



### Questions for the Stream C projects

a. What are the target 6G KPIs and KVIs you plan to address?

Below the target list of KPIs from our DoA. Use case specific KPIs can be defined in additions to those listed in the table below (the new KPIs could based on the experiments from the open calls that the 6G-SANDBOX facility will host). For the major network KPIs, the target values are aligned with ones included in SRIA 2021-2027. For all the KPIs the achievable values depend on the technology that will be used, the final setup of the platform and the use cases/experiments that will be hosted.

KPI Family	KPIs
Response time	<ul style="list-style-type: none"> <li>- E2E service latency</li> <li>- Delay deviation/jitter</li> <li>- New components latency contribution</li> <li>- E2E application latency</li> <li>- Sensor to vehicle latency</li> </ul>
Capacity/ Bandwidth	<ul style="list-style-type: none"> <li>- User data rate</li> <li>- Capacity</li> <li>- User density - connection density</li> </ul>
Packet loss/Reliability	<ul style="list-style-type: none"> <li>- Reliability @ network layer</li> <li>- Reliability (frame error rate)</li> <li>- Packet loss rate &amp; Frame loss</li> </ul>
Compute	<ul style="list-style-type: none"> <li>- Edge computational resource usage</li> <li>- Delta in network management decision</li> <li>- Availability</li> <li>- Resource utilization, Scale out latency</li> <li>- Computing resource utilization</li> </ul>
Energy	<ul style="list-style-type: none"> <li>- Network energy efficiency</li> <li>- Device energy efficiency</li> <li>- NFV energy efficiency</li> </ul>
Security	<ul style="list-style-type: none"> <li>- Anomaly detection precision</li> <li>- Security Conformance</li> <li>- Tenant data privacy</li> </ul>
Channel	<ul style="list-style-type: none"> <li>- Spectral efficiency</li> <li>- Communication reliability (SINR)</li> <li>- Reliability of the RIS control channel</li> </ul>
EMF	<ul style="list-style-type: none"> <li>- Self EMF exposure</li> <li>- Inter EMF exposure</li> </ul>
Localization	<ul style="list-style-type: none"> <li>- Localization accuracy</li> <li>- Direction accuracy</li> <li>- localization related delays &amp; integrity (error)</li> </ul>
Service availability and reliability	<ul style="list-style-type: none"> <li>- Service availability</li> <li>- Service reliability</li> <li>- Service safety, integrity and maintainability</li> <li>- Mission critical QoS of services</li> </ul>

For the KVIs our starting point is the methodology provided in the 6G-IA white paper from the VSC Work Group (online available: <https://5g-ppp.eu/wp-content/uploads/2022/05/What-societal-values-will-6G-address-White-Paper-v1.0-final.pdf> )

**Table 2. Methods for evaluating KVIs**

Assessment type / phase	Lower TRLs (early in the technology development)	Higher TRLs (later in the technology development)
Subjective assessment	Trials, experiments, interviews	Questionnaires, interviews, focus groups
Objective assessment	Assessment by subject matter experts	Measurements on deployed networks

b. Will your platform be fine-tuned for specific vertical use cases or will it be able to support multiple 6G use cases?

No, in principle the 6G-SANDBOX facility is designed to be re-configurable to be able to support multiple use cases. However, to exemplify the usage of the facility, XR (NOKIA) and Haptic (OWO) communications will be examined and also a large-scale trial is expected, where the XR and Haptic communication are combined. The target environment is a theater where the experience provided from the stage to the present audience is also offered to remote audience connected through XR devices and the OWO haptic system.

c. How do you plan to support openness to your platform and modularity for potential future upgrades?

In 6G-SANDBOX the openness and modularity concepts are introduced in multiple levels.

- The experimentation platforms that are included in the 6G-SANDBOX facility will be represented as Trial Networks, i.e., as fully configurable, manageable and controllable networks which combine digital/virtual and physical nodes and on top of them an experimenter can set up experiments and collect measurements in an automatic way. *This approach guarantees zero-interaction with the platform administrator that has produced the Trial Network, and conflicts-agnostic reservation of the resources needed.*
- We offer a standardized API manager for enabling interaction with any new/additional component the external could bring to the Facility.
- We adopt the “infrastructure as a code” approach (e.g., through the terraform tool) for treating in the same way (same pattern) not only the in-project infrastructures but also external ones.
- We will release innovative software developments and integrations of the project to an open repository, named open 6G Library. And we will provide open access to the results and to the data that will be produced by the project.

d. Will your platform be available only through the open calls?

No, there are plans to run also invited experiments beyond the ones that will be funded through the open calls.

e. What will you be looking to get out of the open calls to enhance your platforms?

We expect that from the open calls we will get new ideas for experimentation (use of the facility for measurements) and new components/technologies to be integrated (expand the facility).

f. When will your platform will be ready for testing and how do you plan to disseminate this information to the public?

Preliminary tests can run now. The platforms that are included now as the physical connectivity infrastructure of the 6G-SANDBOX facility are mature enough to host experiments and to investigate potential expansions from day one.

For running test over the 6G-SANDBOX Facility (use of 6G-SANDBOX Trial Networks) the expected/estimated date is in Sept 2023. A

We plan to disseminate this information through: announcements in our social media channels, our web site, the SNS-JU channels, and the EU portal. We target also co-organization of infoday(s)/workshop(s) (with other Stream C projects) – an initial target is EUCNC23.