

**Stream C (RIA):** Experimental Infrastructures

- To develop EU wide **experimentation platforms** that can **incorporate candidate 6G technologies** for their further validation.
- To make such an experimentation platform **capable of hosting advanced pilot “6G” use cases** as targeted **under Stream D** during the **subsequent SNS implementation phase**
- **Reusability and evolvability** of the platforms over the lifetime of the SNS programme
- **Accessibility and openness** (e.g., modular implementation, open-source solutions, well-defined interfaces, complete documentation, etc.).
- **Directionality and optimisation** of previous and related investments
- **Disruption friendly**: experimental facilities, even if originating from earlier experimental initiatives, should be capable of hosting possible upcoming 6G disruption and hence guarantee their future-proofness
- **End-to-End**: the target experimental facility should be capable of demonstrating E2E service capabilities and include a full value chain including IoT devices, connectivity, and service provision

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### Expected Outcome:

- demonstrate the performance of key **6G candidate technologies, components, and architectures**. To that extent, technologies as identified notably under Stream B Strands may be considered as a baseline
- demonstrate technological feasibility of “**better than 5G**” KPIs, related indicatively to capacity, ubiquity, speed, latency, reliability, density of users, location accuracy, energy efficiency, service creation time, network management CAPEX/OPEX. It will include capability to **incorporate emerging 6G specific KPI’s** and the **capability to address key KVI’s** as developed by ICT52 projects. KPI’s from this project may also be taken as reference objectives in that respect.
- demonstrate **innovative radio spectrum technologies** and the use and sharing applicable to beyond 5G and 6G spectrum. This should include, if appropriate, **licensed, unlicensed, or licensed-shared access**. It also includes **novel spectrum at THz bands**.
- **validate a representative end-to-end beyond 5G architecture (and later 6G)** including end-to-end service provisioning with slicing capabilities and ability to accommodate technological and architectural disruptions of 6G
- demonstrate **performance of disaggregated architectures**, both at interface level (interoperability) and at cloud implementation level (Open RAN).

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### Expected Outcome:

- validate **landscape aware and end-to-end security architectures** and technologies.
- validate **multi access edge computing scenarios** and their integration into a complete cloud continuum with representative opportunity from the EU supply side.
- integrate **full value chain experiments** covering IoT/devices, connectivity, and service delivery.
- support **innovative use cases with vertical actors**, beyond 5G capabilities, and to support showcasing events
- demonstrate and validate **performance of innovative 6G applications** with a **focus on the Internet of Sense** (integration of communication and sensing capabilities) and on **demanding immersive applications such as holographics, digital twins and/or XR/VR**.
- support to **impactful contribution to standards**.
- demonstrate the technological feasibility of key societal requirements and objectives such as **energy reduction at both platform and use case levels, EMF impact and acceptability, sustainability, and resilience**. Other key societal indicators include coverage, accessibility and affordability of the technology.
- validate **management functions such as zero-touch and fully automated operation** with a **high level of trust with security** measures and processes including and covering the full technological chain, from device to service provision and execution of trustworthy and exchange of actionable information.

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- As 6G is still largely undefined, proposals may target in the first place **KPI's currently contemplated under authoritative industrial/research environments** (e.g., 5G PPP ICT-52-2020 projects, and national 6G initiatives or of other regions of the world).
- the proposals should be flexible enough to **accommodate new relevant KPI's** as they become available from the wider 6G community
- desirable that the platforms **support open framework principles** (e.g., both legal and technical like open APIs) enabling future vertical projects to access and use them
- **evaluation of competing technologies** where appropriate
- experimental infrastructure may be based on the **integration** of components in several **solutions** developed in the context of previous initiatives **like the 5G PPP, IoT or cloud computing projects or in the context of ongoing European 6G initiatives, also at the national level, but this is not a pre-requisite**

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- Each Project may include **multiple components in different locations/countries**, targeting interconnections between them to create a pan-European experimentation Platform
- stakeholders will **facilitate easy replication of results in the same or additional locations/countries** if this platform will be selected for large scale trials as part of subsequent phase of Stream D
- The target **experimental facilities and their modules should be open and accessible for a long enough period to allow for an easy handover from one phase to the other**. Conditions should allow experimental **facilities to be easily reused under fair and reasonable conditions for subsequent phases** of the SNS programme implementation