Ref. Ares(2024)2243293 - 25/03/2024

funded by the European Union

Awareness and resilience through European multi sensor system

Deliverable 6.1 Communication and Dissemination Plan

Final Version revised - 24 March 2024

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Document type	**Deliverable**
Document number	Del 6.1
Document title	Del 6.1 Communication and Dissemination Plan
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Release date	31 January 2023
Contributing partners	IESE Business School, KTH, Sintec
Dissemination level	Internal

Version	Short description	Main author / Reviewers	Coordinator
1	Advanced Draft 31 January 2023	Beatriz Moutinho, IESE Business School	Ayse Nyberg. KTH
2	Revised Draft 28 February 2023	Beatriz Moutinho, IESE Ramon Wyss, KTH Silva de Grandis, Sintec Ayse Nyberg, KTH Magda Rosenmoller IESE	Ayse Nyberg, KTH
3 FINAL	Final 10 March 2023	Beatriz Moutinho, IESE Jaume Ribera, IESE Magda Rosenmoller, IESE Ramon Wyss, KTH Silva de Grandis, Sintec Ayse Nyberg, KTH	Ayse Nyberg, KTH,
4. Final Revised	As per Evaluator's request for additional information 24.03.2024	Shabs Rajasekharan, IESE Magda Rosenmoller, IESE	Ayse Nyberg, KTH

Executive Summary

ArtEmis' goal is to radically improve earthquake forecasting through an innovative way of monitoring radon in ground water, in a sustainable way. Here, raising awareness with the public, municipalities, other actors and stakeholders, as well as potential sponsors will be essential: of the **ArtEmis** mission, its pan-European scope, and its capabilities and services.

Key activities for raising awareness and spreading new knowledge include dissemination, exploitation, and communication. In addition, by focusing on the role of cities / municipalities and other stakeholders, **ArtEmis** will contribute towards encouraging the participation of citizens and other actors in future alerting systems.

This deliverable is on the strategy for **ArtEmis communication and dissemination;** it outlines the communication objectives, the strategy for external and internal communication, and the resources and governance of related activities. Moreover, it provides an action plan for the use of the different communication tools, and guidance for future communication actions of the project and the consortium, on the sustainability of the future **ArtEmis Network** and potential marketing for the sensor to be developed and exploited. It is key that **ArtEmis** communication and dissemination actions support the sustainability of the project beyond-European funding and scale the initiative geographically and other. Communication and dissemination activities will be monitored continuously by an impact assessment.

Outcomes will be measured

- on the increase in the a**wareness of the project**, the u**sefulness of the measurement of radon** in groundwater for early warning of earthquakes, and the i**ncrease in acceptability** of these **practical installations** of sensors in the communities.
- on the **creation of the ARTEMIS network,** including sustainability measures, needs assessment, value creation, main activities (installations / measurements etc.) financing options (membership fees vs. sensors prices), other scaling, transferability, and sustainability measures.

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1. Introduction

ArtEmis, a Horizon-Europe project, aims to design, build and operate a smart and scalable multi-sensor system comprising some 100–200 novel low-cost geochemical sensors, to measure with unprecedented spatial and temporal resolution any changes in radon concentration in ground water, together with other observables such as temperature and acidity. The real time data collected from the sensor system is used to build machine learning (ML) and deep learning (DL) models for the detection of anomalies, quality control and the correlation analysis with seismicity nearby.

The sensor design integrates features of AI-supported awareness, adaption, and smart signalling. Low power consumption and affordability are additional design criteria. The prototypes of the sensor unit will be tested and optimised under realistic and challenging field conditions with the developed network architecture. The demonstration sites have been chosen to reflect different tectonic movements and geological conditions. Seismic activities in the Ionian Islands and the Abruzzi region are very high, while a smaller number of sensors are placed in the Swiss Alps, where there is a lower frequency of events but different geological conditions. To improve the geological and hydrological models for changes in radon and other observables in ground water, measurements with high sensitivity to seismicity and accuracy are performed at two world-leading infrastructure sites: *the Gran Sasso Aquifer* in Italy and the *Bedretto Tunnel* in Switzerland.

ArtEmis is a cross-disciplinary systemic project in which detection of ionisation radiation at individual sites is integrated into a large sensor system that will provide a new service to authorities and individuals. The project goes beyond the state of the art in the following aspects:

- Development of a radiation sensor optimising price vs. performance for measurements in ground water in real time.
- Integration of the radiation sensor with other sensors into a single smart design, reducing maintenance and energy consumption.
- Deployment of a sufficiently large number of sensors that will generate geographical dense coverage and thus allow for correlating observed seismicity and radon concentration.
- Use of machine learning – deep learning algorithms – for analysis of the data that will yield new insights into how best to analyse observed radon time-series and seismicity.
- Collaboration with municipalities to develop models for widespread deployment, public engagement, and scientific outreach.

Regarding particularly the latter point, raising awareness and spreading new knowledge are crucial, for example through the involvement of stakeholders and actors at the city level, through dissemination and communication, focus groups and design thinking workshops. In addition, by focusing on the role of citizens and other stakeholders, **ArtEmis** will contribute towards overcoming wariness relating to the participation of citizens and other actors in a future alerting system.

The aim of this deliverable is to provide a plan for **ArtEmis** communication and dissemination. This document elaborates on the communication objectives, the strategy for external and internal communication, and the resources and governance of related activities. Moreover, it provides an action plan for the use of the different communication tools. Finally, communication and dissemination activities will be monitored continuously, which will be carried out based on the impact assessment described further down.

2. Goals and Objectives

This report reviews **ArtEmis** Communication Plan and Strategy, detailing Communication, Dissemination, Networking, and Exploitation activities, involving municipalities, national bodies, partners, similar projects, and the general public. We will review the strategic approach and the concrete marketing activities regularly over the course of the project.

We have defined the target group(s) and the respective optimal channels and tools for marketing and dissemination of the **ArtEmis** project.

The main objectives are as follows:

- Increase general interest with a view to raising awareness.
- Increase the interest of the municipalities and civil society in taking an active role in earthquake mitigation, so increasing resilience of society.
- Increase interest among the (different) academic communities.
- Be seen as the expert initiative/network in earthquake prevention and all relevant matters – regarding the sensors and the related processes – by the various communities where the devices and the alert system are installed.
- Be recognised by the general public as a network providing a high value service for the benefit of citizens in earthquake regions and beyond.
- Increase awareness of the project with a view to potential beneficiaries, synergies and partnerships.
- Develop new forms of impact to extended stakeholders and transversal areas in society.
- Promote **ArtEmis** and Horizon Europe.

To achieve these goals, the **ArtEmis** consortium links collaborative actions with all project partners: **KTH** (Royal Institute of Technology, Sweden), **SURO** (Czech National Radiation Protection Institute), **Aristotle University Thessaloniki**, **University of L'Aquila**, **RadonTec** Germany, **GSI** (Helmholtz Research Centre for Heavy Irons), **INGV**, National Institute for Geology and Volcanology, Italy; **IESE Business School**, **PEDIN** (the Regional Union of Municipalities of Ionian Islands), **ETH Zurich**, **Aquilla City**, **Sorbonne University,** and **Sintec**, Italy. In collaboration with DG Research and building on **ArtEmis** partners' strong communication functions and networks, we will develop the communication channels and actions.

The **Communication / Dissemination / Exploitation plan** will consist of three sections, gathering efforts in three different areas: (i) **Communication and Dissemination**; (ii) **Networking**; and (iii) **Exploitation**. **The Communication and Dissemination Plan** will focus on building good exchange between **ArtEmis** and the targeted stakeholders, ensuring efficient interactions. The **Networking Plan** will focus on ensuring an ambitious expansion of the stakeholders involved, collecting more partners for the project. **The Exploitation Plan** will focus on maximising use of the project's results to achieve greatest societal impact, finding innovative ways to communicate to the public and to deliver the data acquired to partners.

These three sections will be executed in parallel, building on each other, as shown in the following diagram:

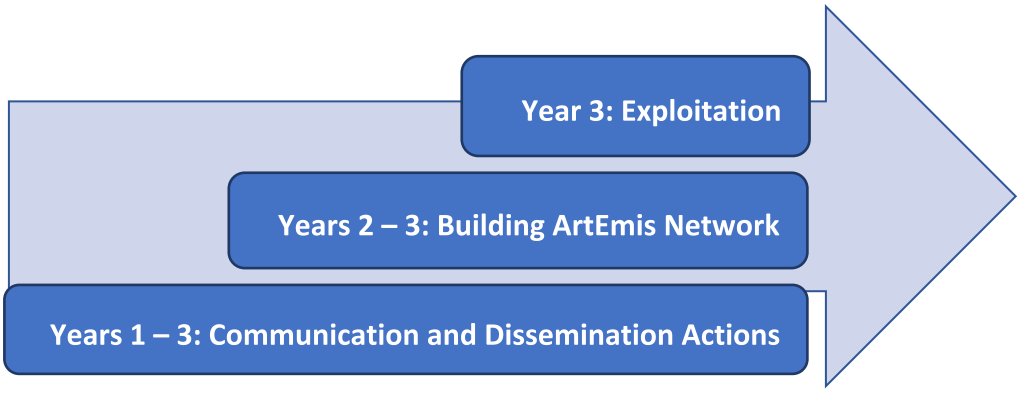


Figure 1: Marketing and Dissemination Strategy

We will execute distinct activities at different points in time, considering all potential synergies. An overview of communication / dissemination / exploitation activities is presented in the roadmap of Figure 2.

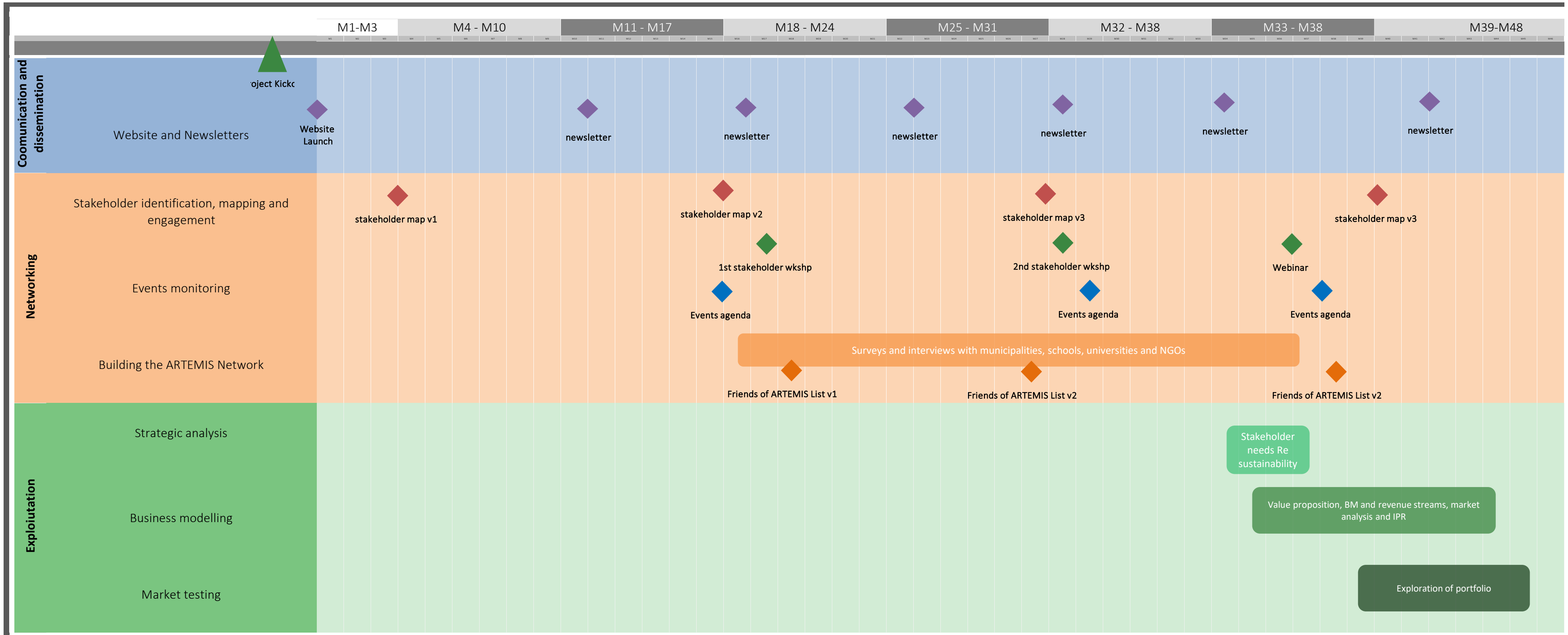


Figure 2: Roadmap of communication / dissemination / exploitation activities

3. Target Audience

The very first step is to forge a strong community among **ArtEmis** members. Here the website, as described further down, is a key instrument that will be complemented by further tools described in the following sections.

A key element of the communication strategy is to identify **ArtEmis** target groups, beyond the partners and academic community. These will be the national bodies in charge of surveillance and geological investigations, respective cities and regions, and their stakeholders and populations. Connecting with these groups will be essential for promoting and ensuring maximum knowledge of the study, the take-up of the innovative technology/sensors, and their appropriate use in well-designed monitoring processes to achieve maximum societal impact. This will be supported by the stakeholder map we have already elaborated in draft form, an essential basis for the detailed needs assessment.

The main target audience of the Communication Plan are the relevant regional and national authorities, municipalities and communities, their actors and stakeholders, the general public, as much as respective EU bodies and policy makers.

3.1. Needs Assessment and Value Proposition

Earthquakes constitute the number-one natural hazard to human life and society at large. Increased radon concentration in water and air has so far been identified as the most significant precursor. But despite the vast extent of scientific literature on different precursors to earthquakes, there is no consensus – and even sometimes controversy – with respect to their usefulness and applicability. **ArtEmis** exploits a new approach, using a large and scalable sensor system that measures in real time and employs deep learning algorithms for the analysis. **ArtEmis** will clarify the potential of radon as a precursor and open a new pathway for reliable monitoring of changes in radon concentration in ground water. Hence **ArtEmis** expects to set a new standard when it comes to scalable sensor technology for natural hazards like earthquakes. Added to its scientific value, **ArtEmis** is a highly innovative solution with the potential to develop a sound risk management system in Europe. **ArtEmis** is a leading initiative, as it integrates many disciplines into a single project: nuclear physics competence in radiation and detector development; smart sensor design involving artificial intelligence and the latest sensor technology; wireless network architecture; machine learning for time series; seismology, hydrology, geology and geophysics, with the exploitation aspects supporting the project's outreach and sustainability, all reflecting **ArtEmis'** interdisciplinarity.

The potential impact of **ArtEmis** in Europe is tremendous. We can expect much interest from the respective academic communities, national and local, municipality bodies, and also the general public. Earthquakes are a important matter – a significant, centuries-long challenge for humanity, and a focus of popular histories and legends since the beginning of time. They are thus of high public interest, which is the baseline for effective communication.

In view of the needs assessment and the consequent value proposition, the consortium will conduct – in cooperation with the partner municipalities – interviews, surveys, focus groups, and design thinking workshops, which will all deeply enrich the understanding of value proposition and the success of the project.

3.2. Stakeholder Map – First Draft

	National and Local Bodies	NGOs	Academic / Scientific Community	Similar Projects	European Citizens
Monitoring	• Prepare risk management policies. • Production of data for policymaking	• Prepare action and post-disaster support more efficiently. • Production of data for support programmes	• Production of data for academic studies	• Production of spill-over effects • Production of data than can be used by similar projects	• Better protection of citizens • More studies in the area • More efficient support to NGO programmes
Awareness	• Joint awareness campaigns for citizens • Prepare citizens for action. • More efficient action and risk management	• Joint awareness campaigns for citizens • Connect NGOs to **ArtEmis'** powerful network	• Collaboration with academic partners for factual scientific-based awareness campaigns	• Joint efforts can be gathered by **ArtEmis** and similar projects to conduct awareness campaigns. • Connection to consortium	• Awareness campaigns will benefit European citizens. • Awareness campaigns will contribute to mitigate the negative effects of earthquakes
Use of Data	• Data/science-based policy to be more efficient. • Better risk management • Data-based awareness campaigns	• Data-based awareness campaigns • Build on joint data bases	• Use of data for new academic studies • Use of data for prediction studies and algorithm development	• Spill-over effects • Have access for the necessary data for their projects without relevant financial investment	• Increase acceptance of science • Increase factual and scientific-based learning. • Publication of the data for general access
Risk Management	• Better risk management • Better learning • Better preparedness	• Better risk management • Better learning • Better preparedness	• Better risk management • Better learning • Better preparedness	• Better risk management • Better learning • Better preparedness	• Better risk management • Better learning • Better preparedness

Figure 3: Stakeholder Map – Initial Draft

4. Communication and Dissemination Actions

Building on the strong communication function and networks of the **ArtEmis** partners, different communication and dissemination channels will be identified, designed, and used to ensure the effective dissemination of the results, and new sensors/network to the public, followed by more scientific information provided to the scientific and academic community, to gain acceptance and support.

4.1. Communication Goals and Objectives

The selected communication and dissemination channels will be used to reach out to other important stakeholders, such as potential NGOs and citizen groups focused on dealing with threats to health and security, involving key opinion leaders, newspapers, and magazines, among others.

Considering innovative ways to monitor and communicate on earthquakes, alternative communication channels will be considered and revised after the first year of implementation, to reflect and incorporate first experiences with regards to channels used for communication, feedback, and networking.

To reach the diverse audience groups with different communication preferences, as well as varied access to electronic media and internet, multiple channels for communication and dissemination at the interpersonal and virtual levels will be considered.

In summary, the aim of the Communication and Dissemination strategy will be to ensure effective contact between **ArtEmis** and the targeted stakeholders, providing efficient interaction and communication between the different parts, to gain their acceptance and support, and also promote the Horizon Europe programme, that supports such innovative and interesting new ways, that are so needed in this area.

4.2. Communication Tools

Website

The **ArtEmis** website (www.artemisproject.eu/) will serve to easily and timely inform partners, and interested parties and stakeholders on the projects updates, progress and other relevant information. The site is live since December 2022.

The website is in English and divided into ***five*** major sections: ***About the Project***, ***Events and News***, ***Partners***, ***Contact***, and ***Internal***, making navigation through the website very easy and intuitive, and the information easily accessible.

In the section ***About the Project***, **ArtEmis** is briefly presented and characterised by three key elements: its **context, objectives,** and the expected **impact**. Info on the project includes **Partners** and **Work packages**, an ***Events and News*** section provides updates on activities, and also list past events. It will serve as a tool for involving the stakeholders in the project's activities. ***Contact*** allows the interested to get in touch with the team, while ***Internal*** is reserved for the consortium members for internal communication exchange on the different working streams and Work Packages; this will support internal cohesion and efficient communication.

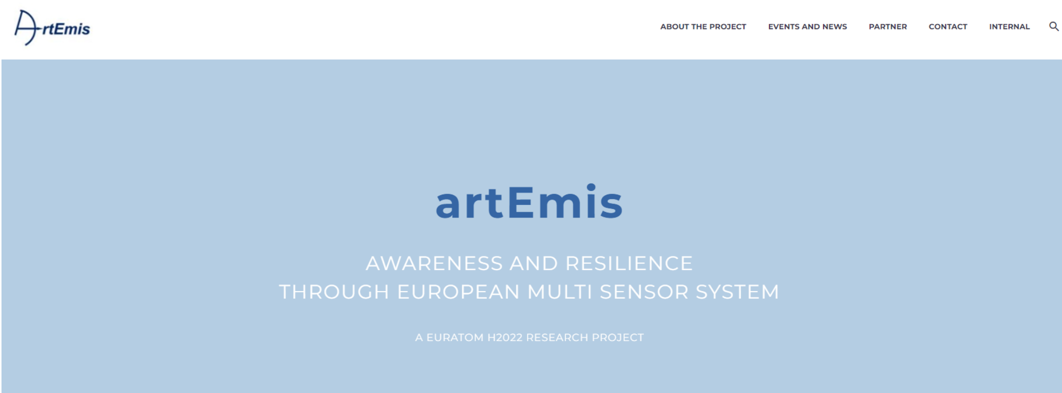


Figure 4: ArtEmis website

Social Media

Numerous types of online communication tools are available, and each having its own specific advantages and disadvantages. While it might not always be suitable for all target groups, the increased presence of **ArtEmis** on social networks and platforms will foster the awareness of **ArtEmis** and reach communities impacted by the project, currently and in the future. Therefore, communicating content in a consistent way via social media is an important marketing action. The consortium will use **ArtEmis'** channels in parallel with the social media channels of the consortium partners, the institutional and the personal ones, starting with **Twitter** and the possibility of expanding to other channels such as **LinkedIn** and **Instagram**. This will be done in a continuous way, to communicate on progress, but also to reach out for the involvement of citizens and others, promote further research, share inspirational stories and/or social activities, as well as introduce testimonials and members of the team, among others. The channels will focus on promotion of the funding by EU Horizon Europe, the **ArtEmis** project, its study advances, and its events. Once the **sensors** are launched as a product, the established channels will be used for promotion.

Face to Face Conversation: Events and Meetings

Conferences will be the place to share the project's progress in the academic and policy community, and they also allow for personal contact between experts and stakeholders. **ArtEmis** partner institutions have their events and meetings and attend respective conferences in their field; these will be used to present, exchange and promote the project and its results, and to discuss the idea of building an **ArtEmis** earthquake monitoring network. A general **ArtEmis** description, and different **updated general notes** reviewed by the relevant partners, will facilitate the partners in their communication activities.

Newsletters

Email newsletters sent to target audiences and 'friends of ArtEmis', are efficient tools to keep these audiences informed and updated on relevant project progress, events, marketing campaigns. The newsletters can be distributed to a broader audience, while in the first phase, the newsletter's main goal will be to strengthen the communication within the **ArtEmis** network. Beyond the consortium, the main target will be the scientific community, sharing important updates, relevant information. KTH /EB and other partners will create the content while IESE will do editing, SINTEC the upload to the Webpage and KTH takes care of the distribution (project mailing list). Partners will propose on further outreach and target audiences.

Newspapers and Magazines

ArtEmis will communicate and disseminate to both the academic/scientific community and the general public. Channels include scientific magazines and newspapers related to seismic activity, risk management, natural disaster, and on the other side newspapers and magazines directed at the general public.

The beneficiaries can submit articles to peer-reviewed journals or present communications at conferences on the studies they perform in **ArtEmis**.

4.3. Publication Policy

Any public representation, publication or presentation of the project results should report the following disclaimer: "*Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them*."

Unless otherwise agreed with the granting authority, communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant **must acknowledge EU support and display the European flag (emblem) and funding statement** (translated into local languages, where appropriate), as in one of the versions shown in article 17.2 of the Grant Agreement. The emblem must remain distinct and separate and cannot be modified by adding other visual marks, brands or text.

For presentations, it is strongly recommended that the **ArtEmis** PowerPoint presentation template is used. But **the minimum requirement is to use the ArtEmis logo, the European flag and the acknowledgement of funding.** In any case, publications need to be approved by all project's beneficiaries. The rules for property rights are reported in the Consortium Agreement.

Prior notice of any planned publication, communication at conferences or workshops or submission of PhD manuscript shall be given in written form to the other Parties at least 30 calendar days before the submission of publication, abstract at the conference or workshop or PhD manuscript. The notice should report a short abstract of the publication, the indication of all the contributors and the details of the publisher/conference etc. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Co-ordinator and to the Party or Parties proposing the dissemination within 21 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

4.4. Communication Action Plan

	M1	*M6*	*M12*	*M18*	*M24*	*M30*	*M36*	*M42*	*M48*
Communication and Dissemination Actions									

Figure 5: Communication and Dissemination Action Plan timeline

Initial activities carried out in the first two months (2022)

- A first draft ***stakeholder map*** identified, it specifies the target groups for the communication activities and corresponding key messages.
- The ***website*** was launched in December, to update on the progress of the project and the respective Work Packages.
- Design and present **ArtEmis'** Communication and Dissemination Plan.

Further current activities to be started in 2023

- create a ***Twitter-account*** for **ArtEmis**, and a plan for optimal dissemination of the account, in accordance with *Annex 1*. This will be initiated by IESE, and further managed by KTH.
- Use the platform ***MailChimp*** to develop and publish the periodic newsletter, initiated by IESE.
- IESE will support and encourage the elaboration by partners of scientific articles on different aspects of **ArtEmis** its results and experiences to be published in scientific magazines, journals and websites.
- Maintain a presence at **international conferences and events**. Establish and agenda/calendar of possible conferences and events where **ArtEmis** should be present, taking up ideas from all partners. Support in preparing general material for these conferences.
- Keep the website continuously updated, in accordance with the progress of the project.

5. Build the ArtEmis Network

A world leading effective and efficient system to be implemented Europe wide, being industrially oriented, driven and jointly owned by the public and private institutions, open to the public via a web-based platform and mobile applications. In order to achieve that, alongside the technology development, the involvement of all stakeholders will be paramount and viable business concepts need to be developed in a sustainable way.

We plan to establish a sustainable **ArtEmis** Network, to continue the work beyond the end of the EU funding. An important task will be to develop a business concept, in close collaboration with the partners in the municipalities and regions, involving different actors and stakeholders across multiple areas of society (academia, scientifical community, social sector, public sector, the general population, etc.). A sound needs assessment will be the basis of the value proposition for different members of the network, and the design of services to cater for these needs. Further will we consider extending to new partners and build synergies with similar projects and their partners (e.g. Horizon Europe Project *"CORE"*, Horizon Europe *"RISE"*, Horizon 2020 *"SERA"* project, Horizon 2020 *"TURNkey"*).

5.1. Networking Objectives and Goals

The broader objectives and goals of the **ArtEmis** activities include engaging with municipalities regions and other stakeholders to build a strong Network **ArtEmis** Community, that we will, based on the results of the project, a sustainable way for earthquake forecasting through the monitoring radon in ground water, in a sustainable way. The raising awareness with the public, municipalities, other actors and stakeholders, as well as potential sponsors will be essential element of the future **ArtEmis** network, with a pan-European, or even international scope, and its capabilities and services.. Furthermore, networking with other stakeholders such as the academic/scientific community, NGOs, and similar problems will support the expansion of the **ArtEmis** network, as well as the development of further synergies to reinforce its future sustainability.

5.2. Engagement with Municipalities / Regions

External interactions and networking, including collaboration with local authorities and public integration, aim to increase awareness of **ArtEmis** and understand the crisis management process, and the authorities' tools for preventing/mitigating the impact of natural disasters. The needs assessment in collaboration with the partners, will help to prepare a sound business concept for the future **ArtEmis Network.**

Engagement with municipalities/regions will allow to build strong collaboration and support the raising awareness and public and private engagement of their stakeholders, actors and general public.

- Supporting trust building between public authorities and citizens – exchanging partners' experience.
- Fostering partnerships with relevant bodies within the municipality (such as schools).
- Developing relevant awareness information/risk awareness for the public.
- Supporting the development of civil protection communication guidelines for future national disasters.
- Increase private collaboration.

5.3. Engagement with Other Stakeholders

All relevant stakeholders, the academic/scientific community, NGOs and similar, will be an important element of the **ArtEmis** network**,** expanding beyond the current partners gaining new interest, identify synergies will be essential for the network's sustainability. As the projects proceeds, **ArtEmis** will share its results widely, to gain new partners, will actively link with other relevant initiatives, institutions, and actors at the local/national, European, and global level. These networking actions aim to create a strong community around **ArtEmis**, involving scientific/academic stakeholders, other EU initiatives, and the scientific and policy community, involving all potential interested user groups.

5.4. Design the Business Concept for a Sustainable **ArtEmis** Network

The **ArtEmis Networks** design will address the pivotal challenges such as the design, implementation and operational conduct of earthquake early detection, also the fragmentation and redundancy of effort between sponsors, sites, and countries. It will provides a pan-European network that allows for optimisation of the conduction of earthquake detection, potentially through a single point of contact, expert advice, aligned processes, high quality standards and training. The ArtEmis network will assure its sustainability, through its active members, and the well and timely managed service provision. It will closely collaborate with the public authorities, NGOs and organisations relevant.

Based on the needs identified, and the value, network partners will see in the creation of the network, we will design a sound business concept for the **ArtEmis** Network, its value proposition, 'services' to be provided to potential 'clients', partners, costs, and funding sources post-EU funding, all the details of the Business Canvas.

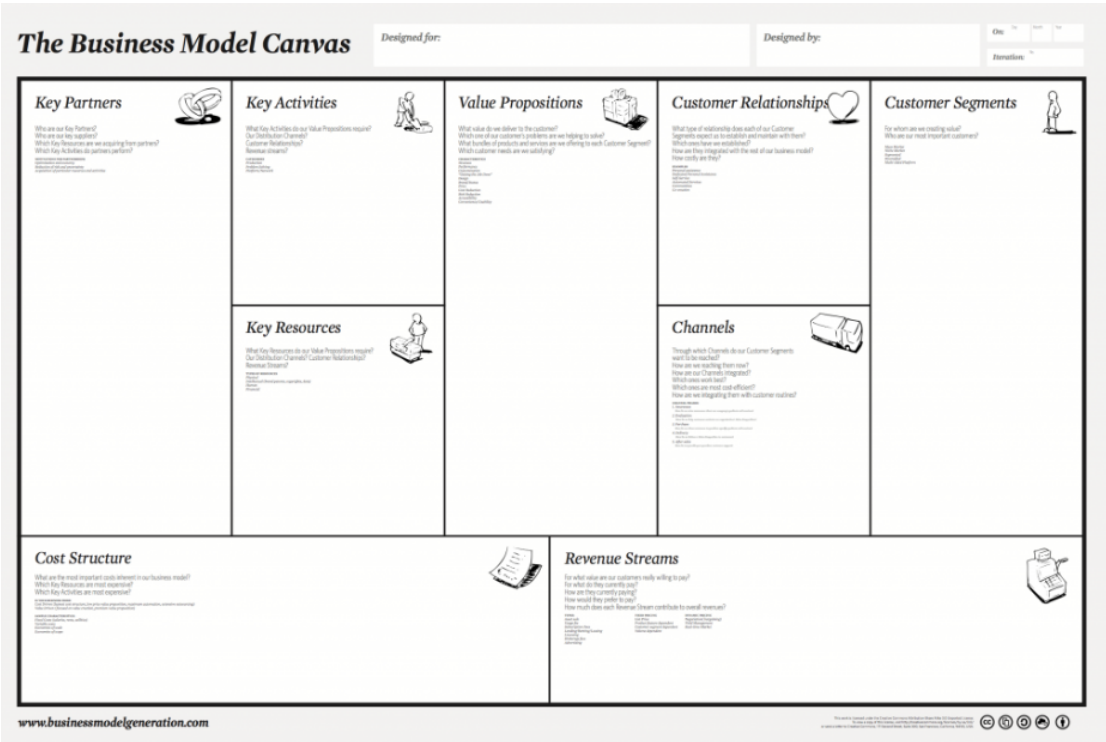


Figure 6 Business Model Canvas, Strategyzer, www.strategyzer.com/

In particular we will develop

- **Needs assessment**, of potential beneficiaries, and future services portfolio: based on a benchmarking exercise, we will define the '*market*', potential clients / partners (municipalities, regions, and others), assess their needs, provide strategic and operational support to future positioning, and service portfolio definition, while challenging added value and possible hidden opportunities.
- **Governance** and **operational set-up** of the new organisation.
- **Legal requirements**, financial needs, fee scheme and alternative ways of funding: we will develop strategic plans in view of different contracts/funding schemes and to identify appropriate form, aligned

with the business plan, main service, ethical consideration etc., in collaboration with a working group that will be created.

- **Development of a sound business** plan for the new network – joint outcomes, results and ideas from the previous tasks to join in order to form a comprehensive business plan for the Network: rationale, mission, vision, capacities, market positioning, revenue and expansion model, five years Net Present Value.
- **Methodology to assess financial viability** of services to be provided after EU funding. Long-term strategy. Cost Structure and Revenue Model. Fundraising activities.

5.5. Networking Action Plan

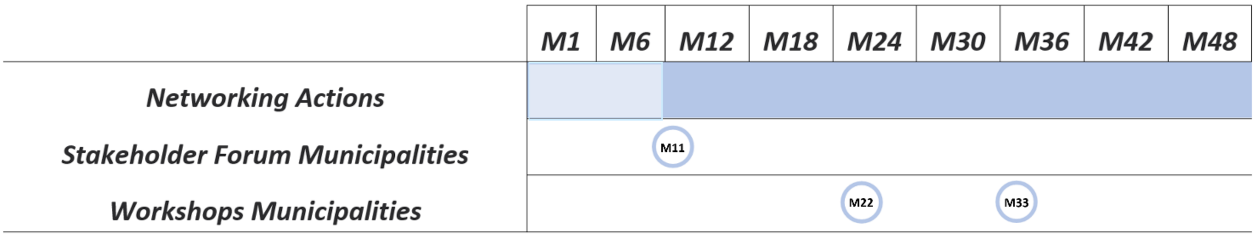


Figure 7: Networking Actions timeline

Initial activities carried out in the first two months (2022):

- Create a first ***stakeholder map***, to identify and specify the target groups for the networking activities and corresponding key objectives. Needs assessment. Initiated by IESE.
- Design and present **ArtEmis'** Communication and Dissemination Plan. Initiated by IESE.
- Carefully prepare engagement with the municipality, taking into account public management tools, such as the ones suggested by the World Bank[1], considering municipality readiness studies, feasibility studies, project concept assessments, or similar documents.

Further current activities to be started in 2023

- Conduct **meetings** with partners and other selected municipalities/regions to better understand the needs, identify shared values and common goals.
- Develop **joint action plans** with municipalities/regions in terms of communication, awareness, and civil response campaigns.
- Create cooperative events with municipalities, directed at the general public.
- Have a total **of 2 workshops** and **one webinar** (one per year, in year 2, 3 and 4) with partners, municipalities and regions, to further understand the challenges and assess the needs for information and communication. The initial workshop will follow a **stakeholder forum approach**, where different tools like focus groups might be used to conduct an interactive meeting with the municipalities and assess their needs and takeaways from the project. The workshops are expected to take place in years 2 and 3 will be **fully fledged presential workshops**, approaching relevant topics yet to be decided by the municipalities and the Executive Board.
- Support consortium partners to foster ties with relevant stakeholders, linking the **ArtEmis** project to partners' networks and all relevant actors and stakeholders, increasing their interactions.
- Organise **the coordination and relations** with similar projects, e.g. Horizon Europe and other European and international initiatives.
- Maintain a presence at international conferences, events and matchmakings. Develop a calendar of possible matchmakings where **ArtEmis** should be present.
- Develop a **"Friends of ArtEmis"** list, targeting partners, future partners and external stakeholders who could cooperate with the project.

[1] https://www.worldbank.org/en/topic/publicprivatepartnerships

- Begin design the basis for a future ArtEmis Network

6. Exploitation Plan for Potential Start Up on Sensor Technology

	M1	M6	M12	M18	M24	M30	M36	M42	M48
Exploitation Actions									

Figure 8: Exploitation Actions timeline

The exploitation plan will be focused on the one hand on maximum sharing of the results of the **ArtEmis** studies, and on the other hand on ensuring the most efficient use of the solution created by the project. The exploitation activities will be in view of the creation of a start-up company on developed sensor / solution to allow for production and marketing, scaling and extension to all interested locations and institutions. The **ArtEmis** Sensor System includes a large number of scalable, smart sensors to be promoted well beyond the geographical extension of the project and will study the future marketing possibilities of the sensor technology developed under the **ArtEmis** project.

6.1. Exploitation Objectives and Goals

Actions will include the review of the business model and market access strategy.

- **Strategic Context:**
  - Define the needs / challenges of different 'clients' their problems, business need and mission.
  - Define external and internal factors that influence the business mission (organizational factors among partners, policy, demographics, society, technology, regulatory, etc.)
  - **SWOT analysis** of the business opportunity
- **Analysis of Stakeholders' Needs:**
  - Mapping of the actors related/interested/affected by the intervention.
  - Definition of the Value Proposition of the Sensor technology / solution to different stakeholders and potential clients
  - Assessment of willingness to pay and by whom (municipality, etc.)
  - Definition of potential customers/users – customer segmentation
- **Overview of Market trends and market segmentation:**
  - Analysis of end-users' needs.
  - Market segmentation and quantification
  - Analysis of potential competitors
  - Definition of Business Added Value and competitive advantage.
  - Financial modelling
- **Assessing Funding Sources**
  - Analysis of potential public funding
  - Review of best practices for similar interventions in other settings / countries
  - Assess needs /actions to allow for inclusions / incentives, other issues to consider.
  - Assess potential of Innovative financing schemes
- **Definition of Business Case**

  The definition of the business model canvas will be defined through work with project partners. Main decision will affect the following topics:
  - Channels of distribution
  - Revenue streams
  - Cost structures, Plan of Investment, Pricing strategy, Return on Investment
  - Customers relationship

   - Strategic alliances, marketing and processes strategy, etc.
- **Strategy on IPR and licensing agreements among partners:**
  Each partner will elaborate its own exploitation expectations. License agreements will be defined among partners for the constitution of a new SME, start-up, spin-off, or the case of the extension of the product portfolio of one of the project's partners.

The exploitation activities will be specially focused on the development of the start-up on sensor technology and the solution concept with the aim to offers a high impact on multiple areas of society. Developing a start up on sensor technology would allow **ArtEmis** to:

- Reach a higher level of impact geographically and in depth. .
- Develop new synergies with other projects, initiatives and industries.
- Develop new uses of the technology developed under ArtEmis not previously considered.
- Have the possibility of increasing profit and achieving financial sustainability post-EU funding.

6.2. Market Analysis and Target Clients

Private citizens, public/national bodies, especially those living in risk areas, could be interested in having access to real-time data regarding radon, temperature, acidity, and other observables in ground water due to its relationship with earthquakes.

In addition, the market for real-time monitoring of ground water observables is growing due to increasing concerns about water quality and the health risks associated with exposure to contaminants like radon. Therefore, there are multiple interested parties who could be identified as direct or indirect target clients, such as:

- **Municipalities and Water Utilities:** Municipalities and water utilities are responsible for providing safe and clean water to their residents. Our sensor system can help them monitor water quality in real time and detect potential sources of contamination, enabling them to take proactive measures to protect public health.
- **Industrial Companies:** Industrial companies that rely on ground water for their operations, such as manufacturing and mining, need to monitor water quality to comply with environmental regulations and ensure the safety of their employees. Our sensor system can help them detect potential contaminants in real time and implement appropriate remedy measures.
- **Agricultural Companies:** Agriculture is one of the largest consumers of ground water resources. Farmers and agricultural companies can use our sensor system to monitor the quality of irrigation water and detect potential sources of contamination, enabling them to optimise crop yields and protect the environment.

Radon is a leading cause of lung cancer, and even though the presence of radon in the water does not present a direct danger to health, the presence of radon in ground water can lead to the absorption of radon from the bedrock material, through the soil, into the air. While in outdoor spaces, the radon tends to get diluted in the air and does not pose any danger, whereas in indoor spaces the presence of radon even in moderate concentrations poses high health risks.

Figure 9: Radon absorption[2]

Therefore, indirect target clients might be related to real estate and related industries:

- **Homeowners:** Radon is a leading cause of lung cancer, and exposure to high levels of radon in ground water can lead to serious health risks. Homeowners can use our sensor system to monitor radon levels in their houses/regions, and take appropriate measures to reduce exposure to radon.
- **Real Estate Agents:** Real estate agents and home inspectors can use our sensor system to help homebuyers make informed decisions about the safety of the homes they are considering purchasing, and the regions where they are located.
- **Industry/City Planners**: City planners, or private planners involved in infrastructure construction, can help policymakers or investors make informed decisions about the safety of the buildings they are considering constructing, and the regions where they are located.

In summary, a scalable start up that exploits a sensor system for monitoring radon, temperature, acidity, and other observables in ground water in real time has a promising market with a wide range of potential clients, including municipalities, water utilities, industrial companies, agricultural companies, and homeowners. These and further possibilities need to be studied in greater detail. It might also be interesting to understand how the sensor developed by **ArtEmis** to assess ground water could be further adapted to studying other types of location, involving soil or air quality.

6.3. Recommendations for Launching

The tool used by the start up to provide the real-life monitoring information regarding monitoring radon, temperature, acidity, and other observables in ground water is under discussion.

One of the most interesting possibilities would be to launch an app that would give its users access to these real-life data.

Some recommendations for launching this app would be:

Key-step	Requirements	Potential barriers
Support from national authorities	To get support from national authorities to ensure the dissemination of the app. In high-risk regions, it could be interesting to study the possibility of the municipalities partially subsidising its acquisition	• Refusal from national authorities • Unsatisfactory benefit that does not justify the subsidy. • End-users will not pay for it

[2] https://www.iaea.org/newscenter/news/what-is-radon-and-how-are-we-exposed-to-it

Attractive functions	Maintain an interesting user interface and functions that are attractive for the end-users. Mobile applications become rapidly out-dated. It is important to keep the app constantly updated	• Offer is not attractive enough for end-users. • End-users do not use the app
Trust	The app has to gain the trust of its end-users, by partnering with trustworthy institutions. Keeping scientific accuracy will be essential for end-users to keep their trust in the app	• Occurrence of measurement mistakes • Occurrence of adverse events
Accessibility	The app should be available for all risk areas in Europe at least in Google Store and Apple Store	• Software difficulties • Additional costs

Figure 10: Recommendations for Launching ArtEmis App

7. Summary of communication, dissemination and exploitation activities

The ARTEMIS project is a pioneering initiative with multifaceted objectives aimed at bolstering societal resilience and fostering widespread engagement. Primarily, the project endeavors to riase general interest and awareness in the benefits of measuring radon in groundwater. During the project, the team will seek to raise interest from municipalities and civil society in the project and multi-sensor system it is developing. Additionally, ARTEMIS aims to cultivate academic interest across various disciplines, positioning itself as an authoritative hub in earthquake prevention and sensor technology. By establishing itself as an expert network, ARTEMIS aims to gain recognition from communities where its devices and alert systems are deployed. Through innovative outreach strategies, the team will collaborate with diverse stakeholders and transversal sectors within society while championing initiatives like Horizon Europe, thus catalysing broader socio-scientific progress.

The Communication / Dissemination / Exploitation plan consists of three blocks of efforts: (i) Communication and Dissemination; (ii) Networking; and (iii) Exploitation.

During the entire length of the project, the **Communication and Dissemination** actions will focus on building good exchange between the project and the targeted stakeholders. Activities will include publication of website and newsletters. **Networking activities** will begin in year 2 onwards until the end of the project and will include the following activities:

- Monitoring opportunities such as scientific conferences or other events to showcase results from the project and creating a calendar of possible matchmakings where the project should be present.
- Stakeholder identification and mapping (update every year)
- stakeholder engagement, readiness and feasibility studies
- internal meetings and interviews with municipalities
- Develop joint action plans with municipalities/regions in terms of communication, awareness, and civil response campaigns.
- Support in the creation of cooperative events with municipalities, directed at the general public.
- 2 presential stakeholder workshops. During the first workshop a value proposition design for sensitive communication will be conducted with stakeholders.
- 1 webinar for wider external stakeholders, schools and universities
- “Friends of ArtEmis” list, targeting partners, future partners and external stakeholders who could cooperate with the project.

Exploitation actions, during year 3, will focus on maximising use of the project's results to achieve greatest societal impact. Activities will include:

Awareness of ArtEmis project and the usefulness of Radon measurements for early warning

- Strategic analysis of needs and challenges of different clients, external and internal factors
- Stakeholder needs analysis in terms of sustainability of project results.

Creation of ArtEmis network, business concept, scaling and sustainability

- Value proposition design
- Business model exploration and willingness to pay
- Overview of Market trends and market segmentation:
- Assessing Funding Sources
- Definition of Business Case and revenue streams
- Strategy on IPR and licensing agreements among partners
- Exploration of products such as an app

Stakeholder Engagement KPIs

Within each phase, the team foresee reaching and engaging with the following stakeholders in Figure 11:

External Stakeholder	Purpose	Methods	KPIs
Municipality Kefalonia (Ionian islands) (Pop. 36,000)	Raise awareness, understand their challenges	Focus groups and participation in at least 3 workshops	Increase in public awareness at local population level
Municipality Lefkada (Ionian islands) (Pop. 8,600)	Raise awareness, understand their challenges	Focus groups and participation in at least 3 workshops	Increase in public awareness at local population level
Municipality Valais (Pop. 348,000)	Raise awareness, understand their challenges	Focus groups and participation in at least 3 workshops	Increase in public awareness at local population level
Municipality Bedretto (Pop. 102)	Raise awareness, understand their challenges	Focus groups and participation in at least 3 workshops	Increase in public awareness at local population level
Municipality L'Aquila (Pop. 1,200,000)	Raise awareness, understand their challenges	Focus groups and participation in at least 3 workshops	Increase in public awareness at local population level
Civil protection agencies	Raise awareness, understand their challenges	Focus groups and participation in at least 1 workshop	Increase in awareness of 10-15 civil protection agencies
External experts inc. social science	Share learnings and explore collaborative opportunities to add to knowledge base	Invitation to at least 3 workshops and planned webinars	Increase in awareness and knowledge of 10-15 experts
Schools & universities	Raise awareness	Presentation at the schools and engagement with students	Increase in awareness at 5 schools and 5 univeristies

Figure 11: List of stakeholders and KPIs

ArtEmis Network Creation KPIs

Along the project, the team foresee actions in view of the creation of the network in Figure 12:

Task	Purpose	Methods	KPIs
ArtEmis Network creation	Raise interest in ArtEmis beyond partners	Focus groups, Conferences, direct approaching	Increase interest in the ArtEmis Network, gaining of (5 new) partners beyond project partners
Radon measurement implementation	Gaining new sites / possibilities	Focus groups, Conferences, direct approaching	Gaining installation for radon sensors (10 new)
ArtEmis Network Business Concept and functions	Establishment of network procedures and functioning	Focus groups and participation in at least 3 workshops	Business concept developed and network established.

Figure 12 List ArtEmis Network creation KPIs

8. Conclusions

ArtEmis communication and dissemination has begun, the **website** is launched, and the communication strategy designed.

The **ArtEmis** project will benefit from strong communication and dissemination actions, building on existing communication functions of the projects partners and actively supported by them.

Target groups will be identified in collaboration with partners, while focus groups and design thinking workshops allow to assess the needs, foster citizens' involvement, ensure community acceptance and ownership, and provide guidance for further project actions. Different online and presentational channels will serve for communication and dissemination of scientific articles.

One aim is to strengthen the **ArtEmis Network** as a **network for earthquake monitoring and warning** with all partners, with a sound **sustainability concept**.

It will then be seen as to whether and how the developed **sensors** and **solution** can be commercialised and manufactured. The idea is to create a **startup**, with a sound **business concept**.

In the following year, the collaboration of the consortium should build on the work already prepared and created. The objective of establishing **ArtEmis**' presence in multiple marketing channels is a priority, for boosting knowledge of the solution with the participating municipalities, targeted stakeholders, and the general public.

Annexes

Annex 1 Twitter Publication Policy

	Twitter
Target audience	• Citizens, Municipalities, Scientific / Academic community, NGOs, similar projects; other relevant stakeholders
Posting schedule	• In accordance with the EB agenda • When the EB considers relevant to share new updates and information with the public
Type of content	• General information about the project • Sharing of scientific content related to the project • Communication of results and progress in the study • Scientific content created by the project • Content that is considered relevant by the EB
Publication policy	• The communication of results, progress or scientific content created by the project should only be published after approval from the EB. It is important to remember that while the communication about **ArtEmis** does not bear any reach by itself, the communication regarding radon levels is more sensitive and demands specialised opinions
Approval / Revision policy	• Scientific communication should be approved by the EB. • In case of time constraints, the approval of the PI of the project might be enough

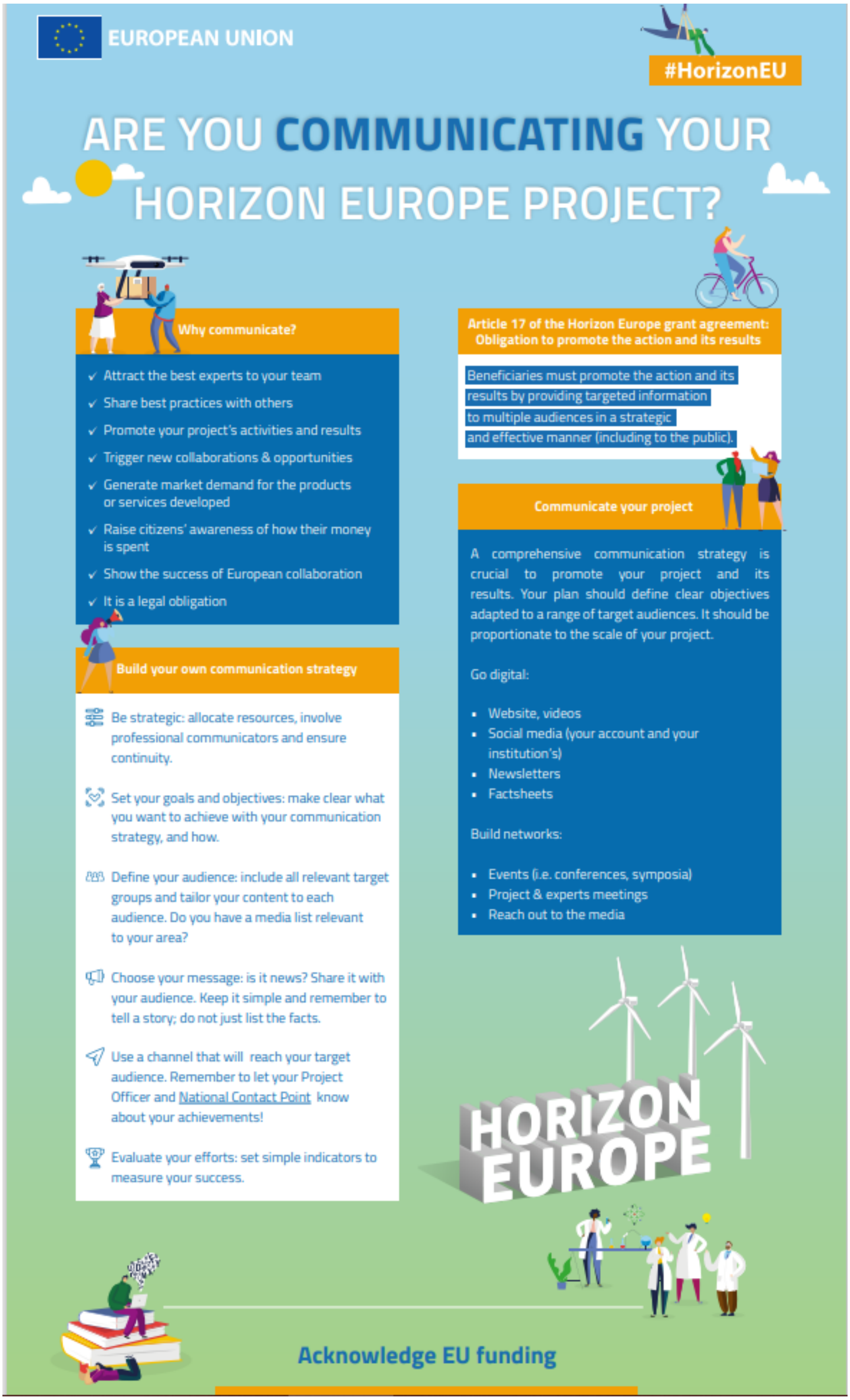
Annex 2 Identity Manual

Social Media Logo:

Palette:

Font:
Arial Black Bold Italic

Annex 3 Horizon Europe Communication Guidelines




Acknowledge EU funding
Article 17.2 of the Horizon Europe grant agreement:
Visibility - European flag and funding statement
Funded by the European Union
Co-funded by the European Union
Find guidance and download the EU emblem: https://europa.eu/!m83Myq
How can the European Research Executive Agency (REA) support you?
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European Research Executive Agency
ISBN: 978-92-95080-47-8
Catalog number: JW-07-22-776-EN-N
DOI: 10.2848/078892
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Annex 4 EU tools to respond to natural Disasters Report

STUDY

Requested by the REGI Committee

European Parliament

EU tools to respond to natural disasters

Regional Development

Policy Department for Structural and Cohesion Policies
Directorate-General for Internal Policies
PE 699.637 - May 2022

EN