



BEEYONDERS

Report on Dissemination and Communication Activities

D8.4: Report on Dissemination and Communication Activities
WP 8, T 8.2

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1. Technical references

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2. Executive Summary

BEEYONDERS' core ambition is to address the current challenges of the European construction sector by producing, commercializing and integrating beyond the state-of-the-art versatile solutions into real construction scenarios.

The WP8 "Dissemination, Communication and Exploitation" aims at supporting this objective by communicating and disseminating the project's objectives towards the targeted audiences, thus facilitating awareness and knowledge transfer.

The deliverable D8.4 "Report on Dissemination and Communication Activities" aims to measure the impacts and analyze the performance of the actions and measures put in place to execute the communication and dissemination (D&C) strategy. The present document deals with the analysis of D&C activities carried out in the first half of the project (M21) while a second updated version will be produced at the end of the project (M42).

Several communication and dissemination activities were implemented ever since the start of the project; their communication effectiveness was measured based on the outreach and engagement indicators, as well as the indices developed by ICONS focused on the web, social media, and multipliers.

As first results, we can highlight what follows:

- Communication channels and materials (website, socials networks, articles) were delivered on time, disseminated, and made available to partners for further dissemination. Among other, ICONS has produced **1 leaflet, 1 roll-up, 1 presentation video and one video-interview**.
- The **website** is engaging, with a total of 6,619 unique page views and 3,825 users with more than 2 minutes of average time spent per session.
- Overall, 12 **press and news releases** were released. The press releases were distributed to information multipliers. 2 **journalistic articles** were published and distributed to multipliers.
- So far, BEEYONDERS' **publications** have a **total outreach of 64,480** and an **aggregated engagement value of 3,064**. The Publication Engagement Index is 4.8%, which is above the average of ICONS' projects.
- Partners attended to and/or organized 16 national and international **events**.
- The two-channel **social media** strategy is effective, as Twitter and LinkedIn have jointly gathered more than 400 followers. LinkedIn is particularly effective in terms of engagement, with a SEI of 15.2%. The total SEI (Twitter and LinkedIn) is 11.3%.
- The **Community Engagement Index (CEI)** which defines the ability of the project to engage and interact with its whole community, reaches an overall result of 11.6%. The score is extremely positive if compared to the average benchmark identified by ICONS (5.9%). This demonstrates how much BEEYONDERS is efficient in attracting audience and generate interest around its content.



3. Introduction

The purpose of this document is to **assess the impacts of the Communication and Dissemination initiatives undertaken during the initial 18 months** of the BEEYONDERS project, spanning from M1 (June 2022) to M18 (November 2023).

These efforts were executed as part of the "Communication and Dissemination Plan" (D8.1), which outlines the overall strategy and plan for disseminating and communicating BEEYONDERS activities and outcomes. The plan adopts a multi-channel approach to enhance stakeholder engagement.

Chapter 2, titled "CED Strategy and Monitoring," introduces the continuous monitoring exercise employed by BEEYONDERS and elucidates its methodological framework, illustrating how it is conducted to evaluate the impacts of the project's Communication and Dissemination activities. Subsequently, prior to delving into the results of the initial analysis, the document provides an overview of the primary tools (**Chapter 3**) and channels (**Chapter 4**) considered.

Chapter 5 offers a summary of events and clustering activities, while **Chapter 6** delves into the analysis, presenting BEEYONDERS impacts during its first 18 months of implementation.



4. Communication & dissemination strategy and monitoring

4.1. Outreach & engagement indicators

Engagement reflects the level at which stakeholders actively interact with a project and its results. It's vital to evaluate how effective communication and stakeholder involvement are.

ICONS has crafted a methodology to assess stakeholders' engagement over the project's contents. This involves constant monitoring of: (i) how a project's content is disseminated, and (ii) how stakeholders engage with the project through various communication methods on all channels. This approach measures the views and interactions associated with the project's content.

- **Outreach indicators:** These gauge the reach of the content and aim to amplify awareness among targeted stakeholders. While important, these indicators, in isolation, don't give a full representation of how well a project communicates. They are more of a preliminary step for deeper analysis.
- **Engagement indicators:** These metrics offer insights into the effectiveness of a project's content in sparking interest and achieving buy-in from target stakeholders. They measure stakeholder interactions, for instance, online engagements. These metrics are essential for determining the success of communication efforts. Using both outreach and engagement metrics, ICONS introduced a comprehensive index known as the Community Engagement Index (CEI). This index combines five distinct metrics: the Website Engagement Index (WEI), Social Media Engagement Index (SEI), Publication Engagement Index (PEI), Webinar Engagement Index (WEEI), and Events Engagement Index (EEI).

The five aforementioned areas embody standard communication tasks undertaken by research initiatives. While these metrics can be aggregated, they can also be determined for specific or groups of channels, such as individual websites, social media platforms, publications, and events. Each index's value is found by comparing its outreach and engagement metrics. For instance, the WEI is derived using the formula $WEI = ew/ow$, where "ew" represents the website engagement metric and "ow" symbolizes the website outreach metric.

4.2. Metrics to measure effectiveness of engagement

4.2.1. The Publication Engagement Index (PEI)

The Public Engagement Index (PEI) lets us gauge, in a quantitative way, the actual engagement of people with the publications provided by the BEEYONDERS project via the following channels: websites, social media, and media multipliers.

The index is expressed as a percentage, similarly to how penetration rates are usually reported in market analysis reports, and can be calculated at different levels:

- By publication



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- By publication type (article, news release, press release, video, etc.)

4.2.2. The Website engagement Index (WEI)

The Website Engagement Index (WEI) quantifies the engagement of BEEYONDERS' website visitors with the contents published on its pages. Outreach is measured based on the total number of page views, while its engagement is gauged as the amount of time spent on these pages.

The index is expressed in percentage with a natural range between 0 and 1. Its value tends to be higher in comparison to PEI. Contrast to the engagement according to the publications, the engagement recorded on the website is based on the visitors' attention span, rather than the specific actions performed, that is, downloads, shares.

4.2.3. The Social Engagement Index (SEI)

The Social Engagement Index (SEI) measures the level of interest generated by all the social media posts made by the BEEYONDERS project. It also represents the amount of engagement made between the social media users with the content present in these posts. This is calculated by finding the ratio between the outreach and engagement levels for each social media channel.

The SEI percentages vary depending on how these channels work. Twitter, for example, has a wider online community in comparison to LinkedIn. This explains the substantial level of outreach with respect to LinkedIn. However, it falls behind with the level of engagement, since a public Twitter account opens its doors to anyone, while a LinkedIn page provides more familiarity with its followers as they are committed to following the content shared by the page.

4.2.4. The Community Engagement Index (CEI)

The Community Engagement Index (CEI) developed by ICONS is used to assess and evaluate the results and impacts of the project. The CEI is a function of the outreach and engagement indicators, and it is calculated as the ratio between total engagement and total outreach. It integrates all communication activities, both online and offline (i.e. publications, project website, social media, webinars, workshops/events, and other activities) into one single metric. Low values of the CEI indicate little interest by the target audience (compared to its outreach), while high values suggest high interest and engagement of the community.



5. Communication and Dissemination tools

5.1. Communication kit

The resources from the communication kit (including a presentation video, a roll-up poster and a flyer) support the project communication throughout the whole lifetime of the project by allowing the partners to use them as a hook to engage with stakeholders, particularly when participating to events. The communication kit contains all the information stakeholders need to know regarding the project. The materials follow the project visual identity. More details on each component of the communication kit can be found in the paragraphs below.

Table 1. Communication kit main info

	Communication kit
Accountability	The communication kit was developed by ICONS.
Input	Acciona and Tecnalia provided key support in the definition of the concept and script of all materials.
Timing/deviations	The communication kit was released in M8.
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies
Next steps	NA

5.1.1. Presentation video

BEEYONDERS [presentation video](#) was published in month 8 (January 2023) as part of the project's Communication kit. It aims at presenting the project to all identified target audiences in a concise yet comprehensive manner. The video has been developed using a graphic animation technique and a storytelling approach, aiming to catch attention from a broader audience and generate interest on professional target groups, pushing them to get to know more about the project. It was published on the project's dedicated [YouTube channel](#) and on the project website home page. A dedicated [press release](#) was published to support its dissemination.

The outreach and engagement data of the publication are available in the table below. The KPI for the presentation video of 400 views is close to being reached.

Table 2. Presentation video outreach and engagement data

	Outreach	Engagement	YouTube views
Presentation video	1,639	515	336



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5.1.2. Flyer

The project [flyer](#) was also released in month 8 as part of the Communication kit. The document is downloadable from the “resources” section of the website. 100 copies were printed in January 2023 and shared among partners during the project’s General Assembly in Denmark.

The flyer is also available (in its digital and printable version) on the shared repository, to allow partners to print them themselves in case of need.

5.1.3. Roll-up

The project [roll-up poster](#) was also released in month 8 as part of the Communication kit. The document is downloadable from the “resources” section of the website. One roll-up poster was printed by ICONS in January 2023 and given to Acciona, who is responsible for sending the roll-up poster to partners who request it, in case of participations to events.

5.1.4. Power Point presentation

A short, visually attractive PowerPoint presentation was created as a key instrument for partners to use as a baseline when presenting BEEYONDERS to external audiences. The presentation was shared with the partnership and is available on the internal repository.

5.2. Editorial production: news, press releases and journalistic articles

Journalistic articles, press and news releases are editorial formats adopted by BEEYONDERS to keep the wide audience informed on the main activities of the project, while delving into its main aspects and challenges.

Once published on the project website, journalistic articles and press releases are distributed across the [alphagalileo.org](#), [phys.org](#), [Construction21](#) and [BuildUp](#) media multipliers. Moreover, the journalistic articles have also been released on [youris.com](#), a major public communication portal on EU research and innovation directly managed by ICONS.

Table 3. Editorial products main info

	Editorial products
Accountability	ICONS is in charge for the development and distribution of these editorial formats.
Input	All project partners contribute with technical contents, input, and statements for the articles.
Timing/deviations	Ongoing
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies
Next steps	Next releases to be developed following the project progress.



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5.2.1. Journalistic articles

Journalistic articles aim at informing and stimulating the interest of a wider public about the topics covered by BEEYONDERS. This approach in communication is particularly effective to reach a wide range of audiences, to raise awareness and ultimately contribute to social acceptance of the project's results.

Two journalistic articles, listed in the table below, were published on the project's website and distributed via multipliers to increase outreach and engagement.

Table 4. Journalistic articles list

Title of journalistic article and link	Date of publication
Robots for gender balance: helping women conquer the construction sector	08/03/2023
Building more, building greener. How robots can help the construction sector grow bigger and more sustainable	21/09/2023

5.2.2. Press and news releases

BEEYONDERS press and news releases are meant to draw the stakeholders' and the public's attention towards BEEYONDERS, the progress made, and the results achieved.

Press releases are particularly effective when it comes to communicating the project's main achievements and key milestones, like the release of a scientific paper or a technical deliverable.

News releases, on the other hand, have an informal structure and they use a plain language as they are easily read by the public. They are usually published on the project website to communicate news about the project, its features and its work which are all worth bringing to the attention of the BEEYONDERS community despite not being "breaking news".

Table 5. Press and news releases list

Title of editorial product and link	Editorial product type	Date of publication
News tech helps construction sector to be more worker-friendly	Press release	27/09/2022
Kicking off the activities to revolutionize the EU's construction industry	Project update	30/09/2022
BEEYONDERS' journey towards a safer, sustainable, and competitive European construction sector	Press release	02/02/2023
#DearLittleScientist: the new social media campaign launched for the International Day of Women and Girls in Science	Project update	06/02/2023



<u>Initiating the activities for the implementation of 3D Concrete Printing technologies</u>	Project update	15/02/2023
<u>BEEYONDERS First Newsletter</u>	Newsletter	23/02/2023
<u>Revealing BEEYONDERS Identity</u>	Project update	06/03/2023
<u>Discussing the present and future of AI and Robotics in Construction</u>	Project update	21/03/2023
<u>Tech4EUconstruction Cluster: revolutionizing the construction sector together</u>	Project update	27/06/2023
<u>Celebrating BEEYONDERS first anniversary</u>	Project update	13/07/2023
<u>Meet Our Tech – Unveiling BEEYONDERS technologies: the Exoskeleton</u>	Project update	07/09/2023
<u>Tech4EUConstruction cluster launches the “Words of Innovation” campaign</u>	Project update	27/09/2023
<u>BEEYONDERS second newsletter</u>	Newsletter	16/10/2023
<u>We are BEEYONDERS – Meet out project coordinator</u>	Project update	20/11/2023

5.3. Newsletter

A project newsletter is released on a six/eight-monthly basis to inform about the progress made by the project. It is structured upon a summary of the key events, journalistic articles, news or press releases issued by the project. Sister projects, partnerships and clusters are offered a space in the newsletter.

So far, two project newsletters were released. In addition to being sent to the registered users, newsletters are available on the project website in the “news” section.

Table 6. Newsletters main info

	Newsletters
Accountability	ICONS is in charge for the development and distribution of these newsletters.
Input	All project partners contribute with statements, news items to be promoted and help with the distribution, advertising the newsletter with their own communities.
Timing/deviations	Ongoing Newsletter #1 was issued in February 2023 Newsletter #2 was issued in October 2023
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies



Next steps	Newsletter #3 is expected to be released in March 2024.
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5.4. Scientific publications

The following scientific publications were published by BEEYONDERS partners:

Table 7. Technical publications

Publication title	Type of publication	Partner	Peer-review	Title of journal or equivalent
Introducing Noise for AirSim's 3D Lidar Sensor to Reduce the Sim2real Gap	Publication in conference proceeding/ workshop	FADA CATEC	yes	ICRA 2023 Workshop: "The Role of Robotics Simulators for Unmanned Aerial Vehicles"
Introducing Noise for AirSim's 3D Lidar Sensor to Reduce the Sim2real Gap	Article in journal	FADA CATEC	yes	ICUAS 2023 eMagazine
Human-in-the-loop optimization of active back-support exoskeleton assistance via lumbosacral joint torque estimation	Publication in conference proceeding/ workshop	IIT	yes	2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
Online Ergonomic Evaluation in Realistic Manual Material Handling Task: Proof of Concept	Article in journal	IIT	yes	Bioengineering

Table 8. Scientific publications main info

	Scientific Publications
Accountability	ICONS keeps track of all the scientific and technical publications made by BEEYONDERS' scientific and technical partners within the project. Moreover, ICONS promotes such publications via the project website and social media.
Input	Research, industrial and technical partners are the main responsible for the release and publishing of these actions, in particular.
Timing/deviations	So far, 4 scientific publications were published.
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies
Next steps	Additional scientific publications are planned to be published in the coming months.



5.5. External publications

External publications were made by project partners and external entities, further enhancing outreach and engagement towards their own communities. These were gathered in the following table:

Table 9. List of external publications

External Publications	Publication Date	Publisher
CONSTRUCTION 4.0: EBC WILL EXPLORE HUMAN-CENTRIC TECHNOLOGIES IN NEW EU-FUNDED PROJECT BEEYONDERS	08/07/2022	EBC
CONSTRUCTION 4.0: KICKING OFF THE BEEYONDERS PROJECT AND ITS WORKER-FRIENDLY TECHNOLOGIES IN MADRID	11/10/2022	EBC
BEEYONDERS project: improving efficiency while reducing the environmental impact of building sites	20/10/2022	BuildUP
BEEYONDERS project kick-off in Madrid	03/11/2022	PNO
Una máquina autónoma para desescombrar túneles que llega donde el operario no podría ver ni respirar	13/12/2022	Heraldo
BEEYONDERS: Robots for gender balance: helping women conquer the construction sector	28/03/2023	PNO
El proyecto Beeyonders mejorará la calidad del sector de la construcción y reducirá el impacto ambiental a través de nuevas tecnologías	08/06/2023	CONSTRUIBLE
Robot autónomo para una construcción más eficiente y segura	19/09/2023	TECNALIA
Digital construction: launch of the tech4euconstruction cluster by three Horizon Europe projects aiming at human-centric technologies in construction	12/07/2023	EBC

Articles and news releases published by BEEYONDERS were taken-up by project partners. The list is available in the table below.

Table 10. List of uptakes

List of uptakes	Publishing Date	Publisher
News tech helps construction sector to be more worker-friendly	07/10/2022	ICONS
BEEYONDERS: Robots for gender balance: helping women conquer the construction sector	07/10/2023	PNO



6. Online channels for communication and dissemination

Before presenting the results of this first analysis, this document provides an overview of the main communication and dissemination channels considered.

6.1. Website

The BEEYONDERS website is the project's main communication channel, as it provides the principal interface towards all BEEYONDERS target audiences. Key information about the challenges addressed by the project, its objectives, and achievements are included, along with the latest news and events. The website is regularly updated with fresh content and acts as a repository for open resources produced by the project to the public.

The project [website](#) was developed by ICONS and it has been released in M4. Before the full website, a landing page was designed in M2 as a first access point to the projects' actions, however, its release was kept on hold by the coordinator due to lack of feedback from the PO, which ultimately lead to direct evolution of the landing page into the more structured project website, to be in line with the mentioned deadline in the DoA (M4).

Table 11. Project website main info

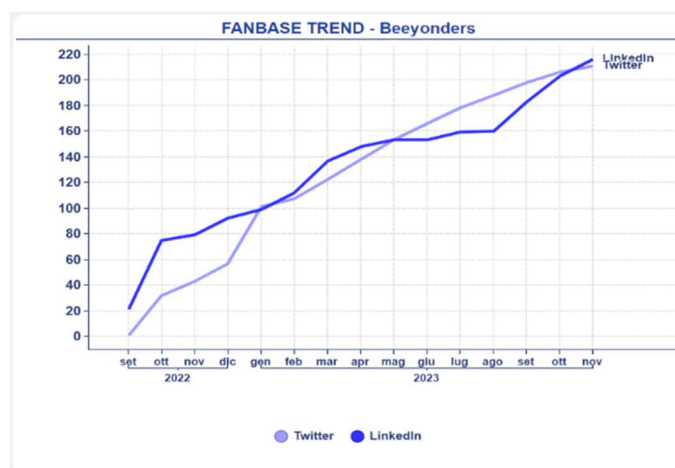
	Project website
Accountability	The BEEYONDERS website is developed and maintained by ICONS, with input and feedback from Acciona and Tecnalia. Input and co-operation from Acciona and the rest of the BEEYONDERS partnership is encouraged to feed regular updates into the website. In compliance with the General Data Protection Regulation – Regulation (EU) 2016/679 (GDPR), private data will remain confidential as ICONS will act as the Data Controller and be responsible for treating all the sensitive data provided by the registered users upon online registration
Input	All partners participate sending inputs for news, events, and scientific papers. ICONS actively searches for news, events, and journalistic articles topics.
Timing/deviations	Ongoing The project website was released in September 2022.
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies
Next steps	The website will be regularly updated with fresh content.



6.2. Social media

The BEEYONDERS **social media** strategy is managed by ICONS, and it is twofold: social media serves both as an additional communication channel and as a participatory tool to foster dialogue, enhance public understanding, acceptance, and participation of end-users through dedicated messages (see D8.1 for further information). A **Twitter** account and a **LinkedIn** company page were opened in M4. The performance of both channels in terms of community size growth as of November 2023 is summarized in the graphic below.

Figure 1. BEEYONDERS followers' growth



The figure shows a steady increase in followers from the start. As visible in the table below both Twitter and LinkedIn accounts have reached 2/3 of the KPI (more than 300 followers on LinkedIn and Twitter).

Table 12. Followers on social media channels

Social media channels	Followers
Twitter	211
LinkedIn	216
Total	427

During the considered reporting period, the following social media campaigns were carried out on the project's LinkedIn and Twitter channels:

Table 13. BEEYONDERS social media campaigns

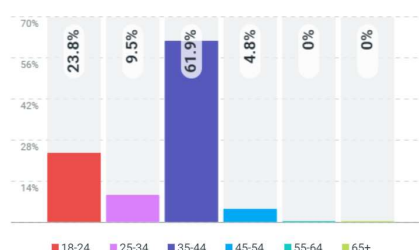
	Link	Timing
Project presentation	example	December 2022
Meet the partners	example	January – February 2023
#DearLittleScientist	Hashtag link	February 2023



Road trip to Japan	Example	September 2023
#WordsOfInnovation	Hashtag link	October – November 2023
#Urbanize4Change	Hashtag link	31 October 2023

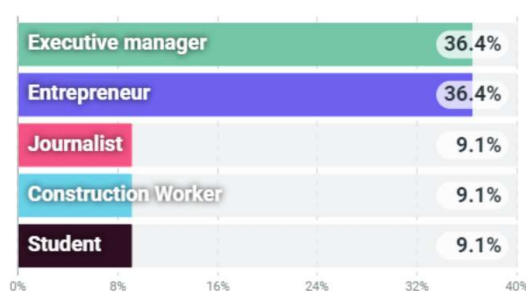
The official **hashtag** [#beeyondersEU](#) was launched in July 2022 to help monitor conversations about the project. As of November 2023, the hashtag has collected 250 mentions and an engagement of 804 (source: Talkwalker). 77% of the mentions stem from Twitter, the remaining from LinkedIn. 83.3% of the hashtag users are males. The age split of the users is available in the figure below.

Figure 2. Age of #beeyondersEU hashtag users



Talkwalker allows to catch a glimpse of the user's occupation. Most of the users are executive managers and entrepreneurs, along with construction workers.

Figure 3. Occupation of #beeyondersEU hashtag users



To animate the project's website and social media channels and increase the audience's knowledge on the project's objectives, the video interview campaign "We are BEEYONDERS" was launched. It aims to raise awareness upon the activities of each work package. In the considered reporting period, the first [video](#) was published in November 2023. Outreach and engagement data is not yet available, and it will be included in the next technical report (due M36).

Table 14. Social media channels main info

Social media	
Accountability	ICONS is responsible for the core social media activities: setting up the accounts, posting, following existing social media channels and monitoring outreach. The consortium partners are encouraged to contribute by joining the community of BEEYONDERS Twitter and LinkedIn followers. They can retweet and repost our content from their organisations' channels and use the #beeyondersEU.



Input	ICONS distributes original project news and events on BEEYONDERS social media channels, retweets and reposts events and news that are interesting for the project's community and help increasing visibility and engagement of partner's posts and tweets. ICONS also designed original social media campaigns on BEEYONDERS - related topics. All the consortium partners contribute posting their original content about the project or engaging with BEEYONDERS social media account activities.
Timing/deviations	Ongoing The project's social media accounts were opened in September 2022.
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies
Next steps	Twitter and LinkedIn will be kept active to increase the followers count and to maximise the visibility of the contents produced by the project. Further campaigns will be carried out in the coming years.

6.3. Multipliers

External media multipliers are used to disseminate contents of general interest produced by BEEYONDERS. News multipliers are portals and websites that relay scientific and non-scientific news and information. They serve as gateways for journalists, media, researchers and the general public.

ICONS has built a network of news multipliers that enjoy large audiences in Europe. Some outlets focus on specific topics while others are managed by the European Commission, or they are related to it. Key multipliers include: [EU Agenda](#), [Alpha Galileo](#), [Phys.org](#), [World News](#) and [Science Daily](#). In addition, two sector specific multipliers will be used for further distribution, namely [BuildUP](#) and [Construction21](#).

Table 15. Multipliers main info

	Multipliers
Accountability	ICONS is responsible for distributing the news and press releases and journalistic articles to external news multipliers.
Input	The consortium partners are encouraged to re-distribute these materials within their networks.
Timing/deviations	Ongoing
Task/deliverable	Task 8.2 - Dissemination and Communication Strategies



7. Events and clustering activities

7.1. Events

The participation in third party events, fairs and conferences is an important tool that the BEEYONDERS consortium is planning to exploit to reach out to professional audiences and to facilitate both the dissemination of its results and outcomes and the creation of fruitful collaborations.

So far, BEEYONDERS partners have taken part in the following events (total: 16):

Table 16. External events attended by BEEYONDERS partners

	Date and location	Partner involved	Role
<u>UNVEX – Unmanned Vehicles Exhibition</u>	14-16/09/2022 Sevilla, Spain	FADA CATEC	Attendee/ speaker
<u>Robot2022 - Fifth Iberian Robotics Forum</u>	23-25/11/2022 Zaragoza, Spain	ITAINNOVA	Attendee/ speaker
<u>Annual ACCIONA's Innovation days</u>	26/01/2023 Madrid, Spain	ACCIONA	Attendee/ Speaker
<u>AI and Robotics in Construction at the European Robotics Forum 2023</u>	15/03/2023 Odense, Denmark	ACCIONA	Attendee/ speaker
<u>AESA and CDTI drone conference</u>	17/03/2023	FADA CATEC	Attendee
<u>EBC Board of Directors</u>	06/02/2023	EBC	Attendee/ Speaker
<u>REBUILD 2023</u>	28-30/03/2023 Madrid, Spain	TECNALIA	Attendee/ speaker
<u>European Sustainable Energy Week</u>	20/06/2023	EBC	Attendee/ Speaker
<u>Digital Transformation of Health and Safety in Construction</u>	21-22/06/2023	DTU	Attendee/ Speaker
<u>Workshop PILLARS Project</u>	29/06/2023 Brussels	EBC	Attendee/ Speaker
<u>EBC Annual Congress</u>	07/07/2023	EBC	Attendee/ Speaker
<u>International workshop</u>	09-13/07/2023	AISCAT	Attendee/ Speaker
<u>FIW 2023</u>	13-15/09/2023 Chiba-city, Japan	ACCIONA	Attendee
<u>Expodronica (Airspace Integration Week)</u>	25-29/09/2023	FADA CATEC	Attendee/ Speaker



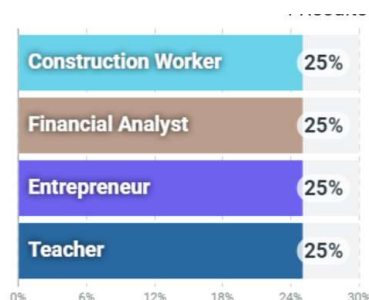
<u>IROS 2023</u>	01-05/10/2023 Detroit, USA	IIT	Attendee/ speaker
<u>Conference on Construction Application of Virtual Reality (CONVR)</u>	13/16/11/2023 Florence, Italy	DTU	Attendee/ speaker

7.2. Clustering activities

BEEYONDERS partners participate in networking and clustering events to raise the project's visibility within the stakeholder community.

In the framework of the collaboration with sister projects, a formal cluster was launched under the name Tech4EUcluster. Besides BEEYONDERS, the cluster is formed by [HumanTech](#) and [Robétarmé](#) projects. To monitor activities related to the cluster, a dedicated hashtag was created. So far, the hashtag [#Tech4EUconstruction](#) has collected 130 mentions and an engagement value of 316. 94% of the mentions stem from Twitter; however, most of the engagement comes from LinkedIn likes. Also in this case, 89% of the users of the hashtag are males, aged between 25 and 54. The figure below shows that the top occupations from the users are construction workers, entrepreneurs, teachers, and financial analysts. This fact underlines that the contents are indeed reaching some of the key target audiences of the project.

Figure 4. Occupation of #Tech4EUConstruction hashtag users



A dedicated visual identity, including a logo (see image below), was created for the cluster. Further actions are being undertaken to enlarge the cluster and include other projects.

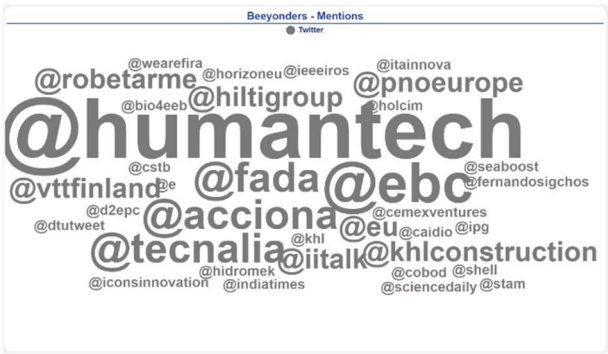
Figure 5. Tech4EUconstruction cluster logo



As visible from the Word Cloud Chart below, HumanTech and Robétarmé represent two of the biggest sources of mentions for BEEYONDERS, demonstrating the positive impact of the collaboration with the sister projects (including, for example, the [#WordsofInnovation](#) joint social media campaign).



Figure 6. Wordcloud representing sources of Twitter mentions



Additional projects are being invited to join the cluster, such as [REINCARNATE](#), [BIM2TWIN](#), [RECONMATIC](#), [HERON](#) and [InCUBE](#).

In March 2024 BEEYONDERS will participate, together with HumanTech and Robétarmé, at the [European Robotics Forum](#) with a joint session on “AI and robotics in construction”.

7.3. Stakeholder database

During the first reporting period (June 2023) an initial stakeholder database was created by the consortium, under the guidance of the D&C leader. A preliminary list of 60 entities was gathered with the contribution of each partner, which have been asked to only include entities with whom they are already in touch. The same partner nominating such organisations will then be responsible for engaging directly with them and liaising with them for disseminating project results. In fact, once the project makes some progress, partner organisations are asked to take on responsibility in approaching and engaging with specific stakeholders to deliver more refined messages and cascade down to them project dissemination materials. The fields included in the stakeholder database are available in the table below.

During the following reporting period the document will be updated to add potential new stakeholders.

Table 17. Fields of the stakeholder database

STAKEHOLDER	STAKEHOLDER'S WEBSITE	STAKEHOLDER TYPE	STAKEHOLDERS GEOGRAPHICAL LEVEL OF OPERATION	GEOGRAPHICAL DETAIL	DISSEMINATION FORMAT(s)	DISSEMINATION FORMAT(s) DETAIL	DISSEMINATED KER(s)	COMMENT
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8. BEEYONDERS monitoring analysis

Following the methodology described in chapter two, this section is dedicated to the analysis of BEEYONDERS communication and dissemination activities.

The focus is placed on:

- Publications’ outreach, engagement and PEI
- Website outreach, engagement and WEI
- Social media outreach, engagement and SEI
- BEEYONDERS total outreach, engagement and Community Engagement Index – CEI

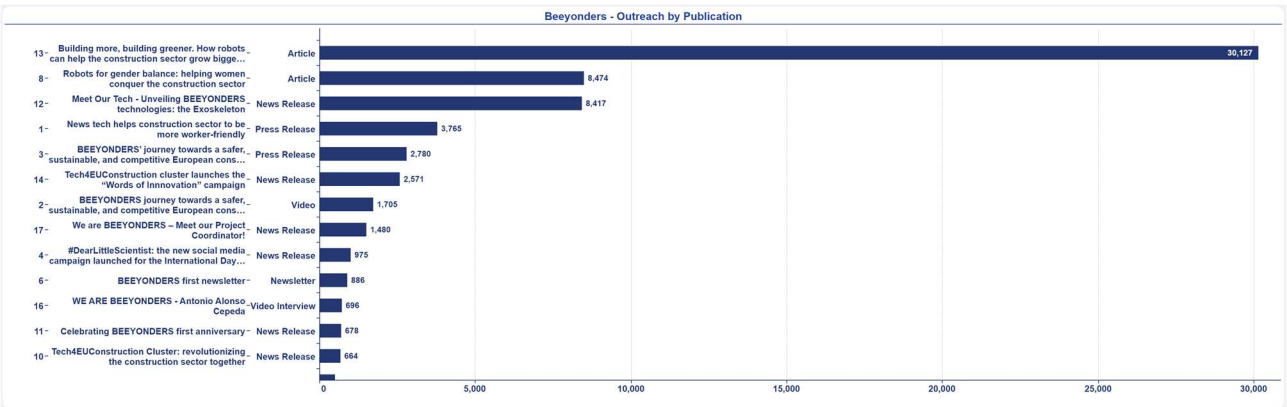
8.1. Publications’ impacts

All 17 BEEYONDERS editorial products, listed in Table 19. *Individual performance of publications* (paragraph 8.1.4), are considered in terms of impact generated. To this end, their outreach and engagement are analyzed, also in an integrated manner through the Publications engagement index. The following paragraphs focus on each aspect of the analysis.

8.1.1. Publications’ outreach

The table below offers an overview of the outreach achieved by each of the BEEYONDERS publications. The second journalistic article, “Building more, building greener” is by far the product which achieved the highest outreach, followed by the first “Meet our tech” news release and the first journalistic article.

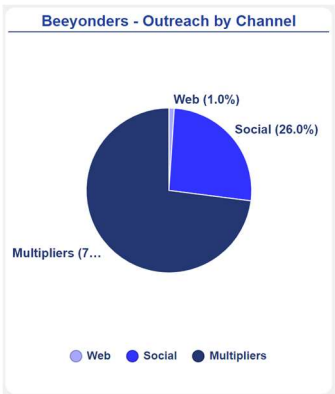
Table 18. Outreach by publication



As visible in the figure below, the channels which provided more outreach are the information multipliers (which are used to disseminate journalistic articles and press releases), followed by social media.

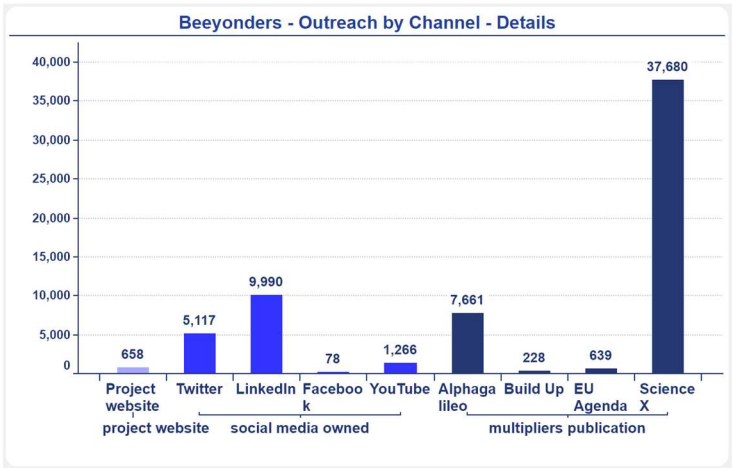


Figure 7. Outreach by channel



Among all multipliers which are used by the projects, Science X appears to be the one achieving the most effective in terms of outreach (see figure below).

Figure 8. Outreach by channel - details

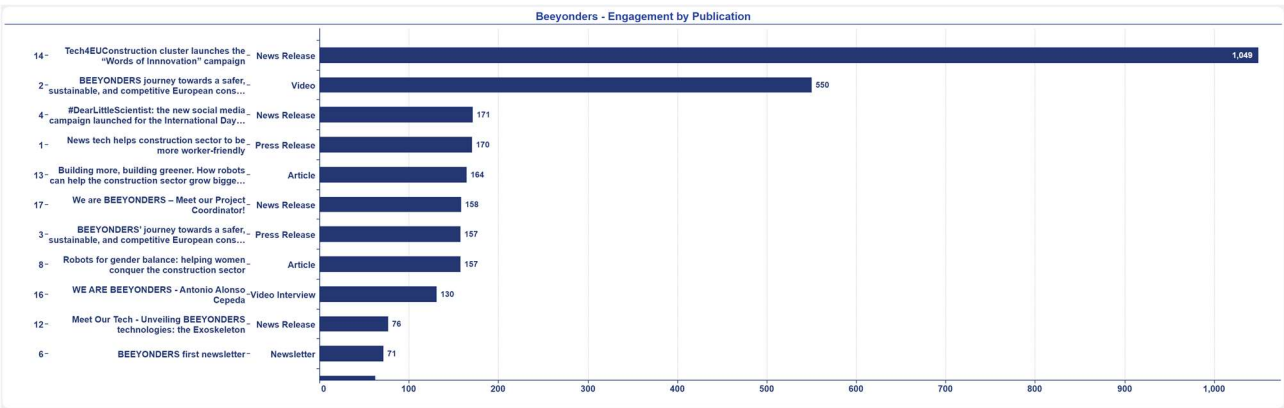


8.1.2. Publications' engagement

The table below shows that the most engaging publication is the news release for the launch of the “Words of Innovation campaign”. This piece of news has received lots of attention and interactions, also because the campaign was carried out together with the sister projects Robétarmé and HumanTech. The second most engaging publication is the one promoting the project presentation video.

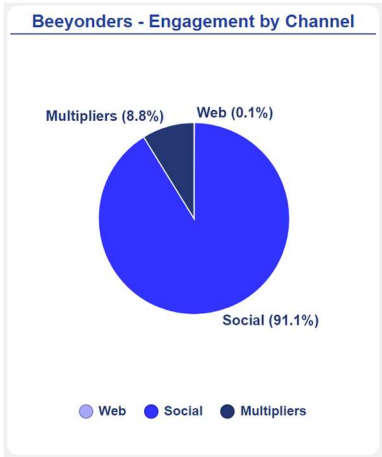


Figure 9. Engagement by publication



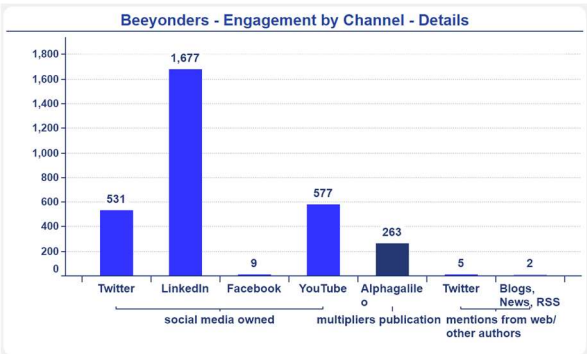
Due to its intrinsic nature, social media are the place where most engagement stems from (see figure below). Social media are followed by multipliers, where 8.8% of the engagement is generated.

Figure 10. Engagement by channel



As visible in the figure below, among the project's social media channels (Twitter, LinkedIn, Youtube), LinkedIn is the source of most of BEEYONDERS' engagement. This confirms that LinkedIn is an appropriate channel to reach and engage with the project's target audience.

Figure 11. Engagement by channels - details



8.1.3. Publications' PEI

Outreach and engagement indicators are not sufficient to assess the evolution of the acceptance level. The former only provide an estimate of audience size, not its interest level. The latter describe the interest and overall impacts on a community but should be read in conjunction with outreach to draw relevant conclusions on engagement. To this aim, a composite indicator is needed.

For each editorial product the **Publication Engagement Index (PEI)** was calculated as the ration between the persons that have been reached by a publication on the project website, on social, on YouTube and on the information multipliers and the ones that have interacted with it. The BEEYONDERS average **PEI is 4.8%**. The result is very positive if compared to the average of 2.5%, given by the average of the projects whose communication and dissemination activities are managed by ICONS.

Across the monitored channels (websites, social media and news multipliers), as of M18 the 17 editorial products collected an **aggregated outreach value of 64,480** and an **aggregated engagement value of 3,064**. The outreach value has surpassed 50% of the target set within the proposal (100,000 readers via the project channels).

8.1.4. Publications' Effectiveness Quadrants

The Effectiveness Quadrants for Publications present a visual depiction of the communication performance associated with BEEYONDERS publications. This tool utilizes two perpendicular Cartesian axes, where the X and Y axes denote total outreach and engagement, respectively. It categorizes publications into four quadrants based on their outreach and engagement values. The size of each bubble indicates **the Publication Effectiveness Index (PEI)**. The point of intersection between the axes represents the average outreach and engagement values for the publications. The four quadrants are as follows:

- **Above-average outreach, above-average engagement:** These are deemed "effective" publications capable of reaching a broad audience and engaging it effectively.
- **Above-average outreach, below-average engagement:** These are classified as "reaching" publications, capable of reaching a large audience but not particularly engaging it.
- **Below-average outreach, above-average engagement:** Labeled as "engaging" publications, these reach a limited audience compared to the average but effectively engage that audience.
- **Below-average outreach and engagement:** These fall into the "neutral" quadrant, signifying that they are comparatively less effective in both reaching and engaging the public.

Since the axes intersect at their average values, there will naturally be publications below average, placing them in the "neutral" quadrant. This term is used because these publications have a neutral impact on outreach and engagement compared to others.

This tool aims to pinpoint the most effective publications concerning content, style, channels, and formats, thereby enhancing BEEYONDERS communication strategy. It's important to note that any effort to improve communication automatically boosts outreach and engagement, shifting the intersection of axes to the right. Consequently, some publications will consistently fall into the neutral quadrant. This dynamic nature makes the quadrants a valuable tool throughout the project but less effective for presenting the final view of the project's results.



For a deeper description of the methodology developed by ICONS to measure effectiveness of communication and dissemination activities, the following paper has been published in Zenodo: [*Two new tools for science communication assessment: the community engagement index and communication effectiveness quadrants*](#).

Figure 12. Distribution of BEEYONDERS' editorial products on the effectiveness quadrants

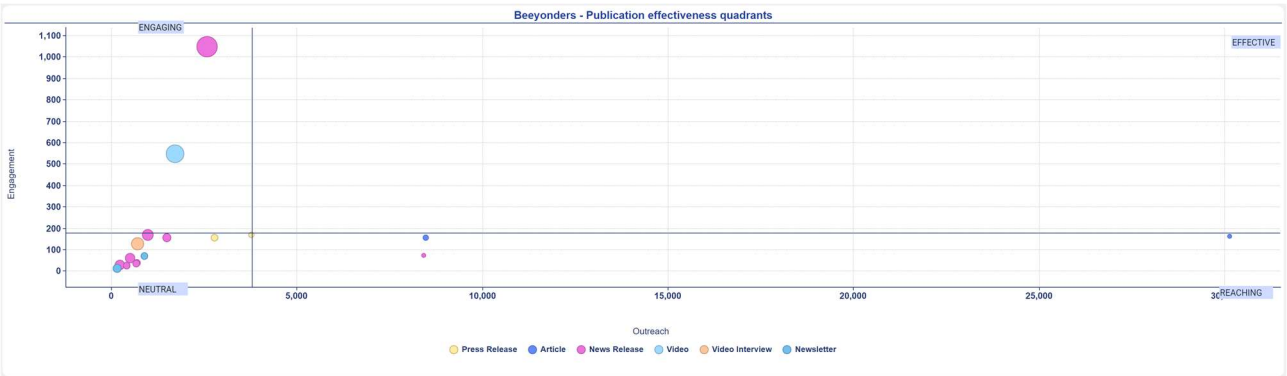


Figure 14. Publication effectiveness quadrants by Publication type

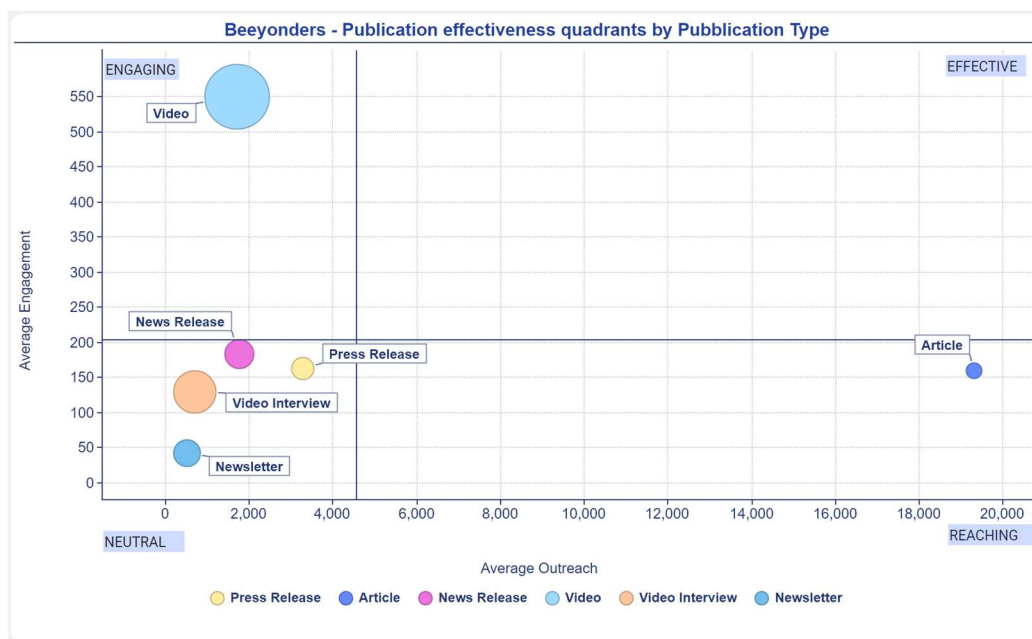


Table 19. Individual performance of publications

	Publication date	Title	Type	Outreach	Engagement	PEI
1	27/09/2022	News tech helps construction sector to be more worker-friendly	Press Release	3,765	170	4.5
2	02/02/2023	BEEYONDERS journey towards a safer, sustainable, and competitive European construction sector	Video	1,705	550	32.3
3	03/02/2023	BEEYONDERS' journey towards a safer, sustainable, and competitive European construction sector	Press Release	2,780	157	5.6
4	06/02/2023	#DearLittleScientist: the new social media campaign launched for the International Day of Women and Girls in Science	News Release	975	171	17.5
5	15/02/2023	Initiating the activities for the implementation of 3D Concrete Printing technologies	News Release	214	31	14.5
6	23/02/2023	BEEYONDERS first newsletter	Newsletter	886	71	8.0
7	06/03/2023	Revealing BEEYONDERS identity	News Release	407	28	6.9



8	08/03/2023	Robots for gender balance: helping women conquer the construction sector	Article	8,474	157	1.9
9	21/03/2023	Discussing the present and future of AI and Robotics in Construction	News Release	492	62	12.6
10	28/06/2023	Tech4EUConstruction Cluster: revolutionizing the construction sector together	News Release	664	37	5.6
11	13/07/2023	Celebrating BEEYONDERS first anniversary	News Release	678	39	5.8
12	07/09/2023	Meet Our Tech - Unveiling BEEYONDERS technologies: the Exoskeleton	News Release	8,417	76	0.9
13	21/09/2023	Building more, building greener. How robots can help the construction sector grow bigger and more sustainable	Article	30,127	164	0.5
14	27/09/2023	Tech4EUConstruction cluster launches the “Words of Innovation” campaign	News Release	2,571	1,049	40.8
15	16/10/2023	BEEYONDERS second newsletter	Newsletter	149	14	9.4
16	20/11/2023	WE ARE BEEYONDERS - Antonio Alonso Cepeda	Video Interview	696	130	18.7
17	20/11/2023	We are BEEYONDERS – Meet our Project Coordinator!	News Release	1,480	158	10.7
	Grand total			64,480	3,064	4.8

8.2. Website impacts

The website performance from its launch on 30 September 2022 as of November 2023 is reported in the table below. 12 months after the full website’s launch, the number of website visits (3,825) is in line to reach the set KPI of 10,000 website visualizations by the end of the project.

Table 20. Website performance

Visits	Page views	Unique page views	Average session	Actions/visit
3,825	8,568	6,619	2:07	2.4



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To measure the effectiveness of the website in terms of outreach and engagement over its contents, ICONS developed the **Website Engagement Index (WEI)**, which quantifies the engagement of BEEYONDERS website visitors with the content published on its pages. Outreach is measured based on the total number of page views, while engagement is gauged as the amount of time spent on these pages by users who remain on the website for more than 60 seconds.

The BEEYONDERS index, 51.6%, is a little higher than the average WEI measured across all projects whose communication and dissemination activities are managed by ICONS, namely 51%.

The average session duration of 2:07 shows a very good level of retention.

8.3. Social media impacts

The Social Media Engagement Index (SEI), being part of the set of indicators developed by ICONS to measure social media effectiveness through the ratio between outreach and engagement levels for each social media channel, is 6.5% for Twitter and 15.2% for LinkedIn. In the two following figures, a more detailed outlook on the outreach and engagement stemming from both channels is provided.

Figure 15. Social media engagement achieved on Twitter and LinkedIn

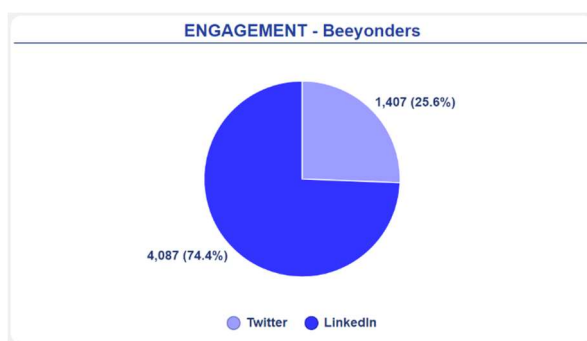
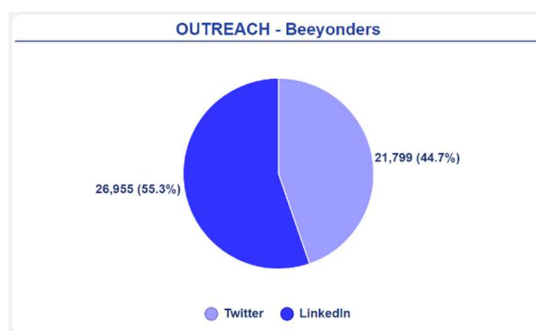


Figure 16. Social media outreach achieved on Twitter and LinkedIn



As visible in figure 16, LinkedIn is resulting as the most engaging channel for BEEYONDERS, considering the targets addressed and the research domain. Between LinkedIn and Twitter, the latter is usually the channel where most outreach is achieved; in BEEYONDERS case, instead, this is not true as LinkedIn has a higher outreach. Additionally, LinkedIn has proven to be the most outreaching and engaging tool.

The total SEI is 11.3%; this value is much higher than the average index measured across all projects managed by ICONS, namely 2.6%. This signifies that the project's audience on social media is very engaged and



interacts much with the content created, suggesting that the proposed content is interesting. This index is well above the set KPI of 0.7% defined in the Description of Action.

Table 21. Social media performance

Channel	Followers	Posts	Total Outreach	Total Engagement	SEI
Twitter	211	118	21,799	1,407	6.5
LinkedIn	216	104	26,955	4,087	15.2
Grand total	427	222	48,754	5,502	11.3

8.4. Other impacts

Other data can be considered to evaluate the impact of the project, for example the number of downloads from the website and the number of subscribers to the newsletter.

As of M18, a total of 85 users were reached via the project's newsletter. More detail on the outreach and engagement, opens and clicks of the newsletters is provided in the tables below.

Table 22. Newsletters outreach and engagement strategies

	Outreach	Engagement
Newsletters	998	85

Table 23. Newsletter insights

	Reach	Opens	Clicks
Newsletter #1	38	63.16%	18.42%
Newsletter #2	47	78.72%	42.55%

Information on the downloads has been gathered using Matomo. Uploaded content was downloaded 83 times. Until M18, downloads from the project websites includes mostly communication materials from the "Resources" section, i.e., the project leaflet and roll-up. The agenda of the ERF 2023 workshop was also downloaded a few times. This is a good result that implies interest in the published content.

Table 24. Downloads

Document	Unique Downloads
BEEYONDERS leaflet	35
BEEYONDERS roll-up poster	35
ERF Agenda	13



8.5. Integrated BEEYONDERS impacts

The results of all project C&D activities performed so far can be merged into the CEI (see table below), which is calculated dividing the total engagement by the total outreach and multiplying the obtained result by 100. In the considered reporting period, the total engagement and outreach values (excluding double counting) are 12,828 and 110,859 respectively, for a total Community Engagement Index (CEI) of 11.6%. The value is very satisfactory, as it is higher than the benchmark identified by ICONS, which is 5.9% and well above the minimum CEI (3.0%).

Table 25. Community Engagement Index

IMPACT AREA	Outreach excl. double counting	Engagement excl. double counting	INDEX excl. double counting
Publications	64,480	3,064	4.8
Social media	34,952	3,353	9.6
Website	11,427	6,272	54.9
Downloads		87	
Subscribers NLs		52	
Grand total	110,859	12,828	11.6



9. Conclusions

Within the next reporting periods, a raise in the number of publications is expected, as a consequence of the launch of the BEEYONDERS pilots. The main objective of the D&C activities will be to expand the size of the audience while keeping very good engagement rates.

Additionally, more dissemination events will be organized, also with the sister projects. As mentioned above, a cluster workshop is planned to take place in March during ERF 2024. Also, a participation in a clustering event, organized by the RECONMATIC project, is planned. According to the Grant Agreement, the following events/webinars shall be organized and/or participated in:

- **Webinars:** at least 4 webinars will be organized tackling specific robotics topics addressing professional audiences and public administrations. The webinars should each count at least 20 participants.
- **Project events and participations in construction reference events:**
 - o Organization/participation of at 3 project workshops at EU level.
 - o Organization of one final conference at EU level.
 - o Participation in reference events such as: ECTP conference and National technology platform events and Construction Fairs.

Besides the above-mentioned outputs and activities, by the end of the project, the following dissemination materials are planned to be published. Most of them will be created in the final year of the project, starting from November 2024:

- **Info packs/technical brochure:** These are specifically designed for the professional community to learn about technical insights, solutions and measures developed by BEEYONDERS. They allow technical achievements and findings to be packaged and into a visually attractive and easy-to-access document. The number of the info packs will be defined with ACCIONA and with the WP leaders.
- **Innovation Handbook:** It will feature the project's key achievements based on the information included in the info packs. It will be issued towards the end of the project, when the BEEYONDERS partnership will be in the position to draw some conclusions from the project, worth to be shared in the scientific community.
- **Short videos:** Five short videos will be produced towards the end of the project to inform various audiences, especially the general public, about BEEYONDERS results and their concrete application into the 6 case studies. The videos will be in English, and they will be accessible via website and distributed via social media, communication portals, platforms and events.

Finally, by the end of the project, a total of at least 12 publications should be published.

