SMART NETWORKS AND SERVICES (SNS) JOINT UNDERTAKING (JU)

2023

WORK PROGRAMME

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1. LIST OF ACRONYMS, DEFINITIONS AND ABBREVIATIONS

6G IA 6G Industrial Association

AAR Annual Activity Report

AWP Annual Work Plan

CA Commitment Appropriations

CAS Common Audit Service

CSA Coordination and Support Action

CSC Common Support Centre

EC European Commission

ECA European Court of Auditors

EDPS European Data Protection Supervisor

FP7 European Framework Programme 7 (2007-2013)

FWC Framework Contract

GB Governing Board

HE Horizon Europe

HR Human Resources

IA Innovation Action

IAS Internal Audit Service

ICF Internal Control Framework

ICS Internal Control Standards

IKAA In Kind Additional Activities

IKOP In Kind Operational Activities

KPI Key Performance Indicator

KVI Key Value Indicator

NCPs National Contact Points

MEP Member of the European Parliament

PA Payment Appropriation

PPP Public-Private Partnership

RIA Research and Innovation Action

SC Scientific Committee

SRIA Strategic Innovation and Research Agenda

SLA Service Level Agreement

SNS JU Smart Networks and Services Joint Undertaking

SO Strategic Orientation

SRG States Representatives Group

SMEs Small and medium-sized enterprises

TA Temporary Agent

TRL Technology Readiness Level

TTG Time To Grant

TTI Time To Inform

TTP Time To Pay

2. INTRODUCTION

2.1. Mission statement of Smart Networks and Services Partnership

The Smart Networks and Services Joint Undertaking (hereinafter "SNS JU"), established by the Council Regulation (EU) 2021/2085 (hereinafter "Regulation"), aims to foster European technological capacities as regards smart networks and services value chains. In this context, the aim is to enable European players to develop the R&I capacities for 6G technologies as a basis for future digital services in the period to 2030. The initiative also aims to foster the development of lead markets for 5G infrastructure and services in Europe. Both sets of activities (for 5G infrastructure deployment and 6G R&I) will foster the alignment of future smart networks and services with EU policy and societal needs, including competitiveness, robust supply chains, energy efficiency, privacy, ethics and cybersecurity.

Background and link with the Strategic Research and Innovation Agenda

The 5G PPP White Paper describing a 'European Vision for the 6G Network Ecosystem'[1] highlights that '*6G is expected to play a key role in the evolution of the society towards the 2030's, as the convergence between the digital, physical and personal worlds will increasingly become a reality*'. The White Paper recommends public and private R&I investment to focus on key 6G technologies, '*such as programmability, integrated sensing and communication, trustworthy infrastructure, scalability and affordability, as well as AI/ML, microelectronics (at least in design), photonics, batteries (e.g., for mobile devices), software, and other technologies that may help to reduce the energy footprint*'.

According to Article 16 of the Council Regulation[2] establishing the SNS Joint Undertaking, the Governing Board (GB) adopts the Strategic Research and Innovation Agenda (SRIA) at the beginning of the initiative and amends it throughout the duration of Horizon Europe, where necessary. The SRIA shall identify the partnership's targeted impact, foreseen portfolio of activities, measurable expected outcomes, resources, deliverables, and milestones within a defined timeframe. It shall also identify the other European partnerships with which the SNS JU shall establish a formal and regular collaboration and the possibilities for synergies between the SNS JU's actions and national or regional initiatives and policies based on information received by the participating states or the States' Representatives Group (SRG) as well as synergies with other Union programmes.

The SRIA is produced by the NetWorldEurope European Technology Platform (ETP), representing more than 1000 entities. The SRIA includes contributions from the 6G industry association (6GIA), the Alliance for Internet of Things Innovation (AIoTI) and the Networked European Software and Services Initiative (NESSI) and Satellite Communications (SATCOM) community. Further to the

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[1] https://5g-ppp.eu/wp-content/uploads/2021/06/WhitePaper-6G-Europe.pdf
[2] https://eur-lex.europa.eu/eli/reg/2021/2085

SRIA 2020[3] adopted by the SNS GB on 15 December 2021[4], the revised SRIA 2022 has undergone a public consultation in November 2022. Other external organisations provided inputs at different stages of the revision of the SRIA.

The SRIA 2022[5] provides a summary of the key areas that the European R&D Community believes relevant for the future of communications technology to meet the objectives of the SNS JU. This analysis has been anchored in the challenges identified by the United Nations Sustainable Development Goals, and in the current policies inside the European Union, notably the Path to the Digital Decade and European Green Deal. It has identified research and innovation directions for the communications technologies and systems, in order to realise these high-level societal objectives. These are implemented into the SNS JU R&I Work Programme 2023-2024.

In addition, the Path to the Digital Decade[6] recognises that a sustainable digital infrastructure for connectivity is '*an essential enabler for taking advantage of the benefits of digitisation, for further technological developments and for Europe's digital leadership*'. It therefore aims to achieve all populated areas covered by 5G by 2030. As part of its objectives, the SNS JU is expected to help lead markets for 5G infrastructure and services to develop in Europe by coordinating 5G deployment with Connecting Europe Facility 2 (CEF Digital). Pursuant to the Regulation that established the SNS JU, its role includes (i) a strategic coordination mechanism for CEF Digital; (ii) accelerating the development and widespread deployment of 5G and (iii) promoting the coordination and strategic support of 5G deployment for Connected and Automated Mobility along cross-border corridors. In this context, the SNS JU shall coordinate stakeholder activities in relation to CEF Digital, assessing the need for reviewing the Strategic Deployment Agenda (SDA) for 5G and facilitating the establishment of project pipelines.

2.2.   Foreword - Message from the Executive Director

Research and Innovation (R&I) initiatives on 6G technologies are now starting around the world, with the first products and infrastructures expected for the end of this decade.

In Europe, the Smart Networks and Services Joint Undertaking (SNS JU) selected its first portfolio of 35 research, innovation, and trial projects to enable the evolution of 5G ecosystems and promote 6G research in Europe. With a combined funding for this new portfolio of around €250 million under Horizon Europe, the aim is to build a first-class European supply chain for advanced 5G systems and build Europe's 6G technology capacities. They will build on the first set of 6G projects worth €60 million that were launched under the 5G-PPP, with the Hexa-X flagship developing a first 6G system concept complemented by nine projects investigating specific technologies for 6G.

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[3] https://bscw.5g-ppp.eu/pub/bscw.cgi/d367342/Networld2020%20SRIA%202020%20Final%20Version%202.2%20.pdf
[4] Decision of the GB of the SNS JU No 12/2021.
[5] URL: Available from 15 December 2022 at: https://www.networldeurope.eu/sria-and-whitepapers/
[6] Proposal for a Decision of the European Parliament and of the Council establishing the 2030 Policy Programme "Path to the Digital Decade", COM(2021) 574 final.

All parts of the world are starting to be heavily engaged in 6G developments. There will be opportunities and challenges concerning new business models and players through software networks with architectures such as Open-Radio Access Networks and the convergence with new technologies in the area of cloud and edge computing, Artificial Intelligence, as well as components and devices beyond smartphones.

Success in 6G will depend on the extent regions will succeed in building a solid 5G infrastructure, on which 6G technology experiments and, later, 6G deployments can build.

Europe 6G initiative takes a broader value chain approach, ranging from connectivity to components and devices beyond smartphones with the massive development of edge clouds and connected objects like cars or robots. Key objectives are i) reinforce our leadership in domains where Europe leads (connectivity) and develop capabilities where opportunities are emerging (edge cloud, IoT devices, enabling technologies) whilst piggybacking on strong European capabilities in domains like automotive, healthcare, Industry 4.0, energy.

Global standardisation and spectrum harmonisation are important success factors for 6G technology and focus of SNS. Both future users and suppliers need to shape key technology standards in the field of radio communications based on existing and future spectrum bands for wireless broadband, but also in next-generation network architecture to ensure the delivery of advanced service features, e.g. through the effective use of software technologies and open interfaces, while meeting energy-efficiency requirements.

The issues at stake call for a strategic research and innovation (R&I) roadmap for Europe through a Joint Undertaking co-led by industry and the Commission with close involvement of Member States.

The main challenges for 2023 will be to kick-off the first wave of SNS projects, put in place a consolidated set of strategic SNS Working Groups, select the second wave of projects based on WP 2023-2024, initiate international collaboration and synergy with actions at member States level, and to implement the SNS JU to autonomy with a new Executive Director and a fully functional SNS JU office.

3. WORK PROGRAMME 2023

3.1. Executive summary 2023

The present SNS JU Work Programme 2023 ('WP 2023') provides an overview of the main activities and related resource needs of the SNS JU during the year 2023. This includes information about the planned 2023 calls for R&I proposals as outlined in annex 2. It has to be noted that although this work programme focuses on the planned work for 2023, the R&I activities already include some orientations for 2024, in view of making clearer how activities are complementary and have been planned over a longer term period. The 2024 activities are indicative and subject of in depth definition in 2023, with the objective of finalising the 2024 call definition by Q3 2023. Other planned actions to launch in 2023 are outlined as well as activities related to communication. It also presents the human and financial resources needed to cover these activities.

Operations

The SNS R&I WP2023-24 addresses the technological and business realisation underpinning the 6G vision[7], targeting massive digitisation of societal and business processes through intelligent connectivity across the human, physical and digital world. The focus of 6G R&I in the WP2023 will complement R&I on enabling technologies / technical enablers with more system-oriented R&I and dedicated prototyping and experimentation, whilst leaving room for long-term R&I on disruptive concepts (e.g. academics driven).

This second Work Programme of the SNS JU materialise the second phase implementation of the SNS roadmap. Compared to the first phase, it includes:

- a reinforced focus on key technological topics complementing the phase 1 retained projects;
- activities designed to support the 6G standardisation phase (target 2025 with first batch of 6G Study Items);
- a reinforced emphasis on sustainability and societal challenges;
- a set of activities on microelectronics for 6G, in the wake of the elaboration of the Corenect Roadmap[8], and establishing the cooperation with the KDT JU;
- a set of focused international cooperation activities, targeting the USA, Japan, and the Republic of Korea;
- complementary and extended opportunities to test 6G technologies through Proof of Concepts and trials with verticals;
- extension of the stakeholder's base, notably towards the microelectronics and vertical user industries.

In this context, complementary activities **of 2023** in the R&I domain will include:

- reinforcement of cooperation with KDT;

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[7] https://5g-ppp.eu/wp-content/uploads/2021/06/WhitePaper-6G-Europe.pdf
[8] https://www.corenect.eu/roadmap

- initiation of international cooperation with the USA and preparation of future international cooperation activities, notably with Japan (B5G Promotion Consortium) and South Korea (5G Forum);
- preparation of a comprehensive approach towards sustainability;
- in-depth extension of the preliminary gap analysis to support elaboration of future work programmes;
- development of strategies to coordinate SNS efforts with the 6G programmes launched by Member States, with support of the related CSA.

The SNS JU will also provide support services for projects implemented under the first call and notably on: i) implementation of the collaboration clause of the MGA through coordination of joint project work; ii) support to the implementation of Financial Support to Third Parties (FSTP).

At R&I level, the target is to launch one single call in January 2023 supported by all needed documents, procedures and configurations of the IT systems.

The estimated EU expenditure for the 2023 call is EUR 132M. The budget is subject to its adoption by the budgetary authority and may be updated accordingly.

Annex 2 details the call 2023 part of the "SNS Phase 2".

Other 2023 activities include:

- R&I calls implementation, including evaluation, Grant Agreements, projects reviews, amendments and payments, experts' management, portfolio analysis, KPI tracking, audit support, etc.;
- Various supporting activities related to communication, administration, finance;
- Finalisation of the Work Programme 2024 and related SRIA update;
- Coordination of stakeholder activities in relation to the CEF Digital Programme in particular reviewing the Strategic Deployment Agenda (SDA) for 5G for Connected and Automated Mobility and facilitating the establishment of project pipelines;
- Contribute to the Work Programme of CEF Digital as well as coordinating the piloting and deployment for pan-European 5G corridors for connected and automated mobility under CEF Digital;
- Pursue the definition on KPIs/KVIs related to 6G and related standards;
- Support the 2023 edition of the EUCNC & 6G Summit conference;
- Coordinating information sessions on the 2023-2024 SNS R&I work programme as well as specific rules for participation;
- Support to audits and audit processes;
- Support the other departments: administration, finance and communication;
- Implement the standard operating procedure (SOP) on Access to documents, organise the training of the staff on access to documents issues and create the internal control processes and methods;
- Reporting, input to Horizon Europe evaluation and monitoring, preparation of progress monitoring reports (including for 2022);
- Work with the EC's central services when necessary to address horizontal legal, financial and administrative issues in a manner coordinated among JUs;

- Ensuring the smooth launch and operations of an autonomous JU office environment in 2023 including recruitment to full staffing of the JU office and needed SLA's for steady operations of the JU;
- Initiate and coordinate the various SNS Working Groups and ensure their contribution to 6G R&I and 5G deployment. Migration of 5G PPP WGs towards SNS WGs will be considered, notably for technological topics;
- Further develop strong cooperation and information sharing with Member States with regular support to SRG meetings.

Communication

1. Events

a. In addition to the annual EUCNC & 6G Summit conference, some other events will be organised to promote the SNS JU activities.

b. To advertise publicly the Call for 2023, the SNS JU will organise Information Day(s), coupled with brokerage session(s). The Call 2023 will be publicised widely through different communication channels and notably the SNS JU presence online.

c. The cooperation with SNS JU Members States' programmes will be continued and developed further.

d. Ongoing communication on 6G R&I activities to the general public and on the links between 5G, B5G and 6G will continue.

e. Standardisation events will be promoted, starting with a workshop with ETSI.

2. Dissemination

a. Align Call 1 projects' communication activities and provide visibility to projects and their main deliverables (both through social media and in events). Include highlights from strategic projects into SNS JU dissemination activities (project posters and flyers, relevant publications).

b. Involvement in SNS JU sponsored events or clustered/combined projects events. These can be in the form of presentations at publicly accessible parts of review meetings, networking opportunities, awards, or prizes to improve and accelerate the synergies amongst the stakeholders.

c. Organise Coordinators' Info day. In addition, a webinar format will be used, minimising the need to travel and to broaden the audience.

3. Communication towards the general public

a. Continued attention to press releases, to be issued timely at key points in the annual calendar.

b. Website: Launching the website and managing its content (https://smart-networks.europa.eu)

c. Social Media primarily via LinkedIn, others to be evaluated (notably Twitter).

A communication plan will ensure that stakeholders are duly informed, in an accurate, clear and accessible way about the activities and results of the SNS JU.

Administration and Finance and Human Resources

The 2023 budget is established in accordance with the provisions of the Regulation.

In 2023, the SNS JU will continue to recruit staff in order to reach the HR capacities foreseen in the Legal and Financial Statement, which was part of the Commission proposal of the Regulation.

The SNS JU is planned to reach its financial autonomy in 2023.

3.2. Operations

3.2.1 Objectives, indicators and risks

Phase 1 of the SNS R&I roadmap started in 2022. The first Horizon Europe call for proposals has been implemented, the first batch of projects selected, and the first 35 SNS JU projects will start early 2023. During 2023, several of the planned KPIs for the SNS JU will already receive their initial values. 2023 also marks the launch of the SNS JU Phase 2, with a new call for proposals prepared for release/opening early 2023 and selected Phase 2 projects will start in 2024.

The below table for 2022 indicates the actual achievements (current figures), while for the coming years (2023-2027) it represents target figures.

KPI Name	Unit of measurement	2022	Target 2023	Target 2025	Target 2027	Ambition >2027	Risk and action plan (if relevant)	Comments
Resources (input), processes and activities								
R1. SME innovation & participation	**% of SMEs participation**	**~18%**	**20%**	**20%**	**20%**	**20%**	For the SNS R&I WP 2023-2024 a similar approach has been followed as in 2022. Although the SNS R&I WP provides explicit hints for the participation of SMEs in various Streams, dedicated webinars for SMEs (e.g., through NetworldEurope's SME WG, or open Information days) will be used to mobilize European SMEs.	Current analysis from the first call indicates that SMEs from selected projects will receive the 18% of the funding budget without taking into consideration that 7 projects will operate cascade funding. In terms of actual participation in Phase 1, selected proposals have 84 SMEs which means 33% out of all the stakeholders (considering 253 stakeholders where affiliated entities are not counted). In case of counting affiliated entities then the number of participants is 288 which means that 29% are SMEs.
R2. Rapid diffusion	**#of end-user workshops & webinars [cumulative]**	**0**	**25**	**60**	**90**	**125**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023

R3. High risk research funding	**% of total funding**	**~68%**	**50%**	**50%**	**30%**	**N/A**	The risk for not meeting this objective in 2023 is minimum as low TRL activities are planned for B projects in the call of 2023 that constitute ~70% of the overall funding.	
R4. Standardization contributions	**Contributions to SDOs [cumulative]**	**0**	**50**	**350**	**750**	**1000**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
R5. Share on family patents	**% of patent families**	**0**	**15%**	**15%**	**15%**	**15%**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
	Patent grant rate							
		0	**60%**	**60%**	**60%**	**60%**		
R6. Scientific excellence	**# of publications [cumulative]**	**0**	**100**	**400**	**700**	**1000**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
R7. Reach an appropriate balance between research, innovation, and deployment	**% RIA**	RIA 78% IA 20% CSA 2%	**78% RIA**	N/A	N/A	N/A	The risk for not meeting this objective in 2023 is minimum based on the structure of the SNS R&I WP 2023-2024 and the mobilization of interested stakeholders as monitored during the first Call.	The SNS R&I WP has been designed in a way to focus on research activities during the first phase of the SNS while working in parallel in large scale trials. This % will be revaluated during the following phases to maximize the impact of
	% IA		**20% IA**					
	%CSA		**2% CSA**					

							the SNS results at a global level.
R.8 Accelerate the development of energy efficient networks	# of related projects investigating to a significant extent energy efficiency topics: >=3	0	>=3	N/A	N/A	N/A	Based on the SNS R&I WP 2023 and 2024, energy efficiency has again a prominent place in multiple streams. Still to ensure that proposals will keep energy efficiency in the core activities may require dedicated sessions during Information Days. Moreover, in 2024 a lighthouse project is being planned to aggregate the efforts from Phase1 and Phase 2 projects so as to achieve a higher impact	The gap analysis of Phase 1 selected projects has identified around 10 projects aiming to work on energy efficient networks.
R.9 Ensure research on secure future digital services	# of related projects:	0	>=3	N/A	N/A	N/A	Based on the first SNS R&I WP, topics related to the security toolbox and privacy support have a prominent place in multiple streams. Still to ensure that proposals will keep security and privacy in the core activities may require dedicated sessions during Information Days.	The gap analysis of Phase 1 selected projects has identified around 12 projects aiming to work in security.
R.10 Collaboration and synergies with other Partnerships	# collaborations	0	2	5	6	6	6G-IA has proactively engaged in discussions with other Partnerships on SNS related topics. This activity will be further strengthened via the	In 2022, a strong collaboration with KDT and Photonics 21 has been established. These ties will be further strengthened during the following years.

							SNS office and 6G-IA and through the SNS CSA projects.	Also, during 2022 links to national initiatives such as Germany and Finland have been established.
Outcomes (SO)								
O.1 Development of energy efficient networks	**White papers**	**GeSI report on Energy consumption by 2030**	**1**	**2**	**3**	**>3**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
	[cumulative]							
O.2 Technological solutions consensus building	**White papers**	**0**	**1**	**2**	**3**	**N/A**	Working towards this direction, activities are planned for 2022 (e.g. public consultation for 6G-IA's vision white paper on 6G technologies) and 2023. The target is to have a first consensus by the end of SNS' first phase (2023).	Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
	[cumulative]							
O.3 Advanced 6G solutions for verticals	**#of different vertical types engaged [cumulative]**	**0**	**3**	**6**	**10**	**10**	In the second phase of the Partnership, the key engagement of verticals will happen again in Stream D where it is expected that 4 large-scale trials will be implemented. Even if the same vertical sectors are selected in Stream D, vertical industries are expected to be engaged in other SNS R&I WP Stream projects that will demonstrate the results of B5G and 6G solutions.	The gap analysis of Phase 1 selected projects has identified around 10 verticals areas that will be addressed by the flagship project, Stream C projects and Stream D projects. Of course, not all verticals will be covered at the same level, but the first step to create related ecosystems will be initiated.

								Note that for 2023 and 2024 special attention is being given to core areas that are covered but at smaller extent in 2022 selected projects (e.g. automotive and transportation, e-health, etc.).
O.4 Foster emergence of new actors in the 6G supply chain	**KPI7: # of related projects or cross-projects WGs dealing with the investigation and potential adoption of open ecosystem principles in B5G and 6G networks**	**0**	>=2	N/A	N/A	N/A	Based on the second SNS R&I WP, topics related to disaggregated architectures have a prominent place in multiple streams. Still to ensure that proposals will keep this topic in the core activities may require dedicated sessions during Information Days	The gap analysis of Phase 1 selected projects has identified at least 4 projects working on open principles
Impacts (GO)								
I.1 A competitive data economy	**% Market share for the communication network**	**40%**	N/A	N/A	N/A	N/A		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
I.2 Reach Programme level consensus on 6G KPIs	white papers [cumulative]	**Networl dEurope SRIA**	1	2	3	N/A	Working towards this direction, activities are planned for 2022 and 2023 to compile results from 5G PPP projects as well as supporting organizations (e.g. NetworldEurope) and 6G-IA WGs.	This is an ongoing process in 2022 where a first list of 6G KPIs will be uploaded in the context of 6G Start. The target is to have a first set of widely accepted 6G KPIs by the end of SNS' first Phase (2023).

Indicator	Metric	Baseline						Notes
I.3 Uptake of digital solutions within verticals	**Number of large-scale trials** **[cumulative]**	**0**	**3**	**6**	**10**	**>10**		Based on the evaluation process selection and contractual agreements expected by the end of 2022. The projects are expected to start in 2023.
I.4 Energy efficiency of telecommunication networks	**% increase of energy efficiency of cellular communications**	**Legacy cellular systems (4G)**	**N/A**	**N/A**	**N/A**	**N/A**		In 2023-2024, the key engagement of verticals will be in Stream D where it is expected that 4 large-scale trials will be implemented.

Table 1: Target SNS JU KPIs

The monitoring of the above-mentioned KPIs (Table 1) is and will be based on data collected from the evaluation and contractual agreement process (e.g. number of projects per topic, funding for low TRL topics, participation of SMEs etc.). The quantitative KPI information (e.g. KPIs 8-10) will be completed by the annual report information of the SNS Partnership. Support to SNS JU KPIs through additional activities not directly related to SNS funded projects (In Kind Additional Activities, IKAA) will be considered where relevant and appropriate.

Other risks

Risk	Action Plan	Comments
Two risks have to be considered for 2023 and 2024 1) Mobilisation of the stakeholders and understanding of the JU model and call conditions; 2) slow start and delays in launching calls.	Risk 1 is mitigated through planned information events and public presentations of the programme. In 2022, several informal events already took place to raise stakeholders' awareness and to increase their preparedness. This has been amplified through Member States informal meetings, in view of relaying information and awareness at national level. Risk 2 is taken care of by a structured dialogue between Commission Services, States Representative groups and private stakeholders in view of making all call documentation available in time for an early start in 2023 and 2024.	

3.2.2. Scientific priorities, challenges and expected impacts

The scope of the SNS R&I WP2023-24 is based on the NetworldEurope Strategic Research and Innovation Agenda (SRIA), the analysis of the coverage gaps resulting from the results and implementation of the first call, and on the identification of specific policy priorities, notably sustainability, micro-electronics and international cooperation.

In that context, the 2023 call covers multiple 6G objectives, notably:

- ***Moving beyond a simple increase in speed or performance of connectivity platforms,*** bringing unique new service capabilities with wider economic implications. It requires capabilities for completely new services and applications, aligned with sustainability targets and a human-centric approach. This will eventually lead to 6G solutions, like the "Internet of Senses", realising a fusion between the communication and sensing environment, massively scalable immersive environments, like XR/VR, digital twins, and holographic type communication. The basis for this 6G vision is being further developed in the context of the EC H2020 5G Infrastructure PPP / ICT-52 projects, including the Hexa-X Flagship project. The integration of concepts and technologies originating from the Cloud/IT/Microelectronics environments to support massive device (IoT) connectivity and ultra-reliable communications and services on top of enhanced mobile broadband services is addressed. A comprehensive value/supply chain materialised by an IoT device-connectivity-service platform is targeted.

- Supporting key United Nations (UN) Sustainable Development Goals (SDGs), with SNS aiming to contribute to:

- SDG 8: Promote sustained, inclusive, and sustainable economic growth: achieve higher levels of economic productivity through diversification, technological upgrading, and innovation.
- SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation, upgrade infrastructure and retrofit industries to make them sustainable with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
- SDG 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
- SDG13: Climate Action: Support smart low carbon lifestyles, monitoring emissions, and shaping demand in transport and energy, enabling resilient mission critical communications in extreme weather (vertical markets: transport, health, and public safety).

Societal challenges, such as technology acceptance, ethical issues in the context of privacy or Electric and Magnetic Fields (EMF) awareness and reduction, are targets of the SNS R&I WP.

The societal work is based on the definition of Key Societal Value indicators (KVI) enabling objective assessment of elements such as safety, security, trustworthiness, inclusiveness, and sustainability.

Moreover, the SNS R&I WP2023-24 targets a strong European impact at future downstream 6G standardisation stages, including a Europe-wide consensus of 6G Key Performance Indicator (KPIs) that will frame future developments. By the time of new projects under WP2023-24, the consensus on KPIs will be outlined in key documents like the ITU IMT 2030 Vison document planned for early 2023. Therefore, the SNS activities will focus on (1) the validation of the KPIs where a consensus has been established and (2) the further definition of the specific European KPIs that are not (yet) reflected in international consensus.

The stimulation of strategic alliances is a key objective, with vertical sectors to build and offer powerful and persuasive Business to Business (B2B) and Business to Consumer (B2C) propositions. In this WP, the industry is described in terms of vertical sectors.

6G should also become an enabler of sustainability, benefitting other sectors and verticals by enabling optimised or new services and applications aimed at reducing the environmental footprint, or contributing to meeting UN SDGs. This approach, already supported in SNS R&I WP2022, is reinforced in this work programme.

The proposed R&I WP2023 includes the following three complementary streams:

- **Stream B (2023)** covers research for revolutionary technology advancements, in preparation for 6G and revolutionary advancements of IoT, devices and software. This Stream targets low to medium TRL in WP2023, with the objective of delivering innovative solutions towards real life networks in a long-term period. It also includes targeted international cooperation with the USA centred on Artificial Intelligence.

- **Stream C (2023)** focuses on SNS system Enablers and Proof of Concepts (PoCs) with a target to further develop and consolidate Europe wide experimental infrastructure(s), in support of the various phases of the SNS. Federation of EU platforms is also targeted with capabilities to extend to non SNS test platforms, either at national level or with third countries.

- **Stream D (2023)** targets large-scale SNS Trials and Pilots with Verticals, including the required infrastructure. The 2023 is to explore and demonstrate technologies and advanced applications and services for the vertical domains focusing on two priorities less covered in the previous call, namely i) automotive, and ii) Health, Smart Cities, Farming or Education (to be considered independently or in combination. These three Streams will be complemented by an SNS Coordination and Support Action (CSA) aimed at dealing with societal challenges related to SNS technologies.

Additional goals of the SNS R&I WP2023-24 applicable to the 2023 WP are to:

- Develop strategies and technologies for the integration of future connectivity and service platforms into larger globally applicable infrastructures, whilst preserving European competitiveness and sovereignty. The implementation of networks will increasingly take place across heterogeneous domains and the challenge will be to keep a strong EU influence whilst ensuring service delivery and control from and E2E perspective.

- Define trust, security, resilience and communication privacy enhancing technologies, processes and architectures that will be required for massively heterogeneous, virtualised and software platforms of the future, as well as the associated enablers for such developments.

- Bring new actors from, and beyond the verticals. Contributions from industry, RTO, academics and Small and Medium-sized Enterprises (SMEs) actors in the connectivity, IoT and cloud/IT domains are expected to be complemented, by appropriate participation of the microelectronics industry, in view of their potential impacts at downstream standardisation level.

- Provide a stable experimental framework towards minimising R&I risk and validating core technologies.

- Provide a unified consensus framework promoting a European approach towards 6G, facilitating international cooperation and placing Europe on par with other regions having started bold 6G initiatives.

3.2.3. Calls for Proposals

3.2.3.1. Calls

In Annex 3, the R&I SNS WP2023-24 details the call for 2023 that will open in January 2023 and will close in April 2023 with selected proposals to be contracted by the end of 2023. It covers the following topics:

Streams / Topics	Call 2023 Topic Budget (in M€)
HORIZON-JU-SNS-2023-STREAM-B (RIA)	
01-01: System Architecture	20.0
01-02: Wireless Communication Technologies and Signal Processing	24.0
01-03: Communication Infrastructure Technologies and Devices	12.0
01-04: Reliable Services and Smart Security	16.0
01-05: Microelectronic-based solutions for 6G networks	15.0
01-06: EU-US 6G R&I Cooperation	3.0
HORIZON-JU-SNS-2023-STREAM-C (RIA)	
01-01: Complementary SNS experimental Pan-EU federated Infrastructure	14.0
HORIZON-JU-SNS-2023-STREAM-D (IA, with FSTP)	
01-01: SNS Large Scale Trials and Pilots (LST&Ps) with Verticals (IA) – Focused Call	27.0
HORIZON-JU-SNS-2023-STREAM-CSA (CSA)	
01-01: SNS Societal Challenges	1.0
Total (M€)	**132**

Table 2: SNS JU Topics for call 2023

3.2.3.2. Measures for Newcomers

The SBA indicates the need for measures to attract newcomers, in particularly SMEs, higher education institutions and research organisations. Horizon Europe also promotes the engagement of a broad range of entities, including newcomers, as part of its underlying openness principle.

Call 1 of the SNS R&I WP 2021-2022 therefore made a careful balance between opening topics to JU members other than the Union, through the Horizon Europe Third Parties Financing (FSTP) mechanism (usually referred as cascade funding, or open calls inside HE actions) and ensuring long-term commitment of beneficiaries through industrial association membership. These first batch of cascading grants will be implemented in 2023 and extended through the 2023 R&I call.

In addition, several actions are planned to publicise the SNS JU activities, the R&I WP and the call launched in 2023 to potential newcomers. It includes, web briefings, webinars, a dedicated proposers' Info Day and a range of presentations and materials available through the website of the EC, the SNS JU and the 6G IA. Once projects start, information sessions are organised for coordinators to learn about financial and reporting issues, amendments and other administrative aspects relevant for their work.

3.2.3.3. Conditions and management of the calls

The General Annexes to Horizon Europe for the Work Programme 2023-2024[9] generally applies with a few exceptions that are specific to the SNS JU. These exceptions are detailed in Appendix 1 to the R&I Work Programme of Annex 2.

Openness: In line with Horizon Europe principles, all open above R&I topics for 2023 are open (with IKOP generation incentives) to the exception of the Stream D "Large Scale pilots" with verticals (see SBA recital 21 and article 5.2 (a)).

Security: Pursuant to the SBA, participation in Union funding programmes in relevant technology domains is conditional on compliance with security requirements. Article 170 of the Single Basic Act (SBA) establishing the SNS JU, suggest that network elements deployed for large-scale experimentation or piloting (Stream D) may have to follow security scrutiny assessments, inspired by the EU toolbox for 5G security. In the context of 5G networks, the role of suppliers has been identified in the EU coordinated risk assessment and the EU Toolbox on 5G cybersecurity as of particular relevance for cyber-security.

IKOP: In Kind Contribution to Operational Activities (IKOP) is an important tool to stimulate private investments in addition to public investments for achieving the SNS JU's objectives. IKOP can only be generated by private members of the 6G-Infrastructure Association (6G-IA). For this Work Programme, the estimated value of In Kind Contribution to Operational Activities (IKOP) by the members other than the Union or their constituent entities shall be a minimum of EUR 8 million. A minimum programme level IKOP contribution of 6% is targeted and proposals are expected to significantly contribute to this target, which is reflected in the impact section of the evaluation procedure.

SMEs: Target for SME participation is at 20% at programme level, also reflected in the impact section of the evaluation procedure.

Collaboration: Projects will be expected to enter into a collaboration agreement to jointly work on topics of mutual interests. They will be subject to a collaboration contractual clause outlined in the Model Grant Agreement.

Procedure: Specific rules apply related to the procedure to rank proposals with equal scores. Moreover, regarding the evaluation and ranking of proposals submitted under topic: HORIZON-JU-SNS-2023-STREAM-D-01-01, to ensure a balanced portfolio covering both identified Priorities, grants will be awarded to proposals not only in order of ranking but at least also to one project that is the highest ranked within each of the two Priorities provided that the proposals attain all thresholds.

Financial Support to Third Parties: Financial support to third parties (FSTP) is planned for SNS-2023-STREAM-D-01-01. Up to 20% of the budget of proposals submitted under this topic may be reserved for Third Party Financing. For these actions, the third party financing contractual clause of Article 6 D.1 of the MGA will apply, as well as some complementary conditions detailed in Appendix 1 to the R&I Work Programme.

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[9] Available from the tender portal in December 2022

3.2.4. Follow-up activities linked to past calls: monitoring, evaluation and impact assessment

The first call of the SNS JU R&I Work Programme 2021-2022 is implemented with a total budget of EUR 248 million. All projects are expected to start at the beginning of 2023.

While the SNS JU will pursue its planned R&I activities, further findings pursuant to a gap analysis and the current policy context highlighted the need to stop Stream A (5G evolution), strengthen links established or intended with Partnerships, national initiatives and international partnerships (in particular with USA, Japan and Korea), focus on end-to-end sustainability (from platforms to verticals) and enhance collaboration with the micro-electronics community (chips for 6G) in the context of the European Chips Act[10]. These activities will be either implemented by the 2023 Work Programme or prepared in 2023 for further implementation in 2024.

3.2.5. Cooperation, synergies and cross-cutting themes and activities

The SNS JU will exchange best practices with other JUs. It will organise workshops on scientific topics of common interest and assess the opportunity of coordinated calls.

Further to the European Chips Act[11], the Memorandum of Understanding between AENEAS and 6G-IA[12], findings of the COREnect study[13], the SNS JU has established close links with the KDT JU, including through the alignment on topics of mutual interest, in the context of microelectronic components for 6G. This Work Programme aims to fund projects, bringing together both communities and focusing on THz communication enabling technologies.

The Memorandum of Understanding (MoU) between the 5G Automotive Association (5GAA) and 6G-IA demonstrates their mutual interest in fostering the use of future connectivity in key vertical sectors, such as connected and automated mobility. Cooperation will be strengthened through the continuation and SNS extension of the 5G PPP Working Group "5G for Connected and Automated Mobility".

The EU-US Trade and Technology Council was established as a forum to coordinate approaches to address key trade and technology issues, and to deepen transatlantic cooperation based on shared values. Its Working Group 4 on ICT security and competitiveness[14] envisaged to launch pilot cooperation projects. The 6G-IA and the Next G Alliance (USA) have also signed a MoU to exchange information regarding their work programmes in areas of mutual interest in the field of 6G communication systems and networks. The MoU also covers collaboration on joint activities, including workshops, seminars, webinars and trials on 6G-related topics. The Japan-EU Digital Partnership[15] advances cooperation on digital issues to foster economic growth and a

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[10] COM(2022) 45 final

[11] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-chips-act_en

[12] https://aeneas-office.org/2022/06/07/aeneas-and-6g-ia-join-forces-to-build-synergies-for-european-leadership-in-next-generation-telecommunications/

[13] https://digital-strategy.ec.europa.eu/en/news/european-think-tank-corenect-launches-roadmap-towards-leadership-chips-6g

[14] Working Group 4 - ICT security and competitiveness | Futurium (europa.eu)

[15] 最終版-jp-eu-digital-partnership-clean-final-docx.pdf (europa.eu)

human-centric digital transformation based on common values[16]. To further promote concrete cooperation in the area of B5G / 6G, the 6G-IA has signed an MoU with the Beyond 5G Promotion Consortium (B5PC) of Japan. Korea and the EU have also recently concluded a Digital Partnership. In 2023, the Work Programme will implement joint R&I cooperation with the USA (NSF) and prepare for implementation of R&I work with Japan and South Korea in 2024.

The SNS JU will also explore horizontal topics of interest through its Working Groups (WGs). During the course of 2023, SNS project related, industry-driven (6G-IA) and other, strategic Working Groups will be launched. Access to WGs and their functioning will be defined in the relevant Terms of Reference of each WG.

In addition, collaboration with Photonics21[17] and with the European Cyber Security Organisation[18] is also pursued further.

The SNS JU will also assess to what extent the additional tasks laid out in the Regulation are being addressed and will in particular, strengthen strategic collaboration with 5G deployment activities and promote synergies among relevant Union-funded trials, pilots and deployment activities in the area of smart networks and services (e.g. CEF2 Digital programme, Recovery and Resilience Funds, InvestEU, etc.).

The SNS JU will also explore potential synergies with national 6G initiatives and policies, in particular through the SNS OPS CSA, notably through the organisation of workshops and interactions with implemented actions at MS level, in view of defining common follow up actions at EU level.

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[16] Japan-EU Digital Partnership - Factsheet | Shaping Europe's digital future (europa.eu)
[17] Photonics21 – A Key Enabling Technology for Europe
[18] ECSO - European Cyber Security Organisation (ecs-org.eu)

3.3. Support to Operations

3.3.1. Communication, dissemination and exploitation

The SNS JU communication activities will support the priorities identified in the annual work plan and agreed by the SNS JU Governing Board. A strategic communication will ensure that all stakeholders will be duly informed, in an accurate, clear and accessible way about the activities and results of the SNS JU.

Communication objectives

The communication objectives for 2023 will be to raise awareness on research and innovation activities on B5G and 6G networks and services, increase knowledge of the SNS JU, and promote participation in the SNS JU activities by engaging with prioritised stakeholder groups. They will also include activities aimed at accelerating the development and widespread deployment of 5G.

The communication activities will focus on the programme achievements that have a strong impact, on the scientific advancements and their market uptake potential, which translate into concrete benefits for European industries, authorities and citizens.

In order to do so the SNS JU will:

- Highlight the programme's relevance, impact and contribution to related EU policy areas;

- Showcase the programme achievements' progress and benefits;

- Leverage project communication and promote projects' success stories to build on the results obtained and to demonstrate the impact of their outcomes;

- Communicate the benefits of the technology with real-life use cases and projects' results;

- Mobilise strongly committed applicants to continue to ensure excellence in our call for proposals/grants;

- Increase communication synergies with other programmes and instruments, in particular those of CEF Digital for 5G deployment;

- Highlight technology potential and market readiness;

- Increase public awareness of the SNS JU beyond the programme stakeholders, reaching out to new audiences.

Target audiences

- Policy-makers: EU institutions (European Commission, European Parliament, Council of the EU, Committee of the Regions), individual Member States (relevant representatives of governments and permanent representations), municipalities and regional authorities;

- SNS stakeholders and their governance structure: 6G IA, European Commission, Member States, technical experts;

- SNS JU current and potential new beneficiaries;

- Financial actors (e.g. investors);
- General public.

Outreach activities

The SNS JU will work on its brand recognition, as well as on promoting its core activities, such as the 2023 Call for proposals. The vision of the current initiative and of the Joint Undertaking itself will be communicated via campaigns that will concentrate on its concrete added value for a more digitalised and greener society. The JU will develop SNS success stories and adapt them to different audiences and channels, while maintaining close contacts with ongoing projects to gather and promote their latest news and results.

In addition, the SNS JU will work in collaboration with the communication unit of the European Commission's Directorate-General for Research and Innovation, responsible for services such as the Horizon Magazine, Futuris and the webpage for EU research success stories.

Communication channels

The SNS JU will develop content for the following channels with the aim of providing all interested stakeholders with access to relevant and specific information on the work of SNS and its projects:

- Website;
- Newsletter;
- Social media (LinkedIn);
- Videos;
- Events;
- Media;
- Direct mailings;
- Publications.

The SNS JU will amplify its communication outreach thanks to publicity from its stakeholders and communities, the Governing Board members, the SNS Coordination and Support Actions, States Representatives Group, National Contact Points, stakeholders' group, SME organisations, other JUs.

Key events in 2023

- Info Day(s) and brokerage event;
- Mobile World Congress 2023;
- EuCNC + 6G Summit 2023;
- 5G Techritory 2023;
- 6G Global Summit and 5G Conference (Forum Europe).

3.3.2. Procurement and contracts

The SNS JU will implement its administrative budget also by means of procurement procedures and contracts, supporting the administrative and support services in accordance with its Financial Rules.

The SNS JU will use existing framework contracts and service level agreements (SLA) with Commission services as appropriate. The use of the existing contracts provides a lighter solution in terms of workload and the possibility to rely on quality service providers. The SNS JU will also seek to join inter-institutional tenders either launched by the European Commission or in agreement with other Joint Undertakings.

The SNS JU will benefit from the common Back Office Arrangement (BOA), pursuant to Article 13 of the Regulation.

The SNS JU will launch individual procurement procedures to obtain desired services and implement its Annual Work Programme (AWP) effectively.

3.3.3. Other support operations

IT

The priorities for IT are to ensure a stable and secure IT system, provide IT support to staff in the use of IT applications and equipment and to cooperate with the Commission to ensure synergy and efficient use of resources.

Main activities include:

- Follow-up and monitor implementation of the contract with IT supplier, notably service delivery plan; ensure maintenance and upgrades are done as necessary;
- Monitor stability of the IT system;
- Participate in coordination meetings with the Commission and other JUs and take action follow-up on the adjustments needed to allow and ensure smooth functioning of Horizon Europe IT tools;
- Ensure adjustment of IT tools to the SNS needs (expansion, upgrade, etc.).

In 2023, the focus will be put on the following:

- Keep in place the full access for the SNS staff to the set of IT applications related to the Horizon Europe programme;
- Set-up external communication through the newly launched website;
- Preparation of the Framework Contract for IT service.

Logistics

In addition, logistical support will be provided in the context of General Administration. It encompasses the management of supply and maintenance of equipment, namely stationery, goods and services for administration and includes monitoring of services provided in particular through the OIB, the translation centre and the publication office.

Based on the new ways of working that was accelerated by the COVID-19 situation, the organisation of the workplace will take into account less presence in the office, increased hybrid modes of working as well as health and safety requirements.

Data protection

The SNS JU applies Regulation (EU) 2018/1725 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies[19].

The role of the Data Protection Officer (DPO) is exercised by the Legal Officer. The DPO together with all staff members involved in data processing activities, ensures an effective application of the data protection legal framework.

Access to documents

The SNS JU will address requests for access to SNS JU documents according to Regulation (EC) No 1049/2001, in a spirit of openness and transparency in order to bring its activities and outputs closer to the public in line with the policy developed by the Programme Office. The SNS JU will implement the standard operating procedure (SOP) on Access to documents and the training of the staff on access to documents issues.

Feedback to policy

The SNS JU will contribute to the activities of a number of services in the European Commission. Contributions will vary in content and format. They will all share the common goals of providing fact-based information on the state-of-the-art of 5G/6G technologies, feeding EU initiatives and policies, especially in the telecommunication sector, and boosting competitiveness and growth.

In practical terms, the SNS JU will take part in a number of technical groups and/or events organised by the Commission and other international bodies, and it will actively participate in meetings. It includes also feedback from projects and studies to the Commission in contribution to relevant connectivity files and topics (e.g. cybersecurity, sustainability, privacy, public health, etc.).

In 2023, the SNS JU Programme Office will ensure a close collaboration with policy makers in the European Commission, specifically (but not exclusively) within the framework for feedback to policy in Horizon Europe, prepared and piloted by the Common Implementation Centre to support evidence-informed policy design and evaluation.

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[19] OJ L 295, 21.11.2018, p. 39–98. Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC

Pursuant to the Regulation, the SNS JU will also contribute to consultations in the context of Union regulatory processes and pursue activities to further develop the ecosystem including through cooperation with verticals.

3.3.4. Human Resources

3.3.4.1. HR Management

The SNS JU aims to achieve its goals through effective recruitment procedures, proper allocation and administration of resources and by developing, motivating and retaining valuable/high qualified staff while maintaining a motivating and efficient working environment.

The Executive Director will ensure that all HR functions are managed well and that all staff work in a safe, respectful and rewarding environment.

In 2023, no appraisals, promotions, retirements or mobility exercises are foreseen.

3.3.4.2. Staff Establishment Plan

The Staff establishment plan gives an overview and forecast of annual staff positions for the year 2023.

From a general point of view, the SNS Staff shall consist of temporary staff (TA) and contract staff (CA). Their contracts will be governed by the Staff Regulations of officials and conditions of employment of other servants of the European Union.

The JU may also make use of seconded national experts and trainees, the selection and working conditions of which are subject to a decision of the Governing Board.

The staff policy followed by the SNS JU consists of:

- a set of implementing rules giving effect to the Staff Regulations of officials and conditions of employment of other servants of the European Union, adopted by the Governing Board with prior agreement of the Commission,

- a set of internal rules organising the day-to-day administration of the Office and responsibilities and tasks entrusted to staff.

In 2022, the JU team consists of seven positions (4 TA and 3 CA) and an Executive Director, acting *ad interim*. The recruitment procedure for the Executive Director post is on-going. Two other posts (1 TA and 1 CA) will be filled as of 1 January 2023. The recruitment procedures for seven posts will be launched (2 TA and 5 CA) to cover all the 17 posts that have been planned for the JU.

PLANNED POST

	2023
Establishment plan posts: TA-AD	7
Establishment plan posts: TA-AST	0
Total establishment plan posts	7
Contract Agents	10
Seconded National Experts	
Traineeships	
Total Staff	17

CATEGORIES AND GRADES	2023
AD 16	
AD 15	
AD 14	1
AD 13	
AD 12	1
AD 11	
AD 10	
AD 9	
AD 8	
AD 7	5
AD 6	
AD 5	
Total AD	7
Total AST/SC	0
TOTAL	7

CONTRACT AGENTS	2023
Function Group IV	5
Function Group III	4
Function Group II	1
Function Group I	
Total Staff	10

ROLE DESCRIPTIONS

Executive Director (TA-AD14)

The Executive Director is the chief executive responsible for the day-to-day management of the SNS Joint Undertaking providing leadership at the strategic and operational level ensuring the achievement of the Joint Undertaking's objectives. The Executive Director is its legal representative and he/she shall perform his/her tasks with independence and shall be accountable to the Governing Board.

This position is presently vacant, occupied temporarily by the Head of Unit of DG CONNECT E1 in the capacity of Interim Executive Director.

Head of Programmes (TA-AD12)

The Head of Programmes has responsibility for the scientific and technical work of the Programme Office, for programming, coordinating and communicating the activities of the JU. In particular he/she has a key coordination role to establish the draft R&I Work Programmes, to oversee the Working Groups of the JU, and to steer the Strategic Research and Innovation Agenda and the Strategic Deployment Agendas in close cooperation with relevant stakeholders. He/she also oversees the operational tasks leading to proposal selection.

Team Leader Administration and Finance (TA-AD7)

The Team Leader of Finance and Administration has responsibility for Human Resources, Budget and Finance, Legal affairs, Governance implementation, Internal Control and Audits, ICT, Housing, Security and Infrastructure.

Program Officer (TA-AD7)

The Program Officer will contribute to the preparation and implementation of the scientific, technical and administrative activities of the annual work programme of the JU and, consequently, for the entire life cycle of a portfolio of projects that cover research, innovation and demonstration activities of technologies under the scope of the JU. He/she will also be responsible for monitoring of the key performance indicators (KPIs) and associated targets in his/her projects portfolio, while maximizing the impact of the JU overall program implementation through dissemination of projects results and achievements, including feedback to policy. He/she also contributes to Working Groups of the JU, and to the steering

of the Strategic Research and Innovation Agenda and the Strategic Deployment Agendas in close cooperation with relevant stakeholders. He/she also develops the draft communications strategy of the JU and the related communications activity plan and oversees all communication activities of the JU.

Financial Officer (CA-FGIV)

The Financial Officer works under the direct supervision of the Team Leader of Finance and Administration and is responsible for the proper functioning of the budgeting and financial aspects of the JU, including the financial management of individual projects, the compilation of the overall budgets, their implementation, forecast and overall execution of sound financial management.

Legal Officer (CA-FGIV)

The Legal Officer provides the JU with all relevant legal advice and support for the smooth operation of the activities of the JU, monitors the implementation of contractual obligations of the JU, drafts the legal documents of the JU. She/He is also the JU's Data Protection Officer. She/he ensures the legality of the procedures in place, provides recommendations to improve the efficiency, effectiveness of the JU and is the liaison with auditing bodies.

Financial Assistant (CA-FGIII)

The Financial Assistant supports the financial management of individual projects, verifies the financial and administrative compliance of the grants and contracts, performs the administrative quality checks on files for signature, monitors the operational and administrative expenditures, and provides budget planning and reporting for operational and administrative expenditures. The Financial Assistant reports to the Finance and Administration Team Leader.

Administrative Assistant (CA – FGIII)

This post is meant to assist the JU on determining an HR strategy and tasks, on supporting the event management and providing administrative support to the finance and administration team. The HR Assistant manages HR personal files and assists in the implementation of the staff policy. He/she also supports the office assistant and acts as his/her backup.

Programme Management Assistant (CA– FGIII)

This post is meant to primarily provide support to the Programmes and Communication team in the full lifecycle of the R&I Work Program. She/he will support the JU's communication activities, including managing the JU website, developing and monitoring the execution of a communications activity plan implementing the Communications Strategy of the JU. Moreover, he/she will support the organisation and management of events.

Administrative Support Assistant (CA-FGII)

This post of office assistant provides the secretarial support to the Executive Director and the whole office of the JU. She/He provides the planning of the activities and administrative support in the relations with JU Bodies. She/He does the general coordination of the document management within the JU.

3.4. Governance activities

The Governing Board (GB) of the SNS JU started its activities in December 2021. The first activities included the setting up of all the necessary rules and operational procedures for the SNS JU to be able to start its operation. This includes the Comprehensive rules on the prevention and management of conflicts of interest and the Code of Conduct applicable to the participants of the meetings of the SNS GB. During the course of 2021-2022, four GB meetings were held[20], which – with regard to governance - allowed for the creation of the States' Representatives and Stakeholders Group of the SNS JU and the introduction of a 3-tier system for Working Groups. The Chair and Vice Chair of the States' Representative Group have attended these GB meetings as observers.

The European Commission (EC) continues to be responsible for the smooth transition of the SNS JU into autonomy during the first half of 2023, until it has the operational capacity to implement its own budget. The Regulation also foresees that until this happens, the Commission shall carry out all necessary actions in collaboration with the other members and with the involvement of the competent bodies of the SNS JU, under the responsibility of the interim Executive Director.

The main target of the SNS JU for 2023 is to start the first projects granted in 2022, to launch a call for Horizon Europe research and innovation proposals in the first quarter of 2023, to formally launch the Working Groups under the SNS JU while ensuring smooth transition from the 5G-PPP WGs, and become autonomous as an EU body.

Concerning the link to piloting and deployment for pan-European 5G corridors for connected and automated mobility under CEF2, the SNS JU will ensure that the States' Representative Group presents a coordinated position with regard to the Strategic Deployment Agenda (SDA) and the deployment activities related to other Union programmes, in particular CEF2. The SNS Governing Board is responsible, *inter alia*, for adopting Strategic Deployment Agendas, as non-binding contributions under CEF2 with regard to 5G corridors.

Considering the global race for the launch of 6G R&I initiatives, the Governing Board needs to ensure fast, effective and efficient decision-making on all required aspects, and be flexible in planning its meetings or in using written consultation when possible. It shall also facilitate the exchange of information with the SNS States' Representative Group (SRG) in order to allow regular updates and obtaining the required opinions of the SRG.

In order to prepare the JU activities for 2024, the GB will also initiate and pursue during the whole year a number of activities, like the monitoring of the development of the updated Strategic Research and Innovation Agenda, the preparation of the Horizon Europe 2024 SNS R&I Work Programme, as well as following relevant Strategic Deployment Agendas in view of CEF2 Digital and national recovery plans.

Regarding the relationship with the SNS stakeholders communities, the GB will continue to contribute and support the relevant conferences, workshops and stakeholder engagement events in the scope of the SNS JU through the active participation of representatives from the JU

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[20] December 2021, May 2022, July 2022 and October 2022

members (6G-IA and EC) and their constituent entities, in close collaboration with the staff of the SNS JU. Among these events, the 2023 edition of the EUCNC & 6G Summit, being the flagship annual conference for the European research and innovation in the area of communication networks, will be of a particular importance.

3.5. Internal Control framework Plans

A. Financial procedures

The financial procedure for projects under Horizon Europe depends on the Horizon Europe IT tools developed by the European Commission. These IT tools encompass the full cycle of the process, including workflows, check-lists, etc.

The Financial rules of the SNS JU have been adopted by the Governing Board on 15 December 2021.

B. Ex-ante and ex-post controls

The internal control processes and methods will be subject to a decision of the Governing Board adopting the internal control standards for efficient management.

With regard to financial matters, ex-ante and ex-post controls are organised in accordance with the Financial Rules of the SNS JU.

The current developments for the electronic management of calls and selected projects shall be complemented in cooperation with the Common Implementation Centre (CIC) of the Commission, in charge of the applications.

C. Audits

Audits are organised both on an internal and external basis.

Internal audits are operated by the internal auditor of the JU (the competent service of the Commission) and by the staff member who will be appointed by the Governing Board for performing the internal audit capability, in accordance with the provisions of Chapter 5 of the Financial rules of the SNS JU.

External audits are operated by the European Court of Auditors (ECA), reporting to the European Parliament and the Council, responsible for the discharge procedure. Within this mandate, the ECA carries out an examination of the annual accounts and the underlying transactions for EU JUs and prepares an Annual Report on their financial and compliance. The SNS JU did not fall under such an obligation in 2022, but will be audited for the first time after it has obtained its financial autonomy, which is expected to be in 2023.

Ex-post audits of beneficiaries are also operated by or on behalf of the SNS JU, with methods which are adapted to the specificities of the programmes for the SNS projects.

The SNS JU will define in 2023 the needs and methods for the ex-post audits, in close cooperation with the Common Implementation Centre (CIC) of the European Commission, in view of a

coordinated approach of audits of beneficiaries. A common audit plan for all EU services involved in the programme Horizon Europe will be implemented by the CIC of the Commission, acting on behalf of the SNS JU. The first audits will be launched in 2023.

4.   BUDGET 2023

In accordance with the provisions of the Regulation, the contributors for its budget are:

- The *European Union*, covering administrative and operational costs.
- The *Private Member of the Joint Undertaking*, which shall make or arrange for their constituent entities and affiliated entities to make financial contributions to the JU's administrative costs.

The Union budget will constitute a ceiling for the actual Union contribution, in accordance with Article 10 of that Council Regulation.

The European Commission's Accrual Based Accounting system (ABAC) will be rolled out in the JU in 2023 and will be used for accounting purposes. DG BUDG is ending the services of Accounting Officer that it previously provided to the joint undertakings. A back-office arrangement (BOA) will be concluded with the other joint undertakings.

Budget Revenue

Budget line: 01 02 02 43: Cluster Digital, Industry and Space — Smart Networks and Services joint undertaking

Human Resources Overview

The table below presents the number of posts in the establishment plans.

Human Resources	2022		2023
	Authorised Budget	**Actually filled as of 31/12/2022**	**Draft Budget Request**
Administrators (AD)	6	4	7
Assistants (AST)			
Assistants/Secretaries (AST/SC)			
ESTABLISHMENT PLAN POSTS	**6**	**4**	**7**
Contract Agents (CA)	10	3	10
Seconded National Experts (SNE)			
TOTAL STAFF	**16**	**7**	**17**

Financial Resources Overview

Revenues Overview

REVENUES	2022	2023
	Revenues estimated by the agency	**Budget Forecast**
EU contribution	243.057.000	131.204.255
Other Revenue	3.322.155	4.400.255
TOTAL REVENUES	**246.379.155**	**135.604.510**

Expenditure Overview

Expenditure	2022		2023	
	Commitment appropriations	**Payment appropriations**	**Commitment appropriations**	**Payment appropriations**
Title 1 - Staff expenditure	1.306.961	1.306.960	2.199.247	2.199.247
Title 2 - Infrastructure and operating expenditure	748.612	748.613	843.014	843.014
Title 3 - Operational expenditure	244.323.582	167.027.125	132.562.249	134.598.074
TOTAL EXPENDITURE	**246.379.155**	**169.082.699**	**135.604.510**	**137.640.335**

For 2023, the total administrative and operational expenditure is estimated at **EUR 135.604.510**.

Title 1 and Title 2: The SNS JU will receive Union's funding for its administrative and operational expenditure, as foreseen in the Regulation. The administrative expenditure budget of the Union will amount to EUR 2 433 809[21] in 2023. This amount, from the General Union Budget, is subject to its adoption by the budgetary authority and it may be updated accordingly. It will be used to cover staff expenditure, infrastructures operating expenditure.

The Private Member will contribute only to the SNS JU's administrative costs. The Private Member's contribution is estimated at EUR 608.452 in 2023.

Title 3: The SNS JU will carry out a number of activities in 2023, via calls for proposals, for an estimated amount of 132 562 249[22]. This amount is subject to its adoption by the budgetary authority and may be updated accordingly.

The financial contributions from EFTA countries are included into the SNS JU budget, proportionally to the EU budget. Being additional to the General Union Budget, they are represented separately from the specific EU contributions. The EFTA rate[23] is the same for administrative and operational budgets.

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[21]   This amount includes EFTA contribution of EUR 68 361 (2023 EFTA contribution rate – 2.89%).
[22]   This amount includes EFTA contribution of EUR 3 723 442 (2023 EFTA contribution rate – 2.89%).
[23]   In 2023, the EFTA contribution rate amounts to 2.89%.

Human Resources

Establishment plan posts

The table below presents the number of posts in the establishment plans, including the posts assigned to programmes financed outside the EU budget.

Function group and grade	2022				2023	
	Authorised Budget		Actually filled as of 31/12/2022		Request of the Agency	
	Permanent posts	Temporary posts	Permanent posts	Temporary posts	Permanent posts	Temporary posts
AD 16						
AD 15						
AD 14		1				1
AD 13						
AD 12		2				1
AD 11						
AD 10						
AD 9						
AD 8		3				
AD 7				4		5
AD 6						
AD 5						
AD TOTAL		6		4		7
AST 11						
AST 10						
AST 9						
AST 8						
AST 7						
AST 6						
AST 5						
AST 4						
AST 3						
AST 2						
AST 1						
AST TOTAL						
AST/SC 6						

Function group and grade	2022				2023	
	Authorised Budget		Actually filled as of 31/12/2022		Request of the Agency	
	Permanent posts	Temporary posts	Permanent posts	Temporary posts	Permanent posts	Temporary posts
AST/SC 5						
AST/SC 4						
AST/SC 3						
AST/SC 2						
AST/SC 1						
AST/SC TOTAL						
TOTAL		6		4		7
GRAND TOTAL	6		4		7	

External personnel

Contract Agents

Contract agents	Authorised 2022	Recruited as of 31/12/2022	Draft Budget 2023 estimate
Function Group IV	5	1	5
Function Group III	4	2	4
Function Group II	1		1
Function Group I			
TOTAL	10	3	10

Financial Resources

Revenues

REVENUES COMMITMENT APPROPRIATIONS	REVENUES COMMITMENT APPROPRIATIONS	
	Executed Budget 2022	Budget 2023
1 EU CONTRIBUTION	243.057.000	131.204.256
- Of which Administrative (Title 1 and Title 2)	1.703.000	2.365.448
- Of which Operational (Title 3)	241.354.000	128.838.808
2 THIRD COUNTRIES CONTRIBUTION (incl. EEA/EFTA and candidate countries)	3.011.646	3.791.802
- Of which EEA/EFTA (excl. Switzerland)	3.011.646	3.791.802

- Of which candidate countries		
3 OTHER CONTRIBUTIONS	**310.509**	**608.452**
4 ADMINISTRATIVE OPERATIONS		
5 REVENUES FROM SERVICES RENDERED AGAINST PAYMENT		
6 CORRECTION OF BUDGETARY IMBALANCES		
7 INTERESTS GENERATED		
8 UNUSED APPROPRIATIONS FROM PREVIOUS YEARS		
TOTAL	**246.379.155**	**135.604.510**

REVENUES PAYMENT APPROPRIATIONS	**REVENUES PAYMENT APPROPRIATIONS**	
	Executed Budget 2022	**Budget 2023**
1 EU CONTRIBUTION	**164.704.000**	**133.182.898**
- Of which (fresh C1) Administrative (Title 1 and Title 2)	1.703.000	2.365.448
- Of which frontloading (Title 1 and Title 2)		
- Of which Operational (Title 3)	163.001.000	130.817.450
2 THIRD PARTIES CONTRIBUTION	**4.068.189**	**3.848.985**
- Of which EEA/EFTA (excl. Switzerland)	4.068.189	3.848.985
- Of which third countries		
3 IN CASH THIRD PARTY CONTRIBUTIONS	**310.509**	**608.452**
- Of which Administrative (Title 1 and Title 2)		
- Of which Operational (Title 3)		
4 REVENUES FROM SERVICES RENDERED AGAINST PAYMENT		
5 INTERESTS GENERATED		
6 UNUSED APPROPRIATIONS FROM PREVIOUS YEARS		
- Of which administrative		
- Of which operational		
7 OTHER		
TOTAL	**169.082.698**	**137.640.335**

Expenditures

EXPENDITURE	**COMMITMENT APPROPRIATIONS**	
	Executed Budget 2021-2022	**Budget 2023**
Title 1 - Staff expenditure	**1.306.961**	**2.199.247**

Salaries & allowances	**1.188.146**	**1.999.315**
- Of which establishment plan posts	625.629	1.119.617
- Of which external personnel	562.517	879.699
Expenditure relating to Staff recruitment (1)	**118.815**	**199.932**
Mission expenses		
Socio-medical infrastructure		
Training		
External Services		
Receptions, events and representation		
Social welfare		
Other Staff related expenditure		
Title 2 - Infrastructure and operating expenditure	**748.612**	**843.014**
Rental of buildings and associated costs	*200.000*	*350.000*
Information, communication technology and data processing	*331.714*	*298.097*
Movable property and associated costs	*5.352*	*4.810*
Current administrative expenditure	*89.257*	*80.211*
Postage / Telecommunications	*16.057*	*14.430*
Meeting expenses	*42.004*	*37.747*
Running costs in connection with operational activities		*0*
Information and publishing		*0*
Studies		*0*
Other infrastructure and operating expenditure	*64.228*	*57.719*
Title 3 - Operational expenditure	**244.323.582**	**132.562.249**
TOTAL	**246.379.155**	**135.604.510**

	PAYMENT APPROPRIATIONS	
EXPENDITURE	**Executed Budget 2021-2022**	**Budget 2023**
Title 1 - Staff expenditure	**1.306.961**	**2.199.247**
Salaries & allowances	*1.188.146*	*1.999.315*
- Of which establishment plan posts	625.629	1.119.617
- Of which external personnel	562.517	879.699
Expenditure relating to Staff recruitment	*118.815*	*199.932*
Mission expenses		
Socio-medical infrastructure		
Training		
External Services		
Receptions, events and representation		
Social welfare		

Other Staff related expenditure		
Title 2 - Infrastructure and operating expenditure	**748.613**	**843.014**
Rental of buildings and associated costs	*200.000*	*350.000*
Information, communication technology and data processing	*331.714*	*298.097*
Movable property and associated costs	*5.352*	*4.810*
Current administrative expenditure	*89.257*	*80.211*
Postage / Telecommunications	*16.057*	*14.430*
Meeting expenses	*42.004*	*37.747*
Running costs in connection with operational activities	*0*	*0*
Information and publishing	*0*	*0*
Studies	*0*	*0*
Other infrastructure and operating expenditure	*64.229*	*57.719*
Title 3 - Operational expenditure	**167.027.125**	**134.598.074**
TOTAL	**169.082.699**	**137.640.335**

Human Resources

The SNS JU will still need to recruit seven staff members in 2023. With 17 posts set out in the Legal and Financial Statements (LFS) included in the Commission's proposal for the Regulation, SNS is one of the JUs with the highest productivity levels. These 17 posts represent the bare minimum that is needed for the functioning of the JU.

The planning and reporting requirements, the internal control system and the process for managing in-kind contributions will be a significant part of the Administration and Finance work of the JU and will be resources intensive.

The SNS JU highly counts on the Back Office Arrangements with the other JUs for the provision of some services. The top priority in 2023 is the Accounting Officer services. The SNS JU is also interested in implementing other services such as ICT, procurement, communication and HR services as a first set of services.

Other information

Building

The SNS JU intends to have its own office space in the White Atrium building, located in Brussels, with the other joint undertakings. This will have to be the subject of an arrangement with the other joint undertakings. The rental costs (and associated costs) will depend on the square meters allocated in the building to the SNS JU. The rental costs (and associated costs) is estimated at EUR 350 000 for the year 2023. The joint undertakings will launch a negotiated procedure on the building for occupancy as of 1 January 2025 as the current contract with the White Atrium will come to an end in 2024.

5.   ANNEX: IKAA Plan

OVERVIEW ESTIMATED AMOUNT OF IKAA FOR YEAR 2023					
Additional Activities category	**Description of the Additional Activities**	**Country of establishment of the contributor**	**Link to JU objectives / KPIs**	**Link to JU project/ topic (if relevant)**	**Estimated annual value (in M€)**
1. Support to additional R&I					
	Point 1 in the plan classification key	FR, SE, DE, FI, ES, IT	a) High Risk Research Funding b) Technological consensus building c) Advanced 6G Solutions for verticals d) Uptake of digital solutions within verticals e) Energy Efficient Telecommunication Networks	Stream B, C, D projects	40
2. Scale up of technologies					
	Point 2 in the plan classification key	-	a) SME Innovation and participation b) A competitive data economy c) Foster emergence of new actors ion the 6G supply chain d) Uptake of digital solutions within verticals	Not applicable	0
3. Demonstrators					
	Point 3 in the plan classification key	FR, SE, DE, FI, ES, IT	a) Advanced 6G Solutions for verticals b) Uptake of digital solutions within verticals	Stream D projects	5
4. Creating new business opportunities					
	Point 4 in the plan classification key	-	a) Share on Family patents	Not applicable	0
5. Training & skills development					
	Point 5 in the plan classification key	FR, SE, DE, FI, ES, IT	a) Scientific excellence	Not applicable	3
6. Contribution to the development of new standards, regulations and policies					
	Point 6 in the plan classification key	FR, SE, DE, FI, ES, IT	a) Standardization contributions	Stream B projects	3

7. Supporting ecosystem development				
	Point 7 in the plan classification key	FR, SE, DE, FI, ES, IT	a) SME Innovation and participation b) A competitive data economy c) Foster emergence of new actors ion the 6G supply chain d) Uptake of digital solutions within verticals	Stream D projects	2
8. Communication, dissemination, awareness raising, citizen engagement				
	Point 8 in the plan classification key	FR, SE, DE, FI, ES, IT	a) Rapid diffusion b) Reach Programme level consensus on 6G KPIs	Stream D projects	2
9. Others				
	Point 9 in the plan classification key	FR, SE, DE, FI, ES, IT	a) Development of energy efficient telecommunication networks b) Collaboration and synergies with other Partnerships c) Ensure research on secure future digital services	Stream B and C projects	5
TOTAL ALL PLANNED IKAA				60
IKAA BREAKDOWN PER COUNTRY				
Country	Estimated value			
France	**5**			
Sweden	**15**			
Germany	15			
Finland	15			
Spain	5			
Italy	5			

SNS JU IKAA Plan classification key

1. Support to additional R&I:

    - Spin off research and development activities (all research activities aligned with the goals of the SNS partnership, namely research into the evolution of 5G systems and research into 6G systems which is not funded by the SNS partnership).

    - Activities financed by loans of the European Investment Bank and not funded under a grant by the Union; (e.g. establishment of new R&D centers, loans for R&D activities).

- Activities related to the preparation of, and participation in, research and innovation projects funded by private or public bodies other than the Union.

- Provision of experts (e.g., to assess economic / societal impact of SNS technologies).

- Acquisition of R&D lab equipment and infrastructures funded by own resources.

2. Scale up of technologies:

   - Investment in start-ups and new products in the advanced networks and services domains.

   - Investment in new infrastructures in conjunction with CEF2 proposals and projects.

   - Orchestration and support of projects in related peer programs such as the EUREKA Clusters, and specifically the CELTIC-NEXT cluster where there is a lot of future networks and applications investments.

3. Demonstrators:

   - Trials, demos, pilots and Proof of Concepts (PoCs), go to market, early deployment of technologies; (not funded by SNS projects like customer trials).

4. Creating new business opportunities :

   - Activities related to patent Filing not funded under a grant by the Union (the costs associated with all Patent filing activities aligned with the goals of the SNS partnership, namely IPR in the area of 5G and 6G. This includes both the costs associated with IPR preparation as well as submission costs).

5. Training and skills development:

   - R&D training programs (e.g., PhD programs) not being funded by the Commission in the advanced networks and services domain.

6. Contribution to the development of new standard, regulations, and policies:

   - Contributions to standardization (all standardization activities aligned with the goals of the SNS partnership, namely standardization of 5G and 6G in SDOs like 3GPP, O-RAN Alliance, ITU etc. which is not funded by the SNS partnership. This includes both the costs associated with participation in standardization as well as any necessary technical preparatory work such as research or simulation).

   - Contributions to regulatory processes; (all regulatory activities – e.g. ITU-R; CEPT, national processes, contributions to preparation of WRC – aligned with the goals of the SNS partnership, namely related to 5G and 6G which are not funded by the SNS partnership).

7. Supporting ecosystems development:

   - Activities to develop the ecosystem including building cooperation with verticals; (e.g., creation of specific interest groups, International cooperation not funded under a grant by the Union).

8. Communication, dissemination, awareness raising, citizen engagement:

   - Dissemination activities of results globally to achieve consensus on supported technologies as preparation of future standards; (publications, workshops, conferences).

   - SNS related education and events to promote future ICT technologies.

9. Others:

   - Investment in environmental and Green deal evolutions.

   - Contributions to activities of the 6G Smart Networks and Services Industry Association (6G-IA) and any other group or association of stakeholders in the area of the Smart Networks and Services Joint Undertaking, not funded under a grant by the Union; (e.g., working groups, white papers).