HEXA-X-II

A holistic flagship towards the 6G network platform and system to inspire digital transformation for the world to act together in meeting needs in society and ecosystems with novel 6G services.

D7.2 Planning for dissemination, exploitation, standardisation and clustering

Smart Networks and Services Joint Undertaking (SNS JU) approval pending

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0.3	15.03.2023	Hexa-X-II WP7	Communication Plan

Abstract

The Hexa-X-II communication plan is a comprehensive document that outlines strategies and tactics to engage with the project's audience and showcase its research and achievements. The plan is designed to support the project's goals and objectives and provide a clear framework for communication efforts. It covers a wide range of topics such as target audience, channels, and platforms to reach the audience, and the content and messaging to engage and inform the audience. The plan also includes a detailed schedule and budget for communication activities and outlines the roles and responsibilities of the project team. Overall, the Hexa-X-II communications plan is an essential tool that will ensure alignment with project's goals and objectives and effectively engage and inform the audience. The plan is a reference document that will be regularly updated with the next deliverables and refined as the project progresses and serves as a valuable guide for the project team in communicating its work and impact.

Keywords

Hexa-X-II, Communication Plan, Strategy, Target Audience, Channels, Platforms, Content, Messaging, Schedule, Roles, Responsibilities, Goals, Objectives, Impact, Audience, Engagement, Guide

Disclaimer

Executive Summary

The Hexa-X-II communications plan is a comprehensive document that outlines strategies and tactics to effectively engage and inform the project's audience about its research, achievements, and key results. The plan is designed to be a working document to support the project's goals and objectives and provide a clear framework for communication, dissemination, clustering, and exploitation efforts. It covers a wide range of topics, such as the target audience, channels, and platforms to reach the audience, and the content and messaging to engage the audience. The document will be updated regularly to correspond to keep project teams up to date.

The document aims to:

- Help effectively engage and inform the project's audience about its research and achievements.
- Support the project's goals and objectives and provide a clear framework for communication efforts.
- Cover a wide range of topics such as the target audience, channels, and platforms to reach the audience, and the type of content and messaging to engage the audience.
- Outline the roles and responsibilities of the project team regarding communicating the project findings and results.
- Act as a guide for the project team on how to communicate its work and impact.
- Describe how to increase visibility and awareness of the project, foster engagement and participation from stakeholders, and communicate the project's impact and results to relevant audiences.
- Identify the key performance indicators related to communication, dissemination, clustering, and exploitation efforts.

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Acronyms and abbreviations

Acronym	Full abbreviation
3GPP	The 3rd Generation Partnership Project
6G-IA	6G Smart Networks and Services Industry Association
BEREC	Body of European Regulators for Electronic Communications
DetNet	Deterministic Networking
DoW	Description of Work
DX7.1Y, D7.2, etc.	Deliverable X.Y, where X is the WP number and Y is the deliverable number
EAG	External Advisory Group
EMF	Electromagnetic Field
ETSI	European Telecommunications Standards Institute
GSMA	Global system for Mobile Communications Association
ICT	Information and Communication Technologies
IETF	Internet Engineering Task Force
IRTF	Internet Research Task Force
ISG	Industry specification groups
ISG-SAI	Securing Artificial Intelligence
ITU	International Telecommunication Union
KER	Key Exploitable Results
KPI	Key Performance Indicator
MANO	Management and Orchestration
MEC	Multi-access Edge Computing
NFV	Network Function Virtualisation
NGMN	Next Generation Mobile Networks
nGRG	next Generation Research Group
NTN	Non-Terrestrial Networks
O	Online
OSM	ETSI Open-Source MANO
PU	Public
R	Report
RAW	Reliable and Available Wireless
RFC	Request for comments
RG	Research groups
SDO	Standards Developing Organization
SEN	Sensitive
SG5	Study Group 5
SNS JU	Smart Networks and Services Joint Undertaking
SWOT	Strength-Weaknesses-Opportunities-Threats
THz	Terahertz technology
TSG RAN	3GPP Radio Access Network
WG	Working groups
WP	Work package
ZSM	Zero touch network and Service Management

1   Introduction

The success of any project relies heavily on effective communication and dissemination efforts. The Hexa-X-II project recognises this fact and has developed a comprehensive communication plan to ensure that its goals and achievements are effectively communicated to its target audiences. This plan includes several deliverables that cover all aspects of communication and dissemination, from the project's online presence to the exploitation of key results and the influence of standardisation and regulation. This document presents an overview of these deliverables and their objectives, as well as their timeline for delivery. It aims to provide a clear understanding of the Hexa-X-II communication plan and its importance in achieving the project's overall goals. According to the Description of Work (DoW), the deliverables due in the lifetime of the project are the following.

Table 1-1: WP7 - List of Deliverables.

ID	Deliverable name	WP	Lead	Type	Dissemination Level	Deliv. date
D7.1	Online project presence	WP7	University of Oulu	O	PU	M1
D7.2	Planning for dissemination, exploitation, standardisation, and clustering	WP7	University of Oulu	R	PU	M4
D7.3	Dissemination, communication, and clustering – Intermediate release	WP7	University of Oulu	R	PU	M12
D7.4	Exploitation of key results – Intermediate release	WP7	Telenor	R	SEN	M12
D7.5	Impact to Industry activities standardisation and regulation – Intermediate release	WP7	Nokia	R	PU	M12
D7.6	Dissemination, communication, and clustering – Final release	WP7	University of Oulu	R	PU	M30
D7.7	Exploitation of key results – Final release	WP7	Telenor	R	SEN	M30
D7.8	Impact to Industry activities standardisation and regulation – Final release	WP7	Nokia	R	PU	M30

2   Communication and dissemination

The communication and dissemination plan of Hexa-X-II is outlined in this section. The Hexa-X-II communications plan is a comprehensive document that outlines the strategies and tactics that will be used to engage with the project's audience and showcase its research and achievements. The plan is designed to support the project's goals and objectives and to provide a clear and practical framework for the project's communication efforts.

The communications plan covers a wide range of topics, including the project's target audience, the channels and platforms used to reach the audience, and the content and messaging used to engage and inform the audience. The plan also includes a detailed schedule for the project's communication activities and outlines the roles and responsibilities of the project team in implementing the plan.

Overall, the Hexa-X-II communications plan is an essential tool that will help ensure that the project's communication efforts are aligned with its goals and objectives and that they effectively engage and inform the project's audience. The plan is a living document that will be regularly updated and refined as the project progresses. It will serve as a valuable guide for the project team in communicating its work and impact.

This project has several roles and responsibilities related to online presence, dissemination, exploitation, standardisation, and clustering. All partners have committed to sharing project news and information through their organisation's website, such as webpages, news, blog posts, and press releases, as well as their organisation's social media channels, including LinkedIn, Twitter, Meta (Facebook), and YouTube. Other Hexa-X-II partner-specific communication practices include newsletters for internal and external audiences, internal events and fairs, customer and academic journals or technical magazines, and company-internal social media.

2.1 Communication goals of the Project

Hexa-X-II communication aims to engage with the project's audience and showcase its research and achievements. The objectives include providing a clear view of project goals and results, increasing awareness of project results among stakeholders, stimulating the exploitation of project achievements, enforcing stakeholder community building, creating liaisons with other projects, communicating high-level results, and impacting future 6G standardisation evolutions. The target audience groups for each objective are listed below and marked as A-F. They include a wide range of stakeholders and partners who are involved in the project or who have an interest in its research and findings, with a specific focus on groups such as telecom operators and vendors, service providers over telecommunication networks, the general public, research and academic community, standards bodies, policymakers, governments, regulatory agencies, and the 6G Smart Networks and Services Industry Association (6G-IA) and related European fora. The target audience consists of

    A.   Telecom operators and Vendors

    B.   Service providers over telecommunication networks

    C.   General Public

    D.   Research and academic community

    E.   Standards bodies, Policy Makers, Governments and Regulatory Agencies

    F.   6G-IA and related European fora

The project's communication efforts will need to be carefully tailored to the needs and interests of these different groups. By engaging with the project's audience and providing regular updates and information about its work, the project can build support and engagement for its research and innovations.

Table 2-1: outlines the communication objectives of the Hexa-X-II project and the target audience groups for each objective.

Communication Objectives	Audience groups
Provide a clear view of the project goals and results, including an SNS Horizon Europe view	A-F
Increase the awareness of the project results among the stakeholders impacted by Hexa-X-II	A-F
Stimulate the exploitation of the achievements of Hexa-X-II towards 6G evolution of the market	A, B, D, F
Enforce stakeholders' community building to share and collect knowledge and increase awareness in the 6G development	A, B, D, E, and F
Create liaisons and relationships with other projects in Europe and abroad (e.g., USA, China, Republic of Korea, Japan), with special focus on 5G PPP and SNS Horizon Europe	E and F
Communicate high-level results, through clear and crisp messages and communications	A-C and F
Impact future 6G standardisation evolutions through participants involvement in the SDOs	E and F

Table 2-2 provides indicative KPIs to evaluate the project's communication strategy and targets to be achieved by the end of the project.

KPI	Target	Verification
Newsletters	2	Proof in Dissemination Reports
Newsletter recipients	200	Email delivery
Submissions in Magazines and technical press	2	Number of published articles
Press releases with project acknowledgements	>5	Number of published press releases
Unique website visitors per month	250	Google Analytics
Website page views per month	1000	Google Analytics
Web visits	4500	Google Analytics
Pages / sessions in the website	>3	Google Analytics
Website average session time	>2 min	Google Analytics
Followers in Hexa-X-II Twitter	>100	Twitter Analytics
Tweets	>50	Twitter Impressions >4000
Followers in Hexa-X-II LinkedIn	>100	LinkedIn analytics
Posts in LinkedIn	>50	LinkedIn analytics

Overall, the goals of Hexa-X-II communication are to support the project's objectives and to help the project achieve its goals. By engaging with the project's audience and showcasing its work and impact, the project can build support and engagement for its work and demonstrate the value and potential of 6G technology.

2.2   Content strategy

Content strategy is the foundation for creating and delivering valuable, relevant, and consistent content to a targeted audience. It involves the planning, development, and management of content, with the goal of driving engagement and achieving objectives. This section discusses the types of content Hexa-X-II should produce.

2.2.1   Content creation and approval

The creation and approval of content are critical components of any successful communication strategy. In the context of the Hexa-X-II project, it is essential to ensure that all communication materials are of high quality, accurate, and aligned with the project's objectives. This section outlines the process for creating and approving content for the project's various communication channels, including the project website, social media, newsletters, and press releases. It also includes guidelines for ensuring that all content is reviewed and approved by the appropriate project members to ensure consistency and accuracy.

The content creation process is described in **Error! Reference source not found.** and follows the best p ractices of the research projects. In particular, after the process is started, having identified a communication need, there is a collaboration inside the project to work on that need. The collaboration happens among the Project Coordinator, the Work Package leader, and the Task on dissemination and communication leader (Task 7.1). In this phase it can also be decided that the news item is not worthy, for certain reasons, and hence the process ends (right-hand side of the Figure). Otherwise, the process continues with an internal review with the partners, and in case of final approval the communication takes place on the selected channels, case by case.
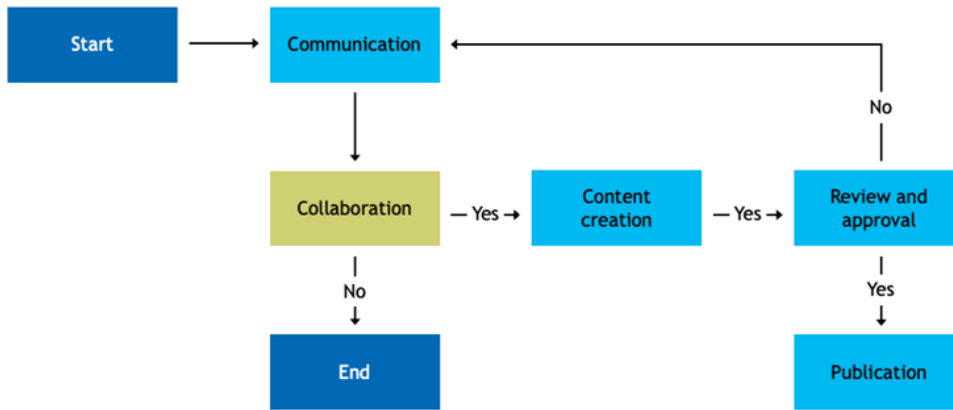
Figure 2-1: Content creation and approval process.

There are several communication items that are part of the plan, as detailed below.

2.2.2   News items

To effectively communicate the latest updates and noteworthy events of the Hexa-X-II project, the team should aim to produce shorter, more frequent news updates. There is no recommended number of news items that Hexa-X-II should produce, but the goal is to create the most effective possible impact. The project lead, work package leads, key researchers, and communications manager should collaborate to determine the most exciting and noteworthy aspects of the project and decide on the content to be included in the news or blog section of the website. They should also identify the best way to present this information to engage the project's audience and achieve its communication goals. Key researchers and project managers are encouraged to provide suggestions on possible topics to be covered. News items will be published at the news section in Hexa-X-II website (https://hexa-x-ii.eu/news/).
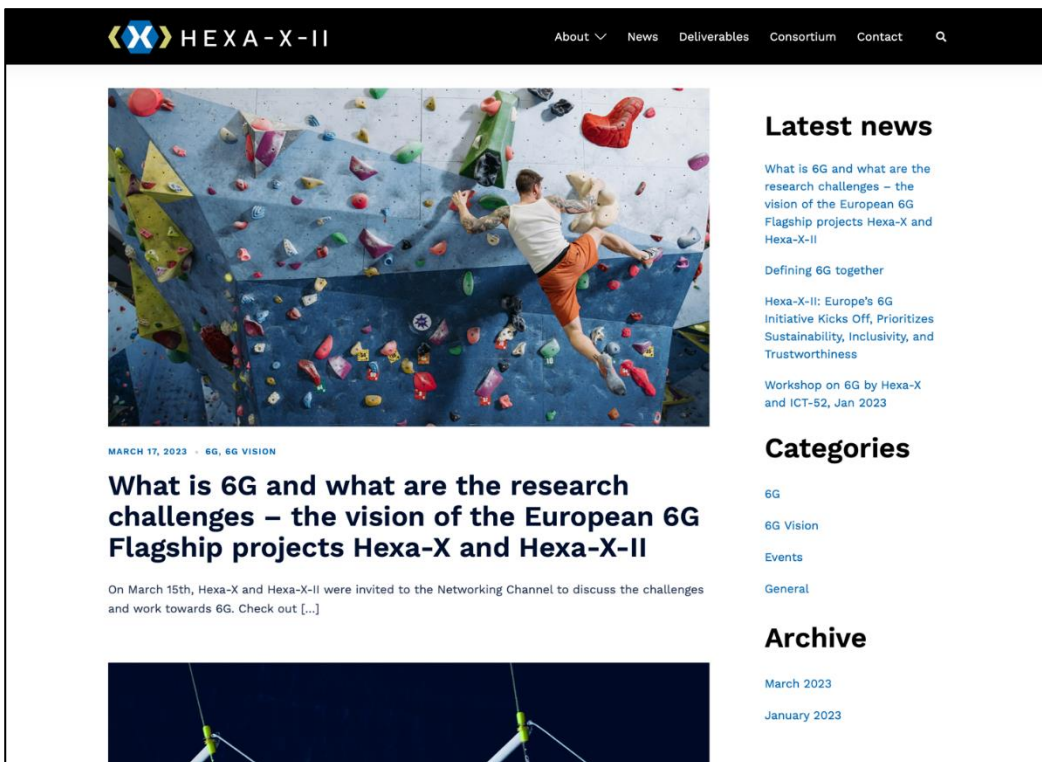
Figure 2-2: Screenshot of the Hexa-X-II News Archive.

2.2.3   Newsletters

The Hexa-X-II newsletters (edited in Task 7.1) are intended to offer frequent updates on the project's advancements to both project partners and stakeholders. The main objective of the newsletters is to keep project partners and stakeholders informed by presenting a detailed yet easily digestible summary of the project's advancements and accomplishments.

The type of content that should be included in the newsletters could include the following:

- Updates on the project's research and findings
- Information about upcoming events and workshops
- Highlights of the project's partnerships and collaborations
- Interviews with key researchers and stakeholders
- Insights into the project's impact on society and the environment

At the minimum, project partners and stakeholders should be informed about key accomplishments and milestones through newsletters biannually. However, higher frequency is encouraged. Each newsletter must provide precise information with text, photos, as well as links to additional resources on the project's website. In this way, all interested parties can stay up to date with noteworthy developments. The newsletter will be distributed through email to those who have subscribed for it (subscriptions managed by Task 7.1 while the project will take care of the subscribers' list).

2.2.4   Social Media channels

The Hexa-X-II project recognises the importance of social media as a powerful tool for communication and engagement with its audience. This chapter outlines the project's social media strategy, including the different platforms and channels that will be utilised, as well as the specific objectives and key performance indicators (KPI) that will be used to evaluate the effectiveness of the project's social media presence. By leveraging the reach and engagement potential of social media, Hexa-X-II aims to increase awareness of its work and impact, build a community of stakeholders, and foster collaboration towards the development of a sustainable and trustworthy 6G platform.

2.2.4.1   Twitter

Figure 2-3: Hexa-X-II Twitter profile.

Hexa-X-II communication on Twitter should be focused on sharing news and updates about the project concisely and engagingly. This could include tweets about the project's research and findings, events and workshops, and partnerships and collaborations. Retweeting from SNS JU and consortium accounts when appropriate content for Hexa-X-II audience is advised. Tweets that include images and videos perform better on Twitter. Content should include compelling visuals to grab attention and illustrate the project's work.

All consortium members of the Hexa-X-II project are encouraged to follow and monitor the project's Twitter account and engage with likes, retweets, or replies to the project's tweets. This will help build relationships with the project's followers and create a sense of community. Consortium partners are asked to use hashtag #HexaXii when discussing project-related accomplishments, events, or other online. Also, tagging @Hexa_X_II is advised when consortium members wish Hexa-X-II to retweet content they have created about Hexa-X-II-related matters. Using relevant hashtags in the tweets helps increase the content's visibility and make it easier for users to find and engage with the project.

The Hexa-X-II project aims for >50 tweets by the end of the project, making the minimum frequency 1.67 tweets per month, but the goal is clearly to overcome this threshold and the minimum goal should not limit tweeting, however. If content becomes available to post more frequently, even daily, this is allowed. Tweets are approved by Project Lead and WP7 Lead. The more Hexa-X-II posts, the more active the channel is and the more attention and audience the project will gain.

2.2.4.2   LinkedIn
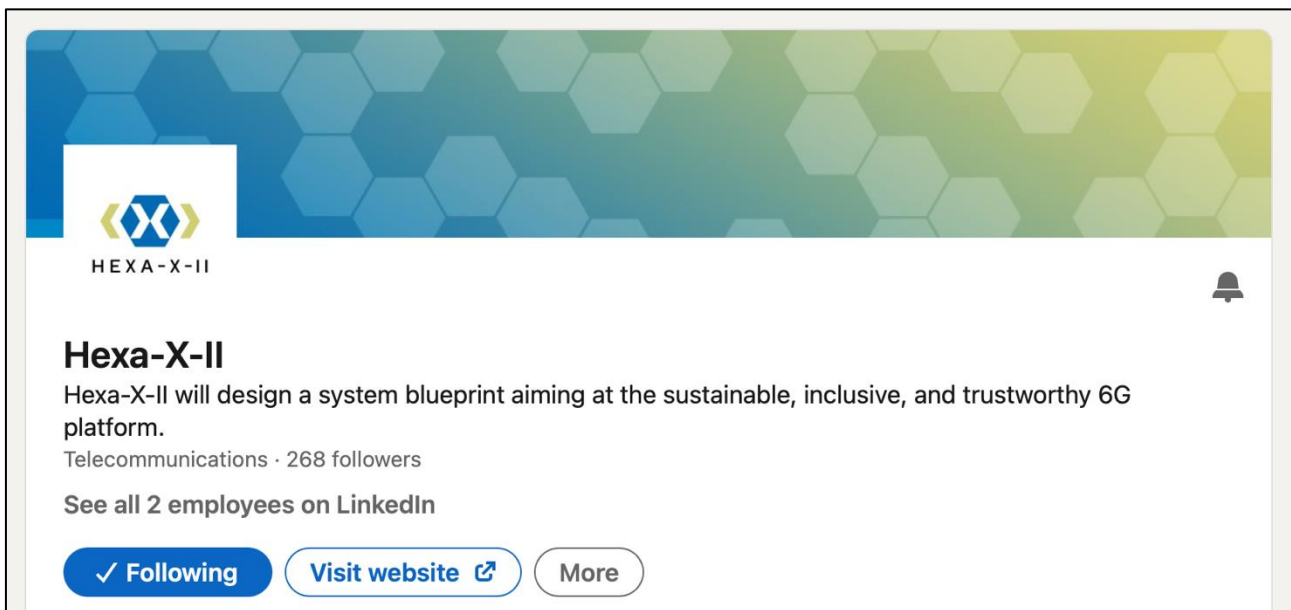
Figure 2-4: Hexa-X-II LinkedIn profile.

The LinkedIn content for the Hexa-X-II project should be focused on providing professional and informative updates about the project's research and impact. This could include posts about the project's goals and objectives, key research findings and innovations, and partnerships and collaborations with other organisations.

To effectively reach and engage the project's audience on LinkedIn, the content should be carefully planned and tailored to the platform. Unlike Twitter, LinkedIn allows for many more characters within a post. This allows for longer posts to be planned with links to other sites/presentation/documents. The content could include the following elements:

- **Visuals:** Include compelling images, videos, and graphics to grab attention and illustrate the project's work.
- **Calls to action:** Ask users to share their thoughts or to visit the project's website to encourage engagement and drive traffic to the project's other channels.

For best engagement, the recommended LinkedIn posting frequency is 2-3 posts per week. However, the Hexa-X-II project aims to have >50 LinkedIn posts by the end of the project, making the minimum frequency 1.67 posts per month. This minimum goal should not limit posting, however. If content becomes available to post more frequently, even daily, this is allowed. Posts are approved by Project Lead Mikko Uusitalo and WP7 Lead Mauro Boldi.

The more Hexa-X-II posts, the more active the channel is and the more attention and audience the project will gain. All consortium members of Hexa-X-II project should follow and monitor the project's Twitter account and engage with likes, retweets, or replies to the project's tweets. This will help build relationships with the project's followers and create a sense of community.

2.2.4.3   YouTube
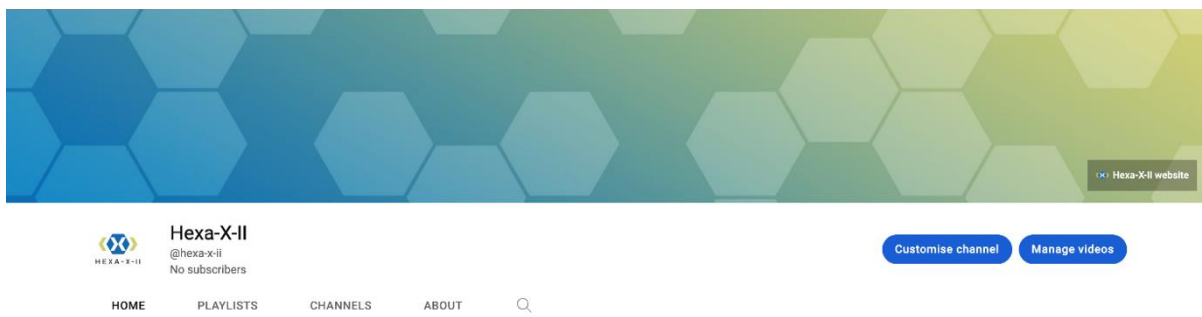
Figure 2-5: Hexa-X-II YouTube profile.

The Hexa-X-II project has a YouTube channel. The length and complexity of producing a video compared to a tweet or LinkedIn post may affect the frequency of video production. There is no specific number of YouTube videos that Hexa-X-II should create. The availability of videos on YouTube can serve e.g., these types of objectives:

1. **Raising awareness:** Videos are an effective way to reach a wide audience and raise awareness about the project's goals, objectives, and achievements.
2. **Explaining complex concepts:** The Hexa-X-II project involves cutting-edge research and technology, which can be difficult to explain in text or even in person. Videos can help to simplify and explain complex concepts in an engaging and easy-to-understand way.
3. **Showcasing results:** Videos can be used to showcase the project's results and achievements, providing a tangible demonstration of the impact of the project.
4. **Engaging stakeholders:** Videos can be a powerful tool for engaging stakeholders, including project partners, policymakers, and the general public. They can help to generate interest and excitement about the project and foster a sense of community among stakeholders.
5. **Demonstrating thought leadership:** By producing high-quality videos that showcase the project's research and innovation efforts, Hexa-X-II can position itself as a thought leader in the 6G technology space, which can help to attract new partners and funding opportunities.

2.2.4.4   Social Media key performance indicators

KPIs are essential for measuring the effectiveness of communication efforts in engaging and reaching the target audience. For Hexa-X-II project's social media presence, the KPIs include reach, impressions, engagements, followers, and post link clicks, which are further elaborated in

. These KPIs can be monitored and analysed regularly to evaluate the project's social media performance, identify areas for improvement, and make data-driven decisions to enhance communication efforts. The project's social media reach KPIs will be regularly compared against the industry publishing and engagement benchmarks shown in Figure .

Table 2-2: Social Media KPIs.

KPI	Definition
Reach	The number of unique individuals who see the project's posts on social media.
Impressions	The total number of times the project's posts are displayed on social media.
Engagements	The number of individuals who engage with the project's social media posts.
Followers	The number of individuals who follow the project's social media accounts.
Post Link Clicks	The number of clicks on the project's social media posts that lead to the project's website.

Industry publishing & engagement benchmarks

	Avg. posts published per day	Avg. inbound engagements on content per day	Avg. outbound engagements per day	Avg. daily inbound engagements per post
All Industries	10	87	2	14
Advertising & Marketing	19	99	3	10
Automotive	16	70	3	10
Banking	8	40	3	7
Consumer Products	10	105	4	23
Education	7	28	1	4
Financial Services	7	37	2	8
Food & Beverage	8	54	3	15
Health, Wellness & Fitness	10	120	3	26
Higher Education	8	32	2	5
Internet & Tech	12	63	3	9
Legal	6	32	1	5
Leisure, Sports & Recreation	9	114	2	16
Media & Entertainment	21	334	4	30
Non-Profit	9	83	2	12
Professional Sports	26	639	5	45
Real Estate	10	21	1	5
Retail	15	110	4	18
Recruiting & Staffing	10	11	1	2
Travel & Tourism	11	125	4	21

Figure 2-6: Industry publishing and engagement benchmarks.

2.2.5   Website

The Hexa-X-II website was published in January 2023. It is accessible at https://hexa-x-ii.eu/.

The website serves as a central hub for project information and serves as a platform to engage with the project's target audience. The website provides detailed information about the project, its objectives, and its partners. It also features news and updates about the project's progress, as well as publications and resources related to 6G technology. Additionally, the website includes contact information for the project team and provides opportunities for stakeholders to get involved in the project. A detailed account of the website can be found in [HEX223-D71].
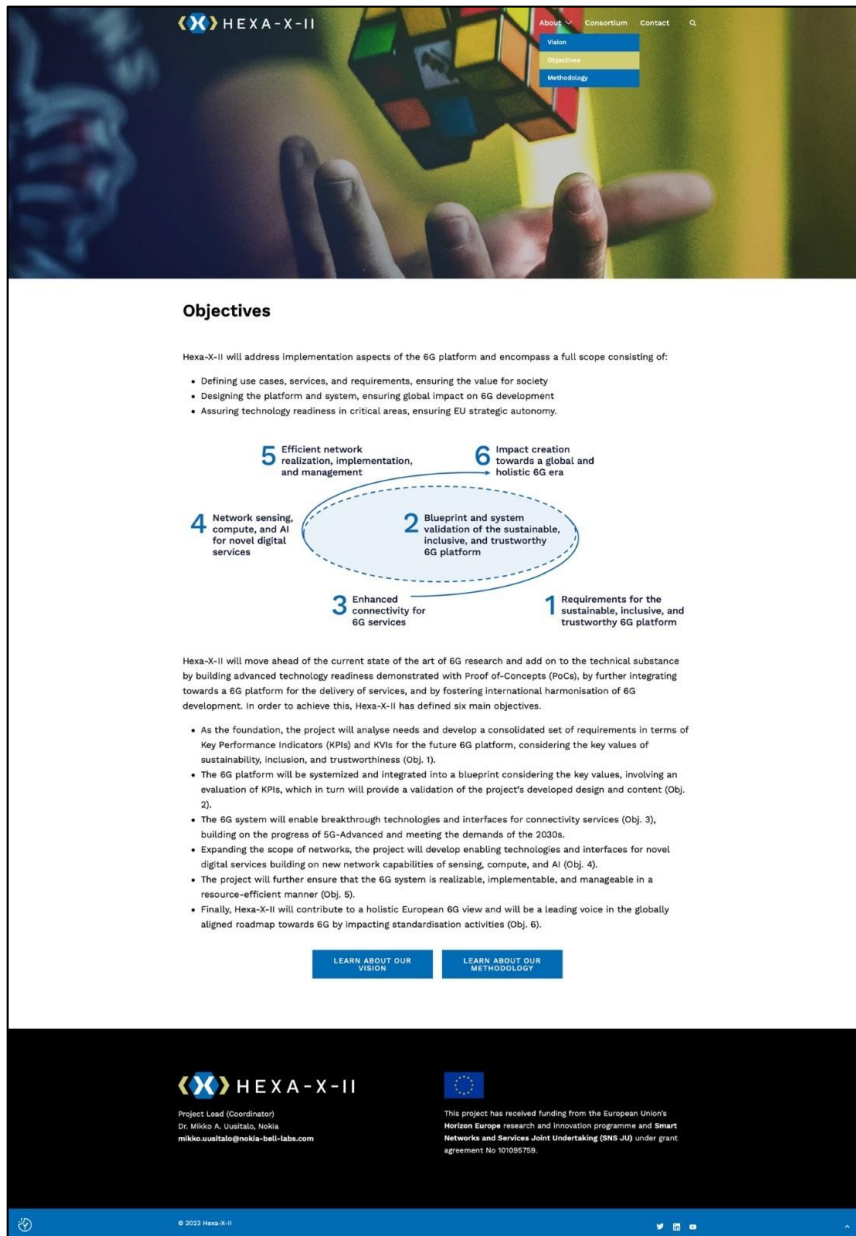

Figure 2-7: Screenshot of the Hexa-X-II website subpage "Objectives".

2.2.6   Media

Sharing press releases and articles on Hexa-X-II in non-technical journals can expand the reach of communication and engage a diverse audience. Whenever feasible, significant project updates will be communicated through press releases and direct outreach to increase visibility.

2.3   Dissemination activities

As it was already stated in the Description of Work, dissemination is an essential factor in maximizing the impact of the project providing technical details of the project outcomes. Dissemination goals are about

- raising awareness in relation to the 6G challenges, the benefits, and the value 6G networks can bring to society with respect to environmental sustainability and new business opportunities; as well as
- promoting the technical advances that can support environmental sustainability, trustworthiness, resilience, digital inclusion, network transforming/automation enablers, innovative radio aspects, devices of the future, AI-based network management enablers, etc.

The Horizon Europe requirement for Open Access (OA) to scientific publications is fully embraced by Hexa-X-II. All scientific publications will be made open access through the Hexa-X-II Zenodo[1] community page – a snapshot of which is shown in Figure 2-8 and possible through the Open Research Europe publishing platform. Scientific publications are peer reviewed and require GA acceptance prior to publishing. The Zenodo repository is publicly accessible without any credentials and supports versioning. Uploaded publications must have a Digital Object Identifier (DOI) that can be used as reference to the document in other sites & repositories. The DOI must be either provided by the publisher of the scientific publication (and therefore provided at document upload) or automatically created by the repository (if not provided by user). The Hexa-X-II participants will upload the corresponding PDF version of their publications in accordance with the conditions of the deposit of journals and publishers. Metadata contains information about EU grant agreement number, publishing date and 'originally published' information that can be used in text search.

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[1] Zenodo is a general-purpose open-access repository developed under the European OpenAIRE program and operated by CERN. It allows researchers to deposit research papers, data sets, research software, reports, and any other research related digital artifacts.
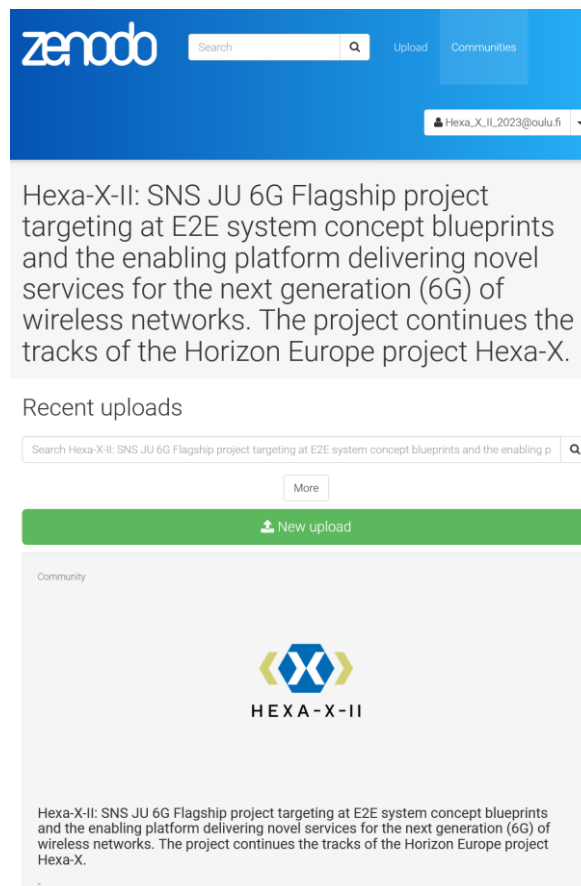
Figure 2-8: A snapshot of the Hexa-X-II Zenodo community page, accessible at
https://zenodo.org/communities/hexa_x_ii_2023/

Hexa-X-II intends to disseminate its innovation results in international peer reviewed scientific journals, magazines, conferences, industrial/stakeholder events and SDOs. To better define the dissemination activities of the project, the Consortium discussed and identified the usual practices of each partner for disseminating results in the scientific area of Hexa-X-II. Table 22-3 below, taken from the DoW and internally revised, summarizes these activities per partner.

Table 22-3: Hexa-X-II Partners' dissemination interests.

Hexa-X-II Partners' dissemination interests
Nokia (Finland, France, Denmark and Germany) dissemination practices include i) Scientific publications, whitepapers, lectures and invited talks; ii) Coordination with 5GPPP, 6G-IA, and other EU projects; and iii) Internal newsletters, workshops, and events. Nokia sets a target of publishing 20 contributions (including whitepapers, journal and conference article) across all its entities during this project.
Ericsson (Sweden, Turkey and Finland) dissemination practices include i) Conferences such as EuCNC, IEEE CCNC, PIMRC; IEEE ICC, IEEE GLOBECOM, VTC, IEEE WCNC, MWC; ii) Journals, e.g., IEEE Access, IEEE Wireless Communications Letters; iii) White papers; and iv) Internal communication. Ericsson (in total for all legal entities) estimates that it will submit approximately 20 contributions throughout the project lifetime.
Aalto University dissemination practices include i) Conferences, e.g., ICC, Globecom, EUCNC, VTC, PIMRC, EuCAP, and IEEE journal publications; ii) Lectures and invited talks in seminars and conferences

outside universities; iii) organisation of workshops and training schools in international conferences and Euro-COST actions; and iv) Open-source software and channel data

Apple does not typically engage in providing presentations at major industry events but plans to deliver at least 10 publications to academic events (such as EuCNC, IEEE PIMRC, ICC, and Globecom) over the project lifetime.

Atos dissemination practices include i) attendance to key events such as MWC, EuCNC; ii) contribution to technical papers to be submitted to conferences and Journals (IEEE); iii) dissemination of project results within open-source standardisation communities that Atos is member, e.g., ETSI TFS and contributions to SDOs like ETSI ZSM; iv) events and whitepapers within e.g., 5GPPP, 6G-IA and SN&S JU partnership.

Barkhausen Institute results will be disseminated via high impact scientific publications and attendance to scientific conferences and workshops like GLOBECOM, INFOCOM, DATE, ISCAS, DAC, 5G++ Summit, 6G Summit, IEEE Transactions on Wireless Communications, IEEE Communications Magazine, IEEE S&P, ACM CCS.

Centre Tecnològic de Telecomunicacions de Catalunya (CTTC) results and project outcomes will be disseminated to relevant industry and scientific communities by means of conferences, workshops, and publications. International conferences, such as OFC, ECOC, ONDM, ICTON, PSC, EUCNC, ICC, or GLOBECOM as well as scientific journals, e.g., IEEE/OSA JLT, JOCN, JSAC, or IEEE Communications Magazine will be targeted. Specifically, 2 indexed journals and 6 conferences are envisioned.

Chalmers University will i) disseminate project results in the fields of signal processing, information theory, communications theory, and wireless networks; ii) contribute to project dissemination at EuCNC (CHA is local organizer of EuCNC'2023); iii) organize special issues in journals such as JSAC, IEEE networks, and tutorials on selected topics in conjunction with international conferences. The results will also be included in M.Sc. and Ph.D. theses.

Institute of Communication and Computer Systems usually publishes project results in i) related top-level international journals and magazines, published from IEEE, ACM, Springer, Elsevier, including IEEE TNSM. IEEE Systems Journal, IEEE TCNS, Computer Networks, IEEE Network Magazine, etc.; ii) top peer-reviewed conferences, e.g., IEEE ICC, GLOBECOM, EUCNC, INFOCOM, etc.; and iii) organized project workshops co-located with important events and conferences.

IMEC disseminates project results through scientific journals, articles, conferences, and workshops, and by participating in events organized by the EC and related research bodies. IMEC aims to publish more than 5 papers during the project lifetime.

Luleå University of Technology dissemination practices include i) Invited speeches, seminars and oral presentations; ii) Lectures, teaching, and education; iii) Scientific publications (IEEE journals and conference, predominantly); and iv) Broad dissemination in (in-)formal contacts within scientific community

Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek TNO plans to disseminate results from the project in internal presentations and workshop. TNO also plans to write scientific publications and whitepapers and attend scientific conferences (e.g., EUCNC) and workshops.

Nextworks plans to contribute to the project dissemination activities, giving preference to joint initiatives. The target is to contribute with publications (and participation to workshops) in top-tier IEEE journals and conference (e.g., ICC, GLOBECOM, EUCNC). Nextworks also intends to participate to relevant whitepapers initiatives (e.g., as part of 6G-IA activities) to promote the project results.

NXP semiconductors will disseminate the learnings using internal& external workshop, at conferences and plans to contribute to papers, journals, and papers created by the consortium. NXP semiconductors intend to demonstrate the project results at the Hamburg show room.

One Reality dissemination practices include i) XR quality experiences of a 6G network in operation (a 6G virtual world); ii) Presentations and Talks; iii) Workshops; iv) Training events and lectures; v) Articles and vi) Events

Optare solutions dissemination practices include i) presentations at relevant industry fora and events (GSMA, TMForum) and ii) participation in workshops in the intersection of academia and industry.

Orange (France and Poland) intend to disseminate the results from the project through publications in leading magazines (IEEE Communications Magazine, IEEE Network, IEEE TNSM) and presentations in conferences, such as IEEE ICC, GLOBECOM, EuCNC, NOMS. The outcomes of the project will also be disseminated through Orange's communication channels, such as publication on Orange Innovation website (Research - Hello Future Orange) or through Orange Labs Research Exhibition, showcasing the most promising innovations and attracting thousands of visitors, from the whole Orange group but also external partners.

University of Oulu dissemination practices include i) publications in top-tier journals (mostly IEEE) and conferences (such as ICC, GLOBECOM, EuCNC, VTC, PIMRC so on); and ii) lectures, invited talks and webinars.

Promozione Per L'innovazione Fra Industria e Università Associazione dissemination practices include i) contributions to 6G Fora and to 6G Position Papers on social acceptability of 6G; and ii) participation to 6G IA Working Groups.

Qamcom Research and Technology ABs main contribution in the project is on the PoC in WP4. Thus, the main dissemination activities expected are publications and demonstrations on conference workshops/events related to this PoC.

Qualcomm Communications SARL will participate in dissemination and standardisation activities, focusing on NextG Alliance initiative in addition to participating in potential whitepapers.

SAS Idate key results will be disseminated to relevant industry communities (both supply and demand markets) through i) invited talks at conferences (5G /IoT World summit, etc); ii) internal (IDATE monthly executive clubs and DigiWorld Summit) and clients' workshops; and iii) publications (both market reports and whitepapers).

Sequans Communications SA dissemination practices include i) internal communication and training; ii) scientific publications and white papers (tentative target: 3 articles during project lifetime, supported also by standardisation activities). Indicative conferences/journals of interest are Mobile World Congress (MWC). IEEE Access, EuCNC, PIMRC.

Siemens Aktiengesellschaft practices include scientific publications and whitepapers, internal presentations and workshops with Siemens stakeholders. Coordination with regional and global interest groups.

Siemens Aktiengesellschaft Oesterreich usually engages in scientific publications. coordination with regional (FEEI, ÖVE) and with Siemens internal interest groups (responsible for global activities).

Siemens Industry Software OY is interested in scientific publications and whitepapers as well as dissemination in Siemens internal groups and trainings.

Sony Nordic (Sweden), branch of Sony Europe B.V. dissemination practices include i) scientific publications, whitepapers, presentations; ii) internal newsletters, workshops, events; and iii) tutorial and education of undergraduate students, e.g., via MSc thesis

Technische Universität Dresden will disseminate project results through i) scientific publications and white papers; ii) conferences and workshops; and iii) training events and lectures.

Technische Universität Kaiserslautern dissemination practices include i) lecture and training of students, MSc and PhD thesis; ii) conferences such as EuCNC, ICC, GLOBECOM, PIMRC, VTC, WCNC; iii) journal publications, e.g., IEEE Access, IEEE Wireless Communications Letters; iv) white papers and presentations to industrial partners; v) contributions to SNS and presentations / contributions in other 6G programs; and vi) organisation of workshops and panels.

Teknologian Tutkimuskeskus VTT Oy dissemination practices include i) journal publications in IEEE Communications Magazine, IEEE Wireless Communications Magazine, IEEE Network, IEEE Transactions on Wireless Communications, IEEE Journal on Selected Areas in Communications, IEEE Access; ii) conference and workshop papers in IEEE GLOBECOM, IEEE ICC, IEEE WCNC, IEEE PIMRIC, EUCNC; iii) organisation of project workshops in international conferences, summits, and other events; and iv) contribution to SNS and other project whitepapers.

Telecom Italia SPA will lead WP7 on the overall Impact for the project and will disseminate project results through i) scientific publications and whitepapers; ii) coordination with 5GPPP, 6G-IA, and other EU projects; iii) internal newsletters and magazine, workshops and events; and iv) invited speeches and oral presentations.

Telefónica Investigación y Desarrollo will disseminate project goals and results through i) scientific publications to IEEE ComSoc magazines and conferences (EuCNC, IFIP/NOMS, etc.); ii) presentations at relevant industry fora and events (GSMA, Telco Global API Alliance, FUSECO, Layer123); iii) participation to whitepapers; and iv) workshop organisation with the different internal business and operation units, to report on project's outcomes and coordinate actions with in-scope pilots and field trials.

Telenor ASA will disseminate results from the project in internal presentations and workshops, and in scientific conferences (e.g., EuCNC, ITS European Conference and ISPIM Innovation Conference), publications (e.g., Telecommunication Policy, Technology analysis and Strategic Management, Technological Forecasting and Social Change and International Journal of Technology Management) and whitepapers. TNR aims to contribute to at least 5 conference and journal papers.

Ubiwhere LDA's usual practice for disseminating the company's research outcomes involves: i) Presentations and demos at conferences such as EuCNC, GLOBECOM, ICC, INFOCOM; ii) Participation in workshops organized within the scope of the aforementioned conferences; iii) Patent filling; iv) Coordination with 5GPPP, 6G-IA, and other EU projects; and v) Internal newsletters and magazine, workshops, and events. UBW aims at engaging in at least 10 dissemination activities during the lifetime of the project, including all 5 activities mentioned above.

Universidad Carlos III De Madrid dissemination practices include i) scientific publications (e.g., IEEE Communications Magazine, IEEE Wireless Communications Magazine, IEEE Access and IEEE Transactions on Networking) and whitepapers; ii) coordination with other 5G-PPP and SNS EU projects; and iii) attendance to key events such as EuCNC.

Vodafone Group Services GmbH will disseminate Hexa-X-II results through i) press releases, white papers and internal communications; and ii) conferences such as MWC, NGMN discussions, 3GPP Standards, 5GAA, GSMA, 5G-ACIA. VGS also participates in a range of workshops at the intersection of academia and industry.

> **WINGS ICT Solutions Information & Communication Technologies** disseminates the company's research outcomes through i) presentations and demos at conferences such as EuCNC, GLOBECOM, ICC, PIMRC, VTC; ii) participation in workshops within such conferences; iii) scientific papers in renowned journals / magazines. WIN will engage in at least 10 dissemination activities during the project, including all the above 4 activities.

Considering the interests of the partners and the goals to be achieved in the project, the dissemination plans can be defined following main dissemination categories:

- *Publications in peer-reviewed scientific journals published from* e.g., IEEE, ACM, Springer, Elsevier such as IEEE Access, IEEE Wireless Communications Letters, EURASIP Journal on Wireless Communication and Networking, IEEE Wireless Communications Magazine, Springer Computer Networks, IEEE Transactions on Cognitive Communications and Networking, Elsevier Engineering Applications of Artificial Intelligence, Telecommunication Policy, Technology analysis and Strategic Management, Technological Forecasting and Social Change and International Journal of Technology Management
- *Participation at conferences* (including peer-reviewed paper presentations, demos / exhibitions, workshops, webinars and invited talks) such as European Conference on Networks and Communications (EuCNC) and 6G Summit, IEEE Consumer Communications and Networking Conference (CCNC), IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC); IEEE International Conference on Communications (ICC), IEEE Global Communications Conference (GLOBECOM), IEEE Conference on Vehicular Technology (VTC), IEEE Wireless Communications and Networking Conference (WCNC), Mobile World Congress (MWC), SDN/NFV World Congress, IEEE International Conference on Computer Communications (INFOCOM), ITS European Conference, ISPIM Innovation Conference, IEEE/IFIP Network Operations and Management Symposium (NOMS)
- *Participation in research community networks and stakeholder groups* including the coordination with 5GPPP, 6G-IA, SNS and other EU projects and presentations at relevant industry fora and events such as NGMN, GSMA, 5G-ACIA, Telco Global API Alliance, FUSECO, Layer123
- *Internal workshops and events, training and whitepapers*
- *Patent filing*

2.4   Demonstrations and Proof-of-Concepts

As stated in the Description of Work, the project will also aim to the implementation of the following three system-PoC demonstrations:

- System-PoC A: Foundation, management and orchestration of the 6G continuum
- System-PoC B: Elements of the 6G network architecture
- System-PoC C: End-to-End system with radio and device components

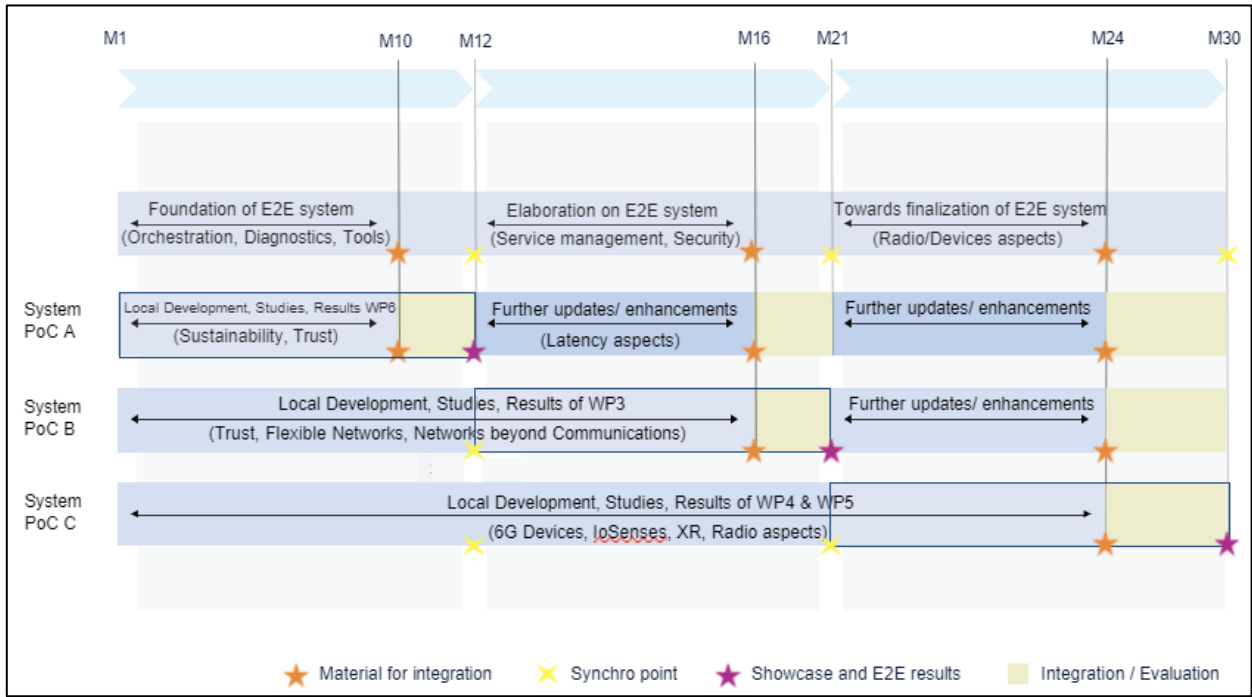These demonstrations are based on the scheduled roadmap presented in Figure 2-9.

Figure 2-9: Timing of proposed System-PoCs

3   Key exploitable results: implementation plans, methodology, stakeholders and expected outputs

3.1   Identifying the project's Key Exploitable Results

A central metric for measuring the tangible output and impact of the project is to identify Key Exploitable Results (KER). A KER is an identified main interesting result, which has been selected and prioritized due to its high potential to be "exploited" – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education. The following criteria will be used: degree of innovation, exploitability and impact.

3.2   Engaging the project

It is expected that all Hexa-X-II work packages will contribute with KERs from the project. In order to engage, 2 questionnaires will be prepared to collect ideas and inputs.

The first questionnaire will focus on the partners' expected impact and will contain questions in the following domains:

- Organisational impacts

- Marketing and communication impacts

- Hexa-X-II key innovation areas impacts

- Economic impacts

- Impacts on universities/public education (for academic partners)

- Innovation areas

- Ecosystem impacts

After the analysis of the feedback on the first questionnaire, a second questionnaire will be designed, focusing more directly on identifying KERs.

3.3   Engagement outside the project

As a 6G flagship project, it is also expected that there will be engagement with other SNS projects and external stakeholders. The Hexa-X-II External Advisory Group (EAG), will e.g., be an important resource for the project, and so will the engagement through the 6G-AI and SNS JU Working Groups. The composition of the EAG is shown in Table 3-1:, and gathers stakeholders and experts from all relevant segments. The objective of the EAG is to provide the project with an outside-in perspective and guidance, especially in the areas of 6G research topics and relevance, use case scenarios and eco-system dynamics.

Table 3-1: Hexa-X-II External Advisory Group members

Name	Role	Segment
Peter Vetter	Head of Nokia Bell Labs Core Research, Hexa-X-II AG co-chair	Vendors
Magnus Frodigh	Head of Ericsson Research, Hexa-X-II AG co-chair	Vendors
Liu Guangyi	China Mobile Research Institute, CTO wireless	Telco
Takehiro Nakamura	NTT DoCoMo, VP/GM 5G Lab	Telco
Bernhard Quendt	Thales, SVP Group Chief Technical Officer	Industrials and vertical

Ed Knapp	American Tower, CTO	Vertical, real estate
David De Almeida	SNCF, Chief scientific director	Transport
Joachim Göthel	BMW, Senior Manager	Transport
Raj Singh	Marvell, EVP, Processor Bus Group	Semiconductors
Mingxi Fan	MediaTek, Head of 5G/6G Mobile System R&D	Semiconductor
Alessandro Vanelli-Coralli	Uni Bologna, Professor	Non-terrestrial networks
Amina Boubendir	Airbus, Head of Research Strategy and Development	Non-terrestrial networks
Alexandros Kaloxylos	SNS JU, Director	Public funding
Riikka Koulu	University of Helsinki, Professor	Legal, Social
Petri Lehikoinen	Traficom, Deputy Director-General	Regulator
Rene Vroom	Dutch Radiocommunication Agency, Head of Innovation Department and Head of Antenna bureau	Regulator
Abhay Karandikar	Indian Institute of Technology (IIT) Kanpur, Director	Private Public Partnership, research

3.4   Way of work

Hexa-X-II is following an exploitation strategy consisting of three phases:

> Phase 1: Initial refinement of KERs

> Phase 2: Analysis of initial KERs and refinements

> Phase 3: Consolidation of KERs and exploitation roadmap

To support this, we are preparing two rounds of questionnaires for identifying and prioritizing KERs. The first round will collect input on believed impact from the works packages in the first year of the project, and a preliminary analysis will be done and documented in D7.4. It is expected that this will be based on preliminary thoughts from the different work packages in order to create the awareness of the importance of impact. The second round will collect more mature outputs and will be able to provide more quantification in terms of KERs of the impact, which will be reported in D7.7.

The time schedule of the two rounds is shown in Figure 3-1. The first phase started by distributing the first questionnaire ("Questionnaire 1") at end of March 2023 (M03).

Figure 3-1: Roadmap/time schedule for collecting and analysing the impact and KERs from the project.

Further, the project should use events and workshops to engage a wider audience and stakeholders to understand the wider impact of 6G in general and the project research in particular.

3.5   Analysis, prioritisation, and impact

The above-mentioned criteria will be used to prioritize the KERs. The work packages will be requested to provide the initial assessment according to:

- Degree of innovation
- Exploitability
- Impact

Further analysis should result in a shorter list which will be prioritized for a deeper analysis addressing:

- Stakeholders
- Market reach
- Value propositions
- Hurdles and enablers

A plan will be suggested for how prioritised KERs best could be handled by the project and brought further to ensure impact. Well-known methods and analytic tools in the business development process like Strength-Weaknesses-Opportunities-Threats (SWOT), value proposition canvases, lean start-up and design-thinking approaches will be used for each selected KER. The aim is to identify their pains and gains, hurdles, and enablers for the further success of the KERs.

4   Industry activities, standardisation and regulation: implementation plans, methodology, stakeholders and expected outputs

The overall goal of Hexa-X-II is to enable a 6G platform for setting up new value creation opportunities while being trustworthy, inclusive, and sustainable. To achieve this, Hexa-X-II has defined six main objectives. As part of objective number 6: "*Impact creation towards a global and holistic 6G era*", Hexa-X-II will contribute to a holistic European view of 6G development and align with key stakeholders, with the aim of globally harmonized standards. This will lead to paving the way for 6G systemisation and standardisation, through industry consensus and interactions with the scientific community. The activities of the project members toward achieving this goal will be measured as number of standardisation groups and European Smart Networks and Services Joint Undertaking (SNS JU) working groups [6GSNS] addressed and contributions made as well as scientific publications, (contribution to) whitepapers, position papers, etc.

Figure 4-1 shows the 6G standardisation timeline estimated for 3GPP and ITU-R/IMT. Based on the progress of the work in pre-standardisation ecosystem in industry and academia, 3GPP is currently expected to start the 6G standardisation process after the World Radiocommunication Conference in September 2023 (WRC-23) (discussion on the 6G spectrum) and, accordingly, the Release 21 could be the first release of the 6G standardisation . By then, main 6G use cases and 6G requirement will be identified by the ecosystem which will be the foundation of 3GPP 6G study and later on 6G specification. After finalizing the "*IMT vision toward 2030 and beyond*", ITU will focus on technical performance requirements as well as requirements and evaluation criteria to provide a foundation for the technology proposals for "IMT -2030" in 2028 timeframe.
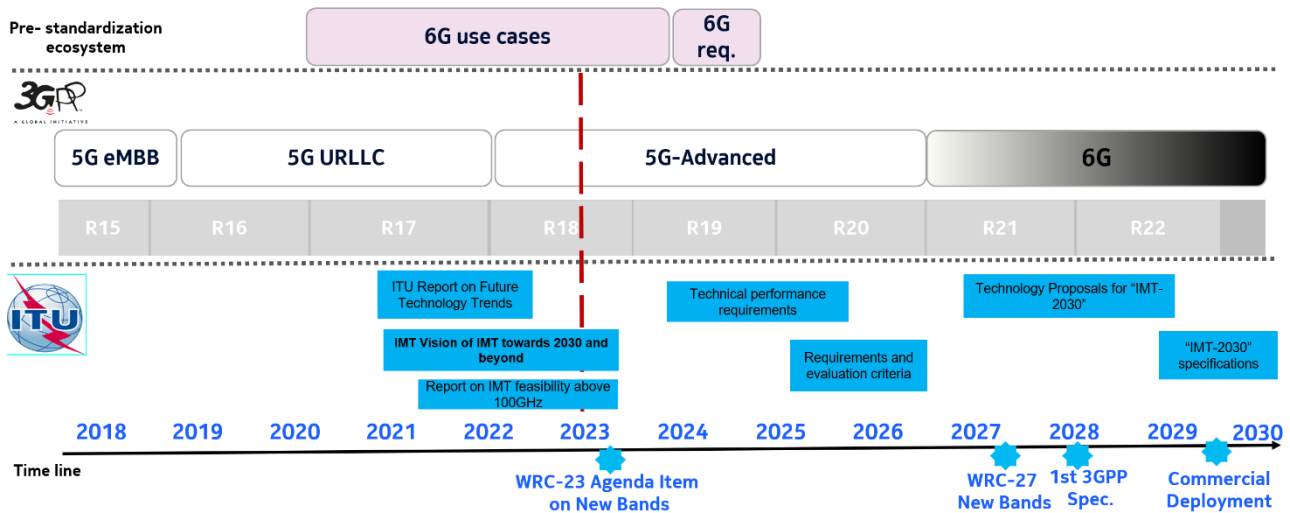
Figure 4-1: 6G standardisation timeline estimates for 3GPP and ITU-R/IMT

4.1 Standardisation and industry groups activities[2]

The Hexa-X-II project sets as a fundamental part of Objective 6 to contribute to standardisation and pre-standardisation activities. Standards Developing Organisations (SDO) and similar organisations where Hexa-X-II can provide input are listed in the Table 4-1. The further details are drawn in the following sub sections.

Table 4-1: Hexa-X-II standardisation and industry groups activities

SDOs	Responsible WP	Topic scope
3GPP SA1	WP1 (T1.4)	Use cases, corresponding requirements and key performance/value indicators
3GPP SA2	WP2 (T2.1), WP3 (T3.4)	Develop the overall 3GPP system architecture and services including User Equipment, Access Network, Core Network, and IP Multimedia Subsystem Architecture modularisation, AI/ML usage, RAN-CN interface, UE-CN and CN-Application (e.g., network exposure) interfaces.
3GPP SA3	WP2 (T2.4)	Security and privacy threats, and their impact on system resilience, and the techniques to address them, Distributed and trustworthy AI, Quantum-safe crypto, Distributed ledgers, Remote attestation, Context-awareness, etc.
3GPP SA5	WP2 (T2.4), WP6	Flexible network configuration, sustainable and trustworthy AI/ML-based control
3GPP RAN (1,2,3,4)	WP2 (T2.2), WP3, WP4 (T4.1), WP5	Radio Interface architecture and protocols (e.g., MAC, RLC, PDCP, SDAP), the specification of the Radio Resource Control protocol and the Radio Resource Management procedures, Intelligent radio air interface design, flexible spectrum access solutions, Non-Terrestrial Networks

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[2] The method of contribution to SDOs and Industry groups is purely through Hexa-X-II partners. Since Hexa-X-II, as an entity is not a member of such arenas, the active partners will contribute their results which they have developed in the project as a form of contribution and in some cases also cite the Hexa-X-II project.

		(NTN) solutions, Joint communication and sensing (if RAN1 agrees on a study item on the topic), RedCap devices
ITU-R SG1	WP4	Spectrum management
ITU-R SG5	WP4	Terrestrial services
ITU-R WP 5D	WP1	6G vision and requirements.
ITU-T SG5	WP1	EMF, environment, climate action, sustainable digitalisation and circular economy.
ETSI ZSM	WP2 (T2.4, T2.5), WP6	Security and privacy threats Programmability, zero-touch automation, AI-based network management and orchestration, trustworthy management and integration fabric, interdomain network and service management.
ETSI MEC	WP2 (T2.4), WP3 (T3.5)	Security and privacy threats, the techniques to address them, and the use of NDT techniques to evaluate threats and mitigation strategies Edge computing, extreme edge computing
ETSI THz	WP4	Channel modelling, sub-THz radio
ETSI NFV	WP2 (T2.4), WP3 (T3.5)	Security and privacy threats Cloud evolution e.g., dynamic discovery and monitoring different extreme edge nodes, Resource allocation
ETSI ISG SAI	WP2 (T2.4)	Understanding of the risks associated to widespread use and support to AI by networks, including the realisation of relevant proofs of concept
ETSI OSM	WP6	Management and orchestration
NGMN	WP1	Use cases and requirements
O-RAN nGRG	WP1, WP2, WP3	Use case and requirements, architecture
GSMA	WP1	Use cases and requirements
IETF detnet	WP3, WP6	Deterministic network (data plane) and orchestration (control plane)
IETF raw	WP3, WP6	Deterministic network (data plane) and orchestration (control plane)
IETF dmm	WP3, WP6	Mobility management
IETF Security Area	WP2 (T2.4)	On the application of attestation techniques, quantum-safe technologies, and automated certificate and key management procedures to improve security and privacy in next-generation networks.
IRTF NMRG	WP6	AI-based orchestration

BEREC	WP1 (T1.3)	environmental sustainability

4.1.1   The 3rd Generation Partnership Project (3GPP)

3GPP specifications cover cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications [3GPP]. The 3GPP specifications also provide hooks for non-radio access to the core network, and for interworking with non-3GPP networks.

3GPP Service and System Aspects is responsible for the overall architecture and service capabilities of systems based on 3GPP specifications and, as such, has a responsibility for cross 3GPP TSG co-ordination.

3GPP Radio Access Network (TSG RAN) is responsible for the technical co-ordination of the specification work done in Radio Layer 1, 2, 3, UTRAN/E, UTRAN/NG, RAN architecture and related network interfaces.

Hexa-X-II plans to contribute to the following working groups:

- *3GPP SA1 "service requirements"* group, which is responsible to consider and study new and enhanced services, features, and capabilities and identify any corresponding stage 1 requirements to be met by 3GPP specifications. Hexa-X-II, via partners in WP1 (Value, requirements, and ecosystem), can contribute results on forward-looking use cases, corresponding requirements and key performance and value indicators as well as new services and market technology enablers.
- *3GPP SA2 "system architecture and services"* group which is developing the overall 3GPP system architecture and services including user equipment, access network, core network, and IP multimedia subsystem (the radio access network architecture is under TSG RAN's responsibility). SA2 has a system-wide view and defines the main entities of the system architecture, and how these entities are linked to each other. SA2 also defines the main functionality and the information exchange between these entities. Partners in WP2 (E2E System) and WP3 (6G architecture design), of Hexa-X-II can be able to contribute on particular topics such as architecture modularisation, AI/ML usage, RAN-CN interface, etc.
- *3GPP SA3 "Security and privacy"* group defining the requirements and specifying the architectures and protocols for security and privacy in 3GPP systems. SA3 also ensures the availability of cryptographic algorithms which need to be part of the specifications. Hexa-X-II has a dedicated Task 2.4 (Security, privacy, and system level resilience) which will characterize and identify the security and privacy threats, and their impact on system resilience, and the techniques to address them. The active partners in T2.4 may be able to contribute to SA3.
- *3GPP SA5 "Management, orchestration and charging"* group currently responsible for management and orchestration which covers aspects such as operation, assurance, fulfilment, and automation, including management interaction with entities external to the network operator (e.g., service providers and verticals). Flexible network configuration and sustainable and trustworthy AI/ML-based control are two possible candidate topics from Hexa-X-II via its partners in WP2 T2.4 (Security, privacy, and system level resilience) and WP6 (Smart Network Management).
- *3GPP RAN (1,2,3,4)* is the forum in which Hexa-X-II experts in WP2, WP3, WP4 (Radio evolution and innovation) and WP5 (Future devices and flexible infrastructure) can contribute towards the topics such as intelligent radio air interface design, flexible spectrum access, NTN solutions, as well as joint communication and sensing and RedCap devices.

4.1.2   International Telecommunication Union (ITU)

The International Telecommunication Union is a specialized agency of the United Nations responsible for many matters related to information and communication technologies [ITU]. ITU is at the very heart of the ICT sector, brokering global agreements on technologies, services, and allocation of global resources like radio-frequency spectrum and satellite orbital positions, to create a seamless global communications system that's robust, reliable, and constantly evolving.

The contribution toward ITU has been started in the previous project (Hexa-X) and will continue in Hexa-X-II in particular in the in the following groups:

ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits that ensure safety of life on land, at sea and in the skies. ITU-R study group mostly relevant to Hexa-X-II work (WP4 (Radio evolution and innovation)) is Study Group 1 (SG 1) spectrum management as well as Study Group 5 (SG 5) terrestrial services. Working Party 5D (WP 5D) is also identified for the work in Hexa-X-II WP1 (Value, requirements, and ecosystem) on 6G vision and requirements.

ITU Telecommunication Standardisation Sector (ITU-T) assembles experts from around the world to develop international standards known as ITU-T Recommendations which act as defining elements in the global infrastructure of Information and Communication Technologies (ICT). The most relevant ITU-T study group is Study Group 5 (SG5) electromagnetic field (EMF), environment, climate action, sustainable digitalisation and circular economy which is related to the work in Hexa-X-II WP1 (Value, requirements, and ecosystem).

4.1.3   European Telecommunications Standards Institute (ETSI)

ETSI is a European Standards Organisation, an independent, not-for-profit organisation in the field of information and communications technologies. It is a recognized regional standards body dealing with telecommunications, broadcasting and other electronic communications networks and services [ETSI]. As for ITU, Hexa-X has contributed to the ETSI and planned to continue the activity through the lifetime of the Hexa-X-II project.

Hexa-X-II has identified the following Industry specification groups (ISG) to which the project can provide contributions:

Zero touch network and Service Management (ZSM) develops full end-to-end automation of network and service management which is an urgent necessity for delivering services with agility and speed and ensuring the economic sustainability of the very diverse set of services offered by digital service providers. Partners in Hexa-X-II WP6 (Smart Network Management) could be able to contribute in this ISG, in particular on the topics such as programmability, zero-touch network automation, AI-based network management and orchestration integration fabric and trustworthy management. Partners in WP2 in particular Task 2.5 and WP6 can also provide contribution toward interdomain network and service management for this ISG. Security and privacy threats are the possible topics which partners in Hexa-X-II WP2 T2.4 can contribute.

Multi-access Edge Computing (MEC) is focus on cloud computing capabilities and IT service environment at the edge of the network. To this end, partners in WP2 (E2E system) and in particular Task 2.4 may be able to contribute on the security and privacy threats, the techniques to address them, and the use of NDT techniques to evaluate threats and mitigation strategies. Partners in WP3 task 3.5 (cloud and virtualization evolution) can also provide contributions on the extreme edge and cloud computing aspects.

Terahertz technology (THz) provides the opportunity for pre-standardisation efforts on THz technology resulting from various collaborative research projects and being extended with relevant global initiatives, towards paving the way for future standardisation of the THz technology. Hexa-X-II WP4 (Radio evolution and innovation) active partners may consider this ISG for the contribution in topics of channel modelling, sub-THz radio, etc.

Network Function Virtualisation (NFV) has developed different specifications and reports for the virtualisation of network functions, with focus on management and orchestration of virtualized resources. This ISG has also studied VNF performance, reliability, and resiliency matters, analysed the security challenges related to virtualisation and has specified associated requirements. In Hexa-X-II, WP3 (in particular Task 3.5) may be able to place the outcome of the studies in NFV. Security and privacy threats are the possible topics which partners in Hexa-X-II WP2 T2.4 can contribute.

ISG on Securing Artificial Intelligence (SAI) focuses on three key areas: using AI to enhance security, mitigating against attacks that leverage AI, and securing AI itself from attack. WP2 Task 2.4 partners can contribute on topics on the application of attestation techniques, quantum-safe technologies, and automated certificate and key management procedures to improve security and privacy in next-generation networks.

ETSI Open-Source MANO (OSM) is developing an open-source Management and Orchestration (MANO) stack aligned with ETSI NFV. Active partners in Hexa-X-II WP6 (Smart Network Management) could target OSM for contribution on relevant topics in management and orchestration.

4.1.4   Next Generation Mobile Networks (NGMN)

The Next Generation Mobile Networks (NGMN) Alliance is a mobile telecommunications association of mobile operators, vendors, manufacturers and research institutes [NGMN]. It was founded by major mobile operators in 2006 as an open forum and its goal is to ensure that next generation network infrastructure, service platforms and devices will meet the requirements of operators and, ultimately, will satisfy end user demand and expectations. The vision of the NGMN Alliance is to provide impactful guidance (e.g., to the work plans in SDOs) to achieve innovative and affordable mobile telecommunication services for the end user. The main focus of NGMN is on supporting 5G's full implementation as well as highlighting 6G key trends across technology and societal requirements and use cases. Hexa-X started shaping NGMN activities in 6G dissemination e.g., NGMN's whitepaper on "6G use cases and analysis" [NGM22] contained Hexa-X results on 6G Vision, Use Cases and Key Societal Values. Hexa-X-II, via the involved partners will continue contributing to NGMN works.

4.1.5   O-RAN Alliance

O-RAN alliance is a world-wide association of mobile operators, vendors, research and academic institutions [ORAN]. The main mission of this alliance is to re-shape the radio access networks towards more intelligent, open, virtualized and fully interoperable mobile networks. O-RAN specifications target at enabling a more competitive RAN supplier ecosystem with faster innovation to improve user experience.

The next Generation Research Group (nGRG) is a research task force founded by the O-RAN alliance in June 2022 [nGRG]. The mission of this research group is to provide a forum to facilitate O-RAN related 6G research efforts and to publish research findings as well as to leverage industry and academic 6G research efforts. It determines how O-RAN will evolve to support 6G and beyond, considering regional research efforts, ITU-R, and 3GPP development through white papers and research reports. Hexa-X-II partners in particular in WP1 (Value, requirements, and ecosystem) and WP2 (E2E system) and WP3 (6G architecture design) can contribute to various O-RAN and O-RAN nGRG Research Streams such as architecture and management.

4.1.6   Global system for Mobile Communications Association (GSMA)

The GSMA is a global organisation aiming at unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change [GSMA]. GSMA vision is to unlock the full power of connectivity so that people, industry, and society thrive. GSMA is representing mobile operators and organisations across the mobile ecosystem and adjacent industries. The main focus of GSMA is threefold: Industry Services and Solutions, Connectivity for Good, and Outreach. Same as Hexa-X, the members of Hexa-X-II will continue monitoring the activities in GSMA as well as possibly provide input to influence the various discussions in the group.

4.1.7   Internet Engineering Task Force (IETF) and Internet Research Task Force (IRTF)

The IETF is the main standards development organisation for Internet related technology. It was founded in 1986 and it is organized in working groups structured within areas [IETF]. Quoting RFC 3935: *"the overall goal of the IETF is to make the Internet work better. Its mission is to produce high quality, relevant technical and engineering documents that influence the way people design, use, and manage the Internet in such a way as to make the Internet work better. These documents include protocol standards, best current practices, and informational documents of various kinds."* [RFC35]

The IETF has a sister organisation – the IRTF – focused on more long term research problems. Standards produced by both IETF and IRTF have the form of request for comments (RFC).

Hexa-X-II has identified the following working groups (WG) and research groups (RG) to which the project can provide contributions:

Deterministic Networking (DetNet) and **Reliable and Available Wireless (RAW)** WGs which focus on mechanisms to enable deterministic networking at layer 3 over wired and heterogeneous wireless networks. The RAW WG actually extends the DetNet concepts focussing on the wireless aspects. Hexa-X-II partners can contribute with data and control plane extensions (WP3) devoted to enhancing deterministic connectivity and higher reliability, also benefiting from AI-based prediction-enabled orchestration (WP6).

Distributed Mobility Management WG is responsible of IPv6-based mobility work at the IETF. While this might not be the main focus of Hexa-X-II, there are some mobility under virtualisation environments (where it is not the end-user device which moves, but a function or a resource hosting a function) which might be of interest for the project (WP3 and WP6 potential scope).

IETF Security Area focused particularly on security protocols which provide one or more of the security services: integrity, authentication, non-repudiation, confidentiality, and access control. Partners active in Hexa-X-II WP2 Task 2.4 can identify topics for contribution such as the application of attestation techniques, quantum-safe technologies, and automated certificate and key management procedures to improve security and privacy in next-generation networks.

Network Management RG is a research groups belongs to the IRTF and it is looking at longer term research topics related to network management. One of the main areas being tackled currently is the application of AI to network management, which aligns naturally to WP6 topics.

4.1.8   Body of European Regulators for Electronic Communications (BEREC)

BEREC contributes to the development and better functioning of the internal market for electronic communications networks and services [BER23]. It does so by aiming to ensure a consistent application of the EU regulatory framework and by aiming to promote an effective internal market in the telecoms sector. Furthermore, BEREC assists the European Commission and the national regulatory authorities in implementing the EU regulatory framework for electronic communications. Active partners in WP1 in particular Task 1.3 (Economic sustainability) work toward contribution in BEREC on environmental sustainability topics.

5   Clustering plan and activities for international cooperation

This chapter is a plan on how Hexa-X-II shall work to promote international cooperation at European and at global level. This goal is addressed in three ways:

- Participate and collaborate in major international 5G/6G events,
- Contribute to workshops with counterparts outside EU, on the international scene,
- Engage digitally with international experts.

Key for the success of this plan is the internal repository where data on events, workshops, and contacts is registered. The plan is made in close interaction with WP1, especially for topics related to sustainability and social acceptability, where all Hexa-X-II partners are involved.

In this section, we first introduce an overview of our clustering plan for international cooperation and exchange of results; then, we describe how Hexa-X-II will contribute to the participation of international events. Figure 8 illustrates how concrete activities relate to the objective and purpose.
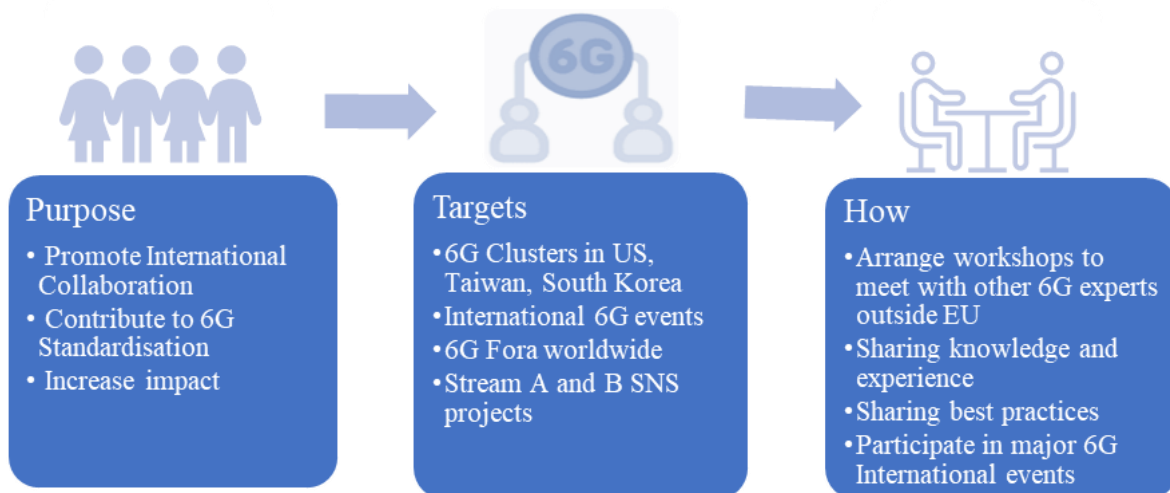
Figure 5-1: Illustration of purpose, targets and method of the activities for cooperation.

5.1.1   International cooperation

The objective of the activity in this context is to foster cooperation with other global areas. This shall form a meta-cluster together with the SNS program and other 6G initiatives. The project will engage with other SNS consortia and projects. Moreover, the focus shall be to foster cooperation with associations such as:

- Global 6G Fora
- Other international initiatives on 6G services
- 6G clusters in the USA, Japan, Korea, India, and other global areas interested in the 6G evolution.

This plan adds digital engagement to the original description of THIS ACTIVITY. We see this as a natural and complementary component of the clustering activities. All activities require that Hexa-X-II build a repository of contacts, events, and workshops. In collaboration settings, Hexa-X-II members promote:

- exchange of results
- sharing knowledge and experience
- best practices for the emerging 6G services to different relevant verticals

This fits the purposes of liaison, result improvement, vertical insight relaxes such demands, especially in early phases of the project.

This activity has primarily the responsibility of searching and reaching out in the international community, and coordinating contacts, events, and workshops. Other WPs in Hexa-X-II and different project beneficiaries will carry out the actual clustering activities, which are events participation and arranging workshops. All activities must be closely coordinated with Task 7.1 regarding Dissemination & Communication.

Summarizing the following main responsibilities are envisaged:

- Search and reach out for international events and workshops, register, and promote internally.
- Search for international contacts, register, and enable digital contacts.
- Enable reporting from event participation.
- Identify suitable workshops.
- Update contact list for dissemination collaborating with the SNS ICE support action.

5.1.2   Participation to international events

This activity concerns the Hexa-X-II participation in international events. The activity needs to identify events, prioritize, and decide whether to be involved, and actually participate. We foresee that our participation will have different characteristics throughout the next 2 years.

- 2023: Get involved in new 6G initiatives worldwide
- 2024-25: Mainly contribute with presentations., aiming to converge on a 6G system view, and seek global alignment

In the initial phases it is common to seek new insight and build a network – in later phases we will be in the position to contribute significantly drawing upon expected results.

In order to participate in an international event, the following procedure is the preferred approach. This is to ensure a push on activities, being able to reach objectives, and coordination of available budgets.

Table 5-1: Routine for event planning and participation.

What	Who (and where)
Search for and identify event: register event in excel sheet	Task 7.4 and the whole project personnel All beneficiaries
Assess and categorize events Promote internally in Hexa-X-II	Task 7.4
Prioritize, participate	To be discussed in regular WP7 meetings according to the purpose of international clustering Consensus for decision criteria will be built over time
Report participation and recommend events for future participation in shared excel	Event participants
Update overview of contacts	Event participants

There are additional ways to engage in the international cluster, as alternative or complementing activity. Many 6G associations are reaching out to their stakeholders digitally to get comments and input on ideas, news or implementations. We encourage all Hexa-X-II partners to consider themselves as representatives and agents in the ongoing 6G debate. Task 7.4 will as far as possible, identify and share arenas and happening of this sort. We also call on everybody in Hexa-X-II to engage digitally on the global scene.

Concerning the responsibility for coordinating contributions to workshops in international conferences or events, the project will focus on searching for and identifying international workshops, register, assess and categorize, and promote internally. Furthermore, the project shall ensure that contact details are registered, and included in Hexa-X-II contact list.

The workshops can take different forms. Ideas collected from project partners fall into the following categories.

- Coordinate with, and be part of other international workshops
- Arrange workshop sessions as part of international conferences (e.g., Globecom 2023)
- A partner arranges general workshops where HEXA-X-II is invited to participate
- Workshops organized solely by HEXA-X-II or in cooperation with other SNS JU projects

HEXA-X-II has decided that one element in the international clustering activity is to interact digitally with relevant stakeholders. With digital contact we mean to invite others to our events, to disseminate open reports and newsletters, and generally to report the status (e.g., a project review result). This activity requires a contact list with contact details, e.g., email.

However, a contact list will contain more information about contacts than a self-subscription link on a web site. We will register name, title, affiliation, and other relevant comments considering the rules of the GDPR EU Directive. Thus, the contact is to a larger degree validated as a relevant stakeholder. This will be done in collaboration with the SNS ICE support action.

Table 5-2: Routine for administering contacts

What	Who (and where)
Search for and identify contacts.	Task 7.4 and all project personnel

register contact in excel sheet	All beneficiaries WP 7
Establish contacts (send first e-mail, invite contact to visit web page, refer to newsletter subscription)	Task 7.4: carry out interaction, follow up All others: carry out interaction where this is natural
Register contact in newsletter subscription list	WP7
Send relevant information to all contacts as a part of regular tasks, e.g., dissemination, reports, newsletters, invitations	WP7, Task 7.1

All HEXA-X-II participants will meet new people and make first contact. This activity is a formalisation of this, in order to mobilize an international cluster of relevant stakeholders. The plan addresses the purpose of improving results from projects use cases, promote international cooperation, and contribute to global 6G acceptability together with WP1/Task 1.6.Next step is to report on event participation and workshops arrangements, in close collaboration with Task 7.1.

6   Conclusion

This deliverable, reporting the plans for the activities related to communication, dissemination, standardisation, exploitation and international activities of Hexa-X-II is an integral part of achieving the project's objectives and ensuring its impact. The plan outlined several key measures, including modern and attractive project branding and visual identity, a project website and social media presence from the project and involved participants, newsletters, press releases, media and EC media support, blog posts, and white papers. By effectively utilizing these channels and tools, Hexa-X-II can reach a wider audience, showcase its work and achievements, and foster engagement and participation from stakeholders. The communication plan will be regularly updated and refined to align with the project's goals and objectives and ensure the project's impact.

Appendix 1: Social Media dissemination KPIs as realised by the date of submission

The social media performance of the Hexa-X-II project is shown in the report generated by Hexa-X-II social media management system **Sprout Social**. The report presents data on the project's impressions, engagement, post link clicks, and net audience growth across social media platforms. These metrics can help the project team understand its audience's preferences and behaviour on social media, as well as identify areas for improvement in its communication strategy. Snapshots of different KPIs of Hexa-X-II's social media accounts for January 1, 2023 – March 27, 2023 are shown in Figure 6-1 – Figure 6-3.
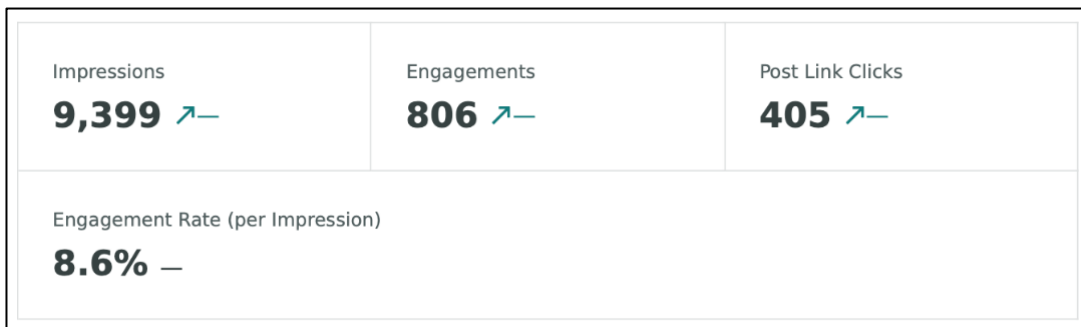

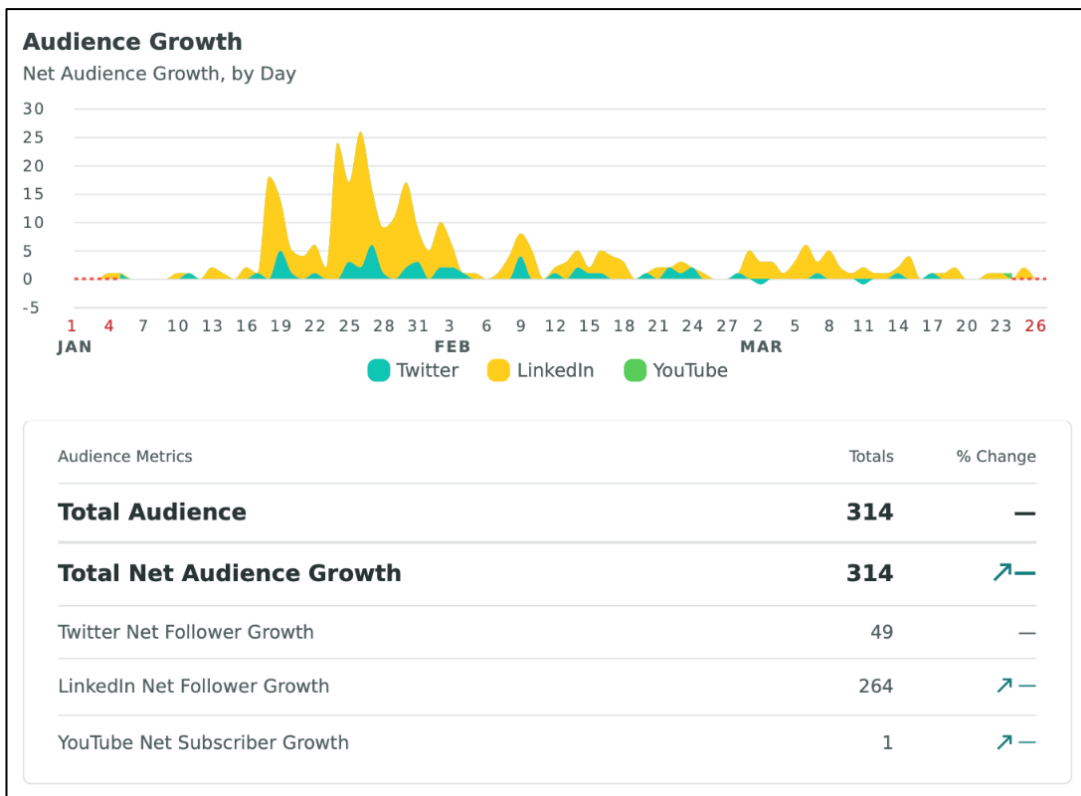Figure 6-1: Social Media Impressions and Engagement: January 1, 2023 – March 27, 2023

Figure 6-2: Social Media audience report: January 1, 2023 – March 27, 2023

Profiles

Profile ▲	Audience	Net Audience Growth	Published Posts	Impressions	Engagements	Engagement Rate (per Impression)	Video Views
Reporting Period Jan 1, 2023 – Mar 27, 2023	314 —	314 ↗—	15 ↗—	9,399 ↗—	806 ↗—	8.6% —	1,029 —
Compare to Oct 7, 2022 – Dec 31, 2022	—	0	0	0	0	—	—
🔵 🐦 **@Hexa_X_II**	49	49	8	1,796	122	6.8%	25
🔵 in **Hexa-X-II**	264	264	7	7,603	684	9%	1,004
🔵 ▶ **Hexa-X-II Project**	1	1	—	N/A	—	N/A	—

Figure 6-3: Social Media profile performance: January 1, 2023 – March 27, 2023

Appendix 2: Hexa-X-II website KPIs

Error! Reference source not found. presents an overview of the website statistics for the Hexa-X-II project. T hese metrics help the project team assess the overall performance of the website and identify areas for improvement. The project team can use this information to optimize the website's content and user experience, ultimately improving its effectiveness in communicating the project's goals and achievements.

Table 6-1: Hexa-X-II website statistics

Metric	Statistic	Explanation
Users	518	The total number of active users.
Views	2,411	The number of web pages your users saw. Repeated views of a single screen or page are counted.
Sessions	1,102	The number of sessions that began on your site.
Engaged sessions	675	The number of sessions that lasted longer than 10 seconds, or had a conversion event, or had 2 or more screen or page views.
Bounce rate	38.75%	The percentage of sessions that were not engaged sessions.
Average session duration	3min 23sec	The average duration (in seconds) of users' sessions.

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