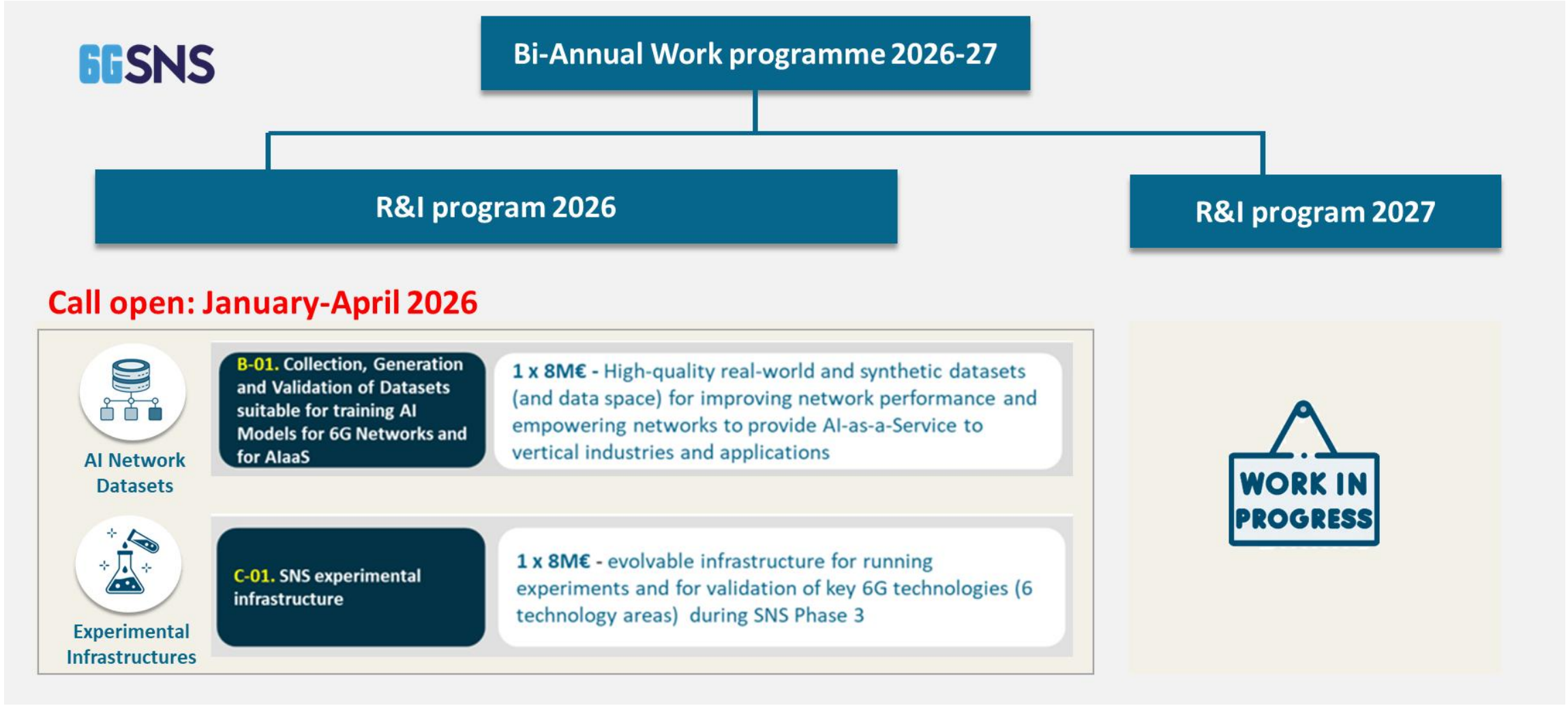
Collaborate on the features that make combinations possible

Combinatorial Innovation

Differentiate on the intelligence and services

2026-27 Bi-Annual **Work Programme**

SNS JU Call for Proposals 2026 : Open util 29 April!



In summary

- ETSI and SNS JU are aligned in the need to **turn research funding into accumulating assets**.

- Together, we can **synchronize our ecosystem to collaborate**, which is the only way large-scale innovation compounds.
  - **Creating synergies** between open source and standardisation
  - **Ensuring interoperability and "true" openness** to accelerate innovation
  - **Defining governance models** that facilitate industrial adoption

- SNS JU is not just funding ideas; it is building **long term value for Europe**.
  - **Open-source components** that survive beyond projects
  - **Interoperable platforms** that others can extend
  - **Repositories of information** that future projects can leverage
  - **Skills and operating models** that compound over time

- If Europe rewards **reuse, integration, and operational continuity**, we will get compounding returns on our public investment.

6GSNS

SMART NETWORKS AND SERVICES
JOINT UNDERTAKING

THANK YOU FOR YOUR ATTENTION

Contact us: smart-networks.europa.eu

~100 research projects in SNS JU portfolio

Europe made a bold and early commitment to 6G R&I through the SNS JU

~630 MM € of public funding

Invested in SNS JU Calls

	Call 1 Started Jan '23	Call 2 Started Jan '24	Call 3 Started Jan '25	2025 Calls To be Started in 2026
Stream A 5G Evolution systems	Components, systems & networks **7** Complementarity projects validate **complete system** view			Not started yet
Stream B Research for radical technology advancement towards **6G definition**	System Architecture Wireless & Signal Infrastructure & Devices Security Microelectronics Sustainability International Collab **19** projects research **Novel technologies** expected to be adopted in commercial networks in a **mid /long-term horizon**	**24** projects working on Innovative solutions towards real life networks over a **long-term horizon.** Also targets **International Cooperation**	**12** projects targeting a higher TRL range, compared to previous calls, aiming to produce **more mature results** and impact on standardization . Includes lighthouse project on **Sustainability** and targets **International Cooperation**	**16** projects on **Forward looking topics** (advance architectures and IoT), **Wireless tech** (MIMO, AI/ML, Spectrum sharing, Open RAN), **NTN- TN** unification/integration, Optical networks and **Photonics**, **Security and Resilience**, and **Microelectronics.**
Stream C Experimental Infras/Platforms	Platforms Enablers/ Proof Concept **3** projects validate **6G technical enablers**	**1** Europe-wide **experimental infrastructure(s)** to support SNS program	**1** project on integration of **microelectronics** components	**1** project on **Telco cloud** and service provision enablers
Stream D Large Scale Trials With Verticals	Applications & services Business ecosystems **4** projects on specific verticals with **high economic and societal importance**	**2** projects focusing on i) **Automotive** ii) **Health, Smart Cities, Farming and Education**	**2** projects on advanced **5G/6G technologies in/for verticals**, with special focus on sustainability	**4** projects on (1) Industry/Manufacturing, (2)Media (3)Transportation/Logistics, (4) Emergency Services and (5) Health
	Call 1 240 MM €	**Call 2** 132 MM €	**Call 3** 129 MM €	**Call 4 & 5** 128 MM €