

**6G SNS**



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***SEamless integratiON of efficient 6G WirelesS  
tEchnologies for Communication and Sensing***

**D6.1 6G-SENSES Standardisation, Dissemination,  
Communication, and Liaison Activities Plan**

September 2024

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## Executive Summary

This document is the first outcome of the effort dedicated to standardisation, dissemination, communication and liaison activities of 6G-SENSES project. It sets the principles and summarizes the 6G-SENSES plans that have been devised in order to effectively track the progress, evaluate and maximise impact of the project activities related to standardisation, dissemination and communication as well as participation to 6G Infrastructure Association (6G-IA) / Smart Networks and Services Joint Undertaking (SNS JU) activities and liaison with other projects. In general terms, the plans are defined in terms of: target audience, material to be prepared, sharing of responsibilities between consortium members, timelines to be followed, feedback procedures and assessment against relevant, specific, measurable Key Performance Indicators (KPIs).

The initial activities that have been undertaken by the consortium in the early phases of the project until the time of writing, are also listed. These activities are part of the project's Work Package 6 (WP6) and, in general, run continuously throughout the lifetime of the project. This document also outlines the main intention of the 6G-SENSES consortium towards achieving the goals in these areas, and maximising impact in this respect. For this purpose, the plans defined in this document are subject to continuous monitoring, revision and modification throughout the course of the project to ensure that the targets are achieved.



# 1 Introduction

The goal of the Digital Europe Programme, implemented by the European Commission (EC) [1], is to invest in research that will bring Europe at the forefront of mobile networks' development and sustainable deployment. The ongoing research within this Programme would be incomplete if the results of the funded projects are not shared within the industrial and research communities, and if these results are not communicated to the relevant bodies for standardization and for shaping/influencing the relevant EU policies. Therefore, for 6G-SENSES, having a clear standardisation, communication and dissemination plan is critical to ensure the required return of this investment (funds). At the same time, focus is put on the exploitation of results at various time and market/policy scales.

In general, standardisation is a consensus-driven activity, necessary to ensure for any solution delivered to the industry: Interoperability and Compatibility, Quick and Sustainable adoption of technological advancements, the required Quality and Performance in line with the market needs and industry capacities. To this end, standardisation activities of any research effort (should) have a dual purpose: (1) to achieve compliance with existing ecosystem, and (2) to achieve consensus from industry to follow the proposed methods/solutions. These principles are considered and reflected to 6G-SENSES' standardisation activities plan. This document details the standardisation activities plan of the project in terms of identified Body of Interest (BoI), and partners' involvement specifying the actions each partner will take to contribute to the standardisation process, such as participation in working groups, submission of technical proposals, and attendance at key industry events.

At the same time, communication and dissemination activities are important to raise awareness at the local, national and international levels on the project targets and achievements, and to inform specific target groups (especially industrial stakeholders and policy makers) about the results in order to maximise impact and achieve sustainability of project work beyond the project end. In parallel, bidirectional communication and liaison activities with other research efforts of similar scope and objectives are important to facilitate the alignment of the project work and results with the industrial and research community at early development stages. At more mature project stages, communication and dissemination activities would aim to pave the way for the definition of a clear and robust policy environment to boost the formulation of 6G ecosystems with the inclusion of multiple stakeholders at various layers.

For this purpose, a well-defined communication, dissemination and liaison activities plan is devised to optimise the 6G-SENSES communication efforts. This plan is presented in this document addressing aspect such as target audience, material to be prepared, sharing of responsibilities between consortium members, timelines to be followed, feedback procedures and assessment against relevant, specific, measurable Key Performance Indicators (KPIs).

## Organisation of the document

This document comprises five sections. Following the Executive Summary and Introduction sections:

Chapter 2 provides an outline of the planning of activities related to standardisation.

Chapter 3 defines the methodology underpinning the communication and dissemination and liaison activities plan, and defines the initial plan and the monitoring and evaluation procedures to be followed; it also presents the early communication and dissemination activities that have been performed by project partners until the date of submission of this deliverable.

Chapter 4 provides reports on the liaison activities plan.

Finally, Chapter 5 summarises the document.

## 2 Standardisation activities plan

Standardisation is a consensus-driven activity carried out by the interested parties themselves. This activity is openness and transparent inside any organisation with the aim to establish adoption of this standard and compliance with standard<sup>1</sup>. The main reasons why standardisation is necessary are:

- Interoperability and Compatibility.
- Simplification of the processes.
- Ensuring QoS, QoE and Safety.

Standardisation activities in 6G-SENSES will be performed through interaction between Bodies of Interest (BoI) and Project partners. BoI for 6G-SENSES are not only standards development organisations (SDOs), but also other organisations, initiatives and partnerships important for the project work.

Interactions between project partners and BoI are based on:

- monitoring activities (monitoring and obtaining access on pre-standards),
- dissemination activities (awareness and external dissemination of project work), and
- contributing activities (giving feedback to the relevant SDOs promoting project work and contributing to new (pre)-standards).

### 2.1 Organisation of standardisation activities in 6G-SENSES

The leading partner for the standardisation activities in 6G-SENSES project is Intel Deutschland GmbH (INT), and the contributions are expected from the following partners: INT, NTU, TUBS, ACC, BI.

Standardisation-related activities are focused on establishing a two-way influence between standardisation/regulation bodies and the project work, and they will be carried out through communication and contributions to SDOs. The project will contribute to regulatory-related activities at a European and an international level that might influence the work in the project. The aim is to guarantee overall viability and coherence of the 6G-SENSES project results, to support the market readiness of the project outcomes, as well as to influence technology advancements.

These activities will include monitoring regulatory and standardisation activities directly related to the research areas of 6G-SENSES, and contributions to the relevant SDOs. The plan will be further revisited and regularly updated throughout the project lifetime (see Figure 2-1).

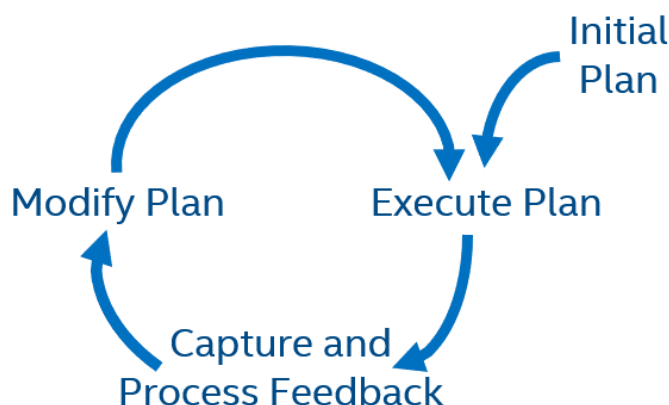


Figure 2-1 Monitoring and evaluation of standardisation plan

<sup>1</sup> Benefits of standards and standardization". Cooperation Platform for Research And Standards (COPRAS project).

The main activities that will be performed through the plan are:

- soliciting inputs from 6G-SENSES partners to identify bodies where 6G-SENSES needs to have direct contact,
- 6G-SENSES project internal dissemination of relevant standards to ensure awareness and alignment of the partners and the respective Work Packages (WPs) and tasks with the best practices,
- making a good connection to SDOs and obtaining a draft of new standards (pre-standards), becoming active pre-standard Work Group (WG) member, and
- participating in the evolution of standards and giving feedback to the SDOs, promoting results of 6G-SENSES results and innovations.

## 2.2 Standardisation Domains covered in the project

As an early identification of work, activities' monitoring and contributions to the following standardisation bodies/groups/forums are expected (but not limited to). The standardisation activities within 6G-SENSES are initially focused on the following topics/domains:

### 2.2.1 6G Networks technology-specific standardization activities

In the sequel, we present 6G networks technology-specific standardization activities, which are mainly focused on within 6G-SENSES project:

- **IEEE Wireless technologies:** IEEE provides a neutral platform that unites communities for standards development and technological innovation. In the 6G-SENSES project, IEEE is the main SDO targeting at specifications of local area network (LAN) technical standards, and specifies the set of medium access control (MAC) and physical layer (PHY) protocols for implementing wireless local area network (WLAN) computer communication and sensing.
  - INT is driving the work on several WGs of IEEE 802.11, for instance on the technology that will succeed 802.11.ax-2021 (the latest available family called 'Wi-Fi 6E'), which has the provisional name of 'Wi-Fi Extreme high throughput' (Wi-Fi 7). In the 6G-SENSES project, INT will impact the evolution of 802.11.bf (Wi-Fi sensing), of which the first 802.11 TG meeting was held in October 2020, and the final 802.11 RevCom and SASB approval will be conducted in June 2025. One aspect of the Wi-Fi sensing standardisation is to define procedures that enable efficient and reliable channel measurement (or "sampling").
  - INT also supports the IEEE 802.11.bq IMMW study group (i.e., integrating mmWave into Wi-Fi) in the 6G-SENSES project. The IEEE IMMW study group is conducting an analysis on expanding Wi-Fi to mmWave band and may consider joint communication and sensing from the very beginning.
  - INT within the 6G-SENSES project may be selectively involved in the required IEEE 802.11.bf and IEEE 802.11.bq standard support, including
    - Negotiation of sensing parameters and schedule.
    - Determine transmission characteristics of PPDU used for sensing.
    - Power saves (e.g., not rely on the opportunistic reception of packets).
    - Enables transmit/receive station diversity.
    - Protocol flow that efficiently supports unique and fundamental characteristics of Wi-Fi sensing.
  - INT and NTU are involved in IEEE 1932.2 standardization development.

- To this end, **INT** related IEEE standard development activities along with key envisioned use-cases/schemes are summarized in Table 2-12-2.
- **TUBS** is participating in IEEE 802 and will monitor and create input documents to existing and future activities at IEEE 802. Prof. Kürner (**TUBS**) is a voting member of IEEE 802.18, which deals with regulatory and spectrum aspects in IEEE 802.
- **ETSI**: European Telecommunication Standardization Institute (ETSI) will prepare systematic output on 6G use cases, channel models, architecture, and deployment considerations, KPIs and evaluation assumptions, for subsequent evaluation by standards organizations such as 3GPP future 6G releases and ITU-R IMT2030 deliverables (e.g., capabilities, evaluation methodology). In the **6G-SENSES** project, ETSI is also the main SDO, targeting at the following specifications:
  - **INT** is a main driver of ETSI activities and will represent **6G-SENSES** in ETSI ISG ISAC as the consortium partner. Specifically, **INT** is involved in Wi-Fi use cases of ISAC and their relation to 6G use cases, and will propose requirements for coexistence of both systems based on use cases (6G and Wi-Fi).
  - **INT** will also investigate the system architecture by **i)** identifying considerations and challenges for integration of non-3GPP (i.e., Wi-Fi) RAT sensing input; **ii)** exploring potential approaches for Wi-Fi sensing function and the integration of Wi-Fi RAT sensing inputs.
  - To this end, **INT** related ETSI standard development activities are summarized in Table 2-1.
  - If applicable, **INT** will provide the needed expertise to impact project outcomes in several groups, among which millimeter wave transmission (mWT).
  - **BI** is a member in multiple ETSI industry specification groups (ISG). The participation in the ISG-ISAC offers an opportunity to contribute to the pre-standardisation work. At the same time, being the organizer of yearly IEEE JC&S symposium gives **BI** the opportunity to bring academic and industrial leaders in a discussion forum towards key applications and standardisation efforts. Through partner institution TU Dresden, **BI** also contributes in 6G-Industrial alliance activities. **BI** has participated in July 2024 plenary meetings of ETSI ISG ISAC. This engagement will be continued in coming years.
- **3GPP**: 3GPP specifications and studies contain cellular communication technologies, comprising radio access network (RAN), core network (CN) and Services & Systems Aspects (SA), by providing a whole system guideline for cellular communication systems. The 3GPP specifications and studies also cover interworking with non-3GPP networks (i.e. IEEE 802.11 Wi-Fi).
  - **INT** within the **6G-SENSES** project is currently concentrated on standardization development activities regarding 3GPP interworking with the non-3GPP (IEEE 802.11 Wi-Fi), such as integration considerations of non-3GPP RAT sensing inputs as well as potential approaches for integration of non-3GPP (i.e., Wi-Fi) RAT sensing inputs. In addition, a new Task Group (TG) may be created in this domain (mostly 3GPP 6G SA1, SA2 and RAN work on Wi-Fi cellular interwork), along with a significantly increasing interest in this domain. This would establish new opportunities for further contributions from **INT** within the **6G-SENSES** project.
- **O-RAN**: Open Radio Access Network (O-RAN) is a shift in the way to designing and deploying RAN infrastructure in the telecommunications industry. The goal of O-RAN is to disaggregate and open up the RAN, providing operators with greater flexibility and scalability, interoperability, and innovation in network deployments, and nourish new innovative business opportunities.

- NGRG "Next Generation Research Group", here we can present features that go into the future standardisation options in O-RAN
- Conflict mitigation in O-RAN, contributions can be of two types:
  - identification of conflicts and
  - how to resolve those conflicts

**2.2.2 6G Networks operation/deployment-related**

In the initial stage of the 6G-SENSES project, the standardisation bodies/groups/forums/domains are monitored and potentially contributed to, as follows:

- Next Generation Mobile Networks Alliance (NGMN): monitoring of groups’ activities, and possible contribution.
- GSMA NESAS: Enhancing existing Security Certification Methodologies for Open RAN (O-RAN) Network Functions.

Table 2-1 shows a more detailed list of standardisation bodies/sectors mapped to the involved partners, with all activities that will be carried out to contribute to the new (pre)-standards.

**Table 2-1 Standardisation Bodies of Interest**

Standardisation Body	Sector/ Area	Partner Acronym	Activity
IEEE	Wi-Fi: 802.11bf	INT	<p><b>1. Actions:</b> INT will explore current Wi-Fi technologies and standardisation gaps to impact the evolution of 802.11bf. Thus, during the standardisation process, below potential Wi-Fi sensing schemes may be selectively involved according to different use cases, including:</p> <ul style="list-style-type: none"> <li>• Active sensing + presence detection</li> <li>• Active sensing + hand gesture recognition</li> </ul> <p><b>2. Exploitation Opportunity:</b> during the IEEE 802.11bf standardisation, the algorithms is not required for the above Wi-Fi sensing schemes, standardisation is needed for the systems regarding CSI generation, timing, accuracy, consistency, protocol, etc.</p>
IEEE	Wi-Fi: 802.11bq	INT	<p><b>1. Actions:</b> INT will also support the IEEE 802.11bq IMMW study group (i.e., integrating mmWave into Wi-Fi). The IEEE IMMW study group is conducting an analysis on expanding Wi-Fi to mmWave band and may consider joint communication and sensing from the very beginning. Therefore, the below potential Wi-Fi sensing scheme may be involved during the standardisation process, that is:</p> <ul style="list-style-type: none"> <li>• DMG/EDMG sensing with high range resolution</li> </ul> <p><b>2. Exploitation Opportunity:</b> similarly, the algorithms may not be needed during the IEEE 802.11bq standardisation development process for the above Wi-Fi sensing scheme. The IEEE 802.11bq standardisation may be required for the systems aspects such as CSI acquisition, timing,</p>

Standardisation Body	Sector/ Area	Partner Acronym	Activity
			accuracy, consistency, protocol, and so on.
IEEE	1932.2	INT, NTU	INT and NTU are developing standard for the interoperability of 5G & Wi-Fi in wireless mobile networks
IEEE	802, TAG 18	TUBS	Following activities on coexistence of IEEE 801.11 and IEEE 802.15 systems. Providing input from 6G Senses Task 4.4. This may create large impact.
ETSI	ISG ISAC	INT	<p>1. <b>Actions:</b> INT is involved in Wi-Fi use cases of ISAC and their relation to 6G use cases, such as:</p> <ul style="list-style-type: none"> <li>Proposed requirements for the coexistence of both systems based on use cases (6G and Wi-Fi)</li> <li>Common sensing products based on 6G sensing and Wi-Fi: reporting formats (e.g., delay/doppler/angle maps, point scatter/point cloud parameterisation, compression schemes, RCS) at each interface.</li> </ul> <p>Besides, INT also identifies considerations/ challenges, and potential approaches, inclusive of:</p> <ul style="list-style-type: none"> <li>Integration considerations of non-3GPP (i.e., Wi-Fi) RAT sensing inputs</li> <li>Identification of passive sensing and active sensing inputs, considerations/challenges on consecutive Wi-Fi sensing algorithms</li> <li>Approaches for the integration of non-3GPP (i.e., Wi-Fi) RAT sensing inputs</li> <li>Applications for passive and active sensing services, by exploring enhanced sensing signal processing procedures, Wi-Fi sensing via ML, and hybrid methods.</li> </ul> <p>2. <b>Exploitation Opportunity:</b> Interplay between 6G and Wi-Fi standardisation may be needed for the systems regarding Wi-Fi CSI generation, timing, sensing accuracy, protocol, sensing applications, etc.</p>
ETSI	ISG THz	TUBS	Develop the pre-standards for research efforts on THz technology
3GPP	SA, RAN, CT	INT	INT will follow 3GPP SA standard development activities on core network enhanced support for Artificial Intelligence (AI)/Machine Learning (ML). As a result, INT will supply the technique alignment between the WP4 within the 6G-SENSES project and 3GPP SA standard.
		INT, ACC	INT and ACC are supporting the O-RAN standard

Standardisation Body	Sector/ Area	Partner Acronym	Activity
O-RAN	WG1, WG2, WG5		development procedure.

### 3 Communication and Dissemination Activities plan

Dissemination, communication and exploitation activities, including appropriate and careful management of IPR and data, will be essential to ensure successful achievement of 6G-SENSES’s objectives. These activities will be coordinated among all work packages, to ensure a coherent plan of action that will assist the partners to effectively promote the 6G-SENSES platform and results during and beyond the project lifetime. Dissemination and communication activities will foster a constructive, on-going technology-enabled dialogue between the involved stakeholders. The 6G-SENSES comprehensive and well-articulated dissemination plan is based on a rich set of dedicated tools and activities and involve the definition of: (1) Objectives for the envisioned activities; (2) Target stakeholders benefiting from the proposed activities; (3) A work plan for implementing the envisaged activities; (4) Communication means, measures and KPIs.

The main objectives of the 6G-SENSES dissemination and communication strategy include: (1) **Definition of a clear and distinctive brand identity for 6G-SENSES.** The brand identity will be consistent online and offline, and it will represent the cornerstone values of 6G-SENSES, i.e. a multi-technology 6G RAN; (2) **Ensure broad visibility of 6G-SENSES’s work** and disseminate its results towards the targeted stakeholder groups to effectively promote the 6G-SENSES offering for large uptake. (3) **Facilitate joint and individual partner exploitation of 6G-SENSES outcomes** as well as exploitation for the EU research and industry communities by promoting the development and deployment of innovative solutions based on the 6G-SENSES technical findings and innovations to create effective socio-economic impact (4) **Ensure broad visibility and promotion of 6G-SENSES,** beyond the programme borders via a strategic and operational coordination of the specific communities through dedicated efforts embracing all target stakeholders; (5) **Support the sustainability of 6G-SENSES** beyond the project lifetime.

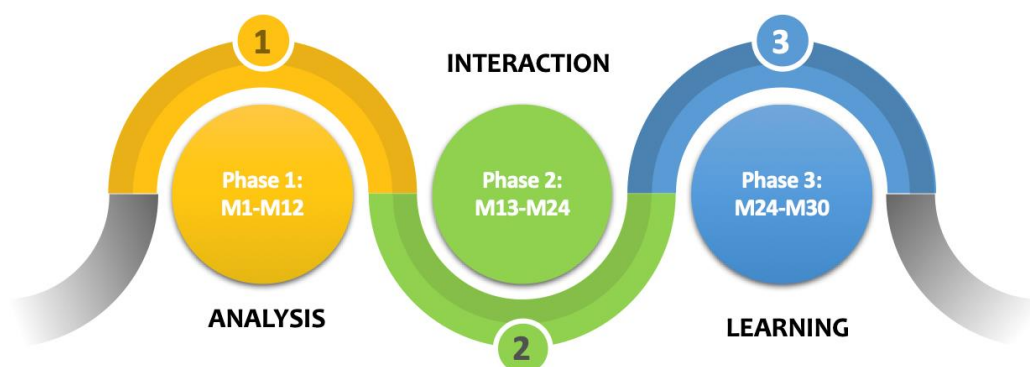


Figure 3-1 6G-SENSES Communication Phases

#### 3.1 Target Stakeholders

The target stakeholders identified at the proposal’s preparation time are listed below. The main 6G-SENSES stakeholders are depicted in Table 3-1.

Table 3-1 6G-SENSES target stakeholders

Potential beneficiaries	Main objective	Dissemination / Material
Scientific community (Academic and research institutes)	Promote 6G-SENSES both to raise awareness and also to attract users. Explore educational use cases.	Flyers, Workshops and questionnaires.
Research and development departments from industry	To promote the use of the 6G-SENSES for industrial uptake.	Questionnaires to collect evaluate outcomes of 6G-SENSES
Researchers and SMEs	Promote the 6G-SENSES and attract	Dissemination material focused on



working in product and services on mobile networks	new user communities.	non-specialists, questionnaires.
National authorities (Government, Ministries, dedicated agencies)	Raise awareness to (i) include 6G-SENSES in all relevant national roadmaps or similar political documents, (ii) obtain Expressions of political Support (EoS), and to (iii) obtain Expressions of Commitment (EoC) of financial contributions.	High level materials (mission statement, slide-deck, brochure for policy makers)
National and EU regulators as Policy makers	To explore how 6G-SENSES could be used from different user communities.	Specific report on the technical and regulatory barriers that limits the adoption of novel and open technologies in EU
Members of 6G-IA	Networking through the various 6G IA WGs to maintain interaction and cross-fertilisation with all current 6G activities.	Participation to WGs, posters, presentations, contributions to white papers, etc.
European initiatives supporting research like JUs, PPPs in big data, security, transport, green deal, etc.	Promote 6G-SENSES solution as the technical means to support a variety of ICT and vertical sector needs.	Promotion of the 6G-SENSES and its visibility to different communities during info days, engagement with stakeholders, etc.
Standardisation organisations at global level	Raise awareness regarding 6G-SENSES and establish links with all the international organisations and SDOs that focus on research work addressed by 6G-SENSES.	Follow relevant standardisation activities and contribute actively to relevant upcoming standards through the 6G-SENSES partners with involvement in standardisation bodies.

### 3.2 Communication Activities Plan

In general, the first essential step for any communication plan is therefore the identification and profiling of the targeted audience. After that, the second step is the definition of proper and most effective messages to be used to convey the intended information, and the third step the identification of the relevant, available, and most efficient communication channels.

#### 3.2.1 Target Audience and Messages

The first essential step prior to generating a concrete strategy is the identification and profiling of the targeted audience, along with the associated message that is of their interest, and the appropriate communication methods to reach them. To this end, based on commonly followed approaches we have segmented the 6G-SENSES audience into specific “target groups”, or else we have identified and profiled the key groups to address.

Given the nature of the project; i.e. to provide network infrastructure solutions to vertical industries, the general audience primarily consists of corporate/business entities and its segmentation has been done on the basis of the stakeholders’ business activities.

In general, the research and academia communities as well as the industry working on 5G networks are of primary interest to the project. As aforementioned, we consider the dissemination activities as mainly focused on targeting the academia and research communities and the communication activities as mainly focused on targeting the 5G network’s market and industry (of course not excluding the academia). The latter audience, considering the current market ecosystem and value chains, can be further refined to:

- Telecom Network Operators,
- ICT and Software Developers/companies; especially those including or targeting expansion of

- Telecom equipment vendors; traditional or new coming ones, and
- Network solutions integrators and infrastructure providers.

Considering the 5G ecosystem value chain, the unique setup of the 6G-SENSES project, characterized by the strong integration of the envisioned 6G networks comprising novel 6G RAN components and integrated in 5G High Performance Infrastructures with innovative applications, allows the outreach of the project results, especially those with activities in the fields of:

- Perceptive wireless networks, making use of Integrated Sensing and Communication strategies.
- Augmented reality / Metaverse.
- AI/ML

### 3.2.2 Communication Channels

Once the target groups and the messages have been identified and defined, the selection of the most effective communication channels follows. Aspects such as communication channels availability, effectiveness, and cost and resources availability need to be considered at this point. To this end, 6G-SENSES will exploit communication channels available to the project partners using besides resources provided by the EC also internal partner resources, such as existing media communication channels of companies-partners. The initially identified communication channels as well as initial status of activities utilising them are presented in the following paragraphs.

#### 3.2.2.1 Websites

The 6G-SENSES public website is one of the main communication tools, as it provides a window to all audiences, and actually provides the central point of obtaining information about the project in general, the project status, the project outcomes and the project news. The projects' one has been developed by IHP being accessible at <https://www.6g-senses.eu/> and, to date, it comprises the following sections:

- Home.
- About 6G-SENSES.
- Consortium.
- Dissemination and Communication.
- News & Events.
- Contact.

The 6G-SENSES website has been developed with Wordpress.org. Wordpress.org is a free and open source content management system (CMS) platform based on PHP and MySQL. It is usually used with the MySQL or MariaDB database servers but can also use the SQLite database engine. Features include a plugin architecture and a template system, referred to inside WordPress as Themes. Moreover, the website uses Secure Sockets Layer (SSL), also called a Digital Certificate, creating a secure link between the website and a visitor's browser. The website has been designed so that visits related statistics can be collected by web analytics tools, such as Google Analytics, providing insightful metrics on usage, user engagement and content performance. The website uses Search Engine Optimization (SEO) tools, such as Google Search Console and Yoast SEO, to improve organic search visibility and effectiveness. The website is planned to be maintained at least throughout the course of the project and for 3 years beyond that. A plan will be agreed as part of project exploitation activities in how to address interest in the website contents, and the maintenance of it beyond the project end.

Initial screenshots of the 6G-SENSES website can be found in Figure 3-2 and Figure 3-3.



About 6G-SENSES ▾ Consortium Contact Dissemination & Communication News & Events

# SEamless integrationN of efficient 6G wireless tEchnologies for communication and Sensing

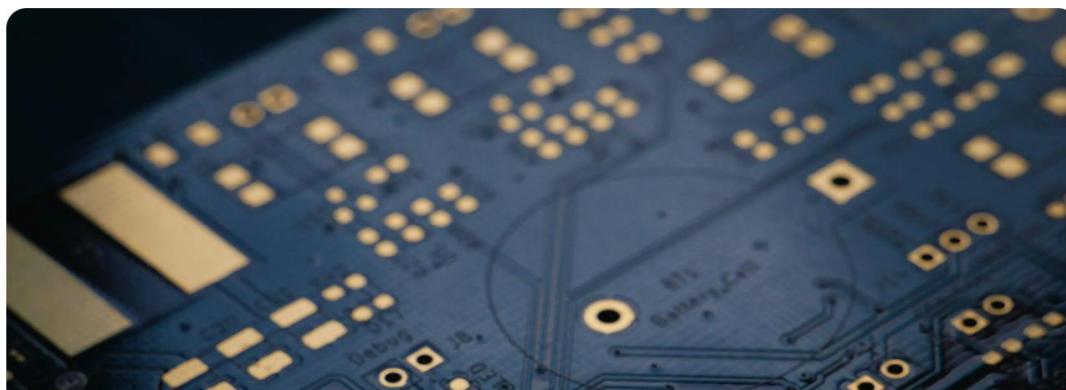


Figure 3-2 Screenshot of 6G-SENSES Website



About 6G-SENSES ▾ Consortium Contact Dissemination & Communication News & Events

## Consortium



11 partners  
7 countries

**Project Coordinator**  
**Jesús Gutiérrez Terán**  
IHP Leibniz-Institut für Mikroelektronik

**Technical Manager**  
**Shahid Mumtaz**  
Nottingham Trent University

1. IHP GMBH – INNOVATIONS FOR HIGH PERFORMANCE MICROELECTRONICS/LEIBNIZINSTITUT FUER INNOVATIVE MIKROELEKTRONIK, IHP Germany
2. INSTITUTE OF ACCELERATING SYSTEMS AND APPLICATIONS, IASA, Greece

Figure 3-3 Screenshot of 6G-SENSES Website

Complementarily, to maximise visibility and impact, other websites will be maintained by 6G-IA and project partners to provide information on a permanent basis, and links to the official 6G-SENSES website.

### 3.2.2.2 Social Networks

Given the key role of social networks in spreading messages and news around the globe, and their wide adoption not only for private but also for professional purposes, 6G-SENSES will use widely adopted social networks to increase project visibility and to exchange experiences/views/news among professionals and stakeholders. The key social networks used are the following:

**LinkedIn:** A 6G-SENSES company profile (URL: <https://www.linkedin.com/company/6g-senses>) has been created where news about the progress and achievements of the project will be posted. The LinkedIn page will be continuously fed with news regarding the project activities from the initial steps of the project; including notifications of project events and partners’ communication/dissemination ones (Figure 3-4).

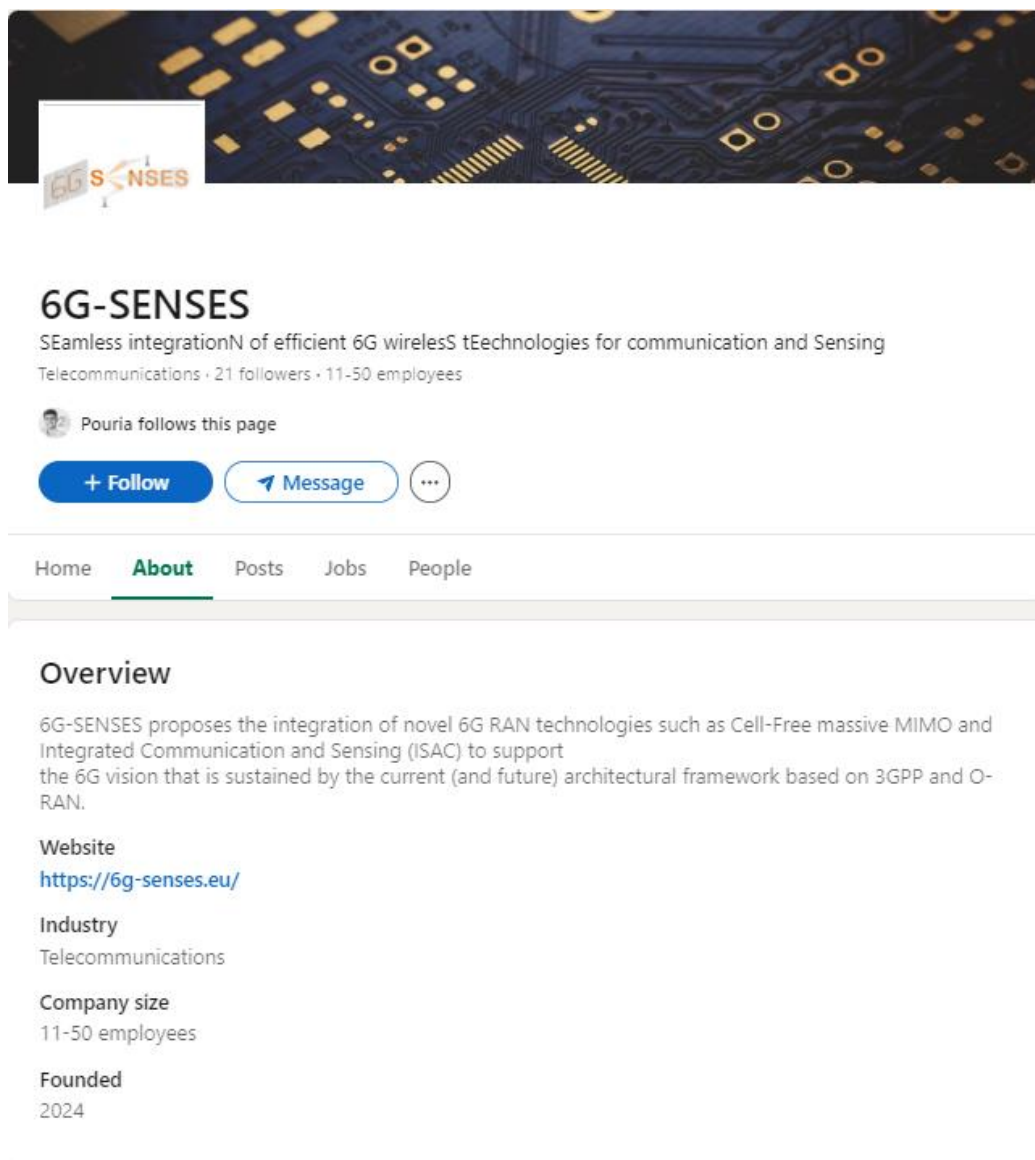


Figure 3-4 Screenshot of 6G-SENSES LinkedIn profile

**X:** X is a main social platform to drive engagement through dissemination of project updates and outcomes (60% of the content), and other relevant information for the project community and ecosystem (40% of the content). A twitter account will be created and maintained by **IHP** for these purposes.

**YouTube:** A dedicated account to publish the forthcoming videos produced within the project activity will be also created. **IHP** will undertake the management of the project's YouTube channel.

The social network accounts are planned to be maintained at least throughout the course of the project and for 3 years beyond that. A plan will be agreed as part of project exploitation activities in how to address interest in the networks' contents, and the maintenance of them beyond the project end.

### **Press Releases**

Local press is another significant communication channel to disseminate the project work and outcomes. The locality of the **6G-SENSES** Proofs of Concept (PoCs) and the partners' involvement in them, facilitates and also necessitates the exploitation of such channels to communicate project activities especially to the demonstrations'-related countries/markets, namely – not restrictively though – to Germany, Spain, France, Greece and UK. In particular, the fact that demonstrations in these countries involve a number of industrial partners from these countries, allows for exploiting their existing media relations' communication channels for issuing press releases especially targeting in these countries' market/stakeholders, and maximising impact locally. Of course, press releases will be considered by all industrial partners irrespectively of their basic activities' location. Press releases will be channelled to appear in a number of local electronic and printed media.

Press releases at initial project stages will aim at notifying of the involvement of partners in the project. At later stages, press releases will focus on communicating the partners' involvement along with major project achievement.

### **EC Communication Mechanisms**

For the purposes of maximising visibility in EC's research community as well as the whole European research and market segments, the EC supported communication mechanisms will be utilized. Such communication activities will be linked to the 6G IA / SNS JU liaison activities of Task 6.1. At first stages, these mechanisms would be the publication of project information on the official EC sites such as the collective SNS JU site, and CORDIS. In particular, the former links **6G-SENSES** activities with the general 6G IA / SNS JU ones, while the latter enables users to advertise their events or publish press releases relative to Research, Technological Development and Innovation activities on the CORDIS News and Events service, thus addressing a wider spectrum of the research community. At next, participation in networking activities organized by the European Commission will be sought, such as the concertation meetings organized within the EU, participation in Workshops and invited talks in events.

### **3.2.3 Communication Material**

Communication and dissemination activities, will be supported by a rich set of communication material that will be created, maintained and updated throughout the project lifetime. The material will include various forms of printed and electronic documentation, of various degrees of elaboration, delivering various (usually brief though significant) messages/ project highlights, addressing a wide number of audiences, to be distributed through a wide number of channels, and at different project time-phases. The main communication material to be generated is presented in the following paragraphs.

### 3.2.3.1 Logo

6G-SENSES logos have been designed by IHP and the official one has been selected through a voting process. It is depicted in Figure 3-5.

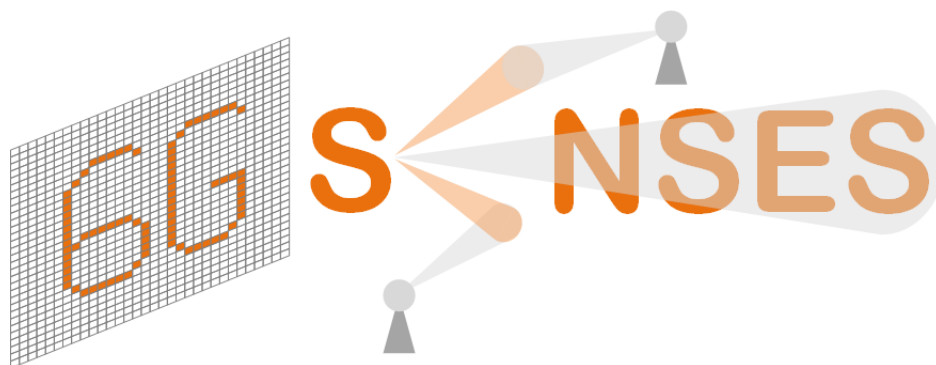


Figure 3-5 6G-SENSES Logo

### 3.2.3.2 Presentation

The 6G-SENSES presentation is a document to be used by the project partners to provide an overview of the project scope, objectives and expected outcomes in various events (e.g., workshops, conferences, etc.) especially at the initial phases of the project. A first version of the 6G-SENSES presentation provides the following information:

- What 6G-SENSES is;
- Partners;
- Objectives;
- General Architecture;
- Use cases;
- Contact info.

An overview of this presentation is shown in Figure 3-6. The presentation will be continuously updated incorporating information about the project running status, progress and main running achievements.

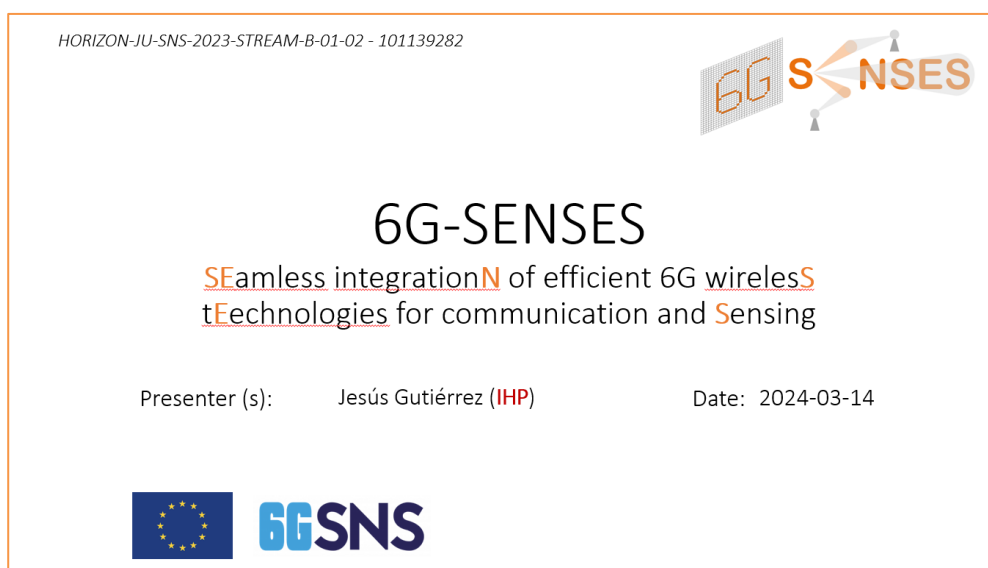


Figure 3-6 Overview presentation given at the SNS Webinar – Introducing the Call 2 SNS projects

### 3.2.3.3 Brochure/Leaflet

The 6G-SENSES brochure/flyer will be used to spread the main messages of the project and will be available in electronic format in the 6G-SENSES Website, while hard copies will be printed to support dissemination activities of partners in a number of dissemination events.

The brochure/flyer will provide similar information to the project presentation, but in more detailed way. In particular it will include the following information:

- What 6G-SENSES is; Partners;
- Key Objectives;
- General Architecture, Concepts and Highlights of the Technical Solution;
- Use Cases addressed and benefits;
- Partners and project details: including duration, Grant Agreement number, budget;
- Contact information.

### 3.2.3.4 Poster

6G-SENSES posters will be created at various phases of the project in order to accompany partners' communication activities, especially those associated with demos and booth presence at various events. The poster will be updated throughout the project lifetime, incorporating information about the project running status, progress and main running achievements. Initial version of the poster will provide similar information to the Brochure/Leaflet, in a more graphically attractive way.

### 3.2.3.5 Video

At least one official 6G-SENSES video will be created at a mature stage of the project to attract interest. Given the high cost incurred by a well-processed video production, the details will be arranged after a communication circle between a number of partners is completed. In practice the generation of the video will involve: preparation of the scenarios to be presented, identification of resources within these companies, arrangement of shooting processes, processing of material, distribution of material in communication channels, etc. The project will identify the initial requirements of this activity, and will undertake the organisation effort of it. At the same time partners involved in the demonstrators will be involved so as to allow, arrange, and participate in the shootings.

For the final distribution of the video YouTube streams can be used at final stage for reaching out the public.

## 3.2.4 Communication Activities Identification

### 3.2.4.1 Participation in Industry Events

As aforementioned, communication activities will primary focus on market/industry audiences/segments. Considering the direct business to business communication barriers, the initial way to establish communication and convey the 6G-SENSES messages, is through participation to targeted industry events. The latter will be the focus of the industry partners, but considering that communication comes hand in hand with dissemination in this case, the whole consortium will seek such opportunities for short scale or larger scale presentations/demonstrations/, etc. For this purpose, a list of events has been created and will be further maintained, such as those included in Table 3-2.

**Table 3-2 Initial List of Industry Events**

Domain	Type	Event
ICT and 5G Network	Conferences / Industry Events	Mobile World Congress (MWC), IWPC, InfoCom World Conference (Athens), IEEE 5G World Forum, 5G World Summit London, Telecom Infra Project Summit, etc.

**Table 3-3 6G-SENSES Communication Activities Responsibilities**

Domain	Type	Event
Official Project Website	IHP	Maintenance, update of content upon request from partners, and based on project progress
LinkedIn Account	IHP	Maintenance, update of content upon request from partners
Twitter Account	IHP	Maintenance, update of content upon news from partners, etc. monitoring of impact, monitoring of sent invitations/ comments/ questions etc. and contacting partners to act upon.
YouTube Account	IHP	Maintenance, update of content with project videos, monitoring of impact, monitoring of sent invitations/ comments/ questions etc. and contacting partners to act upon.
Permanents Webpages	Partners hosting 6G-SENSES information	Maintenance, update of content monitoring of impact.
Press Releases	1. Industrial Partners, 2. Academic Partners	Issuance of press release to partners' existing media relations' communication channels; Notification of consortium upon submission; monitoring of impact.
EC Communication	Project Management Team	-
Logo	IHP	Create Logo, trigger a voting procedure to select the logo.
Presentation	IHP, NTU	Preparation of the material and notification of consortium.
Brochure/ Leaflet	IHP	Preparation of the material and notification of consortium.
Poster	NTU, IHP, IASA, OTE	Preparation of the material and notification of consortium.
Video	OTE, IHP	Preparation of the scenarios to be presented, identification of resources within these companies, arrangement of shooting processes, processing of material, distribution of material in communication channels, etc.
Participation in Industrial Events	Mainly Industrial Partners	Presentation of 6G-SENSES scope and results to specifically targeted market/industry audiences/segments.
Organisation of Workshop	IHP	Organisation of project Workshop, send invitations to relevant research projects/communities/groups, arrangement of presentations' agenda, arrangement of workshop logistics, etc.
Internal Communication Activities	Mainly Industrial Partners	Identification of internal companies' communication channels and communication of project results in other departments, affiliated companies, etc.

### 3.2.4.2 Other Communication Activities

Additional communication activities will be conducted especially by 6G-SENSES industry partners related to the internal communication of the project activities and results within their companies' departments, or where possible to other affiliated companies (e.g. companies within the same group).



### 3.2.5 Communication Activities Responsibilities and Time plan

The partners' responsibilities with regard to maintaining the communication/dissemination material, and planning/performing the planned communication activities is summarised in Table 3-3.

A time plan underpinning the performance of communication activities is presented in Table 3-4. It shall be noted that depending on the responsiveness of the communication channels (which is different of that of the partners) and based on the project progress the plan will be subject to modifications throughout the course of the project.



### 3.3 Scientific Dissemination Activities Plan

6G-SENSES will constantly and eagerly pursue dissemination of the project research/ scientific/ technology-related results through high-profile international dissemination channels. The latter will include participation in highly ranked conferences, congresses, workshops, etc. with high-quality papers and presentations, submission of scientific publications in high-profile international journals, technical magazines, white papers etc., disseminating the most refined, advanced and innovative aspects and results of the project.

Contrary to communication, as dissemination activities mainly refer to publishing research/ scientific/ technology-specific results thus need to follow a more flexible plan, given the fact that:

- Messages are very specific, addressing a highly educated/ skilled audience.
- Cannot be repeated several times in the same way; thus one piece of dissemination work can be only presented at one event.
- The main channels are the research/ scientific/ technology – related events/ journals/ etc., which are many, but work to be disseminated needs to provide significant results/ innovative content, in very well defined ways, thus addressing one event requires more effort, time, scientific and technical competence.
- Implies competing with similarly advanced work.

For these reasons, although having a plan related to the tentative events to participate can be helpful, acceptance is not certain, thus the plan needs to be constantly monitored, evaluated and adjusted in close relation with the conducted project work.

As expected, dissemination opportunities and activities of these types are expected to peak after the project is halfway, and especially towards its end. The associated activities time plan will be continuous throughout the project, and contribution is expected from all partners. To this end, partners are encouraged to circulate information (freely e.g. through the project mailing lists) about tentative, significant dissemination opportunities and select and publish scientific papers according to their own specific objectives and work. To this end also, at this initial stage of the project, a number of tentative events/ opportunities have been listed, as shown in Table 3-5. The guidelines and procedures to be followed in these submissions have been agreed and included in the Projects' GA.

**Table 3-5 Initial Dissemination opportunities' list**

Domain	Activity Type	Opportunity
ICT and 5G Network	Conferences / Industry Events	<b>General/Wireless:</b> EuCNC, ICC, PIMRC, GLOBECOM, CNC, MobiCom, CoNEXT, ETSI 5G Summit, IEEE NFVSDN, IEEE Net Soft, IEEE INFOCOM, IEEE SPAWC. <b>Optical/Networking:</b> OFC, ECOC, ONDM.
	Journals/ Magazines	<b>General:</b> IEEE Journal of Selected Areas in Communications, IEEE Communications Magazine <b>Wireless:</b> IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology. <b>Networking:</b> IEEE Transactions on Network and Service Management. <b>Optical/Networking:</b> IEEE/OSA JOCN, IEEE JLT, IEEE PTL, IEEE Transactions on Networking.
	White Papers, Book(s) chapters	WG Architecture, WG SDN/NFV, WG Trials

## Organisation of a Workshop

At least one 6G-SENSES Workshop and/or educational exhibitions open to various stakeholders will be organised. According to initial planning, the consortium will seek opportunities so that the workshop is collocated with a popular dissemination event (e.g. conference), thus maximising potential participation from external audience. The initial time plan for this workshop is set towards the project end, to allow the project activities to achieve a specific maturity state and to allow for results to be gathered. However, given the high competition usually experienced in terms of hosting a workshop with popular events, opportunities will be sought even from the initial stages of the project.

## Joint Dissemination Activities

Finally, it shall be noted that in the context of liaison activities with other SNS JU activities/actions and ICT projects (see also 4.2 and 4.3), joint dissemination activities will be sought.

### 3.4 Communication and Dissemination Activities Monitoring and Evaluation

The communication and dissemination activities progress will be monitored throughout the course of the project, and will be evaluated against the initial planning, in order to be able to adjust the communication strategy, uptake corrective actions, towards maximising project visibility and impact. To this end, a structure evaluation plan has been created, on the basis of specific measurable KPIs on a per type of activity. This is shown in Table 3-6.

**Table 3-6 Key Performance Indicators (KPIs) for dissemination and communication**

Measure	Indicators	Target	Means of verification
Posters	Number of posters produced	2 in total	Dissemination reporting activities
High-level materials for policy makers	Number of sets (mission statement, slide-deck, brochure)	At least 1 per year	Dissemination reporting activities
6G-SENSES website	Number of unique visitors	> 1000 visitors/year	Google analytics
Social networks	Number of followers in: Twitter, LinkedIn, YouTube	> 500 /> 100/ > 100	Active profiles on such networks via regular posting & monitoring
6G-SENSES Workshops	Number of workshops and number of participants	3 workshops (100 participants/event)	Attendance proofs (e.g., photos, presentations, videos, interviews)
Videos	Number of videos published on the project's YouTube channel and average number of views	2 videos and > 500 views per video	Videos published via the YouTube channel of the project
Scientific publications	Number of peer-reviewed papers/articles	At least 25 by the end of 6G-SENSES	Papers/articles published in proceedings & online in premium quality conferences and journals.

### 3.5 Initial Communication and Dissemination Activities

Given the experience and high interest of the partners of the consortium, communication activities worth mentioned have started since the very early stages of the project. These are summarised in the following sections.

#### 3.5.1 Partner’s Websites’ pages on 6G-SENSES

At present a number of partners’ websites host – on a permanent basis – information on 6G-SENSES along with links to the official channels. More partners will be incorporating 6G-SENSES information in their websites. The ones available so far are presented in Table 3-7.

**Table 3-7 Permanent 6G-SENSES Webpages in other Websites**

Partner Website	Website
3/ UC	<a href="https://web.unican.es/portal-investigador/proyectos/detalle-proyecto?pi=113326">https://web.unican.es/portal-investigador/proyectos/detalle-proyecto?pi=113326</a> <a href="https://web.unican.es/noticias/Paginas/2024/09/proyecto-6G-SENSES.aspx">https://web.unican.es/noticias/Paginas/2024/09/proyecto-6G-SENSES.aspx</a>
5/ OTE	A dedicated webpage will hang under the following OTE website: <a href="https://www.cosmote.gr/cs/otegroup/en/ereuna_kai_kainotomia.html">https://www.cosmote.gr/cs/otegroup/en/ereuna_kai_kainotomia.html</a>
7/ TUBS	<a href="https://www.tu-braunschweig.de/ifn">https://www.tu-braunschweig.de/ifn</a>
8/ BR	<a href="https://bubbleran.com/research/">https://bubbleran.com/research/</a>
9/ BI	<a href="https://silicon-saxony.de/en/barkhausen-institute-eu-project-to-drive-forward-6g-technologies/">https://silicon-saxony.de/en/barkhausen-institute-eu-project-to-drive-forward-6g-technologies/</a> <a href="https://www.barkhauseninstitut.org/en/6g-senses-6g-connectivity-with-radio-technologies">https://www.barkhauseninstitut.org/en/6g-senses-6g-connectivity-with-radio-technologies</a>

#### Press Releases

Initial press releases have been already issued in the local language and in English by a number of partners. A complete report of these activities, their appearance and their impact will be presented in deliverable D6.2.

#### EC Communication Mechanisms

EC’s collective SNS JU projects’ site already hosts information about 6G-SENSES project, under URL:

<https://smart-networks.europa.eu/6g-research-gets-a-130-million-eur-eu-funding-boost-in-europe/>

6G-SENSES information is also available in CORDIS website under URL:

<https://cordis.europa.eu/project/id/101139282>

#### 3.5.2 Participation in 6G-related events

##### 3.5.2.1 Presentation of 6G-SENSES @ 6G SNS JU

YouTube Video presenting 6G-SENSES by the Project Coordinator, Dr. Jesús Gutiérrez (IHP).

<https://www.youtube.com/watch?v=YyxLbWS7ApI>

HORIZON-JU-SNS-2023-STREAM-B-01-02 - 101139282

6G SENSES

SEamless integration of efficient 6G wireless Technologies for communication and Sensing

Presenter (s): Jesús Gutiérrez (IHP) Date: 2024-03-14

6G-SENSES project presentation

Smart Networks and Services J... 194 suscriptores

Suscribirse 0 Compartir Guardar

3.5.2.2 EuCNC 2024

6G-SENSES was represented at EuCNC 2024 in Antwerp in two events, which are listed below.

Propelling EU-Taiwan 6G SNS Collaborations Forward

The 6G-SENSES Project Coordinator, Dr. Jesús Gutiérrez (IHP), presented 6G-SENSES planned work in the EuCNC 2024 Special Session “Propelling EU-Taiwan 6G SNS Collaborations Forward”. Some facts specifically related to the willing of collaboration with Taiwanese partners, e.g. ITRI and NTUST, were raised. Figure 3-7 shows a group photo including representatives from the SNS JU and Taiwanese partners.



Figure 3-7 Propelling EU-Taiwan 6G SNS Collaborations Forward

### Architectural Considerations Enabling the IMT 2030 Framework by European 6G R&D Activities

The 6G-SENSES Project Coordinator, Dr. Jesús Gutiérrez (**IHP**), presented **6G-SENSES** Integrated Sensing and Communication (ISAC) technology at EuCNC 2024 Workshop 8 “Architectural Considerations Enabling the IMT 2030 Framework by European 6G R&D Activities”.



**Figure 3-8 Architectural Considerations Enabling the IMT 2030 Framework by European 6G R&D Activities**

### 3.5.3 Participation in Industry Events

Even from the early stages of the project partners have seized opportunities to reach out the industry with the objectives and vision of **6G-SENSES**, towards raising awareness. A complete report of these activities, including details regarding the presenters, their appearance and their impact will be provided in deliverable 5.2.

#### 3.5.3.1 Future of Wireless

<https://futureofwireless.eu/>



**Future of Wireless<sup>®</sup>**  
Technology Workshop



Prof. Shahid Mumtaz  
Nottingham Trent University - UK

### 6G Affection-Centric Metaverse: Learn from In-Network Human-Like Sentiment

[Click here for abstract](#)

Shahid Mumtaz is an Innovative strategist with strong business acumen and passion for innovation, driving concepts, research, standards, prototypes, and products from conception to market. He has demonstrated the ability to establish cross-departmental, multidisciplinary, multi-site, and multi-cultural collaborative teams and programs. Shahid Mumtaz has more than 15 years of wireless industry/academic experience. Shahid Mumtaz received his Master's and PhD degrees in Electrical & Electronic Engineering from the Blekinge Institute of Technology, Sweden, and the University of Aveiro, Portugal, in 2006 and 2011, respectively. Shahid Mumtaz is a full professor at Nottingham Trent University (NTU), UK, and a board member of the SWFIT (Smart Wireless Innovation Facility) Center at NTU, which is worth 15M Euro. Shahid Mumtaz is an IET Fellow, IEEE ComSoc/VTS Distinguished speaker, recipient of the IEEE ComSoC Young Researcher Award, founder and past FiC of IET "Journal of Quantum communication" Vice-Chair: Europe/Africa Region- IFFF ComSoc: Green

#### 3.5.3.2 ESOF 2024

<https://www.esof.eu/programme>

#### 3.5.3.3 AI for smart Industry

Panel discussion on AI for smart industry and YouTube interview

<https://www.youtube.com/watch?v=cWCYRUG3m3s>

#### 3.5.4 Events where 6G-SENSES partners were explaining the work done in the project

- **BubbleRAN (BR), Open RAN Studio Mini Series Webinar - Episode 3: O-RAN and 6G-Innovations**, Date: 16/07/24, **Platform:** Zoom, Note: the video will be soon available online (youtube, BR website, etc.).
- **BR DEMO:** BubbleRAN participated as an exhibitor in 2024 Open RAN summit in Taipei and presented a DEMO titled "Towards GenAI Assisted 5G O-RAN auto pilot", showing dynamic performance scaling of cloud-native 5G O-RAN, enabled by OpenAI GPT4 and Mistral 7B-AWQ.

#### 3.5.5 Scientific Paper Publications

Even from the early stages of the project partners have seized opportunities to reach out the research community with early results of their work performed in the context of 6G-SENSES (see Table 3-8). A complete report of these activities, including details regarding the presenters, their appearance and their impact will be provided in deliverable D6.2.

**Table 3-8 Scientific Paper Publications**

Pub #No	Details	Type	Partners involved
1	M. Anastasopoulos, A. Tzanakaki, G. Kaponis, Y. Jian, L. Lopacinski, J. Gutiérrez, "A 6G Transport Network converging THz and Optical network technologies empowered by Federated Learning techniques", ECOC 2024, Frankfurt, Germany.	Conference	IASA, IHP
2	I. Santamaría, M. Soleymani, E. A. Jorswieck, J. Gutiérrez, "MIMO Capacity Maximization with Beyond-Diagonal RIS", Special Session 08 (SS08): Beyond diagonal reconfigurable intelligent surfaces, 25th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), 2024, Lucca, Italy.	Conference	UC, TUBS, IHP
3	M. Soleymani, I. Santamaría, E. A. Jorswieck, M. di Renzo, J. Gutiérrez, "Energy Efficiency Comparison of RIS Architectures in MISO Broadcast Channels",	Conference	UC, TUBS,



	Special Session 17 (SS17): Energy-efficient resource allocation in wireless communications, SPAWC'24, Lucca, Italy.		<b>IHP</b>
5	M. Nauman, L. Lopacinski; N. Maletic, M. Scheide; J. Gutiérrez; M. Krstic; E. Grass, "Enhancing the WLAN OFDM-PHY by OTFS Precoding, European Conference on Networks and Communications (EuCNC 2024), Antwerp, Belgium.	Conference	<b>IHP</b>
4	H. Cao, S. Garg, S. Mumtaz, M. Alrashoud, L. Yang and G. Kaddoum, "Softwarized Resource Allocation in Digital Twins-Empowered Networks for Future Quantum-Enabled Consumer Applications," in IEEE Transactions on Consumer Electronics, vol. 70, no. 1, pp. 800-810, Feb. 2024, doi: 10.1109/TCE.2024.3370052	Journal	<b>NTU</b>
5	J. Huang, S. Mumtaz, V. Frascolla, et al., "Reinforcement Learning based Resource Management for 6G-Enabled mIoT with Hypergraph Interference Model," in IEEE Transactions on Communications, doi: 10.1109/TCOMM.2024.3372892.	Journal	<b>NTU, INT</b>
6	K. Zhang, X. -Q. Jiang, H. Hai, R. Qiu and S. Mumtaz, "Enhanced Index Modulation Aided Orthogonal Time Frequency Space with Variable Active Grids and Multiple Constellations," in IEEE Transactions on Vehicular Technology, doi: 10.1109/TVT.2024.3373591.	Journal	<b>NTU</b>
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9	Y. Yang, H. Hai, X. -Q. Jiang, Y. Wu and S. Mumtaz, "Low-Complexity Detectors for Space-Time Block Coded Differential Spatial Modulation," in IEEE Transactions on Vehicular Technology, doi: 10.1109/TVT.2024.3381863.	Journal	<b>NTU</b>
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11	S. Kurma, T. A. Lestari, K. Singh, A. Paul and S. Mumtaz, "Active RIS in Digital Twin-based URLLC IoT Networks: Fully-Connected vs. Sub-Connected?," in IEEE Transactions on Wireless Communications, doi: 10.1109/TWC.2024.3391663.	Journal	<b>NTU</b>
12	Y. Ju, S. Mumtaz, et al., "Energy-Efficient Cooperative Secure Communications in mmWave Vehicular Networks Using Deep Recurrent Reinforcement Learning," in IEEE Transactions on Intelligent Transportation Systems, doi: 10.1109/TITS.2024.3394130.	Journal	<b>NTU</b>
13	Y. Mao, S. Mumtaz et al., "A High-Capacity MAC Protocol for UAV-Enhanced RIS-Assisted V2X Architecture in 3-D IoT Traffic," in IEEE Internet of Things Journal, vol. 11, no. 13, pp. 23711-23726, 1 July1, 2024, doi: 10.1109/JIOT.2024.3387997.	Journal	<b>NTU</b>
14	Z. Hu, X. Chen, Z. Zhou, S. Mumtaz, "Localization with Cellular Signal RSRP	Journal	<b>NTU</b>

	Fingerprint of Multiband and Multicell", IEEE Journal on Selected Areas in Communications, JSAC 2024.		
15	W. Wei, L Fu, H. Gu, X. Lu, L. Liu, S. Mumtaz, M. Guizani, "Iris: Towards Intelligent Reliable Routing for Software Defined Satellite Networks ", IEEE Transactions on Communication, 2024.	Journal	NTU
16	I. Santamaria, M. Soleymani, E. Jorswieck, J. Gutiérrez, "Interference Minimization in Beyond-Diagonal RIS-assisted MIMO Interference Channels", submitted IEEE Transactions on Communications, 2024.	Journal (under review)	UC, TUBS, IHP
17	M. Soleymani, I. Santamaria, E. Jorswieck, R. Schoeber, L. Hanzo, "Optimization of the Downlink Spectral and Energy-Efficiency of RIS-aided Multi-user URLLC MIMO Systems, submitted IEEE Transactions on Communications, 2024.	Journal (under review)	UC, TUBS, IHP

## 4 Liaison Activities plan

One of the main targets of a collaborative work, such as the 6G-IA / SNS JU framework, is for each of the projects participating in it to be able to provide both project-related results, as well as to accomplish joint collaboration activities towards the establishment of 5G in Europe. 6G-SENSES is willing to be one of the main instigators of these activities, with more or less involvement based on the project targeted objectives.

6G-SENSES will foster the cooperation and commitment to joint activities/Working Groups/, etc. towards maximizing the impact of 6G-SENSES and the 6G-IA / SNS JU projects as a whole, as well as providing/obtaining support on technology, market, etc. issues that are common to the different stakeholders participating in the 6G-IA/SNS JU framework.

### 4.1 Participation in SNS JU

The task activities will include participation indicatively: in the Steering Board (SB) (mainly by the Project Coordinator), in the Technical Board (mainly by the Technical Manager), in various Work Groups (WGs) already set up for the previous 6G-IA/SNS JU Phases and in 6G-IA/SNS JU fora (by the members of the consortium).

6G-SENSES has declared from the project starting date its degree of involvement in most of the Working Groups (WGs) related to 6G-IA / SNS JU, either triggered by the 6G-IA or the SNS JU itself. We summarise the contributions per WG in Table 4-1, where the main contributors from 6G-SENSES are listed. The criteria of choosing these responsible people stem from their general expertise working at their organisations, together with previous expertise in driving and contributing to the mentioned WGs.

6G-SENSES will also align activities to NetWorldEurope and 6G-IA to maximise impact. To this end, the project will focus on contributing to showcasing the 6G-SENSES deployments' capabilities to meet the stakeholders/verticals/end-users' service and performance requirements.

Working Groups originating from the SNS JU Projects are referred to as the SNS JU WGs and include:

- **6G Architecture WG**
- **Reliable Software Network WG**
- **Test, Measurement and KPIs Validation WG**

These WGs are elaborated below:

There is also a number of WGs organised via the 6G IA:

- **Vision WG**
- **Open SNS WG**
- **Trials WG**
- **Pre-Standardization WG**
- **5G/6G for Connected and Automated Mobility WG**
- **Spectrum WG**
- **Security WG**
- **WiTaR WG**

Information on these WGs is available on the 6G IA website by clicking on the group names above.

Many of the 6G-SENSES partners have collaborated over many years with each other in 5G-PPP and SNS projects, and have extensive experience in European research projects, both as contributing research partners and in leading roles. A plenty of previous collaborations among the 6G-SENSES partners reflects the degree of commitment and productivity this offers to the project. The collaboration in this consortium will only ensure a fruitful continuation of the work within the SNS JU framework.

Many of the 6G-SENSES partners are involved in the development and assessment of 5G technology in the last years. Such involvement will foster liaison activities with these projects towards sharing experiences and know-how related to vertical industries-specific requirements/ challenges/ restrictions and ways to address them not only through the meetings organised under the umbrella of 6G-IA / SNS JU but also through direct contact with partners of these projects and direct sharing of information.

Table 4-1 lists the 6G-SENSES participants that will be contributing actively to each of the 6G-IA/SNS JU WGs.

**Table 4-1 6G-SENSES Contributors to the different WGs established by the 6G-IA**

Group / WG	6G-IA OR SNS JU	Partners	Contributors
SNS Steering Board	N/A	<b>IHP, NTU</b>	Jesús Gutiérrez ( <b>IHP</b> ), Shahid Mumtaz ( <b>NTU</b> )
SNS Technology Board	N/A	<b>NTU, IHP</b>	Shahid Mumtaz ( <b>NTU</b> ), Jesús Gutiérrez ( <b>IHP</b> )
6G Architecture WG	SNS JU	<b>IASA, INT, IHP</b>	Anna Tzanakaki ( <b>IASA</b> ), Valerio Frascolla ( <b>INT</b> ), Jesús Gutiérrez ( <b>IHP</b> )
Spectrum WG	6G-IA	<b>IHP, INT, TUBS</b>	Jesús Gutiérrez ( <b>IHP</b> ), Yazhou Zhu ( <b>INT</b> ), Thomas Kürner ( <b>TUBS</b> )
Trials WG	6G-IA	<b>INT, IHP</b>	Valerio Frascolla ( <b>INT</b> ), Jesús Gutiérrez ( <b>IHP</b> )
SNS/ 6G-IA Vision and Societal Challenges WG	6G-IA	<b>OTE, INT, IASA, IHP</b>	Ioanna Mesogiti ( <b>OTE</b> ), Valerio Frascolla ( <b>INT</b> ), Anna Tzanakaki ( <b>IASA</b> ), Jesús Gutiérrez ( <b>IHP</b> )
Societal Needs and Value Creation (SNVC)	6G-IA Sub-WG under Vision WG	<b>OTE</b>	Ioanna Mesogiti ( <b>OTE</b> )
Business Validation, Modelling and Ecosystems (BVME-Sub WG)	6G-IA Sub-WG under Vision WG	<b>OTE, INT</b>	Ioanna Mesogiti ( <b>OTE</b> ), Valerio Frascolla ( <b>INT</b> ),
Sustainability Task Force	N/A	<b>IHP</b>	Jesús Gutiérrez ( <b>IHP</b> )
Hardware Technologies (HT) WG	N/A	<b>IHP, INT</b>	Jesús Gutiérrez ( <b>IHP</b> ), Jessica Sanson ( <b>INT</b> )
Test, Measurement and KPIs Validation	SNS JU	<b>OTE</b>	Ioanna Mesogiti ( <b>OTE</b> )
Pre-Standardization	6G-IA	<b>INT</b>	Yazhou Zhu ( <b>INT</b> )

## 4.2 Relation of 6G-SENSES with other peer SNS Projects / HE Projects

Several members of the 6G-SENSES consortium can act as links to other SNS actions, which are presented in Table 4-2.

**Table 4-2 Relation of 6G-SENSES with other peer SNS Projects**

Project	Partner	Responsible Person	Role	Synergies
BeGREEN	<b>IHP</b>	Jesús Gutiérrez ( <b>IHP</b> )	Technical Manager	ISAC, O-RAN extensions, RIS, etc.
INSTINCT	<b>BI</b>	Padmanava Sen ( <b>BI</b> )	Project Coordinator	ISAC
VERGE	<b>INT</b>	Valerio Frascolla ( <b>INT</b> )	Partner	AI for edge
5G-TACTIC	<b>IASA</b>	Anna Tzanakaki ( <b>IASA</b> )	Project Coordinator	
Eco-eNET	<b>OTE</b>	Elina Theodoropoulou ( <b>OTE</b> )	Consortium Member	Sensing, KPIs, etc.
6G-SANDBOX	<b>OTE</b>	Fofy Setaki ( <b>OTE</b> )	Consortium Member	Testbed capabilities, KPIs, etc.
SUNRISE-6G	<b>OTE</b>	Fofy Setaki ( <b>OTE</b> )	Consortium Member	Testbed capabilities, KPIs, etc.
TIMES	<b>TUBS</b>	Thomas Kürner ( <b>TUBS</b> )	Technical Manager	Use cases in industrial environments
TERRAMETA	<b>TUBS</b>	Thomas Kürner ( <b>TUBS</b> )	Dissemination Manager	RIS

## 4.3 Participation in other relevant initiatives

Table 4-3 lists the mapping of 6G-SENSES partners and their involvement in bodies that the project will pursue for dissemination and engagement.

**Table 4-3 Partner involvement in bodies that will be pursued for dissemination and engagement**

Relevant Community / Key organisation / Industry Body	Partners involved	Type of relationship
AIOTI - <a href="https://aioti.eu/">https://aioti.eu/</a>	<b>UC</b> , INT	Member ( <b>UC</b> ), WG-lead (INT)
6G Smart Networks and Services Industry Association (6G-IA) <a href="https://6g-ia.eu/">https://6g-ia.eu/</a>	<b>IHP</b> , <b>IASA</b> , <b>ACC</b> , <b>BR</b> , INT, <b>COSM</b>	Full membership, WG-co-Lead (INT)
BDVA – <a href="https://bdva.eu">https://bdva.eu</a>	INT	VP of industry (INT)
OpenAirInterface Software Alliance (OSA)	<b>BR</b>	Non-profit member of OSA, Member / Co-Founder
FMD - Forschungsfabrik Mikroelektronik Deutschland	<b>IHP</b>	Member

## 5 Conclusions

Towards addressing the European Commission's (EC) goal underpinning the Horizon Europe programme of funded research, which is to bring Europe at the heart of research and innovation and drive its economic growth, 6G-SENSES will perform concrete and effective standardisation, dissemination, communication and liaison activities, in the context of the relevant, dedicated Work Package 6 (WP5) towards maximising its visibility, and impact to the research and industry communities.

This document has described 6G-SENSES's plan on standardization, dissemination and communication actions, together with the envisaged liaisons. Although these plans are subject to modifications, they constitute the framework of reference that will drive the coordination, implementation, and supervision of 6G-SENSES dissemination and communication activities. Also, they ensure that 6G-SENSES achievements are widely spread over the 6G-SENSES target audience to enhance the project's impact and visibility to the European Union (EU) and the entire world.

As far as **standardisation** is concerned, the procedures supervising the associated activities have been defined. The latter include monitoring regulatory and standardisation activities directly related to the research areas of 6G-SENSES – towards achieving compliance with existing ecosystem –, and contributing to the relevant SDOs – towards achieving consensus from industry to follow the proposed methods/solutions –, while maintaining feedback procedures aiming at continuous monitoring of project activities and uptake of corrective actions. The standardization plan includes a roadmap that captures the standardization activities that may influence or get influenced by the project's technological innovations. It also describes the leading open-source related activities and the expected contributions to them where applicable. Given the widely known challenges faced in accessing standardization bodies and achieving consensus in potential contributions, the plan will be further revisited and regularly updated over the course of the project. Regarding the standardization plan, this deliverable identifies the primary SDOs whose activities are aligned with the project. Specifically, the SDOs considered are 3GPP, ETSI, and O-RAN Alliance.

Secondly, a well-defined **communication plan** has been devised in order to optimise the 6G-SENSES communication efforts – considering the existing resources, capabilities and constraints – and maximise the project impact. This plan is elaborated in terms of: target audience, material to be prepared, sharing of responsibilities between consortium members, timelines to be followed, feedback procedures and assessment against relevant, specific, measurable KPIs. The initial activities that have been undertaken by the Consortium in the early phases of the project until the time of writing, are also listed.

The project identifier, the communication activities that will be carried out in the 6G-SENSES project throughout its lifetime, the external/internal communication channels, and social media have been defined in the communication plan. For internal communications of the partners, the project consortium uses NextCloud as the repository and collaboration tool. As a principal external communication channel, a project website has been developed and is ready to be launched. Besides, social media accounts (i.e., Twitter, LinkedIn, and YouTube), which are accessible from the project website, have been created to enhance the visibility of the project and to distribute the potential benefits derived from the solutions proposed in the project.

This document also presents the **dissemination plan** to communicate the project outcomes to the Industry, Academia, and the public in general. The key envisaged activities in this regard are the production of scientific publications in leading international conferences and journals, the organization of journal/magazines special issues and books, and the participation in program committees and editorial boards. Furthermore, project's liaison plan, especially with SNS community and its working groups, are outlined and representatives are identified.

Last but not least, a specific plan underpinning the **6G-SENSES activities related to participation and contribution to 6G IA and SNS JU Work Groups** and Teams as well as the liaison activities with project of specific interest has been defined. The plan specifies the targeted WGs, Teams, projects along with the sharing of responsibilities. The plans defined in this document outline the main intention of the **6G-SENSES Consortium** towards achieving the goals in its areas of interest, and maximising impact in this respect. For this purpose, the plans will be subject to continuous monitoring, revision and modification throughout the project lifetime to ensure the fulfilment of the targets.

Further, updated plans on standardization, communication and dissemination contributions, together with tangible results, will be subsequently reported in deliverable D6.2 (*“Preliminary Standardisation, Dissemination, Communication and liaison Activities Report”* – due in 19), and deliverable D6.3 (*“Final Standardisation, Dissemination, Communication and liaison Activities Report”* – due in M30).

## 6 References

- [1] The Digital Europe Programme, <https://digital-strategy.ec.europa.eu/en/activities/digital-programme>



## 7 Acronyms

Acronym	Description
3GPP	3rd Generation Partnership Project
3GPP SA1	Service and System Aspects WG
6G-IA	6G Infrastructure Association
BoI	Bodies of Interest
CN	Core Network
EC	European Commission
ENISA	EU Network and Information Security Agency (Cyber-security Agency)
ETSI	European Telecommunication Standardization Institute
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISA	International Society of Automation
ISO	International Standard Organization
ITU	International Telecommunication Union
LAN	Local Area Network
MAC	Medium Access Control
MEC	Multi-access Edge Computing
NFV	Network Functions Virtualization
NGMN	Next Generation Mobile Networks Alliance
O-RAN	Open Radio Access Network
OSM	Open Source Manual Orchestration
PoC	Proof of Concept
QoS	Quality of Service
QoE	Quality of Experience
RAN	Radio Access Network
RAN / RAN 1 / RAN 2, etc.	Radio Access Network (Layer1....)
SB	Steering Board

SDN	Software Defined Networking
SDO	Standard Development Organisation
SEO	Search Engine Optimization
SNS JU	Smart Networks and Services Joint Undertaking
WG	Work Group
WP	Work Package