D6.5
Final report on dissemination and communication activities

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Project acronym	REINDEER
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Call	H2020-ICT-52-2020

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Abstract	This report summarizes all dissemination and communication activities carried out since project start and addresses planned activities beyond project lifetime (update of D6.3).
Keywords	Dissemination, communication, infrastructure, website, homepage, internal communication

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Executive Summary

This final report on dissemination and communication activities for the REINDEER project provides a comprehensive overview of efforts undertaken from January 2021 (M01) until December 2024 (M48). It demonstrates the project's commitment to effective outreach and engagement, detailing both completed activities and plans for continued engagement beyond the project's lifetime.

The report is structured into six chapters. **Chapter 2** reflects on the overall importance and scope of dissemination and communication activities within the project, emphasizing their role in enhancing visibility and stakeholder engagement. It summarizes the dissemination and communication strategy as outlined in previous deliverables (D6.1 and D6.3), detailing the internal and external communication frameworks established, including the project website and IT infrastructure. **Chapter 3** outlines the specific dissemination and communication targets set for the project. **Chapter 4** provides a detailed list and descriptions of the executed dissemination and communication activities, highlighting the variety of outreach methods and engagement strategies employed throughout the project. **Chapter 5** is the summary and conclusion and **Chapter 6** includes a list of abbreviations used in the report for clarity and ease of understanding.

During the project, 64 joint papers were published (5 papers are still in progress), demonstrating the intense cooperation within the consortium. Moreover, special actions, such as the Summer School and podcasts in the *Wireless Future* series, reached a large public and significantly enhanced the project's visibility. High visibility was also achieved in prominent EU-level conferences, such as EUCNC, showcasing the project's progress and contributions.

By surpassing key performance indicators (KPIs) related to dissemination and communication, the REINDEER project has laid a solid foundation for long-term impact and continued collaboration in the fields of wireless communication and 6G technologies.

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Chapter 1   Introduction

This deliverable provides a final report, summarizing all dissemination and communication activities carried out since project start and addresses planned activities beyond project lifetime. This provides an update of D6.3, whereby in the final phase of the project specific effort has been invested to target high-impact publications, as suggested in the project review. Several initiatives to also publish the final project results have been started and are expected to result in further dissemination beyond the project duration.

Dissemination & communication activities ensure the visibility and awareness of the project and support the widest adoption of its results among potential users. The REINDEER dissemination & communication plan prepared the way for successful exploitation by facilitating internal communication within the project from the beginning. Dissemination & communication activities were actively pursued from the beginning to the end of the project – engaging continuously with both internal and external audiences. The activities have been clustered into three main phases:
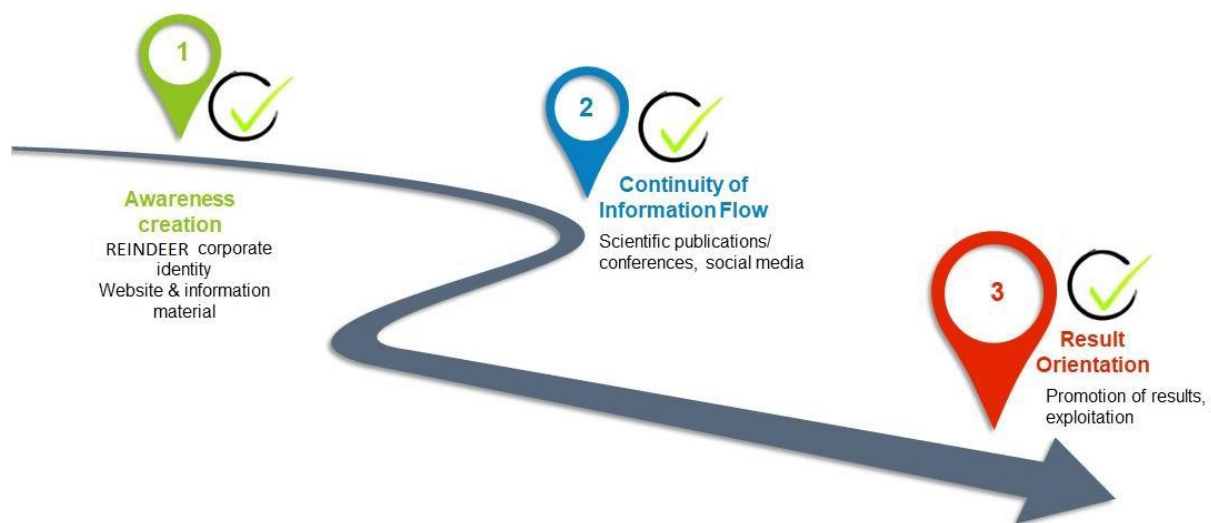

Figure 1: Dissemination and communication phases

The first phase was called *"Awareness Creation"* and consisted of building up the REINDEER branding and identity, as well as establishing the REINDEER website and additional project information material, like templates for documents as well as presentations.

In the second phase called *"Continuity of Information Flow"*, in which the project submitted scientific papers and presentations to conferences, journals and workshops, presented an opportunity to further raise awareness among the scientific and industrial stakeholders. Furthermore, publications, whitepapers and certain deliverables continued to be published on the project website in order to keep interested parties informed about the latest progress. In addition, engaging posts on X (former Twitter) & LinkedIn and on the Blog constituted an important part of keeping the information flow going and increase the interest of multiple audiences. Besides that, newsletters, press releases, posters, information about workshops and conferences, etc. were an integral part of this dissemination phase.

In the third and final phase *"Result Orientation"*, dissemination and communication intensified to the different communities, fed into **exploitation and standardisation**, which means using the results for commercial purposes or in public policymaking. The REINDEER project has successfully passed the three phases.

There will be some ongoing dissemination activities after the project end in order to promote the project results (e.g., project website will stay alive for 5 years, cooperation activities with other projects will continue, talks at conferences will be held, standardisation activities will continue and follow-up projects are likely). The main focus will be to exploit the project outcomes and attract target audience groups. Deliverable D6.6 will focus on the exploitation activities.

Chapter 2   Dissemination and communication strategy

As highlighted in previous deliverables - D6.1 *"Internal and External IT Communication Infrastructure and Project Website"* and D6.3 *"Updated Plan and Initial Report on Dissemination and Communication Activities",* establishing a robust communication and dissemination strategy is fundamental to the success of the project's outreach efforts. Building on this foundation, D6.5 reflects the continued execution and refinement of the REINDEER project's dissemination and communication plan, ensuring alignment with the project's needs and objectives.

The REINDEER project followed the defined strategy that identifies key target audiences, provides argumentation for engaging these audiences, and specifies the appropriate tools and channels for effective outreach (Figure 3). With this approach the project achieved the project's communication and dissemination goals.

In terms of communication, the focus remained on demonstrating the societal benefits of the REINDEER project, particularly by showcasing its benefits for improving connectivity, which today is crucial in many sectors. Through various communication channels, including engagement with the general public, media, and other stakeholders, we aimed to highlight how the project's innovations impact everyday life.

For dissemination, the objective continued to be the transfer of knowledge, ensuring that the project's results and breakthroughs are made available to interested parties. This included stakeholders in research, academia, and industry, who were in a position to apply or build upon the outcomes of the REINDEER project.
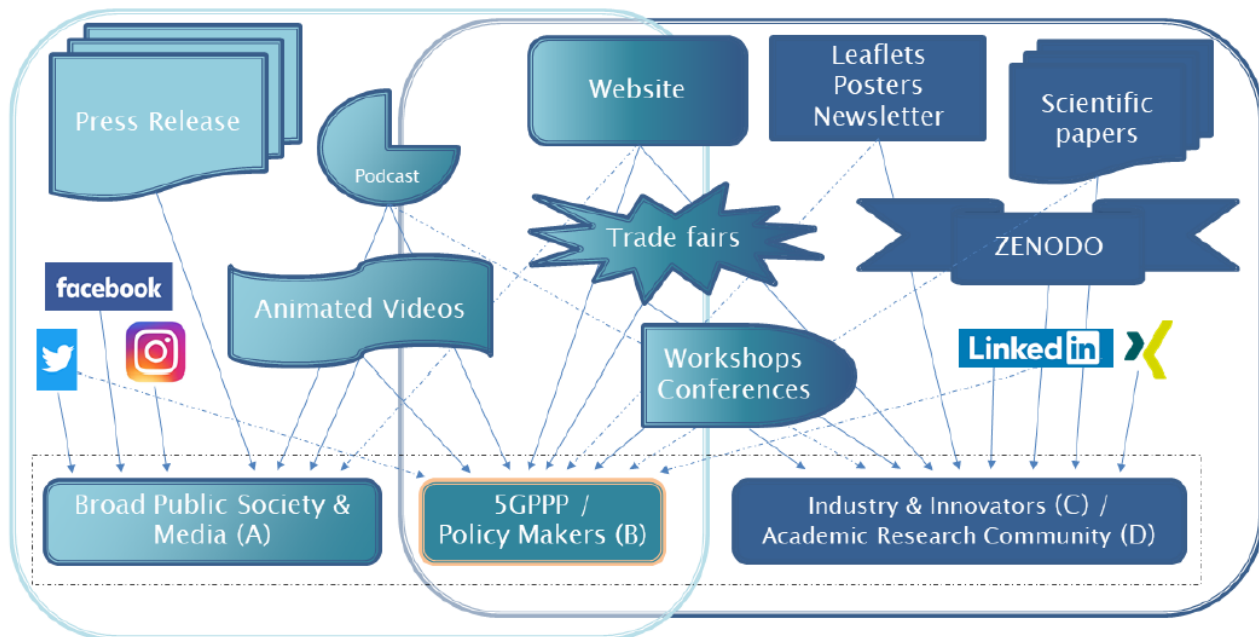

Figure 2: REINDEER Dissemination & Communication strategy

To summarise, within the REINDEER project four main target audience groups were defined:

- **Broad Public Society & Media** (A)**,**
- **Policy Makers incl. the 5G Public-Private Partnership (5GPPP)** (B),

For dissemination:

- **Policy Makers incl. the 5G Public-Private Partnership (5GPPP)** (B),
- **Industry and Innovators** (C)**,** and
- **Academic Research Community** (D).
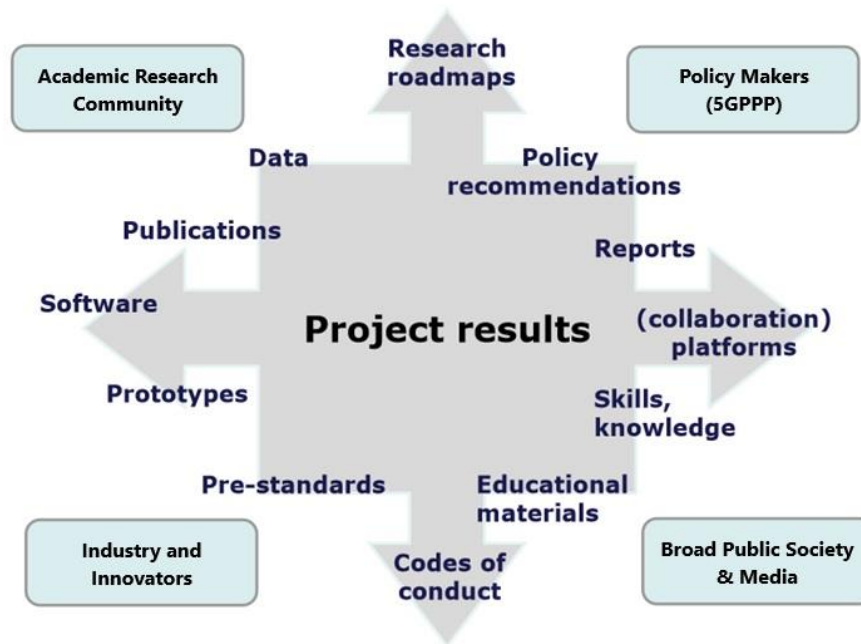
Figure 3: REINDEER target audiences and measures

2.1 Broad Public Society & Media

The Broad Public Society & Media (A) encompass the general public (civic society or citizens), a wide range of organizations, as well as media outlets. According to the EU's definition, Civil Society Organisations include non-State, non-profit, non-partisan, and non-violent structures through which people organize to pursue common objectives and ideals, spanning political, cultural, social, or economic spheres. These organizations operate at local, national, regional, and international levels, including both formal and informal setups.

In the REINDEER project, various channels engaged the public. The project website functioned as a central hub, offering easily accessible materials. Additional communication tools were introduced, including a series of introductory video interviews available on the project website, aimed at fostering engagement. The REINDEER X and LinkedIn account also provided ongoing updates on EU-funded R&I activities, ensuring the project's visibility in the digital space. Moreover, through the partners REINDEER was able to be included in established channels that have a large audience, such as the wireless future podcast and the related blog.

2.2 Policy Makers, including the 5G Public-Private Partnership

Engaging policymakers with the REINDEER project's research and outcomes was a priority to support collaboration, innovation, and the adoption of project results. Effective dissemination to this audience brought multiple benefits: enhancing the visibility of the research, raising the profile of project partners, and securing further understanding and financial support. Moreover, it allowed us to attract

potential end-users and demonstrate the broader socio-economic and policy relevance of REIN-DEER.

Policymakers (B) include members of government departments, legislative bodies, and organizations responsible for developing new rules, laws, and fostering Public-Private Partnership (PPP) relations. REINDEER's involvement with the 5G Public-Private Partnership (5GPPP) - the world's largest 5G research initiative - was important. This partnership, a joint effort between the European Commission and the 5G Infrastructure Association (5G IA), focuses on delivering 5G solutions, architectures, technologies, and standards. REINDEER played an active role in 5GPPP activities, such as workshops and working group meetings, which was mostly relevant in the beginning of the project. Towards the end of the project the efforts were directed to the SNS program.

2.3 Industry and Innovators

For the REINDEER project's innovation to deliver real-world value, it was essential to demonstrate its relevance and applicability to industry stakeholders. Engaging the industry was critical for facilitating the exploitation of project results, which will ultimately contribute to the broader European economy.

Industry and Innovators (C) include companies involved in producing goods and services, such as network equipment manufacturers, system integrators, ICT providers, and sector-specific operators like factories and hospitals. SMEs, which account for 99% of all businesses in the EU, are a key target group. They play an important role in translating research outputs into improved products, services, and processes for the market.

To engage the industry, REINDEER prioritized participation in trade fairs, conferences, and workshops, and provided updates via newsletters, as well as maintained an up-to-date project website. Additionally, two members of the REINDEER Advisory Board were from the industry (Niko, SES-imagotag), further anchoring the project's industrial relevance and ensuring insights from key industry stakeholders.

2.4 Academic Research Community

The Academic Research Community (D) comprises universities, research institutions, and platforms dedicated to generating, sharing, and applying knowledge. This group was vital for both, the dissemination of project results and fostering collaboration on future research initiatives.

REINDEER ensured that all scientific publications were made openly accessible, with full-text articles available via Zenodo. These publications were also linked via DOIs on the project website, ensuring widespread visibility and access for the academic community.

To further engage the research community, REINDEER maintained an active presence on social media platforms like LinkedIn and X, where partners were encouraged to share results with peers and followers. The project's regular newsletter, which provided updates on progress and key findings, is still available on both the website and social media.

In addition to digital engagement, REINDEER actively participated in conferences of European significance, where posters and leaflets were distributed. This physical presence helped to raise awareness of the project within the academic community. Furthermore, project partners were encouraged to present their findings at national conferences in their respective languages, further broadening the scope of REINDEER's impact.

Chapter 3   Dissemination and communication targets

At the beginning of the REINDEER project, a comprehensive communication and dissemination plan was developed, identifying key audiences, the objectives for engaging these groups, and the expected impact of reaching them. This plan served as reference for our final dissemination and communication efforts and can be found in Section 2.2 of the Description of Action (DoA). Throughout the project, we continually assessed the effectiveness of our dissemination and communication activities by measuring progress against a set of predefined Key Performance Indicators (KPIs). These KPIs provided measurable insights into how well we reached our target audiences and the success of our outreach initiatives. Over the course of the project, these KPIs were monitored, updated, and referenced across project reports. They were proven invaluable for ensuring that we met the goals outlined in the communication and dissemination plan, and for making any necessary adjustments along the way to optimize engagement with our audiences. The table below outlines the final status of these KPIs, which reflect the overall impact of REINDEER's dissemination and communication activities:

Dissemination activity/ channel	KPI defined	Numbers reached
REINDEER website	• Number of visits • Number of new and returning visitors	377k visits 115k unique visitors
Social Media	• Number of postings • Number of follower/contacts • Engagement rate	Twitter (X): 148 posts and 88 followers. LinkedIn: 350 followers and 6,6% engagement rate
Scientific journals and conferences	• Number of publications per year • Number of views per publication • Number of attendees • Number of citations • Feedback received	See Table 2, 3 and 4 in sections below
Presentation/ workshops	• Number of attendees • Number of events	See Table 2 and 3 in sections below

Table 1: Final Key Performance Indicators for Dissemination and Communication Activities

Over the lifespan of the REINDEER project, the communication and dissemination activities successfully reached a wide variety of stakeholders, from policymakers to industry leaders, the academic community, and the broader public. The project website served as a central platform, attracting a consistent flow of visitors, while our social media channels and newsletters ensured regular engagement and updates on the project's progress.

Through participation in scientific conferences, workshops, and presentations, the project's results were disseminated to a global audience, leading to meaningful feedback, citations, and further collaboration. Engagement with the academic community was strengthened by open-access publications, which saw significant visibility and interaction.

By the conclusion of the project, all KPIs were achieved, ensuring that REINDEER's outcomes were effectively communicated, contributing to its long-term impact on both research and industry.

Chapter 4 Summary of dissemination and communication activities

4.1 Phase 1: Awareness Creation

Phase 1 focused on establishing the project's visibility and engaging relevant stakeholders by introducing the project's objectives, mission, and expected outcomes to a broad audience.

Table 2: Summary of Phase 1 activities

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[1]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
1	Website	TEC		REINDEER Project website	01/02/ 2021	NA	online	x	x	x	x	~115k[2]	Official project website online: www.reindeer-pro-ject.eu	Interna-tional
2	Social Media	TEC		REINDEER Twitter Ac-count	01/01/ 2021	NA	online	x		x		88[3]	https://twit-ter.com/H2020Reindeer	Interna-tional
3	Social Media	TEC		REINDEER LinkedIn Account	01/01/ 2021	NA	online	x		x		351[4]	https://www.linkedin.com/ company/reindeer-h2020/	Interna-tional
4	Video/ Film	TEC		REINDEER project teaser	08/01/ 2021	08/01/ 2021	online	x	x	x	x	389[5]	https://reindeer-pro-ject.eu/reindeer-quick-overview/ https://vimeo.com/497188 798	Interna-tional
5	Website	TEC		Today in a talk with Erik G. Larsson (LiU)	20/01/ 2021	20/01/ 2021	online	x				N/A	https://reindeer-pro-ject.eu/today-in-a-talk-with-erik-g-larsson-from-linkoping-university-liu/	Interna-tional

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[1] A = Broad Public Society & Media, B = Policy Makers incl. 5GPPP, C = Industry and Innovators, D = Academic Research Community
[2] Total amount of visitors from M01-M46 (end of Oct 2024)
[3] Total number of followers on Twitter (November 2024)
[4] Total number of followers on LinkedIn (November 2024)
[5] Total impressions via Vimeo (November 2024)

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Au-dience[1]					Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D	TOTAL/ KPI		
6	Website	TEC		Solutions for tomorrow's high speed wireless	20/01/ 2021	20/01/ 2021	online					N/A	https://reindeer-pro-ject.eu/solutions-for-to-morrows-high-speed-wire-less/	Interna-tional
7	Press release	EAB		Press release	25/01/ 2021	25/01/ 2021	online	x	x	x	x	N/A	https://www.erics-son.com/en/news/2021/1/ ericsson-in-eu-6g-drive	Interna-tional
8	Other	EAB		Article at "The Voice of 5G & LTE for the Ameri-cas"	25/01/ 2021	25/01/ 2021	online	x	x	x	x	N/A	https://www.5gameri-cas.org/ericsson-a-key-player-in-eu-drive-to-de-velop-6g-multi-antenna-technologies/	Interna-tional
9	Flyer	TEC		Project Leaflet	26/01/ 2021	26/01/ 2021	online	x	x	x	x	N/A	https://reindeer-pro-ject.eu/wp-content/up-loads/2021/01/REIN-DEER_Leaflet_Web.pdf	Interna-tional
10	Other	EAB		Ericsson embarks on 6G journey with REINDEER	26/01/ 2021	26/01/ 2021	online	x	x	x	x	N/A	https://www.mobileworld-live.com/featured-con-tent/top-three/ericsson-embarks-on-6g-journey-with-reindeer	Interna-tional
11	Press release	TEC		REINDEER Announce-ment Letter	27/01/ 2021	27/01/ 2021	online	x	x	x	x	N/A	https://reindeer-pro-ject.eu/wp-content/up-loads/2021/01/REIN-DEER_Announce-ment_Letter-Techni-kon.pdf	Interna-tional
12	Other	EAB		How Ericsson is Power-ing Innovation in 6G Multi-Antenna Technolo-gies	27/01/ 2021	27/01/ 2021	online	x	x	x	x	N/A	https://tele-comdrive.com/how-erics-son-is-powering-innova-tion-in-6g-multi-antenna-technologies/	Interna-tional

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Au-dience[1]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
13	Organi-sation of a Work-shop	KU Leu-ven	LIU	WIC Midwintermeeting 2021: 5G networks – and beyond: technolo-gies for a new applica-tion era	28/01/2021	28/01/2021	online	x		x	x	116[6]	http://www.w-i-c.org/events.html	Interna-tional
14	Website	TEC		Today in a talk with Juan Francisco (TID)	09/02/2021	09/02/2021	online	x				N/A	https://reindeer-pro-ject.eu/today-in-a-talk-with-juan-francisco/	Interna-tional
15	Other	KU Leu-ven		Technologiecampus Gent neemt voortouw in de race naar 6G (page 34-35)	15/02/2021	15/02/2021	online, print	x		x	x	3000[7]	https://iiw.ku-leuven.be/nieuws-en-agenda/connecting	National
16	Website	TEC		Today in a talk with Ul-rich Muehlmann (NXP)	16/02/2021	16/02/2021	online					N/A	https://reindeer-pro-ject.eu/today-in-a-talk-with-ulrich-muehlmann/	Interna-tional
17	Website	TEC		Today in a talk with KU Leuven Team	22/02/2021	22/02/2021	online					N/A	https://reindeer-pro-ject.eu/today-in-a-talk-with-ku-leuven-team/	Interna-tional
18	Partici-pation to other events	EAB		1st IEEE International Online Symposium on Joint Communications & Sensing	23/02/2021	24/02/2021	online	x		x	x	N/A	https://jcns-sympo-sium.org/	Interna-tional
19	Presen-tation	KU Leu-ven		REINDEER's 6G vision, technical enablers and envisioned challenges	16/03/2021	16/03/2021	online	x	x	x	x	>100	https://digital-strat-egy.ec.eu-ropa.eu/en/events/5g-ppp-webinar-europe-ac-celerates-towards-6g	Interna-tional
20	Website	TEC		Today in a talk with Joao Vieira (Ericsson)	16/03/2021	16/03/2021	online	x				N/A	https://reindeer-pro-ject.eu/today-in-a-talk-with-joao-vieira-ericsson/	Interna-tional

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[6] Number of people subscribed before the event, workshop was online, more people may have consulted partial recording afterwards.
[7] Number of magazines distributed

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[1]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
21	Other	TEC		Technikon' s financial webinar for H2020 projects	24/03/ 2021	24/03/ 2021	online	x				2.823[8]	https://vimeo.com/528387638	International
22	Website	TEC		Today in a talk with Technikon Team	13/04/ 2021	13/04/ 2021	online	x				N/A	https://reindeer-project.eu/today-in-a-talk-with-technikon-team/	Inter Inter-national national
23	Presentation	KU Leuven		Technologies exploiting new spatial and spectral dimensions for new applications in 5G, and beyond	16/04/ 2021	16/04/ 2021	online	x				~20	https://etn-peter.eu/wp-content/uploads/2021/04/PETER_NWE2_Online-Event_April-12-16-2021_Detailed_Agenda_zonder-links.pdf	International
24	Press release	TU Graz	NXP, TEC	6G technology: Domestic Trio Working on Tomorrow's Mobile Communications	20/04/ 2021	20/04/ 2021	online	x	x	x	x	N/A	https://www.tugraz.at/en/tu-graz/services/news-stories/media-service/singleview/article/6g-technologie-heimisches-trio-arbeitet-am-mobilfunk-von-morgen0/	National
25	Participation in activities organized jointly with other H2020 projects	EAB		The 5G Infrastructure Association (5G IA) elects its Governing Board and broadens its membership in view of the new 'Smart Networks and Services' European Partnership	23/04/ 2021	23/04/ 2021	online	x	x	x	x	N/A	https://5g-ia.eu/single_post/?slug=the-5g-infrastructure-association-5g-ia-elects-its-governing-board-and-broadens-its-membership-in-view-of-the-new-smart-networks-and-services-european-partnership	International
26	Tutorial lecture	TU Graz		Array Signal Processing	20/05/ 2021	27/10/ 2021	Graz, online	x				6	https://online.tugraz.at/tug_online/pl/ui/$ctx/wbLv.wb	National

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[8] Total number of impressions via Vimeo (November 2024)

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[1]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													ShowLVDetail?pStpSpNr=261643	
27	Other	TEC		5GPPP Annual Journal	02/06/ 2021	02/06/ 2021	online	x		x		N/A	https://5g-ppp.eu/annual-journal/	International
28	Participation to a Workshop	KU Leuven		Smart Networks and Services Info Session	11/06/ 2021	11/06/ 2021	online	x	x	x	x	N/A	https://5g-ppp.eu/smart-networks-and-services-info-session-eucnc-6g-summit/	International
29	Other	TEC		5GPPP Brochure	15/06/ 2021	15/06/ 2021	online	x		x		N/A	https://5g-ppp.eu/flayer-brochure/	International

4.2 Phase 2: Continuation of Information Flow

The goal of the *Continuity of information flow* phase, which started approximately after the first six months of the project, was to raise further awareness among our different target groups.

Table 3: Summary of Phase 2 activities

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
30	Participation to a Conference	LIU		6GWFF 2021 - Radio-Weaves Technology for the sub-6 GHz 6G Physical Layer	01.07. 2021	01.07. 2021	Eurecom, France	x	x	x	x	600+ registered participants	Invited Talk: https://eur01.safe-links.protection.out-look.com/?url=https%3A%2F%2Fwww.6gwff.org%2F&data=04%7C01%7Csarven-dranath.rimalapudi%40liu.se%7C148143f8ba9d418	International

[9] A = Broad Public Society & Media, B = Policy Makers incl. 5GPPP, C = Industry and Innovators, D = Academic Research Community

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													[19ea408d945d16399%7C913f18ec7f264c5fa816784fe9a58edd%7C0%7C0%7C6376175878978952 42%7CUnknown%7CTWFpbGZsb3d8eyJWI-joiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=y1%2F1OXJA-LIk4u6Slmx4x8RLgv5wEkPucz7XaAyS1PrA%3D&reserved=0](#)	
31	Social Media	NXP		An IoT Without Batteries or Cords?	01.08. 2021	01.08. 2021	online	x		x		1500	[https://www.nxp.com/company/blog/an-iot-without-batteries-or-cords:BL-IOT-WITHOUT-BATTERIES-OR-CORDS](#)	Interna-tional
32	Video/Film	TECH-NIKON	KU Leu-ven	Project Audiogram with Liesbet Van der Perre	16.08. 2021	16.08. 2021	online	x		x	x	~280	[https://vimeo.com/techni-kon/reindeer-message](#)	Interna-tional
33	Video/Film	TECH-NIKON		REINDEER Project Video	01.09. 2021	01.09. 2021	online	x	x	x	x	~10.000	[https://vimeo.com/techni-kon/reindeer-s](#)	Interna-tional
34	Partici-pation to a Con-ference	EAB	LIU	Reciprocity calibration of Distributed Massive MIMO Access Points for Coherent Operation	13.09. 2021	16.09. 2021	online				x	N/A	The paper was presented at PIMRC 2021. The 2021 IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC 2021) will bring together global experts to the es-teemed scientific and technical forum dedicated	Interna-tional

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													to diverse facets of wire-less communications. https://pimrc2021.ieee-pimrc.org/	
35	Social Media	NXP		Blog Article	01.10. 2021	01.10. 2021	Online	x				N/A	https://www.nxp.com/company/about-nxp/smarter-world-blog:BLOGS#/	Interna-tional
36	Flyer	TECH-NIKON		1st Newsletter	04.10. 2021	04.10. 2021	online	x	x	x	x	N/A	https://reindeer-pro-ject.eu/first-newsletter-now-available/	Interna-tional
37	Other	TECH-NIKON	KU Leu-ven	1st Podcast with Liesbet Van der Perre	04.10. 2021	04.10. 2021	online	x	x	x	x	50	https://omny.fm/shows/euvation/reindeer-1-h2020-project	Interna-tional
38	Lecture	KU Leu-ven		One World Signal Pro-cessing Seminar Series	20.10. 2021	20.10. 2021	Online	x			x	124	Invited talk: The quest for future connected environ-ments: the potential of RadioWeaves technology. https://www.youtube.com/watch?v=8F4q8qOBRk8	Interna-tional
39	Panel debate	LIU	KU Leu-ven	Erik G. Larsson partici-pated and debated in a panel organized by NYU Wireless, Liesbet Van der Perre was co-organ-izer of the event	28.10. 2021	28.10. 2021	online	x	x	x	x	approx. 75	https://wireless.engineer-ing.nyu.edu/	Interna-tional
40	Confer-ence	KU Leu-ven		A Multi-band Solution for Interacting with Energy-Neutral Devices	30.10. 2021	03.11. 2021	online				x	+300 regis-tered	https://www.asilom-arsscconf.org/	Interna-tional
41	Podcast	LIU	KU Leu-ven	Liesbet Van der Perre guest on the Wireless Future podcast show	10.11. 2021	10.11. 2021	YouTube, Spotify, Ap-ple, ...	x	x	x	x	~1000	https://www.youtube.com/watch?v=jq-r3XO9zKw&list=PLTv48TzNRhaKqYJl-NucvpaN6Mr8Slkk8Z&in-dex=20	Interna-tional

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
42	Partici-pation to a Con-ference	LIU		Carrier Synchronization in Distributed Radio-Weaves	10.11. 2021	12.11. 2021	online				x	est. 25	http://www.wsa2021.org/	Interna-tional
43	Tutorial lecture	LIU	ULUND	Tutorial on distributed MIMO to students in H2020-MINTS, deliv-ered by Erik G. Larsson in Lund (some industry people also attended)	12.11. 2021	12.11. 2021	Lund	x		x	x	est. 20	Tutorial lecture	Interna-tional
44	Partici-pation to other events	KU Leu-ven	TEC	Present progress of REINDEER in 5G-PPP context	26.11. 2021	26.11. 2021	online		x	x		~30	5GPPP Architecture WG (Project presentations of MARSAL, REINDEER, Hexa-X)	Interna-tional
45	Other	TECH-NIKON	LIU	2nd Podcast with Erik Larsson	23.12. 2021	23.12. 2021	online	x	x	x	x	84	https://reindeer-pro-ject.eu/reindeer-podcast-2/	Interna-tional
46	Partici-pation to a Work-shop	KU Leu-ven		Presented REINDEER in 5G-PPP workshop	18.01. 2022	19.01. 2022	online		x	x	x	~25	5G-PPP TB workshop	Interna-tional
47	Partici-pation to a Work-shop	KU Leu-ven	TSA	ICT-52 Workshop on 6G	03.02. 2022	04.02. 2022	online		x	x	x	>200	Liesbet Van der Perre (KU Leuven) and Juan Francisco Esteban Rivas (Telefonica) presented the REINDEER project at the ICT-52 workshop on 6G: https://reindeer-pro-ject.eu/ict-52-workshop-on-6g-2/	Interna-tional
48	Partici-pation to a Work-shop	TU Graz	ULUND	COST CA20120 INTER-ACT 2nd MC Meeting and 1st Technical Meet-ing	08.02. 2022	11.02. 2022	Bologna, IT and online			x	x	80 on site + 200 online	COST Action "Intelli-gence-Enabling Radio Communications for Seamless Inclusive Inter-actions (INTERACT)";	Interna-tional

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													https://inter-actca20120.org/meet-ings/2nd-mc-meeting-and-1st-technical-meeting/	
49	Social Media	TECH-NIKON	KU Leuven	Happy International Women`s Day!	08.03. 2022	08.03. 2022	online					N/A	Cooperation activity with the 5GPP initiative WiTaR "Women in Telecommunication and Research": https://reindeer-project.eu/happy-international-womens-day/	International
50	Presentation	KU Leuven		5G: Where are we (going) in EU-China relations?	27.04. 2022	27.04. 2022	Online (EU-China)		x			35	Closed event - link to ppt presentation added in events list	International
51	Participation to other events	KU Leuven		Visit to POSTECH, Pohang University of Science and Technology, South Korea	15.05. 2022	15.05. 2022	Seoul, South Korea				x	30	Invited lecture co-authored by REINDEER partners on distributed architectures for 6G	National
52	Participation to a Conference	EAB		ICC 2022, Seoul South-Korea	16.05. 2022	20.05. 2022	Seoul, South Korea				x	approx. 2000 participants	Uplink D-MIMO with Decentralized Subset https://doi.org/10.1109/ICC45855.2022.9838868	International
53	Participation to a Conference	LIU		ICC 2022, Seoul South-Korea	16.05. 2022	20.05. 2022	Seoul, South Korea				x	approx. 2000 participants	Energy-Efficient Power Allocation for an Underlay Spectrum Sharing Cell-Free Massive MIMO Network https://doi.org/10.48550/arXiv.2208.04668	International
54	Participation to a Conference	TU Graz	LIU	ICC 2022, Seoul South-Korea	16.05. 2022	20.05. 2022	Seoul, South Korea				x	approx. 2000 participants	Conference Paper: Location-based Initial Access for Wireless Power Transfer with Physically Large Arrays (TU Graz, LIU)	International

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													https://doi.org/10.48550/arXiv.2202.10749	
55	Work-shop	ULUND	KU Leuven	ICC 2022, Seoul South-Korea	16.05. 2022	20.05. 2022	Seoul, South Korea				x	approx. 2000 participants	Organized a workshop on "Synergies of sensing, communication, and localization towards 6G".	International
56	Participation to a Conference	KU Leuven		SITB 2022	01.06. 2022	02.06. 2022	Louvain-la-Neuve, Belgium				x	N/A	Presentation of a paper on Grant-Free Random Access in Massive MIMO for Static Low-Power IoT Nodes Symposium on Information Theory and Signal Processing in the Benelux (SITB 2022) https://sites.google.com/view/sitb2022/home	International
57	White paper	EAB		Beyond 5G/6G KPIs and Target Values	03.06. 2022	03.06. 2022	online				x	1296	White paper on 6G KPIs https://reindeer-project.eu/beyond-5g-6g-kpis-and-target-values/	International
58	Panel debate	KU Leuven		EUCNC 2022	07.06. 2022	10.06. 2022	Grenoble, France				x	approx. 1600 participants	Developments and Challenges Enabling 6G THz Radio HW EuCNC Panel Contribution https://www.eucnc.eu/programme/panels/panel-3/	International
59	Participation to a Conference	KU Leuven		EUCNC 2022	07.06. 2022	10.06. 2022	Grenoble, France		x	x	x	approx. 1600 participants	Techtile testbed introduction	International
60	Participation to a Conference	KU Leuven		EUCNC 2022 - EuCNC Workshop organized by Hexa-X	07.06. 2022	10.06. 2022	Grenoble, France				x	approx. 1600 participants	Attend workshop organized by Hexa-X	International

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													https://www.eucnc.eu/pro-gramme/workshops/work-shop-2/	
61	Keynote at work-shop	LIU		Technical Challenges and Solutions in Radio-Weaves for 6G	19.06. 2022	19.06. 2022	Finland			x	x	10	IEEE VTC 2022 work-shops	Interna-tional
62	Flyer	TECH-NIKON		2nd Newsletter	22.06. 2022	22.06. 2022	Online	x	x	x	x	N/A	https://reindeer-pro-ject.eu/newsletter-issue-02-2/	Interna-tional
63	Partici-pation to a Con-ference	KU Leu-ven	ULUND	IEEE SPAWC 2022 Conference	04.07. 2022	06.07. 2022	Oulu, Finland				x	N/A	Presentation of paper: Dy-namic Federations for 6G Cell-Free Networking: Concepts and Terminol-ogy - IEEE SPAWC con-ference https://2022.iee-espawc.org/	Interna-tional
64	Summer School Tech-nical Talk	TU Graz, KU Leu-ven, ULUND, LIU		6G beyond communica-tions: Positioning, sens-ing, and wireless power transfer	29.08. 2022	01.09. 2022	Linköping, Sweden				x	100	2022 IEEE SPS - EURA-SIP summer school on "Defining 6G: Theory, Ap-plications, and Enabling Technologies" (https://6g-school.com/)	Interna-tional
65	Invited Work-shop Talk	TU Graz		6G wireless networks beyond communica-tions: Positioning, sens-ing, and power transfer	19.09. 2022	22.09. 2022	Valencia, Spain and online				x	200	Joint Workshop COST IN-TERACT + 6G JIC Huawei-iTEAM on "Ena-bling Technologies for 6G" (https://inter-actca20120.org/meet-ings/3rd-mcm-and-tech-nical-meeting/)	Interna-tional
66	Partici-pation to a Work-shop	TU Graz		Wireless Power Transfer Using Physically Large Arrays	21.09. 2022	21.09. 2022	Graz, Austria	x		x	x	100	TU Graz – Science for Fu-ture https://www.tugraz.at/en/r	National

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]					Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D	TOTAL/ KPI		
													esearch/fields-of-expertise/tu-graz-science-for-future/2022-digital-visions/	
67	Participation to a Workshop	TU Graz		Synthetic Aperture Channel Sounding for Wireless Power Transfer	19.10. 2022	19.10. 2022	online		x		x	20	IEEE Synthetic Aperture Standardization Committee (SASC)	International
68	Organisation of a Workshop	ULUND	KU Leuven	Arranged special session on "Decentralized Baseband Processing" where one joint ULUND and KU Leuven paper on REINDEER was presented.	30.10. 2022	30.10. 2022	Monterrey, California. Online.				x	30		International
69	Conference presentation	KU Leuven	LIU	RadioWeaves For Communication, Positioning, And WPT: How To Share Resources?	30.10. 2022	02.11. 2022	USA				x	N/A	Asilomar Conference on Signals, Systems and Computers (ASILOMAR 2022)	International
70	Participation to a Conference	EAB	LIU	D-MIMO Processing and Combining Using Kalman filter	04.12. 2022	08.12. 2022	Rio de Janeiro, Brazil				x	approx. 2000 participants	IEEE Globecom conference https://globecom2022.ieee-globecom.org/	International
71	Participation to a Conference	KU Leuven		Finite Precision Implementation of Recursive Algorithms for Uplink Detection in Cell-Free Networks	04.12. 2022	08.12. 2022	Rio de Janeiro, Brazil				x	approx. 2000 participants	IEEE Globecom conference https://globecom2022.ieee-globecom.org/	International
72	Participation to a Conference	LIU	EAB	Dynamic Range Improvement in Bistatic Backscatter Communication Using Distributed MIMO	04.12. 2022	08.12. 2022	Rio de Janeiro, Brazil				x	approx. 2000 participants	Presentation of the paper: Dynamic Range Improvement in Bistatic Backscatter Communication Using Distributed MIMO - IEEE Globecom conference	International

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
												https://globecom2022.ieee-globecom.org/	
73	Other	LIU	KU Leu-ven	6G Urging new network-ing concepts and termi-nology – Wireless Fu-ture Blog	08.12. 2023	08.12. 2023	online	x	x	x	x	N/A	https://ma-mimo.el-lintech.se/2022/12/08/6g-urging-new-networking-concepts-and-terminol-ogy/	Interna-tional
74	Other	KU Leu-ven		White Paper: The 6G Architecture Landscape – European perspective	06.02. 2023	06.02. 2023	online	x		x	x	3000	https://zenodo.org/rec-ords/7313232#.Y-TFtS-ZNaQ	Interna-tional
75	Social Media	TU Graz	TECHNI-KON	Video: Synthetic Aper-ture Testbed	25.05. 2023	25.05. 2023	Online	x			x	N/A	Making a reel (short video clip) for social media - blog post based on ICASSP paper: https://reindeer-pro-ject.eu/icassp-2023-work-shop-on-signal-pro-cessing-for-synthetic-ap-ertures/	Interna-tional
76	Partici-pation to a Con-ference	TU Graz		XL-MIMO Channel Mod-eling and Prediction for Wireless Power Transfer	28.05. 2023	01.06. 2023	Rome, Italy				x	2000	IEEE ICC	Workshop pa-per; https://arxiv.org/abs/2302. 11969 conference: https://icc2023.ieee-icc.org/	Interna-tional
77	Partici-pation to a Work-shop	TU Graz	ULUND	Propagation Modeling for Physically Large Ar-rays: Measurements and Multipath Compo-nent Visibility'	25.05. 2023	25.05. 2023	Barcelona, Spain				x	150	COST INTERACT TD presentation of the results from D1.2	Interna-tional
78	Partici-pation to a Work-shop	TU Graz		Bistatic MIMO Radar Sensing of Specularly Reflecting Surfaces for Wireless Power Transfer	04.06. 2023	10.06. 2023	Rhodes, Greece				x	4000	IEEE ICASSP	Workshop paper accepted https://sa-groups.ieee.org/sps-	Interna-tional

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													sasc/icassp-2023-work-shop	
79	Other	KU Leu-ven	EAB, TU Graz, TEC	White paper contribution: Towards Sustainable and Trustworthy 6G – Challenges, Enables and Architectural Design	06.06.2023	06.06.2023	Online		x		x	Down-loaded: 83049 times	REINDEER Contribution to Book in several chapters: http://dx.doi.org/10.1561/9781638282396	International
80	Organi-sation of a Work-shop	KU Leu-ven		EuCNC - Workshop Synergies between communication, localization, and sensing towards 6G	06.06.2023	06.06.2023	Gothenburg, Sweden					40	https://www.eucnc.eu/programme/workshops/workshop-1/	International
81	Partici-pation to a Work-shop	TU Graz	KU Leu-ven	Propagation characteristics and channel models for large scale antenna arrays: Application to RadioWeaves infrastructure for communication and positioning	06.06.2023	09.06.2023	Gothenburg, Sweden				x	1700	IEEE EUCNC workshop presentation of propagation modeling	International
82	Partici-pation to a Con-ference	TU Graz	ULUND	Propagation Modeling for Physically Large Arrays: Measurements and Multipath Component Visibility'	06.06.2023	06.06.2023	Gothenburg, Sweden				x	1700	IEEE EUCNC paper presenting results from D1.2	International
83	Other	KU Leu-ven		7th European 5G Annual Journal	06.06.2023	06.06.2023	Online	x		x		N/A	https://reindeer-project.eu/7th-european-5g-annual-journal/	International
84	Other	EAB		Whitepaper: Beyond 5G/6G KPI Measurement	07.06.2023	07.06.2023	Online		x		x	N/A	Contribution to 5GAA white paper by REINDEER team	International
85	Partici-pation in confer-ence	KU Leu-ven		EuCNC Panel participation: Sustainability Challenges and Opportunities in 6G	08.06.2023	08.06.2023	Gothenburg, Sweden				x	N/A	https://www.eucnc.eu/programme/panels/panel-3/	International

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
86	Panel at conference	LiU		Panel in the IEEE Communication Theory Workshop	02.07. 2023	05.07. 2023	Hualien, Taiwan					est. 100	https://ctw2023.ieee-ctw.org/#:~:text=Welcome%20to%20IEEE%20Communication%20Theory%20Workshop%202023%20Welcome,interactive%20atmosphere%2C%20in%20contrast%20to%20more%20formal%20conferences. Panel: The Role of Information Theory in 6G and organisation of session 2 "Electromagnetics and Wireless Communications" --> program: https://ctw2023.ieee-ctw.org/program	International
87	Social Media	TECH-NIKON		Interview with Technikon	17.08. 2023	17.08. 2023	online			x	x	248	Marion Habernig from Technikon is talking about the REINDEER project and its challenges. https://reindeer-project.eu/interview-with-technikon/ https://vimeo.com/851544426	International
88	Participation to a Conference	KU Leuven	ULUND	Presentation "What is expecting from 6G circuits and transceivers?" at ESSCIRC 2023 - W1: Technologies and Circuits for 5G evolution to 6G	11.09. 2023	14.09. 2023	Lisbon, Portugal	x	x	x	x	N/A	https://www.esscirc-essderc2023.org/technologies-circuits-5g-evolutionto6g	International

No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
89	Partici-pation to a Con-ference	KU Leu-ven		Anchor Layout Optimi-zation for Ultrasonic In-door Positioning Using Swarm Intelligence	25.09. 2023	28.09. 2023	Nuremberg, Germany					N/A	IPIN 2023; https://ipin-conference.org/2023/	Interna-tional
90	Keynote at work-shop	ULUND	KU Leu-ven	Channel modeling for 6G	27.09. 2023	28.09. 2023	Stockholm, Sweden	x		x	x	N/A	Dissemination of commu-nication technology re-sults and propoting re-search cooperation/ https://site.ieee.org/swe-ctw/	Interna-tional
91	Partici-pation to a Work-shop	ULUND	TU Graz, KUL, LiU	ELLIIT Focus Period	23.10. 2023	24.11. 2023	Lund, Swe-den	x		x	x	200	Disseminating results and motivating collaborations for 6G. https://el-liit.se/news-and-events/fo-cus-period-lund-2023/	Interna-tional
92	Social Media	TECH-NIKON		Interview with AB mem-ber Philipp Jauck	24.10. 2023	24.10. 2023	online	x	x	x	x	196	https://reindeer-pro-ject.eu/interview-with-phil-lipp-jauck/ https://vimeo.com/man-age/videos/891403279	Interna-tional
93	Social Media	TECH-NIKON	KU Leu-ven	Interview with Gilles Callebaut from KU Leu-ven	24.10. 2023	24.10. 2023	online	x	x	x	x	217	https://reindeer-pro-ject.eu/interview-with-gilles-callebaut/	Interna-tional
94	Partici-pation to a Con-ference	LIU	EAB	Robust Covariance-Based Activity Detection for Massive Access; Joint Optimization of Switching Point and Power Control in Dy-namic TDD Cell-Free Massive MIMO	29.10. 2023	01.11. 2023	CA, USA					N/A	https://www.asilom-arsscconf.org/webpage/as il23/	Interna-tional
95	Partici-pation to a Work-shop	TU Graz		SAL Symposium on 6G	22.11. 2023	23.11. 2023	Linz, Austria				x	N/A	Disseminating results and motivating collaborations for 6G. https://silicon-aus-tria-labs.com/en/about-	Interna-tional

No	Type of activities	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Audience[9]				TOTAL/ KPI	Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D			
													sal/events/details/default-4b999dc28485d8cb50960 b4e537998b6	
96	Participation to a Conference	EAB, LIU, KU Leuven		LQR-based precoding weights for downlink D-MIMO with phase misalignment; Data-Driven Robust Beamforming for Beyond-5G and 6G Wireless Applications; Sequential Processing in the Uplink of Cell-free Massive MIMO Network with Limited Memory Access Points	04.12. 2023	08.12. 2023	Kuala Lumpur, Malaysia					N/A	https://globecom2023.ieee-globecom.org/	International
97	Keynote at workshop	LIU		REINDEER perspectives on 6G	14.02. 2024	14.02. 2024	online				x	100+	Hexa X Workshop series 2 - Erik Larsson giving a talk about "REINDEER perspectives on 6G"	International
98	Participation to a Conference	LIU		Access Point Selection for Bistatic Backscatter Communication in Cell-Free MIMO; Resource Efficient Over-the-Air Fronthaul Signaling for Uplink Cell-Free Massive MIMO Systems	09.06. 2024	13.06. 2024	Denver, CO, USA					N/A	https://icc2024.ieee-icc.org/	International
99	Flyer	TECH-NIKON		3rd Newsletter	29.07. 2024	29.07. 2024	online	x	x	x	x	N/A	https://reindeer-project.eu/reindeer-newsletter-issue-03/	International
100	Participation to a Conference	TU Graz		Combined Wideband Channel Estimation and Direct Link Interference Mitigation in Bistatic Backscatter Systems	10.09. 2024	13.09. 2024	Lucca, Italy	x	x			N/A	https://spawc2024.org/	International

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No	Type of activi-ties	Main Leader	Other partners involved	Title	DATE		Place	Type & size of Au-dience[9]					Type and goal of the event / website	Countries addressed
					Start	End		A	B	C	D	TOTAL/ KPI		
101	Video/ Film	TECH-NIKON		Use Case 1 Video	11.11. 2024	11.11. 2024	online	x	x	x	x	N/A	Use Case Video 01 (fu-ture factories, ware-houses, and logistics) https://vimeo.com/102201 2130	Interna-tional
102	Video/ Film	TECH-NIKON		Use Case 2 Video	11.11. 2024	11.11. 2024	online	x	x	x	x	N/A	REINDEER - Use Case Video 02 (Immersive en-tertainment for crowds of people) https://vimeo.com/102201 4369	Interna-tional
103	Video/ Film	TECH-NIKON		Use Case 3 Video	19.11. 2024	19.11. 2024	online	x	x	x	x	N/A	REINDEER – Use Case Video 03 (human-ma-chine interaction in care environments, hospitals and assisted living) https://vimeo.com/102829 8752	Interna-tional
104	Video/ Film	TECH-NIKON		Use Case 4 Video	19.11. 2024	19.11. 2024	online	x	x	x	x	N/A	REINDEER – Use Case Video 04 (home automa-tion and smart home sys-tems) https://vimeo.com/102761 8714	Interna-tional
105	Video/ Film	TECH-NIKON		Impact Video	In pro-gress	In pro-gress	online	x	x	x	x	N/A	https://vimeo.com/show-case/reindeer-results-video-showcase	Interna-tional
106	Video/ Film	TECH-NIKON	KU Leu-ven	Demonstrator Video	In pro-gress	In pro-gress	online	x	x	x	x	N/A	https://vimeo.com/show-case/reindeer-results-video-showcase	Interna-tional

4.2.1 Highlights of Phase 2

As listed in the table above, within the second phase of the project, several communication and dissemination activities were performed. Several interviews were completed, newsletters and presentations were produced, project outcomes were presented in social media, and the videos of the demonstrator and the impacts of the REINDEER project were produced.

Project website statistics

The REINDEER project website can be accessed by following this link: https://reindeer-project.eu/.

The website is kept up to date with the latest information on past and upcoming events. Regular blog entries are also posted on the website, making work of different project partners visible to public. In addition to that, submitted public deliverables as well as publications related to the project are available at the website.

To summarize, and according to Google Analytics, the REINDEER website was looked in approximately 377k times (visits) from its launch until end of October 2024 by approximately 115k unique visitors.

Interviews

In a series of interviews, people involved in the REINDEER project shared their perspectives on the initiative, its challenges, and its potential impact on industries and future technologies. Below is a summary of the main points discussed in each interview.

Project Coordinator on REINDEER's Challenges

The project coordinator provided a detailed overview of the REINDEER project, highlighting the technical and operational challenges the team has encountered. The coordinator emphasized the complexity of integrating cutting-edge technologies, such as 5G and advanced sensor networks, while ensuring scalability and efficiency. The discussion also touched upon the need for collaboration across various disciplines and industries to achieve the project's ambitious goals. The coordinator's remarks underscored the importance of adaptive problem-solving and innovation in overcoming these hurdles to achieve success in real-world applications.

Advisory Board Member Philipp Jauck on the Importance of REINDEER

Philipp Jauck, an Advisory Board member of the REINDEER project, spoke about the significance of the project, particularly for companies like SES-imagotag, which stand to benefit from its innovations. He explained how the project's cutting-edge developments in 5G networks, IoT, and smart technologies are not only important for academic and industrial growth but also vital for the evolution of businesses that rely on real-time data and automation. Jauck highlighted how REINDEER's work could lead to improved operational efficiency, reduced costs, and enhanced customer engagement, making it a crucial initiative for the tech-driven future of companies in various sectors.

Gilles Callebaut from KU Leuven on REINDEER's Real-World Implementation

In this interview, Gilles Callebaut from KU Leuven shared his experiences with the practical implementation of innovative technologies emerging from the project, particularly focusing on the use of physical inventory management in real-world settings. He described the tangible impact of REINDEER's innovations, providing a glimpse into how the project's technologies are being applied in real environments. Callebaut also shared his personal insights into what makes REINDEER unique for him—emphasizing the project's potential to revolutionize inventory management through 5G-enabled systems and its broader implications for the future of telecommunications and smart systems.

Project Videos

The REINDEER project has produced several key videos that illustrate its groundbreaking research in next-generation wireless networks and their potential impact on various sectors. These videos served as crucial tools for dissemination, highlighting both technical advancements and practical

applications. The videos illustrate the use cases established at the start of the project as motivating scenarios for developing the various new technology components for RadioWeaves-based and other relevant novel D-MIMO architectures.

Demonstrator Video

This video explains the potential of 6G networks to drive innovation in the Internet of Things (IoT) and Extended Reality (XR). It outlines the requirements for 6G, such as improved throughput, network capacity, ultra-reliable low-latency communications, and new functionalities like precise positioning, sensing, and wireless power transfer. A key innovation presented is the REINDEER project's RadioWeaves technology, which utilizes a cell-free massive MIMO approach to ensure seamless connectivity. The demonstration focuses on the Techtile testbed, equipped with 140 tiles connected via Raspberry Pi and software-defined radios, showcasing the practical implementation of 6G capabilities like positioning, communication, and sensing.

Use Case 1 Video

This video is about the transformative applications of 6G technology in industrial environments. Key use cases include real-time digital twins for manufacturing, human-robot collaboration, real-time inventory tracking, electronic labeling, augmented reality for professional use, and robot/unmanned vehicle positioning. By utilizing the RadioWeaves infrastructure, factories can achieve low-latency communication, high-precision positioning, and real-time data processing. The video outlines a hypothetical production hall scenario, demonstrating how the RadioWeaves system can handle high device density and provide reliable connectivity, boosting efficiency and safety.

Use Case 2 Video

This video explores how 6G-enabled immersive experiences can enhance large-scale events like sports. Augmented reality (AR) applications offer real-time data to spectators, while people tracking and location-based information transfer enhance safety and convenience. The video illustrates a scenario in a tennis arena, with RadioWeaves antennas providing seamless, low-latency connectivity to thousands of AR devices. This cell-free infrastructure supports high data rates, precise positioning, and real-time processing, opening new avenues for interactive entertainment.

Use Case 3 Video

This video highlights the benefits of 6G technology in healthcare and assisted living. Use cases include patient monitoring with wearable sensors, human-robot collaboration in medical settings, AR for healthcare professionals, and wander detection for patients. The video describes how the RadioWeaves infrastructure, deployed in hospitals, can ensure ultra-reliable, low-latency connections for real-time data processing and monitoring. The technology also supports energy-efficient devices and wireless power transfer, enhancing patient care and operational efficiency.

Use Case 4 Video

This video explores how 6G can revolutionize home automation and entertainment. Use cases include virtual reality (VR) home gaming, which demands high data rates and low latency, and smart home automation with energy-neutral IoT devices. In a smart apartment scenario, the RadioWeaves system ensures seamless connectivity for multiple devices, enabling real-time processing and secure data handling through edge computing. The video emphasizes the importance of positioning accuracy and reliable communication for enhancing daily life in smart homes.

Impact Video

The impact video summarizes the REINDEER project's contributions to European innovation. It showcases the successful development of the RadioWeaves platform, which offers near-infinite capacity, ultra-low latency, and real-time interaction between devices. The technology is positioned as a cornerstone for Europe's leadership in smart networks, enabling new business opportunities in private networks, robotics, healthcare, and immersive entertainment. The video underscores how REINDEER's achievements align with the EU's Horizon 2020 objectives of scientific excellence, industrial leadership, and addressing societal challenges.

<u>Social Media</u>

Social media is a very powerful tool to communicate and disseminate information and to effectively let people know about the activities we carried out in REINDEER project, that's why we created at the beginning of the project, a REINDEER X (former Twitter), as well as a LinkedIn account. Both accounts were updated on a regular basis, to schedule the postings and tweets. We used a posting plan, which helped us to plan and organize upcoming content.

Throughout the project social media hashtags, tagging contacts and emoticons become more important. These elements were integrated stronger as part of the social media posts. The main REINDEER hashtags used were #H2020, #REINDEER, #Research, #RadioWeaves, #6G, #5GPPP, #cellfreenetworking, #MIMO, #telecommunications,…

Partners and individuals involved in the results, distributed through social media, were tagged to increase the visibility of their work and to expand the dissemination of results beyond followers, providing an opportunity for content to be shared and organic engagement rates with the posts on social media to be increased.

Moreover, through the partners REINDEER was able to be included in established channels that have a large audience, such as the wireless future podcast and the related blog.

X (former Twitter)

The REINDEER project is available on https://twitter.com/H2020Reindeer. Since the beginning of the project, REINDEER published 148 posts and is mainly used for communication activities, including the announcement of the project website, press releases, newsletter publications and different meetings. The account has 88 followers.

LinkedIn

The REINDEER project has a "company" account, which can be accessed via: https://www.linkedin.com/company/71394608/.

By the end of the project, the REINDEER team established a good network on the social media platform and increased followers from 108 followers in M12 to 350 followers by the end of the project. Information (publications, deliverables, conferences, workshops) on the project was posted on a regular basis. The average engagement rate was throughout the lifetime of the project 6,6%, which highlights that our followers were interested in the posted content (Engagement measures: the number of likes, shares, and comments our social updates received). In our opinion a good engagement rate is more important than just the number of followers.)

Scientific peer-reviewed publications

As soon as a scientific paper submitted to a conference or a journal is published, the Consortium is committed to provide open access *via* the EU compliant repository Zenodo (https://zenodo.org/), where a REINDEER community has been established. Zenodo is convenient to access and easy to use. It allows to easily share research results in a wide variety of formats including text, spreadsheets, audio, video, and images across all fields of science. Further, each uploaded publication and dataset receives a persistent identifier (DOI), which ensures long term preservation. If relevant, also underlying research data is made publicly available and linked to the specific publication.

The primary goals included publishing a minimum of 20 conference papers and 10 top-level journal articles during the project's duration, with an additional 7 conference papers and 5 journal articles in progress by the project's end. The REINDEER Consortium published between M01 and M48 all together 64 publications (5 papers are still in progress). Please find further details in Table 5. The publications which are already on https://zenodo.org/ or provided through other open access channels are summarised in table below.

Table 4: Scientific Publications with open access

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
1	A Multi-band Solution for Interacting with Energy-Neutral Devices	Chesney Buyle, Bert Cox, Liesbet Van der Perre and Lieven De Strycker	Publication in Conference	IEEE Asilomar 2021	https://arxiv.org/abs/2112.08855
2	Reciprocity calibration of Distributed Massive MIMO Access Points for Coherent Operation	Joao Vieira, Erik G. Larsson	Publication in Conference	PIMRC 2021	https://doi.org/10.1109/PIMRC50174.2021.9569495
3	A Primer on Techtile: An R&D Testbed for Distributed Communication, Sensing and Positioning	Gilles Callebaut, Jarne Van Mulder, Geoffrey Ottoy and Liesbet Van der Perre	Publication in Conference	SITB 2021	https://arxiv.org/abs/2105.06740
4	BeamSync: Over-The-Air Carrier Synchronization in Distributed Radio-Weaves	Unnikrishnan Kunnath Ganesan, Rimalapudi Sarvendranath and Erik G. Larsson	Publication in Conference	WSA 2021	https://doi.org/10.48550/arXiv.2112.00592
5	Physical layer latency management mechanisms: A study for millimeter-Wave Wi-Fi	Alexander Marinšek, Daan Delabie, Lieven De Strycker and Liesbet Van der Perre	Article in Journal	MDPI: Advances in Low-Latency Communications: Protocols, Applications, Challenges, and Opportunities	https://doi.org/10.3390/electronics10131599
6	Uplink D-MIMO with Decentralized Subset Combining	Ke Wang Helmersson, Pal Frenger, Anders Helmersson	Publication in Conference	IEEE International Conference on Communications (ICC) 2022	https://liu.diva-portal.org/smash/record.jsf?pid=diva2%3A1675023&dswid=2380
7	Physical Layer Abstraction Model for RadioWeaves	Sarvendranath Rimalapudi, Unnikrishnan Kunnath Ganesan, Zakir Hussain Shaik, Erik G. Larsson	Publication in Conference	VTC 2022 - IEEE 95th Vehicular Technology Conference	https://doi.org/10.48550/arXiv.2206.13924
8	Partial Interference Suppression in Massive MIMO Systems: Taxonomy and Experimental Analysis	Andrea P. Guevara, Cheng-Ming Chen, Alessandro Chiumento, Sofie Pollin	Publication in Conference	IEEE Access	https://doi.org/10.1109/ACCESS.2021.3113167
9	Location-based Initial Access for Wireless Power Transfer with Physically Large Arrays	Benjamin J. B. Deutschmann, Thomas Wilding, Erik G. Larsson, Klaus Witrisal	Publication in Conference	IEEE International Conference on Communications (ICC) 2022	https://doi.org/10.48550/arXiv.2202.10749

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
10	Techtile – Open 6G R&D Testbed for Communication, Positioning, Sensing, WPT and Federated Learning	Gilles Callebaut, Jarne Van Mulders, Geoffrey Ottoy, Daan Delabie, Bert Cox, Nobby Stevens, Liesbet Van der Perre	Publication in Conference	IEEE EUCNC 2022	https://doi.org/10.48550/arXiv.2202.04524
11	White Paper - Beyond 5G/6G KPIs and Target Values	Lars Nielsen, Anastasius Gavras, Michael Dieudonne, Ioanna Mesogiti, Priit Roosipuu, Drissa Houatra, Evangelos Kosmato	Other	5PPP - Test, Measurement and KPIs Validation Working Group	https://doi.org/10.5281/zenodo.6577506
12	Uplink D-MIMO Processing and Combining using Kalman Filter	Ke Wang Helmersson, Pal Frenger, Anders Helmersson	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2022)	https://www.diva-portal.org/smash/get/diva2:1722003/FULLTEXT01.pdf
13	Dynamic Federations for 6G Cell-Free Networking: Concepts and Terminology	Gilles Callebaut, William Tärneberg, Liesbet Van der Perre, Emma Fitzgerald	Publication in Conference	2022 IEEE 23rd International Workshop on Signal Processing Advances in Wireless Communication (SPAWC)	https://doi.org/10.48550/arXiv.2204.02102
14	Dynamic Range Improvement in Bistatic Backscatter Communication Using Distributed MIMO	Ahmet Kaplan, Joao Vieira and Erik G. Larsson	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2022)	https://doi.org/10.48550/arXiv.2306.17437
15	Activity Detection in Distributed MIMO: Distributed AMP via Likelihood Ratio Fusion	Jianan Bai and Erik G. Larsson	Article in Journal	IEEE Wireless Communications Letters	http://export.arxiv.org/abs/2208.03070v2
16	Finite Precision Implementation of Recursive Algorithms for Uplink Detection in Cell-Free Networks	Vida Ranjbar, Sofie Pollin, Marc Moonen	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2022)	https://kuleuven.limo.libis.be/discovery/fulldisplay?docid=lirias3837888&context=Search-Webhook&vid=32KUL_KUL:Lirias&lang=en&search_scope=lirias_profile&adaptor=Search-Webhook&tab=LIRIAS&query=any,contains,LIRIAS3837888&offset=0
17	Energy-Efficient Power Allocation for	Zakir Hussain Shaik, Rimalapudi	Publication in Conference	IEEE International Confer-	https://doi.org/10.48550/arXiv.2208.04668

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
	an Underlay Spectrum Sharing Radio-Weaves Network	Sarvendranath and Erik G. Larsson		ence on Communications (ICC 2023)	
18	Wireless Power Transfer: Systems, Circuits, Standards, and Use Cases	Jarne Van Mulders,Daan Delabie,Cédric Lecluyse,Chesney Buyle,Gilles Callebaut,Liesbet Van der Perre and Lieven De Strycker	Article in Journal	MDPI Sensors	https://doi.org/10.3390/s22155573
19	Grant-Free Random Access in Massive MIMO for Static Low-Power IoT Nodes	Gilles Callebaut, Liesbet Van der Perre and François Rottenberg	Publication in Conference	42nd WIC Symposium on Information Theory and Signal Processing in the Benelux (SITB 2022)	https://doi.org/10.48550/arXiv.2110.07927
20	Grant-Free Random Access of IoT devices in Massive MIMO with Partial CSI	Gilles Callebaut, Franc̨ois Rottenberg, Liesbet Van der Perre and Erik G. Larsson	Publication in Conference	IEEE Wireless Communications and Networking Conference (WCNC 2023)	https://doi.org/10.48550/arXiv.2301.04861
21	UAV-based Servicing of IoT nodes: Assessment of Ecological Impact	Jarne Van Mulders, Jona Cappelle, Sarah Goossens, Lieven De Strycker, Liesbet Van der Perre	Article in Journal	MDPI (Special Issue RF Energy Harvesting and Wireless Power Transfer for IoT)	https://doi.org/10.3390/s23042291
22	Phase Calibration of Distributed Antenna Arrays	E.G. Larsson and J. Vieira	Article in Journal	IEEE Communication Letters	https://doi.org/10.48550/arXiv.2304.05144
23	White Paper "The 6G Architecture Landscape - European perspective".	Bahare, Massod Khorsandi; Gavras, Anastasius; Gramaglia, Marco; Cosmas, John; Li, Xi; Bulakci, Ömer; Rahman, Arifur; Kostopoulos, Alexandros; Mesodiakaki, Agapi; Tsolkas, Dimitris; Ericson, Mårten; Boldi, Mauro; Uusitalo, Mikko; Ghoraishi, Mir; Rugeland, Patrik	Other	5GPPP White Paper	https://5g-ppp.eu/white-papers/
24	Uplink Joint Positioning and Synchronization in Cell-Free Deployments with Radio Stripes	Alessio Fascista, Benjamin J. B. Deutschmann, Musa Furkan Keskin, Thomas Wilding, Angelo Coluccia, Klaus	Publication in Conference	IEEE International Conference on Communications (ICC 2023)	https://arxiv.org/abs/2302.03387

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
		Witrisal, Erik Leitinger, Gonzalo Seco-Granados, Henk Wymeersch			
25	XL-MIMO Channel Modeling and Prediction for Wireless Power Transfer	Benjamin J. B. Deutschmann, Thomas Wilding, Maximilian Graber, Klaus Witrisal	Publication in Conference	IEEE International Conference on Communications (ICC 2023)	https://arxiv.org/abs/2302.11969
26	Bistatic MIMO Radar Sensing of Specularly Reflecting Surfaces for Wireless Power Transfer	Benjamin J. B. Deutschmann, Maximilian Graber, Thomas Wilding, Klaus Witrisal	Publication in Conference	IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2023)	https://doi.org/10.48550/arXiv.2305.05002
27	Large Intelligent Surface Measurements for Joint Communication and Sensing	Christian Nelson, Xuhong Li, Thomas Wilding, Benjamin Deutschmann, Klaus Witrisal, Fredrik Tufvesson	Publication in Conference	European Conference on Networks and Communications (EuCNC 2023)	https://doi.org/10.48550/arXiv.2304.12457
28	Propagation Modeling for Physically Large Arrays: Measurements and Multipath Component Visibility	Thomas Wilding, Benjamin Deutschmann, Christian Nelson, Xuhong Li, Fredrik Tufvesson, Klaus Witrisal	Publication in Conference	European Conference on Networks and Communications (EuCNC 2023)	https://doi.org/10.48550/arXiv.2305.05958
29	Impact of Reconfigurable Intelligent Surface Geometry on Communication Performance	Zhuangzhuang Cui, Sofie Pollin	Article in Journal	IEEE Wireless Communications Letters	https://arxiv.org/abs/2210.16695
30	RF Energy Harvester Circuits Supplied with Multi-sine Signals	Jarne Van Mulders, Chesney Buyle, Lieven De Strycker, Liesbet Van der Perre	Publication in Conference	43rd Symposium on Information Theory and Signal Processing in the Benelux (SITB 2023)	https://zenodo.org/record/8095121
31	Distributed Signal Processing for Out-of-System Interference Suppression in Cell-Free Massive MIMO	Zakir Hussain Shaik and Erik G. Larsson	Publication in Conference	IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2023)	https://doi.org/10.48550/arXiv.2307.16824

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
32	Direct Link Interference Suppression for Bistatic Backscatter Communication in Distributed MIMO	Ahmet Kaplan, Joao Vieira, Erik G. Larsson	Article in Journal	IEEE Transactions on Wireless Communications	https://arxiv.org/abs/2306.06658
33	Towards Sustainable and Trustworthy 6G – Challenges, Enables and Architectural Design	Pål Frenger, Vida Ranjbar, Liesbet Van der Perre, Benjamin Deutschmann, Klaus Witrisal, Thomas Wilding	Book/Monograph	now publishers	http://dx.doi.org/10.1561/9781638282396
34	Beyond 5G/6G KPI Measurement	Dieudonne, Michael; Wang, Hua; Mesogiti, Ioanna; Kosmatos, Evangelos	Other	5GPPP White Paper	https://zenodo.org/record/7963247
35	Robust Precoding Weights for Downlink D-MIMO in 6G Communications	Ke Wang Helmersson, Pal Frenger, Anders Helmersson	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2023)	https://zenodo.org/records/11936648
36	Distributed MIMO Precoding with Routing Constraints in Segmented Fronthaul	Jale Sadreddini, Omer Haliloglu, Andres Reial	Publication in Conference	IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (IEEE PIMRC 2023)	https://doi.org/10.48550/arXiv.2405.20122
37	Cell-free Massive MIMO with Sequential Fronthaul Architecture and Limited Memory Access Points	Vida Ranjbar, Robbert Beerten, Marc moonen, Sofie Pollin	Article in Journal	IEEE Transactions on Communications	https://doi.org/10.48550/arXiv.2407.21754
38	6G Radio Testbeds: Requirements, Trends, and Approaches	Gilles Callebaut, Liang Liu, Thomas Eriksson, Liesbet Van der Perre, Ove Edfors and Christian Fager	Article in Journal	IEEE Microwave Magazine	https://doi.org/10.48550/arXiv.2309.06911
39	Data-Driven Robust Beamforming for Initial Access	Sai Subramanyam Thoota, Joao Vieira, Erik G. Larsson	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2023)	https://doi.org/10.48550/arXiv.2308.07132
40	Robust Covariance-Based Activity Detection for Massive Access	Jianan Bai and Erik G. Larsson	Publication in Conference	Asilomar Conference on Signals, Systems, and Computers (Asilomar SSC 2023)	https://arxiv.org/abs/2405.09425v1

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
41	Joint Optimization of Switching Point and Power Control in Dynamic TDD Cell-Free Massive MIMO	Martin Andersson, Tung T. Vu, Pål Frenger, Erik G. Larsson	Publication in Conference	Asilomar Conference on Signals, Systems, and Computers (Asilomar SSC 2023)	https://arxiv.org/abs/2406.14126
42	Anchor Layout Optimization for Ultrasonic Indoor Positioning Using Swarm Intelligence	Daan Delabie, Thomas Wilding, Liesbet Van der Perre, Lieven De Strycker	Publication in Conference	International Conference on Indoor Positioning and Indoor Navigation (IPIN 2023)	https://doi.org/10.48550/arXiv.2405.09222
43	Sequential Processing in Cell-Free Massive MIMO Uplink with Limited Memory Access Points	Vida Ranjbar, Robbert Beerten, Marc Moonen, Sofie Pollin	Publication in Conference	IEEE Global Communications Conference (GLOBECOM 2023)	https://doi.org/10.48550/arXiv.2312.05622
44	An Open Dataset Storage Standard for 6G Testbeds	Gilles Callebaut, Michiel Sandra, Christian Nelson, Thomas Wilding, Daan Delabie, Benjamin J. B. Deutschmann, William Tärneberg, Emma Fitzgerald, Liesbet Van der Perre	Publication in Conference	IEEE International Conference on Antenna Measurements and Applications (IEEE CAMA 2023)	https://www.semanticscholar.org/paper/An-Open-Dataset-Storage-Standard-for-6G-Testbeds-Callebaut-Sandra/31807bacdb58d8bc9787e76e6337538c471565cd
45	Joint Sequential Fronthaul Quantization and Hardware Complexity Reduction in Uplink Cell-Free Massive MIMO Network	Vida Ranjbar, Robbert Beerten, Marc Monnen, Sofie Pollin	Publication in Conference	EuCNC & 6G Summit 2024	https://doi.org/10.48550/arXiv.2405.01303
46	5G PPP in review	5G PPP steering board/technology board	Other	5G PPP paper	http://doi.org/10.5281/zenodo.10037805
47	BeamSync: Over-the-Air Synchronization in Distributed Massive MIMO Systems	U.K. Ganesan, R. Sarvendranath and E.G. Larsson	Article in Journal	IEEE Transactions on Wireless Communications	https://arxiv.org/abs/2311.11070
48	Keeping Energy-Neutral Devices Operational: a Coherent Massive Beamforming Approach	Jarne Van Mulders, Bert Cox, Benjamin J. B. Deutschmann, Gilles Callebaut, Lieven De Strycker and Liesbet Van der Perre	Publication in Workshop	2024 IEEE 25th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)	https://doi.org/10.48550/arXiv.2401.13438
49	Scheduling of Industrial Control Traffic for Dynamic RAN Slicing with Distributed Massive MIMO	Emma Fitzgerald, Michal Pioro	Article in Journal	Future Internet 2024 - Special Issue Wireless Industrial Internet of Things	https://doi.org/10.3390/fi16030071

No	Title	Authors	Journal/ Conference	Journal/ Conference	DOI
50	Propagation Modeling for Physically Large Arrays: Measurements and Multipath Component Visibility	Thomas Wilding, Benjamin Deutschmann, Christian Nelson, Xuhong Li, Fedrik Tufvesson, and Klaus Witrisal	Publication in Conference	2023 Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit)	https://doi.org/10.4855 0/arXiv.2305.05958
51	Access Point Selection for Bistatic Backscatter Communication in Cell-Free MIMO	Ahmet Kaplan, Diana P. M. Osorio, and Erik G. Larsson	Publication in Conference	IEEE International Conference on Communication (ICC 2024)	https://arxiv.org/abs/24 07.18048v1
52	Energy Reduction in Cell-Free Massive MIMO through Fine-Grained Resource Management	Ozlem Tugfe Demir, Lianet Mendez-Monsanto, Nicola Bastianello, Emma Fitzgerald, Gilles Callebaut	Publication in Conference	IEEE EUCNC 2024	https://doi.org/10.4855 0/arXiv.2405.07013
53	Massive Synchrony in Distributed Antenna Systems	Erik G. Larsson	Article in Journal	IEEE Transactions on Signal Processing (Volume: 72)	https://doi.org/10.4855 0/arXiv.2401.11730
54	Distributed MIMO Measurements for Integrated Communication and Sensing in an Industrial Environment	Christian Nelson, Xuhong Li, Aleksei Fedorov, Benjamin J. B. Deutschmann, and Fredrik Tufvesson	Article in Journal	MDPI Sensors - Special Issue Sensing Technologies and Wireless Communications for Industrial IoT	https://doi.org/10.3390/ s24051385
55	Towards Practical Cell-Free 6G Network Deployments: An Open-Source End-to-End Ray Tracing Simulator	W Tärneberg, A Fedorov, G Callebaut, L Van der Perre, E Fitzgerald	Publication in Conference	Asilomar Conference on Signals, Systems, and Computers (Asilomar SSC 2023)	https://doi.org/10.4855 0/arXiv.2401.08624
56	Combined Wideband Channel Estimation and Direct Link Interference Mitigation in Bistatic Backscatter Systems	Lukas D'Angelo, Benjamin Deutschmann, Klaus Witrisal	Publication in Workshop	25th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2024)	https://graz.elsevier-pure.com/de/publica-tions/combined-wide-band-channel-estima-tion-and-direct-link-in-terference
57	Reducing Dynamic Range in Bistatic Backscatter Communication via Beamforming Design	Ahmet Kaplan, Diana P. M. Osorio, and Erik G. Larsson	Publication in Workshop	2024 IEEE 25th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)	https://doi.org/10.4855 0/arXiv.2411.08401

No	Title	Authors	Journal/Conference	Journal/ Conference	DOI
58	Accurate Direct Positioning in Distributed MIMO Using Delay-Doppler Channel Measurements	Benjamin Deutschmann, Christian Nelson, Mikael Henriksson, Gian Marti, Alva Kosasih , Nuutti Tervo, Erik Leitinger, Fredrik Tufvesson	Publication in Workshop	2024 IEEE 25th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)	https://doi.org/10.48550/arXiv.2404.15936
59	How to Perform Distributed Precoding to Wirelessly Power Shelf Labels	Gilles Callebaut, Jarne Van Mulders, Bert Cox, Liesbet Van der Perre, Lieven Strycker, Franc̨ois Rottenberg	Publication in Conference	SPAWC 2024	https://doi.org/10.48550/arXiv.2408.10611
60	Keeping Energy-Neutral Devices Operational: a Coherent Massive Beamforming Approach	Jarne Van Mulders, Bert Cox, Benjamin J. B. Deutschmann, Gilles Callebaut, Lieven de Strycker and Liesbet Van der Perre	Publication in Conference	SPAWC 2024	https://doi.org/10.48550/arXiv.2401.13438
61	Resource Efficient Over-the-Air Fronthaul Signaling for Uplink Cell-Free Massive MIMO Systems	Zakir Hussain Shaik, Sai Subramanyam Thoota, Emil Björnson, and Erik G. Larsson	Publication in Conference	ICC 2024	https://doi.org/10.48550/arXiv.2311.08319
62	A Flexible Framework for Grant-Free Random Access in Cell-Free Massive MIMO Systems	Sai Subramanyam Thoota and Erik G. Larsson	Publication in Conference	SPAWC 2024	https://doi.org/10.48550/arXiv.2411.09328
63	Single versus Multi-Tone Wireless Power Transfer with Physically Large Arrays	Jarne Van Mulders, Benjamin J. B. Deutschmann, Geoffrey Ottoy, Lieven De Strycker,Liesbet Van der Perre, Thomas Wilding and Gilles Callebaut	Publication in Workshop	1st International Workshop on Energy Neutral and Sustainable IoT Devices and Infrastructure (EN-IoT 2024)	https://doi.org/10.48550/arXiv.2410.01299
64	Multipath-based SLAM for Non-Ideal Reflective Surfaces Exploiting Multiple-Measurement Data Association	Lukas Wielandner, Alexander Venus, Thomas Wilding, Erik Leitinger	Article in Journal	Journal of Advances in Information Fusion (JAIF)	https://doi.org/10.48550/arXiv.2304.05680

The following publications are currently in progress:

No	Title	Authors	Journal/ Confer- ence	Journal/ Conference	Info
65	Combined Synchro- nization and Inter- Array Communica- tion Solution for Dis- tributed and Cell- Free Massive MIMO [SP]	Gilles Callebaut, Geoffrey Ottoy and Liesbet Van der Perre (KU Leuven)	Publication in Confer- ence	IEEE Asilo- mar 2021	presented in Asilomar but not published
66	Massive MIMO Scheduling for In- dustrial Communica- tions	Emma Fitzgerald, Michał Pióro	Publication in Confer- ence	IEEE Interna- tional Work- shop on Re- silient Net- works Design and Modeling (RNDM 2023)	https://portal.re- search.lu.se/en/publica- tions/scheduling-for-in- dustrial-control-traffic-us- ing-massive-mimo-and- DOI IEEE: https://doi.org/10.1109/RN DM59149.2023.10293135
67	Spatial Separation of Closely-Spaced Users in Measured Distributed Massive MIMO Channels	Yingjie Xu, Mich- iel Sandra, Xue- song Cai, Sara Willhammar, Fredrik Tufves- son	Publication in Confer- ence	SPAWC 2024	Not yet Open Access https://doi.org/10.1109/SP AWC60668.2024.106945 95
68	Joint Localization, Synchronization and Mapping via Phase- Coherent Distributed Arrays	Alessio Fascista, Benjamin Deutschmann, Musa Furkan Keskin, Thomas Wilding, Angelo Coluccia, Klaus Witrisal, Erik Leit- inger, Gonzalo Seco-Granados, Henk Wymeersch	Article in Journal	IEEE JSTSP	Revision --> Paper not yet accepted
69	Experimental Study on the Effect of Syn- chronization Accu- racy for Near-Field RF Wireless Power Transfer in Multi-An- tenna Systems	Gilles Callebaut, Jarne Van Mul- ders, Bert Cox, Benjamin J. B. Deutschmann, Geoffrey Ottoy, Lieven De Strycker and Liesbet Van der Perre	Publication in Confer- ence	IEEE EUCAP 2025	In progress

Below we list the specific aims and related KPIs regarding dissemination and communication activi- ties for the REINDEER project (as listed in the project application), and report the obtained metrics for each of the KPIs.

Table 5: Project KPIs relevant to D6.5

Specific aim	KPIs defined during proposal phase	Assessment at project end
Share the REINDEER in- novation to a broad group of stakeholders. Provide training on the new tech- nologies.	News about the project spread via: at least quarterly general newsflashes and blog arti- cles twice per year. Multimedia illustrations provided for all major results and demonstrators.	More than 50 blog posts; 7 Press releases, newsletters;

Specific aim	KPIs defined during proposal phase	Assessment at project end
	2 tutorial workshops at relevant events and one summer school organized.	10 Multimedia illustrations (e.g. videos); 9 Tutorial lecture, Panel debate, Keynote at workshop; 1 Summer School 2022 IEEE SPS - EURASIP 4 Workshop organizations 28 participations to conferences
Disseminate the technological progress in relevant top-level conferences and journals.	Scientific papers published within the duration of the project: >20 in conferences, ≥10 in top-level journals. Scientific papers in progress (submitted) by the end of the project: ≥7 in conferences, ≥ 5 in journals.	54 publications in conferences, workshops, others; 15 articles in journals
Ensure interoperability to existing solutions and industrial policies.	For operation in unlicensed bands and inter-action with energy-neutral devices interoperability will be ensured with established RAIN RFID, WiFi, Bluetooth, LoRa, and Zigbee already on the market. Security guidelines in line with industrial policies will be defined.	See Table 4 in D6.6
Establish industrial relevance of REINDEER's main findings. Promote up-take of selected features in relevant pre-standardization forums.	REINDEER's main technological features will be promoted in relevant 5G PPP activities and pre-6G forums (e.g. 6G Wireless Summit, conference keynotes) to prepare for eventual take up in actual standards on the longer term (e.g. beyond Rel.17 in 3GPP): ≥ 12 Project-related references and/or talks delivered at such forums.	See Table 4 in D6.6
Advance the exploitation and the creation of new business opportunities.	IPR developed within the project is consistent with identified novel technological directions and features: ≥10 filed patent applications during the project's timeframe; Exploitation plan prepared specifying timing and value, and including specific identification of at least 7 new product introductions based on the REINDEER results, each creating a multitude of new business opportunities.	See Table 4 in D6.6

Specific aim 1: *Share the REINDEER innovation to a broad group of stakeholders. Provide training on the new technologies.*

Achievements: The REINDEER project successfully engaged a broad group of stakeholders through consistent dissemination efforts. Newsletters and blog articles were published regularly, effectively raising awareness of the project's goals and progress. Multimedia illustrations were created for all significant results, enhancing visibility and understanding of key innovations. The training component was fulfilled through tutorial workshops held at events, and one summer school was successfully organized, reaching the target audiences and providing hands-on training on the new technologies.

Specific aim 2: *Disseminate the techno-logical progress in relevant top-level conferences and journals.*

Achievements: The REINDEER project achieved its dissemination objectives within the scientific community. Over 54 papers were presented at leading conferences, workshops or other events

meeting the target. Additionally, the goal of publishing at least 10 papers in top-level journals was fulfilled by a number of 15. By the project's conclusion, additional conference papers were in the submission phase, along with papers for journals, indicating ongoing commitment to disseminating project findings even after the project's official end. These efforts have significantly contributed to the visibility of REINDEER's technological advancements in both industry and academia.

4.2.2 Related projects

REINDEER, as part of the European Commission's 5G PPP Phase 3 initiative, was selected among ten distinguished projects from a pool of 81 proposals submitted in response to the ICT-52-2020 call: "5G-PPP Smart Connectivity beyond 5G." These projects were aimed at advancing 5G connectivity towards 6G-ready technologies, particularly in areas emphasizing ultra-reliable, low-latency communication (URLLC), and next-generation networked systems. As a contributor to the 5G PPP Collaboration Agreement, REINDEER collaborated extensively with other ICT-52 projects (see projects in figure below) to drive interoperability, standardization, and knowledge-sharing within the European research and industrial community, ultimately contributing to the foundational work for future 6G networks. This collective effort underscores Europe's strategic leadership in advancing network resilience and efficiency while fostering a sustainable digital ecosystem that can meet future connectivity demands.

Figure 4: REINDEER related projects

4.3 Phase 3: Result orientation

The REINDEER project dedicated technology result-oriented dissemination and teaching events throughout the project. The result orientation phase consisted of three main goals:

- Promotion of project results (see Table 3)
- Exploitation activities (see D6.6 for further details)
- Attraction of a large target group, to create awareness of the technologies developed at REINDEER

There is a close link between dissemination and exploitation. Dissemination (sharing research results with potential users - peers in the research field, industry, other commercial players and policymakers) feeds into exploitation (using results for commercial purposes or in public policymaking). Of course, there will be a continuation of dissemination activities after the project end in order to promote the project results (e.g. project website will stay alive for 5 years, cooperation activities with other projects will continue, talks at conferences will be held and follow-up projects are likely). The main focus will be to exploit the outcomes of the project and to maximize the project impact.

Chapter 5 Summary and Conclusion

Communication activities to promote the project itself and its success, as well as the dissemination of outcomes of the project were key activities of the REINDEER project. Our goal was to bring research and its outcomes to the attention of non-scientific audiences, scientific community, potential business partners or policymakers. To achieve this, the REINDEER dissemination and communication strategy was created as described in Chapter 2.

This document provided an overview of dissemination and communication activities that were executed throughout the project lifetime. The activities were assigned to different phases: "awareness creation", "continuity of information flow" and "result orientation". As reported, several targeted dissemination activities were performed both jointly and individually by all partners. As presented in Table 5, all KPIs were reached with high numbers.

Furthermore, the REINDEER project published 64 scientific publications (5 papers are still in progress) in M01-M48 via the EU compliant repository Zenodo or other compliant repositories. Social Media presence was boosted by visual content interpreting results specifically towards the end of the project.

In addition to that REINDEER was also boosted via the Euvation innovation platform called "Spotlight on European Innovation", a platform for videos, podcasts and other dissemination material which work in different innovation domains. Here we can talk with partners from selected European high-tech research and innovation projects and stay in contact also beyond the project end.

During the project many joined papers were published, and multiple other ways of disseminating the project results were used, surpassing all the set KPIs. This was enabled by the intense cooperation of the project consortium. Moreover, special actions, such as the summer school and podcasts in the Wireless future series, reached a large public. There was also a high visibility of REINDEER in EU-level conferences, such as EUCNC.